

Facsimile

Mackenzie Valley Environmental Impact Review Board

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| Ranjitt Soniassy, DIAND | | 669-2701 |

From: Luciano Azzolini, EAO

Pages: including this cover

Date: Thursday, July 26, 2001

File: EA01-002

Subject: Environmental Assessments - Prairie Creek Mine

- Phase II Mineral Exploration Drilling Program (MVEIRB File EA01-003)
- Metallurgical Pilot Plant Program and Underground Decline and Exploration Drilling (MVEIRB File EA01-002)

The Mackenzie Valley Environmental Impact Review Board (Review Board or Board) authorized three Information Requests (IRs) prepared by the Government of the Northwest Territories (GNWT) and 10 Information Requests prepared by the Department of Indian and Northern Affairs Canada (INAC) for the CZN environmental assessments (EAs). In addition, on July 16, 2001, the Review Board endorsed two Information Requests prepared by the Canadian Parks and Wilderness Society (CPAWS) to INAC for

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From.....

MVEIRB
P.O. Box 938
Yellowknife, NT X1A 2N7
Phone (867) 873-9189
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41-

the CZN EAs. They are all attached.

The Review Board will distribute its amended work plan for the two CZN EAs after getting comments from CZN regarding government's suggested changes to the existing work plan. The amended work plan will let everyone know when responses to all IRs are due. However, please do not wait for the Review Board to issue an amended work plan before responding to the IRs. Please respond to the IRs, as soon as reasonably possible, as the Review Board has indicated it wants to undertake the EAs in an efficient and timely manner.

I have taken the liberty of attaching an electronic copy of Mr. Christensen's letter dated July 28, 2001 regarding CZN's letter dated July 13, 2001. If there are any questions regarding the attached IRs please call me. Thank you.

Sincerely,

Luciano Azzolini,
Environmental Assessment Officer,
Mackenzie Valley Environmental Impact Review Board,
Box 938, Yellowknife, NT. X1A 2N7
Phone (867) 873-9189; Fax 920-4761;
mveirb.nt.ca

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From.....

MVEIRB
P.O. Box 938
Yellowknife, NT X1A 2N7
Phone (867) 873-9189
Fax (867) 920-4761

Environmental Assessment - Technical Review Information Request #1

**Canadian Zinc Corporation Prairie Creek Project
Decline Development, Exploration Drilling, and Metallurgical Pilot Plant Program**

Date: 20 July 2001

From: Ranjit Soniassy, Environmental Scientist
Department of Indian Affairs & Northern Development (DIAND)

Phone: 867-669-2591

Fax: 867-669-2701

email: soniassy@inac.gc.ca

Subject: Tailings Containment Area

Objective: To ensure integrity of the tailings pond. The tailings pond must be shown to be capable of containing the waste water that will be placed there.

Time Limits: Require information as soon as possible, to meet MVEIRB Environmental Assessment schedule.

Reference: EA Documents provided by proponent.

Preamble: The water management plan for the Pilot Plant is to dispose of about 4000 m³ of waste water in the tailings pond that was constructed in 1982 but never used. The chemical contaminants are unknown at this time. Mine water from the decline development will also be disposed of in the tailings pond. At the rates provided in the document, there is potentially another 67,500 m³ of water that may be diverted into the old tailings pond.

There have been concerns raised in the past regarding the integrity of the tailings pond: the clay liner has apparently been reported to be cracked, the synthetic liner is exposed to the weather and may have deteriorated, the upslope area has slumped into the pond and the containment dams along Prairie Creek have experienced some degree of erosion during normal high water events. A geotechnical survey of the tailings containment area was commissioned by San Andreas Resources in 1994 or 1995 which pointed out problems and deficiencies with the engineering. An assessment of the structure with respect to probable maximum floods was apparently done prior to construction of the dams in 1982.

Request: An updated report by qualified geotechnical engineers is required which includes assessment of the integrity of the tailings containment area and any recommendations for rehabilitation of the impoundment dam and pond liners. Also requested is a schedule for implementation of any rehabilitation measures proposed for the impoundment dam and pond liners before the pond is used for the disposal of contaminated water. An update of this with data from the Prairie Creek gauge (1974 to 1990) is required to verify the ability of the dams to withstand expected storm events. Recent water level data for the tailings pond and adjacent Prairie Creek is also required in support of the above assessment.

Environmental Assessment - Technical Review Information Request # 2

Canadian Zinc Corporation Prairie Creek Project

Decline Development, Exploration Drilling, and Metallurgical Pilot Plant Program

Date: 20 July 2001

From: Ranjit Soniassy, Environmental Scientist
Department of Indian Affairs & Northern Development (DIAND)

Phone: 867-669-2591

Fax: 867-669-2701

email: soniassy@inac.gc.ca

Subject: Groundwater flows in the decline and through the flood plain under the mine site.

Objective: To ensure that groundwater flows are understood and properly dealt with.

Time Limits: Require information as soon as possible, to meet MVEIRB Environmental Assessment schedule.

Reference: EA Documents provided by proponent.

Preamble: The groundwater flows given for the 870m level adit suggest that throughout a summer about 67,500 m³ of groundwater can issue from this adit 20m above the 850m elevation of the mine site, which suggests that the adit intersected a seasonally perched aquifer. The proposed decline from the 905m level will descend to near the 825m level approximately 1460 m upstream of the mouth of Harrison Creek, where a greater hydraulic head may be encountered which is likely to produce greater flows than at the 870m level if the decline intersects a similar aquifer. The report also states that the probability of sump failure in the decline is "low" and the consequences of failure would be "small" volumes of "water and suspended solids", to "max. 50 gals.", which are "unlikely to migrate much beyond drill pad". A flow rate of 0.5 m³/min will yield 50 U.S. gals. in 2.5 minutes, and can potentially flood the end of a 15% decline (2.3m high by 3m wide) to the ceiling and 15m along its length in 1 hour.

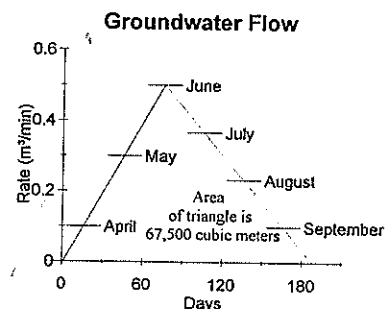


Figure 1. Total groundwater volume is the integral of flow rate times the duration of flow.

Well and pump hose No.1 on the flood plain mine site are also a source of data for deriving hydraulic conductivity of the sands and gravels which underlie the tailings pond.

Request: A statement is required of intent to monitor and report the rate of groundwater flow encountered in the decline, and to commission pumps capable of handling the flow, with sufficient backup pumps in the event of pump failure(s). Also requested is an analysis of the hydraulic conductivity of the flood plain sands and gravels using draw-down and pumping-volume data from well and pump hose No. 1, and information on what treatment of the tailings impoundment will be undertaken to counteract this hydraulic conductivity.

Environmental Assessment - Technical Review Information Request # 3

**Canadian Zinc Corporation Prairie Creek Project
Metallurgical Pilot Plant Program**

Date: 20 July 2001

From: Ranjit Soniassy, Environmental Scientist
Department of Indian Affairs & Northern Development (DIAND)

Phone: 867-669-2591
Fax: 867-669-2701
email: soniassy@inac.gc.ca

Subject: Water quality in the Tailings Area

Objective: To better understand project impacts on downstream water quality.

Time Limits: Require information as soon as possible, to meet MVEIRB Environmental Assessment schedule.

Reference: EA Documents provided by proponent.

Preamble: The water management plan for the Pilot Plant is to dispose of about 4000 m³ of waste water in the tailings pond that was constructed in 1982. Although they have provided a list of possible reagents to be used in processing, CZN has not given any information on the predicted quality of effluent from the pilot plant. It is stated that the effluent will be held in the plant pending testing and/or treatment, then released to the tailings area. No data is provided regarding the quality of the water in the existing tailings area or the expected performance of the tailings containment system. CZN states that the effluent from this program will be diluted by a factor of 50:1, but this figure is meaningless without knowing the quality of the existing liquid in the tailings area and the predicted quality of the effluent. It is stated that there will be negligible impacts on the water quality of Harrison Creek, Prairie Creek and the South Nahanni, but this is not justified by comparing actual data with guidelines for the protection of aquatic life.

Request: CZN is asked to provide all current information which exists about the water quality of the existing liquid in the tailings area. CZN should also provide an assessment of the predicted quality of the effluent from the pilot plant and the expected performance of the tailings area in treating this effluent. CZN is asked to identify the water quality standards or guidelines that they have used in reaching their conclusions of negligible impact on water quality.

Environmental Assessment - Technical Review Information Request # 4

**Canadian Zinc Corporation Prairie Creek Project
Metallurgical Pilot Plant Program**

Date: 20 July 2001

From: Ranjit Soniassy, Environmental Scientist
Department of Indian Affairs & Northern Development (DIAND)

Phone: 867-669-2591
Fax: 867-669-2701
email: soniassy@inac.gc.ca

Subject: Test work to be performed in this phase and the utility of the resulting information.

Objective: To better understand project impacts on downstream water quality.

Time Limits: Require information as soon as possible, to meet MVEIRB Environmental Assessment schedule.

Reference: EA Documents provided by proponent.

Preamble: It is stated that test work performed in this period would produce results representative of future conditions, should the mine proceed to production. However, there is little information regarding how the data from this phase will be collected and used. CZN mentions that they will be testing effluent from processing but does not identify which parameters they consider to be of concern. It is also stated that the representative tailings solids will be characterized using procedures including ABA and neutral pH metal leaching potential.

Request: The company should provide more detail as to which parameters will be examined in the examination of the effluent. CZN is asked to identify which specific ABA and Kinetic Tests will be used on the tailings solids, and the number of "representative" samples to be taken. The company is also asked if any further kinetic testing will be performed on waste rock or coarse ore with a NPR less than 4.

Environmental Assessment - Technical Review Information Request # 5

**Canadian Zinc Corporation Prairie Creek Project
Underground Decline Development and Exploration Drilling**

Date: 20 July 2001

From: Ranjit Soniassy, Environmental Scientist
Department of Indian Affairs & Northern Development (DIAND)

Phone: 867-669-2591
Fax: 867-669-2701
email: soniassy@inac.gc.ca

Subject: Minewater quality

Objective: To determine the quality of water that may be encountered in the decline.

Time Limits: Require information as soon as possible, to meet MVEIRB Environmental Assessment schedule.

Reference: EA Documents provided by proponent.

Preamble: Water is expected to be encountered during the development of this decline. The proponent has proposed that this water be disposed of in Harrison Creek, a tributary of Prairie Creek and ultimately, the South Nahanni River (National Park, Canadian Heritage River, UNESCO World Heritage Site). It is stated that the water quality of minewater is "expected to be typical" of the groundwater in the area.

Significant volumes of groundwater was encountered with previous underground developments and there has apparently been water flowing from the 870m adit on occasion ever since.

Request: CZN is asked to provide water chemistry data from previous mine water discharges so that the chemistry of the expected discharge can be assessed. In addition, please provide additional information about the proposed minewater sampling program.

Environmental Assessment - Technical Review Information Request # 6

**Canadian Zinc Corporation Prairie Creek Project
Underground Decline Development and Exploration Drilling**

Date: 20 July 2001

From: Ranjit Soniassy, Environmental Scientist
Department of Indian Affairs & Northern Development (DIAND)

Phone: 867-669-2591
Fax: 867-669-2701
email: soniassy@inac.gc.ca

Subject: Waste rock and ore drainage management

Objective: To determine the consideration given to potential runoff and seepage from waste rock and ore piles.

Time Limits: Require information as soon as possible, to meet MVEIRB Environmental Assessment schedule.

Reference: EA Documents provided by proponent.

Preamble: There is little information about the potential for seepage water contamination from the waste rock and coarse ore piles on surface. The proponent indicates that these materials have no acid generating potential, but this should be confirmed with operational monitoring; as well, the possibility of other contaminants leaching into the water remains.

There is not a collection system proposed for waste rock seepage and from the ABA testing performed on waste rock and ore it is assumed that no significant adverse impacts to the environment will occur.

Request: Please provide any historical water quality data for drainage from the surface ore stockpile and waste rock, as well as information regarding contingency plans for containment, monitoring and treatment should waste rock testing identify parameters that could cause deleterious surface runoff. Please include information on the design of containment sumps including that of the runoff settling pond and its control gates, what liners, sampling frequency and pumps are to be incorporated to contain, monitor and treat deleterious runoff.

Environmental Assessment – Technical Review Information Request # 7

**Canadian Zinc Corporation Prairie Creek Project
Underground Decline and Drilling and Metallurgical Pilot Plant Developments**

Date: July 20, 2001 to the Review Board

From: Ranjit Soniassy, Environmental Scientist
Department of Indian Affairs & Northern Development (DIAND)

Phone: 867-669-2591
Fax: 867-669-2701
email: soniassy@inac.gc.ca

Subject: South Nahanni water quality

Objective: To determine the applicability and relevance of the water quality data that CZN references in assessing the potential cumulative impacts to the South Nahanni River.

Time Limits: Require information as soon as possible, to meet MVEIRB Environmental Assessment schedule.

Reference: Page 36, fourth paragraph, and page 39, paragraphs three and four of the Environmental Assessment report for the Metallurgical Pilot Plant Program and page 33, fourth paragraph and page 36, paragraphs three and four of the Underground Decline Development and Exploration Drilling report.

Preamble: CZN utilized the results of the Environment Canada and Parks Canada water sampling program when assessing potential cumulative impacts to water quality in the South Nahanni River. The Environment Canada and Parks Canada study was initiated in 1988, which is 2 years after operations at the Cantung Tungsten Mine ceased in 1986. According to CZN's report, exploration at Howard's Pass was actively explored between 1972 and 1981, and in 2000. CZN did not indicate whether any operations took place between 1981 and 2000 in association with the Howard's Pass Project. According to this information, from 1986 to present, the only mining activity that took place in the Flat River and South Nahanni watershed was the drilling of 8 holes in 2000 at the Howard's Pass site. CZN also utilizes water quality data from the Surveillance Network Program associated with the Cantung Mine. This data was also collected following cessation of mining operations in 1986.

Request: Please provide:

- (a) Clarification regarding the operating schedules from 1986 to present at the Cantung Mine and Howard's Pass sites. Also include details regarding the activities undertaken;
- (b) Water quality data acquired as part of the Cantung mine operations prior to 1986 if available;
- (c) An analysis of the data limitations and uncertainties; (Substantiate why similar data would be expected when the Cantung Mine, Howard's Pass, and CZN projects are operating simultaneously).

Environmental Assessment – Technical Review Information Request # 8

**Canadian Zinc Corporation Prairie Creek Project
Underground Decline and Drilling and Metallurgical Pilot Plant Developments**

Date: July 20, 2001 to the Review Board

From: Ranjit Soniassy, Environmental Scientist
Department of Indian Affairs & Northern Development (DIAND)

Phone: 867-669-2591

Fax: 867-669-2701

email: soniassy@inac.gc.ca

Subject: Water Quality and Quantity Assessment.

Objective: Obtain clarification of water usage and discharge rates, and the projected water quality resulting from the decline and underground drilling programs.

Time Limits: Require information as soon as possible, to meet MVEIRB Environmental Assessment schedule.

Reference: Page 19, 20 and page 34 last paragraph of the Environmental Assessment Report for the Underground Decline Development and Exploration Drilling report.

Preamble: CZN indicates that de-watering of the underground workings will be required, but have not provided any estimates. CZN has provided estimates of groundwater flow at the 870 m level, but have not used this data to estimate the total volume of water to be discharged. CZN also does not provide any details regarding the chemical and physical characteristics of the discharge water. CZN indicates, without sufficient substantiation, that the discharge water should be typical of the local groundwater regime. CZN does not assess the impact of blasting and drilling operations on discharge water. CZN also does not provide estimates for water usage.

Request: Please provide:

- (a) Estimated discharge rates during underground decline development and exploration drilling ;
- (b) Estimated chemical and physical characteristics of discharge water (consider impacts from drilling operations and nitrogen loading from blasting operations);
- (c) Estimated water usage rates during underground decline development and exploration drilling.

Environmental Assessment – Technical Review Information Request # 9

**Canadian Zinc Corporation Prairie Creek Project
Underground Decline and Drilling and Metallurgical Pilot Plant Developments**

Date: July 20, 2001 to the Review Board

From: Ranjit Soniassy, Environmental Scientist
Department of Indian Affairs & Northern Development (DIAND)

Phone: 867-669-2591
Fax: 867-669-2701
email: soniassy@inac.gc.ca

Subject: Cumulative Effects Assessment.

Objective: Include consideration of all current and foreseeable CZN applications in the cumulative effects assessment.

Time Limits: Require information as soon as possible, to meet MVEIRB Environmental Assessment schedule.

Reference: Cumulative Impacts section, pages 32 to 44 of the Environmental Assessment (EA) Report for the Metallurgical Pilot Plant Program, and pages 29 to 43 of the Underground Decline Development and Exploration Drilling report.

Preamble: CZN's cumulative impact assessment sections in both reports do not take CZN's other applications into account when assessing potential impacts. For example, the cumulative impact section in the EA report for the Metallurgical Pilot Plant Program does not consider impacts associated with the Underground Decline Development and Exploration Drilling program and vice versa. The sections also do not consider the Phase I or II drilling programs, or the Cat Camp Fuel Recovery Program when assessing potential cumulative impacts

Request: Please provide:
(a) A revised cumulative impact assessment including consideration of all current and foreseeable CZN applications.

Environmental Assessment – Technical Review Information Request # 10

**Canadian Zinc Corporation Prairie Creek Project
Underground Decline and Drilling and Metallurgical Pilot Plant Developments**

Date: July 20, 2001 to the Review Board

From: Ranjit Soniassy, Environmental Scientist
Department of Indian Affairs & Northern Development (DIAND)

Phone: 867-669-2591
Fax: 867-669-2701
email: soniassy@inac.gc.ca

Subject: Cumulative Effects Assessment

Objective: To determine the applicability and relevance of the water quality data that CZN references in assessing the potential cumulative impacts to the South Nahanni River.

Time Limits: Require information as soon as possible, to meet MVEIRB Environmental Assessment schedule.

Reference: Page 7, first and second paragraphs of the Cumulative Impact Assessment for the Phase II Mineral Exploration Drilling Program at Prairie Creek Mine report.

Preamble: CZN utilized the results of the Environment Canada and Parks Canada water sampling program when assessing potential cumulative impacts to water quality in the South Nahanni River. The Environment Canada and Parks Canada study was initiated in 1988, which is 2 years after operations at the Cantung Tungsten Mine ceased in 1986. According to CZN's report, exploration at Howard's Pass was actively explored between 1972 and 1981, and in 2000. CZN did not indicate whether any operations took place between 1981 and 2000 in association with the Howard's Pass Project. According to this information, from 1986 to present, the only mining activity that took place in the Flat River and South Nahanni watershed was the drilling of 8 holes in 2000 at the Howard's Pass site. CZN also utilizes water quality data from the Surveillance Network Program associated with the Cantung Mine. This data was also collected following cessation of mining operations in 1986.

Request: Please provide:

- (a) Clarification regarding the operating schedules from 1986 to present at the Cantung Mine and Howard's Pass sites. Also include details regarding the activities undertaken;
- (b) Water quality data acquired as part of the Cantung mine operations prior to 1986 if available; and
- (c) An analysis of the data limitations and uncertainties; (Substantiate why similar data would be expected when the Cantung Mine, Howard's Pass, and CZN projects are operating simultaneously).

**Canadian Zinc Corporation Decline Development and Bulk Testing
Environmental Assessment**

Information Request # 1

Date: July 5, 2001

From: Lionel Marcinkoski, Government of the Northwest Territories, RWED
Environmental Protection Services.

Phone: 873-7654
Fax: 873-0221
Email: lionel_marcinkoski@gov.nt.ca

Subject: Alternatives to the proposed insitu pilot plant operation.

Objective: To permit a thorough assessment of the available alternatives to the proposed project

Time Limits: Information is required as soon as possible to permit review by RWED and other review agencies

Preamble: As a component of all resource projects RWED appreciates that Pilot Plant programs and testing are the requirements for financial investors and establishing assurance that the milling process will perform to the standards forecasted. In the Environmental Assessment documents submitted, no evaluation was conducted on the following alternatives:

1. A pilot plant operation based on a DRY milling process, which would create dry tailings that, could be disposed of underground, and should be investigated.
2. Bulk testing occurring at a similar mining operation such as the Cantung Mine or alternates in Canada. Note: on page 20 the reader does not understand the significance of this statement "Test work would not generate as representative results due to the inability to duplicate site conditions (ie. Use of site water); for these reasons this is not a viable alternative." This raises the concern is their some special characteristics of the Prairie Creek groundwater and process water, that we have not been advised of.
3. Stabilization of complete tailings streams liquids and solids as backfill in the underground mine.

Requests: Please provide an expanded discussion of these alternatives that demonstrates why they are not feasible from the perspective of Canadian Zinc.

**Canadian Zinc Decline Drilling and Pilot Plant
Environmental Assessment**

Information Request # 2

Date: July 5, 2001

From: Lionel Marcinkoski, Government of the Northwest Territories, RWED
Environmental Protection Services

Phone: 873-7654

Fax: 873-0221

Email: lionel_marcinkoski@gov.nt.ca

Time Limits: Require information as soon as possible, in order to meet MEIRB
Environmental Assessment schedule

Subject: Water Quality

Objective: To obtain further information regarding the management of mine water
during and after the development of the proposed decline.

Preamble: The Environmental Assessment Report submitted on June 21, 2001
for the underground decline development and exploration drilling program
does not demonstrate that the proponent has incorporated adequate
management of contaminated water in its project planning.

In the submission three sources of contaminated water will be discharged
to the environment;

1. Contaminated mine water (from surface or groundwater flows)
produced during the mine decline development and in the underground
exploration program.
2. Contaminated mine water that will result from the abandonment and
flooding of the underground workings, therefore contaminating
groundwater, which will enter the environment.
3. Seepage water contamination from the waste rock piles on surface.
The proponent indicates that these material have no acid generating
potential, but the possibility of other contaminants leaching into the
water remains.

The proponent in all three cases states that no significant adverse impacts
to the environment will occur. For the mine water, the option proposed for
mitigation is pumping/storage into the tailings containment area. No
collection system is proposed for waste rock seepage.

Requests: RWED requests information on the water quality monitoring program that is proposed for CZN, including sample frequency, parameters of interest, and QA/QC program. Details of the drainage collection systems for the underground development and surface waste rock piles are also requested.

Please note: this IR is similar one submitted by INAC. Please answer each accordingly and avoid duplication of responses.

Information Request # 3

Date: July 5, 2001

From: Lionel Marcinkoski, Government of the Northwest Territories, RWED
Environmental Protection Services.

Phone: 873-7654

Fax: 873-0221

Email: lionel_marcinkoski@gov.nt.ca

Subject: Predicted water quality in the tailings containment facility and for discharge to the environment

Objective: To permit a thorough assessment of the expected water quality impacts of the proposed development.

Time Limits: Information is required as soon as possible to permit review by RWED and other review agencies

Preamble: The Environment Assessment Report submitted by Canadian Zinc on June 21, 2001 for the Metallurgical Pilot Plant Program, (LUP application MV2001L2-0003), does not quantify the degree of contamination associated with the effluent discharge, and tailings waste impacts on the environment. The proponent has not discussed in detail the final disposal and abandonment/remediation plans for the byproducts of the Pilot Plant bulk test program.

Requests: RWED requests information on the following water quality issues:

- ◆ CNZ is asked to provide a discussion of the predicted geochemical characteristics of both the effluent water and tailings solids that will be produced as a result of the pilot plant process.
- ◆ The proponent is asked to research and provide information on effluent quality from other lead zinc mines with similar operating conditions, eg, Cantung, Polaris, Nanisivik, Pine Point.
- ◆ CZN is asked to discuss the water quality standards that they have used in reaching their determination that no adverse effects will occur as a result of the pilot plant development for the water volumes discussed on page 23 of the EAR. (e.g. Metal Mining Effluent Regulations, Canadian Council of Ministers of the Environment standards)
- ◆ Has proponent conducted acute toxicity testing for water in tailings pond? Can the proponent predict toxicity results accounting for addition of effluent inflow from milling?
- ◆ The proponent is asked to describe the current quality of the 225,000 m³ of water in the present tailings facility and the geochemical characteristics of any tailings or other solids that are already in the tailings containment area.
- ◆ RWED requests the proponent to submit evidence that the tailings containment area is competent to contain the current volumes and the proposed additional volumes of effluent over time. This could be accomplished through the conduct of a

geotechnical assessment of the containment facility and an assessment of the integrity of the high density membrane by a Professional Engineer.

- ◆ The proponent is asked to provide contingency plans for tailings containment facility failure, including a remediation plan.
- ◆ CZN is asked to discuss any programs planned to monitor groundwater in the vicinity of the tailings containment area

Cc: Ken Hall

L/m: inforeqBulktestjul3