

Expert Review and Comment on the Environmental Impact Assessment (EIA) Report for the Sisson Brook Tungsten and Molybdenum Mine

CCNB Action

Fredericton – Hugh John Fleming
Complex

October 8, 2013

Background to the EIA report

- There are two environmental assessment processes for the Sisson Brook Project:
 - Federal (*Canadian Environmental Assessment Act*)
 - Provincial (*Env. Impact Assessment Regulation*)
- The Federal government and the Province agreed to work on a “harmonized” environmental assessment for the project.

Cdn. Env. Ass. Act

NB Env. Impact Ass. Reg.

Terms of Reference for EIA Report

Environmental Impact Assessment Report
- written by Northcliff Resources

45 day public review of EIA Report
- started on August 30th

Public comments go to
Cdn. Env. Assess. Agency –
due Monday, Oct. 14

Public comments go to NB EIA Branch
- no official due date (see next slide)

Cdn. Env. Assess. Act process

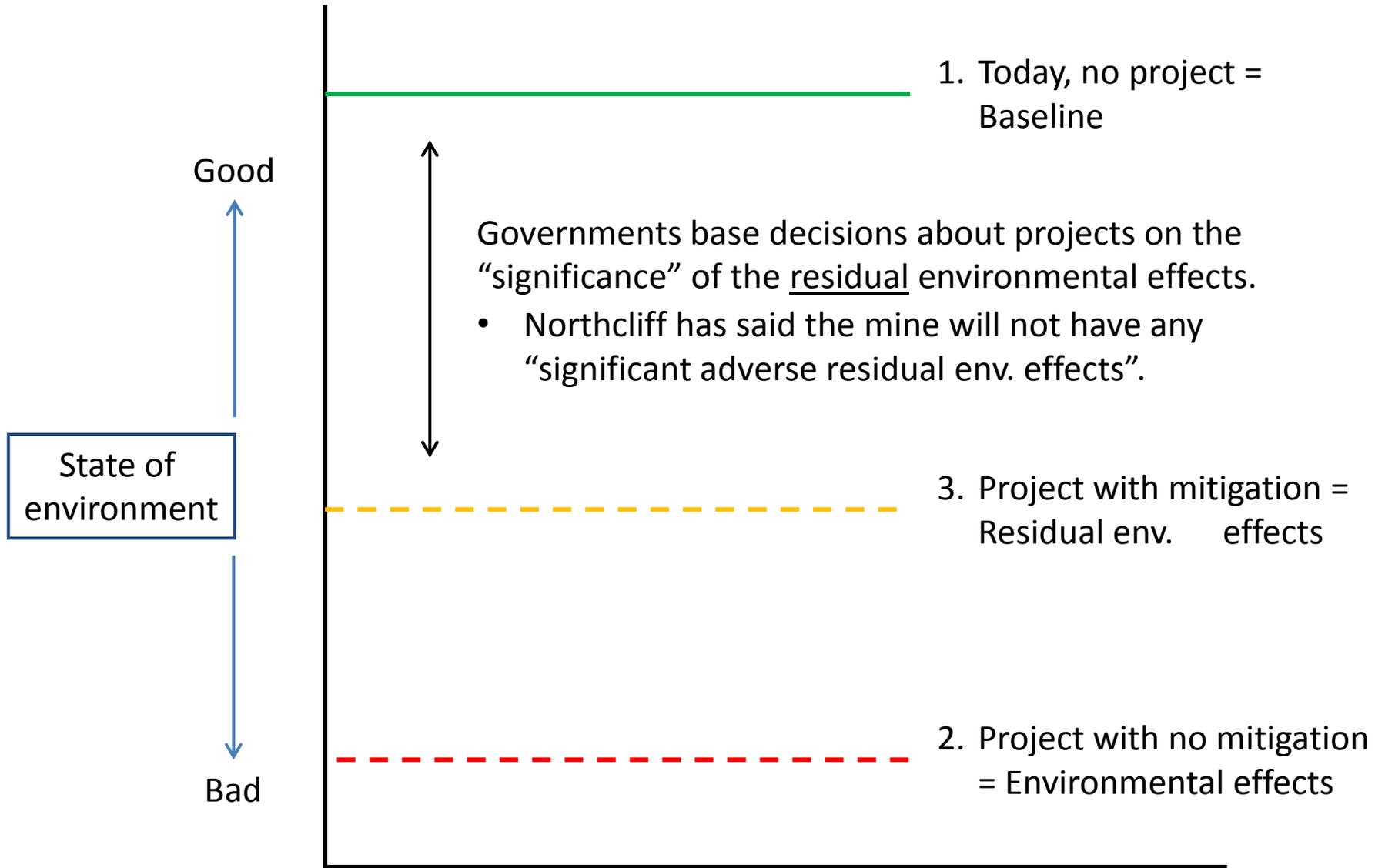
1. CEA Agency reads comments from public and govt. departments.
2. CEA Agency writes a Comprehensive Study Report (CSR).
3. CSR has CEA Agency's recommendations about the mine, e.g., it will/will not cause significant adverse env. effects.
4. Public comment on CSR.
5. Federal Min. of Env. reads CSR and public comments, and decides if the mine can proceed.
6. If mine can proceed, Northcliff has to get authorizations from different federal depts. e.g., an authorization to destroy fish habitat from DFO.

NB EIA Regulation process

1. Public comments should go to provincial Technical Review Committee (TRC).
2. Provincial Min. of Env. and TRC decide whether EIA report is complete—has it met all the Terms of Reference.
3. If EIA report is complete, official NB public participation process begins.
 - Public can comment on the mine or EIA report in writing or at a public hearing(s).
4. After public hearing, govt. decides if mine can proceed.
5. If mine can proceed, Northcliff has to get permits from different prov. depts. e.g., a watercourse alteration permit from DOE.

Purpose of EIA report

1. Tell us about the environment today = baseline.
 - Needs to be accurate.
2. Tell us how the mine will change or impact the environment = environmental effects.
 - These are predictions.
3. Tell us how Northcliff will mitigate (lessen) the impacts of the mine = residual environmental effects.
 - Will mitigation work is not always clear.
4. Tell us how “significant” are the mine’s residual environmental effects (e.g., Will the change in water quality impact human or fish health?).
 - “Significance” is the opinion of Northcliff.
5. Tell us how “significant” are the mine’s residual env. effects in combination with the env. effects of other projects, such as forestry (known as “cumulative environmental effects”).



“Mitigation” means trying to lessen the environmental effects of a project, such as by creating new fish habitat, using air filters, putting in warning alarms, etc.

Where did our EIA report experts come from?

- For big projects like the Sisson Brook mine, the Cdn. Env. Asses. Agency has a “participant funding program”.
 - CCNB Action (the Conservation Council of NB) and the Nashwaak Watershed Association applied for and received participant funding.
 - Most of CCNB’s funding was to be used to hire experts to review and comment on the EIA report, and later the CEA Agency’s comprehensive study report.

What our experts did

CCNB Action asked its reviewers to focus on:

- Methods used by Northcliff to gather baseline information for the EIA report
- Methods used by Northcliff to conduct environmental effects analyses for the mine alone and cumulatively
- Effectiveness of planned mitigation
- Conclusions reached by Northcliff, in particular those dealing with the significance of the residual env. effects of the mine
- various technical aspects of the mine, such as the design of the tailings dam

Reviewers were asked *not* to comment on the merits of the mine.

Why did CCNB Action ask its reviewers to do this?

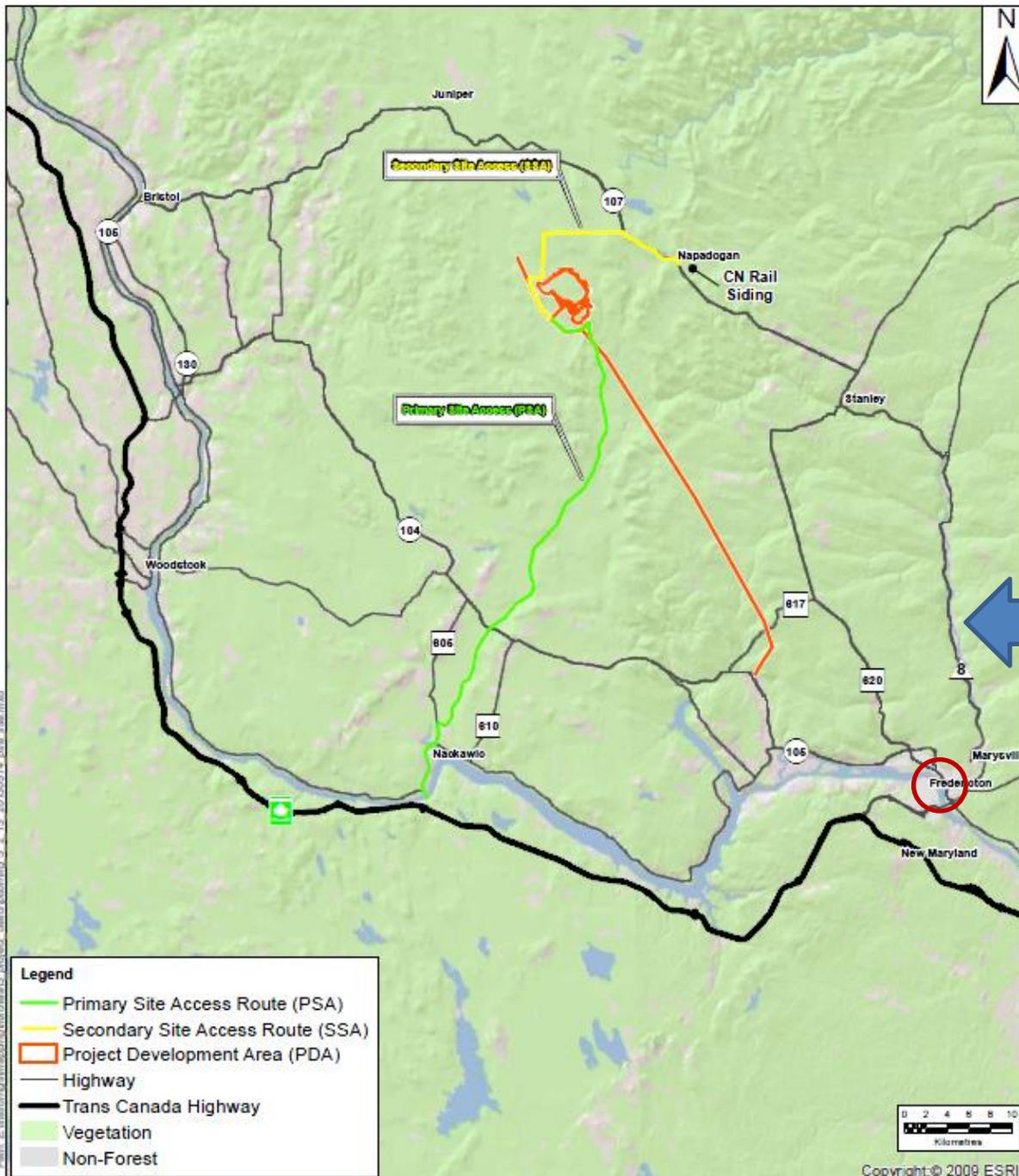
- To make decisions that are socially, environmentally, and economically sustainable, we (public and decision makers) need good information.
 - Environmental assessment processes are supposed to provide this information.
- We are trying to strengthen the environmental impact assessment report (information) for this mine.
 - Does the report properly identify the risks and benefits of the mine?
 - Promoting discussion of making the mine better, e.g., what is the best design for the tailings pond, if the mine is built.

Bottom line of reviewers

1. Not the best or worst done environmental impact assessment report they have read.
2. Not the best or worst plans for a mine they have seen.

CCNB Action's experts

André St.-Hilaire, PhD. INRS (Institut national de la recherche scientifique)	Impacts of the mine on hydrogeology (groundwater) and stream flows.
Allen Curry, PhD. University of New Brunswick	Impacts of the mine on the aquatic environment, fish and fish habitat.
Inka Milewski, B.Sc.	Impacts of the mine on air quality and public health.
Tony Diamond, PhD. University of New Brunswick	Impacts of the mine on the terrestrial environment, in particular impacts on birds.
Tracy Glynn, PhD. (candidate) CCNB Action's Forest Conservation Program Director	Impacts of the mine on forestry resources.
Stephanie Merrill, M.Sc.F. CCNB Action's Freshwater Protection Program Director	Impacts of the mine on regulated waters, particularly wetlands.
Ramsey Hart, M.Sc. MiningWatch Canada	1) Impacts of the mine in the context of sustainable development. 2) Act as a general resource on mining to CCNB Action Inc.
Rob Moir, PhD. University of New Brunswick	Impacts of the mine on labour and the economy.
David Chambers, PhD. Stuart Levit, M.Sc., J.D. Center for Science in Public Participation	To provide expertise in various mining matters, including: <ul style="list-style-type: none"> - Alternative ways of carrying out the mine - Alternative methods of mining and dealing with waste rock/tailings - Acid mine drainage issues - Safety of storage method/potential for failure of tailings dam - Financial matters re: mine closure, bonding
Lawrence Wuest (volunteered his time, not paid)	Expert knowledge about all aspects of the mine, particularly toxicity of ore and tailings and mine impacts on air quality.
Roy Parker, M.E.S.	Effectiveness and reliability of the proposed tailings pond.
Scott Kidd, B.Sc., LL.B.	Manage CCNB's overall participation in the EIA process.



Nashwaak River



From EIA report
p. 3-35

A few details about the mine

- Tungsten and molybdenum (used in steel)
- 568,647,000 tonnes of rock moved
- 30,000 tonnes/day of ore crushed
- Open pit:
 - 300-370 m deep, 145 hectares
- Tailings storage facility
 - 751 hectares
- Quarry for rock to build walls for tailings lake
- Crusher/ore processing plant
- Water treatment plant
- EIA report – over 5000 pages of technical info

A few details about the mine

- Construction – 2 years
- Operation – 27 years
- Closure – 12 years
 - During this time, water from the tailings lake fill the open pit.
- Year 40 – start treating water in open pit before it is released.

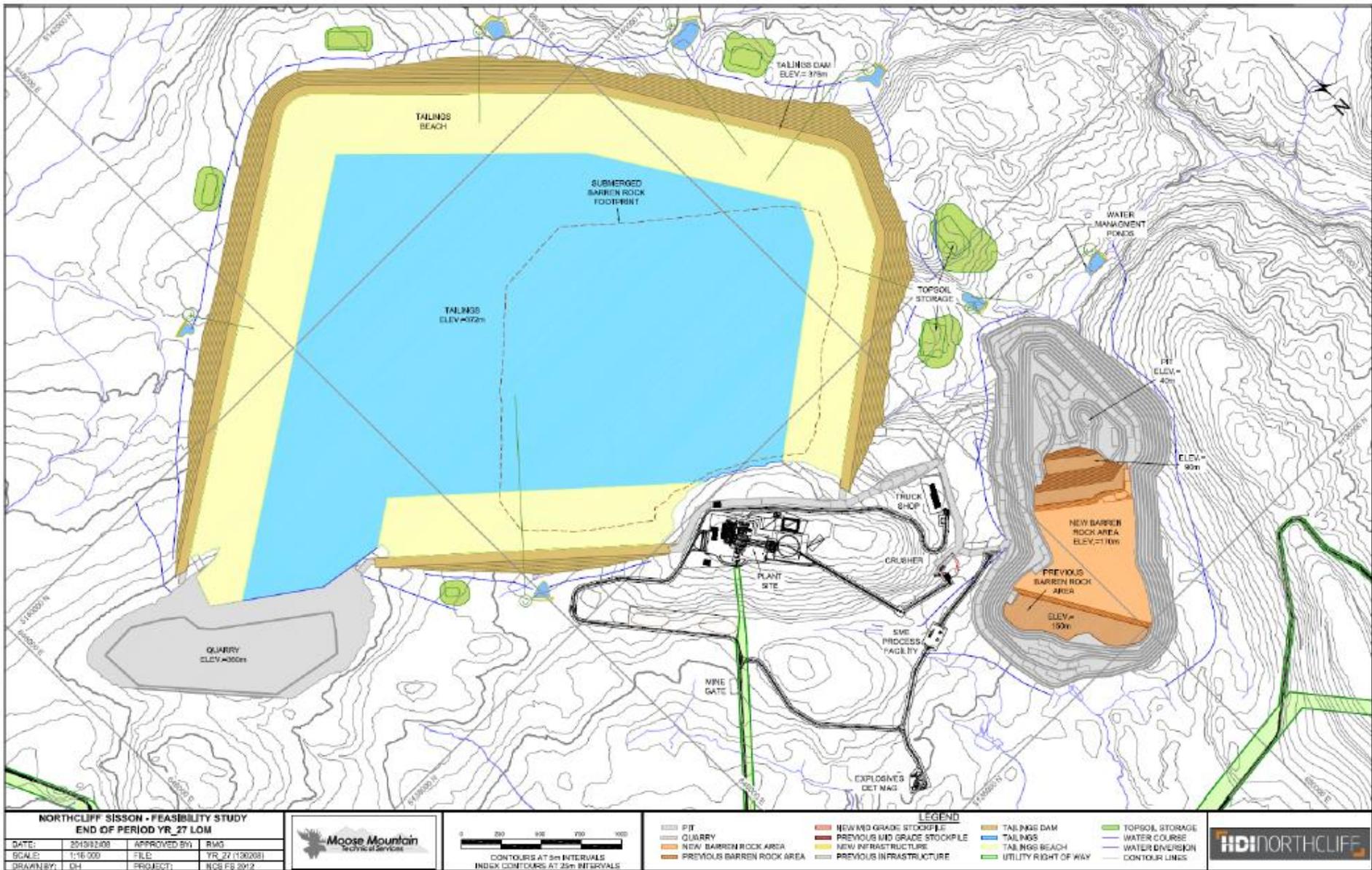
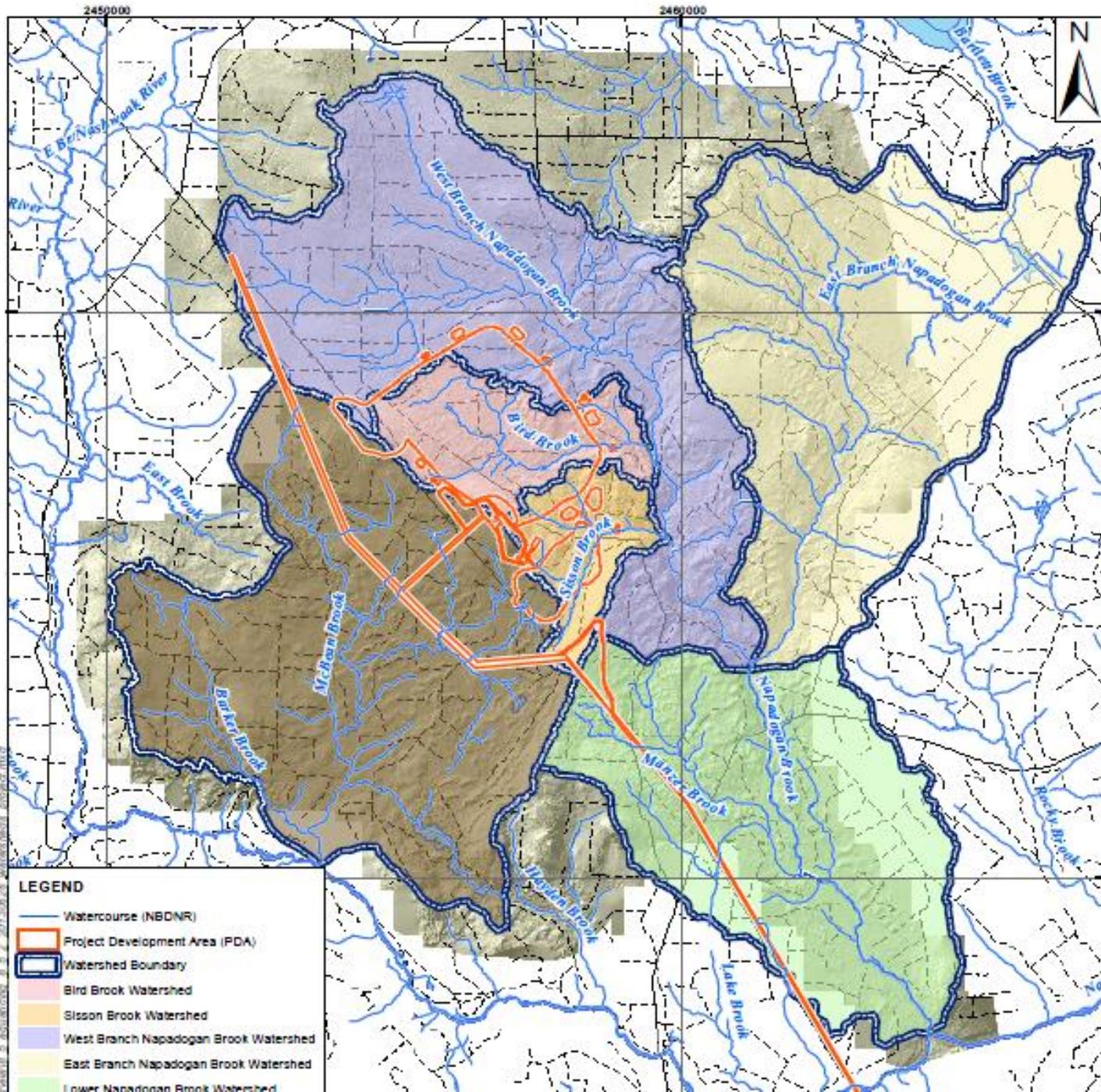


Figure 3.4.6 End of Period (EoP) Map, Production Year 27 (Life-of-Mine)

From EIA report p. 3-113



LEGEND

-  Watercourse (NBDNR)
-  Project Development Area (PDA)
-  Watershed Boundary
-  Bird Brook Watershed
-  Sisson Brook Watershed
-  West Branch Napadogan Brook Watershed
-  East Branch Napadogan Brook Watershed
-  Lower Napadogan Brook Watershed

Nashwaak River



From EIA report p. 8-155

Economics

EIA report p. 8-467:

“...it is estimated that direct employment for Construction (2 years) and Operation (27 years) will reach 9,826 person-years over its lifetime, over 90% of which will be created in New Brunswick. Including direct, indirect, and induced employment, the Project will support an estimated 32,619 person-years of employment, with 16,406 person-years of that employment directly within New Brunswick.”

EIA report p. 8-468:

“The expected direct, indirect, and induced GDP generated over the life of the Project is \$5.91 billion, including \$3.75 billion (63.5%) of that total contributing directly to the New Brunswick economy.”

Economics

Rob Moir, reviewed:

- EIA report Sec. 8.10 – Labour and Economy
- Canadian National Instrument 43-101 Technical Report (a securities filing)

His main concerns with the EIA report:

1. EIA report dedicated to benefits of mine.
2. Uncertainties about economic model used to calculate benefits.
 - Everything is a benefit, including clean-up of spills and tailings floods.
3. Economic benefits of mine likely over-estimated.
4. A traditional cost-benefit analysis would have improved our knowledge about the economic impacts of the mine.
5. No details of how closure costs were estimated.

Air Quality

EIA report p. 8-4:

“Given these observations, as demonstrated by the analyses that follow, with the proposed mitigation and environmental protection measures, the residual environmental effects of a Change in Atmospheric Environment during all phases of the Project are not significant.”

Air Quality

Inka Milewski and Larry Wuest, reviewed:

- EIA report Sec. 8.2 – Atmospheric Environment
- Baseline Ambient Air Quality Technical Report
- Metal Leaching and Acid Mine Drainage Characterization Report

Their main concerns with the EIA report:

1. Not enough data/information has been collected to say accurately what and how much contaminants are in the rocks, soil, ore, etc.
 - Example: “At the time of reporting, acid-base accounting data was not available.” (from EIA - Metal Leaching Acid Rock Drainage Report, p. 40)
 - “Failing to sample the overburden for sulfur is a significant technical deficiency.” (Reviewer - Center for Science in Public Participation)
 - It is important to note that information about what is in the ore, etc. used in the Acid Rock Drainage report (which deals with water quality) was also used for air quality modeling.

Air Quality

Their main concerns with the EIA report:

2. They calculate there is more arsenic than what is reported in the EIA report.
 - EIA report (41 mg/kg of arsenic in waste rock)
 - Reviewers (64.8 mg/kg of arsenic in waste rock)
3. Wind data was not collected from the highest point of the mine.
4. It is unclear how much dust (particulate matter) there will be.
5. The EIA report does not say how much hydrogen sulfide (rotten egg smell) and other pollutants the ammonium paratungstate plant will emit.

Human Health

EIA report p. 8-434

“Overall, the potential environmental effects of the Project on Public Health and Safety (including cumulative environmental effects) were rated not significant for all phases of the Project.”

Human Health

Inka Milewski, reviewed:

- EIA report Sec. 8.9 – Public Health and Safety
- Baseline Ambient Air Quality Technical Report
- Metal Leaching and Acid Mine Drainage Characterization Report

Human Health

Her main concerns with the EIA report:

1. “The most serious deficiency ... is that it did not evaluate the non-cancer health risk of the most common route of exposure to arsenic - ingestion of soil, water and food and dermal contact with soil.”
2. Not a big enough area was covered by the report –
“Locations in the community of Napadogan, and other locations at the edges of the LAA where people from Williamsburg, Currieburg, Boyds Corner, Fredericksburg and Stanley may spend recreation time, are not covered.”

Human Health

Her main concerns with the EIA report:

3. The baseline health risks associated with exposure to particulate matter (dust) from the project were not examined or assessed.
4. What kinds and amounts of other air pollutants will come from the mine is unclear.
5. Predictions in the report are based on perfect conditions.
6. Potential air quality impacts on workers have been down-played.

Water Quality

EIA report pp. 8-57 to 8-58

“The environmental effects of the Project on Water Resources will not be significant because:

- the environmental effects of watercourse alterations on surface water hydrology will be mitigated and authorized under provincial and federal regulation;
- virtually all of the water requirements for the Project will be met by the reuse of water collected on-site, and recycled through the TSF;
- the collection of mine contact and process water in the TSF during Operation, and in the pit lake during Closure, will not adversely affect downstream surface water use or groundwater use;
- discharge of surplus water from the Project will be treated (as necessary) to acceptable discharge standards prior to release; and
- the design and management of the TSF will ensure that seepage through the TSF embankments will not affect downstream groundwater and surface water quality to an extent that it causes a persistent exceedance of Health Canada’s “Guidelines for Canadian Drinking Water Quality”.”

Water Quality

Allen Curry and Center for Science in Public Participation, reviewed:

- EIA report Sec. 8.4 – Water Resources
- Baseline Water Quality Technical Report
- Metal Leaching and Acid Mine Drainage Characterization Report
- Predictive Water Quality Report

Water Quality

Main concerns with the EIA Report

1. The EIA report was written before the Metal Leaching/Acid Rock Drainage Potential Report was completed.

What is Acid Rock Drainage (ARD)?

- ARD results when sulfide minerals, primarily iron (Fe) sulfides (S = sulfur) like pyrite (FeS_2), are exposed to oxygen and water.
- The iron 'oxidizes,' that is the oxygen has a greater affinity for the iron (Fe) than the sulfur (S), and 'replaces' it.
- Produces dissolved iron and weak sulfuric acid. It is this weak acid that is the source of ARD.
- The acid does two main things:
 - A. Lowers the pH of water (makes streams more acidic)
 - B. The acid leaches (dissolves) the metals from sulfides of copper, lead, mercury, arsenic, antimony, selenium, and others. This puts these metals into a stream. These dissolved metals are typically toxic to aquatic life at very low concentrations.
- Acid rock drainage is a big problem that can go on for a long time.

Water Quality

Main concerns with the EIA Report:

1. This mine will need a water treatment plant (WTP). This is the core of the mine's water management plan.
 - The WTP is poorly described (plans are not in the actual EIA report).
 - WTP was designed to deal with arsenic and antimony only, not other of the many chemicals in the tailings pond.
2. There are no plans to put a liner in the tailings pond to prevent seepage. Tailings pond seepage is a major source of acid rock drainage.
3. The predictions in the EIA report are based on “perfect” conditions and it does not describe properly the risks if things go wrong. For example:
 - Too much rain or seepage from the tailings pond.
 - There is more acid generation or metal leaching.
4. Details for all water management at the mine site are not provided. For example:
 - Water management ponds are to collect and pump back any seepage or other surface water to the tailings pond. How will this be managed (e.g., secure pumping when required, overflow conditions)?

Water Quality

- The EIA discusses putting all potential acid generating rock in the tailings pond or open pit.
 - This would be a good thing and is mining industry best practice.

Fish and Fish Habitat

EIA report p. 8-136

“The environmental effects of the Project on the Aquatic Environment will be mitigated and not significant as follows.

- The loss of fish habitat will be compensated by restoring free-flow in the main stem of the Nashwaak River where an abandoned dam is currently considered a partial barrier to fish passage. This compensation will ensure that there is no-net-loss of productive fish habitat ...
- Fish will be relocated from affected habitat prior to Construction activities to minimize fish mortality and facilitate productive use of habitat elsewhere.
- The mine waste and water management approach will maintain all mine contact water within the Project site in the TSF during Operation. The beneficial re-use of stored water from the TSF as process water in a closed cycle will minimize Project water demands on the Napadogan watershed. Potentially acid generating (PAG) tailings and waste rock will be stored under water in the TSF to effectively mitigate the potential for acid generation. The TSF embankments and associated water management systems will limit the amount of seepage that may enter surface waters.
- Surplus water stored in the TSF, and afterwards from the pit lake that will be formed during Closure of the mine, will be treated prior to release to comply with regulatory requirements, and monitored extensively to ensure that downstream water and environmental quality is not jeopardized by the Project.
- An adaptive management strategy and mitigation plan will be applied in the event that follow-up and monitoring identifies that seepage or treated surplus water releases lead to concentrations of metals in surface waters that pose a risk to ecological or fish health.”

Fish and Fish Habitat

Allen Curry, reviewed:

- EIA report Sec. 8.5 – Aquatic Resources
- Baseline Water Quality Technical Report
- Metal Leaching and Acid Mine Drainage Characterization Report
- Predictive Water Quality Report

Fish and Fish Habitat

Main concerns with the EIA Report:

1. Not enough basic field work was done.
2. Atlantic salmon – Soon to be an endangered species and the Nashwaak River is officially recognized as the critical river for their survival, yet there is no planning for the risk of loss if any/some/all of the water management plans fail.
3. The toxicity of water releases from the tailings pond to Sisson Brook have not been addressed fully.
4. The EIA report says that fish habitat loss will be compensated by the removal of the Lower Lake Dam. Northcliff has been told by locals and scientists that this is not needed.
5. Same concerns as detailed for water quality.

Big issues

1. EIA report is not complete.
 - Example: missing information about acid rock drainage.
2. Models do not measure enough variability.
3. No economic cost-benefit analysis.
4. No discussion of what happens if tailings dam breaks.
5. What happens after closure
 - What does treating water for “as long as necessary” mean.
6. How much will it cost to safely close the mine?

Contact Info

Sisson Project

Canadian Environmental
Assessment Agency

1801 Hollis St.

Suite 200

Halifax NS B3J 3N4

(T): 902-426-0564

(F): 902-426-6550

sissonproject@ceaa-acee.gc.ca

- Make sure to tell them you are writing about Sisson Project.

Conservation Council of New Brunswick

- (506)458-8747
- info@conservationcouncil.ca
- www.conservationcouncil.ca

Nashwaak Watershed Association

- www.nashwaakwatershed.ca