



Water Resources Division
Resource Management Directorate
Nunavut Regional Office
P.O. Box 100
Iqaluit, NU, X0A 0H0

Your file - Votre référence
2AM-DOH1335
Our file - Notre référence
GCDOCS# 117142697

September 20, 2023

Robert Hunter
Licensing Administrator
Nunavut Water Board
P.O. Box 119
Gjoa Haven, NU, X0B 1J0
E-mail: licensing@nwb-oen.ca

Re: Crown-Indigenous Relations and Northern Affairs Canada's Reply to Response to Comments on the Security Review Estimate for the Hope Bay Project, Type A Water Licence No. 2AM-DOH1335

Dear Robert,

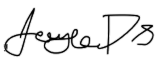
Thank you for the September 13, 2023 invitation to review the referenced licence response to comments on the security review estimate, submitted by Agnico Eagle Mines Limited (AEM) and their consultant Nunami Stantec Limited (NS), for Type A Water Licence No. 2AM-DOH1335.

Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) considers this to be the final submission on the security review estimate for Hope Bay and defers to the Nunavut Water Board's decision as to whether a hearing is required.

CIRNAC would also like to note that its position on the security review estimate for the Boston site, water license 2AM-BOS1835, should also be reviewed. CIRNAC requests that the Nunavut Water Board (NWB) also provide its position on this matter.

CIRNAC examined the submission pursuant to its mandated responsibilities under the *Nunavut Waters and Nunavut Surface Rights Tribunal Act* and the *Department of Crown-Indigenous Relations and Northern Affairs Act*. Please find CIRNAC comments and recommendations in the attached Technical Memorandum and in Attachment 1.

If there are any questions or concerns, please contact me Joyce Demers at (867) 975-3877 or joyce.demers@rcaanc-cirnac.gc.ca Andrew Keim at (867) 975-4550 or andrew.keim@rcaanc-cirnac.gc.ca.

Sincerely,
Joyce Demers B.Sc. 
Industrial Coordinator

Canada 



Technical Review Memorandum

Date: September 20, 2023

To: Robert Hunter – Licensing Administrator, Nunavut Water Board

From: Joyce Demers – Industrial Coordinator, CIRNAC

Subject: **Crown-Indigenous Relations and Northern Affairs Canada's Reply to Response to Comments on the Security Review Estimate for the Hope Bay Project, Type A Water Licence No. 2AM-DOH1335**

Region: ☒ Kitikmeot ☐ Kivalliq ☐ Qikiqtani

INTRODUCTION

CIRNAC is providing the attached information that outlines the areas of major differences in the security review estimate developed by Arcadis, on behalf of CIRNAC, and of that provided by NS, on behalf of Agnico Eagle Mines Ltd. (AEM), in July, pursuant to their revision of the original April estimate to address material issues identified by Arcadis, with regards to the security review estimate of the Hope Bay Project water license 2AM-DOH1335. AEM-NS submitted a reply to CIRNAC's comments on the security review requesting more information about how Arcadis, CIRNAC's contractor for this project, obtained its security review estimate.

The attached information includes two summary tables: Table 1 - Current Conditions, and Table 2 - Life of Mine Conditions. The tables provide NS and Arcadis summary costs by major RECLAIM Estimate Category along with the differences in the costs by Direct and Indirect Category, Sub-Total, and Total Costs. The tables also highlight the categories with material differences in the estimate. As can be seen from these tables, the increase in the Security Requirement Estimate is 17% and 10%, respectively, for Current Conditions and Life of Mine Conditions and relate to the following RECLAIM closure categories:

- Open Pit,
- Underground Mine,
- Chemicals and Contaminated Soil Management,
- Interim Care and Maintenance, and
- Post-Closure Monitoring and Maintenance.

Brief discussions of the underlying estimating factors that resulted in the increased estimates considered by Arcadis are also provided in Attachment 1. Attachment 1 has three sections: A,B, and C. Section A discusses the current conditions security review estimate main differences between NS-AEM estimate and CIRNAC-Arcadis estimate; section B discusses the life of mine security review estimate main differences between NS-AEM estimate and CIRNAC-Arcadis estimate; finally section C discusses the documents reviewed and referenced for this security review estimate. Additional details can be provided upon request.

**ATTACHEMENT 1****NS/AEM AND ARCADIS ESTIMATE COMPARISONS****A. CURRENT CONDITIONS**

Summary comparison of NS-AEM and Arcadis security estimates highlighting material changes (shown in yellow highlight).

Table 1. Current Conditions

| CURRENT CONDITIONS | NS-AEM | ARCADIS | ARCADIS | |
|----------------------------------------------------|---------------------|---------------------|---------------------|------------|
| DIRECT COSTS | | | Add'l Cost | % |
| Open Pit | \$4,190,608 | \$5,024,455 | \$833,847 | 20% |
| Underground Mine | \$3,344,311 | \$5,690,090 | \$2,345,779 | 70% |
| Tailings Facility | \$12,561,086 | \$12,727,075 | \$165,989 | \$0 |
| Rock Pile | \$1,398,359 | \$1,398,359 | \$0 | \$0 |
| Building and Equipment | \$10,727,366 | \$10,728,931 | \$1,565 | \$0 |
| Chemicals and Contaminated Soil Management | \$1,625,661 | \$1,972,356 | \$346,695 | 21% |
| Surface and Groundwater Management | \$1,126,649 | \$1,141,649 | \$15,000 | \$0 |
| Water Treatment ^(Note 1) | Not used | see below | | |
| Interim Care and Maintenance | \$7,111,287 | \$10,741,931 | \$3,630,644 | 51% |
| SUB-TOTAL | \$42,085,327 | \$49,424,846 | \$7,339,519 | 17% |
| INDIRECT COSTS | | | | |
| Mobilization/Demobilization | \$8,455,000 | \$9,229,000 | \$774,000 | \$0 |
| Post-Closure Monitoring and Maintenance | \$1,225,000 | \$1,660,000 | \$435,000 | 36% |
| Engineering (5%) | \$2,104,266 | \$2,471,242 | \$366,976 | 17% |
| Project Management (5%) | \$2,104,266 | \$2,471,242 | \$366,976 | 17% |
| Health and Safety Plans/Monitoring & QA/QC (1%) | \$0 | \$0 | \$0 | |
| Bonding/Insurance (1%) | \$0 | \$0 | \$0 | |
| Contingency (20%) | \$8,417,065 | \$9,884,969 | \$1,467,904 | 17% |
| Market Price Factor Adjustment ^(Note 1) | \$0 | \$0 | \$0 | |
| SUB-TOTAL | \$22,305,598 | \$25,716,454 | \$3,410,856 | 15% |
| TOTAL COSTS | \$64,390,925 | \$75,141,300 | \$10,750,375 | 17% |

Note 1 – Unit Rates from 2014 Version 7 RECLAIM have been indexed to 2023 Q1 rates so no marker price factor adjustment provided in AEM estimate.

Direct Costs**Open Pit**

The work evaluated included the drilling and blasting of quarry material, as well as the crushing and screening of material as necessary to meet the current gradation requirements for cover materials as part of the remedial works. The quantities required are based on the information provided by AEM, and Arcadis reviewed these quantities against those provided



in the SRK documentation. The unit rates used by Arcadis are based on rates we have seen on a recent program where the same activities were required. As such, Arcadis kept the unit rate for drilling and blasting at \$16.30/m³ but used the higher crushing and screening rate in RECLAIM for this work (i.e., \$13.25/m³) so that the aggregate cost would be in line with recently noted costs on an Arcadis project for similar work. No other differences exist between the Arcadis and AEM/NS estimates.

Underground Mine

On the basis of the information provided by AEM, this work includes: the decommissioning of infrastructure associated with the mine openings (i.e., vent raises and portals), sealing vent raises with a concrete cap, backfilling underground workings with ore and waste rock (note this task is not included in the life of mine (LOM) evaluation), and using local waste rock to construct portal seals as required at the Doris and Madrid work sites.

The material quantities provided by NS are consistent with the SRK documentation for the outlined closure work. Arcadis has increased the cost for the placement of ore and waste rock into the underground from the \$8.50/m³ used by NS to \$15.00/m³ to reflect the restrictive nature of the work underground and the overall quantity of material estimated for this work that will require travelling into the underground a considerable distance from the material source areas as discussed in the NS technical memo. No other concerns were identified with the NS estimate and as such the quantities and rates used by Arcadis are consistent with the NS estimate.

Chemicals and Contaminated Soil Management

Arcadis has no concerns with the quantities used by NS in their estimate and as such the same quantities have been used in the Arcadis estimate. In general, the unit rates for the work as presented by NS have also been used by Arcadis as they are reflective of the level of effort required to address these closure works.

However, Arcadis has carried costs for Phase I and II environmental site assessment (ESA) work to be done at all sites included under this water licence prior to the implementation of the closure work to confirm the quantities of impacted materials and flag any potential environmental concerns as may be present on site at the time of abandonment. In order to address this recommendation, Arcadis also included costs associated with both these tasks where it is assumed Phase I ESA work will be required at Madrid North, Doris and the Roberts Bay dock area while the unit rate for the Phase II ESA would be to cover all three mine areas.

Interim Care and Maintenance (ICM)

The time period used by NS is two years for the interim care and maintenance to be completed however given the time required to assess the condition of the site, prepare a



remedial work plan and technical specifications, and subsequently retain a contractor to complete the required closure work. Arcadis considers two years too short a period of time.

Normally, CIRNAC would ask for a five-year care and maintenance period to be included in a security estimate as part of the water licence process, however for this estimate, Arcadis has applied a three-year ICM period using NS's unit rates to derive a quantum of security plus an additional \$25,000 per annum as an allowance for a Regulatory Report over and above the reporting required to address a geotechnical assessment and Surveillance Network Program / Aquatic Effects Monitoring Program (SNP/AEMP) works. It is noted that three years is a conservative time frame however, the timing is also a function of when the mine may be abandoned thus necessitating the site go into care and maintenance.

Indirect Costs

Post-Closure Monitoring and Maintenance

The post-closure monitoring and maintenance costs as presented by NS are based on a 10-year period. The Arcadis estimate assumes costs based on 25 years of monitoring for geotechnical and environmental concerns where monitoring would be done yearly for the first ten years, and then in years 15, 20 and 25. The 25 year estimate is based on current CIRNAC practice and has been set to protect against uncertainties related to the long-term water quality of the site. Those uncertainties include, but are not limited to, the effectiveness of the proposed waste rock cover on the tailing impoundment area (TIA) and the potential for metal loadings to surface water receivers to be higher than currently predicted. There is insufficient information available to state for certain whether or not there will be an issue with seepage water quality from the TIA, and as such, Arcadis has included security to cover some water treatment pending the results of further testing to confirm the quality of the leachate being released from within the TIA.

B. LIFE OF MINE CONIDITONS

Summary comparison of NS-AEM and Arcadis security estimates highlighting material changes (shown in yellow highlight).

Table 2. Life Of Mine Conditions

| LIFE OF MINE | NS-AEM | ARCADIS | ARCADIS | |
|---------------------|--------------|--------------|-------------------|----------|
| DIRECT COSTS | | | Add'l Cost | % |
| Open Pit | \$10,432,759 | \$11,806,922 | \$1,374,163 | 13% |
| Underground Mine | \$941,369 | \$959,000 | \$17,631 | 2% |
| Tailings Facility | \$14,049,334 | \$13,867,223 | -\$182,111 | -1% |
| Rock Pile | \$1,470,056 | \$1,470,056 | \$0 | 0% |



| | | | | |
|----------------------------------------------------|---------------------|---------------------|--------------------|------------|
| Building and Equipment | \$19,994,766 | \$20,543,242 | \$548,476 | 3% |
| Chemicals and Contaminated Soil Management | \$3,392,874 | \$3,772,931 | \$380,057 | 11% |
| Surface and Groundwater Management | \$1,700,329 | \$1,715,329 | \$15,000 | 1% |
| Water Treatment | Not used | Not used | | |
| Interim Care and Maintenance | \$7,111,287 | \$10,741,931 | \$3,630,644 | 51% |
| SUB-TOTAL | \$59,092,775 | \$64,876,634 | \$5,783,859 | 10% |
| INDIRECT COSTS | | | | |
| Mobilization/Demobilization | \$10,141,500 | \$10,683,000 | \$541,500 | 5% |
| Post-Closure Monitoring and Maintenance | \$1,225,000 | \$1,660,000 | \$435,000 | 36% |
| Engineering (5%) | \$2,954,639 | \$3,243,832 | \$289,193 | 10% |
| Project Management (5%) | \$2,954,639 | \$3,243,832 | \$289,193 | 10% |
| Health and Safety Plans/Monitoring & QA/QC (1%) | \$0 | \$0 | \$0 | |
| Bonding/Insurance (1%) | \$0 | \$0 | \$0 | |
| Contingency (20%) | \$11,818,555 | \$12,975,327 | \$1,156,772 | 10% |
| Market Price Factor Adjustment ^(Note 1) | \$0 | \$0 | \$0 | |
| SUB-TOTAL | \$29,094,332 | \$31,805,990 | \$2,711,658 | 9% |
| TOTAL COSTS | \$88,187,107 | \$96,682,624 | \$8,495,517 | 10% |

Note 1 – Unit Rates from 2014 Version 7 RECLAIM have been indexed to 2023 Q1 rates so no marker price factor adjustment provided in AEM estimate.

Direct Costs

Open Pit

In general, with two exceptions, Arcadis agrees with the material quantities provided in this updated document and have used them in the RECLAIM. The two exceptions, relate to the closure plan requirement for the production and placement of drainage channel armouring for the TIA Subaerial Tailings Area (18,150 m³) and the Quarry 3 Landfill (8,124.3 m³). The Arcadis estimate has integrated these quantities into the security estimate at the rates used for the production and placement of quarried rock in other portions of the site. Note that part of the cost for the placement of riprap, as part of the TIA drainage channel, has been included under the Tailings header in the NS security estimate.

The unit rate used by NS for the drilling and blasting of the rock are indexed from the RECLAIM rates with which Arcadis agrees, and as such Arcadis used the NS rate for the drill and blasting (\$16.30/m³). However, with respect to the rate for the crushing and screening of rock materials, we note that Arcadis is currently working on a project in Northern Manitoba with costs of \$27.60/m³ for the production of 5" minus material and \$38.15/m³ for riprap. Based on Arcadis' experience, Arcadis has amended the crushing unit rate to reflect the higher scale of the range provided by NS for this type of work i.e. RBS1H (\$13.25/m³)



rather than RBS1L (\$8.50/m³) used in NS' estimate. This change in unit rate has had an impact on the charges related to the preparation of rock cover material as provided in the detailed costing sheet.

Chemicals and Contaminated Soil Management

The same rational is used here for the LOM as for the current conditions. Please refer to the section above titled Chemicals and Contaminated Soil Management under the current conditions in Section A.

Interim Care and Maintenance (ICM)

The same rational is used here for the LOM as for the current conditions. Please refer to the section above titled Interim Care and Maintenance (ICM) under the current conditions in Section A.

Indirect Costs

Post-Closure Monitoring and Maintenance

The same rational is used here for the LOM as for the current conditions. Please refer to the section above titled Post-Closure Monitoring and Maintenance under the current conditions in Section A.

C. DOCUMENTS REVIEWED AND REFERENCED

The following table (Table 3) provides a list of the documents reviewed under the submission and reference during the review.

Table 3. Documents and Activities Reviewed and Referenced

| Document Title | Author, File No., Rev., Date |
|----------------------------------------------------------------------------------|-----------------------------------------|
| Interim Closure and Reclamation Plan for the Project | TMAC, 2017 |
| Joint two-day Closure Workshop with representatives of Agnico Eagle and KIA | AEM and KIA, March 13-14, 2023 |
| follow up discussions on the joint two-day closure workshop | AEM and KIA, April 2023 |
| RECLAIM 7.0 spreadsheet model and User Manual (Mining Version) | |
| Doris-Madrid Interim Closure and Reclamation Plan Comparison (SRK February 2023) | SRK, February 2023 |
| 230811 2AM-BOS1835 - updated of the Conceptual Reclamation letter to NWB-ILAE | Agnico Eagle, August 11, 2023 |
| 230912 2AM-DOH1335 AEM NWB Response to CIRNAC review-ILAE | NS on behalf of AEM, September 11, 2023 |