TECHNICAL MEMORANDUM

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FROM Adam Auckland

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RESPONSE TO COMMENTS REGARDING THE METHOD FOR ASSESSMENT OF POTENTIAL ENVIRONMENTAL IMPACTS – HAMMOND REEF GOLD PROJECT

1.0 INTRODUCTION

Comments received from the Ontario Ministry of Environment and Climate Change (MOECC) Environmental Approvals Branch (EAB) [Comments EAB 3 and EAB 4] on the Hammond Reef Gold Project (the Project) Environmental Impact Statement/Environmental Assessment (EIS/EA) have expressed concern with the method used in the EIS/EA to assess the potential impacts of the Project. In particular, there was a concern that the detailed assessment focused on particular project phases that were determined to most impactful and that a detailed assessment on potential impacts was not completed for every phase of the project (i.e., construction, operations, closure and post-closure). These concerns were re-iterated in a meeting with MOECC on March 6th, 2017 and in a letter from MOECC to CMC dated April 6th, 2017. In addition, clarification was requested with respect to where to find support for the use of the bounding scenario method within the EIS/EA documents that is required under Section 6.1(2) of the Environmental Assessment Act of Ontario (the Act) and by the Terms of Reference (ToR) for preparing the EA.

This memorandum has been drafted in response to these concerns and comments and has been revised in response to comments received from the MOECC in a letter dated July 20th, 2017 on the previous version. References to the EIS/EA sections that provide the information required under Section 6.1(2) of the Act and by the ToR and are respectively provided in Section 2.1 and 2.2 of this memorandum. Further clarifying explanation and narrative is provided within the text of the amended Version 3 EIS/EA where appropriate.

2.0 SUPPLEMENTAL EXPLANATION OF ENVIRONMENTAL ASSESSMENT METHOD

The “bounding scenario” approach seeks to evaluate and define the worst-case scenario in terms of potential impacts through a thorough and systematic review of the potential impacts during all projects phases. The use of the term “bounding scenario’ is synonymous with the term “worst case scenario”. The term is not meant to indicate or imply that all project phases were not given due consideration in the assessment of alternatives and in the assessment of the preferred alternatives. The Hammond Reef Gold Project EIS/EA assessed all potential impacts for all project phases in a conservative fashion.

CMC acknowledges that additional narrative (as requested in EAB-3) may be useful to describe impacts for each project phase rather than providing a narrative for only the “bounding” or “worst-case” scenario. As such, supplemental discussion by project phase has been added, where appropriate, within the text of the amended Version 3 EIS/EA, following the overall methodology as described in the ToR and as discussed herein.

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In response to comments provided in MOECC's letters dated April 6, 2017 and July 20, 2017, in which the MOECC requested a clear explanation of how the "bounding scenario" effects assessment method is consistent with the approved ToR and Section 6.1(2) of the Act, the following sections demonstrate how the EIS/EA meets the requirements of Section 6.1(2) of the Act and the approved ToR with due consideration to all Project phases.

2.1 Environmental Assessment Act of Ontario (Section 6.1(2))

The following provides a summary of the location within the EIS/EA of the information required under Section 6.1(2) of the Act.

a) **Description of the purpose of the undertaking** – The need for and purpose of the Project is provided in EIS/EA Section 1.3.

b) **Description of, and statement of the rationale for:**

i) **The undertaking** – An overview of the Project (i.e., the undertaking) is provided in EIS/EA Sections 1.3 through 1.6. The full undertaking, inclusive of all Project phases, is described in the Project Description provided in EIS/EA Chapter 5.

ii) **Alternative methods of carrying out the undertaking** – Alternative methods of carrying out the undertaking and methodology for evaluating the alternative methods are provided in EIS/EA Chapter 4, and in the Version 3 Alternatives Assessment TSD which has been updated to include an explicit evaluation of all Project phases (see Part 3 of the Version 3 Alternative Assessment TSD) and reflect responses to information requests from the government review team (GRT) regarding the access road and transmission line alignment alternatives. While the term 'bounding scenario' has been used in some locations to describe the results of the EIS/EA, the assessment included evaluation of all project phases. The 'bounding scenario' conveys a worst case condition as developed through consideration of all project phases. Additional narrative has been added to the Version 3 EIS/EA for clarification of this approach where appropriate.

iii) **Alternatives to the undertaking** – The only alternative to the undertaking, given that the resources cannot be moved without the Project, is the "do nothing" alternative. EIS/EA Chapter 4, Section 4.1 provides advantages and disadvantages of the Project relative to the "do nothing" alternative. The assessment concluded that the project can be undertaken to provide economic and social benefits with a reasonable expectation of minimal potential impact to the environment, as such the EIS/EA has been completed on the undertaking.

c) **A description of:**

(i) **The environment that will be affected or that might reasonably be expected to be affected, directly or indirectly** – EIS/EA Chapter 3 and multiple TSDs provide substantial information on both the physical and social environment that might reasonably be expected to be affected directly or indirectly by the project.

(ii) **The effects that will be caused or that might reasonably be expected to be caused to the environment** – EIS/EA Chapter 6 and multiple TSDs provide substantial information on effects that will be caused or that might reasonably be expected to be caused to the environment during all Project phases. Relevant sections of Chapter 6 include:

Section 6.1 – Physical Effect Assessment

Section 6.2 – Biological Effects Assessment

Section 6.3 – Social Effects Assessment

Section 6.4 – Residual Effects Assessment

Section 6.8 – Cumulative Effects

EIS/EA Chapter 6 also includes an assessment of effects of the environment on the project (Section 6.5) and the potential effects due to unexpected malfunctions and accidents (Section 6.6). Supplemental clarifying discussion by project phase has been added, where appropriate, within the text of the amended Version 3 EIS/EA to demonstrate consideration of each Project phase. Residual Effects are identified for each Project phase in the Version 3 Alternatives Assessment TSD, EIS/EA Chapters 4 and Chapter 6, and Tables 6-55 to 6-57. While the term 'bounding scenario' has been used in some locations to describe the results of the EIS/EA, the assessment included evaluation of all project phases. The 'bounding scenario' conveys a worst case condition as developed through consideration of all project phases.

(iii) **The actions necessary or that may reasonably be expected to be necessary to prevent, change, mitigate or remedy the effects upon or the effects that might reasonably be expected upon the environment** – Mitigation measures were identified throughout the Project development phases and, in many cases, are included in the Project Description provided in EIS/EA Chapter 5 (Section 5.5). Additional mitigation measures have been identified or further evaluation of mitigation strategies have been undertaken as part of the EIS/EA process and in response to comments from the GRT. Where mitigation measures are identified for a specific activity, the mitigation measures will be applied during all Project phases during which that particular activity is occurring. A few examples of mitigation measures and actions that are identified as part of the undertaking are:

- Use of cyanide destruction technology (Section 5.2.4.7) (added based on an initial evaluation of Project water quality).
- Evaluation of seepage and confirmation of seepage reduction measures from the site and TMF through additional groundwater modelling (see responses to T(2)-17, T(3)-08) in Part A of the Addendum to the Version 3 EIS/EA).
- Provision of habitat compensation where the Project will impact fish or fish habitat
- Provision of air quality control equipment (Section 5.3.6.4)
- Implementation of a no hunting or fishing policy for workers residing at the on-site accommodation camp.

CMC will continue to evaluate and incorporate mitigation measures into the Project design where required, feasible and viable to do so.

d) **An evaluation of the advantages and disadvantages to the environment of the undertaking, the alternative methods of carrying out the undertaking and the alternatives to the undertaking -** An evaluation of the advantages and disadvantages to the environment of the undertaking is provided in EIS/EA Section 6. An evaluation of the advantages and disadvantages to the environment of the

alternative methods of carrying out the undertaking is provided in EIS/EA Chapter 4, and in the Version 3 Alternatives Assessment TSD. An evaluation of the advantages and disadvantages to the environment of alternatives to the undertaking are provided in EIS/EA Chapter 4, Section 4.1, and in the Version 3 Alternatives Assessment TSD.

e) **A description of any consultation about the undertaking by the proponent and the results of the consultation. 1996, c. 27, s. 3.** – EIS/EA Chapter 7 provides details of the consultations completed, with resulting environmental and social management plans provided in EIS/EA Chapter 8.

2.2 Terms of Reference

Section 2.0 of the ToR provides a description of how the EA is to be prepared. The EIS/EA meets the requirements of the ToR as follows:

- **Project Description (including project phases and timelines)** – The full Project Description, inclusive of all Project phases, is provided in EIS/EA Chapter 5. Alternatives to the Project Description are described in the ToR, in EIS/EA Chapter 4 and in the Version 3 Alternatives Assessment TSD.
- **Identification of Project interactions including potential impacts, alternatives and alternative methods** – Described within EIS/EA Chapters 6 and 4, and the Version 3 Alternatives Assessment TSD for all Project phases. The bounding scenarios or worst case conditions, as referenced in the methods and results of the EIS/EA, were developed through consideration of each project phase (as applicable), thus meeting the requirements of the ToR. Additional narrative and clarification regarding bounding scenarios, and evaluation of worst case scenarios for each project phase is provided in the Version 3 text.
- **Baseline studies** – Provided in EIS/EA Chapter 3 and associated TSDs.
- **Development of Criteria** – The applied methodology uses indicators and performance objectives which are evaluated based on data to identify the preferred alternatives. Performance objectives and additional discussion of criteria and indicators is provided in EIS/EA Section 2.5 for each of the key VECs, and in the Version 3 Alternatives Assessment TSD.
- **Assessment of Impacts (including alternatives and alternative methods)** – The applied method for assessing impacts is consistent with the approved ToR, was completed at an appropriate level of detail sufficient to evaluate the merits of the alternatives, and includes consideration of the relevant project phases. The method uses indicators and performance objectives which are evaluated in consideration of criteria and to identify the potential for impact. EIS/EA Section 2.5 identifies key issues and criteria considered. Additional detail on assessment methods is provided in EIS/EA Section 2.6 and within the appropriate sections of the TSDs. Where used to describe the results of the EIS/EA, bounding scenarios or worst case conditions were developed considering each project phase (as applicable), thus meeting the requirements of the ToR.
- **Potential effects including alternatives and alternative methods and development of mitigation measures** – Following the method for assessment of impacts, potential effects were evaluated as described in EIS/EA Section 2.6.2, Chapter 6 and within the appropriate sections of the TSDs.
- **Decision making to identify alternatives with most acceptable environmental and socio-economic impact** – Decision making was based on a review of the ability of each alternative to achieve the performance objectives and criteria to minimize disturbance or adverse effects to the degree practicable, while maximizing project benefits.

- **Consultation report and plans** – Consultation methodology and results are discussed in Section 2.1 of the Social-economic Environment TSD, and in EIS/EA Chapter 7.
- **Environmental and social management plans** – Management plans were developed in consultation with the GRT and public and aboriginal stakeholders, based on a review of potential areas of impact, and based on an understanding of indicators specific to each monitoring program as identified within the plans described in EIS/EA Chapter 8.
- **Monitoring plans and follow-up** – As indicated in EIS/EA Section 8.3.4, and as will be identified in the future during the permitting, construction, operations, closure and post closure phases of the Project.

With reference to Section 7.0 of the ToR, this supplemental explanation provides additional information and summary information on the methods by which the EIS/EA has been completed with references to locations within the EIS/EA relating to fulfillment of the ToR requirements.

- **Design Study Areas (Section 7.1 in ToR)** – Study areas were defined based on a review of the Project Description and the proposed locations and processes to be included in the Project. Study areas were considered for potential impacts on the basis of increasing size around the site as described in EIS/EA Section 2.2.2.2. Additional detail on study area selection is provided for each discipline as indicated in EIS/EA Chapter 3 and within each TSD (see EIS/EA Table of Contents for full list of TSDs.
- **Data Collection (Section 7.2 in ToR)** – Data collection methodology is specific to the discipline for which data was collected and is described for each technical discipline within EIS/EA Chapter 3 and the associated TSDs).
  - **Criteria and Indicators** – **(Section 7.2.1 of the ToR)** – The method used to define criteria and indicators (also referred to as VECs), including rationale and selection of indicators is provided in EIS/EA Section 2.5.
    - Data sources used for the Social and Cultural assessment include those as identified in Section 7.2.1 of the ToR, and:
      - Baseline study results including economic analysis to determine employment and fiscal benefits of the Project (see Sections 2, 3 and 4 of the Socio-Economic Environment TSD).
      - Results of multiple consultations with communities and First Nations (EIS/EA Chapter 7 and Section 6.1 of the Aboriginal Interests TSD)
      - Review of multiple reports, population projections, statistics, local planning, and guideline documents as identified in the ToR and in the Section 5 of the Socio-economic Environment TSD.
  - **Baseline Characterization Tools (Section 7.2.2 of the ToR)** – Substantial work has been completed on baseline characterization as documented in EIS/EA Chapter 3 and the TSDs. Sampling methods are specific to each technical discipline and, in general, include:
    - Sampling and analysis of relevant media (as per methodology sections in each TSD)
    - Assessment of physical and ecological features following standard protocols (as per the Assessment sections of each TSD).

- Assessment of species and Species at Risk (SAR) (see Aquatic Environment and Terrestrial Ecology TSDs).

- **Evaluation of Alternative Methods (Section 7.3 of the ToR)** – A description of the process for completion of the Evaluation of Alternative Methods is provided in EIS/EA Section 2.6 (Assessment Methodology), with additional discussion of methods and assessment provided in Chapters 4 and 6 of the EIS/EA and in the Version 3 Alternative Assessment TSD.

  The assessment included evaluation of preferred options and alternatives throughout all phases of the Project including construction, operations, closure and post-closure. For each phase of the Project, the influence of a given alternative was considered and evaluated using methods identified in EIS/EA Section 2.6. Performance indicators and criteria were developed and used as described above and in EIS/EA Sections 2.5, 2.6 and in the Version 3 Alternatives Assessment TSD.

  The method used for assessment of project phases, alternatives and the preferred alternative evaluation is summarized as follows:

  - Review of potential associated activities for each of the construction, operations, closure, and post-closure phases as indicated in the Project Description, the approved ToR and in the publicly available NI 43-101 Technical Report.
  - For each activity and project phase:
    - Project and environmental interactions that could result in measureable impacts were identified as indicated in the Version 3 Alternatives Assessment TSD, EIS/EA Chapter 4, and for the preferred alternatives, in EIS/EA Chapter 6, based a review of the performance indicators and criteria.
    - Physical, biological, and socio-economic components that could be affected by Project activities were evaluated for all phases in consideration of existing conditions (EIS/EA Chapter 3), as described in the Alternatives Assessment TSD, and the effects assessment (EIS/EA Chapter 6) for the preferred alternatives.
  - Numerical modelling (Hydrology, Air Quality, Noise, Hydrogeology, Water Quality, and Biology) was conducted where applicable and appropriate (as summarized in EIS/EA Chapter 6, and as presented in TSDs and the Addendum to the Version 3 EIS/EA). All modelling was conducted in consideration of all project phases as follows:
    - Initial input values for each project phase and activity were developed;
    - Models were constructed using conservative assumptions whereby input conditions were assigned for each project phase (in some cases the same input condition was applied to multiple phases where input data was considered conservative – i.e. where potential for impact would be over-predicted – these conservative conditions were defined as bounding scenario or worst case conditions);
    - Model results were evaluated relative to each project phase (construction, operations, closure and poste closure) and assessed for potential impact;
    - Impacts were assigned similar values in each project phase in instances where model results showed that (using conservative input values) results for all phases were not expected to cause impact (see EIS/EA Section 6, impact evaluation Tables 6-55 to 6-57 by project phase);

- Model methods and results were documented and reported in TSDs or within the Addendum to the Version 3 EIS/EA; and
- In response to comments received from the GRT regarding the above described approach, additional narrative for each project phase has been added, were applicable, within specific sections of the Version 3 EIS/EA.

- Impact Management - In some instances initial calculations showed that mitigation measures were required as part of the Project. (e.g. cyanide destruction technology). These mitigation measures were assumed as part of the Project and are included in the assessment.
- Residual Effects are identified for each of the construction, operations, closure and post-closure phases in the Version 3 Alternatives Assessment TSD, EIS/EA Chapters 4 and Chapter 6, and Tables 6-55 to 6-57.

Based on the evaluation of alternatives completed, Preferred Methods (**as per Section 7.4 of the ToR**) were identified and, in some instances, mitigations were applied and included in the assessment to determine the proposed undertaking. Section 5 of the EIS/EA provides the Project Description and includes the items identified in **Section 7.5 of the ToR**).

Given that the alternatives vary by project component and phase, additional clarifying summary text on specific methodology (including Criteria and Performance indicators) has been added where appropriate in the relevant sections of EIS/EA Chapters 4 and 6 for the relevant project phases.

Based on the methodology used CMC is confident that this EIS/EA addresses all potential impacts for all project phases in a conservative fashion.

Closure

Should you have any questions or comments regarding the content of this memorandum, please contact the undersigned.

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