Nunavut Impact Review Board

Public Hearing Report

Doris North Project: 2015 Amendment Application

TMAC Resources Inc.

NIRB File No. 05MN047

June 2016

INSIDE COVER PAGE

The Nunavut Impact Review Board's Primary Objectives under the Nunavut Land Claims Agreement, Article 12, Section 12.2.5 states:

In carrying out its functions, the primary objectives of NIRB shall be at all times to protect and promote the existing and future well-being of the residents and communities of the Nunavut Settlement Area, and to protect the ecosystemic integrity of the Nunavut Settlement Area. NIRB shall also take into account the well-being of residents of Canada outside the Nunavut Settlement Area.

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SIGNATURE PAGE

SIGNATURE PAGE

Photo 1: Board Members: (from Left) Phillip (Kadlun) Omingmakyok, Elizabeth Copland, Guy Alikut

THIS REPORT IS SUBMITTED TO THE HONOURABLE CAROLYN BENNETT, MINISTER OF INDIGENOUS AND NORTHERN AFFAIRS BY THE NUNAVUT IMPACT REVIEW BOARD ON THIS 13TH DAY OF JUNE 2016.

Elizabeth Copland, Chairperson	Guy Alikut, Board Member
Phillip (Kadlun) Omingmakyok, Vice Chairperson	

COVER LETTER

NIRB File No.: 05MN047
NWB File No.: 2AM-DOH1323

June 13, 2016

The Honourable Carolyn Bennett
Minister of Indigenous and Northern Affairs
10 Wellington, 21st Floor
Gatineau, QC K1A 0H4

Sent via email and courier: minister@aadnc-aandc.gc.ca; carolyn.bennett@canada.ca; infopubs@aadnc-aandc.gc.ca

Re: Public Hearing Report for TMAC Resources Inc.'s Amendment to Project Certificate No. 003 for the Doris North Project

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As required under Section 12.8.3 of the Nunavut Land Claims Agreement (NLCA) please find enclosed the Public Hearing Report of the Nunavut Impact Review Board (NIRB or Board) with respect to TMAC Resources Inc.'s (TMAC or Proponent) application for proposed amendments to NIRB Project Certificate No. 003 and to Nunavut Water Board (NWB) Type "A" Water Licence 2AM-DOH1323 for the Doris North Gold Mine (known collectively as the 2015 Amendment Application). The enclosed Public Hearing Report contains the NIRB's assessment of the potential ecosystemic and socio-economic effects of the 2015 Amendment Application proposal and concludes that the proposed amendments should proceed. Having concluded that the Project as proposed to be amended should be allowed to proceed, the NIRB has also provided recommended revised and additional terms and conditions of the Project Certificate No. 003 consistent with the objectives set out in Section 12.2.5 of the NLCA and as outlined in the attached Report.

Translated versions of the Public Hearing Report are being prepared in Inuktitut, Inuinnaqtun, and French and will be made available as soon as possible. Please contact the undersigned in writing if you have any questions regarding this matter.

Sincerely,

Elizabeth Copland
Chairperson
Nunavut Impact Review Board

cc: The Honourable Dominic LeBlanc, Minister of Fisheries, Oceans and the Canadian Coast Guard, GOC
The Honourable Jim Carr, Minister of Natural Resources, GOC
The Honourable Marc Garneau, Minister of Transport, GOC
The Honourable Hunter Tootoo, MP for Nunavut
The Honourable Peter Taptuna, Premier, Nunavut
Cathy Towtongie, President, Nunavut Tunngavik Incorporated
Stanley Anablak, President, Kitikmeot Inuit Association
Thomas Kabloona, Chairperson, Nunavut Water Board
John Roberts, Vice President Environment, TMAC Resources Inc.
Alex Buchan, Director of Community Relations, TMAC Resources Inc.
Doris North Distribution List

CHAIRPERSON'S FOREWORD

This report has been prepared by the Nunavut Impact Review Board (NIRB or Board) for the review and consideration of the Minister of Indigenous and Northern Affairs (the Minister) as set out under Article 12, Sections 12.8.2 and 12.8.3 of the Nunavut Land Claims Agreement (NLCA). The report summarizes the results of the Board's assessment of the application (the 2015 Amendment Application) submitted in 2015 by TMAC Resources Inc. (TMAC or the Proponent) for proposed amendments to the Doris North Gold Mine Project, NIRB File No. 05MN047 (the Project). The proposed changes to the Project described in the 2015 Amendment Application were found by the Board to be integrally linked to the Project as originally approved by the Board under the Doris North Gold Mine Project Certificate (Project Certificate No. 003) issued in 2006. Reflecting this linkage, the Board determined that any potential ecosystemic and socio-economic effects associated with the proposed changes to the Project should be assessed pursuant to Section 12.8.2 of the NLCA. The assessment and reconsideration that provides the basis for this report arises from the NIRB's powers under the NLCA to reconsider the terms and conditions of an existing project certificate when changes in circumstances warrant such reconsideration.

The Board wishes to highlight for all parties reviewing the report that the scope of the Board's assessment and reconsideration is limited to the amendments as proposed in the 2015 Amendment Application only. As indicated by TMAC at the Public Hearing, and as residents in the Kitikmeot region may be aware, TMAC has plans for additional mining and exploration activities along the Hope Bay belt and has submitted project descriptions to the Board for the assessment of several additional proposed activities, works and undertakings in future, but these additional components are outside the scope of the amendments to the Project proposed in the 2015 Amendment Application. Consequently, the Board will assess any of TMAC's applications for changes to the Project or new project proposals under the appropriate provisions of the NLCA and the *Nunavut Planning and Project Assessment Act* in future.

The assessment for a new major mining development is typically preceded by assessments for earlier phases of development, such as exploration, advanced exploration and bulk sampling. Where, as was the case for this assessment, a Proponent's phased development plans for its properties involve multiple exploration and mine development plans with corresponding applications at various stages in the regulatory process, clearly delineating the scope of activities for each required assessment may become extremely challenging. Community members, intervenors, and the Board must spend additional time to develop a clear picture of the scope of the changes being proposed in the specific application before the Board and to reasonably assess the cumulative effects associated with all reasonably likely development in a given area at the time. Further, the Board notes that for this type of phased or incremental development it is becoming very important that project proponents take an integrated approach to project development that, to the greatest extent possible, focuses on minimizing the footprint and disturbance associated with the various project phases as these are being planned and carried out.

In determining whether the amendments to the Project proposed in the 2015 Amendment Application should be allowed to proceed to the regulatory stage, and if so whether changes to the terms and conditions of NIRB Project Certificate No. 003 are necessary, the Board provided several opportunities for technical and public comments on the proposed amendments over an approximately one (1) year period. The assessment process concluded with a three (3) day Public Hearing in Cambridge Bay on April 12-14, 2016. During the Public Hearing, the NIRB received information from more than 60 people, including Elders, students, interested parties, Intervenors, representatives from four (4) of the seven (7)

potentially affected communities, and members of the public, who all shared their knowledge, vision, hopes, experiences and concerns.

During the Board's assessment, the Board heard there was uncertainty associated with the potential for ecosystemic impacts associated with the transport of saline groundwater from underground mining and treated effluent from the Tailings Impoundment Area by pipeline along the road to a small jetty in Roberts Bay, with the pipeline to extend along the ocean floor for over two (2) kilometres before discharging into Roberts Bay. As this type of discharge into the marine environment has not been used by any other existing or proposed mines in Nunavut during the technical review phase it was unclear how this pipeline and the marine discharge would be regulated and under what authority. At the Public Hearing it was confirmed that Indigenous and Northern Affairs Canada would be responsible for regulating this infrastructure.

While the Board considers the regulatory issue to be resolved, the Board still has two (2) key technical concerns with this pipeline: ensuring that the pipeline remains stable, protected from damage and secure in the portion of the pipeline on land; and avoiding the potential for lasting and adverse effects on the marine environment resulting from the pipeline being abandoned on the ocean floor when it is no longer required. To address these concerns, the Board has recommended the addition of terms and conditions to Project Certificate No. 003 to: require that the portion of the pipeline on land be included in TMAC's overall assessment of changes to site permafrost conditions and effects on the stability of mine infrastructure; require a hazard and operability study along the entire pipeline; and require the Proponent to remove the pipeline in the marine environment when it is no longer required unless the Proponent can demonstrate that the pipeline would not cause adverse effects if left in place.

The Board also had concerns that although TMAC has designed the proposed changes to the Project to not require a significant increase to the existing mine footprint, the tripling of the underground aspect of the mine could result in impacts to the levels of Doris Lake as the mining of the two (2) additional deposits under the Lake in the talik proceeds. To address this concern, the Board has added terms and conditions to require monitoring of levels in Doris Lake over time.

In addition, the Board has included revisions and additions to the terms and conditions to Project Certificate No. 003 to reflect the requests and agreements of TMAC, the Kitikmeot Inuit Association, regulatory authorities, other Intervenors and community members. The Board considers these revisions to be necessary to ensure the changes to the Project as described in the 2015 Amendment Application are conducted in a responsible and sustainable manner in accordance with various enhancements to the mitigation measures originally proposed for the Project during the Board's original assessment in 2005-2006.

In this assessment, the NIRB heard from community members that in the decade that has passed since the original Project was approved to proceed, the communities have waited with anticipation and wish for the Project to be developed in a sustainable manner that would allow the Region to realize on the full economic opportunity associated with moving beyond exploration to an operating mine. As Jimmy Haniliak, a Community Representative from Cambridge Bay, stated at the Public Hearing:

> *we have no objections regarding the proponent's desire to mine at the mine site, but just to be -- cautioned to be sensitive and to respect the land and the environment and, as well, the people that are working at the mine site.*[1]

This general level of support from the Intervenors and the communities for TMAC's continued development of the mine, as proposed in the 2015 Amendment Application, was also noted by the Kitikmeot Inuit Association (KIA) at the Public Hearing:

> *More importantly, the Board has heard that none of the intervenors in this proceedings have any serious concerns remaining about the TMAC's application.*
>
> *From the KIA perspective, it is equally important that the community representatives who spoke in this hearing also indicated support for this project… The KIA wishes to repeat its strong support for this project. Inuit in this region will benefit substantially from this project. KIA is convinced that all important environmental and socioeconomic issues related to this project have been addressed. TMAC mitigation plans and commitments are, in the KIA's opinions, sufficient to resolve all concerns.*[2]

After due consideration, the Board has decided that if undertaken in accordance with the Board's recommended limits and mitigation measures as expressed in new and revised terms and conditions to the NIRB Project Certificate No. 003, the changes to the Project as proposed in the 2015 Amendment Application can proceed in a manner that will protect and promote the existing and future well-being of the residents and communities of the Nunavut Settlement Area, and that will protect the ecosystemic integrity of the Nunavut Settlement Area. In coming to this conclusion, the Board has considered the written material filed by the parties and members of the public on the record, oral and written technical review comments received by the Board in advance of the Public Hearing and the information and views expressed by the people who participated at the Public Hearing.

The NIRB is very grateful to all who actively participated in this assessment, and who worked in a collaborative and productive manner during this process. Specifically, the Board thanks TMAC Resources Inc., various federal, territorial, and local government representatives, the Kitikmeot Inuit Association, Elders, community representatives, and members of the public who gave of their time, shared their experiences and expertise and supported the Board's efforts to complete a thorough and timely assessment of the changes to the Project proposed in the 2015 Amendment Application.

[1] J. Haniliak, Cambridge Bay, NIRB Public Hearing File No. 05MN047, Transcript, Vol. 3, April 14, 2016, p. 541, lines 9-13.

[2] S. Anablak, Kitikmeot Inuit Association, NIRB Public Hearing File No. 05MN047, Transcript, Vol. 3, April 14, 2016, p. 544, lines 1-7 and 18-24.

Sincerely,

Elizabeth Copland
Chairperson
Nunavut Impact Review Board

IKHIVAUTALIUP HIVUNIKHAA

Una unipkaaq upalungaiyariiqhimayuq Nunavut Avatiliqiyit Katimayiit (taiguutauyuq NIRB Katimayiitaluuniit) qimilruriaqaqtangit ihumaliugiaqaqtangillu Ministanit Nunaqaqaaqhimayut Inuliqiyiinut (Ministauyuq) maligaunmi titiraqhimagami uvani Nakataq 12, Ilanganit 12.8.2 unalu 12.8.3 haffumani Nunavut Nunataaturaata Angirunmi (NLCA). Hamna unipkaaq unipkaariyauyuq kiuviniit haffumani Katimayiita'm naunaiyaivingat atiliurnirnut (2015 Aallannguqtiqhimayait Atuqtakhainit) turaariyauhimayuq uvani 2015 mi ukunanngat TMAC Resources Inc. (TMAC Havaakhaliuqtunulluuniit) tukhiqimayangit aallannguqtiqublugu uvunga Doris Nuat Kuulu Uyaraqtarviuyuq Havaangit, NIRB Titiqqaitigut Nampanga 05MN047 (Havaangit). Una tukhiutauhimayangit aallannguqtiqhimayait Havaanut tukiqaqhuni iluani 2015 mi Aallannguqtirningagut Atuqtakhainit naniyauhimayuq Katimayiita katilviunnaqhuni Havaanut angiqtauhimalraaqtumi Katimayiitam malikhugu Doris Nuat Kuulu Uyaraqtarvik Havaangit Ilitaridjutinit(Havaanut Ilitaridjutingit Nampanga 003) turaaqtauhimayuq 2006 mi. Tautungnaqhuni katilviuhimayuq, Katimayiit ihumaliuqhugu qanurilingayaugumi ihumagiyaugumi nunam avatait inungnut ikayuutikhangillu atuliqtauyut ilagivlugit tukhiutauhimayumi aallannguqtauyit ukunani Havaanut ihivriuqtauyukhaq maligautimi malikhimalugu Ilangani 12.8.2 haffumani NLCA. Hamna ihivriugait ihumagiyakhangillu ilaliutauhimayut tunngavia unipkaanut puqtuhimavluni hakugingniata NIRB'ip malikhugulu NLCA ihumagiyakhaat hivitunia qanurilinganingillu aturiiqtangit havaanut ilitaridjutinut aallannguqtiqtaugaangat hakugingniutigiyakhait ihumaliuffaarmiluni.

Una Katimayiit naaguhivlutik tamainnut ihumagiyakhait tamainnut ilaudjutauhimayut qimilruqhimalugit unipkaangit taamna hivunikhangit haffumani Katimayiita ihivriurningit nailihimayauyukhaq aallannguqtiqtauhimayumi tukhiqtaaqhimayuq uvani 2015 mi Aallannguqtirningagut Atuqtakhainit kihimiinngaq. Naunaiyariiqhimayangit TMAC uvunga Kavamanut Tuhaumayakhaat, nunaqatigiit Qitirmiut nunaani ilittuqtauvlutik, TMAC upalungaiyarumayangit ilagilugillu uyaraqtarviuyukhamaat qauyiharviuyukhamaat hulidjuhiit hinaani Kapihiluktuk uyaraqtarviuyuni turaaqtaaqhimayait tiliugait Katimayiinut ihivriuqtakhait amihuvyaktut ilagiyait tukhiutauhimayut hulidjuhiit, havaangit havaktakhangillu hivunikhaat, kihimi hapkuat ilagiyauyut ilanganit hilataaniittut hivunikhautikhaat ukunani aallannguqtiqtauhimayumi Havaanut havaariyauyukhanut iluani titirariiqhimayuq 2015 mi Aallannguqtiqtauningit Atuqtakhainit. Taimaattauq,Katimayiit ihivriurniaqtangit uuminngat TMAC'iup atuqtakhait aallannguqtiriakhaat Havaariyakhanut nutaamigluuniit havaatigut tukhiutainit malikhugu nalaumayuq ilaliutikhait haffumani NLCA unalu *Nunavut Parnaiyaiyut Havaanut Ihiriuqtakhainlu Maligaq* hivuani.

Una ihivriurningit haffumani nutaamut uyaraqtarvigyuaqhimayunut pivalliayakhait hivunigiyakhait ihivriuqhimayangit pilihaaqhimayumi ilanganit pivallianingit, uuminngatut qauyihaqtuqtut naunaiyaivlutiktauq. Humiliqaak, ihivriuqtauniaqhuni, una Havaakhaliuqtunut ilangani pivallianinganit parnautaa nanminiriyangit ilagivluniuk amihuuyut qauyiharningit uyarqtarviuyut pivallianingit parnautait ilagivluniuktauq atuqtakhait aallatqiinit inikhait maliguarutimi piliriakhait iluani, tutqinnaqhunilu tiliurahuarningit hivunikhaat hulidjuhiit tamainnut maliktakhangit ihivriurningit taimaa akiharnaqpiannaqtuq. Nunaqatigiit, nutqarnahuaqtangit, Katimayiitalu hivituyumik pivalliariaqaqhtuik qanuq tutqinnaqtumik tautuktuuyaariangani hivunikhaat aallannguqtiqtauhimayut parnairiiqtakhait uvani atiliurvikhamut Katimayiit ihiviurniaqtinnatik hapkuat angiklivallianinganit atuliqtauyukhat ilagiyauhimayumi tamaat itqunnaqtut pivallianingit inikhaliuqtakhamut. Kinguani, Katimayiita naunaiqhiiyangit aallatqiinit inikhaanit uuminngaluuniit angiklivallaarningit pivalliayangit ihumagiyaulluarnaqhunilu hamna havaangit havaakhaliuqtunut ilagiinahuarlugu inikhaliurnahuarlutik

havaanut pivallianingit taimaa, hivituyumik pinahuarialik, hivumuurutilugu nailinahuariarlugulu tumiliurnirnit aktuqtailinahuarlugulu ilagiyamingnit parnaiqhimayait turaaqtauniarlugulu.

Qanuq ihumaliuriangani aallannguqtiqtauhimayut Havaanut tukhiutaanit uvani 2015 mi Aallannguqtiqtauyukhamut Atuqtakhait aullaqtiriarlunilu maliguarutainit inikhaat, taimainniqqat qanuq aallannguqtiqtauyut ukunani hivunitianit qanurilinganingillu NIRB Havaariyauyukhanut Ilittaridjutingit Nampanga 003 pidjutigiyakhait, una Katimayiit ikayuutiqaqhutik amihuvyaktumik inikhautikhait haffuminngat naunaiqpiaqtauyukhat unalu kitunuliqaak kiuvikhait uumani tukhiutauhimayumi aallannguqtiqtauhimayut tukhiutauhimayut aallannguqtirninganit naahimalugu atauhirmik (1) ukiunganit inianit. Una ihivriurninganit pilirianganit iniqpiaqhimayangit pingahunit (3) ublunganit Kitkutuinnarnut Tuhaumayakhaanit Iqaluktuuttiami uvani Qitiqqautiyuq 12-14, 2016 mi. Kitunuliqaak Tuhaumaliqhutik, NIRB tuniyauyut ilittuqhainit avatquttumik 60 inungnit, ilaliutauhimayut Inirnikhait, ilihaqtut, piyumayauyunit ilauqatauhimayunut, Nutqaquiyunut, ikayuqtiuyunillu hamanngat hitamanit (4) saivaugaluat (7) ihumagiyauhimayut aktuqtauhimayunit nunaliit, ilauhimayunullu kitunuliqaak, tamaat avvautihimayangit unipkaaqatigiiktut, hivumuarutigiyumayangit, naaguhiqhimayait, qauyimayangit ihumaaluutigiyangillu.

Katimayiit ihivriuqtautillutik, una Katimayiit tuhaumaliqhugu naunaqtumik ilaliutauhimayungnaqhiyangit aktuqtauhimayauyumi nunaup avataita agyaqtauhimavlutik taryulingnit nunamit imaq nunaum iluanit uyaraqtarviuhimayut amiriyauvlunilu imaq nakuuhittiqhugu Uyaraqtarvium kuvvinganit Hiamittailiyauyut Inianit tuqhuanngat apqutiup hinaani uvunga mikiyumik tulagvinnuangat Roberts Bay mut, hamna tuqhuangat tahiyaaqhugu hinaa taryurm natianit qaangirlugu malruk (2) kilamiitastigut ahivaqtinnagu iluanut Roberts Bay mut. Haffuminngatut unguvaqtauhimayut iluanut imarmiut avatainut atuqtauhimaittut aallanit havakhimayunut tukhiutauhimayunullu uyaraqtarviuyut Nunavunmi naunaiqpiaqtauhimayunut qimilrurningit ilangani tutqittiaqhimaittumi qanuq hamna tuqhuanga unalu imarmiuttat unguvaqtauhimayut maliguarutilingnit kitunuliqaak amiriyauhimakpat. Uvani Kitunuliqaak Tuhaumayakhanut ilittuqhimayauvluni hamna Nunaqaqaaqhimayunt Inuliqiyunut Kanata amiriyakhaat maliguangit haffumani igluqpaqarvikhaliurutikhainit.

Hamna Katimayiit ihumavlutik maliguarutingit akihautaat ihuaqtaugialik, Katimayiit huli malrurnik (2) naunaiqpiaqtauhimayait ihumaaluutigiyangit uumani tuqhuangat: pidjarikhivlugillu tuqhuangit aulahimattiaqtakhait, ahiruqtailivlugulu ilainnaat tuqhuanga nunami; ahianunngarahuarlugulu aktuqtailinahuarlugu imarmiut avataita tuqhuanga ikhinnaqtailinahuarlugu taryum natiani aturuiraangat. Turaarnahuarlugit ihumaaluutingit, Katimayiit kiutquiyangit ilagiyauyut hivitunia qanurilinganingillu Havaariyauyukhanut Ilitaridjutinut Nampaa 003 uvunga: kiuhimalugu ilanganit tuqhuanga nunamiittuq ilagiyakhaat uvani TMAC'ip tamaat ihivriurningit aallannguqtauyut nayugaanut hiku auktulaittumi qanurilinganingit atuliqtauningillu hakugingniangagut uyaraqtarviup igluqpaqarviliurahuarnikkut; kiugiaqaqhutik ilanganit tuqhuangat nunami ilaliutigiaqaqtuq TMAC'ip tamaat ihivriurninganit aalannguqtiqtauyut nayugaanit hiku auktulaittumi qanurilinganingit atuliqtauningillu hakugiktumik uyaraqtariuyuq igluqpaqarvikhaliurutikhanut; maligiaqaqtangit hivuuranaqtumik aulattitinnaqtumik ilittuqhait tamainnut tuqhuangat; kiugiaqaqtangillu Havaakhaliuqtunut ungivaqtauyukhat imarmiuttanit avatait aturuiqtaugumik kihimi hamna Havaakhaliuqtunut ilittuqhilaarumiuk tuqhuanga aktuqtaulaitkumi ikhinnaqtaunngittumi iniani.

Katimayiit ihumaaluutiqaraluaqtut kihiani TMAC tiliurniqaqhutik tukhiqtaanit aallanngayungit Havaariyakhanut malikhimaittangit angikliktiqtauhimayait tadja uyaraqtarviuhimayuq tumingit, amigaitpaliqhutik nunaup iluanit haffumani uyaraqtarviuhimayut kiugiaqarumik aktuqtaunianut uuktuutainit Doris Tahia uyaraqtarviuhimayut malrurnik (2) ilaqaqtumik uyaraqtariuyut malikhugit

Tahiup piliriaqqat. Kiunahuariangani ihumaaluutingit, Katimayiit ilaaqtuihimayangit hivitunia qanurilinganingillu kiugialik amiqhainikhanut uuktuutainut Doris Tahia qakugunnguraitpat.

Ilagivluniuk, Katimayiit ilaliutihimayait hivunikhautikhamaat ilagiyakhangillu hivitunianut qanurilinganingillu Havaatigut Ilitaridjutaanut Nampaa 003 tautugiangani tukhiutauhimayut angiqtauhimayunullu TMAC nit, Kitikmeot Inuit Katudjiqatigiit, maliguarutait aulattitiningit, aahiillu Nutqaqtirahuarnikkut nunaqatgiiktunullu. Katimayiit ihumagivluniuk hivunikhautikhamaat angiqhimayangit tahapkuat aallannguqtiqtauhimayut Havaanut tukiliuqhimayauyuq uvani 2015 Aallannguqtiqtauningagut Atuqtakhanut ihuaqhiyauhimayut amirittiaqhimayumi aturaarnaqtumik ilitquhianut ilagivluniuk aallatqiit pivalliayakhainit ingattaqhittailinahuariangani uuktuutainit tukhiutaugaluaqtangit Havaariyauyukhanut uvani Katimayiita nanminiraluangit ihivriurningit uvani 2005-2006 mi.

Uvani ihivriuqtauhimaningit, NIRB naalakhimayangit nunaqatigiiktunut qakugunnguqqat qaangiqtaugumi hamna nanminiriyangit Havaariyauyunut angiriiqtauvluni aullaqtiriami, nunaliit kangiqhidjutait utaqqikhimaraaqtangit naahugivlugillu Havaangit pivalliayakhaat aturaarnaqtumik ilitquhiita taimaa Aviktquhimayumi itqariaqaqhutik tatamayumik maniliurahuarnikkut inikhaliuqtakhait ilagilugulu ingutaaqhimayumi qauyihaqtumik aulattitinnaqtumik uyaraqtarvik. Una Jimmy Haniliak, Nunaqatigiyangit Iqaluktuuttiamiutaq, niplautigiyaa uvani Kitunuliqaak Tuhaumayakhangit:

> *Uvagut qinngihimanngitaqqut haffumani havaakhaliuqtunut piyumayainnit uyaraqtarviuyumayunut, kihimi – qauyimayakhaat akhuuqtailiyukhat malittiarlugulu nunam avataitalu, uuminngalu, inuit havaktut uyaraqtarviuyunut nayugaanit.*[3]

Una tamainnut uuktuutainit ikayuutigiyait haffumanngat Nutqaquiyangit unalu nunalingnit haffumani TMAC'ip pivalliayakhautait uyaraqtarviuyunut, tukhiutauhimayauyuq uvani 2015 Aallannguqtiqtauningagut Atuqtakhanut naunaiqtauhimayurlu ukunanngat Kitikmeot Inuit Katudjiqatigiit (KIA) uvani Kitunuliqaak Tuhaumayakhaanut:

> *Ihumagiyauyurlu, Katimayiita tuhaumayangit kinaliqaak nutqaquiyangit pinahuaqtakhait qanuq ihumaaluutiqanngittutik haffumani TMAC'ip atuqtakhainit.*
>
> *Hamanngat KIA ihumagiyaita, taimaa ihumagiyaunnaqtuq hamna nunalingnit kivgaqtingit niplautigihimayait tuhaumaliqhutik naunaiyaivlutik ikayuqhimavlutik havaariyauyukhanut… KIA naaguhiriyait niplautiffaarmiluni hakugikpiaqtumik ikayuutigiyangit havaariyauyukhanmut. Inuit iluani aviktuqhimayumi ikayuutigilluarniaqtangit havaariyauyukhanut. KIA nalaumattiaqtangit hamna tamaat ihumagiyaulluaqtait avatait inungnut ikayuutikhait ihumaaluutingit ilagihimayangit havaanut kiutaaqhimayauyut. TMAC ingattaqhittailiyauyut upalungaiyautait maligumayangillu, uvani KIA't ihumagiyangit, nalaumayut ihuaqhinahuaqtangillu tamaat ihumaaluutingit.*[4]

[3] J. Haniliak, Iqaluktuuttiaq, NIRB Kitunuliqaak Tuhaumayakhanut Titiqqak Nampaa 05MN047, Unipkaangit, Ilangat 3, Qitiqqautiyuq 14, 2016, makpiraq 541, titiqqak 9-13.

[4] S. Anablak, Kitikmeot Inuit Association, NIRB Kitunuliqaak Tuhaumayakhanut Titiqqak Nampaa 05MN047, Unipkaangit, Ilangat 3, Qitiqqautiyuq 14, 2016, makpiraq 544, titiqqak 1-7 unalu 18-24.

Ihumaliuqtaaqhimavluniuk, Katimayiita ihumaliuqhimayait hamna angiqtaunniqqat ilaliutaugumilu ukunanngat Katimayiita tukhiqhimayangit kigliinnangit ingattaqhittailiyangillu uuktuutainit havaktauniaqqat nutaamik ilagiffaarmiyangit hivitunia qanurilinganingillu NIRB Havaariyauyukhanut Ilitaridjutaanit Nampaa 003, aallannguqtirningit Havaanut tukhiutautaarumik uvani 2015 Aallannguqtiqtauningagut Atuqtakhanut havaktaulaarumik ilitquhiqaqtumik taimaa hapummilaaqhutik ikayurnahuarlugillu atuqhimayumi hivunikhautikhangillu inuuttiarnaqtumik nunaqatigiit nunalingnilu Nunavut Nunataarviup Iluani, taimaa hapummilaaqhugillu nunaup avataita ilagiyait haffumani Nunavut Nunataarviup Iluani. Taimaa iniqhimaniaqhugu, Katimayiit ihumagivluniuk titirariiqhimayumi parnautikhaat titiraqhimayauyuq ilauhimayunut ilagiyangillu kitunuliqaak nipiliuqtauhimayumi, niplautigiyauhimayumi unalu titiraqhimayangit naunaiqpiaqtauhimayumi qimilrurningit kiuviniit aittuqtauhimayut ukunanngat Katimayiita hivunngani haffumani Kitunuliqaak Tuhaumayangit unalu ilittuqhainirnut ihumagiyangillu naunaiqtauhimayut inungnit ilauqatauhimagaluaqtut Kitunuliqaak Tuhaumayaraluangit.

NIRB quviahuutigiyangit tamainnut ilauqatauhimagaluaqtunut ihivriuqhivlutik, havaqatigiivlutiktauq ilauqattautigivlutik nakuuyumiglu ilitquhianit piliriakhutik. Ihumagiyait, Katimayiit quyagiyangit TMAC Resources Inc.nut, aallatqiit kavamatuqait, nunallaangit, nunaqatigiiktunut kavamaita kivgaqtiuyut, una Kitikmeot Inuit Katudjiqatigiit, Inirnikhait, nunaqatigiiktut ikayuqtiuyut, ilauhimayunullu kitunuliqaak iniliuqhimayangit, avvautihimayangillu ilihimayarnit ayuinningillu ikayuqhimayut Katimayiita hulinningat iniqhugu hivituyumik ikaarnaqtumik ihivriurningit aallannguqtiqtauhimayut Havaariyauyukhanut tukhiutauhimayut uvani 2015 Aallannguqtiqtauningagut Atuqtakhanut.

Titiraqtuq,

Elizabeth Copland
Atanguyauyuk Ikhivautalik
Nunavut Aviktulikyiit Katimayiit

ᐃᑲᓂᐅᑕᓕᐅᖅ ᑐᐊᒐᕐᓯᖓ

ᐅᓇ ᐅᓂᖅᑲᑕᐊᖅ ᖃᖅᓯᑕᐅᓯᒪᔪᖅ ᓄᓇᕗᒻ ᐊᓂᑎᓕᓴᕐᓂᐊᖅᑯᑦ ᑲᑎᒪᔨᖅᑕᕐᓄᑦ (NIRB ᐅᖃᓂᔭᓐᓂᑦ ᑲᑎᒪᔨᑦ) ᖁᒥᖁᑭᐅᐅᔪᓐᓇᖅᑯᓗᒍ ᐃᓱᒪᒃᖁᕗᑦᑕᐅᔪᓐᓇᖅᑯᓗᒍᓗ ᐃᓄᓕᓴᕐᓗᑐᖅᑯᑦ ᒥᓂᕐᖏᓄᑦ (ᒥᓂᕐᑕ) ᒪᓕᒃᓗᒍ ᓄᓇᕗᒻ ᓄᓇᑦᓂᓕᒧᑦ ᐊᖏᕈᑎᑎᓕᐊᑦ ᐃᓕᖏᑎ 12, ᐃᓕᒃᖅᓂᖏᑎ 12.8.2 ᐊᒻᒪᓗ 12.8.3. ᐅᓂᖅᑲᑕᐊᖅ ᓇᐃᑦᓕᒥᐊᖅᑎᑎᓱᒪᔪᖅ ᑲᑎᒪᔨᑦ ᖃᐅᔨᓴᐅᑎᒥᓕᐅᖅᑕᖏᕐᕋᑦ ᓴᖅᑭᓱᒪᔭᖏᓂᓂᒃ ᐱᓕᕆᐊᖏᓴᕆᐊᖃᖅᑕᐃᒃᑯᑦ (2015-ᒥ ᐊᖅᑭᒥᐊᖅᓱᓂᑯᑦ ᑐᓴᕐᐅᑕᐅᓱᒪᒃᑯᑦ) ᑐᓂᕐᑕᐅᓕᐅᖅᑐᖅ 2015-ᒥ TMAC Resources Inc.-ᑯᓗᓂ (TMAC ᐅᖃᓂᔭᓐᓂᑦ ᐅᔾᕋᓂᐊᖅᑐᓕᕆᔨᑯᑦ) ᐊᖅᑭᒥᐊᕐᑕᐅᔪᓐᓇᒪᔪᓂᓂ Doris North ᔫᔭᒥᒃ ᐅᔾᕋᓂᐊᖏᔪᐅᔪᓂᑦ, ᓄᓇᕗᒻ ᐊᖏᑎᓕᕆᔨᑯᑦ ᑲᑎᒪᔨᖅᑕᕐᓄᑦ ᑎᑎᖅᑲᓕᑎᑎᖅᑕᕐᓂᓂᒃ ᓱᓴᕿᑎᓕᖅᑕᒃ 05MN047-ᒥᒃ (ᐱᓕᕆᐊᖏᔪᖅ). ᐊᓱᔨᖅᑕᐅᔪᓐᓇᑦ ᐱᓕᕆᐊᖏᔪᒪᑦ ᐅᖅᑲᐅᓱᐅᓱᓕᔪᑦ 2015-ᒥ ᐊᖅᑭᒥᐊᕐᑕᐅᔪᓐᓇᓂᓂᒃ ᐅᔨᓴᕆᔭᐅᓕᐅᖅᑐᓂ ᐱᓕᕆᐊᓗᒃᑯᑦ ᐊᐅᑐᐊᓂᖅᑲᖅᑐᓂᕐᕕᓄᑦ ᐱᓕᕆᐊᖏᔪᒪᑦ ᐊᐅᑐᐊᓂᖅᑲᖅᑐᓂᕐᕕᓄᑦ ᐱᓕᕆᐊᖏᔪᒪᑦ ᐊᖏᕈᑎᑎᓕᐊᑦ ᐃᓕᖏᑎ 12.8.2. ᖃᐅᔨᓴᕐᑕᐅᔪᖅ ᐊᒻᒪᓗ ᐃᓱᒪᒃᖁᕗᑦᑕᐅᒃᑲᓂᓂᖅᑐᖅ ᑐᙵᓚᐃᕐᔾᔪᖅ ᑕᑯᓇᓗ ᐅᓂᖅᑲᑕᐊᖅᑯᑦ ᓴᖅᑭᒥᐊᖅᑯᑦ ᓄᓇᕗᒻ ᐊᖏᑎᓕᕆᔨᑯᑦ ᑲᑎᒪᔨᖅᑕᕐᓄᑦ ᐱᔪᓐᓇᕐᓂᕐᓂᑦ ᓄᓇᕗᒻ ᓄᓇᑦᓂᓕᒧᑦ ᐊᖏᕈᑎᑎᓕᐊᑦ ᐃᓱᒪᒃᖁᕗᑦᑕᐅᒃᑲᓂᓂᖅᑐᖅᓂᕐᓂᑦ ᒪᓕᒐᒃᓴᕆᔨᑯᓂᖅ ᐱᓕᕆᐊᖏᔪᒪᑦ ᐊᐅᑐᐊᓂᖅᑲᖅᑐᓂᕐᕕᓄᑦ ᐱᓕᕆᐊᖏᔪᒪᑦ ᐊᐅᑐᐊᓂᖅᑲᖅᑐᓂᕐᕕᓄᑦ ᐊᓱᔨᐅᓴᓂᓄᖅ ᐃᓱᒪᒃᖁᕗᑦᑕᐅᔪᓐᓇᖅᑯᓗᒍ.

ᑲᑎᒪᔨᑦ ᐊᓗᐊᐃᖅᓱᒪᒪᓂᑦ ᑕᒪᐃᓐᓄᑦ ᐱᓕᕆᖅᑎᑎᒃᑐᓄᑦ ᖁᒥᖁᑦᔪᓄᑦ ᐅᓂᖅᑲᑕᐊᕐᒥᐅᖅ ᑲᑎᒪᔨᑦ ᖁᒥᖁᑦᓂᕆᔨᓴᖏᓐᓄᑦ ᐃᓱᒪᒃᖁᕗᑦᑕᐅᑎᑎᒃᑐᓂᕐᓂᓗ ᑭᓚᓂᖅᑲᒪᒃᑕ ᐊᖅᑭᒥᐊᖅᑕᐅᓱᒪᔪᓂᑦ ᐊᖅᑭᒥᐊᖅᑕᐅᖅᑎᑦᑕᐅᓕᐅᖅᑐᓄᑦ 2015-ᒥ ᐊᖅᑭᒥᐊᖅᓱᔪᓕᓂᖅᑐᓄᑦ ᑐᓴᕐᐅᑕᐅᑎᑎᒃᑐᓂᕐᓂᑦ TMAC-ᑯᓗᓂ ᐃᓄᐃᑦ ᑲᑎᒪᑎᑕᐅᑎᓪᓗᑎᑦ, ᐊᒻᒪᓗ ᖁᑎᖁᒥᑕᑦ ᐅᔾᔨᑭᓴᖅᑐᓴᐅᓗᑎᒃ, TMAC-ᑯᑦ ᐸᖓᐃᓱᒪᔪᑦ ᐊᓱᓚᑐᓂᓄᖅ ᐅᔾᕋᓂᐊᖅᑕᐅᑎᖅᑕᓂᓄᖅ ᐅᔾᕋᓱᐅᖅᑕᐅᑎᖅᑕᓂᓗ Hope Bay-ᑯᑎᒍᑦ ᐊᒻᒪᓗ ᑐᓂᓱᒪᒪᑦ ᐱᓕᕆᐊᖃᓕᒪᔾᔪᑎᑦᑕᕐᓄᑦ ᓄᓇᕗᒻ ᓄᓇᑦᓂᓕᒧᑦ ᐱᓕᕆᐊᖏᔪᒪᑦ ᖃᐅᔨᓴᕐᑕᐅᓂᖅᑐᓂᕐᓂᑦ ᖃᓄᐃᓱᒪᒃᑯᑦ ᐊᓱᓚᑐᓂᓄᖅ ᐱᓕᕆᐊᖏᔪᒪᑦ, ᐱᓕᕆᐊᖅᓂᓄᖅ ᐊᒻᒪᓗ ᖃᓄᐃᓕᐅᕕᑕᐅᔪᓐᓇᖅᑐᓄᖅ ᓱᕐᓂᓄᖅᓂᒥ, ᐳᓱᐊᓂ ᑕᒪᐃᑯᐊ ᐊᓱᓚᑐᓂ ᓱᓕᑦᓵᓕᑐᑦ ᐊᖅᑭᒥᐊᖅᑕᐅᔪᓐᓇᓂᓂᒃ ᐱᓕᕆᐊᖏᔪᓚᐅᖏᓐᓂᖅᑐᓂᕐᕕᓄᑦ 2015-ᒥ ᐊᖅᑭᒥᐊᖅᑕᐅᖅᑎᑦᑕᕐᓄᑦ ᑐᓴᕐᐅᑕᐅᑎᑎᒃᑐᓂᕐᓂᑦ. ᑕᒪᐃᓐᓄᑦ, ᐊᖅᑭᒥᐊᖅᑕᐅᖅᑎᑦᑕᕐᓄᑦ TMAC-ᑯᓗᓂ ᐃᓄᐃᑦ ᐊᖅᑭᒥᐊᖅᑕᐅᖅᑎᑦᑕᕐᓄᑦ ᐱᓕᕆᐊᖏᔪᒪᑦ ᐊᐅᑐᐊᓂᖅᑲᖅᑐᓂᕐᕕ

ᓇᓗᓇᐃᔨᐃᑎᐊᖅᑲᓂᐱᐊᓪᓚᐅᓪ ᖃᓄᖅ ᐊᖏᑎᑭᖏᓚᖏᑐᒃ ᐊᓯᔨᕐᓂᐅᔪᓚᐅᔪᓂᑦ ᑐᓴᓯᖅᑎᐅᔪᓚᐅᖅᑐᑦ ᑲᑎᒪᔨᑦ ᐃᖏᓚᒃ ᐊᒥᑕᓂ ᖃᓄᐃᔨᐃᑎᐊᕐᓗᑎᑐᖅ ᐊᒋᑦᓯᓂᐅᔪᖏᓐᓄᑦᑐᖅ ᐱᓕᕆᓚᐊᑎᑦᑎᓂᐅᔪᖅᑐᖅᓯᑦ ᐱᓕᕆᓚᐊᖅᑐᖅᓯᑦ ᐱᓚᒪᐊᔪᓕᕐᓂᖅᑐᖅ ᐱᓕᕆᓚᐊᖅᑐᖅᓯᑦ, ᐱᓚᒪᐅᓂᖅᓯᒃᑯᓯᑦ, ᐅᓴᔨᖅᑐᕐᓗᑎᑐᖅ ᐱᑕᖅᖏᑦᑐᖅᓂᖅᓴᐅᔪᓗᒍ ᑐᒥᖅᑎᑦᑐᖅᓂᖅᓴᐅᔪᓗᒍ ᐊᓯᔨᕐᓂᐅᔪᖅᑐᖅᓯᑦ ᑕᒪᐃᓐᓇᖅᑐᑦ <ᓴᐃᓚᑕᐅᒋᑦᓯᓚᑕᒪᓕᑕ ᐅᒪᐃᓚᑕᐅᒋᑦᓯᓚᑕᒪᓕᑕᓐᓄᓗ.

ᓇᓗᓇᐃᔨᐃᓂᐊᖏᓗᓂᑦ ᐋᖅᑭᑎᐊᖅᓱᒍᑎ ᐱᓕᕆᓚᐊᖅᓯᒪᑦ ᐊᑐᓕᖅᓴᐅᔨᑕᐅᔪᖅᑐᑦ 2015-ᒥ ᐋᖅᑭᑎᐊᖅᓱᔾᔨᒪᓕᕐᓗᑦ ᑐᓴᓯᐅᑎ ᑲᔪᓯᑎᐊᕈᑕᐅᓇᔨᖏᓐᓄᑦ ᒪᓕᑐᓕᕆᔨᓂᖏᑦ, ᐊᑎᓚᓗ ᑕᐃᒪᐃᓕᑐᐊᓕᕆᔨᖏᑦ ᐊᓯᔨᖅᓱᒪᔾᔨᑦ ᒪᓕᖏᑕᐅᔨᖅᑕᐃᓕᖅᖏᓐᓄᑦᑐᖅ ᖃᓄᐃᓕᖅᑕᐅᔨᖅᑕᐃᓕᖅᖏᓐᓄᑦᑐᒥᓪᓗ ᓇᓐᓂᐊᕐᓗᒍ ᐊᔭᑎᓕᕆᓚᐅᖅᑐᒥ ᐅᓇᐅᑎᓕᕆᓚᐅᖅᑐᒥ ᐊᑐᓕᖅᓴᐅᔨᑕᐅᔪᖅᑐᑦ ᐋᖅᑭᑎᐊᖅᑕᐅᔨᕐᓂᖅᑐᑦ ᐊᑐᓚᓗ ᐃᓇᓐᓂ ᓂᓪᓕᐅᑕᐅᔨᕐᓂᖅᑐᑦ ᐋᖅᑭᑎᐊᖅᑕᐅᔨᕐᓂᖅᑐᑦ (1) ᐱᕆᔭᖏᓐᓄᑕᐅᓪᓚᐅᖅᑐᒃ. ᖃᐅᔨᓴᐃᓂᐅᔨᖅ ᐱᐊᓂᑕᐅᔨᕐᓂᖅᑐᖅᓯᖅ ᐱᖓᓱᓂᖅ (3) ᐅᓪᓚᓂᖅ ᐃᓇᐃᑦ ᑲᑎᒪᔨᑕᐅᓪᓚᐅᖅᑐᒃ ᐃᖏᓇᔾᔪᑎᑕᐅᖅᑐᒥᖅ 12-ᒥ 14-ᒧᑦ, 2016-ᒥ. ᐃᓇᐃᑦ ᑲᑎᒪᔨᑕᐅᑎᓪᓚᐅᑦ, ᓇᓗᓇᖅ ᐊᖏᑎᓕᕆᓚᐅᖅᑐᑦ ᑲᑎᒪᔨᖅᑭᑦ ᑐᓴᖅᑎᑕᐅᓕᕆᓚᐅᖅᑐᑦ 60 ᐅᖅᑲᒋᓂ ᐃᓇᖅᓂᒃ, ᐃᓕᐅᖏᑕᐅᓪᓚᐅᑦ ᐃᖅᓇᑐᖏᐃᑦ, ᐃᓕᓴᓂᐊᖏᑦ, ᐱᓪᒥᒧᓗᖅᑐᑦ ᐱᓕᕆᖏᑎᒃᑐᑦ, ᐃᓕᐅᖏᑕᐅᓂᓪᓕᐅᑦ, ᑭᓱᑲᖅᑐᐃᓐᓇᖅᑐᑦ ᖃᓄᐃᓕᖅᑕᐅᔨᖅᑕᐃᓕᖅᖏᓐᓄᑦᑐᖅ ᐊᑐᓚᓗ ᐃᓱᒪᓕᕆᑎᒥᓂᖅᑐᒃ ᐅᖏᐅᔨᖏᓐᓄᑦ.

ᑲᑎᒪᔨᑦ ᖃᐅᔨᓴᐃᓂᐊᖅᑐᓪᓚᐅᑦ, ᑲᑎᒪᔨᑦ ᑐᓴᖅᑎᕈᓚᐅᖅᑐᑦ ᓇᓗᓕᐅᖅᑲᖅᑎᓂᖅᓴᖓᓂᑦ ᓇᓇᒃᑯᑦ ᐊᒋᑦᖅᑕᐅᓂᖅᑎᖅᑐᖅᑐᒃᑯᑦ ᐱᓯᐊᑎᖅᑎᖅᑐᓂᒃ ᑲᓚᐅᓂᒃᑯᑦ ᓇᓇᒥ ᐃᒪᓕᖅᓂᒃ ᓇᓇᐅᓯ ᐊᒋᒡᓂ ᐅᓴᖅᓂᓂᐊᓕᖅᓂᖅᓴᖓᓂᑦ ᑯᐃᖅᑕᓕᖅᖏᑦ ᓂᓪᓕᐅᑕᐅᔨᕐᓂᖅᑐᑦ ᓂᓪᓕᐅᑕᐅᔨᕐᓂᖅᑐᑦ Roberts Bay-ᒥ, ᓂᓪᓕᑕᒃ ᐃᓕᕆᐊᖅᓯᒪᓂᐊᖅᓱᓂᒃ ᐃᓕᐅᑦ ᓇᑎᖃᒪᔪᑦ ᒪᓴᔭᓇᑦ (2) ᑭᒡᒥᑕᓇᑦ ᑯᐊᖏᓂᐅᖅᑲᖅᑎᓂᓪᓗᒍ Roberts Bay-ᒧᑦ. ᑕᐃᒪᐃᑐᑎᒃ ᐃᓕᖅᒧᑦ ᐊᖏᑎᓵᑎᓇᑦ ᑯᐊᖏᓂᐅᖅᑲᖅᑎᓂᓪᓗᒍ ᐊᓯᔨᖅᑐᓂᐅᖅᑲᖅᑎᓂᐅᖅᑲᖅᑎᓂᓪᓗᒍ ᐊᓯᔨᖅᑎᓂᒃ ᐅᓴᖅᓂᓂᐊᓕᖅᓂᐅᓕᕆᔨᓇᓂᒃ ᓇᓇᐅᓯ ᓯᓚᑐᓂᖅ ᐊᒋᑦᓯᓂᐅᖅᑲᖅᑎᓂᐅᖅᑲᖅᑎᓂᓪᓗᒍ ᐊᓯᔨᖅᑎᓂᒃ ᐅᓴᖅᓂᓂᐊᓕᖅᓂᐅᓕᕆᔨᓇᓂᒃ ᓇᓇᐅᓯ ᐊᑐᓚᓗ ᐃᓕᖅᒧᑦ ᑯᓚᖅᑐᖅᓯᑦ. ᐃᓇᐃᑦ ᑲᑎᒪᔨᑕᐅᑎᓪᓚᐅᑦ, ᑲᑎᒪᔨᑦ ᐊᑐᓕᖅᓴᐅᔨᓯᒪᓂᒃ ᐊᓯᔨᓂᐅᓪᓚᐅᖅᑐᖅᓯᑦ ᓇᓗᓇᐃᔨᐃᓂᐊᖏᓗᓂᑦ ᐱᓕᕆᓚᐊᖅᑐᖅᓯᑦ ᐃᓇᐃᑦ ᐊᑐᓕᖅᓴᐅᔨᑕᐅᔪᖅᑐᑦ ᐃᓕᐅᖏᑕᐅᔨᖅᑕᐃᓕᖅᖏᓐᓄᑦᑐᖅ ᐱᓕᕆᓚᐊᖅᑐᖅᓯᑦ ᐃᓇᐃ

ᐋᓴᐃᓴᑕᐊᕐᓂᐸᒥᓱᓕᕐᓂᖅᑐᓄᓪᓗᓂ ᓯᕐᓗᓂᖅᓂᒃ ᐊᑐᕈᓐᓇᒃᐸᑕ ᑭᓯᐊᓂ ᐅᓴᖏᓂᐊᕐᓂᑐᐃᓴᐅᑎᑦ ᓇᓗᓇᐃᖅᓯᐅᓇᖅᐸᑕ ᓯᕐᓗᓂᓪᓚᑎᑦ ᐊᓂᑐᖅᓯᓴᖅᑎᑦᓱᓂᓪᓗᑎᑦ ᓴᖏᒪᓂᐅᓴᖅᑎᑦᓱᓂᓪᓗᓂ ᖃᐅᒪᓂᐅᑐᐃᓇᖅᐸᑕ. ᑲᑎᒪᔨᓂ ᐃᓱᒪᓗᐃᑎᒃᑲᓂᐅᕐᒥᔪᑦ TMAC-ᓄᑦ ᐋᖅᑭᒃᓯᐃᓱᒪᒪᓕᓗᐊᖅᑎᓪᓗᑎᑦ ᐊᓱᔨᕐᖅᑕᐅᔪᓚᐅᖅᓂᒃ ᐱᓕᕐᓂᐊᖅᑐᖅᑕ, ᐃᓕᓴᐅᔪᓂᖅᓱᒃ ᐅᖃᓕᒫᓂᖅᓱᒃ ᐃᓕᓴᐅᑎᓪᓗᐊᖅᑐᖅᑕ ᐃᓕᓴᐅᔪ

*ᐱᓕᓇᐅᕐᒥᔅ… ᖃᑎᖅᑕᐅᑦ ᐃᓄᐃᑦ ᑲᑐᔾᔨᖅᑎᑕᕐᓂᑦ ᐅᖃᖅᖃᓪᓚᕐᓂᖅᑕᕐᓗᓂᑦ ᐃᑲᔪᖅᑐᐃᓐᖓᓕ ᑕᒪᑐᐊᕐᒥᔅ. ᐃᓄᐃᑦ ᖃᑎᖅᑕᐅᑦ ᐱᓪᓕᖅᑕᓇᓐᖓᓂᖅᑐᐊᖅᑐᑦ ᑕᑯᓐᓇ ᐃᓕᓇᐅᕐᒥᔪᑎᑦ. ᖃᑎᖅᑕᐅᑦ ᐃᓄᐃᑦ ᑲᑐᔾᔨᖅᑎᑕᕐᓂᑦ ᐃᓕᓴᕐᓂᑦ ᖃᐅᔨᒪᓂᕆᔨᖅᑐᑦ ᑕᒪᖅᑭᑐ ᐱᓪᓚᕆᐅᔪᓐᓇᖅᑎᑦ ᐊᐅᖅᑕᓇᓂᖅᑎᑦ ᐃᓅᖅᑎᕐᕕᓂᖅᑎᑦ ᕿᓇᐅᔨᕗᖅᑐᖅᑎᑦ ᐃᓕᓴᕐᑕᕐᓂᑦ ᑕᑯᓐᓇ ᐱᓕᓕᓇᐅᔪᓐᓇᖅᑎᑦ ᑲᒪᓂᖅᑐᑦ. TMAC-ᒥᑦ ᐊᑦᖃᑎᐊᖅᓯᐊᓂᕐᒧᑦ ᐸᕐᓇᐅᑎᖅᑎᑦ ᐊᓪᓚᓗ ᐱᓕᓇᔪᓂᖅᑎᑦ, ᖃᑎᖅᑕᐅᑦ ᐃᓄᐃᑦ ᑲᑐᔾᔨᖅᑎᑕᕐᓂᑦ ᐃᓕᓴᕐᑎᑦᓯᔪᑦ, ᐃᓅᓚᐅᑎᑦ ᐊᐅᓚᑦᑐᖅ ᐱᓕᓕᓇᐅᔪᓐᓇᖅᑎᑦ ᐃᓕᓴᕐᑕᕐᓂᑦ ᑲᒪᓂᖅᑐᑦ ᐃᓕᓴᕐᑕᕐᓂᑦ ᐃᓄᐃᑦ ᑲᑐᔾᔨᖅᑎᑕᕐᓂᑦ ᐃᓕᓴᕐᑕᕐᓂᑦ ᐃᓄᐃᑦ ᑲᑎᒪᔨᖅᑎ

AVANT-PROPOS DE LA PRÉSIDENTE

Ce rapport a été préparé par la Commission du Nunavut chargée de l'examen des répercussions (CNER ou la Commission) aux fins d'examen et de considération par la ministre des Affaires autochtones et du Nord (la ministre), conformément à l'article 12, paragraphes12.8.2 et 12.8.3 de l'Accord sur les revendications territoriales du Nunavut (ARTN). Le rapport résume les résultats de l'examen par la Commission de la demande (la « demande de modification de 2015 ») présentée en 2015 par TMAC Resources Inc. (« TMAC » ou « le promoteur ») de propositions de modification du projet de la mine d'or de Doris North, n^{o} de dossier CNER 05MN047 (« le projet »). La Commission a conclu que les propositions de modification au projet décrites dans la demande de modification de 2015 étaient liées de façon intrinsèque au projet tel qu'il a été approuvé à l'origine par la commission sous le certificat de projet de la mine d'or de Doris North (certificat de projet n^{o} 003), délivré en 2006. En tenant compte de ce lien, la Commission a établi que toutes les répercussions écosystémiques et socioéconomiques potentielles, associées aux propositions de modification du projet devraient être évaluées en vertu du paragraphe 12.8.2 de l'ARTN. L'examen et le réexamen à la base du présent rapport découlent des pouvoirs de la CNER, en vertu de l'ARTN, de réexaminer les conditions d'un certificat de projet existant lorsque des changements aux circonstances justifient un tel réexamen.

La Commission souhaite souligner pour toutes les parties qui passent en revue ce rapport que la portée de l'examen et du réexamen par la Commission se limite uniquement aux propositions de modification comprises dans la demande de modification de 2015. Comme l'a indiqué TMAC dans le cadre de l'audience publique et comme le savent peut-être déjà les résidents de la région de Kitikmeot, TMAC planifie des activités d'exploration et minières le long de la ceinture Hope Bay et a présenté des descriptions de projet à la Commission en vue de l'examen de plusieurs propositions additionnelles d'activités, de travaux et d'entreprises dans l'avenir. Cependant, ces composants additionnels ne relèvent pas de la portée des propositions de modification incluses à la demande de modification de 2015. Par conséquent, la Commission évaluera ultérieurement les demandes de changements au projet et les nouvelles propositions de projet de TMAC en vertu des dispositions pertinentes de l'ARTN et de la *Loi sur l'aménagement du territoire et l'évaluation des projets au Nunavut*.

L'examen d'un grand projet de développement minier est normalement précédé par des examens des premières phases de développement telles que l'exploration, l'exploration avancée et l'échantillonnage massif. Dans le cas où, comme c'était le cas pour cet examen, le plan de développement progressif d'un promoteur pour ses propriétés implique de multiples plans d'exploration et de développement minier rattachés à des demandes correspondantes aux diverses étapes du processus réglementaire, il peut devenir très difficile de définir clairement la portée des activités de chaque examen. Des membres de la collectivité, des intervenants et la Commission doivent consacrer plus de temps à élaborer une image claire de la portée des changements proposés dans une demande précise présentée à la Commission et à examiner de façon raisonnable les répercussions cumulatives associées à tout développement relativement probable dans une zone donnée au même moment. En outre, la Commission constate que pour ce type de développement progressif, il est de plus en plus important que les promoteurs de projet adoptent une approche intégrée dans le développement de projet qui, dans la mesure du possible, vise à limiter la superficie au sol et la perturbation associées aux différentes étapes du projet, et ce, pendant leur planification et leur mise en œuvre.

Pour déterminer si les modifications au projet proposées dans la demande de modification de 2015 devraient être autorisées à passer à l'étape réglementaire et si les changements aux conditions du

certificat de projet n^{o} 003 de la CNER sont nécessaires, la Commission a offert plusieurs occasions de rétroaction technique et publique aux modifications, et ce, sur une période d'environ un (1) an. Le processus d'examen s'est conclu par une audience publique de trois (3) jours, tenue à Cambridge Bay du 12 au 14 avril 2016. Au cours de l'audience publique, la CNER a reçu de l'information de la part de plus de 60 personnes, y compris des aînés, des étudiants, des parties intéressées, des intervenants, des représentants de quatre (4) des sept (7) collectivités potentiellement affectées et des membres du public qui ont tous partagé leurs connaissances, vision, espoirs, expériences et préoccupations.

Durant son examen, la Commission a eu vent d'une certaine incertitude associée aux répercussions écosystémiques potentielles liées au transport par pipeline d'eaux souterraines salines tirées de l'extraction minière souterraine et d'effluents traités de la zone de bassin des résidus le long de la route jusqu'à une petite jetée à Roberts Bay. Le pipeline s'étendrait sur le plancher océanique sur une distance de plus de deux (2) kilomètres avant de se déverser dans Roberts Bay. Comme ce type de déversement dans l'environnement marin n'a jamais été utilisé dans aucune mine actuelle ou projetée au Nunavut durant la phase d'examen technique, il n'a pas été clairement établi de quelle façon ce pipeline et le déversement maritime seraient réglementés et en vertu de quelle autorité. Lors de l'audience publique, il a été confirmé qu'Affaires autochtones et du Nord Canada serait responsable de réglementer cette infrastructure.

Même si elle considère que l'enjeu réglementaire est résolu, la Commission continue d'avoir deux (2) préoccupations techniques clés par rapport à ce pipeline : veiller à ce que le pipeline demeure stable, protégé des dommages et sécurisé dans sa partie terrestre et éviter les répercussions nocives et durables potentielles sur l'environnement marin après l'abandon du pipeline sur le plancher océanique une fois qu'il n'est plus utile. Pour répondre à ces préoccupations, la Commission recommande l'ajout de conditions au certificat de projet n^{o} 003 : que la partie terrestre du pipeline soit incluse à l'examen global de TMAC concernant les changements aux conditions du pergélisol et les répercussions sur la stabilité de l'infrastructure minière; qu'une étude portant sur les risques et l'exploitabilité soit menée sur le pipeline au complet; et que le promoteur du projet retire le pipeline de l'environnement marin lorsque ce dernier ne sera plus utile à moins que le promoteur puisse prouver que le pipeline n'aura aucune répercussion nocive s'il est laissé en place.

La Commission est aussi préoccupée par le fait que même si TMAC a conçu les propositions de modification du projet de sorte à ne pas nécessiter une hausse considérable de la superficie au sol, comme la facette souterraine de la mine a été triplée, celle-ci pourrait avoir des répercussions sur le niveau du Doris Lake lorsque l'extraction minière des deux (2) dépôts supplémentaires sous le lac est enclenchée. Pour répondre à cette préoccupation, la Commission a ajouté aux conditions la surveillance du niveau d'eau du Doris Lake au fil du temps.

De plus, la Commission a inclus des révisions et des ajouts aux conditions du certificat de projet n^{o} 003 pour tenir compte des demandes et des ententes de TMAC, de l'Association inuite du Kitikmeot, des autorités de réglementation et d'autres intervenants et membres de la collectivité. La Commission juge ces révisions nécessaires pour veiller à ce que les changements au projet décrits dans la demande de modification de 2015 soient effectués de façon responsable et durable, conformément aux diverses améliorations aux mesures d'atténuation proposées à l'origine pour le projet lors de l'examen initial de celui effectué par la Commission en 2005 et 2006.

Pour ce présent examen, la CNER a entendu des membres de la collectivité qui, au cours de la décennie qui s'est écoulée depuis que la mise en œuvre du projet original a été approuvée, attendent avec

anticipation et espèrent que le projet sera développé d'une manière durable pour permettre à la région de réaliser son plein potentiel économique quand le projet passera du stade de l'exploration à celui d'une exploitation minière. Comme l'a affirmé Jimmy Haniliak, représentant communautaire de Cambridge Bay, lors de l'audience publique :

> *« Nous n'avons aucune objection quant au projet d'exploitation minière par le promoteur sur le site; nous lui demandons simplement d'être prudent et sensible et d'agir en respect du territoire, de l'environnement et des gens qui travaillent sur les lieux de la mine. »*[7]

Ce niveau général de soutien de la part des intervenants et des collectivités au développement minier continu par TMAC, tel qu'il est proposé dans la demande de modification de 2015, a aussi été dénoté par l'Association inuite du Kitikmeot (KIA) lors de l'audience publique :

> *« Plus important encore, la Commission a remarqué qu'aucun des intervenants dans la procédure ne continuait d'entretenir des préoccupations graves au sujet de la demande de TMAC.*
>
> *Selon la perspective de la KIA, il est aussi important que les représentants communautaires qui ont pris parole à l'audience publique signifient également leur soutien au projet... La KIA souhaite réitérer son appui solide au projet. Le projet bénéficiera grandement aux Inuits de la région. La KIA est convaincue que tous les enjeux environnementaux et socioéconomiques majeurs liés à ce projet ont été abordés. À l'avis de la KIA, le plan de mesures d'atténuation et les engagements de TMAC suffisent à résoudre toutes les préoccupations. »*[8]

Après mûre réflexion, la Commission arrive à la conclusion que, si ce projet est réalisé conformément aux limites et mesures d'atténuation recommandées par la Commission telles que stipulées dans les conditions révisées du certificat de projet n° 003 de la CNER, les changements au projet tels qu'ils sont définis dans la demande de modification de 2015 peuvent se faire de manière à protéger et à promouvoir le bien-être actuel et futur des résidents et des collectivités de la région du Nunavut et à protéger l'intégrité écosystémique de la région du Nunavut. Pour en arriver à cette conclusion, la Commission a étudié les documents écrits soumis officiellement au dossier par les parties et les membres du public, les commentaires oraux et écrits sur les évaluations techniques reçus par la Commission avant l'audience publique ainsi que les renseignements et les opinions exprimés par les participants dans le cadre de l'audience publique.

La CNER est très reconnaissante à tous ceux qui ont participé activement à cet examen et qui ont travaillé de façon collaborative et productive au cours du processus. Plus particulièrement, la Commission remercie TMAC Resources Inc., divers représentants des gouvernements fédéral, territorial et local, l'Association inuite du Kitikmeot, les aînés, les représentants communautaires et les membres du public qui ont consacré leur temps, leurs expériences et leur expertise et ont appuyé la Commission dans ses efforts pour effectuer un examen approfondi et en temps opportun des changements au projet décrits dans la demande de modification de 2015.

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[7] J. Haniliak, Cambridge Bay, transcription de l'audience publique de la CNER concernant le dossier n° 05MN047, vol. 3, 14 avril 2016, p. 541, lignes 9 à 13.

[8] S. Anablak, Kitikmeot Inuit Association, transcription de l'audience publique de la CNER concernant le dossier n° 05MN047, vol. 3, 14 avril 2016, p. 544, lignes 1 à 7 et 18 à 24.

Veuillez agréer, Madame la Ministre, l’expression de ma considération distinguée.

Elizabeth Copland
Présidente
Commission du Nunavut chargée de l’examen des répercussions

EXECUTIVE SUMMARY

This report and recommendations are the culmination of the Nunavut Impact Review Board's (NIRB or Board) assessment of the potential ecosystemic and socio-economic effects of the proposed project amendments described within the 2015 Amendment Application for the Doris North Gold Mine Project (the Project), proposed by TMAC Resources Inc. (TMAC or the Proponent). The scope of the original Project included the construction, operation, and eventual reclamation of an underground gold mine (Doris Hinge zone) located 125 kilometres (km) south of Cambridge Bay and 150 km north of Omingmaktok (Bay Chimo) on Inuit-owned surface lands; associated infrastructure for the extraction, transportation, and shipment of gold from the single deposit; and the construction of a 4.8 km long all-weather road with associated airstrip linking Roberts Bay infrastructure with the main camp and mine site.

In the NIRB's March 2006 Final Hearing Report for the Doris North Gold Mine Project, the Board concluded that if the Project was developed in accordance with the Board's 35 recommended terms and conditions, the Project could proceed to the regulatory phase. On August 1, 2006 the Minister of Indian and Northern Affairs Canada (as the Ministry was known then) subsequently accepted the Board's report and recommendations and directed the Board to issue a project certificate for the Doris North Gold Mine Project. On September 15, 2006, the Board issued Project Certificate No. 003 to the Proponent of the Project at that time, Miramar Hope Bay Limited.[9]

On December 9, 2013 the NIRB and the Nunavut Water Board (NWB) received an application from TMAC to amend the Project and specified terms and conditions in Project Certificate No. 003. Between December 2013 and June 2015, TMAC considered technical comment submissions and requests for clarification from the NIRB and the NWB, and revisited and refined the scope of the modifications to the Project that were being requested.

On June 23, 2015 TMAC provided the Board with the information necessary to define the scope of the proposed changes to the Doris North Gold Mine Project that were being sought. The 2015 Amendment Application proposed to extend the mine life, update waste storage at site, as well as requesting the removal of term and condition 9 (the requirement to have an on-site accredited lab for real time water testing) from Project Certificate No. 003. Additionally, TMAC noted that it continued to be supportive of a coordinated process between the NIRB and the NWB and requested that the NIRB and the NWB continue the coordinated process during these Boards' respective consideration of the proposed amendments (for additional information see Section 1.2: Procedural History).

Under the plans as described in the 2015 Amendment Application TMAC proposed to include the following *additional* activities and undertakings to expand the original Doris North Gold Mine Project:

- Proposed extension of mine life by four (4) additional years;
    - Proposed mining of Doris Central and Doris Connector zones via the existing Doris North portal instead of only mining the Doris Hinge zone;
- Increase of both mining and milling rates from 720 tonnes/day (t/day) and 800 tonnes/day, respectively, to 2,000 t/day;

[9] The Project Certificate was assigned in 2013 from Miramar Hope Bay Limited to TMAC Resources Inc., and TMAC is the Proponent of the 2015 Amendment Application.

- Increase total volume of deposited tailings in the Tailings Impoundment Area (TIA) from 458,000 tonnes to 2.5 million tonnes;
    - Proposed modification to the destruction of cyanide in process tailings from Caro's Acid (hydrogen peroxide and sulfuric acid) to the INCO process;
    - Proposed change to the disposal of tailings from subaqueous to subaerial tailings at the south end of the TIA;
    - Proposed restructuring of the TIA:
        - Installation of an interim dam approximately midway in the TIA.
        - Proposed south dam construction and operations to change from frozen core to frozen foundation.
- Discharge of up to 7,000 cubic metres/day (m^3/day) directly into Roberts Bay:
    - Direct discharge of up to 3,000 m^3/day of saline groundwater from underground year round.
    - Discharge of up to 4,000 m^3/day from the TIA during summer months.
    - Construction/installation, operation, and eventual decommissioning of a 550 metre (m) access road at Roberts Bay and installation of 5.64 kilometres (km) of overland pipeline, 2.3 km long marine outfall pipeline.
    - Installation, operation, and eventual abandonment of a 95 m long marine diffuser and approximately 900 m long marine outfall berm.
- Alternative disposal option for saline groundwater from underground workings to the TIA prior to the deposition of TIA water in Roberts Bay;
- Construction, operation, and eventual decommissioning of two (2) additional vents (Doris Central Vent and Doris Connector) and associated spur roads;
- Construction, operation, and eventual decommissioning of Pad U, which would be a 31,000 m^2 pad and associated pollution control pond for use as ore storage and temporary laydown area;
- Increase camp capacity from 180 to 280 persons to accommodate project personnel;
- Replace existing sewage treatment plant with a new plant with an increased capacity for the larger camp and retrofitting of existing sewage treatment plant for backup;
- Use of existing quarries A, B, D, and 3 to supply foundation materials for additional proposed infrastructure;
- Relocation of proposed landfill from Quarry A to Quarry 3 once the resources have been exhausted;
- Construction, operation, and eventual decommissioning of three (3) additional laydown areas at Roberts Bay (Roberts Bay Extension Laydown Area West, Southwest, and Southeast);
- Relocation of explosives facility from pad adjacent to Quarry 3 to Quarry A;
- Over-wintering fuel barges in Roberts Bay as required to support operations; and

- Removal of the requirement for TMAC to install and operate an on-site laboratory to test TIA water onsite in real time prior to release into Doris creek as previously required under Term and Condition 9 of the NIRB Project Certificate No. 003.

Although there are no mandatory process requirements for the Board's assessment and reconsideration set out under Article 12, Section 12.8.2 of the NLCA, upon review of TMAC's requested amendments, the NIRB determined that a full and thorough technical review of the proposed project amendments described in the 2015 Amendment Application would be required, including a Public Hearing in the community most likely to be directly affected by the proposed activities and undertakings, namely Cambridge Bay, Nunavut. Throughout the NIRB's assessment and reconsideration of the proposed project amendments, the NIRB received technical review comments, written submissions and verbal testimony from TMAC, the Kitikmeot Inuit Association, the Government of Nunavut, Aboriginal Affairs and Northern Development Canada, (now Indigenous and Northern Affairs Canada) Environment Canada (now Environment and Climate Change Canada), Fisheries and Oceans Canada, Natural Resources Canada, Transport Canada, representatives from four (4) of the communities in the Kitikmeot region of Nunavut, and members of the general public.

The Board heard from Intervenors, Community Representatives and members of the public in attendance at the Public Hearing that there is support for the amendments to the Project, as proposed in the 2015 Amendment Application. However, these parties also identified concerns regarding ensuring that the Proponent minimize the potential for negative impacts to caribou, Doris Lake, fish and fish habitat, as well as freshwater and marine environments. Reflecting these concerns, mitigation and management of the tailings facility, the discharge of effluent into Roberts Bay via the discharge pipeline and overall site surface and saline groundwater management received considerable focus during the technical review of the application for the proposed amendments and during the technical component of the Public Hearing. In addition, the potential for climate change to affect the mine, mine infrastructure, winter roads and eventual closure and reclamation planning were also discussed throughout the Board's reconsideration process. A complete record of the technical review comments, extensive written submissions and evidence presented at the Public Hearing in respect of the Board's reconsideration is available from the Board's public registry, accessible from the NIRB website at www.nirb.ca by using either of the following search criteria:

- Project Name: Doris North Gold Mine
- NIRB File No.: 05MN047

On the basis of all of the information that contributed to the NIRB's assessment of the proposed project amendments and reconsideration of the terms and conditions of Project Certificate No. 003, the Board has concluded that if undertaken in accordance with the Board's recommended limits and mitigation measures as expressed in new and revised terms and conditions to the NIRB Project Certificate No. 003, the amendments to the Project as proposed in the 2015 Amendment Application can proceed in a manner that will protect and promote the existing and future well-being of the residents and communities of the Nunavut Settlement Area, and that will protect the ecosystemic integrity of the Nunavut Settlement Area.

In closing, the Board wishes to highlight a few key revisions and additions to Project Certificate No. 003 recommended by the Board as necessary to prevent, minimize, monitor and adaptively manage the potential for adverse ecosystemic and socio-economic effects from the Project as proposed to be amended in the 2015 Amendment Application:

- New terms and conditions have been included to minimize the potential for effects arising from the effluent pipeline discharging into Roberts Bay;
- A new term and condition has been added to require periodic monitoring of the water levels in Doris Lake;
- A new term and condition requiring the development and submission of a detailed groundwater management plan;
- New and modified terms and conditions to continue monitoring for potential socio-economic project-induced effects, including new measures aimed at planning for and assessing effects associated with temporary closures of the mine, and measures to identify potential project-induced effects on in-migration in the region; and
- A new term and condition confirming TMAC's reporting obligations to the Government of Nunavut with respect to the presence of archaeological sites encountered by TMAC.

The Board is confident that if the amendments to the Project as proposed in the 2015 Amendment Application are carried out in compliance with the revised and new terms and conditions of Project Certificate No. 003 in combination with the Board's existing and robust project monitoring system, the proposed amendments to the Project can proceed in a manner that will be protective of the Kitikmeot region's ecosystemic integrity while contributing significantly to long awaited socio-economic benefits for the people and communities of the Kitikmeot.

Under the plans as described in the 2015 Amendment Application TMAC proposed to include the following *additional* activities and undertakings to expand the original Doris North Gold Mine Project:

- Proposed extension of mine life by four (4) additional years;
    - Proposed mining of Doris Central and Doris Connector zones via the existing Doris North portal instead of only mining the Doris Hinge zone;
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The Board heard from Intervenors, Community Representatives and members of the public in attendance at the Public Hearing that there is support for the amendments to the Project, as proposed

in the 2015 Amendment Application. However, these parties also identified concerns regarding ensuring that the Proponent minimize the potential for negative impacts to caribou, Doris Lake, fish and fish habitat, as well as freshwater and marine environments. Reflecting these concerns, mitigation and management of the tailings facility, the discharge of effluent into Roberts Bay via the discharge pipeline and overall site surface and saline groundwater management received considerable focus during the technical review of the application for the proposed amendments and during the technical component of the Public Hearing. In addition, the potential for climate change to affect the mine, mine infrastructure, winter roads and eventual closure and reclamation planning were also discussed throughout the Board's reconsideration process. A complete record of the technical review comments, extensive written submissions and evidence presented at the Public Hearing in respect of the Board's reconsideration is available from the Board's public registry, accessible from the NIRB website at www.nirb.ca by using either of the following search criteria:

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- A new term and condition confirming TMAC's reporting obligations to the Government of Nunavut with respect to the presence of archaeological sites encountered by TMAC.

The Board is confident that if the amendments to the Project as proposed in the 2015 Amendment Application are carried out in compliance with the revised and new terms and conditions of Project

Certificate No. 003 in combination with the Board's existing and robust project monitoring system, the proposed amendments to the Project can proceed in a manner that will be protective of the Kitikmeot region's ecosystemic integrity while contributing significantly to long awaited socio-economic benefits for the people and communities of the Kitikmeot.

ATANGUYALUAP TITIKIUTTIHIMAYAINIK NAUNNAITKUTAIT TALVANIITUM MAKPIRAAT NAUNNAITKUTAIT

Una unipkaanga tukhiqhimayangillu kingulliutauhimayut haffumani Nunavut Avatiliqiyit Katimayiita (NIRB Katimayiitaluuniit) ihivriurningit ihumagiyauhimayut nunaup avataita atuliqtauyut tukhiutauhimayumi havaariyauyukhanut aallannguqtiqtauhimayut tiliuqhimayuq iluani 2015 Aallannguqtiqtauningagut Atuqtakhanut haffumani Doris Nuat Kuulu Uyaraqtarviuyuq Havaangit (Havaangit), tukhiutauhimayuq TMAC Resources Inc. (TMAC Havaakhaliuqtunut). Una hivunikhautikhangit ilitquhiriyangit Havaangit ilaliutauhimayut igluliuqtunut, aulattitiyunut, utiffaarniaqtangit haffumani nunaup iluanit kuulunit uyaraqtarviuyut (Doris Kigliata Kiglingani) nayugaat 125 kilamiitas ungahingnia (km) hivuraanit Iqaluktuuttiami unalu 150 km tun'ngani Umingmaktuk (Omingmaktok) uvani Inuit – nanminiqutingit nunaanit; ilagiyaita igluqpaqarvikhaliurutikhait unguvaiyarahuarningit, agyaqtuilutik, agyarlugillu kuulut uyaraqtarviuhimayumi; unalu havaangit uumani 4.8 km takiyaaqtuq ukiuraalungmi apqutinut uuminngalu milvik aturviuvaktangit Roberts Bay igluqpaqarvikhaliurutikhait hiniktarvingit uyaraqtarviuyut nayugaanit.

Uvani NIRB'iup Qiqailruq 2006 mi Iniqhimayangit Tuhaumayakhaat Unipkaangi haffumani Doris Nuat Kuulu Uyaraqtarvik Havaangit, Katimayiita kingulliutiyangit hamna Havaangit pivalliayauhimayuq ilagiyangit Katimayiita 35 tukhiutigihimayait hivitunianut qanurilinganingillu, Havaangit aullaqtiqtaariaqaqtangit maliguarutainit ilanganit. Niqiliqivik 1, 2006 mi Nunaqaqaaqhimayum Inuliqiyit Kanata Ministanga (Ministanga qauyimagaluaqtangit) kinguani angiqtauhimayangit Katimayiita unipkaangit kiuyakhautaallu aulapkaihimayuq Katimayiit titiraquivlugu havaangit ilitaridjutaanit haffumani Doris Nuat Kuulu Uyaraqtarviuyuq Havaariyauyukhanut. Uvani Apitilirvik 15, 2006 mi, Katimayiit titirariiqhimayangit Havaariyauyukhanut Ilitaridjutaanit Nampanga 003 uvunga Havaakhaliuqtunut haffumani Havaariyauyukhanut qangalikiaq, Miramar Hope Bay Limited-nguuvluni.[10]

Uvani Ubluirvia 9, 2013 mi NIRB unalu Nunavut Imaliqiyit (NWB) aittuqtauhimayut atuqtakhainit hamanngat TMAC aallannguqtiriaqaqtangit Havaakhaliuqtunut hivitunianit qanurilinganingillu Havaariyakhanut Ilitaridjutaanit Nampanga 003 mik. Ikiangani Ubluirvia 2013 mi uvanilu Imaruqtirvia 2015 mi, TMAC ihumagivlugit naunaiqpiaqtauhimayangit niplautigiyait turaaqtauvluni tukhiutauvlunilu tutqittiarnaqtumik NIRB nit NWB nilu, pulaaffaarmiyangillu tiliuffaarmiyangillu hivunikhautikhait aallannguqattaqhimayangit Havaariyauyukhanut tukhiutaulraangit.

Imaruqtirvia 23, 2015 TMAC ilaliutihimayangit Katimayiita ilittuqhainirnit tiliuffaariangani hivunikhautikhait uumani tukhiutauhimayangit aallannguqtiqtauhimayut ukunani Doris Nuat Kuulu Uyaraqtarvik Havaariyauyukhanut turaaqtauhimavlutik. 2015 Aallannguqtiqtauningagut Atuqtakhanut tukhiutigiyangit tahinahuarlugulu uyaraqtarviup inuuhiangat, nutaannguqtiqhimalugillu huruqhimayut tutquumavikhait nayugaanit, uuminngalu tukhiutauhimayait ahivaqtaulugillu hivitunia qanurilinganingillu 9 (kiugiaqaqtangit pigiaqaqtut nayugaanit ilitariyuminaqtumik naunaiyarvik imarmik ihivriuqattaqtakhainit) hamanngat Havaariyauyukhanut Ilitaridjutaanit Nampanga 003. Ilagivluniuk, TMAC naunaiqhiivlutik huli ikayuqhimmaariaqaqhutik aulapkaihimayumik piliriangit ukunanngat NIRB unalu NWB tukhiutihimayangillu NIRV unalu NWB aulapkaivaglugillu piliriangit uvani Katimayiita

[10] Una Havaariyauyukhanut Ilitaridjutaanit tiliuqtauhimavluni uvani 2013 mi hamanngat Miramar Hope Bay Limited uvunga TMAC Resources Inc., unalu TMAC Havaakhaliuqtunuuvluni uvani 2015 Aallannguqtiqtauningagut Atuqtakhanut.

ihumagivlugit ihumagiyait tukhiutauhimayait aallannguqtiqtauhimayut (ilagihimayangit ilittuqhainiq takulugu Ilangani 1.2: Naunaiqpiaqtauhimaningit Ilitquhiriyait).

Malikhugu hamna upalungaiyangit tukiqariiqtuq uvani 2015 Aallannguqtiqtauningagut Atuqtakhanut TMAC tukhiutihimayait ilaliutigivluniuk maliktangit *ilagivlugit* hulidjuhiit amiriyangillu angikliktirnahuarlugillu nanminiriyait Doris Nuat Kuulu Uyaraqtarvik Havaangit:

- Tukhiutauhimaningit angikliktauhimayut uyaraqtarviup inuuhiat hitamanut (4) ilagiyangit ukiunganit;
    - Tukhiutauhimayait uyaraqtarviuhimayuq uumani Doris Qitqani unalu Doris Katilviuhimayut kiglinganit uumani atuqtaaqhimayait Doris Nuat tulagviat kihimi uyaraqtarviuhimayut Doris Kigliinnaa kiglingani;
- Angikliqtirlugu tamarmik uyaraqtarviuhimayut hauvikhanullu uuktuutait hamanngat 720 taans/ubluat (t/ubluat) unalu 800 taans/ublut, ihumagivluniuk, uvunga 2,000 t/ubluat;
- Angikliqtirlugu tamatkiumayait ininganit uyaraqtarviuhimayumi kuvvingit iluani Uyaraqtarviuhimayait Kuvvingit Nutqarviat Inia (TIA) hamanngat 458,000 taans uvunga 2.5 milian taansnit;
    - Tukhiutauhimayangit ihuaqhaqtauhimayait ahiruqtauningit uuminngat qayangnaqtumik ilaurutilingnit uvani piliriakhait kuvvingit hamanngat Caro'm Uutirnaqtumik (hydrogen peroxide unalu sulfuric uutirnaqtumik) uvunga INCO piliriakhangit;
    - Tukhiutauhimayangit aallannguqtiqtauhimayut iqqaktakhanmut kuvvirnut hamanngat imaup iluani aulattitiyakhaat uvunga nunaup quluuani kuvviutainit uvanihivuraanut TIA nit;
    - Tukhiutauhimayangit havaktauffaarmiyangit TIA nit:
        - Illiriyakhait haffumani atukaffuktakhait kuvvinga qitqaniinnginnaqtumi iluani TIA nit.
        - Tukhiutauhimayangit hivuraanit kuvvinga hanayauhimayut aulapkaihimayangillu aallannguqtiriangani qiqumayumi ilua uvunga qiqumayangit tunngavia.
- Unguvaqtaulugillu uvunga 7,000 kikkariktumik miitastigut/ublungani (m^3/ublungani) aulainnaqhutik Roberts Bay mut:
    - Ahivainnaqtuq ukunanngat 3,000 m^3/ublua taryulingnit nunaup iluanit imangat hamanngat nunaup iluani ukiuraalungmi.
    - Qurluqtittilutik 4,000 m^3/upluq tamaat TIA-mit auyautillugu.
    - Havaanguyut/illiriyauyut, aulapkaiyangit, unalu unguvaiyaqtauyut haffumani 550 miitas (m) apquliurahuaqtunit uvani Roberts Bay mi illiriyakhangillu ukunani 5.64 kilamiitasnit (km) ukunani nunaup qaangani tuqhuangit, 2.3 km takiyaaqtumik imarmiuttanit ikaaruhirnit tuqhuangit.
    - Illiriyangit, aulattitiyangit, qakugunnguqqanlu unguvaqtauniaqtuq uumani 95 m takiyaaqtumik imarmiuttanit qavyaqtuutitut ihuaqutainit unalu takiyaavyaktumi 900 m imarmiuttanit ikaaruhirnit maniraanit.

- Aahiittauq iqqaktauhimayut ukuninngat taryulingnit nunaum iluani imaq nunaup iluangat havaangit TIA nit unguvaiyaqtauhimayut imanga iluani Roberts Bay mi;
- Havaanguyut, aulapkaiyangit, unalu unguvaiyaqtauyut malrurnik (2) ilagiyait angmaumayut (Doris Qitqani Angmaumayuq unalu Doris Katilviuniq) ilaliutigiyangillu apqutinit;
- Havaanguyut, aulapkaiyangit, unalu unguvaiyaqtauyut Uqquuquhikhamaat U, taimaa anginiqhautiqaqhuni 31,000 m^2 uqquuquhikhamaat ilagiyangit hiamittailinahuarlugit hururnikunit amiqhaiyangit tahirannuanit atuqtakhait uuminngaluuniit tutquumavikhaat tulagvikhaat inikhaat;
- Angikliktirlugu hiniktarvikhaat inikhait hamanngat 180 mit 280 mut inungnit havaktukhat;
- Himmauhirlugit atuqtangit anaqtautit anaqtautiqarvikhaat nutaamik angikliktiqhimalugillu inikhaat anginiqhangit hiniktarvik nayugaat unalu iniliurlugillu atuqtangit anaqtautiqarvikhaat parnautikhaanit;
- Aturlugillu atuqtangit uyaraqtarviit A, B, D, unalu 3 tunngaviliuqtakhaat parnautait ilagiyakhaat tukhiutaaqhimayainnit igluqpaqarvikhaliurutikhanut;
- Nuutittilugit kuvvighaq Quarry A-mit talvunga Quarry 3-mut taapkua pivighat nungutpalliagumik;
- Havaanguyut, aulapkaiyangit, unalu unguvaiyaqtauyuluni pingahunit (3) ilagihimayait tulagvikhaanit inikhaat uvani Roberts bay mi (Roberts Bay Ilagiyangit Tulagvikhaat Ininganit Uataanit, Hivuraanit uataanit, unalu Hivuraanit kivataani);
- Nuuttirlugu qagalaaqtut qaaqturvikhaat hamanngat maqilaiyarvik qaliriiqhimayumi Uyaraqtarvik 3 mit uvunga Uyaraqtarvik A mut;
- Ukiiyangit uqhuryuangit agyaqtuiyut Roberts Bay mut kiugiaqarniqqat ikayuutigilugit aulattitiyangit; unalu
- Unguvaiyarlugit malikhimayangit haffumani TMAC nit illiriyakhaat aulapkaiyakhaallu nayugaanit ihivriuqhiiqarvikhaat uuktuqtakhait TIA imanga nayugaanit unguvaiyarianganit iluanut Doris kuugaanut malikhimalugu hamna Hivitunianit Qanurilinganingillu 9 haffumani NIRB Havaariyauyukhanut Ilitaridjutaat Nampanga 003.

Kihiani maliktakhaqanngittangit piliriakhait kiuvikhait haffumani Katimayiita ihivriuqtakhainit ihumaliuqtaaqtakhangillu turaaqtauhimayut uvani Nakataq 12 mi, Ilangani 12.8.2 haffumani NLCA, qimilruqtangillu TMAC'ip tukhiutingit aallannguqtiqtauhimayut, NIRB ihumagvluniuk tamatkiumayangit hivituyumiglu naunaiqpiaqtauyukhat qimilrurningit tukhiutauhimayut havaangit aallannguqtiqtauhimayut uvani 2015 Aallannguqtiqtauhimaningit Atuqtakhanut kiugialik, ilaliutauhimayuq Kitunuliqaak Tuhaumayakhaat nunalingnit aktuqtauhimayunut tukhiutauningit hulidjuhiit amiriyangillu, taiyauhimayuq Iqaluktuuttiaq, Nunavut. Tamainnut NIRB'ip ihivriuqtangit ihumaliuqtakhangillu haffumani tukhiutauhimayangit havaariyauyukhat aallannguqtiqtauhimayut, NIRB aittuqtauhimayut naunaiqpiaqtauhimayauyut qimilrurningit niplautauyut, titiraqhimayullu turaarutait unalu niplautigiyait uqariiqtauhimayut hamanngat TMAC, una Kitikmeot Inuit Katudjiqatigiit, Nunavut Kavamangit, Nunaqaqaaqhimayut Inuliqituqangit Kanatami, (tadja taiyauvagaat Inuliqiyiit Kanatami) Avatingillu Kanata (tadja taiyauvagaat Avatingnut Hilaup Aallannguqtirningagut Kanatami), Iqaluk Taryurmiuttanit Kanata, Nunaup Nanminiriyangit Kanata, Agyaqtuliqiyit Kanata, kivgaqtiit hamanngat hitamauyut (4) nunalingnit iluani Kitikmeot nunangani Nunavunmi, ilagiyangillu tamainnut kitunuliqaak.

Hamna Katimayiit tuhaumayangit ukunanngat Nutqaquiyangit, Nunalingnit Kivgaqtuiyut ilaqatigiiktunut kitunuliqaak ilauqatauhimayut uvani Kitunuliqaak Tuhaumayakhaat ikayuutauhimayut aallannguqtiriangani Havaariyakhanut, tukhiutauhimayangit uvani 2015 Aallannguqtiqtauhimaningit Atuqtakhanut. Kihiani, tahapkuat ilauqatauhimayut naunaiyaivlutik ihumaaluutinit haffumani pinahuariangani Havaakhaliuqtunut nailinahuaqhutik ihuittumik aktuqtauhimayut tuktunut, Doris Tahia, iqaluit iqaluillu nayuqpaktangit, uuminngalu imatqiktumik halumayut imat imarmiuttanillu avatingit. Tautungnaqtut tahapkuat ihumaaluutauyut, ingattaqhittailiyunillu amiriyangillu haffumani uyaraqtarviuhimayut kuvviqarviat, unguvaiyaqtullu halummaqtauhimayut uvunga Roberts Bay uvuuna unguvaiyaqhimayait tuqhuangit tamainnut nayugaanit qulaanit taryulingnit nunaup iluaniittut imaq amiqhaiyangit tuniyauhimayut ihumagiyauyut hivunikhaat uvani naunaiyaqpiaqhimayauyut qimilrurningit atuqtakhainit tukhiutauhimayumi aallannguqtiqtauhimaningit uvani naunaiyaqpiaqtauhimayangit ilangani haffumani Kitunuliqaak Tuhaumayakhaat. Ilagiyangillu, ihumagiyauhimayut hilaup aallannguqtiqtauhimaningit aktuqtauhimakpat uyaraqtarvingmi, uyaraqtarvik igluqpaqarvikhaliurutikhait, ukiumi apquliuqtut unalu umikhimagumik ihuaqhiiyariirumiktauq upalungaiqhigumi niplautigiyauhimayuq tamainnut Katimayiita ihumaliuffaarmiyakhait piliriakhat. Una iniqhimayumik nipiliuqtauyuq naunaiyaqpiaqhimayauyut qimilrurningit niplautigiyait, angikliyauyullu titiraqhimayut turaarvikhaat itquttunillu takugakhautauyut uvani Kitunuliqaak Tuhaumalaaqtangit ihumagivluniuk Katimayiita ihumaliuqhimayait piyumayaukpat hamanngat Katimayiita kitunuliqaak atiliurvikhat, ihivriunginnarialik hamanngat NIRB qaritauya turaarutaanit uvani www.nirb.ca aturluguluuniit hamna maliglugu qiniqhiyangit ilangani:

- Havaap Atia: Doris Nuat Kuulu Uyaraqtarvik
- NIRB Titiqqait Naahauta: 05MN047

Tunngavianut tamainnut ilittuqhiiyangit ikayuutigivluniuk ukunanngat NIRB'iup ihivriuqhiyakhaat haffumani tukhiutauhimayait havaariyauyukhanut aallanguqtiqtauhimayut ihumaliuffaaqtakhaillu haffumani hivitunianut qanurilinganingiillu Havaariyakhanut Ilitaridjutaanit Nampanga 003 mi, Katimayiit iniqhimavluniuk amiriyangit ilaiutauhimayut ukunanngat Katimayiita kiuhimayakhait haffumani 2015 Aallannguqtiqtauhimaningit Atuqtakhanut aullaqtiqtakhaat qanuq hapumminnaqtumik ikayuqtakhangillu atuqhimayainnit hivunikhangillu inuuhirningagut nunaqatigiiktut nunalingnit iluani Nunavut Nunataarviup Iluani, taimaa hapuumilaaqhugu nunaup avataita ilagiyangillu Nunavunmi Nunataarviup Iluani.

Nutqarniahaaqtumi, Katimayiit naaguhiriyangit nakuuqpiaqtumik hivunikhaliuqhimayait ilagivluniuk Havaariyauyukhanut Ilitaridjutaanit Nampanga 003 tukhiutauhimayait Katimayiita pittailinahuarlugit, nainaarnahuarlugillu, amirilugit ihuaqtumik amirinahuarlugillu ihumagiyauyunit ihuigiyaunniqqat nunaup avatingit unalu inungnut ikayuutauhimayut atuliqtauyukhat hamanngat Havaariyauyukhanut tukhiutautaaqtangit aallannguqtiqtaugialik uvani 2015 Aallannguqtiqtauhimaningit Atuqtakhanut:

- Nutaamik hivitunianit qanurilinganingillu ilaliutauhimayangit nailinahuarluniuk aktuqtauhimayait atuliqtauyukhanut pigumik hamanngat halummaqtauhimayangit tuqhuangit unguvaqtauhimayut iluani Roberts Bay mut;
- Nutaamik hivitunianit qanurilinganingillu ilaliutauhimayangit kiugiangani hiqumitpaktumik amiqhaiyangit imarnut uuktuutait uvani Doris Tahiani;
- Nutaamik hivitunianit qanurilinganingillu kiugiaqaqhutik pivallianingit turaarvikhangillu tiliuqtauhimayut nunaup ilauni imanga amiqhaivikhaanit upalungaiyautingit;

- Nutaamik ihuaqhimayumiktauq hivitunianit qanurilinganingillu huli amiqhaigiaqaqtangit ihumagilugillu inungnut ikayuutikhainit havaariyakhainit iluanunngaqtut atuliqtauhimayut uvani ingutaaqtumik iluani aviktuqhimayumi; unalu
- Nutaamik hivitunianit qanurilinganingillu angiqtauhimayangit TMAC'iup unipkaariyangit ukpiruhuutait Kavamat Nunavunmut ihumagivluniuk takupkaiyakhaat initurliinit nunaa naniyauhimayangit TMAC nit.

Hamna Katimayiit naammakpiaqtumik ihumagiyangit haffumani aallannguqtiqtauhimayauyut Havaariyakhanut tukhiutauhimagaluaqtuq uvani 2015 Aallannguqtiqtauhimaningit Atuqtakhanut turaaqtauhimavluni ilaliutauhimayait ihuaqhiyauhimayangit nutaannguqhugit hivituninganit qanurilinganingit haffumani Havaariyauyukhanut Ilitaridjutaat Nampanga 003 ilaliutauvluniuk Katimayiita atuqhimayangit hakunnatak havaangit amiqhaiyangit, tukhiutauhimaningit aallannguqtiqtauhimayut Havaariyakhanmut aullaqtiqhimalugit taimaa hapumminaqtumik haffumani Kitikmeot nunanganit avataita ilagiyauyukhat tunihiyakhaillu utaqqikhaaqhimayangit inungnut ikayuutikhait ikayuuhiat inungnut nunaliinullu Kitikmeonmi.

ᓇᐃᓕᓐᑎᐊᕐᓂᖅ ᐃᓱᒪᓕᐅᖅᑕᐅᓱᒪᔪᑦ

ᐅᓇ ᐅᓂᐠᑲᓕᐊᖅ ᐊᒻᒪᓗ ᐊᑐᓕᖏᐅᓱᒪᔪᓂ ᑲᑎᑕᐅᓱᒪᔪᓂ ᓄᓇᕗᒥ ᐊᖏᑎᓕᓚᓴᒃᑯᓂ ᑲᑎᒪᔨᖏᓐᓄᓂ (NIRB ᐅᕐᖏᓗᓐᓂᓂ ᑲᑎᒪᔨᓂ) ᖃᐅᔨᓴᐃᓱᒪᓂᒃᑯᓂ ᓄᓇᒃᑯᓂ ᐃᓅᓵᖃᑎᒌᓂᒃᑯᓂ – ᑭᓇᐅᔪᖏᓴᖅᑭᑎᑎᓂᒃᑯᑦᓗ ᐊᒃᑐᖅᓱᓂᖃᖅᓂᒋᐊᖅᓯᓐᓂᒃ ᐱᓕᕆᓚᐅᖅᑕᐅᔨᔾᔪᑎᖏᓂ ᐅᖃᐅᓱᐅᓱᒪᔪᓂ 2015-ᒥ ᐋᖅᑭᑎᐊᖅᓱᒪᓂᒃᑯᓂ ᑐᓴᕐᓂᑎᐅᒃᑯᓂ Doris North ᔫᔨᒥᐅᒃ ᐅᔪᖁᓐᓂᐊᑭᑕᐅᔨᒃᑯᓂ (ᐱᓕᕆᐊᖅᓯᖅᓴᖅ), ᐊᑐᓕᖏᐅᓱᒪᔪᖅ TMAC Resources Inc. ᐅᔪᖁᓐᓂᒋᐊᖅᓴᒃᑯᓂᓐᓄᓂ (TMAC ᐅᕐᖏᓗᓐᓂᓂ ᐅᔪᖁᓐᓂᐊᖅᓴᒃᑯᓂ). ᐊᓐᑎᑎᑭᓐᓴᑦ ᐱᓕᕆᐊᖅᓯᒪᓂᖅᑲᓕᐅᖅᑲᐠ ᐅᑯᓂᓴᖅᑲᖅᓴᖅ ᓇᐠᓴᖅᑎᕆᓂᖏᒥᐅᖅ ᐱᓕᕆᖃᕐᓇᓐᓂᒃ ᐊᑐᖅᑕᐅᓂᐊᖅᑐᓂᒃ, ᐊᐅᓪᓕᑎᓂᖅ, ᐊᒻᒪᓗ ᓭᕐᓂᒃᑭᒃ ᓄᓇᕗᐠ ᖃᐅᓇᓐᓂᖏᓐᓄᑦᑎᐊᓂᐅᐊᖅᑐᓂᒃ ᐅᑎᖅᑎᓂᒪᕐᓪᓕᐊᓂᔪᓂᖅᑐᓂᒃ ᓄᓇᕗᐠ ᐊᒋᑦ ᔫᔨᒥᐅᒃ ᐅᔪᖁᓐᓂᐊᓂᓂᖅᑎᓪᓗᑎᓂ (Doris Hinge ᐃᓂᓐᓄᓂᒃ) 125 ᑭᓪᓕᒋᒋᒃ ᐅᓐᓄᓭᓂᓂᒃ ᐃᖃᓄᐅᑎᑦᑎᐊᐠ ᓂᒋᐊᓄᓂ ᐊᒻᒪᓗ 150 ᑭᓪᓕᒋᒋᒃ ᐅᓐᓄᓭᓂᓂᒃ ᐅᒥᓐᓴᐅᒋᐠ ᐅᐊᓐᓇᓐᓄᓂ ᐃᓄᐃᑦ ᓄᓇᕗᐠ ᖃᐅᓐᓄᑦᓄᔪᑦ; ᐱᖁᓂᕐᕕᐊᑦ ᐋᓴᐃᓂᖁᔪᑦ, ᐊᓴᖅᑐᐃᓂᖁᔪᑦ, ᐊᒻᒪᓗ ᔫᑦ ᓇᒋᐅᖁᑦᑎᒋᓂᖁᔪᓂᓐᓄᓂ ᒋᐃᑲᓐᓂ ᐊᒋᐅᓄᖁᔪᓂ ᔫᑦᓂᓂᕐᓗᓐᓂᒃ; ᐊᒻᒪᓗ ᓴᓇᓂᖅ 4.8 ᑭᓪᓕᒋᒋᒃ ᒋᑭᓂᓐᒃᑯᓂ ᐅᑭᐅᓵᑲᓂᒃᑯᓂ ᐊᐠᓵᑎᑎᓐᓄᑦᑎᒋᓂᐅᒋᒋᐊᖅᑐᓂᒃ Roberts Bay-ᒥ ᐱᖁᑎᖁᔭᓚᐅᔨᓂ ᐃᓂᒋᓴᐅᓂᐊᖅᑐᒍᑦ ᐊᒻᒪᓗ ᐅᔪᖁᓐᓂᐊᖁᔨᐠ ᐃᓂᓐᓄᓂ.

ᓄᓇᕗᒥ ᐊᖏᑎᓕᓚᓴᒃᑯᓂ ᑲᑎᒪᔨᓐᓄᑕᒡ ᐃᖁᓗ 2006-ᒥ ᑭᓱᓕᓂᖅᐸᒃᑯᓂ ᐃᓄᓐᓂᒃ ᑐᓴᖅᑎᕆᑎᓂᓐᓄᓂ Doris North ᔫᔨᒥᐅᒃ ᐅᔪᖁᓐᓂᐊᕈᒪᓂᓪᓗᑦ, ᑲᑎᒪᔨᓂ ᓇᓗᓇᐃᖅᓯᓚᐅᖅᑐᑦ ᐅᔪᖁᓐᓂᐊᓂᖁᔭᒃ ᓴᖅᑭᑎᑕᐅᓇᔪᖅᐸᑦ ᒪᓕᓴᓗᑎᒃ ᑲᑎᒪᔨᓂ 35 ᐊᑐᓕᖏᓐᓄᑦ ᒪᓕᓐᑕᒃᓴᖅᑯᓂ ᖃᐅᔨᐃᓕᓚᐅᔪᕈᑕᐅᓴᓚᐊᓂᖃᖅᑐᖅᑐᒃᑯᓪᓗᓂ, ᐱᓕᕆᐊᖅᓱᒪᔪᓂᖅ ᑲᔪᓯᑎᐊᕐᓇᓴᖅᑐᑦ ᒪᓕᑎᓕᖅᑐᑦᑎᐅᓂᐊᖅᓯᓂᖅ. ᐊᒪᓯ 1, 2006-ᒥ ᒥᓂᑕ ᐃᓄᓕᓚᓴᑐᖃᖅᑯᓂᓐᓄᓂ (ᑕᐃᒪᓐᓇ ᒥᓂᑕ ᖃᐅᔨᒪᔨᐅᓕᕆᓂᖅᓯᓪᓗᒍ) ᓇᓱᒪᓴᓕᐅᖅᑐᑦ ᑲᑎᒪᔨᓂ ᐅᓂᐠᑲᓕᐊᖅᓱᒪᓂᒃ ᐊᒻᒪᓗ ᐊᑐᓕᖏᓐᓄᑦ ᐊᒻᒪᓗ ᑎᓕᓯᔪᓄᓇᓂ ᑲᑎᒪᔨᓂᒃ ᑐᓴᕐᓂᑎᐅᒃᑯᓂ Doris North ᔫᔨᒥᐅᒃ ᐅᔪᖁᓐᓂᐊᖁᔭᓴᓱᒪᓂ. ᔪᑎᐱᓇᓗ 15, 2006-ᒥ, ᑲᑎᒪᔨᓂ ᑐᓴᕐᓕᐅᖅᑐᑦ ᐱᓕᕆᐊᖅᓯᓐᓂᖅᑲᓕᐅᖅᑐᑦ ᓇᓗᓇᐃᖅᑕᐅᓕᕆᓚᐅᖅᑐᒃ 003-ᒥ ᐅᔪᖁᓐᓂᐊᖅᑐᑦᑎᐅᓂᐊᖅᓯᓐᓄᓂ ᐱᓕᕆᐊᖅᓱᒪᔪᓂ ᑕᐃᔨᕐᓕᓂ, Miramar Hope Bay Limited-ᓯᓐᓄᓂ.[11]

ᑎᕐᐱᓇᓗ 9, 2013-ᒥ ᓄᓇᕗᒥ ᐊᖏᑎᓕᓚᓴᒃᑯᓂ ᑲᑎᒪᔨᖏᓐᓄᓂ ᐊᒻᒪᓗ ᓄᓇᕗᒥ ᐃᒪᓐᓇᓂ ᑲᑎᒪᔨᓂ (NWB) ᑐᓂᔪᐅᓕᐅᖅᑐᑦ ᑐᓴᕐᓂᐅᑎᒥᒃ TMAC-ᓯᓐᓄᓂ ᐋᖅᑭᑎᐊᖅᓱᓕᒪᓐᓂᒍᑦ ᐱᓕᕆᐊᖅᓱᒥᒃ ᐊᒻᒪᓗ ᖃᐅᔨᓴᐃᓕᓚᐅᖅᑕᐅᓕᕆᓚᐅᖅᑐᑦᑎᐅᓂᐊᖅᓯᓐᓂᒃ ᒪᓕᓐᑕᒃᓴᖅᓱᐅᔪᓂᖅ ᖃᐅᔨᐃᓕᓚᐅᖅᑕᐅᓕᕆᓚᐅᖅᑐᑦᑎᐅᓂᐊᖅᓯᓐᓄᓂᓐᓄᓂ ᐱᓕᕆᐊᖅᓱᒪᔪᓂ ᓇᓗᓇᐃᖅᑕᐅᓕᕆᓚᐅᖅᑐᒃ ᓇᓗᓇᐃᖅᑕᐅᓕᕆᓚᐅᖅᑐᒃ 003-ᓯᓐᓄᓂ. ᐊᑯᓂᓐᓄᑦ ᑎᕐᐱᓇᓗ 2013 ᐊᒻᒪᓗ ᐋᓐ 2015, TMAC-ᓯᑦ ᐃᓱᒪᓴᖅᓯᐅᑎᖃᓕᓚᐅᖅᑐᑦ ᓯᓚᑐᓴᓯᑦ ᐅᖃᐅᓴᖅᑲᓕᐅᖅᑐᒃᑯᓂ ᑐᓂᔭᕐᑕᐅᔪᓂᒃ ᑐᓂᔭᕐᑕᐅᔪᓂᒃ ᐊᒻᒪᓗ ᑐᓂᔭᕐᑕᐅᓂᐊᖅᑐᓂᒃᑐᓗᒃ ᓄᓇᕗᒥ ᐊᖏᑎᓕᓚᓴᒃᑯᓂ ᑲᑎᒪᔨᖏᓐᓄᓂ ᐊᒻᒪᓗ ᓄᓇᕗᒥ ᐃᒪᓐᓇᓂ ᑲᑎᒪᔨᓂᒃ, ᐊᒻᒪᓗ ᑕᑯᓕᐊᖅᑲᓂᓐᓄᓂᓐᓄᓗ ᐋᖅᑭᑎᐊᖅᓱᒪᓂᒃᑯᓂ ᐃᓗᐃᑦᑐᖅᑯᓂ ᐋᖅᑭᑎᐊᖅᓱᒪᓂᒃᑯᓂ ᐱᓕᕆᐊᖅᓱᒪᔪᓂ ᑐᓂᔭᕐᑕᐅᔪᓂᖅ.

ᐋᖅᑭᑎᐊᖅᓱᒪᓂᒃᑯᓂ ᑲᑎᒪᔨᖏᓐᓄᓂ ᐊᒻᒪᓗ ᐊᑐᓕᖏᓐᓄᑦ ᐊᒻᒪᓗ ᑎᓕᓯᔪᓄᓇᓂ ᑲᑎᒪᔨᓂᒃ ᐱᓕᕆᐊᖅᓱᒪᔪ

ᒪᑐᐃᖅᓂᕆᔨᒻᒪᓕᖅᑕᖅᓯ, ᐊᐅᖅᑭᑎᐊᖅᑕᐅᖅᓯᐅᔪᓐᓇᔪᓐ ᐊᐳᑕᐅᖅᑲᖏᓐᓇᖅ, ᑐᐳᔪᕐᕋᐅᑎᓐ ᐋᖅᓯᔪᐅᓕᓂᒪᑦ ᒪᓕᐳᑕᓴᒥᖅ ᖃᓄᐃᑕᐅᑭᑕᐅᓴᕆᔨᐳᓐᓄᓐᓗᓐ 9-ᒥ (ᐱᑕᖅᑲᐊᖅᑲᓂᖅ ᐅᓴᖅᓂᓂᐊᖅᖏᐅᑦ ᐃᓂᓯᑎᐅᓂᖅ ᐱᓕᖅᑭᐅᓂᖅᓴᖅᓴᒥᖅᑎᑦ ᐃᒪᖅᔪᑦ) ᐱᑕᕆᑎᐊᑭᓐᓇᖅᓯᓂᒃᑯᑦ ᓇᓗᓇᐃᓴᐅᑎᒃᑯᑦ 003-ᑯᑦ. ᐊᓗᒪᓗᑕᐅᖅ, TMAC-ᑯᑦ ᓇᓗᓇᐃᖅᓯᒪᐅᖅᑐᑦ ᐃᑲᔪᖅᑐᐃᓐᓯᓐᓇᖅᒪᑕ ᐊᐳᑭᐅᐅᒪᔪᒥᑦ ᖃᓄᐃᑕᐅᑎᑦᑎᓂᖅᓴᖅᓴᒥᖅᑎᑦ ᓇᓂᐊᖅᑎᑦ ᐃᓕᖅᔪᑦ ᑲᑎᑎᕆᔨᒃᑯᑦ ᐊᐳᑭᐅᐅᒪᔪᒥᑦ ᑲᑎᒪᓂᖅᑐ

- ᓇᐸᐸᖅᑎᓗᓂᖅ/ᐃᓕᐅᖅᑲᐃᓂᖅ, ᐊᐅᓪᓚᕐᑎᓂᖅ ᐊᓚᒪᓗ ᖃᑦᔨᔪ ᐋᓴᐃᓂᖅ 550 ᑭᑕᒥᑦ ᐊᐸᖅᔨᑎᑲᒥᑦ Roberts Bay-Γ ᐊᓚᒪᓗ ᐃᓕᐅᖅᑲᐃᓂᖅ 5.64 ᑭᓪᒥᑕᓂᑦ ᓄᓇᐅᐸ ᖃᑲᖏᒪᔪᑦ ᓯᐸᓗᓕᓂᑦ, 2.3 ᑭᓪᒥᑕᑦ ᑕᑭᓂᓪᑦ ᐃᒪᑦᔨᑦ ᓯᐸᓗᓪᑦ.
- ᐃᓕᐅᖅᑲᐃᓂᖅ, ᐊᐅᓪᓚᕐᑎᓂᖅ ᐊᓚᒪᓗ ᖃᑦᔨᔪ ᖃᑭᒪᐃᓂᖅ 95 ᑭᑕᓂᑦ ᑕᑭᓂᓪᖏᑦ ᐃᒪᐃᔭᐅᑎᒥᑦ ᐊᓚᒪᓗ ᐃᓚᒡᑲᑦ 900 ᑭᑕᓂᑦ ᑕᑭᓂᑦ ᐃᒪᑦᔨᑦ ᖃᑎᑦᑕᐃᓕᓴᕐᑎᒥᑦ.

- ᐊᑐᖅᑕᐅᔨᓴᓇᕆᔨᖅᓯᖅ ᐃᑎᐅᖅᑲᐃᔭᐊᑎ ᑕᓚᐅᖅ ᐃᒪᖅ ᓄᓇᐅᐸ ᐊᒋᓂ ᐱᓕᓚᐊᖏᓴᒪᑦ ᑕᐃᔪᖏᓪᓕ ᔪᐃᖅᑕᑦᕆᐊᖅᓯᓗᒍᑦ ᐋᓴᐃᖅᑲᓂᖅᑎᓴᓇᑕᑦ ᔪᐃᖅᑕᑦᕆᐊᖏᒥ ᐃᒪᕐᒥᑦ Roberts Bay-Γ;
- ᓇᐸᐸᖅᑎᓗᓂᖅ, ᐊᐅᓪᓚᕐᑎᓂᖅ ᐊᓚᒪᓗ ᖃᑦᔨᔪ ᐋᓴᐃᓂᖅ ᒪᓐᔅᓂᐅᓂᖅ (2) ᐊᓄᓗᑐᑎᒃᑲᓴᓂᑎᓂᖅ (Doris ᖃᑭᑎᐊᓂ ᐊᓄᓗᑐᑎ ᐊᓚᒪᓗ Doris Connector –Γ) ᐊᓚᒪᓗ ᐊᒃᑐᐊᓂᓪᑦ ᐊᐸᖅᔨᔪᐲᑦ;
- ᓇᐸᐸᖅᑎᓗᓂᖅ, ᐊᐅᓪᓚᕐᑎᓂᖅ, ᐊᓚᒪᓗ ᖃᑦᔨᔪ ᐋᓴᐃᓂᖅ ᑐᖓᒪᓚᕐᓴᐅᕆᑦ U, 31,000 ᑭᐸᓪᓗᒪᒃᑐᑦᔨᑦ ᑭᑕᓂᑦ ᐊᖏᑭᓂᓪᑦ ᐊᓚᒪᓗ ᐊᒃᑐᐊᓂᓪᑦ ᐅᓄᓗᐊᓇᖅᑐᓂᑎᓂᖅ ᐊᐅᓪᓚᕐᑎᔪᓇᖅᓂᕐᒧᑦ ᑕᔪᖅ ᐅᓴᖅᑲᓄᓂᑦ ᐃᓂᖅᑎᖃᓚᐅᑦ ᐊᓚᒪᓗ ᐱᖅᔨᒪᓄᑦ ᐃᓂᖅᑎᖃᓚᐅᐅᓪᓕᐊᓂᓪᓕᕐᓂᓚᖅᑐᖅ;
- ᐃᓕᑎᐊᖅᔪᓂᖅ ᐱᓕᓇᖏᓴᒪᑦ ᐃᓂᑎᕆᐅᕆᑦ 180-ᓂᐅ 280-ᓄᑦ ᐃᓄᖓᓄᑦ ᐃᓂᖅᑎᑕᐊᕐᓇᓕᔨᓪᓕᐊᑦᓯᑦ ᐱᓕᓇᖏᓴᒪᑦ ᑲᓇᓴᑎᐅᕆᑦ;
- ᐃᓇᖕᑎᓪᓗᒍ ᒪᓇᓕᐅᔨᖅ ᐃᑎᑕᔪᓄᑦ ᑲᒪᑎᐅᕆᖏᖅ ᓄᑦᒪᐅᕆᐅᖅᑐᖅ ᐃᓕᑎᐊᔨᓪᓕᒪᓕᒪᑦ ᐃᓕᓴᐅᔨᓪᓕᐊᑦᓯᑦ ᐊᐅᓪᓚᕐᑎᓂᖅ ᐃᓕᐅᖅᑲᐃᓂᖅ ᒪᓇᓕᐅᔨᖅ ᐊᐅᑕᐊᕐᓇᓕᔨᓪᓕᐊᑦᓯᑦ ᐊᐅᓪᓚᕐᑎᓂᖅ ᐃᓕᐅᖅᑲᐃᓂᖅ ᐃᓂᖅᑎᖃᓚᐅᐅ

ᐊᕐᑎᓕᓪᓚᕆᔨᑦ ᑲᑎᒪᔨᖏᑦ ᓇᓗᓇᐃᖅᑭᓯᐅᕗᖅᑐᑦ ᐃᓗᐃᑦᑐᕆᔨᑦ ᓯᕗᑐᒃᓴᖅᓯᓗᒃ ᑭᒥᖅᑭᓂᕆᑲᓕᖅᑎᓂᐊᖏᒪᑦ ᑐᕆᔨᕐᑐᐅᕐᒥᖅᑲ ᐱᓕᓪᓚᖕᖏᓚᐅᕆᕕᒃ ᐊᖅᑭᑦᑕᕐᓂᖅᑲᓪᓚᕆᔨᑦ 2015-ᒥ ᐊᖅᑭᑦᑕᕐᓂᖅᓯᒪᓂᖅᓱᑦ ᑐᕆᔨᕐᑎᕆᔨᑦ, ᐃᓕᐅᖅᑲᐅᕐᓗᔪᒃ ᐃᓄᐃᑦ ᑲᑎᒪᑎᑦᐅᕐᓂᖅᑲᓪᓚᕆᔨᖅᑎᑦᑕᕐᓂᑦ ᓄᓇᕗᖓᒥ ᐊᐅᑐᖅᑕᐅᓂᖅᑲᖅᑐᑐᒃ ᐱᓕᓪᓚᕐᖏᓚᓯᒪᔪᖅᑎᑦ ᐊᓚᒪᓗ ᑲᒪᒋᐅᕐᓯᒪᔪᖅᑎᑦ, ᑕᐃᔨᐅᓯᒪᔪᖅᑎᑦ ᐃᖅᑲᓇᐃᕐᑎᐊᖅ, ᓄᓇᕗᑦ. ᓄᓇᕗᒥ ᐊᕐᑎᓕᓪᓚᕆᔨᑦ ᑲᑎᒪᔨᖏᑦᑕ ᖃᐅᔨᓴᕕᑎᓐᓄᑦ ᐊᓚᒪᓗ ᐃᓱᒪᓕᖅᓯᐅᕕᑎᓐᓄᑦ ᐱᓕᓪᓚᕐᖏᓚᓯᒪᔪᖅᑎᑦ ᐊᖅᑭᑦᑕᕐᓯᒪᓂᖅ, ᓄᓇᕗᒥ ᐊᕐᑎᓕᓪᓚᕆᔨᑦ ᑲᑎᒪᔨᖏᑦ ᑐᓂᓯᐅᓕᕐᓂᖅᑐᑦ ᓯᕗᑐᒃᓴᖅᓱᑦ ᐅᖃᖅᑐᓂᖅᑐᑦ, ᐃᑎᕐᓂᕆᔨᖅᑐᑎᓐᓄᑦ ᐅᖃᖅᑎᑦᑕᕐᓂᖅᑲᓪᓚᕆᔨᖅᑎᑦ TMAC-ᑯᓘᓂ, ᖃᑎᖅᑎᐅᑦ ᐃᓄᐃᑦ ᑲᑐᔾᔨᖃᑎᒃᑯᓘᓂ, ᓄᓇᕗᑦ ᓚᐲᒪᑯᖏᑐᓘᓂ, ᐃᓄᕐᓗᑐᑐᖅᑯᓘᓂ, ᑲᓇᑕᒥ ᐊᕐᑎᓕᓪᓚᕆᔨᑯᓘᓂ, ᐃᖅᑲᐅᑕᓗᓪᓚᕆᔨᑯᓘᓂ ᐃᒪᖏᐅᑕᕐᑕᓗᓪᓚᕆᔨᑯᓘᓂ ᑲᓇᑕᒥ, ᓄᓇᒥᐅᑕᕐᑕᓗᓪᓚᕆᔨᑯᓘᓂ ᑲᓇᑕᒥ, ᐅᖓᓕᖅᑭᑦᑕᓗᓪᓚᕆᔨᑯᓘᓂ ᑲᓇᑕᒥ, ᑭᓱᓕᖅᑐᐃᓚᐅᑐᒃ ᓄᑕᕐᕕᒃ (4) ᓄᓇᕗᖓᓂ ᖃᑎᖅᑎᐅᑐᒃ ᓄᓇᕗᒥ, ᐊᓚᒪᓗ ᐃᓄᐃᑦᓇᖅᑎᓂ.

ᑲᑎᒪᔨᑦ ᑐᓴᖅᑲᑕᓪᓚᕆᔨᖅᑐᑦ, ᐃᓕᐅᖅᑲᐅᕐᑐᕕᓂᖅᓱᒃ, ᓄᓇᕗᖓᓂᒃ ᑭᓱᓕᖅᑐᐃᓚᐅᑐᒃ ᐊᓚᒪᓗ ᐃᓄᐃᑦᓇᖅᑎᓂᐊᖏᒪᑦ ᑲᑎᒪᖅᑲᐅᕐᓚᕆᔨᖅᑐᐃᓐᓇᖅᑐᒃ ᐃᓄᐃᑦ ᑲᑎᒪᑎᑦᐅᕐᑎᓐᓂᑦ ᐃᑲᔪᖅᑐᐃᓐᓇᕕᑎᓐᓄᑦ ᐊᖅᑭᑦᑕᕐᓂᖅᑲᓪᓚᕆᔨᑦ ᐱᐅᓪᓚᕆᔨᖅᑎᑦ, ᐊᐅᑦᑎᓂᖅᓯᐅᓂᖅᑐᑦ 2015-ᒥ ᐊᖅᑭᑦᑕᕐᓂᖅᓯᒪᓂᖅᓱᑦ ᑐᕆᔨᕐᑎᕆᔨᑦ. ᑭᓯᐊᓂᓕ, ᑕᒪᑲᑦ ᐱᓕᓪᓚᖕᖏᓚᐅᕆᕕᒃ ᐃᓄᐃᑦ ᐊᓯᖏᓪᓗᓂᐊᓕᖅᑐᐃᓐᓇᖅᑐᒃ ᐅᓇᓗᓇᐃᕐᑐᐃᓚᐅᕐᒥᔪᖅᑎᑦ ᐃᓄᐃᑦ ᑲᑎᒪᔨᖏᑦ ᐊᐅᓚᑦᑎᐊᕐᓂᖅᑐᑦ ᐊᖅᑭᑦᑕᕐᓯᒪᓂᖅᓱᑦ ᐊᐅᓚᑦᑎᐊᕐᓂᖅᑐᑦ, ᐅᖃᖅᑐᓂᖅᑐᑦ ᐃᓄᐃᑦ ᑲᑎᒪᔨᖏᑦ ᐃᓄᐃᑦ ᐊᐅᓚᑦᑎᐊᕐᓂᖅᑐᑦ ᐊᐅᓚᑦᑎᐊᕐᓂᖅᑐᑦ, ᐃᓄᐃᑦ ᑲᑎᒪᔨᖏᑦ ᐃᓄᐃ

ᖃᐅᔨᓴᖅᑎᓪᓗᒍᑕᐅᔪᓂᒃ ᐃᓐᓇᐅᔾᔨᖅ ᐊᓚᓗᔪ ᓯᕗᓂᒃᓴᒍᑦ ᖃᓄᐃᙱᑦᑐᕐᓯᒪᓕᐅᑎᓂᒃ ᓄᓇᖅᑲᑎᒃᓴᓄᑦ ᓄᓇᕗᒻᒥ ᓄᓇᑦᓯᐊᕐᓂᒥ, ᐊᓚᓗᔪ ᓴᓪᓂᐅᐊᖅᑐᔪᓂᒃ ᓄᓇᕆᔨᐅᔾᔨᒥᒃ ᖃᓄᐃᙱᑦᑐᕐᓯᒪᓕᐅᑎᓂᒃ ᓄᓇᕗᒻᒥ ᓄᓇᑦᓯᐊᕐᔪᒥᑦ.

ᑭᖑᑦᑕᖅᑰᒃᑯᑦ, ᑲᑎᒪᔨᑦ ᓇᓗᓇᐃᔨᐃᔾᔪᓪᓚᑦ ᐋᑦᖁᑎᐊᕈᑕᐅᑦᓯᓚᓚᐅᖅᑐᓂᒃ ᐊᓚᓗᔪ ᐃᓕᑎᐊᕈᑎᑲᑎᒃᓴᓂᒃ ᐊᑐᖅᑕᐅᕕᖏᓐᓇᖅᑐᓂᒃ ᐃᓕᓴᕐᓂᖅᑐᑦ, ᑎᑭᓂᖅᑰᒃᑯᑦ, ᖃᐅᔨᓴᖅᑎᑲᑦᑯᑦ ᐊᓚᓗᔪ ᓯᖏᐅᑎᐊᕈᑎᑲᑎᒃᓴᓂᒃ ᐃᒪᓕᖅᑭᐅᑎᑲᑎᒃᑯᑦ ᐃᐅᓚᕐᔪᐊᑲᑎᒃᑯᑦ ᐊᐅᓚᓂᑎᔾᔪᑎᒃᑯᑦ ᐅᓪᓚᒥᖅᑕᐅᑎᒃᑯᑦ ᐱᓕᕐᓂᖅᑐᑦ – ᑭᓇᐅᔾᔨᒃᖃᑎᒌᒃᖃᒃᑯᑦ ᐊᐅᑐᖅᓯᓂᐅᓇᖅᑐᓂᒃ ᐱᓕᕐᓂᖅᑐᑦ ᐃᖅᑲᖅᑕᐅᑎᒃᑯᓂᒃ 2015-ᒥ ᐃᖅᑲᑎᐊᕈᑎᒃᖃᓄᑦ ᑐᓴᕆᖅᑕᐅᔪᓄᑦ:

- ᓄᑦᓯ ᒪᓕᒃᑕᒃᖃᓇᔨᐅᔪᓂ ᖃᓄᐃᓕᓕᐅᕈᑎᒃᖃᓪᓗ ᐃᓕᐅᖅᑲᑕᐅᑎᑕᐅᔪᓂ ᐱᑕᖅᖁᑎᓂᓂᖅᓴᐅᖅᑎᓯᓚᑦᑎᑕ ᖃᓪᓗᑭᓇᐅᓂᖅᑐᑦ ᓯᔪᓗᓕᒃᑐᓂ Roberts Bay-ᑯᑦ;
- ᓄᑦᓯ ᒪᓕᒃᑕᒃᖃᓇᔨᐅᔪᓂ ᖃᓄᐃᓕᓕᐅᕈᑎᒃᖃᓪᓗ ᐃᓕᓐᓄᐅᖅᑲᑕᐅᔪᓂ ᖃᓄᐅᑎᒃᑯᑦ ᖃᓄᐅᓴᖃᑦᑕᐅᖅᑲᖅᑕᑦᑎᓯᔪᓚᑦᑎᑕ ᐃᒪᓕᖅᑎᑎᓐᓇᔨᐅᔪᓂ Doris Lake-ᒥ;
- ᓄᑦᓯᖅ ᒪᓕᒃᑕᒃᖃᓇᔨᐅᔪᓂ ᖃᓄᐃᓕᓕᐅᕈᑎᒃᖃᓪᓗ ᐱᙵᓕᓕᐊᑎᑎᓯᒪᓂᖅᓗᑦ ᐊᓚᓗᔪ ᑐᓂᓯᔪᒪᓂᖅᓗᑦ ᓇᓗᓇᐃᔨᐅᑎᓂᒃ ᓄᓇᒥ ᐃᒪᓕᖅᑐᐅᔾᔨᒃᑯᑦ ᐊᐅᓚᓂᑎᓂᖅᓗᑦ <ᖁᓇᐅᑎᓂᒃ;
- ᓄᑦᓯᖅ ᐊᓚᓗᔪ ᐃᖅᑲᑎᐊᖅᑕᐅᔪᓚᑦ ᒪᓕᒃᑕᒃᖃᓪᓗ ᖃᓄᐃᓕᓕᐅᕈᑎᒃᖃᓪᓗ ᖃᓄᐅᓴᖃᐃᖅᑲᐅᑎᓯᓂᖅᓗᑦ ᐃᓐᓇᖅᑎᑎᓂᒃ – ᑭᓇᐅᔾᔨᒃᖃᓇᔨᐅᔪᓂᒃᑯᑦ ᐱᙵᓕᓕᐊᑎᑎᓯᒪᓂᖅᓗᑦ ᐊᓯᔪᓐᓇᖅᑐᑦ ᐊᐅᓚᓂᑎᓂᖅᓗᑦ ᐅᓇᓗᓇᐃᔨᐅᑎᓂᒃ ᓄᓇᕗᒻᒥ ᐃᒪᓕᖅᑐᐅᔾᔨᒃᑯ

SOMMAIRE

Ce rapport et ces recommandations sont l'aboutissement de l'examen mené par la Commission du Nunavut chargée de l'examen des répercussions (« CNER » ou la « Commission ») pour évaluer les répercussions écosystémiques et socioéconomiques potentielles des propositions de modification au projet décrites dans la demande de modification de 2015 relative au projet de la mine d'or de Doris North (le « projet »), présentée par TMAC Resources Inc. (« TMAC » ou le « promoteur »). La portée du projet original comprenait la construction, l'exploitation et la remise en état ultime d'une mine d'or souterraine (zone de Doris Hinge), située à 125 kilomètres (km) au sud de Cambridge Bay et à 150 km au nord d'Omingmaktok (Bay Chimo), sur des terres dont la surface appartient aux Inuits; l'infrastructure connexe pour assurer l'extraction, le transport et l'envoi de l'or à partir d'un dépôt unique; et la construction d'une route praticable en tout temps d'une longueur de 4,8 km et d'une bande d'atterrissage rattachée pour relier l'infrastructure de Roberts Bay au camp principal et au site de la mine.

Dans son rapport final d'audience de mars 2006 concernant la mine d'or de Doris North, la CNER a conclu que si la proposition de projet était élaborée conformément aux 35 conditions recommandées par la Commission, le projet pourrait passer à la phase réglementaire. Par la suite, le 1er août 2006, le ministre fédéral des Affaires autochtones et du Nord (titre qui était d'usage à l'époque) a accepté le rapport et les recommandations de la Commission et a demandé à la Commission de délivrer un certificat de projet pour le projet de la mine d'or de Doris North. Le 15 septembre 2006, la Commission a délivré le certificat de projet no 003 au promoteur du projet de l'époque : Miramar Hope Bay Limited.[12]

Le 9 décembre 2013, la CNER et l'Office des eaux du Nunavut (OEN) ont reçu une demande de la part de TMAC pour modifier le projet et les conditions spécifiques du certificat de projet no 003. De décembre 2013 à juin 2015, TMAC a reçu des évaluations techniques et des demandes de clarification de la part de la CNER et de l'OEN et a revu et peaufiné la portée des modifications demandées au projet.

Le 23 juin 2015, TMAC a remis à la Commission l'information nécessaire pour définir la portée de ses propositions de modification au projet de la mine d'or de Doris North. La demande de modification de 2015 proposait de prolonger la durée de vie de la mine et d'actualiser l'entreposage de déchets sur le site, en plus de réclamer le retrait de la condition 9 du certificat de projet no 003 (soit l'exigence relative à la mise en place d'un laboratoire accrédité sur le site pour effectuer des analyses d'eau en temps réel). En outre, TMAC a indiqué continuer à appuyer un processus coordonné entre la CNER et l'OEN et a demandé à ce que la CNER et l'OEN poursuivent le processus coordonné au cours de la période d'examen des propositions de modification (pour plus d'information, voir la Section 1.2 : Historique des procédures).

Selon les plans tels qu'ils sont décrits dans la demande de modification de 2015, TMAC a proposé d'inclure les activités et les engagements *additionnels* suivants pour élargir le projet original de la mine d'or de Doris North :

- Prolongement de la vie de la mine de quatre (4) années supplémentaires;

[12] En 2013, le certificat de projet a été cédé par Miramar Hope Bay Limited à TMAC Resources Inc. et TMAC est le promoteur du projet dans la demande de modification de 2015.

- Activité minière dans les zones de Doris Central et de Doris Connector par l'entremise du portail existant de Doris North plutôt que de limiter l'activité à la zone de Doris Hinge;

- Hausse du taux d'extraction et de traitement pour le faire passer de 720 tonnes/jour (t/jour) et de 800 t/jour, respectivement, à 2 000 t/jour;
- Hausse du volume total de résidus déposés dans la zone de bassin des résidus pour le faire passer de 458 000 tonnes à 2,5 millions de tonnes;
    - Modification du processus de destruction de la cyanure dans les résidus de traitement : plutôt que d'utiliser l'acide de Caro (peroxyde d'hydrogène et acide sulfurique), adopter le procédé d'INCO;
    - Modification du plan d'élimination des résidus d'un confinement subaquatique à un confinement subaérien à l'extrémité sud de la zone de bassin des résidus.
    - Restructuration de la zone de bassin des résidus :
        - Installation d'un barrage provisoire à mi-chemin environ de la zone de bassin des résidus;
        - Modification de la construction et de l'exploitation proposées d'un barrage au sud : remplacer le barrage à noyau gelé par un barrage aux fondations gelées.
- Déversement allant jusqu'à 7 000 mètres cubes/jour (m^3/jour) directement dans Roberts Bay :
    - Déversement direct de jusqu'à 3 000 m^3/jour d'eaux souterraines salines en provenance du sous-sol, et ce, toute l'année;
    - Déversement de jusqu'à 4 000 m^3/jour en provenance de la zone de bassin des résidus durant la période estivale;
    - Construction, installation, exploitation et désaffectation ultime d'un chemin d'accès de 550 mètres (m) à Roberts Bay et installation d'un pipeline terrestre d'une longueur de 5,64 kilomètres (km) et d'un pipeline maritime d'une longueur de 2,3 km avec exécutoire en mer;
    - Installation, exploitation et abandon ultime d'un diffuseur maritime de 95 m et d'une berme d'évacuation maritime d'une longueur d'environ 900 m.
- Option de rechange pour l'élimination des eaux souterraines salines des chantiers souterrains vers la zone de bassin des résidus avant le déversement de l'eau de la même zone dans Roberts Bay;
- Construction, exploitation et désaffectation ultime de deux (2) évents supplémentaires (à Doris Central et à Doris Connector) et des liaisons de dérivation connexes;
- Construction, exploitation et désaffectation ultime du parc à résidus U, un parc d'une superficie de 31 000 m^2 avec un bassin de contrôle de la pollution connexe, qui servira au stockage du minerai et de zone de dépôts temporaire;
- Hausse de la capacité du camp pour la faire passer de 180 à 280 personnes afin de loger le personnel du projet;

- Remplacement de l'usine actuelle de traitement des eaux d'égout par une nouvelle usine ayant une capacité accrue pour tenir compte du camp élargi et rénovation de l'usine de traitement des eaux à titre d'installation d'appoint;
- Utilisation des carrières A, B, D et 3 actuelles à titre de fournisseurs des matériaux pour l'infrastructure additionnelle proposée;
- Déplacement du site d'enfouissement proposé de la carrière A à la carrière 3 une fois que les ressources sont épuisées;
- Construction, exploitation et désaffectation ultime de trois (3) zones de dépôts supplémentaires à Roberts Bay (prolongement de l'aire de dépôts de l'ouest de Roberts Bay, aire du sud-ouest et aire du sud-est);
- Déplacement de l'installation d'explosifs du parc adjacent à la carrière 3 à la carrière A;
- Hivernage des barges de carburant à Roberts Bay selon les besoins de l'exploitation et;
- Retrait de l'exigence selon laquelle TMAC doit installer et exploiter un laboratoire sur le site pour effectuer des analyses d'eau de la zone de bassin des résidus en temps réel avant le déversement dans le ruisseau Doris, comme le stipulait la condition 9 du certificat de projet n^{o} 003 délivré par la CNER.

Bien qu'il n'y ait aucune exigence obligatoire en matière de processus concernant l'examen et le réexamen de la Commission énoncés à l'article 12, paragraphe 12.8.2 de l'ARTN, la CNER a déterminé, après examen, qu'un examen technique complet et approfondi des propositions de modification décrites dans la demande de modification de 2015 serait nécessaire, y compris la tenue d'une audience publique dans la collectivité la plus susceptible d'être directement affectée par les activités et les entreprises révisées, à savoir Cambridge Bay, au Nunavut. Dans le cadre de son examen et réexamen des propositions de modification du projet, la CNER a obtenu des commentaires sur les évaluations techniques, des observations écrites et des témoignages oraux de la part de : TMAC; l'Association inuite du Kitikmeot; le Gouvernement du Nunavut; Affaires autochtones et Développement du Nord Canada (renommé Affaires autochtones et du Nord Canada); Environnement Canada (renommé Environnement et Changement climatique Canada); Pêches et Océans Canada; Ressources naturelles Canada; Transports Canada; des représentants de quatre (4) des collectivités de la région de Kitikmeot au Nunavut et de membres de la population générale.

Dans le cadre de l'audience publique, la Commission a entendu des intervenants, des représentants communautaires et des membres du public qui ont exprimé leur appui aux modifications au projet proposées dans la demande de modification de 2015. Cependant, ces parties ont aussi identifié des préoccupations à savoir que le promoteur du projet minimise les répercussions négatives sur les caribous, le lac Doris Lake, les poissons et les habitats du poisson, de même que les environnements d'eau douce et marins. En raison de ces préoccupations, les mesures d'atténuation et la gestion des zones de résidus, le déversement d'effluents à Roberts Bay par l'entremise du pipeline d'évacuation et la gestion générale de la surface du site et des eaux souterraines salines ont fait l'objet d'une attention considérable lors de l'examen technique de la demande des modifications proposées et lors du volet technique de l'audience publique. De plus, le risque que les changements climatiques affectent la mine, l'infrastructure de la mine, les routes en hiver et, au final, le plan de fermeture et de remise en état a aussi été discuté dans le cadre du processus de réexamen de la Commission. Un dossier complet des commentaires sur les évaluations techniques, les longues observations écrites et les preuves présentées à l'audience publique relativement au réexamen de la Commission est disponible dans le registre public

de la Commission, accessible depuis le site Web de la CNER au www.nirb.ca en utilisant l'un ou l'autre des critères de recherche suivants :

- Nom du projet : Mine d'or de Doris North
- N° de dossier CNER : 05MN047

À la lumière de toute l'information ayant contribué à l'examen par la CNER des propositions de modification au projet et au réexamen des conditions stipulées dans le certificat de projet n° 003, la Commission arrive à la conclusion que, si ce projet est réalisé conformément aux limites et mesures d'atténuation stipulées dans les nouvelles conditions révisées du certificat de projet n° 003 de la CNER, les changements au projet tels qu'ils sont définis dans la demande de modification de 2015 peuvent se faire de manière à protéger et promouvoir le bien-être actuel et futur des résidents et des collectivités de la région du Nunavut et à protéger l'intégrité écosystémique de la région du Nunavut.

En conclusion, la Commission souhaite souligner quelques-uns des ajouts et des révisions clés au certificat de projet n° 003, recommandés par la Commission qui les juge nécessaires pour prévenir, minimiser, superviser et gérer de manière évolutive la possibilité de répercussions écosystémiques et socioéconomiques nocives du projet révisé de la manière indiquée dans la demande de modification de 2015 :

- de nouvelles conditions ont été incluses afin de minimiser les répercussions potentielles du déversement d'effluents à l'aide d'un pipeline dans Roberts Bay;
- une nouvelle condition a été ajoutée exigeant l'évaluation périodique du niveau d'eau de Doris Lake;
- une nouvelle condition requiert l'élaboration et la présentation d'un plan de gestion détaillé des eaux souterraines;
- des conditions ont été ajoutées ou révisées pour assurer la surveillance des répercussions socioéconomiques potentielles occasionnées par le projet, y compris de nouvelles mesures visant à planifier et à évaluer les effets des fermetures temporaires de la mine et des mesures pour identifier les répercussions potentielles du projet sur la migration vers la région et;
- une nouvelle condition qui confirme les obligations en matière de rapport de TMAC à l'endroit du Gouvernement du Nunavut en ce qui concerne la découverte par TMAC de sites archéologiques sur le site.

La Commission est confiante que si les changements au projet proposés dans la demande de modification de 2015 sont menés conformément aux conditions nouvelles et révisées du certificat de projet n° 003, en conjonction avec le système de surveillance de projet robuste déjà existant du Conseil, les changements au projet peuvent se faire de manière à protéger l'intégrité écosystémique de la région de Kitikmeot tout en assurant des avantages socioéconomiques considérables et longtemps attendus par les habitants et les collectivités de Kitikmeot.

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1. INTRODUCTION

1.1. PROJECT OVERVIEW

The 2015 Amendment Application (the Application) proposes amendments to the Doris North Gold Mine project (NIRB File No. 05MN047)[13] which the Proponent has indicated will increase project efficiencies and extend the operating life of the mine from 2 (two) years to 6 (six) years. The Proponent for the Doris North Gold Mine Project (Doris North or the Project), TMAC Resources Inc. (TMAC or Proponent), is proposing to amend terms and conditions associated with NIRB Project Certificate No. 003 and the Nunavut Water Board's (NWB) Type "A" Water Licence (File No. 2AM-DOH1323) to allow for a number of modifications to the approved Doris North Gold Mine Project (Doris North Project or the Project).

As originally approved under the NIRB's Project Certificate No. 003, the Doris North Project is located in the Kitikmeot region, approximately 125 kilometres (km) south of Cambridge Bay and 150 km north of Omingmaktok (Bay Chimo), on Inuit-owned surface lands. The original Project included the development of an underground gold mine (Doris Hinge) with a single adit or ramp access with an overall project footprint of approximately 62 hectares. The Project was proposed to operate for two (2) years, processing roughly 458,000 tonnes (t) of ore to yield about 306,830 ounces of gold.

Components of the Project approved in 2006 included a main camp, fuel tank farm, office complex, workshops, power generation plant, sewage treatment plant, portal with associated underground mine for the Doris Hinge zone, construction of two (2) frozen core dams for the creation of a tailing impoundment area (TIA), a crusher and mill, and quarry areas (A, B, D, and 3). Approved components associated with the Project at Roberts Bay included a jetty, fuel tank farm, and laydown areas. A combined 4.8 kilometre (km) all-weather road, with a portion designated as a joint use airstrip, link Roberts Bay (located at the north end of the Project) with the main camp and mine site. In 2011, Hope Bay Mining Ltd. (HBML) amended the Type "A" Water Licence for the Project (NWB File No. 2AM-DOH0713) to include an airstrip expansion/bypass road and on January 14, 2011 the NIRB determined that the amendment was exempt from the requirement for screening under Section 12.4.3 of the Nunavut Land Claims Agreement. Construction began on the expansion; however the completion of the airstrip expansion was put on hold in 2012 due to the Project being placed in care and maintenance. In the fall of 2015 construction recommenced on the airstrip and is anticipated to be completed in 2016.

Although mining operations have not been undertaken since the issuance of Project Certificate No. 003, construction of certain infrastructure has taken place within the main camp, Tail Lake, and Roberts Bay areas listed in Table 1. Existing infrastructure has facilitated a bulk sampling program which has produced approximately 200,000 t of waste rock, currently being stored at the waste rock area (Pad Q). To date, the crushing, milling, and processing plant, the Tailings Impoundment Area (TIA) south dam and associated road, and the landfill have not been constructed and were not expected to be constructed until the Project moved out of care and maintenance and into the construction phase. On March 9, 2015 TMAC notified parties that it would be recommencing construction at the site and anticipated commencing operation of the mine in January 2017 after receipt and installation of the mill and other associated infrastructure.

[13] The NIRB issued Project Certificate No. 003 to Miramar Hope Bay Ltd. In September of 2006 following the Minister of Indian and Northern Affairs' approval of the Doris North Gold Mine Project.

Table 1: Approved Infrastructure Associated with the Original Doris North Gold Mine Project

Main Camp	Tail Lake	Roberts Bay
▪ 180-person capacity accommodations camp; ▪ mine offices; ▪ sewage treatment plant; ▪ waste management and treatment facilities; ▪ power plant; ▪ bulk fuel storage area; ▪ warehouses; ▪ underground mining support facilities (e.g., portal); ▪ vehicle parking; ▪ material laydown areas; ▪ all-weather road and airstrip; and ▪ helicopter operations and landing area.	▪ North dam (for the development of the TIA); ▪ secondary road; and ▪ Explosives Storage Pad.	▪ marine port and ancillary facilities; ▪ rock jetty; ▪ two bulk fuel storage; ▪ facilities; ▪ mechanical shop; ▪ vehicle repair complex; ▪ waste management facility; and ▪ laydown area.

As detailed in the 2015 Amendment Application (the Application), TMAC is proposing to extend the mine life for the Doris North Project by four (4) years to a total of six (6) years through the mining of two (2) additional mineralized zones identified within the Doris deposit, labelled Doris Connector and Doris Central zones, with a total of three (3) zones to be accessed via the existing Doris North portal. The expanded mining program would also include increasing the approved mining and milling rates to 2,000 t per day, which would also require the restructuring of the TIA for receipt of subaerial tailings. TMAC has indicated that the proposed TIA restructuring and alternate method of depositing tailings would be sufficient to manage the increased volume of tailings that would be produced from the expanded mine.

Unlike the originally approved Doris Hinge zone which is fully located in permafrost and thus it was anticipated that no saline groundwater would be encountered in the underground development of the mine, the Doris Connector and Doris Central zones are located beneath Doris Lake in a talik, and consequently TMAC has anticipated encountering saline groundwater. As such, the Application included proposed infrastructure and water management systems to control the predicted discharge of approximately 7,000 cubic metres per day of saline groundwater inflow and processed tailings water from the TIA, into Roberts Bay via a mixing box and piped discharge system.

During technical review of the proposed amendment activities, it was identified that the presence of saline groundwater in the effluent could prove to be problematic from a regulatory perspective. Under the *Metal Mining Effluent Regulations* (MMER) there are no marine species of fish that could be used for toxicity testing. Consequently, purely on the basis of the anticipated salinity of the groundwater, the effluent would likely be toxic to the only approved test fish, rainbow trout, because this is a freshwater species. In its response to technical comments on January 26, 2016, TMAC indicated to the NIRB that it was working with Environment and Climate Change Canada's regional laboratory to determine a suitable marine species that could be used for toxicity testing, but that an accepted alternative to rainbow trout would not be adopted prior to the NIRB's assessment and reconsideration of the Application. TMAC further noted that it understood that necessary changes may need to be made to the MMER with respect to testing saline water and that these changes may not be completed until at least 2017.

Therefore in order to meet the existing MMER, TMAC proposed an engineering alternative which would defer the need to discharge saline groundwater directly to the marine environment. At the NIRB Technical Meeting on January 25 and 26, 2016, TMAC outlined the proposed alternative disposal option: both saline groundwater and mill process water would be deposited into the TIA for mixing and confirmation of suitability with testing before being pumped into Roberts Bay year-round. Once the MMER was amended and it was proven that it was safe to directly discharge the saline groundwater directly to Roberts Bay, TMAC would then commence discharge of mixed saline groundwater and TIA water as described in the Application. On April 6, 2016 the NIRB received a submission from TMAC regarding the proposed scope change related to the TIA alternative water management strategy for consideration during the Board's review.

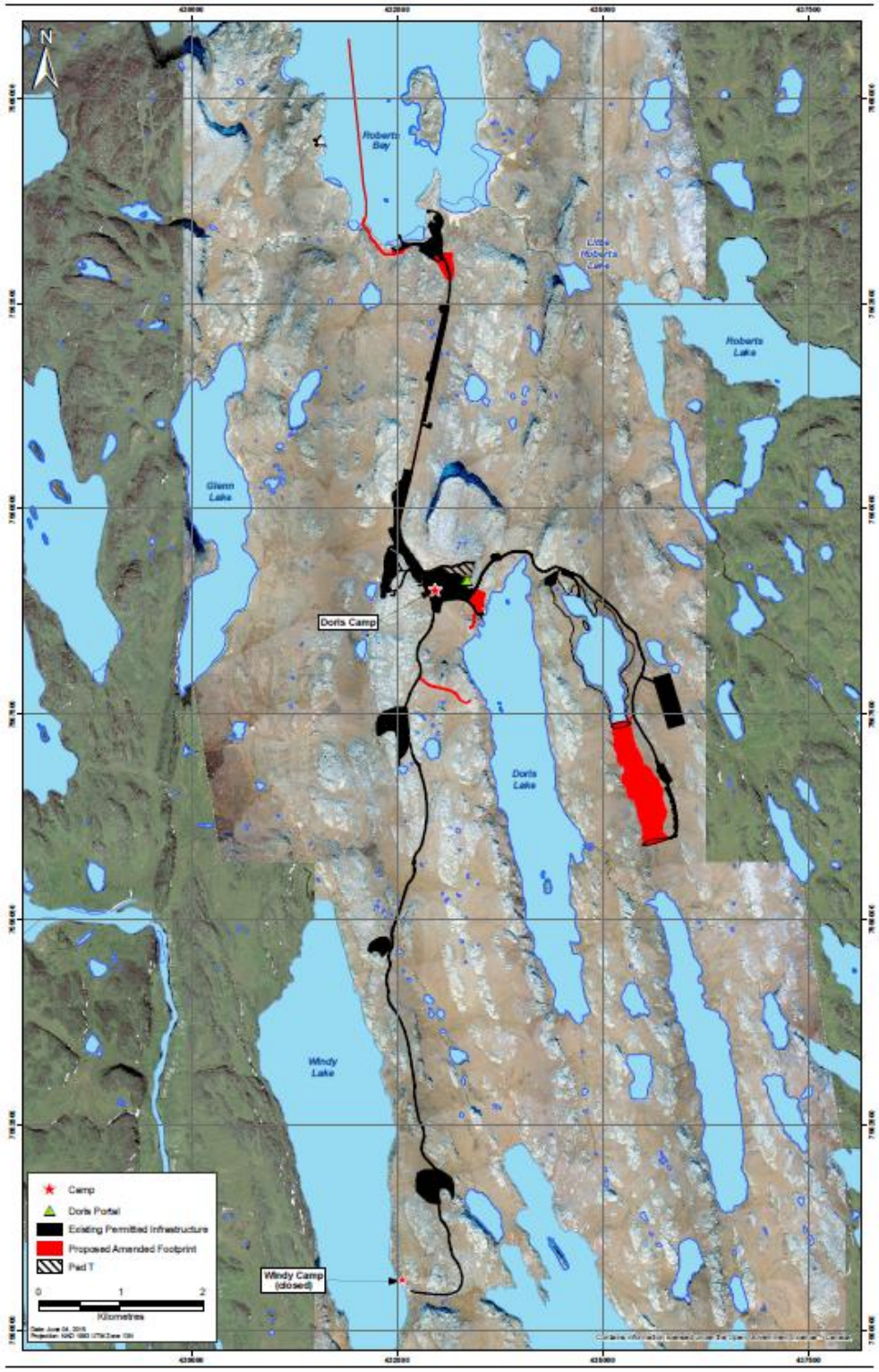
To enable increased mining operations and efficiencies, the 2015 Amendment Application also described the construction and management of two (2) mine vents and associated spur roads, an additional ore storage area (Pad U), development and expansion of laydown areas (Roberts Bay Expanded Laydown Area West, Southwest, and Southeast), use of material from existing quarries (A, B, D, and 3), relocation of the approved landfill and explosives facilities from previously approved locations, construction of additional road systems, and a change to the cyanide treatment system from Caro's Acid (hydrogen dioxide and sulfuric acid) to the INCO process (sulfur dioxide and air) to reduce cyanide in process flotation tailings that would be used for backfill in the underground mine.

The Doris North mine site would continue to be accessed year-round by aircraft and seasonally by ocean-going barges, with proposed over-wintering of fuel barges when required to support the proposed amendments. The Proponent also proposed to expand the existing Doris camp to accommodate up to 280 personnel (from 180), replace the sewage treatment plant with a new one, and retrofit the existing sewage plant for backup.

Finally, the Application included the request to remove the requirement for an onsite laboratory previously required for real time water testing under Term and Condition No. 9 of the NIRB Project Certificate No. 003. This term and condition required TIA water to be tested prior to release into Roberts Creek and the testing of the creek in real time, as the original project scope included the disposal of TIA water into Roberts Creek.

Figure 1 shows the locations of project components proposed under the Application in addition to existing and already approved project infrastructure.

Figure 1: Location of Permitted and Proposed Project Components, Doris Gold Mine Site [TMAC, 2015 Amendment Application (Package 1: Part 1, Figure 2; June 2015)]



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1.2. PROCEDURAL HISTORY

1.2.1. Key Procedural Steps in the 12.8.2 Reconsideration of the Terms and Conditions of the Project Proposal

The original Doris Hinge Project Proposal (renamed the Doris North Gold Mine Project and referenced in this Report as the Project) as proposed by Miramar Hope Bay Ltd. (Miramar) was screened by the Nunavut Impact Review Board (NIRB or Board) in 2002 in accordance with Article 12, Part 4 of the Nunavut Land Claims Agreement (NLCA). On June 5, 2002 the NIRB recommended to the federal Minister of Indian and Northern Affairs that, pursuant to Section 12.4.4(b) of the NLCA, the proposal required a full environmental review in accordance with Article 12, Part 5 or 6 of the NLCA. On August 27, 2002 the Minister referred the Doris Hinge Project to the NIRB for Review pursuant to Article 12, Part 5 of the NLCA.

Following development and issuance of guidelines for the preparation of an Environmental Impact Statement, submission and public review of *draft* and *final* environmental impact statements, and technical meetings, Final Hearings were held as part of the NIRB's Review from July 11 to July 16, 2004 in the communities of Cambridge Bay, Gjoa Haven, Taloyoak, and Kugluktuk. Based on the results of the Final Hearings and the evidence available, the Board determined that pursuant to Section 12.5.6 (a) and (b) of the NLCA the Project should not proceed and identified insufficient information in five (5) key areas of the proposal: the assessment of alternatives to the use of Tail Lake for tailings disposal; Tail Lake water quality and water management strategy; the design of the jetty and related issues including potential effects on fish habitat, shoreline erosion, and the sea bed; the wildlife mitigation and monitoring plan including cumulative effects assessment; and the socio-economic impact of the Project on affected residents and communities of Nunavut. On December 6, 2004 the Minister of Indian and Northern Affairs (the Minister) accepted the NIRB's report and recommendation that the Project not be allowed to proceed.

On February 14, 2005 Miramar submitted an updated Preliminary Project Description for the Project to the NIRB for screening. At the conclusion of its public screening process, the NIRB issued its Screening Decision Report to the Minister on March 7, 2005, recommending the updated proposal required a full environmental review in accordance with Article 12, Part 5 or 6 of the NLCA. On April 22, 2005 the Minister agreed with the NIRB's determination for the updated submission and referred the Project to a second Review under Article 12, Part 5 of the NLCA. To guide the development of its *Draft* Environmental Impact Statement Miramar was issued the Project's original Environmental Impact Statement Guidelines, supplemented by direction provided by the Board in the August 2004 Final Hearing Report.

The NIRB conducted a thorough public review of information provided by Miramar and parties for the updated project proposal, including numerous opportunities for technical review and public input and the solicitation of expert testimony and community-level input at a Final Hearing held January 30, 2006 through February 3, 2006 in the community of Cambridge Bay. Upon completion of the Final Hearing, the NIRB provided a report of its findings to the Minister on March 6, 2006, recommending that the Project be approved to proceed to the regulatory stage. The NIRB's determination was subsequently supported by the Minister and, in September 2006, the NIRB issued the Doris North Gold Mine Project

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Certificate No. 003 (Project Certificate No. 003) to Miramar Hope Bay Ltd. for the Doris North Gold Mine Project.

Following issuance of Project Certificate No. 003, construction of the Roberts Bay jetty, portions of the all-weather road, and 200 metres of the all-weather airstrip was completed in 2007, while regulatory processes for various required operational approvals awaited initiation. In early 2008, Newmont Mining Corporation (Newmont) purchased all interests of Miramar and its subsidiaries for the properties in the Hope Bay Belt, including the Doris North holding. Following this acquisition, Hope Bay Mining Ltd. (HBML) was established for the purpose of operating the Project and advancing other properties in the Hope Bay Belt. In late 2009 construction of the Doris North Gold Mine Project was suspended as HBML re-evaluated the original mine development plan. In November 2009, HBML decided to proceed with the Project through a staged development strategy, subsequently resuming infrastructure construction in the summer of 2010 with mine operation anticipated to commence in 2012.

By 2011, activities at the Doris North Gold Mine were focused on completing the construction of infrastructure necessary for the advanced exploration stage of the Project. However, on January 31, 2012 HBML announced that it had decided to move the Project into care and maintenance with the camp being opened seasonally to maintain regulatory obligations.

In March 2013 HBML notified the NIRB that Newmont was selling the Project to TMAC Resources Inc. (TMAC); later that month TMAC notified the NIRB that it planned to re-open the camp in order to continue exploration activities while maintaining the site in care and maintenance. In April 2013 the NIRB received notice that TMAC had completed the purchase of the Project from Newmont/HBML and it would continue to maintain the Doris North site in care and maintenance while TMAC continued ongoing exploration.

On December 9, 2013 TMAC submitted an application to the NIRB and the Nunavut Water Board (NWB) for a joint amendment/reconsideration of Project Certificate No. 003 to allow for modifications required for TMAC to more effectively mine the Doris North Gold Mine Project. The NIRB commenced reconsideration of Project Certificate No. 003 pursuant to Section 12.8.2 of the NLCA until April 22, 2014, when the NIRB and the NWB received notice from TMAC that it planned to submit additional amendments for consideration as part of its application. On April 30, 2014 the NIRB and the NWB provided joint direction that the joint assessment would be suspended until TMAC submitted a complete scope of proposed modifications. Through the summer of 2014, TMAC continued with ongoing exploration and site management activities while the Doris North Gold Mine site remained in care and maintenance; in the winter of 2014 TMAC maintained its presence on site.

On June 23, 2015 TMAC submitted the Amendment Application to replace the previous 2013 application to recommence the Board's assessment of proposed changes to the Doris North Gold Mine Project. Table 2 below provides a summary of the key procedural steps associated with the NIRB's assessment and reconsideration process as set out under Section 12.8.2 of the NLCA for the 2015 Amendment Application (the Application), commencing with the receipt of the Application from TMAC on June 23, 2015 and continuing through to the completion of the Board's Public Hearing in Cambridge Bay on April 12-14, 2016. Table 2 also identifies key milestones, opportunities for public participation, and involvement of parties and intervenors throughout the NIRB's reconsideration process and associated timelines.

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As this summary is not exhaustive, parties wishing to develop a more complete understanding of the activities associated with the Board's reconsideration process for these proposed amendments to the original Doris North Gold Mine Project are encouraged to consult the complete listing of all associated documentation available from the NIRB's public registry for the Project (NIRB File No. 05MN047). Copies of the specific documents referenced in the listing and associated with the NIRB's review of the Project can be accessed online from the Board's public registry, accessible from the NIRB website at www.nirb.ca by using either of the following search criteria:

- Project Name: Doris North Gold Mine
- NIRB File No.: 05MN047

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Table 2: Procedural History

Review Step	Party	Timeline	Process Steps	Notes[a]
	Hope Bay Mining Limited (HBML)	**November 7, 2011**	The Nunavut Impact Review Board (NIRB or Board) received an amendment application from then project owner HBML[1]	HBML outlined proposed amendments to the NIRB Project Certificate No. 003 and the Nunavut Water Board (NWB) Type "A" Water Licence (No. 2AM-DOH0713). A hard copy was received November 14, 2011.
	NIRB	**December 16, 2011**	Requested comments regarding reconsideration of proposal under Section 12.8.2 of the Nunavut Land Claims Agreement	
	Parties	**January 25, 2012**	Submitted comments regarding the reconsideration	The NIRB received comments from the Kitikmeot Inuit Association (KIA), Aboriginal Affairs and Northern Development Canada (AANDC), Environment Canada (EC), and Transport Canada (TC).
	HBML	**January 31, 2012**	Placed the Doris North Gold Mine Project in Care and Maintenance	
	NIRB	**February 23, 2016**	Requested clarification regarding plans for the Doris North Project	The NIRB also requested additional comments from the Government of Nunavut (GN), Fisheries and Oceans Canada (DFO), and Natural Resources Canada (NRCan) regarding HBML's application.
	HBML	**March 1, 2012**	Requested the NIRB suspend consideration of the amendment application	
	NIRB	**March 28, 2011**	Suspended its reconsideration of the amendment application	After receiving additional comments from the GN, DFO, and NRCan the NIRB suspended its process.
	TMAC Resources Inc. (TMAC or Proponent)	**December 9, 2013**	Submitted an Amendment Application to the NIRB	The Nunavut Water Board (NWB) also received the same request to modify the Type "A" Water Licence (No. 2AM-DOH1323).
	NIRB	**December 19, 2013**	Requested comments regarding reconsideration of proposal under section 12.8.2	Comments were requested on whether amendments warranted reconsideration under Section 12.8.2.

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Review Step	Party	Timeline	Process Steps	Notes[a]
	Public/Parties	**January 20, 2014**	Received Comments on reconsideration process	The NIRB received comments from the KIA, GN, AANDC, EC, DFO, NRCan, and TC.
1. Reconsideration Process Announced	**NIRB**	**February 3, 2014**	Commencement of reconsideration process	Correspondence released separately to the Minister of AANDC and to the Proponent/parties included the Board's determination, the next steps in the reconsideration process, and calls for information requests (IRs).
	Public/Parties	**August 28, 2014**	Submission of parties IRs to the NIRB	IRs received from the KIA, GN, AANDC, EC, NRCan, and TC.
	NIRB	**February 18, 2014**	Requested TMAC address IRs	IRs received from the GN, AANDC, EC, DFO, and TC.
	Responsible Minister (AANDC)	**March 27, 2014**	Issuance of direction from the Minister to the NIRB	The Minister stated that it trusted that the Board would make best efforts to ensure that the reconsideration of the Project Certificate No. 003 is expeditious and thorough, while at the same time allowing opportunity for all interested participants to engage in the process.
	TMAC	**April 22, 2014**	Provided a response to IRs	TMAC also indicated that it planned to submit further amendments for consideration as part of the amendment process.
	NIRB	**April 28 to May 2, 2014**	Community information sessions	Community information sessions held in Kugluktuk, Cambridge Bay, Taloyoak, and Kugaaruk. Gjoa Haven was not accessible due to weather.
	NIRB	**April 30, 2014**	Joint suspension by the NIRB and the NWB of the reconsideration of Project Certificate No. 003 and Type A Water Licence	Suspension was put in place until such time as TMAC submits a complete scope of proposed modifications to the Doris North Project.
	TMAC	**June 23, 2015**	Submission of the 2015 Amendment Application (the Application)	
2. Conformity Review of Application	**NIRB**	**June 23, 2015**	Commencement of conformity review	

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Review Step	Party	Timeline	Process Steps	Notes[a]
	NIRB	**July 21, 2015**	Requested clarification regarding the Phase 2 Hope Bay Belt Project	The NIRB requested clarification of the two (2) TMAC applications, as the proposed Amendment and Phase 2 Hope Bay Belt were proposed to utilize the Doris North infrastructure. On July 24, 2015 the NIRB received clarification and recommenced the conformity determination.
	NIRB	**August 21, 2015**	Determined conformity of the Application to EIS Guidelines and requested parties to submit information request (IRs)	The NIRB commenced the technical review period by requesting parties submit IRs to the Board by September 11, 2015. On August 24, 2015 the NIRB received a request to extend the IR period to September 18, 2015, and all parties were notified of the granted IR extension
	Public/Parties	**September 18, 2015**	Submission of IRs to the NIRB	IRs received from the KIA, GN, AANDC, EC, DFO, NRCan, TC, and the Proponent.
	NIRB	**September 25, 2015**	Requested TMAC address the IRs	
	TMAC	**October 5, 2015**	Requested alternative timeline for assessment	Correspondence included an alternative process map with shorter timelines.
	NIRB	**October 15, 2015**	Requested comment on TMAC's proposed alternative timeline for assessment to parties	
	TMAC	**October 22, 2015**	Withdrawal of request for alternative timeline	
3. Technical Review of Amendment Application	**NIRB**	**November 4, 2015**	Issuance of joint correspondence by the NIRB and the NWB notifying TMAC and parties of commencement of a coordinated public technical review period	The correspondence included an updated joint reconsideration process map. On November 5, 2015 the NIRB provided notice to parties regarding the commencement of the 60-day technical review period, provided anticipated timelines for technical meetings, and requested technical comments on or before January 8, 2016.
	NIRB	**November 27, 2015**	Notification of Technical Meetings January 26 through 29, 2016	The Technical Meeting was coordinated with the NWB and a draft agenda was included.
	TMAC	**December 2, 4, and 7, 2015**	Submission of outstanding amendment materials	TMAC submitted additional materials to be considered during the technical review period.
	NIRB	**December 23, 2015**	Notice of Public Hearing Issued	Notice included information on submitting requests for formal intervener status at the Public Hearing.

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Review Step	Party	Timeline	Process Steps	Notes[a]
	Parties	**January 8, 2016**	Submitted requested items to the NIRB	The NIRB received technical review comments, confirmation of attendance, and comments on the *draft* NIRB Technical Meeting Agenda.
	TMAC	**January 18, 2016**	Responded to the review comments	Included in TMAC's response package was a proposed method for alternative disposal of saline groundwater as per Environment and Climate Change Canada's (ECCC, previously EC) correspondence received by TMAC January 8, 2016.
	Public/Parties	**January 23, 2015**	Application for Intervention Status filed	The Kugluktuk Angoaitit Association and ECCC both filed applications with the Board and both were granted Intervenor status along with ECCC.
	NIRB	**January 26 & 27, 2016**	Facilitated Technical Meeting	Parties in attendance included TMAC, NWB, KIA, GN, EECCC, DFO, Indigenous and Northern Affairs Canada (INAC, previously AANDC), NRCan, and Transport Canada (TC).
	TMAC	**February & March 2016**	Submitted various commitment items from the Technical Meeting	
	NIRB	**February 11, 2016**	Released TMAC's technical commitments list	
	Public/Parties	**March 14, 2016**	Submission of final written submissions to the NIRB	Comment submissions received from the KIA, GN, ECCC, DFO, INAC, NRCan, and TC.
	NIRB	**March 17, 2016**	Requested TMAC respond to final written submissions	
	TMAC	**March 29, 2016**	Responded to technical review comments	
	NIRB	**February 29, 2016**	Requested from communities for community representatives	Requested one (1) community representative from each of the five (5) permanent Kitikmeot communities Kugluktuk, Cambridge Bay, Gjoa Haven, Taloyoak, and Kugaaruk as well as camps Bathurst Inlet and Omingmaktok (Bay Chimo).
	NIRB	**February 11, 2016**	Release of Logistic information regarding the Public Hearing	
	Community organizations	**April 2, 2016**	Provided names of community representative	

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Review Step	Party	Timeline	Process Steps	Notes[a]
	NIRB	**April 4, 2016**	Released final agenda and details for the Public Hearing	
4. Public Hearing	**NIRB**	**April 12-14, 2016**	Public Hearing including technical sessions and community roundtable	Hosted in Cambridge Bay and facilitated by Elizabeth Copland, Chairperson. Parties in attendance: KIA, GN, DFO, INAC, NRCan, TC, and community representative from Bathurst Inlet, Cambridge Bay, Gjoa Haven, and Kugaaruk.

NOTES: a = Abbreviations: Aboriginal Affairs and Northern Development Canada (AANDC), Environment Canada (EC), Environment and Climate Change Canada (ECCC), Fisheries and Oceans Canada (DFO), Hope Bay Mining Limited (HBML), Government of Nunavut (GN), Indigenous and Northern Affairs Canada (INAC), Information Requests (IRs), Kitikmeot Inuit Association (KIA), Natural Resources Canada (NRCan), Nunavut Impact Review Board (NIRB), Nunavut Water Board (NWB), TMAC Resources Inc. (TMAC), and Transport Canada (TC).
1: see http://ftp.nirb.ca/03-MONITORING/05MN047-DORIS%20NORTH%20GOLD%20MINE/01-PROJECT%20CERTIFICATE/03-AMENDMENTS/AMENDMENT%20No.1/1-APPLICATION/.

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1.3. MANDATE OF THE BOARD

In conducting this reconsideration, as with the discharge of all the Board's functions, the Board is guided by the general requirements of Article 12, Section 12.2.5 of the Nunavut Land Claims Agreement (NLCA), which states that:

> In carrying out its functions, the primary objectives of NIRB shall be at all times to protect and promote the existing and future well-being of the residents and communities of the Nunavut Settlement Area, and to protect the ecosystemic integrity of the Nunavut Settlement Area. NIRB shall take into account the well-being of residents of Canada outside the Nunavut Settlement Area.

In the present context, the function of the Board is to gauge and define the extent of the potential impacts of the proposed project amendments, including assessing the likely ecosystemic and socio-economic impacts of the proposed amendments to the original Doris North Gold Mine Project reviewed by the Board in 2005-2006. On the basis of this assessment, the Board is then required to determine if the proposed amendments should proceed. If the Board determines that the project amendments should be allowed to proceed, the Board then considers what, if any, changes and additions to the terms and conditions of the existing Doris North Gold Mine NIRB Project Certificate No. 003 are required to address the anticipated impacts.

1.4. JURISDICTION OF THE BOARD

This assessment of the proposed project amendments and reconsideration of the terms and conditions of Project Certificate No. 003 has been conducted under the provisions of Article 12, Section 12.8.2(b) of the NLCA, which provides that the NIRB, either on its own or upon application by a Designated Inuit Organization, the Proponent or other interested party, may reconsider the terms and conditions contained in a project certificate if it is established that "the circumstances relating to the project or the effect of the terms and conditions are significantly different from those anticipated at the time the certificate was issued".

The Board's jurisdiction for this reconsideration is also defined under both Sections 12.8.2 and Section 12.8.3 of Article 12 of the NLCA, which provides as follows: "…the NIRB shall reconsider the terms and conditions contained in a certificate." These provisions combine to support the Board's jurisdiction to conduct additional assessment of amendments to previously approved project proposals and, if the Board concludes that such amendments can proceed, to then undertake a reconsideration of the terms and conditions of a previously-issued project certificate. Reflecting the Board's jurisdiction under these provisions, the Board has assessed the proposed project amendments and reconsidered the terms and conditions in Project Certificate No. 003 for the Doris North Gold Mine Project.

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1.5. PURPOSE OF THIS REPORT

The reporting parameters for the Board's determination are found in Section 12.8.3 of the Nunavut Land Claims Agreement (NLCA):

> 12.8.3 Where the Minister determines that any of the conditions in Sub-sections 12.8.2(a), (b) or (c) have been established, NIRB shall reconsider the terms and conditions contained in a certificate, and NIRB shall produce a report of its reconsideration.

This Hearing Report presents the results of the NIRB's assessment of TMAC Resources Inc.'s proposed project amendments and its reconsideration of the terms and conditions within the Doris North Gold Project Certificate No. 003 pursuant to Article 12, Section 12.8.2 of the NLCA.

1.6. EVIDENTIARY ISSUES

1.6.1. The Burden and Standard of Proof

The Proponent bears the onus to establish, on the balance of probabilities, that the proposed Project amendments detailed within the 2015 Amendment Application (the Application) are consistent with the Board's mandate and requirements of the NLCA.

The burden of persuading the Board that the proposed amendments to the Project can proceed rests with the Proponent. Recognizing that the Proponent requested that the Board assess the proposed project activities in the Application and reconsider the terms and conditions of the Doris North Gold Mine Project Certificate No. 003 in light of the proposed amendments, it is the Proponent's responsibility to prepare an updated environmental impact statement (EIS) that fully reflects the potential ecosystemic and socio-economic effects of the amendments proposed for the Doris North Project. The Application must also reflect the updates and general requirements in the original project-specific EIS guidelines issued by the NIRB in 2002.

In addition to the overall onus remaining on the Proponent during the Board's consideration of the proposed project amendments, individual participants throughout the assessment process must also meet the burden of proof for specific information or assertions offered to the Board. As stated in the NIRB Rules of Procedure, any party offering evidence has the burden of ensuring that they have provided the Board with sufficient information to support that participant's position.[14] Further, where there is conflicting information, the Board has the authority to decide which information will be accepted by the Board in whole or in part. The standard of proof in this reconsideration process required a careful balancing of all of the information filed in writing with the Board prior to the Public Hearing and the information provided to the Board in person at the Public Hearing. The sections of this Report discussing the Board's Views address how the Board balanced information provided on key topics.

1.6.2. Inuit Qaujimaningit

As indicated in both the Environmental Impact Statement Guidelines and the Board's previous decisions, in the Board's view, Inuit Qaujimaningit, which encompasses Inuit Traditional Knowledge (and variations thereof) as well as contemporary Inuit Knowledge that reflects Inuit societal values and experience,

[14] NIRB Rules of Procedure, Rule 32.1, September 3, 2009, p. 18.

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contributes vital information to the NIRB's assessment process. The term Inuit Qaujimaningit is meant to encompass local and community-based knowledge and ecological knowledge (both traditional and contemporary), which is rooted in the daily life of Inuit people and represents experience acquired over thousands of years of direct human contact with the environment.[15,16] With its emphasis on personal observation, collective experience, and oral transmission over many generations, Inuit Qaujimaningit provides factual information on such matters as ecosystem function, social and economic well-being, and explanations of these facts and causal relations among them. In this regard, Inuit Qaujimaningit has played a significant role in this assessment by: contributing to the development of accurate baseline information, comparing predictions of effects with past experience, and assisting in the assessment of the magnitude of projected effects.

The Proponent was required to incorporate Inuit Qaujimaningit into the Application, to the extent that the Proponent had access to such information and in keeping with the expectation that the Proponent would undertake appropriate due diligence to gain access to the information but may be limited by obligations of confidentiality and other ethical obligations that may attach to such information. In addition to Inuit Qaujimaningit provided as part of the original final environmental impact statement or in questions or responses provided by the intervenors, Elders, Inuit harvesters and other community members freely shared Inuit Qaujimaningit with the Board during the Community Roundtables at the Public Hearing. The NIRB has benefitted from the Inuit Qaujimaningit provided in the Application and shared by the participants at the Public Hearing.

1.7. Scope of the NIRB's Assessment and Environmental Impact Statement Guidelines

On December 9, 2013 the NIRB and the Nunavut Water Board (NWB) jointly received an amendment application from TMAC Resources Inc. (TMAC) which outlined proposed changes to the project infrastructure, process, and mine life of the Doris North Gold Mine Project (the Project) and requested the NIRB reconsider terms and conditions within the Doris North Gold Mine Project Certificate (Project Certificate No. 003). The scope of the proposed project amendments included changing the method of deposition of the tailings in the tailing impoundment area and modifications to existing project infrastructure to commence in 2017.

After considering the information provided by the Proponent, the requirements of Project Certificate No. 003, comments and concerns submitted by parties regarding the changes required to accommodate the proposed activities, and options available pursuant to the Nunavut Land Claims Agreement (NLCA), the NIRB determined on February 3, 2014 that a reconsideration of the terms and conditions contained within Project Certificate No. 003 was warranted pursuant to NLCA Section 12.8.2(b).

The NIRB based its determination on the following:

- the changes to specific project activities as proposed in the Proponent's December 9, 2013 letter to the Board are integrally linked to the Doris North Gold Mine Project as approved under Project Certificate No. 003 and any potential ecosystemic and socio-economic effects associated with these changes are best addressed under the existing Project Certificate;

[15] Berkes, F. (1993). Traditional ecological knowledge in perspective. In J. Inglis (Ed.), *Traditional Ecological Knowledge: Concepts and Cases* (pp. 1-9). Ottawa: Canadian Museum of Nature.
[16] Stevenson, M. G. (1996). Indigenous knowledge in environmental assessment. *Arctic*, 49(3), 278-291.

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- the amendments to specific project components and activities as proposed have not been subject to impact assessment by the Board or full technical review by parties, public comment, or approval by the various responsible authorities; and
- the circumstances relating to the Project are now significantly different than were considered at the time the Board issued its Final Hearing Report and recommendations in March 2006[17] and subsequently, when, as directed by the Minister, the Board issued the Project Certificate on the basis of the Board's Report and Recommendations.

For further details on how the amendments, as currently scoped, came to be considered by the Board, please refer to Section 1.2.1 of this report.

1.8. KEY ISSUES

From January 26 to 29, 2016 the Nunavut Impact Review Board (NIRB) and the Nunavut Water Board (NWB) conducted joint technical meetings in Cambridge Bay to discuss technical issues related to TMAC's Application. The NIRB facilitated its technical meetings on January 26 and 27, 2016 and the commitments generated and tracked by TMAC addressed the following key technical issues:

- Water and water quality (surface and subsurface);
- Disposal of underground saline water into the marine environment;
- Change to disposal of tailings at the Tailings Impoundment Area (TIA);
- Terrestrial ecosystems and environment including landforms, soils, vegetation, wildlife and wildlife habitat, and birds and bird habitat;
- Cumulative effects;
- Adequacy of proposed monitoring and adaptive management plans; and
- Other issues as raised by parties and intervenors.

At the Public Hearing the following additional key issues were the subject of discussion by parties, intervenors, and community representatives:

- The potential effects to Doris Lake and outflows;
- The management of saline groundwater;
- Potential for the proposed amendment activities to have impacts on Roberts Bay;
- Potential impacts to housing availability in the Kitikmeot region;
- Potential for mine training, education, and certifications to be transferred to other settings; and
- Potential impacts from project-related dust.

[17] NIRB Final Hearing Report for Miramar Hope Bay Ltd.'s Doris North Gold Project, NIRB File No. 05MN047, March 6, 2006.

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2. PROJECT SETTING[18]

2.1. DESCRIPTION OF PROJECT LOCATION

Activities and components described in the 2015 Amendment Application (the Application) would largely take place within the existing project footprint of the Doris North Gold Mine site, located approximately 125 kilometres (km) south of Cambridge Bay and 150 km north of Omingmaktok (Bay Chimo) near Melville Sound in the West Kitikmeot region of Nunavut (see Figure 2). The Kitikmeot region is one of Nunavut's three (3) administrative regions (along with the Kivalliq and Qikiqtani regions).

The Kitikmeot region is comprised of two (2) seasonally inhabited communities – Bathurst Inlet and Bay Chimo – and the following five (5) permanent communities: Cambridge Bay, Kugluktuk, Gjoa Haven, Taloyoak, and Kugaaruk. The population of the Kitikmeot region was estimated to have increased by 12% between 2006 and 2011. As of 2011, approximately 90% of the Kitikmeot population identified themselves as Aboriginal, of which almost 100% were reported as Inuit.

The formal economy in the Kitikmeot region is mixed and largely focused on public and private sector services and traditional activities. The formal economy includes government administration, health care and social services, education, construction, transportation, and mineral exploration and development. There is a noted heavy dependence on the public sector in Nunavut, with the Government of Nunavut dominating the service sector and acting as the major economic driver of the local communities. It was further noted that businesses associated with providing mining related services (e.g., catering and janitorial services) have developed in the communities, especially in Cambridge Bay, and have benefitted from opportunities associated with exploration and construction activities associated with the Doris North Gold Mine Project.

The project area is located within the continuous permafrost region of western Nunavut and is characterized by cliffs, outcrops, and special landscape features such as shrubby riparian and marsh ecosystems, sedge and shrub-dominated wetlands, polygonal ground, marine ecosystems, and bedrock-lichen veneers. The project area is also located within the Windy-Glenn and the Doris-Roberts watersheds that both drain north through a variety of lakes, streams, and outflows into Roberts Bay. Surface water flow in the area is typical of the Arctic nival regime where surface water activity peaks twice throughout the year - once during the early summer freshet, and later during autumn rain events. Due to the presence of permafrost, groundwater generally does not contribute to surface water systems except for the interaction of groundwater between larger rivers and lakes through taliks.

[18] Unless otherwise stated, the Project Setting and Description is based on the information provided by the Proponent in the 2015 Amendment Application submitted to the NIRB on July 22, 2015.

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Figure 2: Doris North Gold Mine project, Kitikmeot Region, Nunavut [TMAC, 2015 Amendment Application (Package 1: Part 1, Figure 1; June 2015)]

2.1.1. Biophysical Conditions

Based on recent monitoring data, temperatures in the area range annually between -43.0 degrees Celsius (°C) and 27.0 °C, with an annual average temperature of -11.3 °C. Total annual precipitation during the 2013/2014 monitoring period was 104.9 millimetres, with the majority of precipitation falling during the summer months. Due to the relative absence of obstructions that impede wind (e.g., trees, buildings, and mountains), wind speeds in the area are generally high and average 5.9 metres per second (m/s), with gusting events that can reach up to 22.0 m/s. Wind direction predominantly originates from the west-northwest quadrant year-round. Air quality is considered typical for remote and relatively undisturbed areas in Canada.

Most streams in the area freeze completely throughout the ice-covered season between October and June, while some larger lakes provide overwintering fish habitats and have ice surfaces reaching depths

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of two (2) metres (m). Six (6) different fish species have been observed throughout freshwater environments in the project area including least cisco, ninespine stickleback, lake cisco, lake trout, lake whitefish, and arctic char. Based on sampling from select lakes in the area, lake cisco was noted to be the most abundant large-bodied fish species in Doris Lake, while arctic char was the species most commonly captured through gillnet sampling in Little Roberts Lake.

The project area is located within the ranges of the Bathurst, Ahiak, and the Dolphin and Union caribou herds, as well as muskox. Satellite collar tracking and various surveys have shown that the herds interact with the project area throughout different times of the year. Of the three (3) herds, only the Dolphin and Union herd is known to occupy the area during both spring and winter months for seasonal migration to and from Victoria Island and is listed as a Species of Special Concern under Schedule 1 of the *Species at Risk Act*. Predatory species, such as grizzly bear and wolverine, are also known to occur within the region.

Upland breeding birds, waterbirds, seabirds, and various raptor species are known to seasonally inhabit the project area and most of the bird and raptor species identified, except for the ptarmigan, are considered migratory and are protected under the *Migratory Bird Convention Act*. Among the 62 bird species that could be observed, the Peregrine Falcon and the Short-Eared Owl are the only species listed as a species of Special Concern under the *Species at Risk Act*. Seabird species commonly observed in the area include: common eider, red-breasted merganser, pacific loon, long-tailed duck, canada goose, red-throated loon, herring gull, and glaucous gull.

Marine mammals occurring within the project area include the ringed and bearded seal and more infrequently, the beluga whale and narwhal. The composition of the marine fish community in Roberts Bay is representative of an Arctic marine ecosystem, where saffron cod, greenland cod, pacific herring, and sculpin species are considered some of the most abundant fish species. The nearshore areas of Roberts Bay have been identified as fish habitat for numerous species of marine fish. Flatfish, such as Arctic flounder and starry flounder, have been known to inhabit areas with muddy and sandy bottoms, while sculpin, gunnel, and cod species inhabit areas of hard substrate with vertical reliefs for shelter. Marine sediment and water quality concentrations in Roberts Bay are generally below Canadian Council of Ministers of the Environment guidelines, except for copper and chromium exceedances noted at select sediment samples sites within the area, and total mercury exceedances detected in select water samples during the ice-covered season.

2.1.2. Socio-economic Conditions

TMAC Resources Inc. (TMAC or the Proponent) provided information on socio-economic baseline conditions, including changes that have occurred since the submission of the 2005 Doris North Final Environmental Impact Statement. It was noted that the updated information was predominantly related to data provided by Statistics Canada – the 2006 and 2011 Canadian Census, as well as the 2011 National Household Survey – and that this information was used to provide an indication of changes and trends over time.

It was reported that as of 2011, the population of the Kitikmeot region was approximately 6,010 persons, with population estimates in 2014 indicating an increasing trend. It was also noted that despite rapid population growth between 2001 and 2011, the Kitikmeot region represents approximately 18% of Nunavut's population, the lowest in the territory. Cambridge Bay, Kugluktuk, and Gjoa Haven were reported as having the highest population sizes in the region, with approximately 1,610, 1,450, and

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1,280 persons, respectively, and along with Taloyoak, notably high population increases between 2006 and 2011. Strong natural population increases (birth rate minus death rate) and net in-migration from other areas in Canada were attributed as the main factors contributing to the levels of population growth in the Kitikmeot region and Nunavut as a whole. The median age in the Kitikmeot region was reported as being 23 years, younger than both the Nunavut and Canadian median. It was further reported that with the exception of Cambridge Bay, approximately 31 to 42% of the population of the Kitikmeot communities was less than 15 years of age. In 2011, 90% of the population of the Kitikmeot region was reported to be Inuit, ranging from 77% in Cambridge Bay to 98% in Kugaaruk.

In 2011, the potential labour force of the five (5) year-round communities of the region (Kugluktuk, Cambridge Bay, Gjoa Haven, Taloyoak, and Kugaaruk) was approximately 3,925 individuals. The average participation rate of the active labour force was noted to be approximately 61% in 2011, which was noted to be slightly lower than the rates identified in 2006 and lower than the average participation rate in Nunavut and Canada. TMAC noted that unemployment rates had increased from 2006 to 2011 in all of the Kitikmeot communities except Taloyoak. While it was noted that the active labour force identifying as Aboriginal comprises the majority of the labour force in the region, the participation rate was noted to be slightly lower than the non-Aboriginal population and ranging from 47 to 64% between the five (5) communities. Participation rates in the formal economy were noted to be higher for males compared to females. Although unemployment in the Kitikmeot region is slightly higher among the Aboriginal population, Inuit are experiencing increasing engagement in the wage economy. Although it was reported that in 2010 Cambridge Bay had a substantially higher median individual income than the territorial average, the other Kitikmeot communities were below the Nunavut average.

While Cambridge Bay has the highest level of formal education attainment levels compared to the other communities in the Kitikmeot region, the proportion of the population aged 15-64 in all of the communities that do not have a high school level of education, certificates, or diplomas, is significantly higher than the national average of 20%. However, approximately 28% of the potential labour force in 2011 in the Kitikmeot region had some form of post-secondary education. Wanting or needing to work and boredom were cited as the most common reasons that young Inuit men did not complete school whereas as pregnancy and or childcare was cited by Inuit women. An observed trend in gender variability – less male graduation rates compared to female graduation rates – was further observed over the past decade, minus the 2011/2012 school year. The Kitikmeot region was reported as having the lowest high school attendance rates in Nunavut, and unexplained absences, also called truancy rates, in Nunavut were the highest in the Kitikmeot region during the 2010/2011 school year.

Cambridge Bay was noted to have the most diversified economy in the Kitikmeot region and was considered to be the business hub for the region. While there are comparatively few private sector businesses in the other four (4) communities, each Kitikmeot community was noted to have a minimum of one (1) prominent firm providing construction services (including, but not limited to, housing and building construction, heavy equipment operation and excavation, road construction and maintenance, and equipment rentals). These types of businesses were noted to provide a relatively large number of private sector jobs, particularly during the summer construction seasons.

There is a range of health services and programs available within each of the five (5) year-round Kitikmeot communities, including the employment of at least one (1) social worker and home care provider in each community. It was noted that the majority of visits to community health centres were due to illness or injury and that diseases of the respiratory system accounted for the largest specified portion of health care centre visits from 2002-2012. Data on self-rated health status provided by the

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national census – rated as excellent, very good, good, or fair or poor health – were noted to provide an overall measure of health and indicated that there was a consistent self-rating of health throughout the Kitikmeot communities and compared to the Canadian average. However, it was further noted that there has been a notable decline over the past ten (10) years in the perception of health by Nunavummiut. In addition, the prevalence of chronic conditions in the Kitikmeot region was indicated to be generally the same as in Canada. However the following individual statistics were noted as distinct for Nunavummiut compared to the overall Canadian population: lower life expectancies, higher infant mortality rates, higher incident of low birth weight, higher smoking rates, higher rates of infant respiratory tract infections, higher rates of tuberculosis, and high rates of sexually transmitted infections. Furthermore, there were a reported higher number of suicides in Nunavut compared to Canada as a whole, with 44 suicides in the Kitikmeot communities from 1999 to 2008.

From 2001 to 2013, violent and non-violent crime rates had decreased in all Kitikmeot communities except Taloyoak and Kugaaruk, where slight increases in both types of crime were reported. Crime was noted to consist primarily of family violence or domestic assaults, theft, break and enters, liquor and drug violations, and mischief (e.g., disturbing the peace and property damage). Overcrowding, alcohol and drug abuse, and boredom were cited as some of the underlying issues believed to attribute to crime in the Kitikmeot region.

2.2. PROJECT DESCRIPTION

The Doris North Gold Mine Project (the Project) as currently approved consists of the construction, operation, maintenance, reclamation, and abandonment of a gold mine in the Kitikmeot region of Nunavut, 125 kilometres (km) south of Cambridge Bay. Previously approved components of the Project are described in Section 1.1: Project Overview.

Although mining activities have not been undertaken at the project site since the issuance of the Doris North Gold Mine Project Certificate No. 003 in September 2006, the construction of select infrastructure in the main camp, Roberts Bay, and Tail Lake areas has facilitated an ongoing bulk sampling program.

The proposed project amendments include the following additional components and activities:

- Proposed extension of mine life by four (4) additional years;
    - Proposed mining of Doris Central and Doris Connector zones via the existing Doris North portal instead of only the Doris Hinge zone;
- Increase of both mining and milling rates from 720 tonnes/day (t/day) and 800 tonnes/day respectively to 2,000 t/day;
- Increase volume of deposited tailings in the Tailings Impoundment Area (TIA) from 458,000 tonnes to 2.5 million tonnes;
    - Proposed modification to the destruction of cyanide in process tailings from Caro's Acid (hydrogen peroxide and sulfuric acid) to the INCO process;
    - Proposed change to the disposal of tailings from subaqueous to subaerial tailings at the south end of the TIA;
    - Proposed restructuring of the TIA:
        - Installation of an interim dam in the TIA approximately midway.

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- Proposed south dam construction and operations to change from frozen core to frozen foundation.

- Discharge of up to 7,000 cubic metres/day (m^3/day) directly into Roberts Bay:
  - Direct discharge of up to 3,000 m^3/day of saline groundwater from underground year round.
  - Discharge of up to 4,000 m^3/day from the TIA during summer months.
  - Construction/installation, operation, and eventual decommissioning of a 550 metre (m) access road at Roberts Bay and installation of 5.64 kilometres (km) of overland pipeline, 2.3 km long marine outfall pipeline.
  - Installation, operation, and eventual abandonment of a 95 m long marine diffuser and approximately 900 m long marine outfall berm.
- Alternative disposal option of saline groundwater from underground to the TIA prior to the deposition of TIA water in Roberts Bay (details pending).
- Construction, operation, and eventual decommissioning of two (2) additional vents (Doris Central Vent and Doris Connector) and associated spur roads;
- Construction, operation, and eventual decommissioning of Pad U, which would be a 31,000 m^2 pad and associated pollution control pond for use as ore storage and temporary laydown area;
- Increase camp capacity from 180 to 280 persons to accommodate project personnel;
- Replace existing sewage treatment plant with a new plant with an increased capacity for the larger camp and retrofitting of existing sewage treatment plant for backup;
- Use of existing quarries A, B, D, and 3 to supply foundation materials for additional proposed infrastructure;
- Relocation of proposed landfill from Quarry A to Quarry 3 once the resources have been exhausted;
- Construction, operation, and eventual decommissioning of three (3) additional laydown areas at Roberts Bay (Roberts Bay Extension Laydown Area West, Southwest, and Southeast);
- Relocation of explosives facility from pad adjacent to Quarry 3 to Quarry A;
- Over-wintering fuel barges in Roberts Bay as required to support operations; and
- Removal of the requirement for TMAC to install and operate an on-site laboratory to test TIA water onsite in real time prior to release into Doris creek as previously required under Term and Condition 9 of the NIRB Project Certificate No. 003.

2.2.1. Need for the Project Amendment

As previously-approved, the Doris North Gold Mine Project (the Project) was to operate for two (2) years and produce 458,000 tonnes of ore to yield approximately 306,830 ounces of gold throughout its operation. TMAC's rationale for proposing amendments to the Doris North Gold Mine Project Certificate No. 003 was that the Project as previously approved would not be operationally feasible given the current economic and environmental context. Components and activities associated with the Application are meant to provide sufficient overall stability to the operation of the Doris North Gold

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Mine Project for it to function as a stand-alone project regardless of future developments within the Hope Bay Belt.

TMAC stated in the Application that the expanded mining program, optimized engineering of on-site systems and components, restructuring of the Tailings Impoundment Area, and restructuring of the tailings and groundwater system would lead to a safer and more environmentally sound project of greater benefit to Inuit and to the Kitikmeot region.

2.2.2. Project Components and Phases

The major project components and associated project activities of the Doris North Gold Mine Project as described in the 2015 Amendment Application (the Application), included:

Mining – TMAC proposed to develop two (2) additional deposits – Doris Central and Doris Connector zones for an increase in extraction to 2,500,000 tonnes of ore and approximately 1.4 million tonnes (Mt) of waste rock to be removed total including the development of the two (2) additional deposits, with all waste rock and cyanide-destroyed tailings anticipated to be placed back underground. TMAC noted that although a contingency plan allows to leave some waste rock at the surface as per the current Doris North Gold Mine Project Certificate No. 003, it does not anticipate using this option.

TMAC would utilize equipment already on-site and in use for the Doris North Gold Mine operations, and mining methods and ore handling would be the same as those approved previously for the Project and detailed in the 2005 Doris North Final Environmental Impact Statement. However, mining rates are proposed to increase from 720 to 2,000 tonnes per day and milling rates would increase from 800 to 2,000 tonnes per day as part of the amendment application.

Access – TMAC would be required to construct and operate access roads to the two (2) new vent raises and the new proposed jetty.

Water management – TMAC noted within the 2015 Amendment Application that water diversion and water management activities at the Doris North Gold Mine site would be modified due to the proposed change in operations and additional facilities. The Nunavut Water Board (NWB) Type "A" Water licence for the Doris North Gold Mine site (NWB File No. 2AM-DOH1323), amended in 2013, permits the annual withdrawal of up to 480,000 cubic metres of freshwater from Doris Lake.

2.2.1. Construction

TMAC would begin construction of additional laydown areas as well as at the Tailings Impoundment Area as soon as the proposed modifications to the Doris North Gold Mine Project Certificate No. 003 are approved and in effect.

2.2.2. Decommissioning and Reclamation

Within the 2015 Amendment Application, TMAC noted that the activities and components of the proposed amendments would be reclaimed pursuant to the proposed interim Closure and Reclamation Plan and waste rock extracted from the additional zones would be returned underground. TMAC has also included plans in the event of a temporary closure, which include measures similar to what was conducted at the Doris North Gold Mine site while it was in care and maintenance between 2012 and 2015.

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3. INVOLVEMENT OF INTERESTED PARTIES

3.1. ENGAGEMENT OPPORTUNITIES

3.1.1. Public Consultation

Public participation is a vital part of the NIRB's assessment process during the reconsideration of terms and conditions within project certificates. Meaningful public participation during the reconsideration process requires that the assessment address concerns of the general public regarding the anticipated or potential environmental effects of projects and project amendments. The NIRB's reconsideration process must involve potentially affected Nunavummiut to address concerns regarding any changes that a project, or amendment to a project, may cause in the environment and the resulting effects of any such changes on the traditional and current use of land and resources.

The reconsideration process for the proposed changes to the Doris North Gold Mine Project (the Project) began with TMAC Resources Inc.'s (TMAC or the Proponent) December 9, 2013 amendment application. Between December and February 2013 the NIRB distributed the amendment application publically, soliciting comments and information requests (IRs) from interested parties regarding the proposed changes to the Project. In response to the IRs received, TMAC indicated that it planned to submit further amendments to its application at a later date.

The NIRB held public information meetings in the Kitikmeot communities of Kugluktuk, Cambridge Bay, Gjoa Haven, Taloyoak, and Kugaaruk between April 28 and May 2, 2014 which, as a result of the NIRB's 25 day public notice requirement, coincided with the NIRB and NWB receiving notice from TMAC of possible additional works, and subsequently suspending the assessment on April 30, 2014.

On June 23, 2015 and July 22, 2015 the NIRB received the 2015 Amendment Application (the Application) from TMAC, which reinitiated the reconsideration process for amendments to the Doris North Gold Mine. On August 21, 2015 the NIRB distributed the Application to parties to allow for the development of IRs in preparation of the public technical review period.

The Public Hearing for this reconsideration process was held in Cambridge Bay, Nunavut, the nearest community to the Project, and the Board sat extended hours so that members of the public might have the most opportunity to attend and ask questions. In addition to Elders and other community members who were present and/or made statements, students from two (2) Grade 10 Social Student Classes from Kiilinik High School attended. The NIRB further supported public participation by enabling the seven (7) communities of the Kitikmeot region of Nunavut to each select and send a representative to attend the whole of the Public Hearing, ask questions and make submissions.

Attendance at any of the NIRB's public meetings associated with the review of the proposed project amendments described in the 2015 Amendment Application, including the Public Hearing, was tracked via the sign in sheets associated with these meetings. It is the NIRB's practice to ask all participants to sign in at the beginning of each session of proceedings (morning, afternoon, and evening); a full listing of sign in sheets from the Public Hearing is available online from the NIRB's public registry at www.nirb.ca by using either of the following search criteria:

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- Project Name: Doris North Gold Mine
- NIRB File No.: 05MN047

The consultation efforts and opportunities for Nunavummiut and residents of Canada to provide their comments to the NIRB during the reconsideration process are outlined in **Table 2**.

The Proponent must ensure that Nunavummiut have the information they require regarding the proposed amendments to the Project as described in the 2015 Amendment Application and their associated potential for adverse ecosystemic and socio-economic impacts. In this regard, TMAC's specific consultation efforts are summarized in subsection 4.3 in Package 2 of the 2015 Amendment Application.

3.2. THE PARTICIPANTS

3.2.1. Kitikmeot Inuit Association

The Kitikmeot Inuit Association (KIA) is a Designated Inuit Organization under the Nunavut Land Claims Agreement (NLCA), representing interests, rights, and values of Inuit in the Kitikmeot region. The KIA supports sustainable economic development opportunities for Inuit beneficiaries. As a Designated Inuit Organization, the KIA is mandated to deal with Inuit Owned Land management issues within the Kitikmeot Region. Through its Lands Department the KIA administers the use of Inuit-owned surface lands such as are associated with the Doris North Gold Mine Project and the proposed project amendments in order to meet legal obligations respecting surface land management. The KIA negotiated an Inuit Impact Benefit Agreements in accordance with Article 26 of the NLCA. The KIA participated actively in the NIRB review process and brought forth several technical issues during various stages of the NIRB's assessment and through collaborative meetings with TMAC and other agencies.

The KIA indicated in its final written submission that of the 14 technical issues raised during the NIRB's Technical Meeting, seven (7) were resolved throughout the meetings and seven (7) were resolved during subsequent meetings with TMAC. In its final written submission, the KIA indicated that it expected its final issue regarding the discharge of effluent into Roberts Bay and the Aquatic Effects Management Plan to be resolved through the Aquatic Monitoring Framework workshop. During the Public Hearing TMAC expressed strong support for the amended project and indicated that all important environmental and socioeconomic issues had been addressed.[19] The KIA participated actively throughout the NIRB's Reconsideration process.

3.2.2. Government of Nunavut

Within its final written submission to the NIRB, the Government of Nunavut (GN) noted that it has a unique regulatory role relating to mineral resource development in Nunavut, as well as a real and tangible interest in the outcome of the NIRB's review of the proposed amendments to the Doris North Gold Mine Project. The GN developed its submissions via an interdepartmental Environmental Assessment Review Team. The GN's chief priority was to focus on the proposed management and monitoring plans for the various proposed project amendments within the 2015 Amendment Application. Its overall intent is to ensure the protection of the environment and secure a net-benefit

[19] S. Anablak, Kitikmeot Inuit Association, NIRB Public Hearing File No. 05MN047 Transcript, April 14, 2016, pp. 544, lines 18-24.

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for Nunavummiut as a whole. The GN's Environmental Assessment Review Team consisted of two committees: the Environmental and Human Health Assessment Committee, led by the Department of Environment; and the Socio-Economic Assessment Committee (SEAC), led by the Department of Economic Development & Transportation. The committees consist of the following departments and public agencies:

- Environment;
- Nunavut Research Institute;
- Health;
- Economic Development and Transportation;
- Community and Government Services;
- Culture and Heritage;
- Education;
- Family Services;
- Finance;
- Nunavut Housing Corporation; and
- Justice.

Within its final written submission, the GN discussed socio-economic issues regarding socio-economic monitoring, economic feasibility and tax revenues, youth employment, apprenticeships, occupational supply modelling, financial literacy and access to private housing, demographic changes, health care services and mental health, and cultural resource protection. Issues discussed regarding the biophysical environment included marine shipping and the Dolphin and Union caribou herd, caribou herds interacting with the Project, human-wildlife conflict, and dust effects on wildlife and dust monitoring. At the conclusion of the Public Hearing, the GN stated that it had recommended some terms and conditions and will continue to work with the Proponent on the Project.[20] The GN participated actively throughout the NIRB's Reconsideration process.

3.2.3. Environment and Climate Change Canada

Environment and Climate Change Canada (ECCC) states that it is responsible for leading implementation of the Government of Canada's environmental agenda. ECCC's mandate covers the preservation and enhancement of the quality of the natural environment, including water, air, soil, flora and fauna, as well as Species at Risk and migratory birds. In addition to ECCC's mandate to conserve and enhance the quality of the natural environment, ECCC administers s. 36(3) of the *Fisheries Act* which prohibits the deposit of a deleterious substance into fish-bearing waters. ECCC also administers the permitting of disposal at sea and participates in the regulation of toxic chemicals and the development and implementation of environmental quality guidelines pursuant to the *Canadian Environmental Protection Act*, 1999 (CEPA 1999). ECCC is responsible for protecting and conserving migratory bird populations and individuals, under the *Migratory Birds Convention Act,* 1994 (MBCA), and administers the *Species at Risk Act* (SARA) in cooperation with Fisheries and Oceans Canada and Parks Canada.

[20] D. Baikie, Government of Nunavut, NIRB Public Hearing File No. 05MN047 Transcript, April 14, 2016, pp. 546, lines 3-15.

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Within its final written submissions, ECCC identified outstanding concerns regarding the planned modelling of effluent quality, monitoring in Roberts Bay, and the potential for project-related impacts on migratory birds. During its closing remarks at the Public Hearing, ECCC stated that it was satisfied that all of the issues had been resolved.[21] ECCC participated actively throughout the NIRB's Reconsideration process.

3.2.4. Fisheries and Oceans Canada

The federal government exercises authority over sea, coastal, and inland fisheries within Canada's territorial boundaries. Under the *Fisheries Act*, Fisheries and Oceans Canada (DFO) is responsible for the management, protection and conservation of fish (which include marine mammals as defined by the *Fisheries Act*) and their habitats. The Minister of Fisheries and Oceans is one of the competent ministers under the *Species at Risk Act* (SARA). DFO reviewed the Application and made comments based on its mandate under the *Fisheries Act,* specifically the management and protection of fish, marine mammals and their habitat. DFO's primary focus was the review of proposed developments in and around fisheries waters. DFO conducted a review to ensure that future works, undertakings, and activities detailed within the 2015 Amendment Application would be in compliance with the applicable provisions of the *Fisheries Act.* As such in its final written submission, DFO recommended that TMAC revise their Aquatic Monitoring Framework to include Doris Lake and outflows as well as conduct the planned baseline studies. DFO also requested plans for the marine outfall berm and discharge pipeline and all water crossings prior to construction as well as all plans for operations. During the Public Hearing DFO stated that TMAC had agreed with these recommendations and considered the issues resolved.[22] DFO participated actively throughout the NIRB's Reconsideration process.

3.2.5. Indigenous and Northern Affairs Canada

Indigenous and Northern Affairs Canada (INAC) is the federal government department responsible for meeting the Government's obligations and commitments to First Nations, Inuit, and Métis, and for fulfilling the federal government's constitutional responsibilities in the North. In Nunavut, INAC has responsibilities for land and water resource management. INAC's review of the proposed project amendments addressed the following: environmental impact assessment methodology; land contamination; surface water quality and quantity; groundwater; marine water quality; permafrost; waste management; tailings management; infrastructure and engineering related to mine works; accidents and malfunctions; and socio-economic impact assessment including socio-economic monitoring and mitigation.

In the NIRB reconsideration process, INAC provided technical advice relative to its mandate and made recommendations to the NIRB to assist with the review of TMAC's 2015 Amendment Application. If the proposed amendment is approved to proceed, INAC would be responsible for inspecting and enforcing those conditions contained within any Crown land authorization and water license associated with the Project. During the NIRB's Public Hearing, INAC stated that the seven (7) comments in its final impact

[21] M. Dahl, Environment and Climate Change Canada, NIRB Public Hearing File No. 05MN047 Transcript, April 14, 2016, pp. 546, lines 3-15.
[22] G. Williston, Fisheries and Oceans Canada, NIRB Public Hearing File No. 05MN047 Transcript, April 14, 2016, pp. 548, lines 7-10.

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statement were resolved based on wording in Exhibit 58.[23] INAC participated actively throughout the NIRB's Reconsideration process.

3.2.6. Natural Resources Canada

Natural Resources Canada (NRCan) is the Government of Canada's principal earth sciences agency, providing Canadians with reliable geoscience advice and knowledge. Specific to TMAC's proposed project amendments, NRCan engaged experts to provide advice on geochemistry, permafrost and hydrogeology. In its final written submission, NRCan provided recommendations on permafrost and hydrogeology aspects contained within the 2015 Amendment Application such as the design and stability of the proposed Tailings Impoundment Area; groundwater inflows into the underground mine; post-mining groundwater regime around the underground mine; and monitoring and mitigation in the vicinity of the Tailings Impoundment Area. Further, NRCan outlined that geochemistry expertise provided during the initial technical review of the 2015 Amendment Application would not be available and that INAC would assist to provide expertise in that area for the final written submissions and at the Public Hearing. In its closing remarks at the Public Hearing, NRCan stated that recommendations had been included in Exhibit 58.[24] NRCan participated actively throughout the NIRB's Reconsideration process.

3.2.7. Transport Canada

Transport Canada (TC) is responsible for development and administration of transportation policies and programs for Canada. TC also has a responsibility to regulate associated transportation infrastructure, equipment, and personnel in accordance with key relevant pieces of legislation, including the *Navigation Protection Act, Aeronautics Act, Canada Shipping Act, 2001, Arctic Waters Pollution Prevention Act, Marine Liability Act*, *Marine Transportation Security Act,* and the *Transportation of Dangerous Goods Act*. TC's submission focused on a technical review of applicability of the *Navigation Protection Act* and associated requirements with regards to the proposed Tailings Impoundment Area and Roberts Bay Discharge System; requirements associated with the handling of explosives; and requirements for over-wintering of barges. In its closing remarks at the Public Hearing, TC stated that it had no further concerns related to this phase of the Doris North project.[25] TC participated actively throughout the NIRB's Reconsideration process.

3.2.8. Local Community Representatives

The NIRB invited one (1) community representatives from each of the seven (7) communities identified as being potentially affected by the proposed Project to attend the Public Hearing in Cambridge Bay to be appointed by either a Hamlet or a Community Liaison Officer and, if a community representative was not identified through those agencies, other community organizations were contacted in order to solicit a representative. A total of four (4) community representatives were in attendance, one (1) each from Omingmaktok, Cambridge Bay, Gjoa Haven, and Kugaaruk, and these representatives attended the

[23] K. Costello, Indigenous and Northern Affairs Canada, NIRB Public Hearing File No. 05MN047 Transcript, April 14, 2016, pp. 549 and 550, lines 22-26 and 1-4.
[24] R. Besner, Natural Resources Canada, NIRB Public Hearing File No. 05MN047 Transcript, April 14, 2016, pp. 551, lines 9-21.
[25] A. Gudmundson, Transport Canada, NIRB Public Hearing File No. 05MN047 Transcript, April 14, 2016, pp. 554, lines 12-18.

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technical sessions of the Public Hearing and participated directly in the community roundtable portion of the Public Hearing.

The format of the Public Hearing allowed the community representatives to observe the technical presentations of TMAC and the Intervenors over the first day of the proceedings, and on the second day of proceedings these representatives participated directly through the community roundtable portion of the Hearing. During the community roundtable, representatives replaced the registered Intervenors at the table to hear summary presentations by TMAC regarding each component of the proposed amendment, followed by summary presentations from Intervenors regarding their respective mandates, jurisdictions and the conclusions of their review of the Proponent's proposed project amendments. Community representatives were then invited to pose questions to TMAC and/or Intervenors and to provide their comments and concerns directly to the Board for consideration.

Sections 4, 5, and 6 of this report include specific reference to relevant comments, issues, and concerns expressed by community representatives at the Public Hearing; Table 3 below provides a very brief summary of the key issues, concerns and perspectives offered by the community representatives and members of the public during the community roundtable sessions.

Table 3: Key Issues as Raised by Community Representatives

Subject	Issues/Concerns/Comments
ECOSYSTEMIC EFFECTS	
Caribou	Over the life of the Project starting when the original Project was under construction has TMAC (and the previous Project Proponent) noticed changes to the caribou population (increases or decreases) in that area since the Doris North Project started?
	Caribou are very cautious and do not like to be near humans and will change their migration routes in response to airplanes and helicopters and other human disturbance, so TMAC needs to minimize these types of disturbances.
	Migration patterns have changed a great deal and TMAC should check with Inuit hunters to understand these changes.
	Years ago people would go out to Roberts Bay area to hunt (long before any advanced exploration activities were underway) and there were even stories of caribou calving in that area but today there are not as many caribou observed in that area anymore-inland caribou are migrating to Victoria Island—but people don't see Dolphin or Peary caribou in that area anymore.
	Is it getting very difficult to study these herds due to very little snow and changes to the migration patterns that have resulted in caribou no longer leaving the mainland in some places.
	It is unclear where the Dolphin Union herd is migrating and more studies are required to understand the situation; and the need for these studies will be on-going over the life of the mine.

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Subject	Issues/Concerns/Comments
Caribou (continued)	If the caribou start migrating and grazing close to the mine site what will TMAC do to deter them from coming close to the mine site?
	What is the Government of Nunavut doing to address the declining caribou populations in this area (not just in relation to this Project)?
Doris Lake	When the lake levels start to drop in the lake [Doris Lake] what will TMAC do to protect the fish that are remaining?
Fish	Sometimes when out on the land hunters have noticed large numbers of fish (tens of thousands) dead on the shore but hunters have never found out what could cause such a significant number of fish to die in the vicinity of the Doris North area; does TMAC or do any of the Intervenors have an explanation for this?
	Is there a river and/or streams that Doris Lake feeds into and if there is, would there be fish in those streams that could be affected by the discharge into Doris Lake (especially char going up those water courses into Doris Lake)?
	How deep is the water in Doris Lake and the streams that feed into Doris Lake; do these streams freeze to the bottom?
	What is meant by “water crossings” (from a fish habitat/DFO [Fisheries and Oceans Canada] perspective)?
Freshwater Quality	How will the water quality, water levels and fish health be monitored across the mine site (how frequently, where are the monitoring sites and who is responsible for monitoring and reporting)?
Marine Environment, Water, Ice, and Sediment	Marine shipping must only be undertaken before ice has formed, as there are concerns that any ships breaking through newly formed ice may result in sea ice not forming properly and caribou that are migrating across the sea ice drowning.
Marine Wildlife and Marine Habitat	Have concerns regarding the long-term health of the mammals and fish in Roberts Bay when exposed to the effluent coming into the Bay through the pipeline been addressed?
	Can TMAC prove that the effluent pipeline into Roberts Bay will remain safe for the fish over the long term (even after the mine is closed)?
	Need to remember that marine mammals are our food sources and if their food sources (mussels, clams, shrimp) become contaminated, our food sources become contaminated too.
Monitoring (Environmental)	How was the Inuit Environmental Advisory Committee formed by the KIA and TMAC?
	How were the members selected to be on the Inuit Environmental Advisory Committee?

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Subject	Issues/Concerns/Comments
Tailings	When the camp is closed and no one is there how does TMAC propose to keep wildlife from being exposed to the tailings?
	When you put a cover over the tailings pond what will the cover be made of?
Terrestrial Wildlife and Habitat	Will there be people to act as wildlife monitors at the site?
Waste Management	Is all waste generated at the site going to be disposed of underground?
Waste Rock	Where will you be putting the waste rock from your operations?
Winter Road	The winter road that is being used by TMAC sometimes, who regulates or authorizes the construction and operation of the winter road?
	Specifically, who is responsible to fix the situation when the winter road embankments become too high and caribou cannot cross?
SOCIO-ECONOMIC EFFECTS	
Communication	When people are out on the land, whenever helicopters are spotted we are curious as to why they are there, what they are doing and where they are exploring. It would be beneficial if there was advance notification in communities and consultation regarding what is happening near our communities.
Culture, Resources and Land Use	When people choose to provide traditional knowledge, is there any mechanism for ensuring they are compensated for sharing their wisdom?
Education and Training	Have heard that the mine will be interested in hiring people but only those with higher education/certification and training; will TMAC be hiring/training people who may have a little less formal training from the communities so that they can work at the mine?
Life of the Mine	How long do you intend to operate the mine under this revised project?
Work Force Demographics	Will TMAC only be hiring young people at the mine or will TMAC be willing to hire older workers too?

4. ECOSYSTEMIC EFFECTS

TMAC Resources Inc. (TMAC or Proponent) described its overall approach for analyzing potential project-induced ecosystemic effects as a result of the proposed amendments to the Doris North Gold Mine Project (the Project) in Package 4, Section 1.3 of the 2015 Amendment Application (the Application). The environmental effects assessed within the Application were presented in tables for ease of reference, indicating whether effects were predicted to be positive, negative and mitigable, negative and non-mitigable, unknown, or if no impact was expected to occur.

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TMAC indicated that its assessment methodology was guided by the same approach used for the Doris North Project Final Environmental Impact Statement (2005 FEIS). It was further noted that the valued ecosystemic components (VECs) included in the 2005 FEIS, selected based on both western scientific data and Inuit Qaujimajatuqangit, were also used to guide the identification of potential environmental impacts resulting from proposed project amendments included within the Application. TMAC noted in the Application that interactions that were predicted to have no effect or mitigable effects were not included in the cumulative effects assessment.

VECs selected as parts of TMAC's assessment included:

- Atmospheric and Terrestrial Environment;
- Freshwater Environment and Fish and Fish Habitat;
- Terrestrial Wildlife and Wildlife Habitat
- Marine Environment; and
- Marine Wildlife.

4.1. ATMOSPHERIC AND TERRESTRIAL ENVIRONMENT

4.1.1. Views of the Proponent

TMAC Resources Inc. (TMAC or Proponent) provided its assessment of potential project-induced impacts on the atmospheric and terrestrial environment as a result of the proposed amendments to the Doris North Gold Mine Project (the Amendment) in Package 4, Section 3.0 of the 2015 Amendment Application (the Application). TMAC identified noise (disturbance), air quality, and terrestrial ecosystems as focus areas within its effects assessment and that supporting baseline information related to the atmospheric and terrestrial environment was provided in Sections 3.2.2 and 3.3.1 of the Application and TMAC also proposed Waste Rock and Ore Management Plan in Package 5, section 5-4. The Proponent concluded in the Application and during the Public Hearing that, contingent on the application of mitigation measures, no residual effects would occur on the atmospheric and terrestrial environment.

Air Quality

Air quality monitoring has been conducted at the Doris North Gold Mine site since 2006 and that the most recent air quality compliance monitoring program was conducted in 2013 using passive air sampling systems to measure sulphur dioxide (SO_2), nitrogen dioxide (NO_2), and ozone (O_3) concentrations as well as Partisol samplers to measure airborne suspended particulate matter. Based on results from the 2013/2014 monitoring program, TMAC indicated that airborne suspended particulate matter parameters (total suspended particulates, PM_{10} and $PM_{2.5}$) were measured below objectives and that results were typical of background concentrations for remote undisturbed areas in Canada. TMAC noted that SO_2 and NO_2 measurements were less than relevant annual guidelines, while O_3 was measured as greater than annual objectives but within the lower range of concentrations estimated by Health Canada for areas with negligible exposure to anthropogenic pollution. The results of on-site dustfall monitoring conducted in 2012 revealed that dustfall levels at all monitoring stations were below the Alberta commercial and industrial guidelines.

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During its assessment, TMAC concluded that activities associated with the Project have the potential to impact air quality through the generation of criteria air contaminants (CAC) and through dust and acid deposition. Using professional judgement and experience at similar projects in Nunavut, TMAC identified the following potential project interactions with atmospherics:

- Reduced air quality from emissions due to vehicle use, ore processing, incineration, and fuel combustion; and
- Fugitive dust from materials handling, vehicle movements, blasting, and the subaerial deposition of tailings.

CAC and fugitive dust emissions associated with the Project were assessed in the 2005 FEIS and were identified as stack emissions, vehicle exhaust emissions, and aircraft emissions. The Proponent also identified vehicle travel on unpaved roads, material handling, and blasting emissions as the main sources of fugitive dust for the Project. Based on the determination that subaqueous tailings management would mitigate any potential for fugitive dust emissions, emissions associated with tailings deposition were not assessed in the 2005 FEIS.

In the Application, TMAC proposed to change its tailings management from subaqueous (underwater) to subaerial (under air) deposition with a dry cover at closure, noting that subaerial tailings have the potential to generate more fugitive dust emissions than were previously assessed with subaqueous tailings management. TMAC indicated that fugitive dust emissions would be managed within Tail Lake, the previously approved Tailings Impoundment Area (TIA) using specific design measures. The tailings would be deposited starting at the South Dam and allowed to drain through a permeable interim dike to the reclaim pond. Depending on seasonal restrictions and the year of operation, TMAC noted that fugitive dust emissions from the TIA would be managed by covering beached tailings with a dust suppressing layer of polymer and/or ice or a rock cover. During the Public Hearing, TMAC stated that it conducted additional dustfall modelling around the TIA in response to concerns raised by the Government of Nunavut in response to technical comments regarding potential impacts from dust on caribou. TMAC presented the model's findings and included a diagram within its presentation on the atmospheric environment, submitted as Exhibit 7, which illustrated potential dustfall areas surrounding the TIA that would be above relevant guidelines (Alberta Environment Ambient Air Quality Objective for Dustfall). Based on the scale provided within the diagram, without the application of mitigation measures, dustfall guidelines would be exceeded within an area extending approximately 300 metres (m) east of the TIA and less than 100 m in all other directions. TMAC noted that the model was based on potential activity during Year 4, predicted to be the year with the maximum extent of open tailings during operations. TMAC further noted that post-operations, tailings would be capped and the potential for dust generation from the TIA would no longer exist.[26,27]

Within the Application TMAC committed to continuing to implement energy efficiency and fuel efficiency measures for the Project wherever possible, and that dust suppression would continue through the application of dust suppressants and the implementation of operational restrictions for on-site vehicles. TMAC committed to continuing to monitoring dustfall, particulate concentration, and SO_2, NO_2, and O_3 monitoring, as well as meteorological data collection at the Doris North mine site, noting that, depending on environmental conditions, it would conduct snow core sampling to expand its

[26] D. Chubb, TMAC, NIRB Public Hearing File No. 05MN047 Transcript, April 12, 2016, pp. 69 lines 24-26 and 70, lines 1-4.
[27] TMAC, Exhibit 7, NIRB Final Hearing File No. 05MN047, April 12, 2016.

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monitoring network. During the Public Hearing, TMAC expressed a willingness to add additional dustfall monitoring stations adjacent to the TIA in response to concerns expressed by the Government of Nunavut regarding potential dust impacts on caribou.[28] Additional information pertaining to TMAC's Air Quality Management Plan and proposed Tailings Management Plan was provided in Packages 5-1 and 6-13 of the Application, respectively.

TMAC determined that, contingent on the application of its planned mitigation measures and adaptive management protocols, no residual and/or cumulative effects would occur on air quality and atmospherics.

Terrestrial Ecosystems

The Hope Bay Project area has had terrestrial ecosystem distribution mapping conducted in 1996, 1997, 2010, and 2014, with approximately 56,138 hectares (ha) mapped into 14 vegetated and 12 non-vegetated mapping units during these baseline studies. Within the respective mapping units, six (6) special landscape feature groups were identified for their limited representation on the landscape, their higher likelihood to support rare or unique plant species or communities, or their inherent value as wildlife habitat. Special landscape feature groups identified included: riparian ecosystems, sedge and shrub-dominated wetlands, marsh ecosystems, polygonal ground, marine ecosystems, and bedrock-lichen veneers. There is no formal ranking system for the identification of plant Species at Risk exists in Nunavut; however, the Proponent noted that it developed a potential rare plant and lichen species list from collection records, relevant literature, and expert judgement.

In its assessment of the effects of proposed project modifications TMAC identified that the Project had the potential to impact terrestrial ecosystems though the following three (3) interactions:

- Direct loss or alteration of ecosystems, vegetation, and habitat;
- Fragmentation of ecosystems and habitat; and
- Dust deposition resulting in impacts to vegetation and ecosystem alteration.

It was noted that that the potential effects from the direct loss of ecosystems and vegetation resulting from infrastructure development would be negative and non-mitigable. Additionally the spatial extent of this effect would be minimized by locating proposed additional infrastructure away from critical habitat areas when possible and further noted that habitat fragmentation would be mitigated by locating the proposed expanded laydown areas and ore storage pads immediately adjacent to existing infrastructure footprints.

The Application detailed how dust deposition from the Tailings Impoundment Area (TIA) could cause indirect impacts on terrestrial ecosystems and vegetation by having the potential to cause physical damage to vegetation, which could include damage to photosynthesis receptors, respiration, and transpiration. Dust deposition was also identified as having the potential to promote vegetation growth, depending on the amount and frequency of dusting, the chemical properties of dust, and the species of the receptor plants.

For its assessment of potential effects resulting from dust deposition, a 465 hectare (ha) study area that extended two (2) kilometres (km) north of the TIA interim dike one (1) km south of the southern margin of the proposed TIA, and 600 metres (m) on both the west and east sides of the TIA. Within the study

[28] D. Chubb, TMAC, NIRB Public Hearing File No. 05MN047 Transcript, April 12, 2016, p. 68, lines 5-13.

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area, 93.6 ha of special landscape features could be impacted by fugitive dust emissions. Special landscape features identified within the potentially impacted area included wet meadow, riparian willow, bedrock lichen, and polygonal ground ecosystems. Although five (5) rare plant species were noted to occur within the potential dustfall area, it was predicted that mitigation measures would reduce potential impacts on these species. TMAC concluded that, contingent on the application of mitigation measures to reduce dustfall and adaptive management protocols, no significant residual effects for terrestrial environment would be expected.

Within its response to technical comments, TMAC outlined the proposed mitigation and monitoring measures it had included within the Air Quality Management Plan and proposed Tailings Management Plan and noted that it expected to provide additional revisions prior to operations. As committed, supplemental modelling was undertaken to quantify potential dustfall and distribution resulting from the subaerial tailings deposition and indicated that the results validated the conclusion of the effects assessment. On February 29, 2016 the NIRB received a memo from TMAC provided in response to its commitments from the Technical Meeting, outlining TMAC's predictions in dustfall. On March 8, 2016 the NIRB received a follow-up memo which proposed additional dustfall monitoring locations that incorporated specified thresholds within the watershed area of the TIA. It was further confirmed by TMAC in its response to final written submissions that the outlined changes and updated sampling sites incorporated discussions between TMAC, the KIA, and the GN during meetings held on February 19, 2016 and would be further included within the Air Quality Monitoring Plan.

4.1.2. Views and Concerns of Interested Parties

Within its technical review submission, the Kitikmeot Inuit Association (KIA) commented on the potential for impacts to soils and vegetation resulting from dustfall as well as potential leaching of copper, lead, and arsenic associated with the proposed subaerial tailings deposition. The KIA discussed the potential for associated impacts to wildlife and wildlife habitat, particularly through the consumption of impacted vegetation, noting that it would be unable to assess TMAC's effects assessment without reviewing details of the associated monitoring and mitigation plans. The KIA recommended that TMAC monitor impacts to wildlife habitat and wildlife toxicity risk through the proposed tailings dustfall monitoring program. The KIA requested that the Proponent provide additional information on wildlife attraction and tailings leaching as well as associated management plans.

Within its final written submission, the KIA noted that subsequent review of potential TIA water quality resulting from the sensitivity analysis indicated 'very low' concentrations of toxic substances within the TIA and that the concentrations would be under guidelines set by the Canadian Council of the Ministers of Environment for bovine and aquatic life. Referencing discussions on possible adaptive management and monitoring of TIA tailings attraction, dustfall, and leaching that took place during meetings with the TMAC and the GN on February 19, 2016 the KIA indicated that it had no outstanding concerns. Within its response to final written submissions, TMAC noted that as the KIA considered this issue resolved, no further response was required.

During the community roundtable, a community member requested clarification on how TMAC would manage waste rock that would not be economically feasible for processing. In response, TMAC stated the three (3) main management components are considered when managing waste rock material. Firstly, that waste rock should be placed as close to the mine entrance as possible so that trucks do not have to travel long distances to place the material. Second, material should be placed in a stable fashion to avoid rock-fall situations; and lastly, water that comes in contact with waste rock should be managed

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so that it does not contaminate the environment. TMAC elaborated that all three (3) components were considered in the development of its Waste Rock and Ore Management Plan.[29]

4.1.3. Views of the Board

The Board places a great deal of importance on dust management, in particular dust management required to address increased traffic in and around the mine site in addition to the change from subaqueous deposition to subaerial deposition in tailings management, where dust management was not previously required with the subaqueous deposit of tailings. During the Public Hearing, the Board questioned TMAC on whether its proposed monitoring stations only on the east side of the roadways adjacent to the TIA would provide an accurate representation of conditions, particularly when taking changing wind patterns into account. In response, the Proponent noted that dustfall monitoring throughout the project area was designed to include road-generated dust through monitoring stations and observation, and that dust control measures would be employed to address dust conditions on a daily basis.[30] The Board further questioned TMAC on the potential for the proposed monitoring stations to be too close to the road system, and whether TMAC had considered using all-terrain vehicles to monitor impacts from dust at more distant monitoring sites. TMAC responded that the Kitikmeot Inuit Association (KIA) requested that all-terrain vehicles not be used on the tundra during the spring and summer seasons, and therefore distant monitoring sites would be accessed by snow machines during winter and by foot or helicopter during summer months.[31]

The Board notes that dust management is required to minimize potential impacts on adjacent freshwater habitats and species, on vegetation, on terrestrial wildlife through uptake of vegetation, and on human health and safety at the mine site due to diminished breathing air quality and impairment of visibility. In the Application, TMAC referenced a review completed by A. Farmer (1991) and concluded that dust deposition could have the potential to promote vegetation growth depending on the frequency of dusting, the chemical properties of dust, and the species of plant.[32] The Board reviewed the review and noted that the author stated that road dust has the most damaging effect on any natural community for northern projects as they can have the largest impact on species variation in this sensitive environment.

As such, the Board stresses the importance of the Proponent implementing the dust emission control and monitoring measures referenced in the 2005 Doris North Final Environmental Impact Statement and during the Public Hearing for the proposed project modifications, to minimize impacts to vegetation, especially rare species, from the new and modified project activities. It is the view of the Board that existing Project Certificate term and condition 30 continues to apply to the Project.

Regarding terrestrial ecosystems, the Board has some concern regarding the prediction of dustfall and the dust suppression for the management of subaerial tailings, the increase in production of tailings, and increase in all associated mine traffic. Recognizing that the Board is currently assessing other proposed

[29] J. Roberts, TMAC, NIRB Public Hearing File No. 05MN047 Transcript, April 13, 2016, p.413-415, lines 16-26, lines 1-26, and lines 1-6.
[30] D. Chubb, TMAC, NIRB Public Hearing File No. 05MN047 Transcript, April 12, 2016, p. 73-74, lines 16-23, lines 1-9.
[31] J. Roberts, TMAC, NIRB Public Hearing File No, 05MN047 Transcript, April 12, 2016, p. 101, lines 11-24.
[32] Farmer, Andrew M. 1993. The Effects of Dust on Vegetation-A Review. Environmental Pollution, Volume 79. Pp. 63-75.

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projects owned by TMAC, such as the ongoing review of NIRB File No. 12MN001 and proposed exception for bulk sampling program at Madrid North and South, which have some association with the approved Doris North Project and proposed amendments, it will be important to verify impact predictions related to dustfall deposition and vegetation health for the proposed amendments to Doris North to assess the potential for cumulative impacts. Therefore, the Board encourages TMAC to closely monitor the impacts of the amended project, include adaptive management practices in its Air Quality Management Plan, and include analysis in the annual report as per Appendix D of the Project Certificate in order to afford all parties opportunity to review the data.

4.1.4. Conclusions and Recommendations of the Board

In considering the topic of air quality, the NIRB notes that the terms and conditions previously developed for the original Doris North Gold Mine Project through Project Certificate No. 003 have been designed to address potential project specific impacts to air quality. In the Board's view, the potential impacts of the amended project activities will be adequately addressed through application of the Proponent's commitments and existing term and condition 30 of Project Certificate No. 003.

Further, the Board is supportive of the approach to allowing for future administrative updating of the Appendices to Project Certificate No. 003 as proposed by TMAC and parties through Exhibit 58, to ensure that Proponent commitments are accurately captured in a non-duplicative and straightforward manner enabling more effective monitoring for the Project.

While the Proponent has recommended reducing the frequency of reporting for air quality monitoring through a revision of term and condition 30 in Exhibit 58, given the Board's uncertainty for the effectiveness of dust management approaches employed on site and the continued concerns for adverse effects of dust to the receiving environment, the Board is unable to support this suggested approach. The recommended update to the supporting commentary for this term and condition to recognize an atmospheric monitoring station has been installed is considered to be appropriate has been adopted by the Board. The Board has provided additional commentary to term and condition 30 requiring more frequent reporting during construction and operations to ensure measured values are within the predicted range.

The Board is also of the opinion that the Proponent will need to update its Air Quality Management Plan to address the activity in the Hope Bay Belt including the proposed Project amendments and planned future developments. Incorporation of the following items should be addressed in the updated management plan:

a) Clearly identify the air quality management area that would be monitored for the amended Doris North Project;

b) Identify the specific adaptive management measures to be implemented should monitoring indicate that dust deposition is greater than predicted; and,

c) Report annually observations and/or plan updates through the comprehensive post-environmental assessment monitoring program.

The Board encourages progressive revegetation during operations as well as promotion of natural regeneration of vegetation throughout the mine life. As such, the Board notes that the Closure and

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Reclamation Plan for the Doris North Project should be updated to include an active revegetation research and plan as well as a protocol for monitoring and evaluating revegetation success through operations and into post-closure to ensure long-term goals of reclamation are met and the safety of the public and wildlife assured.

4.2. FRESHWATER ENVIRONMENT AND FISH AND FISH HABITAT

4.2.1. Views of the Proponent

TMAC Resources Inc. (TMAC or the Proponent) provided its assessment of potential project-induced effects on the freshwater environment as a result of the proposed amendments to the Doris North Gold Mine Project (the Project) in Package 4, Section 3.0 of the 2015 Amendment Application (the Application). Additionally, TMAC included a proposed Water Management Plan in Package 5-3. TMAC identified hydrology, freshwater aquatic organisms, fish, and fish habitat as focus areas within its effects assessment. Supporting baseline information related to the freshwater environment was provided in sections 2.3 and 2.4 of the Application. Details regarding TMAC's approach to its freshwater fish offsetting plan were provided in Appendix B in Part 4 of the Application.

The Application indicated that proposed amendments to the Project had the potential to impact the freshwater environment through the following interactions:

- Potential alteration of the Doris Lake outflow;
- Changes in surface water quality from runoff water from the proposed expanded laydown area and ore storage pad;
- Reduction in, or alteration of, habitat through water losses; and
- Removal or alteration of aquatic habitat for infrastructure.

As part of its assessment of potential project-induced effects on hydrology, freshwater aquatic organisms, fish, and fish habitat, TMAC developed project design measures and adaptive management plans to mitigate impacts on the freshwater environment. Measures proposed to mitigate impacts included: optimized design measures to minimize infrastructure footprints and to locate infrastructure away from waterbodies and fish habitat; water management measures to utilize groundwater for drilling and to avoid alteration of natural runoff patterns; measures to reduce sediment displacement from site; adaptive management protocols; and the development, operation, and maintenance of infrastructure following Fisheries and Oceans Canada's (DFO) Measures to Avoid Causing Harm to Fish and Fish Habitat, and other DFO guidance documents. In addition, the Proponent committed that a Fish Offsetting Plan would be developed in accordance with the *Fisheries Act* to address impacts that could not be avoided by employing the mitigation measures noted above.

Additional details regarding the management of groundwater inflows during proposed mining operations were also provided during the NIRB Technical Meeting and in materials provided to parties as part of the commitments TMAC made during the meeting.

<u>Freshwater Environment</u>

The proposed project amendments would occur within two (2) main watersheds: the Windy-Glenn watershed, which covers an area of 42 square kilometres (km^2) west of the existing project development areas, and the Doris-Roberts watershed, which covers an area of 194 km^2 east of the development

areas. Both of these watersheds drain into Roberts Bay and automated hydrometric monitoring has been conducted in the project area since 1996; however, the size of the monitoring network has varied over time to accommodate changes in project scope. Data collected between 2004 and 2014 from the Windy-Glenn and Doris-Roberts watersheds included information on streamflow and lake water levels. Streams in both watersheds were described as having generally low gradients and low bank slopes. Lakes in the area, such as Patch Lake and the Windy Lake, were noted to drain through channelized and permanent outlet streams, while other lake systems drain through undefined, dispersed, and ephemeral drainages (e.g., Wolverine Lake).

The proposed modifications to the Project have the potential for higher levels of groundwater inflow to underground mining areas based on projections for six (6) years of mining operations (previously two (2) years) as the 2005 FEIS predicted no inflow of groundwater based on the conclusion that the Doris Hinge zone was within continuous permafrost and would not approach talik areas. The Application predicted that mining in the Doris Central and Doris Connector zones would interact with talik areas and/or unfrozen ground below Doris Lake, resulting in approximately 3,000 cubic metres per day (m^3/day) of inflow water from Doris Lake. During the Public Hearing TMAC further predicted the total mine inflow contributions to be 70% from Doris Lake and 30% from deep groundwater.[33]

For its assessment of potential project-induced effects on hydrology, TMAC conducted hydrologic modelling to assess potential water quantity impacts on Doris Lake and Little Roberts Lake as a result of the currently permitted withdrawal volumes for use by the Project as milling water and the effects of the above noted predicted water loss from under Doris Lake. For the model, the Proponent considered the maximum permitted water withdrawal volume of 480,000 cubic metres per year (m^3/year) through the Nunavut Water Board's Type "A" Water Licence 2AM-DOH1323, and the estimated additional loss of 610,000 m^3/year of water from Doris Lake into underground development areas through leakage and loss. TMAC included observed baseline outflows, simulated operational outflows, and simulated baseline and operational water surface elevations as hydraulic indices to estimate baseline and operational conditions. TMAC estimated that, on average, water losses through withdrawal and leakage would decrease Doris Lake annual outflow by 13.7%. It was estimated that the Doris Lake water level would be drawn down during the winter by 23 centimetres (cm) compared to baseline conditions, which would be the equivalent of 0.76 million m^3 of water and would represent four (4) percent of the lake volume under two (2) metres (m) of ice. Therefore, TMAC concluded that, as a result of winter water withdrawal, Doris Lake seasonal outflow could be delayed by 10 days compared to baseline conditions. TMAC indicated that potential effects of water loss downstream from Doris Lake would be diminished and noted that no water withdrawal would take place from Little Roberts Lake; however, annual outflows were predicted to decrease by 6.2% from Little Roberts Lake on average. The Proponent further predicted that minimum lake elevation and seasonal onset of lake outflow for Little Roberts Lake would remain unchanged and unaffected by water loss from Doris Lake.

Overall, TMAC concluded that potential changes to Doris Lake and stream outflow systems resulting from the permitted withdrawal of 480,000 m^3 for project use would remain within natural variability and that no additional adverse effects would be predicted than were included in the 2005 Doris North Final Environmental Impact Statement (2005 FEIS). However, TMAC concluded that additional water losses up to an estimated 610,000 m^3/year at its peak from Doris Lake due to underground mining in the talik zones that are interconnected with Doris Lake could result in cumulative effects and serious harm to fish and fish habitat.

[33] M. Rykaart, TMAC, NIRB Public Hearing File No. 05MN047 Transcript, April 12, 2016, p. 118, lines 19-24.

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In response to technical comments, TMAC provided additional information to further characterize the diversity of important hydrological features in its water modelling and to further inform predictions regarding the potential amount of groundwater inflows to the mine site. During the NIRB Technical Meeting, TMAC committed to providing a Groundwater Management Plan Framework to address groundwater-related concerns that would be used for the development a detailed groundwater management plan. TMAC indicated that that this plan would include measures such as advanced drilling, grouting, backfill placement, and bulkhead construction to minimize groundwater inflows. It was noted during final written submissions that the framework for the Groundwater Management Plan had not yet been submitted to parties, and should be provided prior to the NIRB's Public Hearing for review. On March 16, 2016 TMAC submitted the Groundwater Management Plan Framework to the NIRB. In its response to final written submission, TMAC proposed that the Groundwater Management Plan be required for submission under a term and condition during licencing, pending the approval of the amended Project activities.

Fish and Fish Habitat

TMAC presented fish and fish habitat baseline data collected between 1995 and 2014 from three (3) lakes (Roberts Lake, Doris Lake, and Little Roberts Lake) and four (4) streams (Doris Upstream Outflow, Doris Downstream Outflow, Roberts Outflow, and Little Roberts Outflow) in the Doris-Roberts watershed. TMAC indicated that six (6) different fish species, least cisco, ninespine stickleback, lake cisco, lake trout, lake whitefish, and arctic char, have been observed in the project area. Lake cisco was noted to be the most abundant large-bodied fish species in Doris Lake, while arctic char was the species most commonly captured through gillnet sampling in Little Roberts Lake. The Doris Lake outflow stream is divided by a waterfall that splits the stream into two (2) sections and this waterfall acts as a permanent barrier to upstream migration. Lake trout, whitefish, lake cisco, and ninespine stickleback have been observed above the waterfall, while arctic char, lake trout, and ninespine stickleback use habitats downstream from the falls for rearing and feeding. Certain stream habitats, such as the Little Roberts Lake Outflow, were noted to serve as migratory corridors to Roberts Bay for salmonids like arctic char and lake trout during seasonal migration.

Within its assessment, TMAC highlighted proposed project activities and components that would have the potential to impact fish and fish habitat directly through proposed infrastructure development, and indirectly through the impediment of fish passage from improper design and impacts from sediment mobilization during construction activities. TMAC stated that the majority of effects on fish and fish habitat from road development and use would result from the construction and maintenance of stream crossings. Two (2) proposed stream crossings within the project area were specifically highlighted as potentially affecting fish habitats: one (1) stream crossing that flows into Roberts Bay West and a second stream crossing associated with a proposed vent raise access road near Doris Lake.

The proposed and predicted use, storage, and loss of water from Doris Lake from project use was highlighted as having the potential to impact fish and fish habitat through the reduction or deterioration of available fish habitat and changes to primary and secondary productivity. TMAC noted that the primary effects to fish habitat in Doris Outflow and Doris Creek would result from a reduction in flow throughout the open water season due to the predicted decreased available volume in Doris Lake. TMAC indicated that its assessment of potential effects from flow reductions was based on the DFO's "Pathways of Effects" guidance document and involved the analysis of potential effects from the following two (2) pathways:

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- reductions in the total number of flow days; and
- reductions in stream wetted widths considered fish habitat area.

As noted with regards to hydrology, TMAC predicted that potential water losses from Doris Lake would reduce lake water levels by 23 centimeters (cm) during winter months. This water loss was noted to have the potential to affect lake trout spawning habitat; however, it was predicted that this effect would not exceed the level of impacts experienced in the lake system from natural seasonal variation. TMAC predicted that the predicted loss of four (4) percent of lake water under two (2) m of ice would be under the DFO's guidance threshold for under-ice water withdrawal.

It was predicted that on average, the total annual flow days in the Doris Lake Outflow and Doris Lake Creek would decrease by 15 days, and during years of abnormal water loss noted that flow days could decrease by up to 24 days. TMAC indicated that these scenarios would represent an 11% and 18% reduction in available rearing habitat for arctic char, lake trout, and ninespine stickleback over six (6) years of mining operations. It was further discussed in the Application that annual discharge would be reduced by 13.7% on average, which could be up to 27.9% during years of abnormal water loss. TMAC acknowledged that further modelling would be required to quantify impacts from reduced wetted stream widths on fish and fish habitat.

TMAC predicted that total annual flow days would be reduced in the Little Roberts Outflow by three (3) days on average, with the potential for a decrease of seven (7) flow days per year during years of abnormal water loss. These values would represent a potential reduction of less than one (1) percent and seven (7) percent of fish passage habitat available to arctic char and lake trout. Further, it was predicted that annual lake discharge would be reduced by 6.2% on average, and would potentially be reduced by up to 10.8% during abnormal conditions.

TMAC determined, contingent on the application of mitigation measures that no residual effects would occur on fish and fish habitat due to the construction of steam crossings described in the Application. Additionally, the Proponent concluded that the potential loss of water from Doris Lake would not result in adverse effects on fish and fish habitat as maximum predicted drawdown depths would be consistent with natural variability. TMAC also predicted that the potential effects of discharge reduction on fish populations using Little Roberts Lake Outflow would not be distinguished from natural variability and would be considered negligible. However, the Proponent determined that additional water losses from Doris Lake would occur, based on the proposed mine plan, due to interactions with interconnected talik zones beneath the lake. Based on this determination, TMAC concluded that cumulative water losses from Doris Lake would result in serious harm to fisheries, and that an offset plan and DFO Authorization would be required.

At the NIRB Technical Meeting, TMAC provided additional fish baseline data to address concerns raised by parties regarding spawning habitat and fish use. As part of its commitments regarding potential impacts to fish and fish habitat resulting from water losses in Doris Lake and outflows, TMAC acknowledged the need to undertake additional hydrological modeling for Doris Creek and Little Roberts Outflow in 2016 due to an inability to collect data during 2015 as water levels were high. Further, in its response to final written submissions, TMAC stated that action levels for Doris Lake water levels would be identified and monitored through the Aquatic Effects Management Plan (AEMP) which would be incorporated in the Aquatic Monitoring Framework and reviewed through ongoing engagement with the

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Aquatic Monitoring Working Group to be established in 2016. The initial first draft study design in the first quarter of with a final Framework in place prior to entering operations in January 2017 (see section 4.4 Marine Environment) should monitoring indicate that an authorization would be required under the *Fisheries Act*, TMAC committed to consulting with the DFO and pursuing the required authorizations. Through its response to final written submissions and again during the Public Hearing, TMAC committed to conducting their proposed additional baseline studies in the summer of 2016 to evaluate fisheries in watercourses downstream of Doris Lake.[34] Pending results from the additional baseline studies, TMAC committed in its final written submission and during the Public Hearing to further developing the Fisheries Offsetting Plan and obtaining an authorization under the *Fisheries Act.*

During the Public Hearing, TMAC further noted that it considered the proposed discharge of effluent from the Tailings Impoundment Area and saline groundwater directly into Roberts Bay as an enhancement to the existing protocol of discharging Tailings Impoundment Area effluent into the freshwater system.[35] Further, TMAC provided additional details regarding the predicted effects of inflow contact water with mine backfill materials post-mining. TMAC indicated that the post-mining, a source load would be discharged back into Doris Lake, and that based on modelling results water quality concentrations would be below all water quality guidelines for freshwater aquatic life.[36]

On March 15, 2016 TMAC hosted the Doris North Project Aquatic Monitoring Workshop that was attended by the Nunavut Water Board, Kitikmeot Inuit Association, Fisheries and Oceans Canada, Environment and Climate Change Canada, Indigenous and Northern Affairs Canada, and the Nunavut Impact Review Board. Within the draft minutes from that Workshop, issued to the NIRB on April 9, 2016 TMAC highlighted issues discussed, resolved, and/or requiring further attention including subsequent studies and water modelling to be conducted by TMAC; ongoing monitoring requirements and *Metal Mining Effluent Regulations* expectations; as well as additions to be made to the Aquatic Effects Monitoring Plan.

4.2.2. Views and Concerns of Interested Parties

In the parties' respective final written submissions, the Kitikmeot Inuit Association (KIA), Fisheries and Oceans Canada (DFO), Indigenous and Northern Affairs Canada (INAC), and Natural Resources Canada (NRCan) commented on the potential for proposed project amendments to result in changes to water quantity levels in Doris Lake due to groundwater inflow from proposed mining activities below the lake in the talik. The KIA discussed TMAC's groundwater inflow modeling and outlined its previous request that TMAC further characterize the diversity of important hydrogeological features of Doris Lake to further inform predictions regarding the potential amount of groundwater inflow to the mine site. The KIA noted that it further requested additional details on the management of groundwater inflows during mining operations. The KIA indicated that it had no outstanding concerns regarding the information provided by TMAC during the NIRB Technical Meeting, and subsequent commitments, as long as the groundwater inflow modeling indicated that predicted dewatering rates could be effectively managed through the use of standard mining practices to restrict inflow of water from Doris Lake. The DFO noted during the Public Hearing that it planned to continue to work with TMAC during the regulatory phase to ensure that impacts to fish and fish habitat are properly mitigated should the proposed project

[34] J. Roberts, TMAC, NIRB Public Hearing File No. 05MN047 Transcript, April 12, 2016, p. 53, lines 6-7.
[35] D. Chubb, TMAC, NIRB Public Hearing File No. 05MN047 Transcript, April 12, 2016, p. 106, lines 8-19.
[36] M. Rykaart, TMAC, NIRB Public Hearing File No. 05MN047 Transcript, April 12, 2016, p. 122-123 lines 23-26 and lines 1-6.

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amendments proceed, and that based on the responses received from TMAC, DFO's technical issue had been resolved.[37]

INAC highlighted outstanding concerns regarding the potential for winter water levels within Doris Lake to be drawn down below the sill level, which controls water flow from the lake to the downstream channel. Potential effects were noted to include, but not be limited to, the delayed onset of spring outflows to the downstream channel. INAC identified a lack of information of the elevation of the Doris Lake outlet sill, specifically the benchmark used to determine the elevation, and noted that the lake sill elevation needs to be referenced to the same datum used to measure Doris Lake water levels. INAC considered TMAC's approach, as outlined in its response to technical comments, that used the empirical relationship between the Doris Lake water level and Doris Creek discharge to be reasonable. INAC recommended that the Proponent commit to establishing the relationship between Doris Lake water levels, Doris Creek discharge, and Doris Lake sill elevation in order to effectively monitor project induced impacts on Doris Lake levels. INAC further recommended that TMAC undertake year-round monitoring and recording of the Doris Lake water levels during construction and operations. INAC highlighted uncertainties within TMAC's groundwater and site water impact predictions on water quality and quantity and associated concerns regarding management planning. INAC identified the following four (4) outstanding concerns related to the groundwater and site water impact predictions as described in the Amendment and related documents:

- Inadequate description of the location and volumes of groundwater expected to occur as well as plans to manage unexpectedly large volumes of groundwater should they happen;
- Inadequacy of the groundwater model calibration;
- Potential inadequacy of the range of hydraulic parameters used in groundwater modelling and sensitivity analysis; and
- Potential variance between the hydraulic properties of the lake bottom sediments compared to those used to model groundwater flow into the mine.

INAC noted that during the NIRB Technical Meeting, TMAC had committed to providing a groundwater management plan framework to address the aforementioned issues and that would be used to inform the development of a detailed Groundwater Management Plan. INAC stated within its final written submission that as it had yet to receive the anticipated framework its concerns noted above remained outstanding. The potential impacts of parties not reviewing the Groundwater Management Plan Framework were noted to include, but not be limited to, risks to water management planning due to excessive water at lower than anticipated quality, as well as risks to environmental receptors that were not previously assessed and as such INAC recommended that TMAC develop and submit a comprehensive groundwater management plan framework to parties for review prior to the Public Hearing. INAC noted during the Public Hearing that while it had received TMAC's Groundwater Management Plan Framework and considered the plan acceptable in the interim, it recommended that TMAC continue to develop the plan to address all INAC concerns during the licencing phase should the proposed project amendments be approved to proceed. INAC further noted it considered a new term

[37] G. Williston, Fisheries and Oceans Canada, NIRB Public Hearing File No. 05MN047 Transcript, April 13, 2016, p.280 -281, lines 22-26 and lines 1-6.

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and condition concerning modelling uncertainties to be acceptable as it addressed the need to account for model uncertainties identified by INAC and agreed upon during the NIRB Technical Meeting. [38]

Additionally, INAC commented on TMAC's response to final written submissions that an empirical relationship between Doris Lake's water level and the Doris Creek discharge measured at monitoring station TL-2 could be developed and used to determine the theoretical sill elevation. INAC noted that it found this approach to be acceptable and accepted TMAC's estimated sill elevation of 97.8 m to the datum of the Doris Lake water level gauge to be reasonable.[39]

NRCan also commented on the uncertainty associated with the groundwater inflow predictions of approximately 3,000 cubic metres per day (m^3/day) resulting from proposed underground mining, and discussed the following three (3) prior concerns: lack of clarification on model calibration; need for inflows into the underground mine to be further constrained prior to mining; and potential for greater inflows into the underground mine than predicted. NRCan noted that while it was satisfied with the information provided on model calibration within the response to technical comments, the Proponent has not directly addressed the issue of further constraining groundwater inflows prior to mining. NRCan acknowledged that uncertainties in the groundwater model would be addressed through adaptive management and mitigation plans and recommended that TMAC obtain additional information to help constrain the groundwater flow model and obtain an understanding of the range of possible groundwater inflows that could then be used in preparing adaptive management and mitigation plans. In its final written submission and during the Public Hearing, NRCan noted its satisfaction with TMAC's proposed use of advance drilling, grouting, backfill placement, and bulkhead construction to minimize groundwater inflows as mitigation measures to be included within the proposed Groundwater Management Plan.

The KIA and DFO further commented on the potential impacts of water level reductions in Doris Lake on fish and fish habitat. The KIA noted that it had previously recommended that TMAC update its fisheries baseline in reference to spawning habitat and fish use to accurately quantify potential effects and inform mitigation and monitoring plans for Doris Lake. The KIA indicated that it had no outstanding concerns after reviewing additional data collection provided by TMAC at the NIRB Technical Meeting and subsequent submissions. DFO noted that through a review of information provided by the Proponent within the Application, responses to technical comments, and during the NIRB Technical Meeting, it did not expect the maximum predicted water losses in Doris Lake to result in localized effects to fish populations that would require authorization under the *Fisheries Act*. However, DFO highlighted the need for ongoing monitoring to verify impact predictions and recommended that TMAC revise its Aquatic Monitoring Framework to include reporting of ongoing monitoring of water levels in Doris Lake and outflows, as well as observed and potential effects on fish populations. DFO further commented on the need to assess potential impacts to fish and fish habitat that could result from reductions in water levels in the watercourses and water bodies downstream of Doris Lake. Acknowledging TMAC's response to technical comments, which discussed the need to undertake hydrological modeling for Doris Creek and Little Roberts Outflow, DFO recommended that the Proponent undertake its planned baseline studies of fish populations and habitat in the noted watercourse and waterbody. DFO noted that this information could be provided during the regulatory phase of the proposed project

[38] F. Ngwa, Indigenous and Northern Affairs Canada, NIRB Public Hearing File No. 05MN047 Transcript, April 13, 2016, p. 304-305, lines 7-26 and lines 1-6.

[39] F. Ngwa, Indigenous and Northern Affairs Canada, NIRB Public Hearing File No. 05MN047 Transcript, April 13, 2016, p. 302-303, lines 9-26, and lines 1-22.

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amendments, and if approved would be used to determine if further mitigation measures and/or authorization under the *Fisheries Act* would be required for Doris Creek and/or Little Roberts Outflow. Based on TMAC's commitments in its response to final written submissions, DFO noted during the Public Hearing that it considered this technical issue resolved.[40]

DFO further commented on the potential for negative impacts to fish and fish habitat from the expected water crossings associated with two (2) proposed roads – Doris Central Vent Raise Access Road and Doris Connector Vent Raise Access Road. DFO acknowledged TMAC's prior commitments to implement all available and feasible best management practices to avoid and mitigate potential negative impacts to fish and fish habitats on both fish-bearing and non-fish-bearing waterbodies. DFO recommended that TMAC provide detailed plans of all proposed water crossings for review prior to construction activities. During the Public Hearing, DFO noted that the requested information was received from TMAC and that this technical issue was considered resolved.

The KIA, INAC, and NRCan commented on potential impacts to freshwater quality resulting from the proposed amendments to the Tailings Impoundment Area (TIA) and associated mitigation and monitoring methods. In its technical review comments, the KIA discussed the site-wide water and load balance modelling TMAC used to predict water effluent quality and potential impacts to freshwater resulting from the TIA. In its final written submission, the KIA noted that it had previously recommended that the following parameters be incorporated into the modelling: climate change and wet and dry hydrological conditions; use of the 75th percentile concentrations; as well as additional analyses for mercury and selenium using low-level detection limits. The KIA noted in its final written submission that during the NIRB Technical Meeting a review of changes in wet and dry hydrological conditions indicated that there would be no impact on the load balance modeling and effluent quality, and TMAC had committed to conduct the sensitivity analysis of the water and load balance using the 75th percentile for background concentrations and other input source terms. As the required information had been submitted February 29, 2016, the KIA noted it had no outstanding concerns. At the Public Hearing, the KIA further noted that it had no outstanding concerns in response to the results that TMAC had reported and therefore considered the issue resolved.

The KIA further discussed TMAC's site-wide water and load balance model to calculate loadings upon closure. The KIA outlined the Proponent's use of median release rates from humidity cell tests in its modelling to calculate the potential loadings from exposed tailings beaches, which was also used to estimate that a 0.3 metre (m) deep layer of quarry rock would be sufficient to cover the tailings. The KIA noted that in response to its concerns that this method could result in the underestimation of potential effects to surface water and Doris Creek, TMAC agreed to recalculate the tailings beach sources using the 75th percentile leach rates from the humidity cell tests. The KIA indicated that it had no outstanding concerns, and that the revised analysis indicated that the TIA water would be non-toxic for caribou and birds. The KIA further indicated that after reviewing the results of the new model at the NIRB Technical Meeting which took the recommended parameters into account, it considered the estimated tailings cover depth of 0.3 m to be adequate. The KIA further noted that during meetings with TMAC, the possibility of boils developing in the tailing cover was found to be low risk and not likely to occur.

Within their respective final written submissions, INAC and NRCan both commented on the proposed interim dike to be used to impound tailings and act as a filter to prevent tailings solids from migrating

[40] G. Williston, Fisheries and Oceans Canada, NIRB Public Hearing File No. 05MN047 Transcript, April 13, 2016, p. 279-280, lines 7-26, and lines 1-21.

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downstream and entering the reclaim pond. In noting that TMAC has not yet selected the filtering method it would use, INAC acknowledged during the Public Hearing that TMAC committed to providing a trade-off study to evaluate the potential use of both a geotextile filter cloth and a graded rock fill option. NRCan commented on TMAC's commitment to provide further characterization of the interim dike prior to construction and recommended that as project designs change, all engineering analysis, including thermal analysis, would be revisited and site specific foundation conditions would be incorporated as applicable. During the Public Hearing, NRCan acknowledged TMAC's commitments and noted that it supported TMAC's approach to further characterization of the proposed structures (see Section 6.1: Accidents and Malfunctions). TMAC reiterated that it planned to undertake the trade-off study during the licencing phase of the Application, pending approval of the proposed amendments, and concurred with INAC's recommendation that a term and condition be included in the Project Certificate to reflect the need for comprehensive design details in the study relating to filtering methods.[41,42]

NRCan noted that it had previously requested clarification on how the proposed change to subaerial tailings disposal would affect the post-mining groundwater flow regime in the vicinity of the underground mine, specifically as Doris Lake has an open talik and could facilitate connection to deeper groundwater, while taking into account regional groundwater flow. NRCan noted that it was satisfied with the Proponent's description within documents presented during the NIRB Technical Meeting, and later reviewed by NRCan regarding the post-closure groundwater flow interaction between the underground mine and Doris Lake. NRCan further discussed TMAC's conclusion that there would be no need to monitor shallow groundwater within the TIA catchment basin. Within its technical review submission, NRCan highlighted TMAC's explanation: shallow groundwater would be confined to the closed talik post-closure; the TIA reclaim pond would no longer be a source of potential groundwater contamination after being drawn down post-closure; and water and load balance modelling confirmed the load would be not significant. NRCan concluded that taking the site conditions and tailings management plan into account, this conclusion was reasonable.

Within its final written submission, Transport Canada (TC) commented on the potential for the TIA to impact navigation of a navigable waterway. TC concluded that as Tail Lake has been assigned to Schedule 2 of the *Metal Mining Effluent Regulations* it is no longer considered to be navigable and consequently would not be subject to the *Navigable Protection Act*.

During the Public Hearing, the Nunavut Water Board noted that the freshwater monitoring program presented in the Aquatic Monitoring Framework proposed by TMAC should be further developed to include more details on monitoring post-closure, including monitoring of water level changes in Doris Lake, and that it would expect discussions and information to be carried forward into the potential licencing process. In response, TMAC indicated that it was aware of this topic and noted that it anticipated further discussions during the subsequent licencing processes, should the proposed amendments to the Project be approved to proceed by the NIRB.[43]

During the community roundtable, a community member requested clarification regarding the water loss that would occur in Doris Lake from mine inflow and what impacts would occur on lake fish as a result. In response, TMAC stated that the loss of water from underground mine inflow could result in

[41] M. Rykaart, TMAC, NIRB Public Hearing File No. 05MN047 Transcript, April 12, 2016, p. 203, lines 1-18.
[42] F. Ngwa, Indigenous and Northern Affairs Canada, NIRB Public Hearing File No. 05MN047 Transcript, April 13, 2016, p. 308-309, lines 3-26, and lines 1-2.
[43] J. Roberts, TMAC, NIRB Public Hearing File No. 05MN047 Transcripts, April 12, 2016, p. 140, lines 21-24.

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decreased water levels that would impact shallow cisco spawn areas; however, no other impacts on fish or fish habitat would be expected.[44]

A community member requested further clarification from DFO and TMAC on how lakes and streams in the project area would be monitored.[45] In response, DFO noted that Doris Lake and downstream water levels would be monitored by TMAC and that as part of its monitoring program, with a yearly report that would be submitted to DFO by the Proponent. The DFO also noted that TMAC would be monitoring arctic char fish passage to supplement information for its fish offsetting programs.[46] TMAC added that Doris Creek and Doris Lake water quality would be monitored monthly during the open-water season and once in Doris Lake during the winter, further confirming that fish and fish passage monitoring would also occur.[47]

4.2.3. Views of the Board

Freshwater Environment

During the Public Hearing, the Board requested clarification from TMAC regarding the planned monitoring and management of the Doris Lake surface level throughout construction and operations. In response, TMAC noted that monitoring would be in place to validate predictions of the expected drawdown, and if actual drawdown was found to exceed predictions, further evaluations of potential impacts on fish and fish habitat would be made in consultation with the DFO.[48] The Board further requested information on how the Proponent had identified the extent of the talik under Doris Lake and how permafrost was monitored in the project area, asking specifically whether there had been any changes to the permafrost in the Project's history, recognizing potential environmental influences such as climate change. In response TMAC outlined how it had modelled the permafrost and groundwater and also explained that both deep and shallow permafrost data collected between 1991 and 2015 show no indication of changing permafrost extent.[49] TMAC went on to note that climate predictions in the area clearly indicate that the climate is changing and that air temperature at the project site would be expected to change over the long term, which could in turn affect permafrost. Recognizing this, TMAC further confirmed that permafrost monitoring would be in place throughout operations and post-closure in select areas. [50]

The Board acknowledges the specific mitigation measures associated with the freshwater environment such as the updated Water Management Plan and the Groundwater Management Plan which are being developed by TMAC in the Application or later through the reconsideration process, and were subsequently given consideration by the Board. In the Board's view, the potential changes in surface water and groundwater distribution that are directly or indirectly attributable to the development of the mine within the talik under Doris Lake and other associated mining activities will require monitoring

[44] A. Buchan, TMAC, NIRB Public Hearing File No. 05MN047 Transcript, April 13, 2016, p 409-410, lines 22-26, and lines 1-11.
[45] J. Haniliak, Cambridge Bay, NIRB Public Hearing File No. 05MN047 Transcript, April 14, 2016, p. 500, lines 19-25.
[46] J. Marentette, DFO, NIRB Public Hearing File No. 05MN047 Transcript, April 14, 2016, p. 501, lines 1-17.
[47] J. Roberts, TMAC, NIRB Public Hearing File No, 05MN047 Transcript, April 14, 2016, p. 501-502, lines 20-26 and lines 1-7.
[48] D. Chubb, TMAC, NIRB Public Hearing File No. 05MN047 Transcript, April 12, 2016, p. 144, lines 7-20.
[49] M. Rykaart, TMAC, NIRB Public Hearing File No. 05MN047 Transcript, April 12, 2016, p. 145, lines 2-20.
[50] M. Rykaart, TMAC, NIRB Public Hearing File No. 05MN047 Transcript, April 13, 2016, pp. 330-333, lines 22-26, 1-26, 1-26, and 1-12.

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throughout the life of the operations and into post-closure, as more appropriately determined through the Nunavut Water Board's water licensing process.

The maintenance of the health of the underground environment is important to the Board and as backfilling of materials was to occur in the original Project, the release of saline water and the possibility of the continuation of seepage creating an anaerobic environment which could have an effect on the chemistry of the rock was considered by the Board. During the Public Hearing the Board requested clarification regarding how the local environment would be protected from the placement of tailings as backfill in mine workings. In response to this question, TMAC stated that the tailings used as backfill would undergo a chemical process to ensure that trace chemicals used for gold extraction would be destroyed to render these materials safe for underground placement. TMAC elaborated further, explaining that tailings and rock placed in the northern part of the Doris North mine would eventually freeze and contribute the permafrost layer in the area, while backfill placed underneath Doris Lake would remain unfrozen. Based on its modelling results, TMAC does not expect exchange or movement between the backfill and the lake post-flooding at closure.[51]

Fish and Fish Habitat

The Board is concerned that predicted changes to water levels which could also impact fish and fish habitat in Doris Lake and downstream in Doris Creek and Little Roberts Lake. The Board stresses the importance of continuing to implement the mitigation and management plans that are currently in place at the existing Doris North Gold Mine to minimize the impacts from the development of the additional zones in the talik, particularly the Air Quality Management Plan, Water Management Plan, Aquatic Effects Monitoring Plan, Offsetting Plan, Hazardous Materials Management Plan, Spill Contingency Plan, as well as the proposed Groundwater Management Plan.

In regards to the Aquatic Monitoring Framework and the Aquatic Effects Monitoring Plan, the Board encourages the Proponent and all parties to continue working together to allow for finalization of an Aquatic Monitoring Framework that suits the Project environment and circumstances and ensures that all aspects of the freshwater environment are adequately protected and monitored for moving forward.

The Board also notes that it is currently assessing other proposed projects, such as the ongoing review of the Phase 2 Hope Bay Belt Project (NIRB File No. 12MN001) and associated exception proposal for a bulk sampling program at Madrid North and South, which are owned by TMAC and which have some association with the approved Doris North Project and proposed amendments. It will be important to verify impact predictions related to the fresh water environment and fish and fish habitat for the proposed amendments to the Project to assess if there is a cumulative impact.

4.2.4. Conclusions and Recommendations of the Board

In considering these topics, the NIRB notes that the terms and conditions previously developed for the original Doris North Gold Mine Project through Project Certificate No. 003 have been designed to address potential project specific impacts to the freshwater environment, as well as to fish and fish habitat. In the Board's view, the potential impacts of the amended project activities will be adequately addressed through application of the Proponent's commitments and existing terms and conditions 6, 10, 11, 12, 13, 15, 16, 17, 29, 31 and 34 of Project Certificate No. 003 with revisions as noted below. Several

[51] J. Roberts, TMAC, NIRB Public Hearing File No, 05MN047 Transcript, April 13, 2016, pp. 421-422, lines 1-26 and lines 1-14.

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new terms and conditions have been recommended, and it is further recommended that existing term and condition 9 of Project Certificate No. 003 be removed as requested by TMAC.

The Board notes that the Closure and Reclamation Plan for the Doris North Project should be updated to include the proposed modifications and/or changes to ensure long term safety once the mine has been closed and the project areas reclaimed. The Closure and Reclamation Plan should demonstrate consideration for maintaining the integrity of both freshwater and groundwater quality around the mine site and the long term integrity of any remaining project infrastructure following closure. Consideration for potential effects of climate change and the need for long term monitoring of the site, particularly related to the Tailings Impoundment Area, should be clearly identified and discussed where appropriate.

The Board is recommending the following changes to existing terms and conditions to ensure that the amended activities and their effects in the project area are explicitly included. The Board has reviewed Exhibit 58 and adopted or adapted the wording as considered appropriate.

The Board acknowledges the recommendation put forward by the Proponent through Exhibit 58 to include minor updates and new commentary in association with term and condition 6, to increase specificity and acknowledge that the Tailings Impoundment Area has been constructed at Tail Lake. The recommended updates are considered to be appropriate and have been adopted by the Board with some modification.

> **Condition 6:**
> The Proponent shall immediately notify the NIRB of any further alternatives assessments undertaken for the Tailings Impoundment Area, if that analysis concludes that the Tailings Impoundment Area may no longer be the preferred option for tailings disposal.

Although the Proponent has recommended removal of term and condition 10, recognizing that the discharge of water from the Tailings Impoundment Area to Doris Creek has noted as being used during construction and at closure, the Board has determined that it is appropriate for this requirement to remain in place, with modification to the specific wording of the term and condition and associated commentary.

> **Condition 10:**
> Should water from the Tailings Impoundment Area be discharged into Doris Creek, the Proponent shall ensure that monitoring of Tail Lake and Doris Creek water quality occurs, above and below the waterfall, and is verified by an independent, third party laboratory. The Proponent must provide copies of the results directly to the NIRB and NIRB's Monitoring Officer.

The Board acknowledges the recommendation put forward by the Proponent to include updates and new commentary in association with term and condition 13, recognizing the planned discharge of effluent into Roberts Bay has been added to the scope of Project Activities. The recommended updates are considered to be appropriate and have been adopted by the Board with some modification.

> **Condition 13:**
> The Proponent shall collect additional water quality data for the 2006 field season and incorporate it into a revised water quality model to be submitted to the NWB as part of the water licence application. To ensure the protection of the receiving environment at the point of discharge, the Proponent will meet discharge criteria:

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a. Where discharge is to the freshwater environment, on a site specific basis set by the Nunavut Water Board (NWB) where possible and as set by the Metal Mining Effluent Regulations (MMER); and,
b. Where discharge is to Roberts Bay, discharge criteria set by the MMER and the Arctic Waters Pollution Prevention Act.

The Board acknowledges the recommendation put forward by the Proponent in Exhibit 58 to include updates and new commentary in association with term and condition 16, recognizing the planned discharge of effluent into Roberts Bay has been added to the scope of Project Activities.
The recommended updates are considered to be appropriate and have been adopted by the Board.

Condition 16:
The Proponent shall take all reasonable steps to prevent any discharge that is not in compliance with applicable regulatory approvals or requirements. If such a situation is encountered, the Proponent shall take immediate action to address the non-compliant discharge.

The Board acknowledges the recommendation put forward by the Proponent to include updates and new commentary in association with term and condition 29, recognizing the updates to the term and condition to make them more applicable to current legislation. The recommended updates are considered to be appropriate and have been adopted by the Board with some modification.

Condition 29:
The Proponent shall develop and implement a noise abatement plan to protect people and wildlife from mine activity noise, including blasting, drilling, equipment, vehicles and aircraft. The Noise Abatement Plan will be developed in consultation with Government of Nunavut-Department of Environment, Environment and Climate Change Canada, and Health Canada, and should be updated on an as required basis.

The Board acknowledges the recommendation put forward by the Proponent to include updates and new commentary in association with term and condition 31, recognizing the amendment to the scope of Project Activities and infrastructure.

The Board has considered the recommendation put forward by the Proponent in Exhibit 58 to update the commentary to indicate this requirement has been fulfilled as a plan has been developed, with the latest revised version included in the 2015 Amendment Application. The Board recognizes, however, that closure and reclamation plans are living documents and may continue to be updated as a project progresses through the water licensing process, therefore modified wording has been provided.

Condition 31:
The Proponent shall maintain a complete Closure and Reclamation Plan on file with the Nunavut Impact Review Board, prepared in accordance with requirements of the Nunavut Water Board and other relevant regulators.

The Board acknowledges the recommendations put forward by the Proponent in Exhibit 58 for updates and new commentary in association with term and condition 34, recognizing the proposed project amendment. The recommendations are considered to be appropriate and have been adopted by the Board with some modification.

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Condition 34:

The Proponent shall give notice of any planned significant changes to the mine facility, including the Tailings Impoundment Area and mining infrastructure such as the mill, to the relevant regulatory authorities and the Nunavut Impact Review Board (NIRB) through its Monitoring Officer, in a timely basis.

The NIRB recommends the removal of term and condition 9 from the Project Certificate as it would no longer be applicable with the development of the amendment to the Doris North project.

The Board, in considering those views of the Proponent and parties as outlined previously, and throughout the assessment of the Project, is providing the following additional recommendations:

1. The Proponent shall continue year-round monitoring and recording of Doris Lake water levels during construction and operations. This will allow for detection of actual Doris Lake draw down below the sill level; computation of the amount of drawdown, quantification of the project impact, and implementation of adaptive mitigation and management measures as appropriate.

2. The Proponent shall develop and submit a detailed Groundwater Management Plan for review during the water licensing process and to the Nunavut Impact Review Board as part of the plans available on the Doris North project. The plan shall acknowledge uncertainties pertaining to predictions of groundwater quantity and quality. Indigenous and Northern Affairs Canada should be consulted with respect to the contents of the Plan and any required mitigation measures.

4.3. TERRESTRIAL WILDLIFE AND WILDLIFE HABITAT

4.3.1. Views of the Proponent

TMAC Resources Inc. (TMAC or Proponent) provided its assessment of potential project-induced effects on terrestrial wildlife as a result of the proposed amendments to the Doris North Gold Mine Project (the Project) in Package 4, Section 3.0 of the 2015 Amendment Application (the Application). Within its assessment, TMAC focused its analysis on ungulates (barren ground caribou and muskox), carnivores (grizzly bear, wolverine, wolves, and foxes), and birds (upland breeding birds and raptors). Supporting baseline information was provided in sections 3.3.2 to 3.3.5. TMAC concluded that, contingent on the application of mitigation measures, no residual or cumulative effects were anticipated to occur to the terrestrial environment.

Terrestrial vertebrate studies were conducted in the Hope Bay Belt area from 1996 through to 2013, and an active Wildlife Mitigation and Monitoring Program (WMMP) has been in place since 2006 across the Regional Study Area (RSA) of the Hope Bay Belt, which continues to collect data on wildlife species in the area. TMAC noted that a variety of studies, including deoxyribonucleic acid (DNA) studies, aerial surveys, siting and tracking surveys, and radio-collar surveys, have contributed to developing an understanding of wildlife abundance, distribution, and seasonal movement patterns within the RSA and the region.

In its analysis of potential project-induced effects on wildlife, TMAC considered associated mitigation, monitoring, and adaptive management measures included in the WMMP, the Doris North Gold Mine Project Certificate No. 003, and the Kitikmeot Inuit Association Commercial Land Lease (KIA Land Lease

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No. KTCL313D001). Select mitigation measures noted within the Application included: optimized design measures to minimize the project footprint and to locate infrastructure away from wildlife habitats; measures to minimize noise and dust on-site; wildlife deterrent measures to prevent nesting and denning on-site; waste management measures to prevent wildlife attraction; vehicle and aircraft operational protocols; and operational protocols for project activities during sensitive wildlife periods. In response to comments and recommendations received during the NIRB's assessment, on March 31, 2016 TMAC submitted a revised draft WMMP containing additional caribou- and bear-related mitigation measure and optimized monitoring measures. The Proponent also noted that it would continue to contribute to the Government of Nunavut – Department of Environment's wildlife monitoring programs through contributions to the caribou collar program and the use of wildlife cameras to monitor wildlife movements near the Proponent's operations along the Hope Bay Belt.

TMAC predicted that, contingent on the application of mitigation measures, potential impacts to wildlife resulting from proposed activities and components would be limited to habitat loss resulting from the development of the expanded laydown areas and ore storage pads, and general disturbance. The Proponent described this effect as being negative and mitigable, further indicating that the addition of the three (3) new laydown areas at Roberts Bay would be contiguous with existing infrastructure and would not extend outside of the already-affected area. The Proponent also noted that proposed Pad U adjacent to the camp pad would be located within the spatial extents previously assessed within the 2005 Doris North Final Environmental Impact Statement (2005 FEIS), and that it did not anticipate additional impacts associated with the expansions. Proposed activities within the expansion areas were not predicted to cause additional impacts to wildlife, as they were expected to be at the same levels of previously-assessed disturbance from lights, noise, and human presence.

<u>Barren Ground Caribou</u>

Three (3) barren ground caribou herds have historically occur within the Hope Bay Belt area: the Bathurst, Ahiak, and the Dolphin and Union herds. TMAC stated that although past studies identified portions of the regional study area (RSA) as calving and post-calving habitat for the Ahiak herd, recent studies and collar data suggested that the calving range of the Ahiak herd has moved east and out of the RSA during these periods. Of the three (3) herds, only the Dolphin and Union herd is known to occupy the RSA during both spring and winter months for seasonal migration to and from Victoria Island. The Proponent acknowledged that the Dolphin and Union Caribou Herd is listed as a Species of Special Concern under Schedule 1 of the *Species at Risk Act*. Based on recent movement patterns from Government of Nunavut-Department of Environment collar data, TMAC stated that the Bathurst herd's calving grounds have shifted to the southwest end of Bathurst Inlet from their former location on the eastern side of the Inlet.

TMAC noted that although the cottongrass-tussock plant community, used for caribou and grizzly bear foraging, would be the most commonly impacted vegetation within the proposed expansion areas, the Bathurst, Dolphin and Union, and Ahiak caribou herds do not access these areas during summer months and therefore occupation would either not occur or would be negligible. The Application also noted that impacts to the seasonal migration of the Dolphin and Union Caribou Herd over sea ice would not be expected as caribou are not expected to preferentially use the Roberts Bay Jetty and existing laydown area as a migration corridor and discharge of groundwater and effluent from the Tailings Impoundment Area (TIA) was not predicted to affect ice thickness and integrity (freezing time) in Roberts Bay.

During the Public Hearing, TMAC noted that it had conducted additional dustfall modelling based on more conservative parameters recommended by Government of Nunavut during the Technical Meeting. Based on results from the modelling, TMAC indicated that the total extent of potential caribou habitat

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influenced by dust from the TIA would be 0.09% of the total suitable caribou habitat in the RSA of the Hope Bay Project. As descried in Section 4.1 Atmospheric and Terrestrial Environment. TMAC committed to expanding its Air Quality Monitoring Plan at the Public Hearing and further indicated that dustfall monitoring results would be incorporated in the WMMP as appropriate. Further, annually available collaring data would be reviewed to assess caribou proximity to the project area and whether proposed project activities were impacting caribou movement yearly and the WMMP would be updated as appropriate.[52]

Muskox

TMAC noted that muskoxen are observed throughout the year in the RSA, although distributions between years and seasons are highly variable. In most years the proportion of muskox groups with calves and the calf/adult ratio in the RSA has been low; however, in 2012 a group of 20 young were observed in a herd of approximately 50 animals.

Grizzly Bear

Grizzly Bear have been regularly observed throughout the Hope Bay Belt area and TMAC described the coastal system as being highly productive for Grizzly Bear populations. Based on TMAC's most recent DNA hair capture study, it estimated that approximately eight (8) to 11 grizzly bears could be detected for every 1,000 square kilometres (km^2). These values were noted to be slightly higher than other estimates established for western Nunavut at seven (7) bears per 1000 km^2. Grizzly Bears are listed as a Species of Special Concern under Schedule 1 of the *Species at Risk Act* and are classified as sensitive in Nunavut.

In the Application TMAC predicted that Grizzly Bear use of the proposed expansion areas is unlikely based on the determination that Grizzly Bears would be impacted primarily by visual and auditory disturbances. TMAC concluded that since project disturbances would remain unchanged from those previously assessed in the 2005 FEIS no additional effects would occur as a result of the amendments to the Project. However as was previously requested in the Project Certificate, TMAC committed to continue to study Grizzly Bears through DNA-based monitoring programs aimed at quantifying population, habitat use, and species effects.

Wolverine

TMAC noted that wolverine populations are considered stable in Nunavut based on regulatory sources, although Wolverine is listed as a Species of Special Concern in parts of western Canada that extend into Nunavut. Wolverine have been observed in the Hope Bay Belt area during aerial surveys, through incidental observations, and detected through DNA studies. TMAC predicted that no additional effects were identified for Wolverine due to the expansion of the Roberts Bay laydown area. The Proponent committed to continue to study Wolverine through DNA-based monitoring programs aimed at quantifying population, habitat use, and species effects as was requested in the Project Certificate.

Birds

TMAC stated that 25 upland breeding bird, 28 waterbird, and nine (9) raptor species are known to occur with the RSA, as identified through baseline studies and studies associated with its WMMP. TMAC indicated that all upland breeding birds and waterbirds, except for ptarmigan, are considered migratory birds and are protected under the *Migratory Bird Convention Act*. TMAC indicated that among the bird species identified in the RSA, the Peregrine Falcon and the Short-eared Owl are the only species listed as

[52] D. Chubb, TMAC, NIRB Public Hearing File No. 05MN047 Transcript, April 12, 2016, p. 69, lines 15-20.

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a species of Special Concern under the *Species at Risk Act*. The Proponent further noted that several species know to occur within the RSA are listed as Sensitive in Nunavut by the Canadian Endangered Species Conservation Council, and that all bird species, including raptors, are protected under the *Nunavut Wildlife Act*.

TMAC indicated that in a study on upland breeding birds conducted in 2012, six (6) ubiquitous passerine species accounted for over 86% of detections. Based on the same study, the Proponent also noted that lowland and mixed habitats support, on average, one (1) more upland breeding bird species and four (4) more breeding territories per 12 hectares of tundra than upland habitats. Additionally, TMAC stated that breeding success is occurring in the area based on the discovery of active, or recently active, nests within one (1) kilometre (km) of Hope Bay Belt infrastructure.

The Proponent noted that various raptor species (e.g., Peregrine Falcon and rough-legged hawk) are relatively common within the northern Hope Bay Belt, although nest productivity and success between years is highly variable. Based on the 2012 bird study, raptor breeding success across northern Hope Bay was low for rough-legged hawk; however, it was within normal range for all species combined. TMAC noted that in 2011 one (1) of every 10 raptor nests occupied within one (1) km of Hope Bay Belt facilities was successful, while in 2012 two (2) of the four (4) occupied nests within the same range were successful.

TMAC predicted that raptor nests observed two (2) km east and 3.5 km west of the proposed laydown areas in Roberts Bay would not be impacted by project activities based on their distant proximity. TMAC stated that shorebirds and seabirds are uncommon in the proposed Roberts Bay expansion area, and that they are normally observed on islands in Roberts Bay. The Proponent committed that, although upland breeding birds use the habitats in the proposed expanded footprint area, clearing of the expansion areas would occur outside of breeding season, which was expected to minimize disturbance to adults and nests. TMAC concluded that no additional effects are expected for upland breeding birds, shorebirds, and raptors due to the laydown area footprint expansion.

On March 31, 2016 the NIRB received the Proponent's *draft* WMMP which encompassed ongoing discussions with parties, particularly the Kitikmeot Inuit Association and the Government of Nunavut, and incorporated associated revisions. Revisions included updated Grizzly Bear mitigation measures; caribou monitoring, particularly associated with caribou interactions with the TIA; and finally mitigation, monitoring, and associated reporting with regards to bird nesting.

4.3.2. Views and Concerns of Interested Parties

Within its technical review submission, the Kitikmeot Inuit Association (KIA) commented on the potential for the Tailings Impoundment Area (TIA) to attract ungulates as a result of higher chloride levels than in the surrounding environment that could result in ingestion of tailings. The KIA noted the need for adaptive management measures to deter wildlife from feeding from the TIA. Within its response to technical comments submitted by the KIA, TMAC discussed the potential for the TIA to attract wildlife due to higher salt contents than in the surrounding vegetation and environment. In its response to technical comments, the Proponent noted that the KIA only provided one (1) northern example of caribou being observed licking salt in mine tailings in the Arctic. TMAC provided an example of ongoing monitoring of tailings storage not observing caribou ingesting water from the tailings storage facility or consuming tailings; it was concluded that the presence of salts in the TIA at higher concentrations than surrounding soils does not necessarily mean that wildlife would be attracted to the

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TIA. TMAC committed to monitoring and adaptive management measures to be incorporated into the next version of the Wildlife Mitigation and Monitoring Plan (WMMP) to deter potential wildlife attraction to the TIA and resulting ingestion of tailings. Referencing discussions that occurred during the meeting held on February 18, 2016 with the Proponent and the Government of Nunavut (GN), the KIA indicated within its final written submission that it had no outstanding concerns. Within its response to final written submissions, TMAC noted that no further response was required with regards to the KIA's submission as the organization considered the issue resolved.

Within its technical review submission, the GN similarly commented on the Proponent's proposed mitigation measures regarding the potential for project-induced dust effects to wildlife, particularly as a result of the TIA. The GN discussed TMAC's conclusion that potential project-induced dust would result in no significant residual effects and highlighted the potential for dust generated by proposed activities – including dust associated with the TIA and increased mining and milling rates, personnel, and movement and shipping of materials – to impact wildlife. The GN further commented on a lack of dust generation or dustfall modelling within the 2015 Amendment Application (the Application) and noted that assumptions regarding the level of effectiveness and seasonal variation of dust suppression measures were absent. The GN recommended that TMAC assess dustfall scenarios for wildlife in addition to those associated with the TIA.

Within its response to technical comments, and as discussed in Section 4.1: Atmospheric and Terrestrial Environment, TMAC provided results of supplemental modelling undertaken to quantify potential dustfall and distribution resulting from the subaerial tailings deposition and incorporated the dustfall threshold as recommended by the GN; TMAC indicated that the results validated the conclusions of the effects assessment presented in the Application. TMAC committed to incorporating the results into the next version of the Air Quality Monitoring Plan prior to September 15, 2016 to the NIRB. Within its final written submission, the GN commented on the updated dustfall memo and commitment to incorporate additional data collection sites and noted that while it partially addressed its concerns, the dustfall assessment was limited to dust originating from the TIA only and that the assessment did not consider increased dust generation from other sources. The GN concluded that it had outstanding concerns that the spatial extent of potential dust effects on wildlife could be underestimated. In response to the GN's final written submission, TMAC stated that in consideration of the potential for dust deposition, increased dust from sources other than the TIA were not numerically modelled in the effects assessment as changes to the dusting potential of the revised project footprint were considered relatively minor in comparison to the potential for dusting associated with the proposed subaerial tailings deposition in the TIA. Consequently, it considered site-wide modelling assessment unnecessary. During the Public Hearing, the GN stated that based on the Proponent's commitment to install two (2) additional monitoring stations, it considered the GN's concerns regarding dustfall to be resolved.[53]

Within its technical review submission, the KIA commented on the lack of measures within the WWMP to monitor attraction or avoidance of Grizzly Bears associated with the proposed project amendment activities. The KIA concluded that in comparing results of Grizzly Bear avoidance of similar projects in the Arctic region it did not agree with TMAC's conclusions that the project amendments would not result in negative impacts. In response to technical comments submitted by the KIA, TMAC elaborated on its current monitoring program regarding Grizzly Bears and noted that the number of bear sightings associated with project facilities indicates that bears are neither attracted to or avoiding the site. TMAC

[53] D. Baikie, Government of Nunavut, NIRB Public Hearing File No. 05MN047 Transcript, April 13, 2016, p. 350, lines 19-24.

committed to consulting with the KIA during its revisions to the camera program planned in 2016. Within its final written submission the KIA noted that through collaboration with the GN and TMAC during the February 18, 2016 meeting, the parties developed a general approach for effective camera monitoring; the KIA indicated that it had no outstanding issues. Within its final written submission, the GN similarly commented on the potential for increased conflict between people and Grizzly Bears and the potential for an associated increased risk to public safety and probability of bear mortality. The GN recommended that the Proponent update its WMMP to include a stand-alone bear safety and response plan. Within its response to final written submissions, TMAC noted that no further response was required with regards to the KIA's submission as the organization considered the issue resolved. In response to the GN's final written submission, the Proponent noted that revised bear response procedures, with previous GN feedback incorporated, had been implemented at the Doris North Gold Mine site. TMAC noted that as a result of discussions with the GN during the February 18, 2016 meeting, that included human-bear conflict mitigation measures, it had understood the GN had no outstanding concerns and consequently considered this issue resolved.

Within its technical review and final written submissions, the GN commented on the potential for significant interaction of the Bathurst, Dolphin and Union, Ahiak, and Beverly caribou herds with the amended project activities and the need for a revised WMMP specifically for the Dolphin and Union Herd during the winter and early spring, while the other herds could interact during calving and post-calving periods. The GN noted that there was a lack of detail within the existing mitigation and monitoring plans to be able to assess the effectiveness of the plans in reducing potential impacts to caribou herds. The GN discussed the potential for a zone of influence (ZOI) resulting from the proposed amendments and overall increase in work activity and highlighted the need to base mitigation and monitoring activities on the assumption that a ZOI exists. The GN stated that TMAC did not take potential changes to herd distribution, and potential resulting increased interaction of the herds with the Project, into account. As a result, the GN concluded that it had low confidence in the Proponent's conclusion that potential project induced impacts described in the Amendment to the Bathurst, Dolphin and Union, and Ahiak herds caribou herds (the Beverly herd was not included within TMAC's assessment) would be negative but mitigable. As such the GN recommended that the WMMP be revised to encompass the proposed amendments and resulting increased activity and include a mechanism(s) to detect and respond to caribou presence in 'real-time'.

Within its final written submission, the GN further identified outstanding concerns with TMAC's response to technical comments in which it was stated that there was no need to revise the Wildlife Mitigation and Monitoring Plan due to the low densities of caribou presently observed in proximity to the Project and that it would amend its WMMP if GN caribou satellite collaring identified a shift in caribou range towards the Project. The GN emphasized the need for appropriate monitoring and mitigation measures prior to changes of caribou distribution that could result from interaction with the ZOI. The GN again recommended that TMAC revise its WWMP and submit it for review by parties prior to the Public Hearing. Within its response to the GN's final written submission, TMAC committed to submitting a revised WMMP prior to the Public Hearing. TMAC further discussed the February 18, 2016 meeting with the GN and the KIA that included discussions regarding suitable caribou monitoring and changes to monitoring measures to be included within the revised WMMP. The Proponent noted in its response to final written submissions that it understood the GN to be in agreement with the proposed approach and considered the issue resolved. On March 31, 2016 the NIRB received TMAC's *draft* WMMP and during the Public Hearing, TMAC indicated that the updated WMMP was developed in consultation with concerned parties which includes updates to caribou-specific protection measures during all seasons and during calving periods. Supporting details regarding these caribou-specific

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protection measures were provided during the Public Hearing as Exhibit 11.[54] The Proponent also noted that through consultation with the GN during and following the NIRB Technical Meeting, updates were made to its bear response, deterrence, notification, and emergency procedures and that during a technical workshop with the GN and the KIA in February, changes were made to its remote monitoring program to optimize the WMMP design and monitoring capabilities. At the Public Hearing TMAC indicated that these additional monitoring measures were added to the *draft* WMMP to ensure that all concerns raised were addressed.[55]

During the Public Hearing, the GN acknowledged engagement that had taken place between TMAC on the WMMP; however, it added that the WMMP *"would greatly benefit from improved capacity for distant early warning of caribou in the area before caribou reach the project site"* and that it was committed to continuing discussions with TMAC and the KIA.[56]

During the NIRB Technical Meeting and within its final written submission, the GN noted outstanding concerns that extended marine shipping activities as proposed by the Proponent could impact the Dolphin and Union Caribou Herd, particularly from the overlap in the two (2) marine shipping routes and the migration path of the herd. As such, the GN recommended that TMAC commit to limiting project-related shipping to the open water season and discontinue shipping activities after October 15, regardless of whether freeze appears to be delayed. Within its response to final written submissions, TMAC noted that it generally agreed with the GN's recommendation and provided alternate proposed wording, pending approval of the proposed amendments. During the Public Hearing, the GN noted that through consultation with the Proponent, a proposed term and condition had been developed to address this concern and it was therefore considered resolved.[57]

During the Public Hearing, Fisheries and Oceans Canada (DFO) commented on TMAC's position that its obligations under term and condition 29 in Doris North Gold Mine Project Certificate No. 003, concerning the development of the Noise Abatement Plan, had been fulfilled. DFO indicated that while it considered the existing plan to be adequate for stage of development, it would expect a more comprehensive plan to be developed as the Project further advanced construction and into operations that would identify areas where fish and fish habitat could be impacted along with associated site-specific mitigation measures.[58]

Within its final written submission, Environment and Climate Change Canada (ECCC) discussed the potential for project induced impacts to migratory birds and commented on TMAC's commitment to include the mitigation measures recommended by ECCC's technical comments in the WMMP as well as annual reporting to help avoid incidental take to migratory birds, nests, and eggs and as such ECCC indicated no outstanding concerns. Within its response to final written submissions, TMAC noted that it had conducted extensive surveys of birds in the project area and committed to undertaking surveys for bird nesting activity prior to construction activities and it reiterated incorporation of ECCC's

[54] L. Bol, TMAC, NIRB Public Hearing File No. 05MN047, April 12, 2016, p. 79, lines 6-8.
[55] L. Bol, TMAC, NIRB Public Hearing File No. 05MN047 Transcript, April 12, 2016, p. 89, lines 16-23.
[56] D. Baikie, Government of Nunavut, NIRB Public Hearing File No. 05MN047 Transcript, April 12, 2016, p. 91, lines 7-18.
[57] D. Baikie, Government of Nunavut, NIRB Public Hearing File No. 05MN047 Transcript, April 13, 2016, p. 350, lines 3-6.
[58] G. Williston, Fisheries and Oceans Canada, NIRB Public Hearing File No. 05MN047 Transcript, April 12, 2016, pp. 138-139, lines 5-26 and lines 1-9.

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recommendations into the next revision of the WMMP. During the Public Hearing, ECCC requested that that NIRB add ECCC to the contributing parties list for the monitoring and management of the WMMP under term and condition 26 of the Project Certificate No. 003. TMAC responded that it had consulted with ECCC in the past and had no objection to this proposed amendment.[59]

One community representative further commented on wildlife responses to development and disturbance, noting that caribou and narwhals "*don't want to be disturbed. They try to keep away from -- from a development site over any human being. … They don't like to smell any smoke or any fumes from the site*". The community representative further discussed caribou migration routes and noted changes over time:

> *They are changing their migration. They have been travelling back and forth every year. I have been hunting out in the land in summertime. Sometimes they keep their route. Now, up to date, because of the noise from the aircraft and from the development site, they try to keep away from them because there is more noise than ever for the caribou. So they change their route*.[60]

The community representative recommended that TMAC and the local Inuit hunters continue to exchange information, particularly with regards to changing migration patterns.[61] A community representative representing the interests of the Hunters and Trappers Association in Cambridge Bay as well as the community further commented on changes in caribou presence and use of lands towards Roberts Bay and in the Hope Bay area, noting that caribou are being observed in less numbers, particularly from the Dolphin and Peary caribou herds, and are calving in different areas: "*It's very difficult sometimes, even where the collared caribou are migrating through, it's becoming more and more unpredictable as to where they're migrating*."[62]

The community representative further discussed caribou collaring studies conducted by the GN in association with the Ekaluktutiak Hunters and Trappers Organizations and the difficulties in finding caribou to collar, particularly from the Dolphin and Union Herd, as well as actually collaring the caribou.[63] In response to this comment TMAC noted its contributions to the GN's caribou collar studies and that it would assess any resulting information.[64]

Potential interactions and effects regarding project-associated shipping and caribou migrations were further discussed by a community representative who noted that:

> *I have a concern when the ice is just freezing over when the caribou are migrating from Victoria Island to the mainland, it's a big concern. And the caribou wait on the island to migrate before heading across and wait for freeze up. In recent times, the caribou are trying to migrate across*

[59] C. Kowbel, TMAC, NIRB Public Hearing File No. 05MN047 Transcript, April 12, 2016, p. 135, lines 10-20.
[60] B. Nirlungayuk, Kugaaruk, NIRB Public Hearing File No. 05MN047 Transcript, April 13, 2016, pp. 399-400, lines 18-26, and 1-9.
[61] B. Nirlungayuk, Kugaaruk, NIRB Public Hearing File No. 05MN047 Transcript, April 13, 2016, p. 400, lines 14-16.
[62] J. Haniliak Sr., Cambridge Bay, NIRB Public Hearing File No. 05MN047 Transcript, April 13, 2016, p. 406, lines 11-15.
[63] J. Haniliak Sr., Cambridge Bay, NIRB Public Hearing File No. 05MN047 Transcript, April 13, 2016, p. 406, lines 19-21.
[64] A. Buchan, TMAC, NIRB Public Hearing File No. 05MN047 Transcript, April 13, 2016, pp. 407-408, lines 19-26, and 1.

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> *the early freeze over of the ocean, they go through the ice and drown. So it's a concern that the shipping season has to be taken into consideration that -- during the fall.*[65]

The community representative further discussed the changing caribou migration routes and questioned the GN on plans to address the declining caribou populations in the Hope Bay area, both with regards to the Project in general. The GN responded that it shares concerns regarding the fall migration of the Dolphin and Union Caribou Herd across the sea ice and noted that this has informed discussions with TMAC to complete shipping activities by October 15 of each year. The GN further noted that is has acknowledged the decline in caribou populations and has a program currently in place to address declines specifically for the Dolphin and Union caribou herd.[66]

A community member similarly questioned TMAC: "*Now if the caribou start to migrate close by the mine site, and start to graze in that area, how will you deter the caribou from coming too close to the mine site?*"[67] In response, TMAC reiterated that although it did not expect many caribou to interact with the Project, if caribou were observed interacting with the Project it would follow its Wildlife Mitigation and Monitoring Plan. TMAC further noted that "*there aren't too many risks to caribou being around our mine site,*" and outlined various mitigation measures it proposed to employ in the event various scenarios occurred, including encounters with roads and the proposed TIA.[68]

A community representative also commented on the proposed deposition of effluent into Roberts Bay and potential resulting impacts to wildlife and mammals:

> *If they are feeding on something that's contaminated, they will not be able to survive. I'm just making a warning that there might be some -- injury to the animals because the animals eat not only vegetation, but they feed on fish. I have seen caribou feeding on fish. Because the wildlife feed on anything.*[69]

A community member similar questioned TMAC on its proposed measures to mitigate potential interactions between caribou and the TIA:

> *You said you mentioned something about the tailings pond and if wildlife was around the camp and near the tailings lake that you would try hard to keep them away from the tailings pond, and I'm wondering when the camp is closed and nobody's there, how do we protect our wildlife?*[70]

In response, TMAC noted that once mining activities have been completed and all tailings have been deposited into the TIA, it would cover the TIA with coarse rock material to prevent windblown tailings as well as prevent wildlife from interacting with the tailings material. The Proponent further stated that:

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[65] J. Haniliak Sr., Cambridge Bay, NIRB Public Hearing File No. 05MN047 Transcript, April 14, 2016, p. 484, lines 17-25.

[66] D. Baikie, Government of Nunavut, NIRB Public Hearing File No. 05MN047 Transcript, April 14, 2016, p. 485, lines 11-26.

[67] S. Hiqiniq, Gjoa Haven, NIRB Public Hearing File No, 05MN047 Transcript, April 13, 2016, p. 410, lines 23-26.

[68] A. Buchan, TMAC, NIRB Public Hearing File No. 05MN047 Transcript, April 13, 2016, pp. 411-413, lines 1-26, lines 1-26, and lines 1-9.

[69] B. Nirlungayuk, Kugaaruk, NIRB Public Hearing File No. 05MN047 Transcript, April 13, 2016, pp. 424 and 425, lines 23-26 and 1-4.

[70] H. Tologanak, Cambridge Bay, NIRB Public Hearing File No. 05MN047 Transcript, April 13, 2016, p. 425, lines 17-26.

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> *We have looked at the chemical composition of this material. It is -- we feel, a benign material, and if caribou or any other animal were to be exposed to it, there wouldn't necessarily be harm to that creature, but to be safe and to be conservative, we'll cover that up to avoid animals coming into contact with it.*[71]

In response to a community member, TMAC further noted that caribou have recently increased winter use of the Hope Bay area:

> *For example, this year, the Beverly and Ahiak caribou are not travelling to the treeline for the winter that they have normally being doing. Some of them have been staying on the tundra south of our project, and the Cambridge Bay hunters are probably very aware of that because we have hunters visiting our mine site fairly regularly to harvest those animals*.[72]

TMAC concluded that while it has "never seen great use of that area by a large number of caribou," different herds use the area throughout the winter and spring.[73] The Proponent further noted that caribou are free to walk through the mine and that mitigation measures are taken to reduce negative interaction.

4.3.3. Views of the Board

Throughout the Public Hearing the Board noted that the majority of concerns expressed regarding terrestrial wildlife and wildlife habitat related predominately to the management and monitoring of terrestrial wildlife including ungulates (barren ground caribou and muskox), carnivores (Grizzly Bear, Wolverine, wolves, and foxes), and birds (upland breeding birds and raptors). These species are recognized valued ecosystem components and also featured prominently in discussions at the 2005 Final Hearing for the original Doris North Gold Mine project proposal, subsequently leading to establishment of several of the terms and conditions that are currently within Project Certificate No. 003. The Board also places a great deal of importance on monitoring wildlife and wildlife habitat and stresses the need for ensuring that the Wildlife Mitigation and Monitoring Plan (WMMP), as the central instrument intended to guide wildlife management and monitoring efforts for the Project, is as comprehensive in nature as possible.

As such, during the Public Hearing, the Board questioned TMAC regarding whether wildlife monitoring undertaken in the area to date has identified increased or decreased caribou movement. In response, TMAC indicated that because of the low numbers identified over the monitoring years through aerial surveys and remote camera monitoring, tangible differences have been difficult to discern. TMAC added, however, that the updated remote camera program would be expected to detect these types of changes moving forward.[74] After being solicited to comment on this topic, the KIA noted that caribou movement in the area is believed to be well known, and that current mitigation and monitoring procedures in place are considered to appropriate for the current situation of caribou in the region. The GN also commented on this topic, stating that short-term responses do not indicate the absence of long-

[71] A. Buchan, TMAC, NIRB Public Hearing File No. 05MN047 Transcript, April 13, 2016, pp. 425-426, lines 21-26 and 1-15.
[72] A. Buchan, TMAC, NIRB Public Hearing File No. 05MN047 Transcript, April 13, 2016, p. 398, lines 9-16.
[73] A. Buchan, TMAC, NIRB Public Hearing File No. 05MN047 Transcript, April 13, 2016, p. 398, lines 18-20.
[74] L. Bol, TMAC, NIRB Public Hearing File No. 05MN047 Transcript, April 12, 2016, pp. 94-97, lines 6-26, 1-26, 1-26, and 1-16.

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term impacts, and that avoidance and displacement can also contribute to chronic physiological stress that could manifest into reduced body condition, reproduction, and survival. The GN further noted that observations of single-source disturbances do not provide information in the context of cumulative effects, and that it had outstanding concerns regarding TMAC's WMMP in relation to the associated caribou mitigation measures.[75]

The Board requested clarification from TMAC on how caribou movement obstruction and habitat fragmentation would be mitigated on site. In response, TMAC noted that two (2) caribou crossing features were developed on the Madrid road, outside of the assessed Doris site specific project area, as these were the only areas identified as needing crossing infrastructure through collaboration with Elders. At the Public Hearing, the Proponent observed that these crossing ramps had been effective, although caribou have been observed to cross at other locations in the Hope Bay Belt without specific crossing infrastructure. TMAC also added that its Noise Abatement Plan was to be updated to include a blasting stoppage protocol if caribou are within 2.2 kilometres of the quarry and submitted in September. The Proponent indicated that this planned update was based on recent publications regarding sound impacts from low-flying jet traffic on caribou, further noting that other caribou mitigation measures, such as maximum speed limits on roads, wildlife right-of-way protocols, and airstrip checks would also reduce impacts to caribou in this regard.[76]

Regarding terrestrial ecosystems, the Board has some concern regarding the prediction of impacts to wildlife associated with the proposed project amendments. The Project was in Care and Maintenance between 2012 and 2015 and not very active. Some of the data that the Proponent used to draw its conclusions was collected when the site was not well populated. Additionally, the Board notes that muskox have not been included in the WMMP which was committed to as a valued ecosystemic component in the 2005 Doris North Final Environmental Impact Statement . In addition to muskox, the Board notes that mitigation measures and monitoring for birds, specifically ravens and raptors, has not been included in the WMMP. These species prefer to nest on tall structures and as such the Board encourages TMAC to be proactive in implementing deterrents for nesting on project infrastructure and detail it within the WMMP and annual reporting.

The Board also recognizes that unforeseen accidents can and will occur, but if appropriate planning has been completed and implementation of measures happens quickly, damage can be reduced if not eliminated. The Board believes that demonstrating an adequate amount of respect for the land and animals is an important principle for all development in Nunavut to abide by, and the Proponent's planning for the Doris North Project appropriately demonstrates that respect. The Board encourages TMAC to use a precautionary approach when finalizing the WMMP and other mitigation plans while also ensuring that these plans reflect available local knowledge and incorporate lessons learned through the NIRB processes and operation of the site and other active projects in Nunavut.

Further, the Board also notes that comments were made in regards to the Noise Abatement Plan by Fisheries and Oceans Canada which noted that noise and vibration due to use of explosives should be incorporated as the Project develops; the Board encourages TMAC to incorporate these commitments and comments as applicable to the next version of this plan due in September.

[75] D. Baikie, Government of Nunavut, NIRB Public Hearing File No. 05MN047 Transcript, April 12, 2016, pp. 98-99, lines 20-26 and 1-3.
[76] L. Bol, TMAC, NIRB Public Hearing File No. 05MN047 Transcript, April 12, 2016, p. 88, lines 13-23.

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TMAC and the Government of Nunavut proposed a term and condition in Exhibit 56 regarding open water shipping and the Dolphin and Union caribou herd. The Board notes that during the 2005 Final Hearing for the Doris North Project, the original project owner Miramar confirmed that it would be shipping only during the ice-free season and went on further to note that it anticipated that the latest it would be receiving barges would be the second week in September. As such, the Board considers it appropriate to enshrine this into a new term and condition for the Project.[77]

Throughout the review and reconsideration of the proposed project amendments it was sometimes challenging to separate TMAC's monitoring efforts for the Doris North Project from references to proposed monitoring across the Hope Bay Belt area. Recognizing that the Board is currently assessing other proposed projects, such as the ongoing review of NIRB File No. 12MN001 and exception for bulk sampling program at Madrid North and South, owned by TMAC which have some association with the approved Doris North Project and proposed amendments, it will be important to verify impact predictions related to terrestrial wildlife and wildlife habitat for the proposed amendments to the Doris North Project specifically in order to assess if there is a cumulative impact..

4.3.4. Conclusions and Recommendations of the Board

In considering these topics, the NIRB notes that the terms and conditions previously developed for the original Doris North Gold Mine Project through Project Certificate No. 003 had been designed to address potential project specific impacts to terrestrial wildlife and wildlife habitat. In the Board's view, the potential impacts of the amended project activities will be adequately addressed through application of the Proponent's commitments and existing terms and conditions 22 through 27, 31 and 32 of Project Certificate No. 003.

In considering the issue of noise related to the amended activities, the terms and conditions previously developed for Project Certificate No. 003 have been designed to address project specific effects of the Project; and on this basis the Board is not recommending additional terms and conditions at this time. The Board notes that many of the plans for the Project require updating to include the proposed project amendment and should be completed and submitted to the NIRB in a timely manner.

The Board acknowledges the recommendation put forward by the Proponent to include updates and new commentary in association with term and condition 22, recognizing the amendment to the scope of Project Activities and infrastructure and additional operational life it is important to complete these studies. The recommended updates are considered to be appropriate and have been adopted by the Board with some modification within the commentary provided in section 8.0.

The Board acknowledges the recommendation put forward by the Proponent to include updates and new commentary in association with term and condition 26, recognizing the amendment to the WMMP for the Tailings Impoundment Area. The recommended updates are considered to be appropriate and have been adopted by the Board.

The Board acknowledges the recommendation put forward by the Proponent to include updates and new commentary in association with term and condition 27, recognizing the amendment to the scope of Project Activities and infrastructure the WMMP would require updating and further direction is offered

[77] B. Labadie, Miramar, NIRB Final Hearing File No. 05MN047 Transcript, February 2, 2006, p. 773, lines 7-10.

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in the commentary included in Section 8. The recommended updates are considered to be appropriate and have been adopted by the Board with some modification.

> **Condition 27:**
> The Proponent shall update and revise the Wildlife Mitigation and Monitoring Plan (WMMP) to reflect Project terms and conditions and shall revise the WMMP and submit to the Nunavut Impact Review Board (NIRB) for review. NIRB may consult with relevant Government departments and the Nunavut Wildlife Board. The revised WMMP must be submitted within three (3) months after the updated Project Certificate is issued. The Proponent must also submit an updated plan on an annual basis which much also be approved by NIRB.

The Board also encourages the Proponent to update its Wildlife Mitigation and Monitoring Plan to address the activity in the amended project area, and provides the following items for consideration:

a) Clearly identify the air quality management area that would be monitored for the amended Doris North Project;
b) Identify the specific adaptive management measures to be considered should monitoring indicate that impacts to wildlife and wildlife habitat are greater than predicted as well as those committed to during the course of the NIRB's reconsideration of the project certificate;
c) Monitoring and proposed mitigation measures for deterring birds from nesting on the infrastructure (i.e., large fuel tanks); and
d) Report annually observations and/or changes through the comprehensive post-environmental assessment monitoring program.

4.4. MARINE ENVIRONMENT

4.4.1. Views of the Proponent

TMAC Resources Inc. (TMAC or the Proponent) provided its assessment of potential project-induced impacts on the marine environment as a result of the proposed amendments to the Doris North Gold Mine Project (the Project) in Package 4, Section 4.0 of the 2015 Amendment Application (the Application). As part of its analysis of potential project-induced impacts on the marine environment, TMAC focused its assessment on physical oceanographic processes, water quality, and sediment quality. Supporting baseline information was provided in Section 4.3 of the Application. The Proponent predicted that, contingent on the application of mitigation measures, no adverse effects would be expected on the marine environment and that short-term impacts would be reversible.

Tides

Tidal data was collected along the southern shore of Roberts Bay from 2009 to 2011 using tidal gauges. Based on results from the tidal monitoring, Roberts Bay is described as being influenced by two (2) main tidal cycles: a biweekly (every two (2) weeks) spring-neap cycle, and a daily high-low cycle. Tidal cycles in Roberts Bay were further described as being small, with spring tidal levels rarely exceeding 0.4 metres (m) and neap tidal levels typically between 0.2 m and 0.3 m. Meteorological forcing (i.e., wind stress) was identified as having a greater influence on water levels than tides in Roberts Bay, as it was estimated to account for 0.5 m water level fluctuations. The overall circulation of water in Roberts Bay is subject to annual variability and is largely influenced by seasonal and environmental factors such as ice cover, freshwater runoff, and winds. Summer water circulation was described as being dominated by wind-driven flows rather than freshwater discharge, while weak convective flows and tidal currents were noted to gently stir Roberts Bay during the ice-covered season. The water column in Roberts Bay

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is described as a two-layer stratified system consisting of a warmer, lower-salinity top layer, and a cooler and saltier bottom layer. TMAC noted that during winter months, dissolved oxygen levels generally decrease with depth, and that the largest declines in dissolved oxygen occur at the pycnocline (i.e., boundary separating layers of differing densities). Deep water dissolved oxygen concentrations in Roberts Bay fluctuated and were recorded near, but below, the Canadian Council of Ministers of the Environment (CCME) recommended minimum dissolved oxygen concentrations for the protection of marine and estuarine aquatic life in April 2009, below recommended levels in 2010, and above recommended levels in 2011.

TMAC conducted marine water quality sampling from 2009 to 2011 at 17 sites located throughout Roberts Bay during both the ice-covered and open-water seasons. Marine water quality parameters assessed within TMAC's study included physical attributes, anions and nutrients, organic carbon, and total metals. TMAC stated that all water quality parameters in Roberts Bay were recorded below CCME guidelines, except for total mercury concentrations at select sites during the 2009 ice-covered season.

TMAC conducted marine sediment quality sampling in 2009 and 2011 at 18 sampling locations near the southern and southwestern shores of Roberts Bay. Shallow near-shore areas in the Bay were noted to be composed of mainly sand, with some silt and clay, while deeper sites were noted to be finer textured and comprised mainly of silt and clay. Marine sediment quality parameters assessed within TMAC's study included physical attributes, particle size, total nitrogen, organic carbon, available nutrients, metals, hydrocarbons, and polycyclic aromatic hydrocarbons (PAH). The Proponent noted that sites with higher proportions of fine sediments (e.g., silts and clays) tended to contain the highest concentrations of organic carbon, nutrients, and metals. All sediment parameters assessed were noted to be below CCME guidelines, except for copper and chromium concentrations in select sediments along the southwestern shore of Roberts Bay and at deep test site RB1. These exceedances were described as being greater than conservative interim sediment quality guidelines, yet remained below probable effects levels. TMAC stated that all marine sediment samples were measured below detection limits and CCME guidelines for PAH concentrations.

TMAC identified the following two (2) proposed amended project components with the potential to impact the marine environment in Roberts Bay:

- Installation and decommissioning of the subsea pipeline and diffuser in Roberts Bay; and
- Discharge of Tailings Impoundment Area (TIA) effluent and groundwater into Roberts Bay.

Within its analysis, TMAC considered mitigation, monitoring, and adaptive management measures designed to limit or eliminate project-induced impacts on the marine environment. Proposed measures included: optimized design measures to locate discharge pipes in the marine environment rather than freshwater environments and at a depth of 40 m; treatment and monitoring measures to ensure that all discharge meets *Metal Mining Effluent Regulations* (MMER) guidelines; measures to ensure that CCME guidelines are maintained in Roberts Bay for the duration of discharge operations; and adaptive management protocols based on monitoring results from its Aquatic Effects Monitoring Program which will be part of the overall Aquatic Effect Monitoring Framework.

<u>Marine Water Quality</u>

The Proponent noted that the proposed discharge of TIA effluent and saline groundwater into Roberts Bay has the potential to impact marine water quality as the saline concentrations of the discharge could be different than baseline concentrations in the marine environment. In-water construction activities

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were also predicted to potentially cause localized and temporary increases in suspended solids, and their related constituents, within the marine environment.

To predict effluent concentration levels and impacts on the water quality of Roberts Bay for the duration of discharge operations, TMAC conducted modelling using background water chemistry and marine physical process data, estimated performance values for the proposed multi-port diffuser, and anticipated discharge volumes of TIA effluent and groundwater over a six (6) year operational life. TMAC developed TIA effluent and groundwater water quality target concentrations for all parameters using CCME guidelines. TMAC noted that within its model, concentration targets for chromium and inorganic mercury were established as total values based on non-total CCME guideline values as a conservative approach to its analysis.

The Proponent predicted that the discharge of TIA effluent and saline groundwater into Roberts Bay for a period of six (6) years would slowly increase parameter concentrations during the winter months when there would be limited water exchange between Roberts Bay and Melville Sound. It was further predicted by TMAC that effluent pooling would occur during this period and during the open-water season, when winds are high and exchange between Roberts Bay and Melville Sound is greatest, concentrations were predicted to decrease rapidly. TMAC also predicted that equilibrium would be established after four (4) years in Roberts Bay, with peak concentrations reaching CCME guideline limits during the ice-covered season, and the lowest concentrations during the summer when exchange with Melville Sound would be greatest. The Proponent also predicted that following discharge operations, all parameters would return to baseline levels within three (3) to four (4) years due to water exchange between Roberts Bay and Melville Sound. TMAC stated that introduction of nitrates into the marine environment at marine CCME guideline levels at a depth of 40 metres would not be expected to cause eutrophication in Roberts Bay.

TMAC concluded that the water quality changes in Roberts Bay would be completely reversible as all TIA and groundwater effluent would meet the legally-required MMER prior to discharge into the marine environment and that CCME guidelines for the protection of marine life would be met within Roberts Bay for the duration of groundwater and TIA effluent discharge activities. At the Public Hearing, TMAC stated that if required, TIA effluent and saline groundwater would be treated prior to discharge from the reclaim pond to ensure that CCME guideline concentrations would be met in Roberts Bay.

As committed to parties at the NIRB Technical Meeting, TMAC submitted a memorandum on March 7, 2016 and a more detailed version in the Alternate Water Management Strategy Report on April 6, 2016, which described the Roberts Bay Discharge System, in which the dilution required for effluent to meet all marine CCME water quality objectives in Roberts Bay.[78,79] Using the model results, TMAC concluded that:

- All marine CCME water quality criteria would be met within 1 m of the diffuser;
- The discharge plume would be buoyant and expected to be trapped below the surface layer of Roberts Bay and would not interact with the seafloor;

[78] March 7, 2016. TMAC. Memo Re. Doris North Project Water Licence Amendment – Interim Water Management Plan. p. 3.

[79] April 6, 2016. TMAC. Memo Re: Environmental Effects of TMAC Doris North Project, TIA Alternate Water Management Strategy. P. 5.

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- The water quality predictions validate previous findings that water quality in Roberts Bay would be similar to baseline conditions following discharge; and
- There would be no significant effects to marine life in Roberts Bay.

TMAC presented the proposed Mine Water Management Framework during the NIRB Technical Meeting which outlined a temporary alternative strategy to discharge saline groundwater to the TIA prior to discharging into Roberts Bay. The alternative strategy was proposed to parties in response to Environment and Climate Change Canada's January 8, 2016 direction to the Proponent regarding testing to meet MMER in order to address the current absence of a test for salt-tolerant species while complying with the MMER regarding the safe discharge of saline groundwater into Roberts Bay (see Section 4.4.2: Views and Concerns of Interested Parties and Section 4.5: Marine Wildlife Section).

TMAC further concluded during the Public Hearing that discharges into Roberts Bay would not be expected to result in significant impacts to the marine environment, and that changes in water quality would be within the realm of natural water quality variation in the area.[80]

Marine Sediment Quality

Disturbed material from in-water construction was predicted to quickly disperse throughout Roberts Bay, with conditions quickly returning to baseline levels within days following construction activities. TMAC predicted that TIA effluent and groundwater discharge would have minimal interaction with sediments in Roberts Bay as the application of a multiport diffuser at the end of the proposed subsea pipeline would encourage vigorous mixing, and that discharged TIA effluent and saline groundwater would be mostly free of suspended material as it would meet MMER end-of-pipe discharge limits for total suspended solids. TMAC concluded that TIA effluent and groundwater would not be expected to adversely affect the sediment quality of Roberts Bay.

Ice Thickness

TMAC indicated that the discharge of saline groundwater during the winter could introduce a source of heat to Roberts Bay that could potentially impact ice thickness and seasonal freeze-up timing. Approximately 820,000 cubic metres (m^3) of groundwater would be discharged at a temperature of two (2) degrees Celsius (2 °C) over a nine (9) month period at a rate of 35 litres per second (L/s) and at a depth of 40 m. The saline groundwater effluent was predicted to mix into a 20 m thick layer of water representing approximately 160,000,000 m^3 that would be trapped by its density gradient and would have a temperature of approximately 0°C. TMAC predicted that the discharge would warm this layer by no more than 0.01°C and that this change would not interact directly with sea ice. The Proponent concluded that the discharge of saline groundwater would not be expected to have an effect on ice thickness or the timing of freeze-up in Roberts Bay.

4.4.2. Views and Concerns of Interested Parties

Within the technical review submissions provided by the Kitikmeot Inuit Association (KIA) and Environment and Climate Change Canada (ECCC), the parties commented on the need for a comprehensive understanding of the existing receiving environment in Roberts Bay. The KIA discussed the potential for saline groundwater and water from the Tailings Impoundment Area (TIA) to interact with and impact the marine environment as a result of variability in TIA discharge, salinity levels, and

[80] J. Roberts, TMAC, NIRB Public Hearing File No. 05MN047 Transcript, April 12, 2016, p. 54, lines 4-8.

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chemical differences. The KIA noted that it had requested that TMAC provide more detailed information regarding variances in water discharge and chemical differences between saline groundwater and seawater – particularly that saline groundwater had significantly higher levels of hardness, ammonia, nitrate, phosphorous, calcium, and iron – and potential resulting impacts to seawater. Within its response to technical comments, TMAC stated that the assessment presented in the Application was conservative and that additional information on the variability of water quality would only represent water quality of a lower concentration, and therefore any environmental effect would be less than already presented. Within its final written submission, the KIA noted that TMAC provided additional information regarding groundwater during the NIRB Technical Meeting and subsequent submissions on March 7, 2016 and April 6, 2016 indicating that saline variation of ocean discharge would be below Canadian Council of the Ministers of the Environment (CCME) guidelines. The KIA indicated that it had no related outstanding concerns. During the Public Hearing ECCC stated that upon reviewing the modelling scenarios and additional information provided by TMAC, it considered all water-related issues to be resolved. [81]

Within its technical review submission, the KIA further noted that TMAC's approach to deriving water quality targets for Roberts Bay and predicting effluent concentrations for all three (3) discharge scenarios – groundwater only, groundwater plus effluent from the TIA, and effluent from the TIA only – was not sufficient to evaluate potential project-induced effects. The KIA recommended that the use of the 75th parallel percentile baseline concentrations as well as predictions related to mercury and nitrate concentrations be incorporated into TMAC's approach to deriving water quality targets for Roberts Bay and predicting effluent concentrations for all three (3) discharge scenarios in the immediate mixing zone and in the deep and surface layers of Roberts Bay during both open water season and under ice. Within its response to technical comments, TMAC noted that it had updated its marine water quality predictions for modeling dilution zones in Roberts Bay resulting from the discharge of TIA effluent and saline groundwater through a diffuser for each of the three (3) discharge scenarios. TMAC committed to further revise the results using three (3) dimensional hydrodynamic modelling using 75th percentile baseline water quality concentrations to simulate mixing zones, plume movement, and would predict water quality concentrations of CCME parameters which was subsequently submitted to the NIRB on March 10, 2016.

Within its final written submission, the KIA discussed TMAC's commitment to conduct three (3) dimensional hydrodynamic modelling to simulate mixing zones, plume movement, and predict water quality concentrations using 75th percentile concentrations. The KIA noted that it had reviewed the March 11, 2016 submission (see Section 4.4.1: Marine Environment Views of Proponent). Further, the KIA outlined that the model results indicated that tremendous dilutions of discharged effluent would occur within metres of the diffuser, meeting all marine water quality criteria established by the CCME, and that the resulting plume would be buoyant and expected to be trapped well below the surface layer of Roberts Bay and not interact with the seafloor. The KIA indicated that it had no outstanding concerns.

Within its technical review submission, ECCC also commented on TMAC's modelling and characterization of effluent from the TIA and groundwater infiltration into the marine environment. ECCC identified multiple issues related to predicted effluent quality from groundwater and TIA sources as well as at the mixing box, including: predicted groundwater quality; modelling of cyanide, mercury, and selenium;

[81] M. Tobin, Environment and Climate Change Canada, NIRB Public Hearing File No. 05MN047 Transcript, April 13, 2016, p. 271, lines 4-7.

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toxicity testing of effluent; and water licence limits. ECCC added that the effluent parameters TMAC was using were insufficient to enable a thorough and comprehensive understanding of the effluent. ECCC further highlighted TMAC's conclusion that the concentration of total dissolved solids in the effluent would change as mining progresses, which would affect water management methods. Within its final written submission, ECCC commented on TMAC's commitment to model additional parameters as well as monitor effluent quality for the full suite of parameters. ECCC stated that the updated modelling results indicated that it is unlikely that the effluent released into Roberts Bay would be acutely toxic. ECCC further noted that while TMAC had committed to meeting the effluent requirements within the *Metal Mining Effluent Regulations* (MMER) prior to discharge, the discharge limits set in the MMER represent a minimum national standard and do not encompass all chemical parameters that could typically be regulated for effluent discharges. ECCC concluded that parameters not covered under the MMER must meet requirements within the *Fisheries Act.* ECCC recommended that effluent quality modelling be updated periodically as additional source term and effluent quality data become available. In its final written submission and during the Public Hearing, ECCC indicated that as TMAC had committed to modelling additional parameters and to monitoring a full suite of parameters in the fluent it had no outstanding concerns. On April 9, 2016 the NIRB received *draft* meeting minutes for the Doris North Project Aquatic Monitoring Workshop from TMAC.

Within its technical review submission, ECCC raised concerns regarding TMAC's proposed monitoring of the aquatic environment in Roberts Bay and, similar to the KIA's request, made recommendations regarding baseline collection and sampling (including location of site selection). ECCC noted that potential impacts on marine sediments were not clearly identified and further noted ambiguity with how parameters with no associated guidelines would be monitored. Within its response to technical comments, the Proponent provided proposed fixed sampling stations in Roberts Bay and a deep-water reference site in Ida Bay to be included in the Aquatics Environment Management Plan (AEMP). TMAC committed to meeting the marine CCME water quality parameters and stated that the development of an Aquatic Monitoring Framework would be a collaborative process with parties – including ECCC, the Nunavut Water Board, the KIA, DFO, the NIRB, and the Doris North Inuit Environmental Advisory Committee – and in accordance with relative guidelines.

Within its final written submission, ECCC acknowledged TMAC's commitments to develop an Aquatic Monitoring Framework to harmonize requirements of the Environmental Effects Monitoring Program and the Aquatic Effects Monitoring Program as well as to meet CCME guidelines in Roberts Bay and monitor a full suite of parameters as an indication of project-induced effects. ECCC recommended that a marine working group be established to facilitate collaborative development and implementation of a comprehensive Aquatic Monitoring Framework as well as to inform mitigation, monitoring, and adaptive management. ECCC further recommended that TMAC collect additional baseline data prior to discharging to the marine environment and periodically monitor the full suite of parameters in the marine environment throughout the life of the Project, including the proposed project amendments. Within its response to final written submissions, TMAC agreed with ECCC's recommendation to form a Marine Working Group to facilitate collaborative development of environmental effects monitoring. TMAC made further commitments with regards to the characterization of effluent and the receiving environment in Roberts Bay and required annual reporting. During the Public Hearing, TMAC noted that in mid-March 2016 it had presented its initial marine monitoring plan to the Inuit Environmental Advisory Committee and to the KIA, the NIRB, the NWB, ECCC, INAC, and DFO.

Within its technical review submission, the KIA further commented on previous concerns that effluent from both the TIA and the planned Madrid Advanced Exploration Program (both saline groundwater and

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water from pollution control ponds) could result in potential cumulative effects occurring in the TIA and should be taken into consideration when assessing and predicting potential discharge effects in Roberts Bay. Additionally KIA requested reasonable assurance that the TIA would have the required expansion capacity for the Madrid development should it be approved. The KIA noted within its final written submission that TMAC committed to completing additional associated studies to address this concern, and further addressed this topic in in the review for the Phase 2 Hope Bay Belt and the KIA indicated no outstanding concerns.

Within its final written submission, Transport Canada (TC) noted that as Roberts Bay is part of the scheduled waters under the *Navigation Protection Act* (NPA), TMAC would need to ensure that the proposed effluent discharge pipeline and berm within Roberts Bay would comply with the regulatory requirements pursuant to the NPA. TMAC would be required to submit a Notice of Works to TC for any proposed permanent or temporary works within Roberts Bay. Within its response to final written submissions, TMAC noted that it had been in contact with TC and started its required Notice of Works.

4.4.3. Views of the Board

In the Application, the disposal of saline groundwater and water from the Tailings Impoundment Area (TIA) is one of the more significant modifications to be considered amongst the proposed amendments to the Doris North Project. During the Public Hearing, there was discussion surrounding the responsible government authority for the marine disposal of saline groundwater and water from the reclaim pond at the TIA. Fisheries and Oceans Canada noted that its role was to review the physical impacts that the outfall structure would have on fish and fish habitat and the discharge of effluent and marine water quality would fall under the mandate of Environment and Climate Change Canada.[82] Indigenous and Northern Affairs Canada would be authorizing the new jetty as well as parts of the marine outfall pipe located on crown land.[83] Transport Canada would also pay a role in authorization of the Project for the outfall pipeline, any associated temporary in-waterworks, the marine diffuser, and the outfall berm in Roberts Bay as part of the navigability of this portion of the Arctic Ocean. In addition, Transport Canada also regulates the operation of the oil handling facility including the annual resupply of fuel and potential overwintering of fuel barges at site.

The Board is also aware that TMAC has proposed two (2) methods for disposal of saline groundwater and water from the Reclaim pond associated with the TIA. The preferred method for disposal of the saline groundwater and reclaim water would involve pumping saline groundwater not required for other works to a mixing box where it would be mixed with the water from the TIA and then piped to the diffuser for discharge in Roberts Bay. Correspondence was received by TMAC in early 2016 from Environment and Climate Change Canada that requested TMAC propose an alternative method of disposal for the effluent until the *Metal Mining Effluent Regulations (MMER)* could be amended, in order to test and approve the effluent discharge proposed for the Project. At the NIRB's Technical Meeting and through correspondence received by the NIRB, TMAC outlined that the temporary option would be to pump the saline groundwater to the reclaim pond where it could be held for a year or more, as may be needed until the MMER could be amended and testing conducted in order to verify

[82] G. Williston, Fisheries and Oceans Canada. NIRB Public Hearing File No. 05MN047 Transcript, April 13, 2016, p 292, lines 11-26.

[83] K. Costello, Indigenous and Northern Affairs Canada, NIRB Public Hearing File No. 05MN047 Transcript, April 13, 2016, p. 300, lines 6-10.

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TMAC's predictions with appropriate fish species. During the Public Hearing TMAC noted that it would propose to hold the water until it would pass a toxicity test prior to discharge into Roberts Bay.[84]

The Board would like to encourage TMAC and authorizing agencies to seriously consider potential impacts of discharging effluent into Roberts Bay, a pristine environment. The Board has considered the information that the Proponent and parties filed through the assessment and presented at the Public Hearing and remains concerned with this specific proposed project amendment, including the regulatory regime and criteria that would be used in permitting this type of system, the first of its kind in Nunavut. While the Proponent has clearly articulated alternatives that could be implemented should discharge into the marine environment not be permitted in the initial year of operations, the Board is uncertain that the timing required for amendment of the MMER can be accurately predicted at this time.

It is also recognized that infrastructure constructed at Doris North may influence the feasibility of development of additional deposits along the Hope Bay Belt, and although all such developments would be subject to further assessment and regulatory processes the potential for infrastructure such as the Tailings Impoundment Area to be used for a longer term than that currently projected for the mine life for Doris North must be acknowledged in design and approval. Limiting the physical footprint of any development is also important, and the Board believes that maximizing the utility of Tail Lake as a Tailings Impoundment Area for the Project as well as for potential future developments is commendable. However, it is the Board's view that a precautionary approach must be taken in allowing the planned discharge of effluent to Roberts Bay to proceed, and that rigorous monitoring of this activity should be required to demonstrate that the effluent quality is as predicted and that the diffuser and discharge system are also functioning as predicted by the Proponent.

During the Public Hearing, the Board questioned TMAC regarding the planned remediation for the marine outflow pipe and associated in-water infrastructure. In response, TMAC noted that the pipe and concrete ballast weights would remain in place indefinitely, as they are considered to be comprised of inert materials and would add to fish habitat within the marine area.[85] Fisheries and Oceans Canada also responded that the pipeline remaining in place after mine closure may be preferable to the disruption of removal to the seabed and established colonies.[86] However, as this type of installation is being placed in a pristine environment, in the Board's view, the Proponent has not established that leaving this manmade structure in place indefinitely will be appropriate and truly protective of the marine environment. Accordingly, the Board has recommended that the removal of this infrastructure would be required unless the Proponent can satisfactorily demonstrate the validity of its predictions regarding the ability of this infrastructure to achieve a net positive environmental effect through creation of productive habitat without degrading marine water quality or fostering public concern about the environmental health of Roberts Bay.

The Board encourages the completion and implementation of the Aquatic Monitoring Framework currently being developed with TMAC and authorizing agencies based on the outline of monitoring for the marine and freshwater receiving environment that TMAC provided for consideration at the March 14, 2016 meeting. The outline also described the locations for reference sampling and detailed what attributes would be sampled for both in-water and sediment quality, benthic and fish species and the

[84] J. Roberts, TMAC, NIRB Public Hearing File No. 05MN047 Transcript, April 12, 2016, p. 132, lines 14-20.
[85] J. Roberts, TMAC, NIRB Public Hearing File No. 05MN047 Transcript, April 12, 2016, p. 175, lines 21-26.
[86] G. Williston, Fisheries and Oceans Canada, NIRB Public Hearing File No. 05MN047 Transcript, April 13, 2016, pp. 295-296, lines 14-23, 1-26, and 1-16.

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endpoints that TMAC would be monitoring for. The Board stresses the importance of a comprehensive and clearly articulated monitoring program for both the marine and freshwater environments (Aquatic Monitoring Framework) for ensuring the impacts of not only the Doris North Gold Mine Project but that of any additional works in the Hope Bay Belt are observed and can be effectively managed.

4.4.4. Conclusions and Recommendations of the Board

In considering these topics, the NIRB notes that the terms and conditions previously developed for the original Doris North Gold Mine Project through Project Certificate No. 003 have been designed to address potential project specific impacts to the marine environment. In the Board's view, the potential impacts of the amended project activities will be adequately addressed through application of the Proponent's commitments, existing term and conditions 19, 20, and 21 of Project Certificate No. 003.

The Board acknowledges the recommendation put forward by the Proponent to include updates and new commentary in association with term and condition 19, recognizing the amendment to the scope of Project Activities and infrastructure in the marine environment. The recommended updates to the term and condition are considered to be appropriate and have been adopted by the Board with some modification.

> **Condition 19:**
> The Proponent shall install thermistor cables and temperature loggers in the jetty foundation as well as the new jetty foundation. The Proponent shall monitor the effects of the jetty on shallow water permafrost through operations, until such time as the Nunavut Impact Review Board (NIRB) determines that such monitoring is no longer necessary, and report the results of the monitoring collection to NIRB's Monitoring Officer.

The recommended update in Exhibit 58 to the supporting commentary for this term and condition to recognize monitoring equipment in the jetty foundation has been installed is considered to be appropriate and has been adopted by the Board. Further, as the Board is still concerned with how permafrost would affect the discharge pipeline so has modified this term and condition to ensure collection of data for the Doris North project and future projects.

4.5. MARINE WILDLIFE

4.5.1. Views of the Proponent

TMAC Resources Inc. (TMAC or the Proponent) provided its assessment of potential project-induced impacts on marine wildlife as a result of the proposed amendments to the Doris North Gold Mine Project (the Project) in Package 4, Section 4.0 of the 2015 Amendment Application (the Application). As part of its analysis of potential impacts on marine wildlife, TMAC focussed its assessment on marine mammal, invertebrate, fish, and marine bird species. Supporting baseline information was provided in Section 4.3 of the Amendment.

Through fish community studies conducted in 2009 and 2010, TMAC identified 14 of the 20 fish species historically known to occur in Roberts Bay. The Proponent indicated that the marine fish community of Roberts Bay is representative of Arctic marine ecosystems and noted that the majority of the 14 species identified generally prefer marine habitats. TMAC noted that exceptions to this habitat preference include the following species that were identified as being anadromous or preferring brackish habitats:

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arctic char, certain populations of lake trout, arctic cisco, lake whitefish, least cisco, and ninespine stickleback.

TMAC noted that marine bird studies were conducted in Roberts Bay from 2006 to 2010 and highlighted that ground-based nesting surveys, aerial surveys, and ship-based surveys contributed to its baseline of marine bird data for Roberts Bay and Melville Sound. A total of 12 species of seabirds were observed within Roberts Bay, eight (8) of which were considered common in the area. Seabird densities calculated during periods of low marine traffic were not statistically different than those calculated during periods of high marine traffic, and TMAC further stated that marine traffic did not seem to have a detectable effect on seabird densities in Roberts Bay. TMAC noted that little seabird nesting activity was observed in Roberts Bay during baseline studies and that Roberts Bay consistently had the lowest density of seabirds compared to other surveyed inlets.

TMAC stated that three (3) species of marine mammals were observed in marine environments surrounding the Doris North Project: beluga whale, ringed seal, and bearded seal. Beluga whale were noted to occupy Bathurst Inlet infrequently during the summer based on historical evidence, while both seal species were noted to be common within the area. TMAC completed both aerial and ship-based surveys to document the presence of marine mammals in the area and ringed seals were observed to be the most abundant of the two (2) most common seal species. Seal species were observed to be less abundant within Roberts Bay, while larger populations were noted to occur within Melville Sound. TMAC noted that Narwhal are known to occur within Melville Sound, although they were not observed during baseline studies within Roberts Bay.

TMAC identified the following two (2) project components as having the potential to impact marine wildlife in Roberts Bay:

- Installation and decommissioning of the subsea pipeline and diffuser in Roberts Bay; and
- Discharge of Tailings Impoundment Area (TIA) effluent and groundwater into Roberts Bay.

Within its analysis, TMAC considered mitigation, monitoring, and adaptive management measures designed to limit or eliminate project induced impacts on the marine environment. Proposed measures included: optimized design measures to locate discharge pipes in the marine environment rather than freshwater environments and at a depth of 40 metres (m); treatment and monitoring measures to ensure that all discharge meets *Metal Mining Effluent Regulations* (MMER) guidelines; measures to ensure that Canadian Council of Ministers of the Environment (CCME) guidelines are maintained in Roberts Bay for the duration of discharge operations; marine habitat offsetting measures; and adaptive management protocols based on monitoring results from the Aquatic Effects Monitoring Program and the Roberts Bay Compensation Monitoring Program.

Marine Fish and Fish Habitat

TMAC acknowledged that the discharge of Tailings Impoundment Area (TIA) effluent from the reclaim pond and saline groundwater into Roberts Bay has the potential to impact water quality that could result in adverse effects on marine aquatic life, including the health of fish and prey species. TMAC stated that CCME guideline concentrations would be met in Roberts Bay which would be expected to protect all forms of aquatic life, and all aspects of aquatic life cycles, from anthropogenic chemical and physical stressors. The Proponent predicted no adverse residual effects on fish or fish habitat would occur by keeping water quality concentrations below marine CCME guideline levels (see Section 4.4: Marine Environment).

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TMAC stated that the installation and footprint of the proposed marine outfall berm, subsea pipeline, and diffuser has the potential to affect fish and fish habitat during construction and beyond. TMAC predicted that the installation of the proposed berm, ballast weights, and pipeline would result in the alteration or loss of 0.23 hectare (ha) of fish habitat and would cause serious harm to fish, as defined by Fisheries and Oceans Canada's (DFO) *Fisheries Protection Policy Statement* (FPPS). TMAC indicated that to offset potential habitat losses from the development of in-water infrastructure, it would employ habitat offsetting measures consistent with DFO's FPPS with the goal of ensuring that the productivity of commercial, recreational, and aboriginal (CRA) fisheries would be maintained or improved through the proposed offsetting works. Using relevant scientific literature, regulatory literature, and procedures currently in use, the Proponent proposed the following habitat offsetting measures: use of coarse rocky substrates for the construction of the marine outfall berm; creation of new hard surface area through the use of ballast weights; and the creation of two (2) rock shoals similar to those developed for the Roberts Bay jetty habitat offsetting program. The Proponent indicated that these offsetting measures would be expected to create a total of 0.29 ha of marine fish habitat in Roberts Bay, which would result in a net gain of 0.06 ha of marine fish habitat. TMAC also noted that there would be the potential for an additional 0.17 ha of habitable surface area created by the in-water pipeline which could contribute to additional habitat offsetting.

TMAC stated that a marine fisheries mitigation and offsetting monitoring plan would be employed to monitor the performance of the proposed in-water infrastructure and to ensure the success of the offsetting measures. Should monitoring results reveal that offsetting measures were not successful, TMAC noted that it could adapt its offsetting program in consultation with the DFO. Further, TMAC indicated that during the installation of the outfall berm and pipeline, mitigation measures similar to those in the Jetty Expansion Fisheries Authorization (DFO File No. NU-10-0028) would be employed, in addition to measures consistent with the DFO's Measures to Avoid Causing Harm to Fish and Fish Habitat. The Proponent illustrated that the past construction of four (4) shoals to compensate for the alteration or loss of 0.176 ha of fish habitat from the rock jetty resulted in the overall net gain of 0.138 ha of fish habitat. It was noted that compensation structures of this type in Roberts Bay have shown enhancement success based on monitoring results. TMAC further noted that primary and secondary producers occupy offset habitats along the rock shoals and side slopes of the jetty, and that fish prey and fish of multiple age classes have been observed within the area. TMAC concluded that no significant negative cumulative effects to CRA fisheries were anticipated from proposed works, and that the addition of coarse substrates within Roberts Bay would increase fish habitat availability in the area.

TMAC stated that its approach to marine discharge would be subject to change with ongoing engineering, project planning, and environmental considerations. Within its response to technical comments, TMAC committed to conducting a 'pathway of effects' assessment approach in accordance with DFO requirements regarding potential impacts to fish and fish habitat resulting from the Marine Outfall Berm and Roberts Bay Discharge Pipeline. TMAC noted that through this process, site-specific mitigation measures would be identified to ensure serious harm to fish populations does not occur. Potential mitigation measures were noted to include, but not be limited to, sediment control and turbidity monitoring, implementation of marine mammal exclusion zones, and marine mammal observations.

In response to correspondence from Environment and Climate Change Canada as received by TMAC on January 8, 2016, TMAC presented the Interim Mine Water Management Strategy at the NIRB Technical Meeting which outlined an alternative strategy to the preferred option of discharging saline groundwater directly into Roberts Bay as this was not possible under the current MMER legislation. The

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strategy was proposed to address the lack of a test salt-tolerant species while complying with the MMER regarding the safe discharge of saline groundwater into Roberts Bay. In a memo to the NIRB dated March 3, 2016 TMAC outlined the interim strategy that included:

- Initial storage of saline groundwater in the TIA until the sodium chloride (NaCl) is diluted to less than 10,000 milligrams per litre (mg/L); and
- Discharge of the diluted saline groundwater to Roberts Bay during the open water period.

TMAC held an Aquatic Monitoring Workshop in Edmonton on March 15, 2016 where it presented its MMER/Environmental Effects Monitoring (EEM) monitoring plan. TMAC noted the following agreed upon reference and sample sites at the Public Hearing:

- Five (5) sampling sites to be located near the diffuser in Roberts Bay;
- Five (5) reference sites to be located in Roberts Bay; and
- Five (5) reference sites to be located at Ida Bay.[87]

TMAC outlined that monitoring would include profiling of physical parameters, sampling water and sediment quality, and collecting benthic invertebrates at various intervals as per EEM guidance. The Proponent noted that results from multiple modelling exercises indicated that mining effluent would be diluted by 1,000:1 to 10,000:1 at 250 metres (m) from the diffuser and would not interact with sediments or surface waters. TMAC further found that past benthic sampling indicated few bivalves would be present at 40 m depth, and those that are present would not be actively targeted by deep-diving ducks due to the small size of the bivalves and availability of alternative food source. It was clarified that most duck and seabird species observed in Roberts Bay would not dive to 40 m to forage on bivalves.

In response to ECCC's technical comment, TMAC submitted a memo on March 5, 2016 detailing its Interim Water Management Plan and proposed approach to the MMER/EEM program. TMAC proposed to temporarily manage saline groundwater with a concentration of more than 10,000 milligrams per litre (mg/L) of sodium chloride (NaCl) from May 2017 through to January 2018. TMAC estimated that this would result in approximately 415,000 cubic metres (m^3) to be pumped to the TIA rather than directly to Roberts Bay as initially proposed. TMAC noted that the resulting concentration of NaCl stored in the TIA would be approximately one third of the reference method threshold value, which could then be discharged to Roberts Bay in compliance with the MMER. Once permitted by ECCC, TMAC would then carry out toxicity testing on saline tolerant species and revert to the water management plans as proposed within the 2015 Amendment Application. Within its response to final written submissions, TMAC clarified that its Alternate Water Management Strategy would entail pumping mine water to the TIA where it would be expected to dilute through mixing with fresh process water and natural runoff. TMAC predicted that the TIA water would reach an estimated chloride concentration of 2,033 mg/L in the first year and stated that this concentration would be within the estimated tolerance of test species (threespine stickleback). TMAC noted that if confirmed in the field, it would test further the water for toxicity using the afore-mentioned species, and if compliant discharge effluent to Roberts Bay once the marine discharge system has been completed and tested. TMAC committed to including the interim Alternate Water Management Strategy within the updated Water Management Plan, which would be submitted 90 days prior to operations (for additional information, see Section 6.2: Alternative Analysis).

[87] M. Henry, TMAC, NIRB Public Hearing File No. 05MN047 Transcript, April 13, 2016, p. 283, lines 4-10.

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Marine Mammals

Based on its prediction that water quality in Roberts Bay would remain below marine CCME guidelines, TMAC stated that no adverse effects would be expected on aquatic life and fish that seal species may feed on (see Section 4.4: Marine Environment). Additionally, TMAC noted that since ringed and bearded seals are mobile, and recognizing that Roberts Bay is not a permanent residence for seals, their exposure to TIA effluent would be temporary and therefore no direct effect on seal species would be expected.

TMAC also noted that narwhal occupation of Roberts Bay was infrequent and based on its prediction that water quality would remain below CCME guidelines, TMAC predicted that no adverse effects would be expected for invertebrate or fish that comprise narwhal diets and therefore no adverse effects would occur for narwhals.

Seabirds

Based on its prediction that water quality in Roberts Bay would remain below CCME guidelines, TMAC stated that no adverse effects would be expected on aquatic life and fish that seabirds may feed on.

4.5.2. Views and Concerns of Interested Parties

Within its technical review submission, the Kitikmeot Inuit Association (KIA) provided comments regarding potential impacts to marine wildlife in Roberts Bay as a result of proposed site water discharge. The KIA noted that without details of the proposed Aquatic Effects Management Plan (AEMP) it was unable to determine the potential for impacts to wildlife in Roberts Bay. The KIA requested that TMAC add sampling sites within the zone of influence of the proposed new diffuser as well as increase sampling frequency for water quality, dissolved oxygen, sediment quality, and contaminants in bivalves. Within follow-up correspondence to its final written submission submitted on March 17, 2016, the KIA highlighted additional parameters to be incorporated into the modelling and monitoring of the quality of water to be discharged into the marine environment that could be used to assess potential impacts to marine wildlife, including fish (for more information, see Section 4.4: Marine Environment). The KIA commented on the proposed water sampling reviewed during the Aquatic Monitoring Workshop held on March 15, 2016 and found that the additional water sampling locations proposed in Roberts Bay, Melville Sound, and Ida Bay, as well as the frequency of sampling, to be adequate. The KIA concluded that the proposed discharge into Roberts Bay would result in no risk to wildlife or marine life.

Within parties' respective technical review submissions, Environment and Climate Change Canada (ECCC) and Fisheries and Oceans Canada (DFO) commented on the potential impacts on fish and fish habitat associated with the discharge of effluent into Roberts Bay. ECCC commented on saline groundwater management and potential impacts to rainbow trout. ECCC noted that until the agency develops a reference test method using an appropriate marine species, TMAC should ensure effluent meets the current *Metal Mining Effluent Regulations* (MMER). ECCC requested that TMAC develop alternative strategies to manage saline mine water and/or groundwater until the effluent is suitable for discharge to the marine environment. Within its final written submission, ECCC commented on TMAC's Interim Mine Water Management Strategy as provided during the NIRB Technical Meeting, which concluded that the predicted maximum discharge concentration of sodium chloride in the TIA effluent and groundwater combined would be approximately 3,500 milligrams per litre (mg/L) and within the range of tolerance for Rainbow Trout. ECCC stated that while it considered TMAC's Interim Mine Water Management Strategy to be adequate in the short term, it recommended that the strategy be updated throughout project progression and as more information becomes available. Within its technical review submission, DFO discussed potential impacts from the installation of the discharge pipeline in Roberts

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Bay on fish and fish habitat and requested that TMAC provide updated information on proposed mitigation measures. Within its final written submission, DFO commented on the commitment made within TMAC's response to technical comments to undertake a 'pathways of effects' assessment approach. DFO reiterated that the proposed discharge pipeline would be unlikely to require a *Fisheries Act Authorization.* DFO recommended that TMAC provide detailed plans of the marine outfall berm and discharge pipeline for review prior to construction. During the Public Hearing, DFO acknowledged TMAC's commitment to providing the requested additional information as stated in its response to final written submissions, and noted that it considered the technical issue resolved.[88]

Within its technical review and final written submissions, ECCC further commented on the potential for residual and cumulative impacts from shipping on marine birds, specifically common eider ducks. In acknowledging TMAC's commitments made during the NIRB Technical Meeting, ECCC recommended that TMAC provide its shipping contractors with recommended information on marine setbacks and wildlife response measures. ECCC further recommended that the Proponent participate in research and management initiatives regarding shipping activities in the Bathurst Inlet/Elu Inlet Key Habitat Site. Within its response to final written submissions, TMAC committed to requesting shippers to adhere to ECCC suggested setbacks as well as a 500 metre marine setback from identified Key Habitat Sites, subject to safe navigation considerations, while transiting through the Bathurst Inlet/Elu Inlet. TMAC further noted that it would request in its procurement documents that shippers maintain appropriate wildlife response measures in their Ship Oil Pollution Emergency Plans and maintain related equipment on board project-related vessels. TMAC also committed to providing wildlife-related findings to the public and interested parties through existing reporting mechanisms, including its annual report submitted to the NIRB. ECCC stated during the Public Hearing that TMAC's submission of additional information and commitments relating to its Emergency Response and Spill Contingency Plan and Wildlife Mitigation and Management Plan revisions adequately addressed its concerns and that it considered the issue resolved.[89]

4.5.3. Views of the Board

During the Public Hearing, the Board questioned TMAC regarding the monitoring programs put in place for benthic marine animals and whether they would remain in place post-closure. In response, the Proponent noted that monitoring and tissue sampling has been conducted in the area for several years and that monitoring would continue under the *Metal Mining Effluent Regulations* around the discharge area throughout operations until Project closure.[90] During the community roundtable, the Board requested clarification on how exactly the marine pipeline and concrete ballasts would create fish habitat. In this regard the Board prompted DFO to clarify its support for the TMAC's conclusions. In response, DFO noted that when evaluating how the proposed pipeline and diffuser would affect fish and fish habitat, it considered current habitat available in Roberts Bay, the size of the potentially impacted area, and the change of fish habitat that would be expected following the installation of infrastructure. DFO noted that because the ballasts and pipeline would increase viable surface area that could support algae growth, as well as mussel and clam settlement, it was in agreement with TMAC's determination

[88] G. Williston, Fisheries and Oceans Canada, NIRB Public Hearing File No. 05MN047 Transcript, April 13, 2016, p. 283, lines 3-5.
[89] M. Dahl, Environment and Climate Change Canada, NIRB Public Hearing File No. 05MN047 Transcript, April 13, 2016, p. 272, lines 5-8.
[90] M. Henry, TMAC, NIRB Public Hearing File No. 05MN047 Transcript, April 13, 2016, p. 258, lines 1-10.

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that the infrastructure would not cause serious harm to fish.[91] The Board further commented that it had concerns with leaving the discharge pipeline in-place following closure of the Project, stating that it would be unnatural to the environment. In response, TMAC reiterated its initial conclusion that the pipeline would create additional marine habitat; however, it committed to including a study in its Closure and Reclamation Plan to investigate what impacts the infrastructure might have on the marine environment and what the most appropriate solution would be pending results.

Similarly, the Board also questioned TMAC as to whether the proposed method of effluent disposal has been used at other mine sites. In response, TMAC noted that the same discharge method is used in Greens Creek, Alaska, where excess tailings water is discharged into the Arctic Ocean.[92] The Board also requested clarification from DFO as to whether it requested that TMAC monitor fish habitat and other wildlife in Roberts Bay. DFO indicated in its response that specific monitoring for the marine outfall berm and pipeline in Roberts Bay was not recommended, as this would typically only happen if an authorization was issued. DFO clarified however, that there is existing monitoring of fish habitat in Roberts Bay for the fish habitat offsetting associated with the existing rock jetty.[93] TMAC added that although monitoring may not be required by the DFO in certain regards, monitoring would still be occurring as part of the MMER in consultation with ECCC.[94]

In response to a question posed by a community member, which was further clarified by the Board, regarding how the marine pipeline would be safe for fish species, TMAC noted that the effluent and baseline monitoring programs conducted during operations and after closure would include the collection and testing of fish species to identify any occurrences that would need to be addressed.[95] TMAC further elaborated that all water concentration levels in Roberts Bay would meet MMER guidelines and that regulated fish testing would ensure that specific test species could tolerate water that would be discharged into the bay. Additionally, TMAC noted that the use of a diffuser would limit the concentration of effluent discharge in any specific area, and that its aquatic effects monitoring program would monitor and adaptively manage all potential impacts that could occur.[96]

The disposal of saline groundwater and water from reclaim pond into the marine environment is one of the more significant proposed modifications considered by the Board from the Application. The health of an ecosystem and all of its components is of utmost importance, and the Board stresses the need for monitoring, mitigation, and adaptation. Marine wildlife and their health is an important consideration in the monitoring of water and sediment quality in Roberts Bay. As such, the Board believes that the Proponent should update its Wildlife Mitigation and Monitoring Plan to include information on sea ducks and other shorebirds as well as seals that may be encountered through the course of conducting various Project activities.

The Board again encourages parties to work together as part of the Aquatics Working Group to plan and monitor the health of species found in Roberts Bay. The Arctic is a very sensitive ecosystem and small

[91] J. Marentette, DFO, NIRB Public Hearing File No. 05MN047 Transcript, April 13, 2016, p. 419, lines 9-26.
[92] J. Roberts, TMAC, NIRB Public Hearing File No. 05MN047 Transcript, April 14, 2016, p. 504, lines 15-20.
[93] J. Marentette, DFO, NIRB Public Hearing File No. 05MN047 Transcript, April 14, 2016, p. 505, line 21-25.
[94] J. Roberts, TMAC,NIRB Public Hearing File No. 05MN047 Transcript, April 14, 2016, pp. 506-507, lines 26 and 1-10.
[95] J. Roberts, TMAC, NIRB Public Hearing File No. 05MN047 Transcript, April 13, 2016 p.402, lines 3-13.
[96] A. Buchan, TMAC, NIRB Public Hearing File No. 05MN047 Transcript, April 14, 2016, pp. 454-456, lines 19-26, 1-26, and 1-4.

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changes could have larger, unforeseen impacts such as the pipeline and marine diffuser proposed for the floor of Roberts Bay. The floor of the ocean including a bay can change from day to day, year to year depending on the currents and this can affect the quality of the available habitat. Additionally, as this would be the first project of its kind in Nunavut the Board would like to reiterate its concern with leaving the pipeline and associated infrastructure on the Bay floor, particularly give the short mine life that is proposed for the Project.

4.5.4. Conclusions and Recommendations of the Board

In considering these topics, the NIRB notes that the terms and conditions previously developed for the original Doris North Gold Mine Project through Project Certificate No. 003 have been designed to address potential project specific impacts to marine wildlife. In the Board's view, the potential impacts of the amended project activities will be adequately addressed through application of the Proponent's commitments, and through existing terms and conditions 19 through 27 of Project Certificate No. 003 with revisions as noted below.

The Board acknowledges the recommendation put forward by the Proponent in Exhibit 58 to include updates and new commentary in association with term and condition 25, recognizing the amendment to the scope of project activities and infrastructure. The recommended updates are considered to be appropriate and have been adopted by the Board with some modification.

> **Condition 25:**
> The Proponent shall file a monitoring plan focused on assessing and mitigating interaction between wildlife and humans at the mine site, including associated infrastructure such as the TIA (Tailings Impoundment Area), roads, and activity at the waterfall and Roberts Bay. An annual report must be sent by March 30 each year to NIRB's Monitoring Officer on interactions that have occurred, any effect the interaction might have had on humans and wildlife, and mitigation measures taken to avoid similar interactions in the future. The Proponent shall file a report to NIRB within 48 hours should any incident occur which results in wildlife mortality.

5. SOCIO-ECONOMIC EFFECTS

TMAC Resources Inc. (TMAC or Proponent) noted in Package 4, Section 6.1 of the 2015 Amendment Application (the Application) that it had assessed the potential socio-economic effects of the following proposed new or amended project activities associated with the Application:

- Annual ore mining rate to be increased to 2,000 tonnes per day (tpd) with an expected total of approximately 2,5000,000 tonnes of ore to be processed; and
- Accessing the Doris sub-deposits, resulting in an expected extension of mine and mill life for a total of six (6) years.

TMAC provided baseline information, including changes related to socio-economic conditions compared to the 2005 Doris North Final Environmental Impact Statement (2005 FEIS) (see Section 2.1.2: Socio-economic Conditions). Further, a review of the socio-economic effects assessment and proposed mitigation measures as presented in the 2005 FEIS was provided along with an assessment of the potential project-induced effects resulting from the proposed project changes and mitigation measures. TMAC concluded in the Application that the proposed amendments to the Doris North Gold Mine

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Project would not result in new effects to the socio-economic environment compared to the original predictions presented in the 2005 FEIS.

TMAC provided a summary of the public consultation program that took place between 2010 and 2015, conducted initially by previous owner Hope Bay Mining Ltd. and later by TMAC, in Package 2, Section 4.3 of the Amendment Application. The public consultation program included periodic community consultation sessions in Cambridge Bay, Gjoa Haven, Kugaaruk, Kugluktuk, and Taloyoak, as well meetings with territorial and federal agencies, Inuit organizations, and industry stakeholders. Within its response to technical comments, TMAC provided a Consultation Summary Report further detailing community consultations undertaken in association with the Application.

It was highlighted within Package 2, Section 4.4 of the Application that Inuit Qaujimajatuqangit, in addition to what was included in the 2005 FEIS, was not collected in relation to the proposed activities and components associated with the Application as the proposed changes would mostly occur within the existing Doris North Gold Mine footprint. However, TMAC noted that an Inuit Environmental Advisory Committee was established through the signing of the March 30, 2015 Hope Bay Belt Project Inuit Impact Benefit Agreement between TMAC and the Kitikmeot Inuit Association. The role of the Environmental Advisory Committee was outlined to assess environmental impacts and address community concerns during the development and operation of the Project.

5.1. EMPLOYMENT AND BUSINESS OPPORTUNITIES

5.1.1. Views of the Proponent

TMAC Resources Inc. (TMAC) discussed its assessment with regards to employment and business opportunities and expenditures associated with the 2015 Amendment Application (the Application) in Package 4, Section 6.4. TMAC noted in Section 6.5.1 that it anticipated the original effects assessment within the 2005 Doris North Final Environmental Impact Statement (2005 FEIS) regarding employment and business opportunities and the economy would remain valid for the Application. It was noted that the proposed extension to the life of mine by four (4) years would include additional mining and milling activities. TMAC concluded that as a result, employment, contract, and business opportunities would be increased and prolonged compared to the original predictions and that there would be an increase in overall total benefits. Therefore, benefits associated with the proposed changes to the Project were projected to include additional economic production, value added through gross domestic product (GDP), employment and personal income, and government revenue.

<u>Employment</u>

TMAC noted that while project related employment increased substantially between 2009 and 2011 during construction phases of the Doris North Gold Mine Project (the Project), employment levels fell significantly when the Project entered care and maintenance in 2012. In 2013 and 2014 there was a respective monthly average of 48 and 98 contractors and direct employees on-site (specific numbers were noted to be seasonally dependent). TMAC noted that following its acquisition of the Project in 2013 it was successful in engaging Inuit employees from Cambridge Bay, Kugluktuk, and Taloyoak, as well as other communities, and was able to retain a core number of skilled and experienced workers. It was reported that in 2014, Inuit employees represented 10-29% of the total project workforce. In addition, the gender ratio of TMAC employees was reported to be 80% male and 20% female in 2014, compared to 73% male and 27% female in 2013.

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TMAC predicted that employment opportunities during the operations phase of the amended Project would be longer-term, with up to 352 employees, including contractors and on-site and off-site employees, to be hired annually between 2016 and 2021. TMAC noted that this would total approximately 1,822 workers during the proposed six (6) year extended mine life (including the two (2) years previously approved). TMAC anticipated that based on its experience during the past construction phase of the Project that it would be reasonable to expect that the projected 42% Inuit hiring target as presented in the 2005 FEIS would be reasonably achieved.

TMAC noted that the original prediction made within the 2005 FEIS that the Project could potentially result in adverse effects to employers in the Kitikmeot communities if skilled labour was lost to the Project remains applicable for the amendment.

Within its response to technical comments, TMAC committed to providing a supplemental analysis of the demand for labour and supply that would utilize the following approach:

- Estimate labour force requirements of the Project by skill level;
- Estimate available labour supply within the Kitikmeot region; and
- Provide an analysis of the project requirements in relation to labour force capacity.

As summarized by TMAC at the close of the Public Hearing: "*Essentially, the amended project gives TMAC the ability to double the employment opportunities at the mine by increasing the mine footprint by a very small amount. "*[97]

Expenditures

TMAC noted that from 2008 to 2010, $150 million[98] associated with the Doris North Gold Mine Project was paid to the Kitikmeot Corporation and affiliated businesses. It was further reported that in 2014 an estimated $17.5 million, representing 40% of the Project's contract spending, was paid to Inuit-owned businesses; this included $3.0 million to Kitikmeot-based businesses, which represented 7% of the total contract spending. In comparison, it was reported that approximately $5.6 million was paid to Kitikmeot-based or Inuit-owned businesses in 2013, with 1.4% awarded to Kitikmeot-based contractors and 72.1% to Kitikmeot Corporation affiliates. TMAC committed to continue to use Kitikmeot-based or Inuit-owned businesses, including but not limited to the sourcing of air transportation, logistical services, camp supplies, and catering. TMAC predicted that the expected increase in economic benefits associated with the proposed amendments would be due to a substantial increase in capital and operating expenditures compared to original expectations as expressed in the 2005 FEIS. Total project expenditures were expected to equal approximately $522.6 million from 2015 to 2021, compared to a total estimated $92.9 million in the 2005 FEIS. It was further predicted that the majority of capital expenditures would occur in 2015 and 2016 with operational expenditures to occur between 2017 and 2020.

Within its response to technical comments, TMAC committed to undertake additional economic impact analysis to quantify the predicted benefits and project effects on the economy and to provide the results to parties prior to the Public Hearing. TMAC noted that the economic model would be used to estimate direct, indirect, and induced employment and income effects within the Kitikmeot region, Nunavut, and

[97] J. Roberts, TMAC, NIRB Public Hearing File No. 05MN047 Transcript, April 14, 2016, p. 570, lines 9-12.
[98] All monetary amounts provided are in Canadian dollars.

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Canada and would consider overall economic effects in association with increases in aggregate employment, GDP, and government revenue. Although it noted that the economic model could not be used to estimate direct tax revenues, TMAC committed to providing a comprehensive profile of tax revenues by combining results from its economic modelling and financial modelling used for the Prefeasibility Study. TMAC reiterated that the conclusions within the Application with regards to socio-economic benefits and effects remain valid.

In a memo submitted on March 31, 2016 TMAC outlined additional economic impact analyses undertaken, including updated estimates of revenues to accrue to the Kitikmeot Inuit Association, Nunavut Tunngavik Incorporated and the territorial and federal governments, and assessment of potential socio-economic effects resulting from temporary closure. [99]

Mitigation

TMAC noted that the mitigation measures as originally proposed in the 2005 FEIS remain appropriate to address potential project-induced effects on income and employment and business opportunities associated with proposed project amendments. Mitigation measures included collaborating with community stakeholders and suppliers to facilitate the direct and indirect hiring of Nunavummiut throughout operations. TMAC noted that the March 30, 2015 Hope Bay Belt Project Inuit Impact Benefit Agreement would encompass the proposed activities detailed within the 2015 Amendment Application and that an Implementation Committee was established to ensure the provisions of the IIBA are met and would begin meeting in July 2015. TMAC indicated topics included within the IIBA were employment, training, contracting, provisions specifically designed to ensure Inuit benefit from the Project, and also to establish measures to mitigate potential adverse effects.

TMAC further noted that its existing Socio-economic Monitoring Program would accommodate the proposed amendment activities. TMAC stated that the proposed extension to the life of mine would not be expected to result in the need to change the monitoring program, as there were no material differences in the nature of the predicted residual effects between the originally approved Doris North Gold Mine Project and the proposed 2015 Amendment Application. Within its response to technical comments, TMAC expounded on the role of the Doris North Socio-economic Monitoring Program and Doris North Socio-economic Monitoring Committee in monitoring potential socio-economic project effects through all project phases associated with the Application. TMAC committed to undertaking additional mitigation measures through a conceptual Workforce Transition Strategy that would be implemented during the closure phase of the Project, with the objective of supporting project employees transitioning to new employment. TMAC further committed to drafting changes to the Terms of Reference for the Doris North Socio-economic Monitoring Committee to widen the scope of the monitoring program as may be required to reflect the proposed amendments.

5.1.2. Views and Concerns of Interested Parties

Within its final written submission, the Kitikmeot Inuit Association (KIA) discussed the Framework Agreement for land access compensation as well as the March 30, 2015 Hope Bay Belt Project Inuit Impact Benefit Agreement. The KIA noted that through the establishment of the Inuit Environmental Advisory Committee, community members could provide input directly to TMAC regarding environmental concerns and the Committee could develop measures related to employment, business

[99] Gustavson, K. and Sieminska, K., ERM, Memorandum to J. Roberts, TMAC, Re: Doris North Project: Economic Impact Analysis, March 30, 2016.

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development, and training to address Inuit impacts and benefits. The KIA concluded that it would receive direct compensation through the Framework Agreement as well as through: the IIBA for land access, quarry materials, water usage, additional royalty payments from gold production, the KIA equity position in TMAC, and from the Mineral Rights Agreement signed with TMAC. Within its response to final written submissions, TMAC noted that it considered this comment resolved.

During the Public Hearing TMAC provided the following additional details with regards to the composition of the Inuit Environmental Advisory Committee:

> *… we have up to seven knowledgeable Inuit that are selected between TMAC Resources and the KIA that have either lived in the Hope Bay area or have intensively harvested from land in the Hope Bay area so that their knowledge of that land and the sea can be brought to the forefront in managing our project environmentally. … So the Inuit Environmental Advisory Committee does exactly that, is provide us an opportunity to hear from the people that know that land the best.*[100]

TMAC further noted that the Inuit Environmental Advisory Committee has held four (4) meetings since March 2015. In response to a request by a community representative for further clarification on the composition of the Inuit Environmental Advisory Committee, the Kitikmeot Inuit Association (KIA) responded that the committee members represent Inuit with experience or family connections in the area.[101]

Indigenous and Northern Affairs Canada (INAC) asked the KIA to clarify the percentage of its shareholdings with TMAC. The KIA responded that it

> *…holds just over one million shares in TMAC, which is roughly one percent of all shares – share ownership. So this would be characterized as a minority non-controlling shareholding … Further, the KIA shares are to be held in what is called a KIA trust. The KIA trust has already been established, and the KIA trust has separate trustees from the KIA Board*.[102]

The Board raised questions to the KIA regarding the potential risk to the KIA, including indirect effects to youth in training and apprenticeship programs, if TMAC would go into debt, close, or be unable to produce the amount of gold expected. The KIA responded that, as a responsible landowner, it has received satisfactory reclamation security from TMAC in the event the KIA would be responsible for any clean-up activities resulting from an unexpected closure. The IIBA was reported as being structured to allow and respond to variable changes in revenue:

> *the way KIA structured its agreement, if the project has a variable economic or revenue if itself available changes in revenue -- if it has variable changes in revenue, the payments to KIA -- some*

[100] A. Buchan, TMAC, NIRB Public Hearing File No. 05MN047 Transcript, April 12, 2016, pp. 180-181, lines 26, lines 1-6 and lines 12-15.
[101] G. Clark, Kitikmeot Inuit Association, NIRB Public Hearing File No. 05MN047 Transcript, April 14, 2016, pp. 472-473, lines 25-26 and lines 1-4.
[102] G. Clark, Kitikmeot Inuit Association, NIRB Public Hearing File No. 05MN047 Transcript, April 13, 2016, pp. 248-249, lines 22-26, and lines 3-6.

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of the payments to KIA -- particularly the one called the "net smelter return" will be variable as well. But it will allow KIA to participate in the upside if things are better than expected as well.[103]

It was further noted that the Implementation Committee would be responsible for addressing unanticipated project changes that could impact the delivery of benefits through employment training and contracting. Through the Implementation Committee, the KIA and TMAC would discuss the adequacy of training programs and whether additional effort would be required to meet the Inuit employment targets.

In response to a question raised by a community representative on whether TMAC would consider hiring older community members as wildlife monitors, TMAC first noted that labour laws were clear that a person could not be discriminated against based on age. TMAC stated that: "*really it's the law of the land that that is not a factor for our company or anyone else who is hiring, and I wouldn't expect if someone was older, that we would discriminate against them. So we welcome people of any age who are willing to work at our site*".[104] TMAC further noted that accommodations would be made for unilingual Inuktitut or Inuinnaqtun speakers.[105] TMAC also clarified that while it would not have individual positions dedicated solely as wildlife monitors, all employees would receive basic wildlife training and orientation and would be responsible for being aware of their surroundings. There would be a wildlife response team comprised of on-site employees who would be mobilized under specific circumstances.[106]

Within the following parties' respective final written submissions, both the Government of Nunavut (GN) and Indigenous and Northern Affairs Canada (INAC) commented on the importance of project specific regional socio-economic monitoring, particularly in regards to assessing impact predictions. The GN discussed TMAC's commitment to regional socio-economic monitoring through continued participation in the Kitikmeot Socio-economic Monitoring Committee (Kitikmeot SEMC) as well as through the development of the Doris North Socio-economic Monitoring Program Terms of Reference in collaboration with the GN, INAC, and the KIA. The GN noted that as Project Certificate No. 003 was issued prior to the development of the Kitikmeot SEMC, Term and Condition 28 of the Project Certificate does not accurately reflect the current Kitikmeot SEMC model. The GN recommended that, pending approval of the proposed amendments, the Project Certificate be updated to reflect the current Kitikmeot SEMC model as well as to officially recognize the Doris North Socio-economic Monitoring Working Group and the annual reporting requirements of the Doris North Socio-Economic Monitoring Program.

INAC similarly recommended that Term and Condition 28 of the Project Certificate continue to apply if the 2015 Amendment Application is approved to proceed. INAC further recommended that the Doris North Socio-economic Monitoring Committee review the Doris North Socio-Economic Monitoring Plan to determine if changes would be required to the terms of reference of the Committee. Within its response to final written submissions, TMAC proposed alternate wording regarding the suggested terms and conditions with regards to socio-economic monitoring requirements, pending approval of the

[103] J. Donihee, Kitikmeot Inuit Association, NIRB Public Hearing File No. 05MN047 Transcript, April 13, 2016, p. 252, lines 16-23.
[104] A. Buchan, TMAC, NIRB Public Hearing File No. 05MN047 Transcript, April 13, 2016, p. 429, lines 17-22.
[105] A. Buchan, TMAC, NIRB Public Hearing File No. 05MN047 Transcript, April 13, 2016, p.431, lines 5-15.
[106] A. Buchan, TMAC, NIRB Public Hearing File No. 05MN047 Transcript, April 13, 2016, pp. 430-431, lines 1-26 and 1-4.

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proposed amendments, as proposed by the GN. TMAC further responded that it agreed with INAC's recommended updates to Term and Condition 28 of the Project Certificate. During the Public Hearing, TMAC noted the importance of updating this aspect of Project Certificate No. 003 to also reflect the signed Inuit Impact Benefit Agreement (IIBA) and the new commitments related to the socio-economic environment included in the IIBA as well.[107]

During the Public Hearing, the GN responded to questions raised by the KIA regarding the composition of the Kitikmeot SEMC and the work expected to be accomplished that would not be undertaken or produced by the Implementation Committee associated with the IIBA. The GN clarified that the Kitikmeot SEMC would be "*chaired by the Government of Nunavut Department of Economic Development and Transportation … [and] composed of other Government of Nunavut departments, the federal Government, industry proponents, hamlets, designated Inuit organizations, and other stakeholders such as the RCMP or the hunters and trappers association*".[108] The three (3) objectives of the Kitikmeot SEMC were noted to be: bringing stakeholders together, reviewing socio-economic data, and obtaining project specific data and updates from project proponents.[109] In follow-up, the KIA questioned the GN on the expectations it would have for the Implementation Committee regarding its participation in and provision of information to the Kitikmeot SEMC and noted specifically that:

> *… KIA has a bilateral arrangement deal that's very important between the Kitikmeot Inuit and the company and in the past, the KIA has not participated, at least on an ongoing basis, on SCMC* [sic SEMC]. *I'd say the involvements been occasional, I guess, when resources and staff were available … So the concern that we're trying to raise is that … if there is information collected as a result of monitoring required by the benefits agreement, it's not necessarily a given that the information is going to be available for the SCMC* [sic SEMC].[110]

The GN responded that "*we respect the fact that you have a bilateral agreement and we would just expect that if you were able to contribute to the SEMC … that contributions would be welcomed and valued*".[111] TMAC noted that both the KIA and the GN would have an opportunity to review related proposed terms and conditions prior to submission on the record of the Public Hearing.[112]

Within its final written submission, the GN also commented on TMAC's commitment to provide an updated economic impact analysis and tax revenue estimates prior to the Public Hearing (March 30, 2016) and noted that it would assess the estimates for accuracy and raise any outstanding issues during the Public Hearing. During the GN's questioning of the Proponent at the Public Hearing and the GN's presentations at the Public Hearing, the GN did not, however, question or challenge the accuracy or validity of the updated economic impact analysis. The GN outlined the importance of on-going engagement with TMAC to discuss matters related to potential fiscal benefits and recommended that

[107] See generally the discussion of this topic by J. Roberts, TMAC, NIRB Public Hearing File No. 05MN047 Transcript, April 12, 2016, pp. 188-190.
[108] E. Zell, Government of Nunavut, NIRB Public Hearing File No. 05MN047 Transcript, April 13, 2016, p. 352, lines 10-16.
[109] E. Zell, Government of Nunavut, NIRB Public Hearing File No. 05MN047 Transcript, April 13, 2016, pp. 352-352,lines 23-26, and line 1.
[110] J. Donihee, Kitikmeot Inuit Association, NIRB Public Hearing File No. 05MN047 Transcript, April 13, 2016, pp. 353-354, lines 18-24, and lines 5-15
[111] D. Dylan, Government of Nunavut, NIRB Public Hearing File No. 05MN047 Transcript, April 13, 2016, pp. 354-355, lines 25-26 and lines 1-4.
[112] J. Roberts, TMAC, NIRB Public Hearing File No. 05MN047 Transcript, April 13, 2016, p. 357, lines 11-17.

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prior to development, the Proponent provide an updated and refined feasibility study, collaborate with GN finance officials regarding the preparation of tax data, and develop a communication protocol with the GN. Within its response to final written submissions, TMAC noted that it did not agree with the GN's recommendations that it commit to providing project related business or financial information as requested. TMAC noted that as it is restricted on the content and timing of business information that it could share with the GN as a result of regulatory requirements and legal obligations, it was not prepared to commit to a specific type, content, and timing of businesses information to be shared with the GN. Within the joint submission by TMAC and the GN of commitments it was proposed that TMAC communicate with the GN, outside of the NIRB process, regarding the sharing of project information, to the extent possible, to assist governments in the preparation of their annual fiscal outlooks and tax forecasts.[113]

5.1.3. Views of the Board

The Board recognizes that, as noted by the Proponent in its submission at the Public Hearing, that everyone has learned a great deal about the potential and actual socio-economic effects of the Doris North Gold Mine Project since the Board concluded the NIRB's original assessment of the Project and issued the Final Hearing Report in March 2006:

> *So it is fortunate that we have had around ten years of project interaction with the Kitikmeot Region and Nunavut to draw upon as experience at looking at the socioeconomic effects of the Doris amendment before the Board today. For close to decade, Nunavummiut have worked at Doris, Nunavut companies have performed contracted services there, and Inuit Organizations, municipalities, and government agencies have had the opportunity to become familiar with the Doris project.*[114]

In the Board's view it is important that the lessons learned with respect to both the positive and negative effects of this Project on the employment and business opportunities in the Region and the Territory are incorporated into updated instruments governing the Project as proposed to be amended. The Board has noted that the Inuit Impact Benefit Agreement concluded in 2015 by the Kitikmeot Inuit Association and the Proponent has benefitted from the lessons learned during the Project's development to date:

> *The Hope Bay IIBA, now a fully public document, contains different employment, training and contracting provisions than found in the old IIBA. In a fashion, the evolution of the IIBA associated with the Doris North project is an example of long-term adaptive management TMAC Resources is confident that going forward, the previous IIBA implementation experience will mean that greater success will be seen in delivering benefits and mitigating impacts to Inuit as a result of the Hope Bay project, including Doris. So when we get to the point of considering the socioeconomic effects of mining longer and more at Doris deposit, we have the benefit of some hindsight.*[115]

From the submissions of the parties, the comments of Community Representatives and members of the public and as indicated in questions by the Board, one of the key lessons of the development of this

[113] TMAC and the Government of Nunavut, Exhibit 57, NIRB Public Hearing File No. 05MN057, April 14, 2016.
[114] A. Buchan, TMAC, NIRB Public Hearing File No. 05MN047 Transcript, April 12, 2016, p. 186, lines 16-24.
[115] A. Buchan, TMAC, NIRB Public Hearing File No. 05MN047 Transcript, April 12, 2016, p. 188, lines 9-22.

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Project in the past involves the potential for adverse socio-economic effects when there is an unforeseen suspension of construction or operation at the mine and the mine enters short or long term care and maintenance. The Board shares the concerns raised by the Government of Nunavut and Indigenous and Northern Affairs Canada that the effects of these unplanned and temporary suspensions may be significant on the employment and business opportunities available in the Region. As such, the Board accepts that these types of conditions must be included in updated socio-economic monitoring terms and conditions as requested by these parties.

5.1.4. Conclusions and Recommendations of the Board

Term and Condition 28 in the existing Project Certificate addressed the potential for project effects on employment and business opportunities. The Board recommends that an amendment and additions to Term and Condition 28 are required to:

1. Reflect the establishment of a socio-economic monitoring committee for the region, the Kitikmeot Socio-economic Monitoring Committee (K-SEMC);
2. Better integrate the required project-specific socio-economic monitoring with the regional monitoring priorities and activities of the K-SEMC;
3. Add an express mechanism for monitoring and mitigating effects of premature (unplanned) short or long term suspension of construction or operation;
4. Address advanced transition planning and changes to socio-economic mitigation measures resulting from the Proponent's final closure of the mine; and
5. Update socio-economic reporting requirements to reflect these additions to the existing Term and Condition #28.

On this basis, the Board recommends that existing Term and Condition 28 be revised to read:

1. The Hope Bay Belt Socio-Economic Monitoring Committee is continued and renamed as the Hope Bay Socio-Economic Working Group. The invited members of the Hope Bay Socio-economic Working Group shall include the Proponent, the Government of Nunavut, Indigenous and Northern Affairs Canada, and the Kitikmeot Inuit Association and any other invitees the members of the Working Group may, from time to time invite to participate.
2. The central focus of the Hope Bay Socio-Economic Working Group shall be on collaborating to ensure that the Hope Bay Socio-Economic Monitoring Plan provides for appropriate Project-specific socio-economic effects monitoring as required throughout the life of the Project. The Hope Bay Socio-Economic Monitoring Plan shall apply to the Project as described in both the 2005 FEIS and the 2015 Amendment Application.
3. The Proponent, reflecting the input of the Hope Bay Socio-Economic Working Group shall produce an annual Hope Bay Socio-Economic Monitoring Plan report.

In addition, the Board recommends the following additions to Term and Condition 28:

1. Within one (1) year of the issuance by the NIRB of an amended Project Certificate, the Proponent will submit an updated Doris North Socio-Economic Monitoring Plan for the review of the Hope Bay Socio-Economic Working Group review and comment that identifies any updates,

changes and amended Terms of Reference for the Hope Bay Socio-Economic Working Group required to reflect the amendments to the Project as outlined in the 2015 Amendment Application. Any changes as agreed to by the Hope Bay Socio-Economic Working Group shall be submitted to the Nunavut Impact Review Board.

2. Two (2) years prior to the planned Final Closure of the Project, the Proponent shall, in collaboration with the Hope Bay Socio-Economic Working Group submit an updated Doris North Socio-Economic Monitoring Plan to the Kitikmeot Socio-Economic Monitoring Committee (K-SEMC) that will also include detail regarding specific measures that may mitigate the potential for negative effects as a result of Project closure.
3. Within six (6) months following an unanticipated temporary or final closure of the Project the Proponent shall, in collaboration with the Hope Bay Socio-Economic Working Group submit an updated Doris North Socio-Economic Monitoring Plan to the K-SEMC that will also include detail regarding specific measures that may mitigate the potential for negative effects as a result of the Project's temporary or permanent closure.
4. Two (2) years prior to the planned Final Closure of the Project, the Proponent shall submit to the NIRB an updated Human Resource Plan and Wellness Strategy for the Project that includes a Workforce Transition Strategy designed to mitigate the potential negative effects of Project closure on the affected communities of Nunavut.
5. Within six (6) months following an unanticipated temporary or final closure of the Project the Proponent shall, the Proponent shall submit to the NIRB an updated Human Resource Plan and Wellness Strategy for the Project that includes a Workforce Transition Strategy designed to mitigate the potential negative effects of Project closure on the affected communities of Nunavut.

5.2. EDUCATION AND TRAINING

5.2.1. Views of the Proponent

TMAC Resources Inc. (TMAC) noted in Package 4, Section 6.5.1 of the 2015 Amendment Application (the Application) that the original effects assessment within the 2005 Doris North Final Environmental Impact Statement (2005 FEIS) regarding education and training opportunities would remain valid for the Application. TMAC predicted that the proposed amendment would result in benefits to skills development within the Kitikmeot region, and that more Inuit community members would be able to take advantage of education and training opportunities the longer the mine would be in operation. Consequently, TMAC noted that higher levels of education and training attained by Inuit community members would result in increased human capital within the Kitikmeot region, which would support continued economic development across the region and minimize the need for external hiring. TMAC noted that the mitigation measures as originally proposed in the 2005 FEIS remained appropriate to address education and training opportunities associated with the Application. TMAC committed to continuing to participate in the following education and training initiatives in collaboration with the Nunavut Arctic College and the Kitikmeot Inuit Association (KIA) to enable a greater proportion of Nunavummiut to meet project employment requirements: Cambridge Bay Community Readiness Committee, KIA ASETS Program Working Group, Nunavut Mine Training Roundtable, and a joint venture with Geotech Drilling and the KIA to provide training opportunities to Inuit in surface and underground exploration drilling.

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Within its response to technical comments, TMAC committed to providing the Government of Nunavut (GN) with a confidential manpower plan of required positions at the Doris North Gold Mine in 2016. TMAC further committed to categorizing the list of positions in relation to the following three (3) levels of education required – post-secondary education, high school, or on-the-job training – and conduct a supplemental analysis of the labour demand. The Proponent further elaborated on training commitments within Schedules D of the March 30, 2015 Hope Bay Belt Project Inuit Impact Benefit Agreement (IIBA) and noted that it would develop and implement training and education programs, including an Inuit summer student program, in conjunction with its human resources strategy. In the Proponent's response to technical comments, TMAC provided a copy of a previous mine training Memorandum of Understanding (MOU) between the KIA, the Kitikmeot Economic Development Commission, previous owner of the Project, Hope Bay Mining Ltd., the Nunavut Arctic College, and the GN-Department of Education. TMAC suggested that there was potential for a similar MOU to be signed by relevant parties in the future, including the potential for the inclusion of its third party contractor responsible for mining activities at the Doris North Gold Mine.

5.2.2. Views and Concerns of Interested Parties

Within its final written submission, the Government of Nunavut (GN) commented on education and training initiatives related to youth employment, apprenticeship programs, and occupational and supply modelling. The GN noted that while the GN-Department of Education encourages third party organization partnerships to provide education and training opportunities, engagement should not interfere with the government's delivery of education programs. The GN discussed the need for discussions on youth education initiatives to be conducted prior to proponent-led initiatives being undertaken and recommended that the Proponent be required to discuss with the GN-Department of Education at the executive level prior to engaging with individual schools. The GN added that its recommendation was intended to streamline communications and initiatives being undertaken in all Nunavut regions. The GN further recommended that any apprenticeship training should occur in conjunction with the GN-Department of Family Services, Career Development Division, and in accordance with the *Apprenticeship, Trade, and Occupations Certification Act* and associated regulations. Further recommendations were made regarding the reporting of the number and home community of all registered apprentices and journeypersons associated with the proposed amendment.

Within its response to final written submissions, TMAC committed to complying with the *Apprenticeship, Trade, and Occupations Certification Act* and associated regulations and agreed to communicate with the GN-Department of Education headquarters staff prior to undertaking planned initiatives related to youth employment or education. TMAC added that any communication or collaboration between TMAC and the GN-Department of Education would be consistent with commitments made within the March 30, 2015 Hope Bay Belt Project Inuit Impact Benefit Agreement, including those related to training and educational support.

The GN commented on the manpower plan shared by TMAC in follow-up to commitments made in the Proponent's response to technical comments. The GN discussed the importance of understanding the labour requirements of the Project so that it can provide the necessary programs and services to support increased regional employment. The GN recommended that the Proponent provide a detailed staff schedule to the NIRB and the GN prior to each major project phase of the Project. Within its response to final written submissions, TMAC committed to providing a detailed staff schedule to the NIRB and the GN annually, as well as updates when significant revisions have been made.

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Within its final written submission, INAC commented on TMAC's commitment made within its response to technical comments to submit a Human Resources Plan and Wellness Strategy. INAC recommended that, pending approval of the proposed amendments, multiple terms and conditions currently within the Appendices to existing Project Certificate No. 003 be included within the Human Resources Plan and Wellness Strategy, specifically pertaining to: counselling and life skills training, orientation programming, alcohol and drug education programming, financial management workshops, and on-the-job support systems and resources.

Within TMAC's response to final written submissions, TMAC noted that although its commitments with regards to an employment support system were detailed within the IIBA, it would identify and describe related items within the Human Resources Plan, to the extent possible. TMAC further committed to providing INAC and the GN with details on relevant policies and programs as they are developed and implemented. In addition, TMAC made multiple commitments regarding employee support, including but not limited to orientation programming, Inuit cultural and cross-cultural orientation and training for all employees, and provision of country foods. During the Public Hearing, INAC discussed its previous concerns with regards to the content of the Human Resources Plan and TMAC's proposed revisions to INAC's recommended commitments; INAC noted that it accepted the proposed modifications.[116]

In response to statements made by the Board regarding the importance of apprenticeship and training programs during the Public Hearing, TMAC noted that:

> *We are committed to career development plans for every Inuk worker so that if he started in an entry-level position, we don't say that you'll be in that job for your entire career at Hope Bay. There's development and progression that we can look at for every worker as part of what we've committed to under the IIBA.*[117]

One community member asked for further clarification on whether TMAC would rather hire people with higher education/certification and training compared to those with less formal training:

> *Yes, they will know more about the dangers of mining if they get full training. I believe that. But on the other hand, at the -- in more recent times, we have very low employment rate, and people are going hungry. Because of that, I think it would be -- it would benefit our young people if they were to work for the mine so that they can purchase big-ticket items such as vehicles that they could use when they get home.*[118]

TMAC responded that while there are many jobs that require some form of training and qualifications, training would be provided on-site and opportunities for advancement would be available. TMAC further noted a mechanism within the March 30, 2015 Hope Bay Belt Project Inuit Impact Benefit Agreement that if the company did not meet an Inuit training target it would have to contribute to a training and education fund.[119] As a reply, the community member concluded that with regards to the younger generations:

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[116] T. Fast, Indigenous and Northern Affairs Canada, NIRB Public Hearing File No. 05MN047 Transcript, April 13, 2016, p. 309, lines 5-20.
[117] A. Buchan, TMAC, NIRB Public Hearing File No. 05MN047 Transcript, April 12, 2016, p. 198, lines 17-23.
[118] B. Nirlungayuk, Kugaaruk, NIRB Public Hearing File No, 05MN047 Transcript, April 13, 2016, pp. 402-403, lines 22-26, and lines 1-4.
[119] A. Buchan, TMAC, NIRB Public Hearing File No. 05MN047 Transcript, April 13, 2016, p. 404, lines 3-17.

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They have to stand up on their own two feet and right now some are unemployed and we'd like to see your dream come to a reality seeing people hired and trained at -- I'd like to see people own their own homes. There's a lot of people -- skilled people and people that are willing to help in any capacity in their home communities. They are unemployed people, and I know that you can give them that opportunity.[120]

5.2.3. Views of the Board

The Board further raised questions on the level of certification that workers, particularly heavy-equipment operators, would receive on-site and whether this certification would be recognized off-site and could be transferred to other employment opportunities in Nunavut.[121] TMAC outlined that as the Doris North Gold Mine site would be off of the Nunavut roadway system, workers could legally operate heavy equipment without a valid Nunavut driver's licence, which would be a requirement to operate heavy equipment within the communities. It was noted that the recent heavy equipment training provided within the Kitikmeot region included testing through the GN Motor Vehicles; TMAC understood that many of its contracted operators would also have their Class 3 driver's licence.[122]

The Board further questioned the GN on whether there were more students entering apprenticeship programs, particularly with regards to heavy-equipment operations.[123] Through a deferred response, the GN reported that approximately 120 to 130 individuals are trained annually by the territory through apprenticeship programs. While the GN did not have specific data with regards to the number of students enrolled in heavy-equipment operating programs, it noted that there appeared to be a steady participation rate.[124]

As expressed at the Public Hearing, in the Board's view cooperation between the Government of Nunavut, the Kitikmeot Inuit Association, and the Proponent is required to ensure that all Nunavummiut benefit from training and certifications that will provide opportunities for employment even after the Project has ended. [125] Although the Board recognizes that many of the training targets, programs and formal commitments of the Proponent applicable to training for Inuit in the region are contained within the March 30, 2015 Hope Bay Belt Project Inuit Impact Benefit Agreement (IIBA), the IIBA is narrower in scope than the commitments made in Appendix A of the existing Project Certificate No. 003. Consequently, although TMAC had suggested that all references to commitments associated with "business opportunities" be removed from an amended Project Certificate, the Board agrees with the Government of Nunavut that all parties engaged in the assessment and provision of training to meet labour force demands need to communicate regularly in order to ensure the training being offered reflects current needs and opportunities.

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[120] B. Nirlungayuk, Kugaaruk, NIRB Public Hearing File No, 05MN047 Transcript, April 13, 2016, pp. 404-405, lines lines 25-26, and lines 1-7.

[121] E. Copland, Board Chair, clarifying question of G. Alikut, Board Member, NIRB Public Hearing File No. 05MN047 Transcript, April 13, 2016, p.254, lines 3-15.

[122] A. Buchan, TMAC, NIRB Public Hearing File No. 05MN047 Transcript, April 13, 2016, pp. 254-265, lines 7-26, and lines 1-4.

[123] G. Alikut, Board Member, NIRB Public Hearing File No. 05MN047 Transcript, April 13, 2016, pp. 358-359, lines 21-26, and lines 1-3.

[124] D. Baikie, Government of Nunavut, NIRB Public Hearing File No. 05MN047 Transcript, April 14, 2016, p. 451, lines 1-14.

[125] G. Alikut, Board Member, NIRB Public Hearing File No. 05MN047 Transcript, April 12, 2016, pp. 198-199, lines 25-26, and lines 1-7.

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5.2.4. Conclusions and Recommendations of the Board

As articulated in Section 5.1.4: Views of the Board the Board is recommending several new requirements in addition to existing Term and Condition 28 that would ensure that the Proponent communicates and share data with the Government of Nunavut and the Kitikmeot Socio-economic Monitoring Committee about training and education programs being offered by the Proponent more generally; this communication is intended to include initiatives that may be in addition to those programs established under the March 30, 2015 Hope Bay Belt Project Inuit Impact Benefit Agreement (IIBA). These recommended terms and conditions do however also recognize that the Proponent's communications and sharing of data must be consistent with the terms of the IIBA in terms of disclosure.

The Board recommends the following additional Term and Conditions:

1. To the extent that such communications are consistent with and not limited by the Proponent's obligations under the 2015 Hope Bay Inuit Impact and Benefit Agreement (IIBA), the Proponent shall share information with the Government of Nunavut, Department of Education with respect to the Proponent's youth employment initiatives in their Human Resources Plan, and other programs that may relate to education and will, to the extent possible integrate the Proponent's activities into the existing Department of Education program, and communication and delivery plans.
2. To the extent that such communications are consistent with and not limited by the Proponent's obligations under the 2015 Hope Bay Inuit Impact and Benefit Agreement (IIBA), the Proponent shall provide the Government of Nunavut (GN) and the NIRB information regarding the labour force needs of the Project as it proceeds:
    a. the title and number of positions required by department or work area;
    b. the potential start dates; and
    c. to the level of education required (with reference to the specific positions);
    d. whether on-the-job or other forms of training and certification will be required (with reference to the specific positions).
3. To the extent that such communications are consistent with and not limited by the Proponent's obligations under the 2015 Hope Bay Inuit Impact and Benefit Agreement (IIBA), the Proponent shall share relevant data (quantitative and qualitative) concerning the implementation and success of training and education programs, with other socio-economic monitoring initiatives including the Hope Bay Socio-Economic Working Group and the Kitikmeot Socio-Economic Monitoring Committee.

5.3. TRADITIONAL ACTIVITY AND KNOWLEDGE

5.3.1. Views of the Proponent

The March 30, 2015 Hope Bay Belt Project Inuit Impact Benefit Agreement established the Inuit Environmental Advisory Committee as an on-going means of receiving community knowledge and traditional knowledge throughout the Project lifecycle. TMAC provided the following additional details with regards to the composition of the Inuit Environmental Advisory Committee:

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> *We have up to seven knowledgeable Inuit that are selected between TMAC Resources and the KIA that have either lived in the Hope Bay area or have intensively harvested from land in the Hope Bay area so that their knowledge of that land and the sea can be brought to the forefront in managing our project environmentally. … So the Inuit Environmental Advisory Committee does exactly that, is provide us an opportunity to hear from the people that know that land the best.*[126]

TMAC further noted that the Inuit Environmental Advisory Committee has held four (4) meetings since March 2015. In response to a request by a community representative for further clarification on the composition of the Inuit Environmental Advisory Committee, the Kitikmeot Inuit Association responded that the committee members represent Inuit with experience or family connections in the area.[127]

5.3.2. Views and Concerns of Interested Parties

During the Public Hearing, Fisheries and Oceans Canada (DFO) discussed the potential need for a *Fisheries Act* Authorization for Doris Lake related to potential localized effects to fish populations (see Section 4.2: Freshwater Aquatic Environment, Fish, and Fish Habitat for more information). In response to questions raised by the Kitikmeot Inuit Association (KIA) regarding Inuit harvesting and fishing rights and associated historical usage within the area, DFO noted that a *Fisheries Act* Authorization could be required for the Application as a result of Inuit harvesting fish in the area.[128]

One community member commented on potential long-term impacts to fish resulting from the proposed pipeline in Roberts Bay and whether the fish would be safe to eat:

> *I have a little bit of concern in regards to the -- the pipeline that is in the Roberts Bay that is not going to hurt any fish or anything, but perhaps in the future because there will be some plants growing in the area which fish or the mammals will be feeding on it. Perhaps in the long run, I think they will impact the water and the mammals or the fish in the area*.[129]

In response, TMAC noted that through its proposed effluent and baseline monitoring system as well as post-closure monitoring, fish species would be collected and tested for appropriateness as food. TMAC further noted that "*we certainly do anticipate that there will be no negative effects from the – from the pipeline, but with the monitoring, we will be able to identify whether or not there is and issue any notices that may be necessary in that regard*".[130]

One community member further discussed the need for TMAC to consult more with community members prior to undertaking exploration activities, as exploration activities can affect residents' use of the land:

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[126] A. Buchan, TMAC, NIRB Public Hearing File No. 05MN047 Transcript, April 12, 2016, pp. 180-181, lines 26, lines 1-6 and lines 12-15.
[127] G. Clark, Kitikmeot Inuit Association, NIRB Public Hearing File No. 05MN047 Transcript, April 14, 2016, pp. 472-473, lines 25-26, and lines 1-4.
[128] G. Williston, Fisheries and Oceans Canada, NIRB Public Hearing File No. 05MN047 Transcript, April 13, 2016, p. 285, lines 17-25.
[129] B. Nirlungayuk, Kugaaruk, NIRB Public Hearing File No. 05MN047 Transcript, April 13, 2016, p. 400, lines 19-26.
[130] J. Roberts, TMAC, NIRB Public Hearing File No. 05MN047 Transcript, April 13, 2016, p. 402, lines 4-13.

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> *It seems to be very difficult sometimes when -- at times when the helicopters are flying around these parts of our region. It becomes -- we become curious as to why they are -- why they are flying around and for what purpose. I think that it would be more advantageous to us if we were told as to what the companies are exploring for. We need to know. We are owners of the this land. We should be informed better informed about what is going on in our region. We should be consulted in advance before any exploration begins …*[131]

During the Community Roundtable, it was suggested that because traditional knowledge is very valuable to the Proponent and the regulators, there should be a mechanism for compensating traditional knowledge holders who are willing to share their knowledge.[132]

5.3.3. Views of the Board

Although recognizing that the Inuit Environmental Advisory Committee was established under the March 30, 2015 Hope Bay Belt Project Inuit Impact Benefit Agreement and is not intended to be a substitute for the general requirements imposed by the Board to incorporate and respond to Inuit Qaujimaningit received through the Project, in the Board's view this Committee is ideally situated to support the exchange of traditional and community knowledge on an on-going basis. The Board was particularly pleased to learn that the committee membership will include Elders and others who use/used the Hope Bay area and are knowledgeable about the area, its prior uses and ecology.[133]

5.3.4. Conclusions and Recommendations of the Board

The Board has not recommended any additions or revisions to the Project Certificate as a result of this aspect of the assessment.

5.4. CULTURAL, ARCHAEOLOGICAL AND PALEONTOLOGICAL RESOURCES

5.4.1. Views of the Proponent

In Package 4, Section 5.0, Appendix A of the 2015 Amendment Application, TMAC Resources Inc. (TMAC) provided details of archaeological surveys undertaken in 2011, 2013, and 2014 of the general area within the footprint of the proposed amendments that could potentially cause surface ground disturbances. Through assessment of potential effects of the proposed activities and extended project footprint on archaeological resources, TMAC concluded that there were generally no anticipated archaeological conflicts. Proposed measures to mitigate potential indirect effects were further provided.

It was noted that proposed activities related to the Tailings Impoundment Area water management and tailings deposition, Doris camp expansion, potential landfill in Quarry 3, Pad U expansion, and areas of the proposed Roberts Bay Laydown expansion were within the original respective project footprint. TMAC concluded that no archaeological concerns were expected due to the absence of known archaeological sites within these areas and the extent of the previous archaeological survey. TMAC committed to closely monitoring the following two (2) sites in proximity to the Roberts Bay laydown

[131] B. Nirlungayuk, Kugaaruk, NIRB Public Hearing File No. 05MN047 Transcript, April 14, 2016, p. 474, lines 13-25.
[132] S. Hiqiniq, Gjoa Haven, NIRB Public Hearing File No. 05MN047 Transcript, April 14, 2016, p. 475, lines 17-21.
[133] G. Alikut, Board Member, NIRB Public Hearing File No. 05MN047 Transcript, April 12, 2016, p.184, lines 20-26.

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area expansion area to confirm that no archaeological remains were present: one (1) landform west of the laydown area with noted high archaeological potential and one (1) site located on an elevated section of bedrock with 'good' archaeological potential. The results of archaeological surveys undertaken in 2008 for proposed quarries A, B, and D were outlined, which included the identification and documentation of seven (7) archaeological sites. It was noted that these sites were fully mitigated in 2010 and that no further archaeological concerns were expected. It was further noted that the proposed Doris Connector Vent Raise Pad and Access Road were rated as low potential for archaeological resources and that no archaeological conflicts were expected due to significant past disturbance over the entire surface of this landform and lack of evidence of archaeological remains. TMAC noted that it would undertake future archaeological studies and/or monitoring at the following locations: along the proposed Roberts Bay access road and discharge pipe route, Roberts Bay laydown area expansion, Quarry A (including a site with potential to be used for traditional activities located outside of the proposed quarry area), Doris camp, and Doris Central and Connector Vent Raise Pads.

5.4.2. Views and Concerns of Interested Parties

Within its final written submission, the Government of Nunavut (GN) commented on TMAC's statement that the majority of the project area has been surveyed in detail and that archaeological sites within most of the proposed expanded footprint are known, documented, and mitigable. The GN-Department of Culture and Heritage requested that in order to highlight the progress of the development activities, as well as the evolving status of archaeological and historical sites within the project development area, TMAC should provide an annual status report that includes maps and current details of all archaeological sites inventoried in the project development area. Within its response to final written submissions TMAC agreed with the GN's request and noted that all sites within the project development area have been inventoried, mapped, evaluated, and mitigated.

In response to questions raised by the Board during the Public Hearing, the GN clarified that the maps of archaeological resources would be produced by the Proponent and not the GN.[134] TMAC further explained its archaeological program, noting:

> *TMAC Resources and our previous project owners have identified and reported hundreds of archeological occurrences in the Hope Bay area over the years, and these are reported when they've have* [sic] *been identified to the territorial archeologist according to law of Nunavut. There is a strict confidentiality requirements around reporting archeological sites. Even though our surface infrastructure is planned to avoid archeological sites, most of our staff are unaware where these sites are located, so that they cannot be disturbed ... we have a contract archeologist that goes into the field every year in advance of our field program, we have multiple years, many years, of new archeological sites that have been investigated and reported to the territorial archeologist and perhaps because of the wealth of this information, it may be a little hard to have a compilation. And we're fully prepared to provide the territorial archeologist with, a -- you know, a compilation map that summarizes all the archeological sites that have been discovered so far in the project area.*[135]

[134] E. Zell, Government of Nunavut, NIRB Public Hearing File No. 05MN047 Transcript, April 13, 2016, p. 361, lines 2-5.

[135] A. Buchan, TMAC, NIRB Public Hearing File No. 05MN047 Transcript, April 13, 2016, pp. 362-363, lines 16-26, and lines 1-13.

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5.4.3. Views of the Board

As indicated by the Board, oral history would suggest that there may be archaeological resources along the coastal areas, as well as travel routes inland along the eskers.[136] Consequently, the Board, while recognizing the need for the locations of these sites to remain confidential, agrees with the Government of Nunavut that TMAC should keep the territorial archaeologist(s) informed about all sites that have been encountered by TMAC as there are expansions to the project development area.

5.4.4. Conclusions and Recommendations of the Board

With the Board's recognition of the importance of fully documenting archaeological resources, the Board recommends an additional term and condition be added to Project Certificate No. 003 to ensure that the Government of Nunavut receives updated information, at least annually, regarding all archaeological sites encountered by TMAC in the project development area, as follows:

6. By February 28th of each year when there are significant footprint changes to the project development area or an archaeological permit is requested, the Proponent will provide the GN-DCH with a series of maps and tables indicating the current status of all archaeological sites within the project development area. The Proponent shall consult with the GN-DCH to establish the contents of the maps and tables that must be submitted.

5.5. COMMUNITY WELLBEING

5.5.1. Views of the Proponent

TMAC Resources Inc. (TMAC) noted in Package 4, Section 6.5.1 of the 2015 Amendment Application that the Proponent anticipated that the original effects assessment within the 2005 Doris North Final Environmental Impact Statement (2005 FEIS) regarding health and social services would remain valid for the Application. In Package 4, section 7.0 of the 2015 Amendment Application TMAC predicted that the proposed amendments would result in minimal adverse effects on health care services, community well-being, and delivery of social services. TMAC stated that all residual adverse effects on community services were originally predicted in the 2005 FEIS to be negligible to minor and not significant.

5.5.2. Views and Concerns of Interested Parties

During the review of this project proposal, no party challenged or raised concerns regarding community wellbeing.

5.5.3. Views of the Board

Having heard no challenges to the conclusions reached by the Proponent in respect of this aspect of the 2015 Amendment Application and the Board also not having raised any questions or concerns regarding this aspect of the assessment, the Board has accepted TMAC's conclusion that effects on community wellbeing associated with the 2015 Amendment Application will be negligible to minor.

[136] P. Omingmakyok, Board Member, NIRB Public Hearing File No. 05MN047 Transcript, April 13, 2016, pp. 361-362, lines 7-26 and lines 1-9.

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5.5.4. Conclusions and Recommendations of the Board

Finding that the effects on community wellbeing associated with the 2015 Amendment Application are not significant, the Board has made no recommendations with respect to revisions to Project Certificate No. 003 in this regard.

5.6. COMMUNITY INFRASTRUCTURE

5.6.1. Views of the Proponent

TMAC Resources Inc. (TMAC) discussed its assessment and proposed mitigation and monitoring measures with regards to the housing component of the Community Services and Infrastructure Valued Socio-Economic Component associated with the 2015 Amendment Application (the Application) in Package 4, Section 6.5. TMAC stated that while the Application would not result in new socio-economic effects than were predicted in the 2005 Doris North Final Environmental Impact Statement (2005 FEIS) (i.e., predictions of residual and cumulative effects), regulatory environment and community concerns regarding mining development have evolved since the publication of the 2005 FEIS. TMAC suggested that an effects determination of the potential for project-induced direct or indirect effects on housing and overcrowding as a result of the proposed amendment was warranted due to general relationships found between development projects and impacts to community infrastructure, particularly housing. TMAC predicted that the Project as proposed to be amended by the Application would result in minimal adverse effects on housing and stated that all potential residual adverse environmental effects on community services and infrastructure were predicted in the 2005 FEIS to be negligible to minor and not significant. TMAC further predicted that expected project-induced increases to personal and business incomes as well as government revenues over the extended life of mine would result in an increase in the benefits to community services and infrastructure.

Using information provided by the Nunavut Housing Corporation and the Nunavut Bureau of Statistics, TMAC noted that there is a lack of available housing which has resulted in issues of overcrowding in the Kitikmeot communities, particularly in Taloyoak, Gjoa Haven, and Kugaaruk. Overcrowding was noted to be associated with health and other complications, including violence, depression, stress, and higher rates of infectious diseases. In addition, using results from the 2009/2010 Nunavut Housing Needs Survey, approximately 27% of the Kitikmeot public dwellings were reported as requiring major repairs.
TMAC noted that it did not anticipate that the proposed amendment would result in a direct effect on housing availability or overcrowding due to the proposed use of multiple-points of hire, the fly-in/fly-out nature of the Project, and provision of on-site accommodations. However, TMAC predicted that the Application would have minor effects on in-migration as a result of expected indirect and project-induced business growth which would result in additional strain on the housing demand. It was further predicted that any adverse effects on housing could have further implications for community service providers and governments. It was noted that any potential strain on housing demand would predominantly be experienced in Cambridge Bay.

TMAC's proposed mitigation strategy was to collaborate with local education and training institutions to meet project related employment requirements; it was suggested that indirectly increasing community capacity by increasing the number of skilled workers in the Kitikmeot region could reduce the need for external hiring and associated increases to housing demand. Specific mitigation measures were noted to include monitoring of local content plans of major contract bids; collaborating and partnering with

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education/training institutions to support local initiatives; and providing information to training institutions early to further maximize the inclusion of local skilled people in project related contract work. TMAC further noted that it expected project effects on housing to be minor as regional monitoring reports on the impact of the Hope Bay Project on in-migration indicated no associated negative impacts on housing availability.

5.6.2. Views and Concerns of Interested Parties

Within its response to technical comments, TMAC responded to concerns provided by the Government of Nunavut (GN) that the proposed workforce training would not be adequate to mitigate potential negative effects on housing in the Kitikmeot region throughout the life of the mine. Using the 2011 Housing Needs Survey Factsheet for Cambridge Bay, TMAC identified issues of overcrowding and substandard housing being primarily associated with public housing and reiterated that developing the regional workforce would be an acceptable mitigation strategy to address reasonably foreseen project-induced in-migration.

Within its final written submission, the GN commented on TMAC's response to technical comments and reiteration of its position in the 2015 Amendment Application that developing the regional workforce would be an acceptable mitigation strategy to reasonably foreseen project-induced in-migration. The GN noted that while higher incomes associated with project employment and access to proposed financial management workshops would result in benefits to an employee's financial status, the shortage of adequate affordable housing in the Kitikmeot region remains a serious issue. The GN further noted that without assistance, private housing options would likely not be feasible for project employees. The GN recommended that TMAC collaborate with the Nunavut Housing Corporation and with interested groups to improve employee access to a range of housing options, including private homeownership. Within its response to final written submissions TMAC re-iterated its conclusions that while there would be potential minimal adverse effects on housing due to the proposed mitigation strategies and that the Project is expected to have a minor effect on in-migration, it did not predict the Project would have a significant impact. TMAC noted that it did not intend to provide staff housing in the communities or develop an optional housing or homeownership plan. TMAC committed to providing financial management workshops and to reach out to third party providers (banks or financial institutions) to coordinate and facilitate the workshops. TMAC further committed to communicating such workshops with the GN and NHC. During the Public Hearing, NIRB staff asked TMAC to clarify statements that the extended mine life would potentially result in a positive impact from improving access to private home ownership. TMAC responded that through observation, individuals would have a greater chance at accessing financing options for home ownership with a long-term guaranteed income.[137]

Within its final written submission, the GN further commented on TMAC's commitment both within the Amendment Application and response to technical comments that developing a regional workforce would mitigate reasonably foreseeable project-induced in-migration. The GN noted that monitoring would be necessary to confirm this prediction and recommended that TMAC collaborate with the Kitikmeot Socioeconomic Monitoring Committee (K-SEMC) to provide project specific information relating to population demographics, when possible and subject to confidentiality agreements, including changes to pick up and drop off locations and listed address changes. The GN further requested that TMAC consider collaborating with the Nunavut Housing Corporation to develop and deliver a voluntary

[137] A. Buchan, TMAC, NIRB Final Hearing File No. 05MN047 Transcript, April 12, 2016, p. 197, lines 1-14.

housing survey to its Nunavummiut employees regarding the behaviour of mine employees. Within its response to final written submissions, TMAC noted that while it would continue to work through the Doris North Project Socio-economic Monitoring Committee (SEMC) to ensure that the relevant information on workers' community of residence, and any change in residence, is reported, it did not agree to providing a voluntary housing survey as it would not be warranted given the marginal benefits of the survey above the data already collected by the Socio-economic Monitoring Plan SEMP. Within the joint submission by TMAC and the GN of suggested terms and conditions it was proposed that a new term and condition be added that would require TMAC to collaborate with the GN and the Nunavut Housing Corporation to develop a voluntary housing survey and endeavour to cooperate with the Kitikmeot SEMC to provide the survey to Nunavummiut site personnel.[138]

5.6.3. Views of the Board

As recognized by TMAC during their assessment of this component of the 2015 Amendment Application, in the ten years since the Board reviewed the original Doris North Project proposal a significant shortage of housing has developed in all the Kitikmeot communities that will be the principal points of hire for the Project as amended by the 2015 Amendment Application. Despite the observation of the Proponent that perhaps the increased mine life from two (2) years to eight (8) years may improve access to private home ownership, in the Board's view, this is likely to only marginally improve the pervasive housing pressures in these Kitikmeot communities. The Board understands that there are multiple causes of these housing pressures and that the Project's contribution to an already strained housing system may be relatively minor. However, the Board is not convinced that the mitigation measure of developing a regional workforce, particularly in the short term, will be adequate to limit the potential for effects of project-induced in-migration. Consequently, the Board agrees with the Government of Nunavut that additional monitoring of in-migration specifically is warranted. This monitoring should be designed to assess whether the mitigation measure proposed by the Proponent is effective, and will enable all parties to determine if additional measures are required.

5.6.4. Conclusions and Recommendations of the Board

The Board recommends the addition of a new Term and Condition that requires the Proponent to work with the Government of Nunavut and the Kitikmeot Socio-Economic Monitoring Committee to distribute a voluntary anonymous housing survey for the Nunavummiut employees at the Doris North Mine that identifies any changes in residence into or out of the Kitikmeot communities. Any surveys returned to the Proponent would be provided to the Government of Nunavut for collation, interpretation and reporting of the aggregated data.

On this basis, the Board recommends the following new Term and Condition:

7. If the Government of Nunavut and the Nunavut Housing Corporation develop an anonymous voluntary housing survey, the Proponent shall make the survey available to Nunavummiut site personnel and the Proponent will return any completed surveys to the Government of Nunavut.

[138] TMAC and the Government of Nunavut, Exhibit 56, NIRB Final Hearing File No. 05MN047, April 14, 2016.

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5.7. HEALTH AND SAFETY

5.7.1. Views of the Proponent

TMAC Resources Inc. (TMAC) noted in Package 4, Section 6.5.1 of the 2015 Amendment Application (the Application) that the original effects assessment within the 2005 Doris North Final Environmental Impact Statement (2005 FEIS) regarding worker health and safety, which included on-site health and safety and protection services, remained valid for the Application. In Package 4, Section 7.0 of the Application, TMAC predicted that the proposed amendment would result in minimal adverse effects on health care services, public safety, and protection services. TMAC stated that all potential residual adverse environmental effects on community services were predicted in the 2005 FEIS to be negligible to minor and not significant. TMAC committed to develop the current and planned mitigation measures with regards to health and safety and protection services to accommodate the proposed changes associated with the Application. Mitigation measures included within the 2005 FEIS were referenced and noted to include: provision of qualified medical personnel, the development of emergency response and contingency plans, enforcement of safety policies, on-site alcohol and drug education and on-site alcohol and drug free policies, and collaboration with regional health services.

5.7.2. Views and Concerns of Interested Parties

During the review of the proposed project amendments, no party raised concerns or challenged the conclusions of the Proponent in respect of the health and safety component of the assessment of the 2015 Amendment Application.

5.7.3. Views of the Board

During the review of this project proposal, no party raised concerns or challenged the conclusions of the Proponent in respect of the health and safety component of the assessment of the 2015 Amendment Application.

5.7.4. Conclusions and Recommendations of the Board

Having accepted that the effects on health and safety associated with the Project as proposed to be amended by the 2015 Amendment Application will be negligible to minor; the Board has not recommended any changes to this aspect of Project Certificate No. 003.

6. OTHERS MATTERS TAKEN INTO ACCOUNT

6.1. ACCIDENTS AND MALFUNCTIONS

6.1.1. Views of the Proponent

Following the NIRB's Technical Meeting, TMAC provided a memo to Indigenous and Northern Affairs Canada (INAC) on March 3, 2016 which included details on how the marine outfall pipeline and diffuser would be engineered. TMAC's development of the memo was in response to INAC's concerns surrounding the potential for environmental consequences in the event of a failure or malfunction from the construction and operation of the pipeline and diffuser at Roberts Bay. INAC noted throughout the

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technical review period and its final written submission that the proposed technology for this component is relatively new to the Arctic, and potential impacts are not well understood. INAC further noted in its final written submission that it was unclear whether appropriate maintenance, monitoring, or management would be in place to identify, prevent, or respond to hazards during construction and operation.

In its response to final written submissions, TMAC acknowledged that the March 3, 2016 memo was not successful in resolving INAC's concerns relating to the marine outfall pipe and diffuser and committed to providing a detailed design, including a hazard and operability study, for the marine discharge system during the land authorization process, prior to construction (pending Project approval). During the Public Hearing, INAC acknowledged its agreement with this approach and recommended that a term and condition be included in the amended project certificate to reflect this commitment, pending approval.[139]

In response to concerns raised by Transport Canada (TC) regarding the potential overwintering of vessels carrying fuel, TMAC indicated in its response to final written submissions that the overwintering of vessels carrying fuel is not currently planned and is not part of the proposed project scope in the 2015 Amendment Application. In the event that this component would be required, TMAC committed to complying with all TC's relevant regulatory requirements and guidelines. Further, TMAC also addressed TC's concerns regarding the safe handling and transportation of explosives proposed to be used on-site. TMAC noted within its response to final written submissions that it would remain in compliance with all relevant standards and regulations during the handling and transportation explosives and committed to seeking out safe and economical ways to improve explosives handling.

Throughout the technical commenting period and through final written submissions, TMAC provided additional information to Natural Resources Canada (NRCan) regarding the design and modelling studies associated with the proposed amendments to the Tailings Impoundment Area and the proposed interim dike. In its final written submission, NRCan recommended that TMAC conduct further characterization of the interim dike foundation prior to construction and revisit the thermal analysis to incorporate site specific foundation conditions in its thermal model. Within its response to final written submissions, TMAC committed to conducting further geotechnical studies to characterize the interim dike foundation and also noted that engineering analysis, including the thermal analysis, would be revisited as needed following foundation characterization. During the Public Hearing, NRCan acknowledged TMAC's commitments and noted that it supported TMAC's approach to further characterization of the proposed structures.[140]

6.1.2. Views and Concerns of Interested Parties

Within its technical review and final written submissions, Indigenous and Northern Affairs Canada (INAC) raised multiple concerns regarding potential impacts of an accident or malfunction associated with the proposed marine outfall system. INAC noted that an assessment of potential associated impacts has not been completed and that potential environmental and operational consequences of a system failure are not well understood, particularly in a northern environment. INAC further highlighted the uncertainty of

[139] F. Ngwa, Indigenous and Northern Affairs Canada, NIRB Public Hearing File No. 05MN047 Transcript, April 13, 2016, pp. 305-306, lines 7-26 and lines 1-3.
[140] R. Besner, Natural Resources Canada, NIRB Public Hearing File No. 05MN047 Transcript, April 13, 2016, pp. 321-322, lines 24-26 and lines 2-7.

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whether appropriate maintenance, monitoring, or management measures would be in place to identify, prevent, or respond to hazards during construction and operations. INAC noted that while TMAC has provided additional hazard identification and details related to the design of the marine outfall system, it had outstanding concerns of whether prevention, detection, or management of potential impacts would be appropriately implemented so that they would be unlikely to become significant. INAC concluded that it was unable to confirm that appropriate outfall system design and corresponding maintenance, monitoring, and management is in place to prevent or respond to potential hazards or accidental releases of untreated effluent into the receiving surface water or shallow marine water environment. INAC recommended that to mitigate potential risks, TMAC be required to provide detailed information for review during permitting, pending approval of the proposed project amendments, particularly a hazard and operability study and a professionally peer-reviewed detailed design of the marine outfall system. Within its response to final written submissions TMAC committed to providing a detailed design, including a hazard and operability study, for the marine discharge system during the land authorization process. TMAC stated that it agreed with INAC's proposed term and condition, pending approval of the proposed amendments.

Within its final written submission, Transport Canada (TC) commented on proposed activities associated with handling of explosives and over-wintering of fuel carrying vessels in conjunction with marine safety. TC provided details on the application of the recently amended *Cargo, Fumigation and Tackle Regulations*[141] associated with the *Canada Shipping Act, 2001*[142] and provided recommendations with regards to maximum handling amounts and reporting requirements. TC further recommended that, if in the future the Proponent has plans to over-winter vessels or barges carrying fuel, the respective vessel must comply with the updated TC *Guidelines for Over-Wintering of Vessels Carrying Oil or NLS in Canadian Waters.*[143] During the Public Hearing, TC indicated that all issues raised had been resolved through commitments by TMAC and that it had no outstanding concerns. In response to TMAC's request that TC clarify its position on TMAC's proposed amendment to term and condition 20 within Project Certificate No. 003, TC indicated that it supported TMAC's request to remove the required use of a containment boom for fuel and waste transfer from barge to shore from condition 20.[144]

6.1.3. Views of the Board

During the Public Hearing, the Board questioned TMAC on how it would manage aircraft landings in the event of a major spill on the multipurpose road and runway, especially during potential medical emergencies. In response to this question, TMAC stated that its comprehensive Emergency Response and Spill Contingency Plan is designed to manage spills of any type at any location on the site. Additionally, TMAC noted that should any aircraft not be able to land it would be rerouted to the nearest community, Cambridge Bay, as per normal aviation procedures.[145]

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[141] SOR/2007-128.
[142] S.C. 2001, c. 26.
[143] Government of Canada, Minister of Transport, (October, 2015), available on-line from the NIRB Public registry: http://ftp.nirb.ca/03-MONITORING/05MN047-DORIS%20NORTH%20GOLD%20MINE/01-PROJECT%20CERTIFICATE/03-AMENDMENTS/AMENDMENT%20No.1/9-HEARING/05-SUBMISSIONS/160315-05MN047-TC%20Final%20Written%20Submission%20App%20B-IA1E.pdf.
[144] A. Gudmundson, Transport Canada, NIRB Public Hearing File No. 05MN047 Transcript, April 13, 2016, p. 340, lines 13-16.
[145] J. Roberts, TMAC, NIRB Public Hearing File No. 05MN047 Transcript, April 12, 2016, pp. 58-59, lines 20-26 and lines 1-13.

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The Board finds that there is considerable uncertainty surrounding the potential for effects from an accident involving the effluent pipeline both on land and in the marine environment which the Board has noted previously in Section 4.4.3 of this Report. Consequently, the Board is recommending that the Proponent provide the Board with the detailed design for the system prior to construction. In addition, the Board agrees with the recommendation of Indigenous and Northern Affairs Canada that the Proponent should conduct a hazard and operability study along the entire pipeline prior to operation,

However, with the exception of these two outstanding issues, the Board is satisfied with the Proponent's conclusions with respect to the impacts likely to be associated with accidents and malfunctions, as presented in the Application.

The Board acknowledges that, recognizing the experience of this and other mine developers in Nunavut, and noting the agreement of Transport Canada, it is appropriate for the Board to modify the requirement to maintain a containment boom in place while conducting fuel transfer as set out under existing Term and Condition 20.

6.1.4. Conclusions and Recommendations of the Board

The Board recommends the addition of the following Term and Condition to ensure that the Proponent has sufficient information regarding the potential for effects that could result from an accident involving the effluent pipeline:

1. At least six (6) months prior to construction of the effluent pipeline and diffuser system the Proponent shall provide the NIRB with a detailed design for the system that includes the location of the pipeline in relation to the existing roadway, the location of the small jetty supporting the pipeline and the design of the diffuser.
2. At least six (6) months prior to operation of the effluent pipeline and diffuser system, the Proponent shall conduct and submit to the Board a hazard and operability study of the pipeline and marine outfall system as part of the land authorization process.

6.2. ALTERNATIVES ANALYSIS

6.2.1. Views of the Proponent

During the NIRB's Technical Meeting, TMAC presented an Alternative Water Management Strategy designed as an alternative Water Management Plan in place of discharging saline groundwater directly into Roberts Bay. The Alternative Management Strategy, which was identified as Option 2 in the 2015 Amendment Application (the Application), was proposed as an interim measure in response to Environment and Climate Change Canada's (ECCC) and Fisheries and Oceans Canada's (DFO) concerns regarding potential impacts to fish and fish habitat resulting from the proposed direct discharge of saline groundwater into the marine environment. This interim measure was also suggested to address the current lack of protocols within the *Metal Mining Effluent Regulations* (MMER) to appropriately assess saline discharge on relevant marine species, as only rainbow trout, a freshwater species of fish, are currently authorized to be used to test for acute lethality. ECCC reiterated in its final written submission that the current MMER requires that all effluent must be demonstrated to be non-acutely lethal to rainbow trout, and that there is no analogous marine species that can be used. Although ECCC is currently developing an updated reference test method using an appropriate marine species to

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properly assess potential saline discharge impacts, for the purposes of this assessment, this updated reference test method has yet to be developed.

TMAC noted in a memo submitted to the NIRB on April 6, 2016 that to allow ECCC time to amend the MMER to include protocols for saline tolerant aquatic species, it would employ the following interim groundwater management measures as part of the Interim Water Management Strategy:

- Discharge of 415,000 cubic metres of excess saline groundwater into the Tailings Impoundment Area (TIA) from underground workings for up to a year or more, as needed;
- Storage of groundwater in the TIA until the sodium chloride (NaCl) is diluted to less than 10,000 milligrams per litre (mg/L); and
- Discharge of MMER compliant excess water from the reclaim pond into Roberts Bay year-round.

Based on modelling results, TMAC noted in the memo that peak salinity levels in the TIA would be approximately 2,033 mg/L (expressed as Cl), which would be below the rainbow trout toxicity limit of 6,000 mg/L (expressed as Cl) and 10,000 mg/L (expressed as NaCl) that form current MMER standards. TMAC noted further that, based on these modelling results, discharge from the TIA to Roberts Bay would be possible as effluent could meet toxicity testing; however, if required, the TIA would have sufficient design capacity to operate without discharge during the storage period. During the Public Hearing, TMAC further illustrated in Exhibit 16, the Proponent's presentation about the groundwater environment, that NaCl concentrations during the initial discharge of inflow water into the TIA would be over testing limits, but that discharge concentrations would stay below 6,000 mg/L (expressed as NaCl) beyond Day 500 within their model.[146]

TMAC further noted within the memo that the increased salinity of the TIA could act as an attractant to wildlife which was identified as a negative effect that would be mitigated through measures contained in the Wildlife Mitigation and Monitoring Plan (WMMP). TMAC indicated that the existing WMMP is being revised in collaboration with regulators, intervenors, and the Inuit Environment Advisory Committee in response to technical comments regarding the need for monitoring to: determine if large mammals (e.g., caribou) and waterfowl are attracted to the TIA as a source of salt; identify the need for adaptive management measures relating to the alternative water management strategy; and implement a caribou health risk assessment.

TMAC indicated that it would revert to its preferred water management plan (the discharge of groundwater to a marine mixing box and discharged to Roberts Bay) once the MMER is amended to permit the use of salt tolerant species for toxicity testing.

With respect to the alternative means of disposing of waste rock (the preferred alternative being disposal underground) TMAC noted that although a contingency plan would be to leave some waste rock at the surface as is authorized under the current Project Certificate No. 003; however, the Proponent does not anticipate having to use this option.

[146] TMAC, Exhibit 16, NIRB Public Hearing File No. 05MN047, Transcript, April 12, 2016, p. 104.

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6.2.2. Views and Concerns of Interested Parties

Indigenous and Northern Affairs Canada (INAC) discussed the proposed management of potentially and non-potentially acid generating (PAG and NPAG) waste rock by backfilling the underground mine space. INAC did not consider TMAC's approach to be conservative and indicated that it could be difficult to achieve for various reasons, including potentially limited available space for underground disposal, which could result in significant environmental risks. INAC recommended that the Proponent provide a completed impact assessment of potential effects, including confirmation that targets of backfill compaction and filling of void spaces would be achieved and proposed contingency measures should underground space be unavailable, for review prior to the Public Hearing. During the Public Hearing, INAC noted that this concern remained unresolved and recommended that a term and condition be incorporated into the amended project certificate, pending approval of the proposed amendments, to require the monitoring of mine waste rock placement on the ground to confirm that backfill compaction and filling targets are achieved. INAC recognized that although a component of this condition is already incorporated into TMAC's current water licence it recommended that the proposed term and condition be considered to ensure that backfill targets and void space filling is accounted for through monitoring and compliance with project certificate terms and conditions.[147]

6.2.3. Views of the Board

During the Public Hearing the Board questioned why mining equipment was sourced overseas instead of within Canada.[148] TMAC stated that the company commissioned an Australian company who specializes in modularized milling systems to meet the increased processing requirements described within the 2015 Amendment Application. TMAC noted that this company fabricates equipment well suited for the proposed mining environment and that this equipment is not currently available in Canada.[149]

6.2.4. Conclusions and Recommendations of the Board

The Board acknowledges the concern expressed by Indigenous and Northern Affairs Canada with respect to the Proponent's projections of being able to ensure that all waste rock is returned underground and is able to be compacted sufficiently to backfill the underground space. However, with the clear recognition of the jurisdiction of the Nunavut Water Board to regulate potential deposits of waste into both freshwater and groundwater and therefore to regulate the placement and storage of waste rock and after considering the existing term and condition contained in Part G, Item 12(e) under the Type "A" Water Licence for the Project, 2AM-DOH1323, the Board has declined to add an additional term into the existing Project Certificate No. 003, as it appears to the Board that the requested term and condition is more appropriately handled as a requested amendment to the Type "A" Water Licence.

[147] F. Ngwa, Indigenous and Northern Affairs Canada, NIRB Public Hearing File No. 05MN047 Transcript, April 13, 2016, pp. 307-308, lines 7-26, and lines 1-2.
[148] G. Alikut, Board Member, NIRB Public Hearing File No. 05MN047 Transcript, April 12, 2016, p. 57, lines 10-16.
[149] J. Roberts, TMAC, NIRB Public Hearing File No. 05MN047 Transcript, April 12, 2016, pp. 57-58, lines 17-26, and lines 1-4.

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6.3. CUMULATIVE EFFECTS

6.3.1. Views of the Proponent

As outlined in Table 4 below, the Proponent included the following Valued Ecosystem Components (VECs) and Valued Socio-economic Components (VSECs) for potential cumulative effects:

Table 4: Summary of Proponent's Cumulative Effects Conclusions for Specific VECs and VSECs

VEC/VSEC	Conclusions
Atmospheric and Terrestrial Environment	TMAC determined that, contingent on the application of mitigation measures and adaptive management protocols, no residual or cumulative effects would occur on air quality and atmospherics.
Freshwater Aquatic Environment	TMAC concluded that potential changes to Doris Lake and stream outflow systems resulting from the permitted withdrawal of 480,000 m^3 would remain within natural variability and that no additional adverse effects would be predicted than were included in the 2005 Doris North Final Environmental Impact Statement (2005 FEIS). However, the cumulative impacts of water losses due to increased underground mining activities under Doris Lake were predicted to result in serious harm to fish and fish habitat.
Terrestrial Wildlife and Wildlife Habitat	TMAC concluded that, contingent on the application of mitigation measures, no residual or cumulative effects were anticipated to occur on the terrestrial environment.
Marine Environment	TMAC concluded that, contingent on the application of mitigation measures, no residual or cumulative effects were anticipated to occur in the marine environment.
Marine Wildlife	TMAC concluded that no significant negative cumulative effects to commercial, recreational or aboriginal fisheries were anticipated from proposed works, and that the addition of coarse substrates within Roberts Bay would increase fish habitat availability in the area.
Employment and Business Opportunities	TMAC noted that it anticipated that the original effects assessment within the 2005 FEIS regarding employment and business opportunities and the economy would remain valid for the Application. TMAC further concluded that as a result of the extension of mining operations by four (4) years, employment, contract, and business opportunities would be increased and prolonged compared to the original predictions and that there would be an increase in overall total benefits.
Education and Training	The original effects assessment within the 2005 FEIS regarding education and training opportunities would remain valid for the 2015 Amendment Application (the Application). TMAC predicted that the proposed project amendments would result in benefits to skills development within the Kitikmeot region, and that more Inuit community members would be able to take advantage of education and training opportunities the longer the mine would be in operation.

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VEC/VSEC	Conclusions
Cultural, Archaeological and Paleontological Resources	Through assessment of potential effects of the proposed activities and extended project footprint on archaeological resources, TMAC concluded that generally there were no archaeological cumulative effects anticipated.
Community Well Being	TMAC concluded that the original effects assessment within the 2005 FEIS regarding health and social services would remain valid for the Application. TMAC stated that all residual adverse environmental effects on community services were originally predicted in the 2005 FEIS to be negligible to minor and not significant.
Community Infrastructure	TMAC stated that while the proposed project amendments would not result in new socio-economic effects than were predicted in the 2005 FEIS (i.e., predictions of residual and cumulative effects), regulatory environment and community concerns regarding mining development have evolved since the publication of the FEIS. TMAC noted that based on mitigation measures it did not anticipate that the proposed amendment would result in a direct effect on housing availability or overcrowding. TMAC indicated that the Project as amended could have minor effects on in-migration as a result of expected indirect and project induced business growth which would result in additional strain on the housing demand, predominantly in Cambridge Bay. It was further predicted that any adverse effects on housing may have implications for community service providers and governments.
Health and Safety	TMAC indicated the original effects assessment within the 2005 FEIS regarding worker health and safety, remained valid and that all residual adverse environmental effects on community services predicted in the 2005 FEIS to be negligible to minor and not significant. TMAC also predicted that the proposed amendment would only result in minimal adverse effects on health care services, public safety, and protection services.

On the basis of the assessment of effects contained in the 2015 Amendment Application, TMAC concluded that there were no significant cumulative effects associated with the Project as proposed to be amended.

6.3.2. Views and Concerns of Interested Parties

Within its technical review submission, the Kitikmeot Inuit Association (KIA) expressed its concerns that the addition of effluent from both the reclaim pond of the Tailings Impoundment Area and the Madrid Advanced Exploration Program could result in potential cumulative effects in Roberts Bay. The KIA indicated that these concerns should be taken into consideration when assessing and predicting potential discharge effects in Roberts Bay. However, the KIA noted in its final written submission that TMAC had committed to completing additional associated studies of the effluent quality and that this additional information meant that KIA indicated there were no outstanding concerns.

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None of the other Intervenors contributing to the Board's reconsideration raised specific concerns about the potential for cumulative effects associated with the 2015 Amendment Application. The Intervenors also did not challenge the conclusions with respect to cumulative effects provided by TMAC in its updates to the 2005 FEIS. Similarly, Community Representatives also did not identify specific concerns in relation to the potential for cumulative effects associated with the 2015 Amendment Application.

6.3.3. Views of the Board

The Board accepts the conclusions of the Proponent that the monitoring and mitigation of potential effects associated with the 2015 Amendment Application should, for the most part limit the potential cumulative effects that may be associated with the Project as TMAC has proposed to amend it. The Board does however have some concerns with respect to the potential for cumulative effects associated with the discharge into the marine environment and increased strains on housing in the Kitikmeot communities due to project induced in-migration.

The Board notes further that the Proponent is currently pursuing development in several areas of the Hope Bay Belt outside of the Doris North Gold Mine, and that the assessment of the proposed amendments to the Doris North Gold Mine was occasionally complicated by the close association of proposed activities to other ongoing and planned activities. The Board recognizes that the regulatory processes in Nunavut as established through the Nunavut Land Claims Agreement and other Canadian legislation provide for a series of checks and balances aimed at ensuring development projects receive sufficient scrutiny and oversight to ensure environmental protection, while allowing project developers to have the necessary flexibility to develop capital intensive projects incrementally in phases when feasible.

The NIRB's monitoring program for the Doris North Project is well established and provides additional assurance to the Board that cumulative effects associated with the proposed project amendments and other TMAC activities within the Hope Bay Belt can be appropriately managed moving forward. It will be increasingly important, however, for the Proponent to recognize and respect the importance of staging and timing its various developments appropriately to minimize environmental disturbance and potential environmental impacts, while maximizing the delivery of benefits such as employment for Inuit and contracting opportunities for local businesses. The Board believes it is important to promote a precautionary approach to developing across geographically large areas such as the Hope Bay Belt, to ensure that the potential for cumulative effects to far-ranging wildlife species and the overall environment are fully understood and can be adequately managed before additional incremental development is approved to proceed.

6.3.4. Conclusions and Recommendations of the Board

In order to limit the potential for cumulative effects associated with the marine discharge the Board has recommended specific additions to the existing Project Certificate terms and conditions to address these impacts, which are discussed in greater detail in 4.4.4 Conclusions and Recommendations of the Board. With respect to reducing the potential for cumulative effects on housing availability in the Kitikmeot communities that will serve as points of hire and that may consequently be associated with project induced in-migration, the Board has also recommended additional terms and conditions with the objective of monitoring for these potential effects as outlined in Section 5.6, Community Infrastructure, Section 5.6.4 Conclusions and Recommendations of the Board.

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6.4. REGULATORY PROCESS GOVERNING DISCHARGES INTO THE MARINE ENVIRONMENT

6.4.1. The Developing Regulatory Framework for Marine Discharges

During the Technical Meeting and Public Hearing for this file, there was considerable discussion regarding the regulatory framework that would govern the effluent pipeline and associated outflow structure/diffuser into Roberts Bay. The parties expressed some confusion initially as to the extent of the Nunavut Water Board's (NWB) jurisdiction over these structures as some parties indicated that this discharge would constitute the deposit of waste into water that could be authorized under a Type "A" Water Licence. However, the NWB clarified for all parties that the NWB's jurisdiction is limited to the deposit of waste into inland (not marine) waters.[150] Reflecting this limitation, the NWB indicated that the NWB would have jurisdiction over only specific components of the effluent discharge system, including the pipeline that would be on land. Consequently, the NWB could regulate the spill contingency plans and measures proposed to limit the potential for releases of effluent onto land, but it would not be within the NWB's jurisdiction to regulate the effluent pipeline in the marine environment along the floor of Roberts Bay, the effluent outflow/diffuser structure or the "end of pipe" effluent quality at the point of discharge into the marine environment. Although Environment and Climate Change Canada (ECCC) and Indigenous and Northern Affairs Canada (INAC) both acknowledged the limits on the NWB's jurisdiction and indicated that ECCC had some regulatory responsibility for marine discharges under the general pollution provisions of the *Fisheries Act*, R.S.C. 1985, c. F-14, these parties deferred discussion of the specific regulatory framework that could govern the effluent pipeline and outflow/diffuser structure until follow up discussions with TMAC.

At the Public Hearing, in response to questioning by Board staff, INAC clarified that the pipeline and outfall structure in the marine environment would be governed by the terms and conditions of a land use permit issued by INAC:

> [MR. BARRY]: *Just one point of clarification, question for Indigenous and Northern Affairs Canada. In your presentation, you reference the -- I believe it's the land-use permit that would be required for the jetty area, which includes the pathway for the marine discharge. Can you confirm whether or not that authorization would also include the use of the -- the placement of the marine pipe on the marine sea floor -- or to the diffuser.* [151]
>
> [MS. COSTELLO]: …*There is an existing lease for the jetty with our department. Whatever the authorization that will be for the marine outfall and the associated infrastructure, including the pipeline, will be covered.* [152]

Also as discussed in more detail in Section **Error! Reference source not found. Error! Reference source not found.**, under the **Error! Reference source not found.** and the **Error! Reference source not found.** INAC, in its role as a regulator expressed that based on the "uncertainty in operation" of the marine

[150] *Nunavut Waters and Nunavut Surface Rights Tribunal Act*, S.C. 2002, c. 10, s. 4,and the definition of "waters" under that Act.
[151] R. Barry, NIRB, NIRB Public Hearing File No. 05MN047, Transcript, April 13, 2016, p. 314, lines 10-19.
[152] K. Costello, Indigenous and Northern Affairs Canada, NIRB Public Hearing File No. 05MN047, Transcript, April 13, 2016, pp. 314-315, lines 23-26, and line 1.

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effluent discharge system that it would like to see the Board add a specific term and condition in the Project Certificate that would require the following:

> *We believe that an understanding of system design details, particularly the plans and procedures to identify, respond to, and mitigate any potential failures or malfunctions with the system is essential. As such, INAC recommended in our Final Written Comment Number 3 that, if approved the amended project certification [sic certificate] contain the following term and condition: The proponent shall provide for review a detailed design and hazard and operability study related to the marine outfall system as part of the land authorization process prior to construction.*[153]

6.4.2. Conclusions and Recommendations of the Board

The Board shares the view of the Intervenors and Community Representatives that there remains some uncertainty regarding the potential for effects on the marine environment from the presence of the pipeline and the discharge of effluent into Roberts Bay. Reflecting this uncertainty and concerns, the Board has recommended additional terms and conditions applicable to the pipeline and diffuser, as described more fully in Sections 4.4.4 Conclusions and Recommendations of the Board and 6.2.4 Conclusions and Recommendations of the Board.

7. RECOMMENDATION TO THE MINISTER

After due consideration and in accordance with the process for reconsidering an existing Project Certificate as set out in Article 12, Part 8, Section 12.8.2 of the Nunavut Land Claims Agreement, the Board has determined that TMAC Resources Inc.'s proposed amendments as described in the 2015 Amendment Application to NIRB Project Certificate No. 003 for the Doris North Gold Mine NIRB File No. 05MN047 can proceed in accordance with the Board's Public Hearing Report and recommended revisions to the terms and conditions of Project Certificate No. 003.

8. RECOMMENDED PROJECT SPECIFIC TERMS AND CONDITIONS

8.1. THE NIRB'S MONITORING PROGRAM

As set out in Article 12, Sections 12.7.1 and 12.7.2 of the NLCA the NIRB has the jurisdiction to establish a project-specific monitoring program to: measure the ecosystemic and socioeconomic effects of a project; assess whether the project is in compliance with the prescribed project terms and conditions; share information with regulatory agencies to support the enforcement of land, water or resource use approvals and agreements; and to assess the accuracy of predictions contained in the environmental impact statements. Given the Board's application of the precautionary approach to several aspects of the Project amendments, in the Board's view project-specific monitoring will play a crucial role in addressing the uncertainty regarding project effects and enabling all parties to adapt mitigation measures on an ongoing basis to ensure the Project's negative effects are prevented or limited to the extent possible.

[153] F. Ngwa, Indigenous and Northern Affairs Canada, NIRB Public Hearing File No. 05MN047, Transcript, April 13, 2016, p. 305, lines 14-24.

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The role of the Board with respect to the establishment of monitoring programs is to focus the terms and conditions in relation to the Project. With respect to existing or future general regional and territorial monitoring programs that may include some of the same monitoring parameters/indicators as the project-specific monitoring program, the NLCA also directs the NIRB to avoid duplication but facilitate co-ordination and integration between the project-specific monitoring programs required by the NIRB and more general programs such as the Nunavut General Monitoring Program. Where the requirements of regional or territorial programs are more extensive or substantively different than those established through the project certificate, at all times the Proponent must ensure compliance with the project certificate terms and conditions.

In order to co-ordinate, integrate and avoid duplication with other monitoring programs, but also to ensure that the NIRB's project-specific monitoring program yields the information required to measure effects and adequately assess compliance with terms, conditions, regulatory instruments and agreements, the NIRB's monitoring program is developed after consultation with responsible authorities, the resource and land owners and the proponent following a Regulators' Meeting that typically occurs within several weeks after the responsible Minister has issued a decision that the Project can proceed to obtain regulatory authorizations and providing the Minister's direction regarding recommended terms and conditions. A short time after the Regulators' Meeting, the NIRB issued the Project Certificate, but the project-specific monitoring program, which is usually issued as an Appendix to the project certificate may not be issued in final form until some months after key regulatory authorizations, including land use permits, water licences, mineral leases, etc. are issued so that the monitoring program supplements and supports, and does not duplicate, the monitoring requirements in regulatory and land use instruments. Appendix D – Doris North Gold Mine Monitoring Program was issued to Miramar Hope Bay Limited on October 30, 2007 following consultation with regulatory parties.

It is important to remember that the NIRB's monitoring program will have varying requirements over the course of the Project lifecycle, and that monitoring requirements will apply from construction to eventual abandonment and reclamation. In areas where there may be a need for flexibility in relation to the terms and conditions of the project certificate or their application, the NIRB has endeavoured to reflect this in the associated language and/or acknowledge that objectives may be achieved through various means. In addition, in the event that the monitoring program needs to be modified to better achieve its purpose, the Board, the Proponent, the Designated Inuit Organization or other interested parties may cause the Board, under Section 12.8.2 of the NLCA to revisit the monitoring program, or any other terms and conditions in the NIRB project certificate.

8.1.1. Format of Recommendations

To maintain consistency with the existing Project Certificate and to provide clear direction on the intended application, objectives and reporting requirements, the NIRB has implemented a similar format for the revised project-specific terms and conditions as set out within this report.

It should be noted that for some of the existing terms and conditions of Project Certificate No. 003, a non-binding **Commentary** section had also been added following the specific term and condition as an aid to interpretation. The Commentary section reflects clarification of the term and condition, recording the common understanding and interpretation resulting from discussions and guidance provided at the Project Certificate Workshop. The Commentary section has been omitted from the revised terms and conditions as set out in Section **Error! Reference source not found.** below, should this report be accepted by the Minister, a Regulators' Meeting would be scheduled by the NIRB to revisit all associated

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commentary required to ensure effective implementation of approved terms and conditions moving forward.

Further, the Board is supportive of the approach to allowing for future administrative updating of the Appendices to Project Certificate No. 003 as proposed by TMAC and parties through Exhibit 58, to ensure that Proponent commitments are accurately captured in a non-duplicative and straightforward manner enabling more effective monitoring for the Project. Such updates are reflected in the recommended terms and conditions below.

8.1.2. General Provisions

The NIRB retains the ability to give additional clarification or direction, on an ongoing basis through its Monitoring Officer, with respect to compliance requirements for the Project. Upon request by the Proponent or other parties, the NIRB can provide additional clarification or direction regarding implementation of project certificate terms and conditions.

Where the objective of a project certificate term or condition can be achieved through more efficient alternate means, the Proponent is encouraged to consult with the NIRB (and other parties as required) to seek acceptance of proposed alternatives.

Where not specified, the NIRB recognizes and respects the role of other licensing and permitting processes yet to be completed. The NIRB strongly encourages the coordination of monitoring and reporting requirements in order to reduce duplication.

8.2. RECOMMENDED TERMS AND CONDITIONS

ORIGINAL Term and Condition No. 1	**1**
Category:	General
Responsible Parties:	The Proponent, Kitikmeot Inuit Association, Nunavut Impact Review Board, Government of Nunavut, Environment Canada, Fisheries and Oceans Canada, Health Canada, Indian and Northern Affairs Canada, Natural Resources Canada
Project Phase:	All Phases
Objective:	To capture the commitments that were made by the Proponent at the Final Hearing
Term or Condition:	The commitments in the Final Hearing Report as Appendix A (see Appendix A of Project Certificate): MHBL Commitments from the Final Environmental Impact Statement Review are incorporated herein and must be met. Commentary: *The commitments in the Final Hearing Report as Appendix A includes the addendum to the Final Hearing Report dated June 22, 2006.*
Reporting Requirements:	To be included in the Proponent's annual reporting to the NIRB

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REVISED Term and Condition No. 1	1
Category:	General
Responsible Parties:	The Proponent, Kitikmeot Inuit Association, Nunavut Impact Review Board, Government of Nunavut, Environment **and Climate Change** Canada, Fisheries and Oceans Canada, ~~Indian~~ **Indigenous** and Northern Affairs Canada, Health Canada, Natural Resources Canada, **and Transport Canada**
Project Phase:	All Phases
Objective:	To capture the commitments that were made by the Proponent at the Final Hearing and any new commitments that have been made in association with project amendments
Term or Condition:	The commitments in the Final Hearing Report as Appendix A (see Appendix A of Project Certificate): ~~MHBL~~ **the Proponent** Commitments from the Final Environmental Impact Statement Review are incorporated herein and must be met. Commentary: *The commitments in the Final Hearing Report as Appendix A includes all project amendments and ~~to the Final Hearing Report dated June 22, 2006~~* ***the Public Hearing Report dated June 13, 2016***.
Reporting Requirements:	To be included in the Proponent's annual reporting to the NIRB.

ORIGINAL Term and Condition No. 2	**2**
Category:	General
Responsible Parties:	The Proponent, Nunavut Impact Review Board, Kitikmeot Inuit Association, Government of Nunavut, Environment Canada, Fisheries and Oceans Canada, Health Canada, Indian and Northern Affairs Canada, and Natural Resources Canada
Project Phase:	All Phases
Objective:	To capture the commitments Miramar presented as Exhibit 37 at the Final Hearing for the Doris North project
Term or Condition:	The commitments in the Final Hearing Report as Appendix B (see Appendix A of Project Certificate): MHBL Commitments from the Final Hearing, are incorporated herein and must be met.
Reporting Requirements:	To be included in the Proponent's annual reporting to the NIRB

REVISED Term and Condition No. 2	2
Category:	General

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Responsible Parties:	The Proponent, Nunavut Impact Review Board, Kitikmeot Inuit Association, Government of Nunavut, Environment **and Climate Change** Canada, Fisheries and Oceans Canada, Health Canada, ~~Indian~~ **Indigenous** and Northern Affairs Canada, and Natural Resources Canada
Project Phase:	All Phases
Objective:	To capture the commitments Miramar presented as Exhibit 37 at the Final Hearing for the Doris North project
Term or Condition:	The commitments in the Final Hearing Report as Appendix B (see Appendix A of Project Certificate): ~~MHBL~~ **the Proponent** Commitments from the Final Hearing **and any project amendments**, are incorporated herein and must be met.
Reporting Requirements:	To be included in the Proponent's annual reporting to the NIRB.

ORIGINAL Term and Condition No. 3	**3**
Category:	Proponent's Commitments
Responsible Parties:	Proponent
Project Phase:	All phases
Objective:	To ensure all permits are obtained for the Project
Term or Condition:	MHBL must obtain all required federal and territorial permits and other approvals and shall comply with such permits and approvals.
Reporting Requirements:	To be included in the Proponent's annual reporting to the NIRB.

REVISED Term and Condition No. 3	3
Category:	Proponent Commitments
Responsible Parties:	Proponent
Project Phase:	All Phases
Objective:	To ensure all permits are obtained for the Project **and any Project amendments**
Term or Condition:	~~MHBL~~ **The Proponent** must obtain all required federal and territorial permits and other approvals and shall comply with such permits and approvals.
Reporting Requirements:	To be included in the Proponent's annual reporting to the NIRB.

ORIGINAL Term and Condition No. 4	4
Category:	Proponent Commitments
Responsible Parties:	Nunavut Impact Review Board

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Project Phase:	All Phases
Objective:	To ensure staff are available and assigned to the Project
Term or Condition:	NIRB will require a full time Monitoring Officer to monitor the Project as it proceeds and to analyze the success of the Terms and Conditions as the Project becomes operational, and beyond, to closure and reclamation.
Reporting Requirements:	Annually report to the Board

ORIGINAL Term and Condition No. 5	**5**
Category:	The Assessment of Alternatives to Tail Lake for Tailings Disposal
Responsible Parties:	The Proponent
Project Phase:	Construction, Operation, and Care and Maintenance
Objective:	To minimize the damage to the environment by minimizing the effects decisions being made today have on the alternatives for tomorrow. Also to facilitate the development of precautionary thresholds to assist with monitoring and detecting potentially significant changes in the region.
Term or Condition:	MHBL shall report by January 1st of each calendar year to NIRB on MHBL's development plan for future phases of the Hope Bay Belt, including identifying development plans that may affect the selection of Tail Lake as the Preferred alternative for tailings management.
Reporting Requirements:	To be included in the Proponent's annual reporting to the NIRB.

REVISED Term and Condition No. 5	5
Category:	The Assessment of Alternatives to Tail Lake for Tailings Disposal
Responsible Parties:	TMAC
Project Phase:	Construction, Operation, and Care and Maintenance
Objective:	To minimize the damage to the environment by minimizing the effects decisions being made today have on the alternatives for tomorrow. Also to facilitate the development of precautionary thresholds to assist with monitoring and detecting potentially significant changes in the region.
Term or Condition:	~~MHBL~~ **The Proponent** shall report by January 1st of each calendar year to NIRB on ~~MHBL~~**its** development plan for future phases of the Hope Bay Belt, including identifying development plans that may affect the selection of ~~Tail Lake~~ **Tailings Impoundment Area** as the preferred alternative for tailings management. Commentary: *The location of the Tailings Impoundment Area for the Project has been selected and included in the Metal Mining Effluent Regulations*.
Reporting Requirements:	To be included in the Proponent's annual reporting to the NIRB.

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ORIGINAL Term and Condition No. 6	**6**
Category:	The Assessment of Alternatives to Tail Lake for Tailings Disposal
Responsible Parties:	The Proponent
Project Phase:	Pre-construction, construction, operations
Objective:	To notify parties of changes due to future developments
Term or Condition:	MHBL shall immediately notify NIRB of any further alternatives assessments of the Tail Lake tailing impoundment area, if that analysis concludes that Tail Lake may no longer be the preferred option for tailings disposal.
Reporting Requirements:	As required

REVISED Term and Condition No. 6	6
Category:	The Assessment of Alternatives to Tail Lake for Tailings Disposal
Responsible Parties:	The Proponent
Project Phase:	Pre-construction, construction, operations
Objective:	To notify parties of changes due to future developments **in the Hope Bay Belt**
Term or Condition:	~~MHBL~~ **The Proponent** shall immediately notify the NIRB of any further alternatives assessments **undertaken for** the ~~Tail Lake~~ **T**ailings **I**mpound**ment A**rea**, i**f that analysis concludes that Tail Lake may no longer be the preferred option for tailings disposal **or any modifications to the physical area, tailings volumes, or method of containment**. Commentary: *Tail Lake has been selected as the Tailings Impoundment Area for the Doris North Project.*
Reporting Requirements:	To be reported to the NIRB as appropriate and included in the Proponent's annual reporting to the NIRB as required.

ORIGINAL Term and Condition No. 7	**7**
Category:	The Assessment of Alternatives to Tail Lake for Tailings Disposal
Responsible Parties:	The Proponent, Environment Canada, and Fisheries and Oceans Canada
Project Phase:	All phases
Objective:	To ensure that tailings is disposed of responsibly and monitored appropriately throughout the life of the Doris North project.
Term or Condition:	MHBL shall meet immediately with Environment Canada and the Department of Fisheries and Oceans Canada to ensure the information required for Schedule 2 of the Metal Mining Effluent Regulations can be processed according to law.

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Reporting Requirements:	To be reported to the NIRB as appropriate and included in the Proponent's annual reporting to the NIRB as required.

REVISED Term and Condition No. 7	7
Category:	The Assessment of Alternatives to Tail Lake for Tailings Disposal
Responsible Parties:	The Proponent, Environment Canada, and Fisheries and Oceans Canada
Project Phase:	All phases
Objective:	To ensure that tailings is disposed of responsibly and monitored appropriately throughout the life of the Doris North project.
Term or Condition:	~~MHBL~~ **The Proponent** shall meet immediately with Environment **and Climate Change** Canada and ~~the Department of~~ Fisheries and Oceans Canada to ensure the information required for Schedule 2 of the Metal Mining Effluent Regulations can be processed according to law. Commentary: *Tail Lake has been added to Metal Mining Effluent Regulations as as a Tailings Impoundment Area under Schedule 2.*
Reporting Requirements:	To be reported to the NIRB as appropriate and included in the Proponent's annual reporting to the NIRB as required.

ORIGINAL Term and Condition No. 8	**8**
Category:	Tail Lake Water Quality and Water Management Strategy
Responsible Parties:	The Proponent, Environment Canada, and Indian and Northern Affairs Canada
Project Phase:	All phases
Objective:	To obtain real time weather data at the Doris North project site
Term or Condition:	MHBL will fund and install a weather station at the mine site to collect atmospheric data, including air temperature and precipitation. The design and location of this station shall be developed in consultation with Environment Canada officials. Commentary: *Prior to closure and reclamation, NIRB expects MHBL to undertake consultation with appropriate agencies including INAC and EC, to discuss the possibility of the continued operation of the station, including transfer of ownership, for the collection of regional meteorological data.*
Reporting Requirements:	To be annually reported to the Board

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REVISED Term and Condition No. 8	8
Category:	Tail Lake Water Quality and Water Management Strategy
Responsible Parties:	The Proponent, Environment **and Climate Change** Canada, and ~~Indian~~ **Indigenous** and Northern Affairs Canada
Project Phase:	All phases
Objective:	To obtain real time weather data at the Doris North project site
Term or Condition:	~~MHBL~~ **The Proponent** will fund and install a weather station at the mine site to collect atmospheric data, including air temperature and precipitation. The design and location of this station shall be developed in consultation with Environment **and Climate Change** Canada **(ECCC)** officials. Commentary: *Prior to closure and reclamation, NIRB expects ~~MHBL~~ **the Proponent** to undertake consultation with appropriate agencies including **Indigenous and Northern Affairs Canada** ~~INAC~~ and EC**CC**, to discuss the possibility of the continued operation of the station, including transfer of ownership, for the collection of regional meteorological data.*
Reporting Requirements:	To be reported to the Board on an annual basis

Original Term and Condition No. 9	**9**
Category:	Tail Lake Water Quality and Water Management Strategy
Responsible Parties:	The Proponent
Project Phase:	All Phases
Objective:	To track in real time water quality in Tail Lake and Doris Creek before and after discharge
Term or Condition:	MHBL will fund and install an on-site laboratory for continuous and real-time monitoring of water quality contained within Talk Lake and Doris Creek after discharge. This will be done prior to the commencement of operations. The laboratory shall be certified, with standards to include the calibration of water quality monitoring instruments. MHBL shall file proof of application to become accredited, upon the request of the NWB or NIRB's Monitoring Officer.
Reporting Requirements:	To be reported the the Board on an annual basis

Removal of Term and Condition No. 9	9
Category:	Tail Lake Water Quality and Water Management Strategy
Responsible Parties:	The Proponent
Project Phase:	All Phases

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Objective:	To track in real time water quality in Tail Lake and Doris Creek before and after discharge
Term or Condition:	~~MHBL will fund and install an on-site laboratory for continuous and real-time monitoring of water quality contained within Talk Lake and Doris Creek after discharge. This will be done prior to the commencement of operations. The laboratory shall be certified, with standards to include the calibration of water quality monitoring instruments. MHBL shall file proof of application to become accredited, upon the request of the NWB or NIRB's Monitoring Officer.~~
Reporting Requirements:	

ORIGINAL Term and Condition No. 10	**10**
Category:	Tail Lake Water Quality and Water Management Strategy
Responsible Parties:	Proponent
Project Phase:	All phases
Objective:	To reduce the risk of cyanide and precipitate heavy metals
Term or Condition:	Upon the commencement of operations, MHBL shall ensure that the monitoring of Tail Lake and Doris Creek water quality, above and below the waterfall, be verified and reported to NIRB three times during discharge by an independent, third party laboratory. The sampling must be carried out independently or supervised in which case MHBL must provide the sampling and delivery of samples to the independent, third party laboratory, with copies of the results directly to the NIRB and NIRB's Monitoring Officer. Commentary: *The NIRB's preference is for independent, third party sampling. In the case where MHBL collects its own samples, the sampling shall be conducted in accordance with a methodology approved by NWB through a Quality Assurance/Quality Control ("QA/QC") plan and must be submitted to an independent third party laboratory for analysis. For Tail Lake the commencement of operations is defined as when tailing are deposited into the lake. For Doris Creek, the commencement of operations is defined as the time at which discharges from Tail Lake begin.*
Reporting Requirements:	To be included in the Proponent's annual reporting to the NIRB.

REVISED Term and Condition No. 10	10
Category:	Tail Lake Water Quality and Water Management Strategy
Responsible Parties:	Proponent
Project Phase:	Post-closure
Objective:	**To ensure water quality and compare these effects to the impact predictions in the 2005 FEIS and 2015 Amendment Application**

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Term or Condition:	~~Upon the commencement of operations,~~ ~~MHBL~~ **Should water from the Tailings Impoundment Area be discharged into Doris Creek, the Proponent shall ensure** that monitoring of Tail Lake and Doris Creek water quality occurs, above and below the waterfall, **and is** verified ~~and reported to the NIRB three times~~ by an independent, third party laboratory. The ~~sampling must be carried out independently or supervised in which case MHBL must provide the sampling and delivery of samples to the independent, third party laboratory,~~ Proponent must provide ~~with~~ copies of the results directly to the NIRB and NIRB's Monitoring Officer. Commentary: *The NIRB's preference is for independent, third party sampling. In the case where ~~MHBL~~* ***the Proponent*** *collects its own samples, the sampling shall be conducted in accordance with a methodology approved by NWB through a Quality Assurance/Quality Control ("QA/QC") plan and must be submitted to an independent third party laboratory for analysis. ~~For Tail Lake the commencement of operations is defined as when tailing are deposited into the lake. For Doris Creek, the commencement of operations is defined as the time at which discharges from Tail Lake begin.~~*
Reporting Requirements:	To be included in the NIRB's annual reporting **and information collected used to update other reports to be submitted to the NIRB**.

ORIGINAL Term and Condition No. 11	**11**
Category:	Tail Lake Water Quality and Water Management Strategy
Responsible Parties:	The Proponent
Project Phase:	All phases
Objective:	Quality control and quality assurance
Term or Condition:	Monitoring information collected under this approval shall contain the following information: a. The Person(s) who performed the sampling or took measurements b. Date, time, and place of sampling or measurement; c. Date of analysis d. Name of the person who performed the analysis; e. Analytical methods or techniques used; and f. Results of any analysis
Reporting Requirements:	To be stored onsite

REVISED Term and Condition No. 11	11
Category:	Tail Lake Water Quality and Water Management Strategy
Responsible Parties:	The Proponent
Project Phase:	All phases

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Objective:	Quality control and quality assurance
Term or Condition:	Monitoring information collected under this approval shall contain the following information: g. The Person(s) who performed the sampling or took measurements h. Date, time, and place of sampling or measurement; i. Date of analysis j. Name of the ~~**person**~~ **laboratory** who performed the analysis; k. Analytical methods or techniques used; and l. Results of any analysis
Reporting Requirements:	To be stored onsite

ORIGINAL Term and Condition No. 12	**12**
Category:	Tail Lake Water Quality and Water Management Strategy
Responsible Parties:	The Proponent
Project Phase:	All phases
Objective:	Quality control
Term or Condition:	The results and records of any monitoring, data, or analysis shall be kept for a minimum of the life of the project including closure and post closure monitoring. This time period shall be extended if requested by NIRB, DFO, EC or the NWB. Commentary: *The NIRB's Monitoring Officer consulting with Government officials, will provide guidance on how results and records of any monitoring, data, or analysis will be presented.*
Reporting Requirements:	To be reported to the Board on an annual basis

REVISED Term and Condition No. 12	12
Category:	Tail Lake Water Quality and Water Management Strategy
Responsible Parties:	The Proponent
Project Phase:	All phases
Objective:	Quality control
Term or Condition:	The results and records of any monitoring, data, or analysis shall be kept for a minimum of the life of the project including closure and post closure monitoring. This time period shall be extended if requested by **the Nunavut Impact Review Board, the Nunavut Water Board, Environment and Climate Change Canada, and Fisheries and Oceans Canada** ~~NIRB, DFO, EC or the NWB~~.

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	Commentary: *The NIRB's Monitoring Officer consulting with Government officials, will provide guidance on how results and records of any monitoring, data, or analysis will be presented.*
Reporting Requirements:	To be included in the annual report to the Board

ORIGINAL Term and Condition No. 13	**13**
Category:	General
Responsible Parties:	The Proponent, Nunavut Water Board
Project Phase:	Pre-construction
Objective:	Collect additional information due to uncertainty in water management
Term or Condition:	MHBL shall collect additional water quality data for the 2006 field season and incorporate it into a revised water quality model to be submitted to the NWB as part of the water licence application. MHBL will meet discharge criteria on a site specific basis set by the NWB where possible, for the protection of the receiving environment at the point of discharge.
Reporting Requirements:	Include in water licence application to Nunavut Water Board and included in the Proponent's annual report to the NIRB.

REVISED Term and Condition No. 13	13
Category:	General
Responsible Parties:	Proponent, **Environment and Climate Change Canada, Indigenous and Northern Affairs Canada**
Project Phase:	All phases
Objective:	Collect additional information due to uncertainty in water management and
Term or Condition:	~~MHBL~~ **The Proponent** shall collect additional water quality data for the 2006 field season and incorporate it into a revised water quality model to be submitted to the NWB as part of the water licence application. ~~MHBL~~ **To ensure the protection of the receiving environment at the point of discharge, the Proponent** will meet discharge criteria: **a. Where discharge is to the freshwater environment,** on a site specific basis set by the **Nunavut Water Board (**NWB**)** where possible ~~for the protection of the receiving environment at the point of discharge~~ **and as set by the Metal Mining Effluent Regulations (MMER); and,** **b. Where discharge is to Roberts Bay, discharge criteria set by the MMER and the Arctic Waters Pollution Prevention Act.**
Reporting Requirements:	Include in water licence application to Nunavut Water Board and included in the Proponent's annual report to the NIRB.

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ORIGINAL Term and Condition No. 14	**14**
Category:	General
Responsible Parties:	Proponent, Nunavut Water Board
Project Phase:	Pre-construction
Objective:	Collect additional information due to uncertainty in water management
Term or Condition:	MHBL shall collect additional precipitation, evaporation and runoff data and incorporate it into a revised water balance to be submitted to the NWB as part of the water licence application.
Reporting Requirements:	To be reported to the NWB as part of the water licence application

REVISED Term and Condition No. 14	14
Category:	General
Responsible Parties:	The Proponent, Nunavut Water Board
Project Phase:	Pre-construction
Objective:	Collect additional information due to uncertainty in water management
Term or Condition:	~~MHBL~~ **The Proponent** shall collect additional precipitation, evaporation and runoff data and incorporate it into a revised water balance to be submitted to the **Nunavut Water Board (**NWB**)** as part of the water licence application. Commentary: *This obligation has been fulfilled and information was included in the application to the NWB.*
Reporting Requirements:	No reporting requirement

ORIGINAL Term and Condition No. 15	**15**
Category:	General
Responsible Parties:	The Proponent, Nunavut Water Board
Project Phase:	All phases
Objective:	To monitor the impacts of effluent in the Tailings Impoundment Area and Doris Creek
Term or Condition:	MHBL shall not be permit the water discharged into Doris Creek to exceed the criteria set by the NWB.
Reporting Requirements:	To be included in the Proponent's annual reporting to the NIRB

REVISED Term and Condition No. 15	15

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Category:	General
Responsible Parties:	Proponent, Nunavut Water Board
Project Phase:	Pre-construction, construction, closure, post closure
Objective:	To monitor the environmental impacts of the effluent in the Tailings Impoundment Area and Doris Creek and compare these effects to the impact predictions in the 2005 FEIS and the 2015 Amendment Application.
Term or Condition:	~~MHBL~~ **The Proponent** shall not be permit the water discharged into Doris Creek to exceed the criteria set by the NWB.
Reporting Requirements:	To be included in the Proponent's annual reporting to the NIRB

ORIGINAL Term and Condition No. 16	**16**
Category:	General
Responsible Parties:	The Proponent, Nunavut Water Board, Nunavut Impact Review Board, Environment Canada
Project Phase:	All Phases
Objective:	To monitor the impacts of effluent in the Tailings Impoundment Area and Doris Creek
Term or Condition:	MHBL shall take all reasonable steps to prevent any Tail Lake discharge in violation of the Project Certificate or regulatory approvals that may have any likelihood of negatively affecting the environment including wildlife, fisheries, aquatics, and human health. If such a situation is encountered, MHBL shall take immediate action to remedy the violation. If requested by the NWB, MHBL shall accelerate testing or monitoring to determine the nature of any such discharge and its impact or harm to the environment.
Reporting Requirements:	To be reported on an as needed basis and included in the Proponent's annual reporting to the NIRB.

REVISED Term and Condition No. 16	16
Category:	General
Responsible Parties:	The Proponent, Nunavut Water Board, Nunavut Impact Review Board, Environment **and Climate Change** Canada
Project Phase:	All Phases
Objective:	To monitor the environmental impacts of the effluent in the Tailings Impoundment Area and Doris Creek **and compare these effects to the impact predictions in the 2005 FEIS and the 2015 Amendment Application**.
Term or Condition:	~~MHBL~~ **The Proponent** shall take all reasonable steps to prevent any Tail Lake discharge in violation of the Project Certificate or regulatory approvals that may have any likelihood of negatively affecting the environment including wildlife, fisheries, aquatics, and human health. If such a situation is

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	encountered, ~~MHBL~~ **the Proponent** shall take immediate action to remedy the violation. ~~If requested by the NWB, MHBL shall accelerate testing or monitoring to determine the nature of any such discharge and its impact or harm to the environment.~~
Reporting Requirements:	To be reported on an as needed basis and included in the Proponent's annual reporting to the NIRB.

ORIGINAL Term and Condition No. 17	**17**
Category:	General
Responsible Parties:	The Proponent
Project Phase:	All phases
Objective:	To ensure timely notification of incidents on site
Term or Condition:	MHBL shall report any upset, exceedances, or compliance problem not only to regulatory agencies as required by law, but shall also report the same to NIRB's Monitoring Officer.
Reporting Requirements:	To be reported on an as needed basis and included in the Proponent's annual reporting to the NIRB.

REVISED Term and Condition No. 17	17
Category:	General
Responsible Parties:	The Proponent
Project Phase:	All phases
Objective:	To ensure timely notification of incidents on site
Term or Condition:	~~MHBL~~ **The Proponent** shall report any upset, exceedances, or compliance problem not only to regulatory agencies as required by law, but shall also report the same to **the Nunavut Impact Review Board's** ~~NIRB's~~ Monitoring Officer.
Reporting Requirements:	To be reported on an as needed basis and included in the Proponent's annual reporting to the NIRB.

ORIGINAL Term and Condition No. 18	**18**
Category:	General
Responsible Parties:	The Proponent, Nunavut Impact Review Board, Nunavut Water Board, Kitikmeot Inuit Association, Natural Resources Canada
Project Phase:	All phases
Objective:	To assess and mitigate impacts of acid rock generation and metal leaching

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Term or Condition:	MHBL shall submit to the NWB, as part of the water licence application, a program detailing the methodology for testing quarried rock for acid generation and metal leaching potential. The sampling, testing and analysis must be done by a professional geologist registered in Nunavut. Commentary: *NIRB expects any methodology to be certified by a Registered Professional and approved by the NWB. NIRB expects that any analysis of laboratory results must also be done by a Registered Professional The designation of Registered Professional refers to all those professionals registered with NWT and Nunavut Association of Professional Engineers, Geologists, and Geophysicists (NAPEGG).*
Reporting Requirements:	To be reported to the NIRB as required

REVISED Term and Condition No. 18	18
Category:	General
Responsible Parties:	The Proponent, Nunavut Impact Review Board, Nunavut Water Board, Kitikmeot Inuit Association, Natural Resources Canada
Project Phase:	All phases
Objective:	To assess and mitigate impacts of acid rock generation and metal leaching
Term or Condition:	~~MHBL~~ **The Proponent** shall submit to the **Nunavut Water Board (**NWB**)**, as part of the water licence application, a program detailing the methodology for testing quarried rock for acid generation and metal leaching potential. The sampling, testing and analysis must be done by a professional geologist registered in Nunavut. Commentary: **Nunavut Impact Review Board (***NIRB**)** expects any methodology to be certified by a Registered Professional and approved by the NWB. NIRB expects that any analysis of laboratory results must also be done by a Registered Professional The designation of Registered Professional refers to all those professionals registered with NWT and Nunavut Association of Professional Engineers, Geologists, and Geophysicists (NAPEGG). This obligation is complete but should continue to be updated as required.*
Reporting Requirements:	To be reported to the NIRB as required

ORIGINAL Term and Condition No. 19	**19**
Category:	Design of the Jetty and Related Issues
Responsible Parties:	The Proponent
Project Phase:	All phases

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Objective:	To monitor the impacts of the jetty on shallow water permafrost and compare to predations in 2005 FEIS
Term or Condition:	MHBL shall install thermistor cables and temperature loggers in the jetty foundation. MHBL shall monitor the effects of the jetty on shallow water permafrost through operations and report the results of the monitoring collection to NIRB's Monitoring Officer. Commentary: *NIRB's Monitoring Officer will provide guidance to MHBL on data reporting requirements and will, in consultation with MHBL, distribute MHBL's data to interested parties including NRCan.*
Reporting Requirements:	Annually

REVISED Term and Condition No. 19	19
Category:	Design of the Jetty and Related Issues
Responsible Parties:	The Proponent
Project Phase:	All phases
Objective:	To monitor the impacts of the jetty on shallow water permafrost and compare to predations in 2005 FEIS and the 2015 Amendment Application
Term or Condition:	~~MHBL~~ **The Proponent** shall install thermistor cables and temperature loggers in the jetty foundation **as well as the new jetty foundation**. ~~MHBL~~ **The Proponent** shall monitor the effects of the jetty on shallow water permafrost through operations**, until such time as the Nunavut Impact Review Board (NIRB) determines that such monitoring is no longer necessary,** and report the results of the monitoring collection to NIRB's Monitoring Officer. ~~Commentary: *NIRB's Monitoring Officer will provide guidance to MHBL on data reporting requirements and will, in consultation with MHBL, distribute MHBL data to interested parties including NRCan.*~~
Reporting Requirements:	To be included in the Proponent's annual reporting to the NIRB

ORIGINAL Term and Condition No. 20	**20**
Category:	Design of the Jetty and Related Issues
Responsible Parties:	The Proponent
Project Phase:	All Phases
Objective:	To prevent or limit potential for ecosystemic effects in the event of fuel or waste spills

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Term or Condition:	MHBL shall ensure the use of containment booms and berms to control potential spills whenever fuel and or waste is transferred between a barge and the shore. MHBL shall ensure spill kits are at hand at these locations at all times.
Reporting Requirements:	N/A

REVISED Term and Condition No. 20	**20**
Category:	~~Design of the Jetty and Related Issues~~ Accidents and Malfunctions
Responsible Parties:	The Proponent, Transport Canada
Project Phase:	All Phases
Objective:	To prevent or limit potential for ecosystemic effects in the event of fuel or waste spills
Term or Condition:	~~MHBL shall ensure the use of containment booms and berms to control potential spills whenever fuel and or waste is transferred between a barge and the shore.~~ ~~MHBL shall ensure spill kits are at hand at these locations at all times.~~ The Proponent shall ensure spill kits are at hand at the Roberts Bay oil handling facility at all times, and that appropriate containment measures are used in the event of a spill in accordance with the most recent version of the Oil Pollution Emergency Plan and Oil Pollution Prevention Plan reviewed by Transport Canada.
Reporting Requirements:	N/A

ORIGINAL Term and Condition No. 21	**21**
Category:	Design of the Jetty and Related Issues
Responsible Parties:	The Proponent, Kitikmeot Inuit Association, Nunavut Tunngavik Incorporated
Project Phase:	Closure and post closure
Objective:	To ensure a smooth transfer of ownership should the jetty remain for use of the public post closure of the Project
Term or Condition:	MHBL shall consult with Elders, KIA and NTI to determine ***if*** the jetty should be dismantled. The final Closure and Reclamation Plan, if it proceeds, must explain the consultation process used for the jetty and provide a summary of the issues used for the jetty and provide a summary of the issues identified during consultation.

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	Commentary: *NIRB has already considered these components and as quoted by the Minister in his letter to NIRB dated July 28, 2006, "…further review under Article 12 would only be required if substantive changes were proposed that would significantly modify the project." Also, MHBL is expected to submit the summary of issues identified during consultation to NIRB's Monitoring Officer.*
Reporting Requirements:	To be reported by the Proponent prior to closure commencing

REVISED Term and Condition No. 21	21
Category:	Design of the Jetty and Related Issues
Responsible Parties:	Proponent, Kitikmeot Inuit Association, and Nunavut Tunngavik Incorporated
Project Phase:	Closure and post closure
Objective:	To ensure a smooth transfer of ownership should the jetty remain for use of the public post closure of the Project.
Term or Condition:	~~MHBL~~ **The Proponent** shall consult with Elders, **the Kitikmeot Inuit Association** ~~KIA~~ and **Nunavut Tunngavik Incorporated** ~~NTI~~ to determine ***if*** the jetty should be dismantled. The final Closure and Reclamation Plan, if it proceeds, must explain the consultation process used for the jetty and provide a summary of the issues used for the jetty and provide a summary of the issues identified during consultation. Commentary: *NIRB has already considered these components and as quoted by the Minister in his letter to NIRB dated July 28, 2006, "…further review under Article 12 would only be required if substantive changes were proposed that would significantly modify the project." Also, ~~MHBL~~ **the Proponent** is expected to submit the summary of issues identified during consultation to NIRB's Monitoring Officer.*
Reporting Requirements:	To be reported by the Proponent prior to closure commencing

ORIGINAL Term and Condition No. 22	**22**
Category:	Wildlife Mitigation and Monitoring Plan including Cumulative Effects Assessment
Responsible Parties:	The Proponent, Government of Nunavut-Department of Environment and Kitikmeot Inuit Association
Project Phase:	Pre-construction, construction
Objective:	To collect baseline information on wolverine and grizzly bear populations in the area in order to assess impacts of the Project

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Term or Condition:	MHBL, in consultation with GN-DoE and KIA, shall immediately begin the design and implementation of baseline data collection methods to establish both the wolverine and grizzly bear population of the Hope Bay Belt region. Any baseline data results shall be reported to NIRB's Monitoring Officer.
Reporting Requirements:	To be included in the Proponent's annual wildlife report to the NIRB

REVISED Term and Condition No. 22	22
Category:	Wildlife Mitigation and Monitoring Plan including Cumulative Effects Assessment
Responsible Parties:	The Proponent, Government of Nunavut-Department of Environment and Kitikmeot Inuit Association
Project Phase:	Pre-construction, construction
Objective:	To collect baseline information on wolverine and grizzly bear populations in the area in order to assess impacts of the Project
Term or Condition:	~~MHBL~~ **The Proponent**, in consultation with **Government of Nunavut-Department of Environment** ~~GN-DoE~~ and **Kitikmeot Inuit Association,** ~~KIA,~~ shall immediately begin the design and implementation of baseline data collection methods to establish both the wolverine and grizzly bear population of the Hope Bay Belt region. Any baseline data results shall be reported to NIRB's Monitoring Officer. Commentary: *The Proponent shall collect the baseline data and the results are incorporated as appropriate into the Proponent's Wildlife Mitigation and Management Plan.*
Reporting Requirements:	To be included in the Proponent's annual wildlife report to the NIRB

ORIGINAL Term and Condition No. 23	**23**
Category:	Wildlife Mitigation and Monitoring Plan including Cumulative Effects Assessment
Responsible Parties:	The Proponent
Project Phase:	All phases
Objective:	To assess the impacts of the Project on wildlife and compare to the 2005 Doris North Final Environmental Impact Statement
Term or Condition:	MHBL shall designate one of its employees as a primary wildlife contact for the mine, who will work with NIRB's Monitoring Officer and regulatory officials in communicating on-site activities and to fulfill reporting requirements.

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Reporting Requirements:	To be included in the Proponent's annual report and annual wildlife report to the NIRB

REVISED Term and Condition No. 23	23
Category:	Wildlife Mitigation and Monitoring Plan including Cumulative Effects Assessment
Responsible Parties:	The Proponent
Project Phase:	All phases
Objective:	To assess the impacts of the Project on wildlife and compare these effects to the impact predictions in the 2005 Doris North Final Environmental Impact Statement and the 2015 Amendment Application
Term or Condition:	~~MHBL~~ **The Proponent** shall designate one of its employees as a primary wildlife contact for the mine, who will work with **the Nunavut Impact Review Board's** ~~NIRB's~~ Monitoring Officer and regulatory officials in communicating on-site activities and to fulfill reporting requirements.
Reporting Requirements:	To be included in the Proponent's annual report and annual wildlife report to the NIRB

ORIGINAL Term and Condition No. 24	**24**
Category:	Wildlife Mitigation and Monitoring Plan including Cumulative Effects Assessment
Responsible Parties:	The Proponent
Project Phase:	All phases
Objective:	To ensure staff are prepared and are following commitments made for the Project
Term or Condition:	As part of the training for MHBL's on-site wildlife specialist, MHBL shall provide training to that person in areas of bear encounters and safety, effects of noise on wildlife, recording wildlife sightings, waste management, records management, and resorting to NIRB's Monitoring Officer and regulatory officials.
Reporting Requirements:	To be included in the Proponent's annual report and annual wildlife report to the NIRB.

REVISED Term and Condition No. 24	24
Category:	Wildlife Mitigation and Monitoring Plan including Cumulative Effects Assessment

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Responsible Parties:	Proponent
Project Phase:	All phases
Objective:	To ensure staff are prepared and are following commitments made for the Project
Term or Condition:	As part of the training for ~~MHBL's~~ **the Proponent's** on-site wildlife specialist, ~~MHBL~~ **and** shall provide training to that person in areas of bear encounters and safety, effects of noise on wildlife, recording wildlife sightings, waste management, records management, and resorting to **the Nunavut Impact Review Board's** ~~NIRB's~~ Monitoring Officer and regulatory officials.
Reporting Requirements:	To be included in the Proponent's annual report and annual wildlife report to the NIRB as required.

ORIGINAL Term and Condition No. 25	**25**
Category:	Wildlife Mitigation and Monitoring Plan including Cumulative Effects Assessment
Responsible Parties:	The Proponent
Project Phase:	All phases
Objective:	To assess the impacts of the Project on the wildlife
Term or Condition:	MHBL shall fine a monitoring plan focused on assessing and mitigating interaction between humans and wildlife at the mine site, including associated infrastructure such as the TIA (Tailings Impoundment Area), roads, and activity at the waterfall. A quarterly report must be sent to NIRB's Monitoring Officer on interactions that have occurred, any effect the interaction may have had on humans and wildlife, and mitigation measures taken to avoid similar interactions in the future.
Reporting Requirements:	To be included in the Proponent's annual wildlife report and annual report as appropriate to the NIRB

REVISED Term and Condition No. 25	25
Category:	Wildlife Mitigation and Monitoring Plan including Cumulative Effects Assessment
Responsible Parties:	The Proponent
Project Phase:	All phases
Objective:	To assess the impacts of the Project on the wildlife and compare these effects to the impact predicted in the 2005 FEIS and the 2015 Amendment Application
Term or Condition:	**The Proponent** shall file a monitoring plan focused on assessing and mitigating interaction between wildlife and humans at the mine site,

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	including associated infrastructure such as the TIA (Tailings Impoundment Area), roads, and activity at the waterfall **and Roberts Bay**. ~~A quarterly report~~ **An annual report** must be sent **by March 30 each year** to NIRB's Monitoring Officer on interactions that have occurred, any effect the interaction might have had on humans and wildlife, and mitigation measures taken to avoid similar interactions in the future. **The Proponent shall file a report to NIRB within 48 hours should any incident occur which results in wildlife mortality.**
Reporting Requirements:	To be included in the Proponent's annual wildlife report and annual report as appropriate to the NIRB

ORIGINAL Term and Condition No. 26	**26**
Category:	Wildlife Mitigation and Monitoring Plan including Cumulative Effects Assessment
Responsible Parties:	The Proponent
Project Phase:	All phases
Objective:	To alleviate concerns related to wildlife on the Project site
Term or Condition:	MHBL shall consult with local Elders, Kitikmeot Hunters and Trappers Organizations, the Nunavut Wildlife Management Board, GN-DoE, and NIRB's Monitoring Officer to review and discuss the results of wildlife monitoring and develop mitigation measures, including measures to discourage wildlife and birds from coming into contact with Tail Lake and contaminated areas of the mill site. MHBL shall incorporate a plan for this consultation into a reviewed Wildlife Monitoring and Mitigation Plan. Commentary: *Consolation under this section should include EC.*
Reporting Requirements:	To be included in the Proponent's annual reporting to the NIRB

REVISED Term and Condition No. 26	26
Category:	Wildlife Mitigation and Monitoring Plan including Cumulative Effects Assessment
Responsible Parties:	The Proponent
Project Phase:	All phases
Objective:	To alleviate concerns related to wildlife on the Project site
Term or Condition:	~~MHBL~~ **The Proponent** shall consult with local Elders, Kitikmeot Hunters and Trappers Organizations, the Nunavut Wildlife Management Board, **Government of Nunavut-Department of Environment** ~~GN-DoE~~, **Environment and Climate Change Canada,** and **the Nunavut Impact Review Board's** ~~NIRB's~~ Monitoring Officer to review and discuss the results of wildlife monitoring and develop mitigation measures, including measures to

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	discourage wildlife and birds from coming into contact with ~~Tail Lake~~ **the Tailings Impoundment Area** and contaminated areas of the mill site. ~~MHBL~~ **The Proponent** shall incorporate a plan for this consultation into a reviewed Wildlife Monitoring and Mitigation Plan. ~~Commentary: *Consolation under this section should include EC.*~~
Reporting Requirements:	To be included in the Proponent's annual reporting to the NIRB

ORIGINAL Term and Condition No. 27	**27**
Category:	Wildlife Mitigation and Monitoring Plan including Cumulative Effects Assessment
Responsible Parties:	The Proponent
Project Phase:	All phases
Objective:	To assess the environmental impact of the Project on wildlife
Term or Condition:	MHBL shall update and revise the Wildlife Mitigation and Monitoring Plan to reflect these terms and conditions and shall submit the revised Wildlife Mitigation and Monitoring Plan to NIRB. NIRB may consult with relevant Government departments and the Nunavut Wildlife Management Board prior to approving the revised Wildlife Mitigation and Monitoring Plan. The Wildlife Mitigation and Monitoring Plan must be submitted within three (3) months of the issuance of a Project Certificate and it must be approved by NIRB prior to the commencement of construction. MHBL must also submit an updated plan on an annual basis which much also be approved by NIRB. **Commentary:** *NIRB expects the annual plan to include the quarterly plans and the fourth quarter report then becomes part of the annual report.*
Reporting Requirements:	To Proponent is to report to the NIRB quarterly and annually

REVISED Term and Condition No. 27	27
Category:	Wildlife Mitigation and Monitoring Plan including Cumulative Effects Assessment
Responsible Parties:	The Proponent
Project Phase:	All phases
Objective:	To assess the environmental impact of the Project on wildlife <u>and compare these effects to the impact predicted in the 2005 FEIS and the 2015 Amendment Application</u>
Term or Condition:	~~MHBL~~ **The Proponent** shall update and revise the Wildlife Mitigation and Monitoring Plan **(WMMP)** to reflect ~~those~~ **Project** terms and conditions and shall ~~submit the reviewed~~ **revise the** Wildlife Mitigation and Monitoring Plan **and submit** to **the Nunavut Impact Review Board (**NIRB**) for review**.

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	The NIRB may consult with relevant Government departments and the Nunavut Wildlife Management Board prior to approving the revised **WMMP**~~Wildlife Mitigation and Monitoring Plan~~. The **revised WMMP** ~~Wildlife Mitigation and Monitoring Plan~~ must be submitted within three (3) months **after the updated Project Certificate is issued.**~~prior to the commencement of construction~~. ~~MHBL~~ **The Proponent** must also submit an updated plan on an annual basis which much also be approved by NIRB. **Commentary:** *NIRB expects the annual plan to include the quarterly plans and the fourth quarter report then becomes part of the annual report.* ***Monitoring measures included in the Wildlife Mitigation and Monitoring Plan should be appropriate to confirm impact predictions, monitoring impacts, and to support adaptive implementation of mitigation measures. Specific to caribou, during construction and operations the Proponent must annually review relevant available data from on site and caribou collar data and shall consider revisions to the Wildlife Mitigation and Monitoring Plan.***
Reporting Requirements:	To Proponent is to report to the NIRB quarterly and annually

ORIGINAL Term and Condition No. 28	**28**
Category:	Socio-Economic Impacts
Responsible Parties:	The Proponent, Kitikmeot Socio-Economic Monitoring Committee
Project Phase:	All Phases
Objective:	To assess the socio-economic impact of the Project on affected communities of Nunavut
Term or Condition:	Within six (6) months of the issuance of a Project Certificate, a Hope Bay Belt Socio-Economic Monitoring Committee ("SEMC") shall be formed to supplement, not duplicate areas covered by the Inuit Impact Benefit Agreement negotiated for this project. In order to ensure consistent data collection and tracking of data trends in a comparable form to be shared at the regional level and to minimize the duplication of efforts, the composition of the SEMC should include the same membership as the Kitikmeot Socio-Economic Monitoring Committee approved by the Minister. Additionally, the SEMC must engage the affected communities of Cambridge Bay, Kugluktuk, Gjoa Haven, Taloyoak, and NIRB's Monitoring Officer, and consider concerns from Bathurst Inlet and Omingmaktok. In consultation with these parties and immediately upon the SEMC's formation, MHBL shall provide the terms of reference for a socio-economic monitoring program to the SEMC for review and subsequent direction by NIRB. The terms of reference are to include the role of MHBL in data collection and analysis;

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	the key socio-economic indicators to be monitored; the reporting requirements; and the funding formula.
Reporting Requirements:	NIRB strongly suggests the use of a standardized reporting template to ensure consistent data collection and tracking of data trends in a comparable form to be shared upon request at the regional level and to minimize the duplication of efforts.

REVISED Term and Condition No. 28	**28**
Category:	Socio-Economic Impacts
Responsible Parties:	The Proponent, the Government of Nunavut, Indigenous and Northern Affairs Canada and the Kitikmeot Inuit Association ~~Kitikmeot Socio-Economic Monitoring Committee~~
Project Phase:	All Phases
Objective:	To assess the socio-economic impact of the Project on affected communities of Nunavut and <u>compare these effects to the impact predictions in the 2005 FEIS and the 2015 Amendment Application</u>
Term or Condition:	~~Within six (6) months of the issuance of a Project Certificate, a Hope Bay Belt Socio-Economic Monitoring Committee ("SEMC") shall be formed to supplement, not duplicate areas covered by the Inuit Impact Benefit Agreement negotiated for this project. In order to ensure consistent data collection and tracking of data trends in a comparable form to be shared at the regional level and to minimize the duplication of efforts, the composition of the SEMC should include the same membership as the Kitikmeot Socio-Economic Monitoring Committee approved by the Minister~~ **The Hope Bay Belt Socio-Economic Monitoring Committee is continued and renamed as the Hope Bay Socio-Economic Working Group. The invited members of the Hope Bay Socio-economic Working Group shall include the Proponent, the Government of Nunavut, Indigenous and Northern Affairs Canada, and the Kitikmeot Inuit Association and any other invitees the members of the Working Group may, from time to time invite to participate.** **The central focus of the Hope Bay Socio-Economic Working Group shall be on collaborating to ensure that the Hope Bay Socio-Economic Monitoring Plan provides for appropriate Project-specific socio-economic effects monitoring as required throughout the life of the Project. The Hope Bay Socio-Economic Monitoring Plan shall apply to the Project as described in both the 2005 FEIS and the 2015 Amendment Application.**

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	The Proponent, reflecting the input of the Hope Bay Socio-Economic Working Group shall produce an annual Hope Bay Socio-Economic Monitoring Plan report. ~~Additionally, the SEMC must engage the affected communities of Cambridge Bay, Kugluktuk, Gjoa Haven, Taloyoak, and NIRB's Monitoring Officer, and consider concerns from Bathurst Inlet and Omingmaktok. In consultation with these parties and immediately upon the SEMC's formation, MHBL shall provide the terms of reference for a socio-economic monitoring program to the SEMC for review and subsequent direction by NIRB. The terms of reference are to include the role of MHBL in data collection and analysis; the key socio-economic indicators to be monitored; the reporting requirements; and the funding formula.~~
Reporting Requirements:	~~NIRB strongly suggests the use of a standardized reporting template to ensure consistent data collection and tracking of data trends in a comparable form to be shared upon request at the regional level and to minimize the duplication of efforts.~~ <u>To be included in the Proponent's annual reporting to the NIRB.</u>

ORIGINAL Term and Condition No. 29	**29**
Category:	Noise
Responsible Parties:	The Proponent, Government of Nunavut-Department of Environment, Environment Canada, Health Canada, Fisheries and Oceans Canada, Workers Compensation Board
Project Phase:	All phases
Objective:	To assess noise impacts of the Project on wildlife and humans
Term or Condition:	MHBL shall develop and implement a noise abatement plan to protect people and wildlife from mine activity noise, including blasting, drilling, equipment, vehicles and aircraft. The noise abatement plan will be developed in consultation with GN-DoE, EC and HC, and includes: restriction on blasting and drilling when migrating caribou, birds or local carnivores may be affected; the establishment of strict standard for noise level; use of equipment and vehicles with the best noise attenuation devices; when practical, the use of fences or berms around noisy machinery or sites; flight corridor restrictions over sensitive areas with known concentrations of wildlife and birds whenever possible; and requiring with the exception of take off and approach for landing, a minimum flight altitude of 300 meters above ground level when flights to and from the mine site are passing near sensitive wildlife and birds areas. The noise abatement plan will also

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	incorporate the use of sound meters to monitor sound levels at sites in and around the mine site and local study area. The location and design of the sound meters shall be selected in consultation with EC and set up immediately upon issuance of the Project Certificate for the purpose of obtaining baseline data, and during and after operations. The final noise abatement plan shall be filed with NIRB's Monitoring Officer within six (6) months of the issuance of the Project Certificate. Commentary*: The Local Study Area refers to the combined spatial boundaries set by MHBL in its FEIS for each sensitive VEC including arctic char, lake trout, lake whitefish, ninespine stickleback, caribou, grizzly bear, wolverine, upland breeding birds, waterfowl, and raptors. Also the noise abatement plan will consider potential blasting time restrictions with the DFO's Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters (Wright and Hopky, 1998) as modified by DFO for use in the North. MHBL should also consult with Health Canada, the GN-DoE, and the Workers Compensation Board in locating and designing the sound meters.*
Reporting Requirements:	To be included in the Proponent's annual reporting to the NIRB

REVISED Term and Condition No. 29	29
Category:	Noise
Responsible Parties:	The Proponent, Government of Nunavut-Department of Environment, Environment Canada, Health Canada, Fisheries and Oceans Canada, Workers Compensation Board
Project Phase:	All phases
Objective:	To assess noise impacts of the Project on wildlife and humans and compare these effects to the impact predictions in the 2005 FEIS and the 2015 Amendment Application.
Term or Condition:	~~MHBL~~ **The Proponent** shall develop and implement a noise abatement plan to protect people and wildlife from mine activity noise, including blasting, drilling, equipment, vehicles and aircraft. The noise abatement plan will be developed in consultation with GN-DoE, EC and HC, and **should be updated on an as required basis.** ~~includes: restriction on blasting and drilling when migrating caribou, birds or local carnivores may be affected; the establishment of strict standard for noise level; use of equipment and vehicles with the best noise attenuation devices; when practical, the use of fences or berms around noisy machinery or sites; flight corridor restrictions over sensitive areas with known concentrations of wildlife and birds whenever possible; and requiring with the exception of take off and approach for landing, a minimum flight altitude of 300 meters above ground level when flights to and from the mine site are passing near sensitive wildlife and birds areas. The noise abatement plan will also incorporate the use of sound meters to monitor sound levels at sites in and around the mine site and local study area. The location and design of the~~

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	~~sound meters shall be selected in consultation with EC and set up immediately upon issuance of the Project Certificate for the purpose of obtaining baseline data, and during and after operations. The final noise abatement plan shall be filed with NIRB's Monitoring Officer within six (6) months of the issuance of the Project Certificate.~~ *Commentary: The Local Study Area refers to the combined spatial boundaries set by ~~MHBL~~ **the Proponent** in its FEIS for each sensitive VEC including arctic char, lake trout, lake whitefish, ninespine stickleback, caribou, grizzly bear, wolverine, upland breeding birds, waterfowl, and raptors. Also the noise abatement plan will consider potential blasting time restrictions with the DFO's Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters (Wright and Hopky, 1998) as modified by DFO for use in the North. ~~MHBL~~ **The Proponent** should also consult with Health Canada, the **Government of Nunavut-Department of Environment** ~~GN-DoE~~, and the Workers Compensation Board in locating and designing the sound meters.*
Reporting Requirements:	To be included in the Proponent's annual reporting to the NIRB

ORIGINAL Term and Condition No. 30	**30**
Category:	Air Quality
Responsible Parties:	Proponent, EC
Project Phase:	All Phases
Objective:	To assess the air quality of the Project within the project area
Term or Condition:	MHBL will install and fund an atmospheric monitoring station. This station and its location shall be developed in consultation with EC and HC air quality officials and focus on particulates of concern generated at the mine site. The results of air-quality monitoring are to be reported every six (6) months to NIRB through the Monitoring Officer, and from there to all of the parties. **Commentary:** *NIRB expects the Canada Wide Standards for Dioxins and Furans and the Canada Wide Standards for Mercury will apply and should be followed including stack testing of incinerators.*
Reporting Requirements:	Every six (6) months

REVISED Term and Condition No. 30	30
Category:	Air Quality
Responsible Parties:	The Proponent, Environment **and Climate Change** Canada
Project Phase:	All Phases
Objective:	To assess air quality impact of the Project in the project area and **compare these effects to the impact predictions in the 2005 FEIS and the 2015**

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	Amendment Application
Term or Condition:	~~MHBL~~ **The Proponent** will install and fund an atmospheric monitoring station. This station and its location shall be developed in consultation with **Environment and Climate Change Canada** ~~EC~~ and **Health Canada** ~~HC~~ air quality officials and focus on particulates of concern generated at the mine site. The results of air-quality monitoring are to be reported every six (6) months to **the Nunavut Impact Review Board** ~~NIRB~~ through the Monitoring Officer, and from there to all of the parties. **Commentary:** *NIRB expects the Canada Wide Standards for Dioxins and Furans and the Canada Wide Standards for Mercury will apply and should be followed including stack testing of incinerators.* ***The Nunavut impact Review Board has noted that atmospheric monitoring station has been installed on site.***
Reporting Requirements:	Reported every six (6) months

ORIGINAL Term and Condition No. 31	**31**
Category:	Closure and Reclamation
Responsible Parties:	Proponent
Project Phase:	Operations, Care and Maintenance
Objective:	To ensure a plan was in place due to the short lifespan of the Project
Term or Condition:	A complete Closure and Reclamation Plan prepared in accordance with the NWB requirements shall be filed by MHBL at the time MHBL makes application to the NWB for a water license for the mine. *Commentary: The complete closure and Reclamation Plan includes the jetty.*
Reporting Requirements:	The NIRB would require this prior to the closure as the Project is subject to NIRB Review.

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REVISED Term and Condition No. 31	31
Category:	Closure and Reclamation
Responsible Parties:	Proponent
Project Phase:	Operations, Care and Maintenance
Objective:	To ensure a plan was in place due to the short lifespan of the Project
Term or Condition:	**The Proponent shall maintain a complete** ~~A complete~~ Closure and Reclamation Plan **on file with the** ~~prepared in accordance with the~~ **Nunavut Water Board** ~~NWB~~ **prepared in accordance with** requirements **of the the Nunavut Water Board and other regulators.** ~~shall be filed by MHBL **the Proponent** at the time MHBL **the Proponent** makes application to the NWB for a water license for the mine.~~ ~~***Commentary:** The complete closure and Reclamation Plan includes the jetty~~
Reporting Requirements:	The NIRB would require this prior to the closure as the mine is subject to NIRB Review.

ORIGINAL Term and Condition No. 32	**32**
Category:	Environment, Health and Safety Management System
Responsible Parties:	Proponent
Project Phase:	All phases
Objective:	To ensure all plans are approved and in place prior to commencement of construction
Term or Condition:	Prior to the commencement of operation MHBL shall have a complete Environment, Health and Safety Management System in place which includes the following: Wildlife Mitigation and Monitoring Plan; Environmental Protection Plan; Emergency Response and Spill Contingency Plan; Occupational Health and Safety Plan; Reclamation Plan; Education and Orientation Plan; Human Resources Plan; Inuit Involvement Plan; Community Relations Plan; Monitoring and Follow-up Plan; and Auditing and Continuous Improvement Plan. When complete, these Plans shall be forwarded to NIRB's Monitoring Officer. **Commentary:** *MHBL is expected to contact federal and territorial Government Departments immediately regarding the preparation of these plans. The GN, in particular, is involved with the approval of many of the plans and is encouraged to designate an official to approve the plans as applicable. Please see Appendix E for a list of GN contacts.*
Reporting Requirements:	To be included in the Proponent's annual reporting to the NIRB as required

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REVISED Term and Condition No. 32	32
Category:	Environment, Health and Safety Management System
Responsible Parties:	Proponent
Project Phase:	All phases
Objective:	To ensure all plans are approved and in place prior to commencement of construction
Term or Condition:	Prior to the commencement of operation ~~MHBL~~ **the Proponent** shall have a complete Environment, Health and Safety Management System in place which includes the following: Wildlife Mitigation and Monitoring Plan; Environmental Protection Plan; Emergency Response and Spill Contingency Plan; Occupational Health and Safety Plan; ~~Reclamation Plan; Education and Orientation Plan;~~ Human Resources Plan; ~~Inuit Involvement Plan~~; Community Relations Plan; Monitoring and Follow-up Plan; and Auditing and Continuous Improvement Plan. When complete, these Plans shall be forwarded to **the Nunavut Impact Review Board's** ~~NIRB's~~ Monitoring Officer. Commentary: ~~*MHBL*~~ ***The Proponent*** *is expected to contact federal and territorial Government Departments immediately regarding the preparation of these plans. The* ***Government of Nunavut*** ~~*GN*~~*, in particular, is involved with the approval of many of the plans and is encouraged to designate an official to approve the plans as applicable. Please see Appendix E for a list of* ***the Government of Nunavut*** ~~*GN*~~ *contacts.*
Reporting Requirements:	To be included in the Proponent's annual reporting to the NIRB as required.

ORIGINAL Term and Condition No. 33	**33**
Category:	Fuel and Hazardous Materials
Responsible Parties:	The Proponent
Project Phase:	All phases
Objective:	To ensure best practices are being utilized on site
Term or Condition:	MHBL shall ensure that areas used to store fuel or hazardous materials are contained using the safest methods practically available. Commentary: *"Practically" refers to the best available engineering methods.*
Reporting Requirements:	n/a

REVISED Term and Condition No. 33	33

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Category:	Fuel and Hazardous Materials
Responsible Parties:	The Proponent
Project Phase:	All phases
Objective:	To ensure best practices are being utilized on site
Term or Condition:	~~MHBL~~ **The Proponent** shall ensure **spill kits are at hand at the Roberts Bay oil handling facility at all times, and that appropriate containment measures are used to prevent, contain and respond to a spill in accordance with the Most recent version of the Oil Pollution Emergency Plan and Oil Pollution Prevention Plan reviewed by Transport Canada.** ~~that areas used to store fuel or hazardous materials are contained using the safest methods practically available.~~ Commentary: "Practically" refers to the best available engineering methods.
Reporting Requirements:	n/a

ORIGINAL Term and Condition No. 34	**34**
Category:	Planned Changes
Responsible Parties:	Proponent
Project Phase:	Pre-construction, construction, operations, care and maintenance
Objective:	To ensure all future developments are reported on a timely bases due to the short mine life
Term or Condition:	If it becomes necessary, MHBL shall give notice of any planned changes to the mine facility, including Tail Lake and its operation, to the regulatory authorities and NIRB through it Monitoring Officer, immediately. Commentary: *"Planned changes" refers to changes that may cause an environmental effect. Please see related Terms and Conditions #17, #5, and #6.*
Reporting Requirements:	To be reported by the Proponent to the NIRB as required

REVISED Term and Condition No. 34	34
Category:	Planned Changes
Responsible Parties:	Proponent
Project Phase:	Pre-construction, construction, operations, care and maintenance
Objective:	To ensure all future developments are reported on a timely bases due to the short mine life
Term or Condition:	~~If it becomes necessary, MHBL~~ T**he Proponent** shall give notice of any planned **significant** changes to the mine facility, including **the Tailings**

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	Impoundment Area ~~Tail Lake~~, **mining infrastructure such as the mill** ~~and its operation~~, to the regulatory authorities and **the Nunavut Impact Review Boar (**NIRB**)** through it Monitoring Officer, ~~immediately~~ **in a timely basis**. Commentary: *"Planned changes" refers to changes that may cause an environmental effect. Significant means any change to the mine facilities which would require a reconsideration of the project certificate ofr an amendment of the Type "A" Water Licence. Please see related Terms and Conditions #17, #5, and #6.*
Reporting Requirements:	To be reported by the Proponent to the NIRB as required

ORIGINAL Term and Condition No. 35	**35**
Category:	Duty to Comply
Responsible Parties:	The Proponent
Project Phase:	All Phases
Objective:	
Term or Condition:	MHBL shall comply with all terms and conditions and any noncompliance constitutes a violation of the approval and is grounds for NIRB's reconsideration and recommendation to the Minister under Article 12, Part 8 of the NLCA.
Reporting Requirements:	

REVISED Term and Condition No. 35	35
Category:	Duty to Comply
Responsible Parties:	The Proponent
Project Phase:	All Phases
Objective:	
Term or Condition:	~~MHBL~~ **The Proponent** shall comply with all terms and conditions and any noncompliance constitutes a violation of the approval and is grounds for NIRB's reconsideration and recommendation to the Minister under Article 12, Part 8 of the NLCA.
Reporting Requirements:	

NEW Term and Condition No. 36	**36**
Category:	Freshwater
Responsible Parties:	**Proponent, Nunavut Water Board, Kitikmeot Inuit Association**
Project Phase:	Pre-construction, construction, and operations

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Objective:	To assess the environmental impact of the Project on Doris Lake and fish and fish habitat
Term or Condition:	The Proponent shall continue year-round monitoring and recording of Doris Lake water levels during construction and operations. This will allow for detection of actual Doris Lake draw down below the sill level; computation of the amount of drawdown, quantification of the project impact, and implementation of adaptive mitigation and management measures as appropriate.
Reporting Requirements:	To be included in the Proponent's annual reporting to the NIRB.

NEW Term and Condition No. 37	**37**
Category:	Freshwater
Responsible Parties:	**The Proponent, Kitikmeot Inuit Association, Indigenous and Northern Affairs Canada, Natural Resources Canada**
Project Phase:	Pre-construction, construction, operations, care and maintenance
Objective:	To assess the environmental impact of the Project on groundwater due to mining in a talik
Term or Condition:	The Proponent shall develop and submit a detailed Groundwater Management Plan for review during the water licensing process and to the Nunavut Impact Review Board as part of the plans available on the Doris North project. The plan shall acknowledge uncertainties pertaining to predictions of groundwater quantity and quality and inform the Groundwater Management Plan. Indigenous and Northern Affairs Canada should be consulted with respect to the contents of the Plan and any required mitigation measures.
Reporting Requirements:	To be included in the Proponent's annual reporting to the NIRB.

NEW Term and Condition No. 38	**38**
Category:	Marine Environment
Responsible Parties:	**The Proponent, Indigenous and Northern Affairs Canada**
Project Phase:	Operations, care and maintenance, and closure
Objective:	To assess the environmental impact of the Project on the seabed and marine environment if the effluent discharge pipeline is abandoned in place or removed.
Term or Condition:	At least six (6) months prior to construction of the effluent pipeline and diffuser system the Proponent shall provide the NIRB with a detailed design for the system that includes the location of the pipeline in relation to the existing roadway, the location of the small jetty supporting the pipeline and

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	the design of the diffuser.
Reporting Requirements:	To be included in the Proponent's annual reporting to the NIRB.

NEW Term and Condition No. 39	**39**
Category:	Marine Environment
Responsible Parties:	The Proponent, Indigenous and Northern Affairs Canada
Project Phase:	Operations, care and maintenance, and closure
Objective:	To assess the environmental impact of the Project on the seabed and marine environment if the effluent discharge pipeline is abandoned in place or removed.
Term or Condition:	At least six (6) months prior to operation of the effluent pipeline and diffuser system, the Proponent shall conduct and submit to the Board a hazard and operability study of the pipeline and marine outfall system as part of the land authorization process.
Reporting Requirements:	To be included in the Proponent's annual reporting to the NIRB.

NEW Term and Condition No. 40	**40**
Category:	Socio-Economic Impacts
Responsible Parties:	The Proponent, Hope Bay Socio-Economic Working Group
Project Phase:	All phases
Objective:	To monitor the socio-economic effects of the Project on affected communities of Nunavut and compare these effects to the impact predictions in the 2005 FEIS and the 2015 Amendment Application
Term or Condition:	Within one (1) year of the issuance by the NIRB of an amended Project Certificate, the Proponent will submit an updated Doris North Socio-Economic Monitoring Plan for the review of the Hope Bay Socio-Economic Working Group review and comment that identifies any updates, changes and amended Terms of Reference for the Hope Bay Socio-Economic Working Group required to reflect the amendments to the Project as outlined in the 2015 Amendment Application. Any changes as agreed to by the Hope Bay Socio-Economic Working Group shall be submitted to the Nunavut Impact Review Board.
Reporting Requirements:	To be included in the Proponent's annual reporting to the NIRB.

NEW Term and Condition No. 41	**41**
Category:	Socio-Economic Impacts

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Responsible Parties:	The Proponent, Hope Bay Socio-Economic Working Group, Kitikmeot Socio-economic Monitoring Committee (K-SEMC)
Project Phase:	End of Operations, Temporary or Final Closure
Objective:	To prepare for, monitor and mitigate the potential socio-economic effects of temporary or permanent mine closure on the affected communities of Nunavut
Term or Condition:	Two (2) years prior to the planned Final Closure of the Project, the Proponent shall, in collaboration with the Hope Bay Socio-Economic Working Group submit an updated Doris North Socio-Economic Monitoring Plan to the Kitikmeot Socio-Economic Monitoring Committee (K-SEMC) that will also include detail regarding specific measures that may mitigate the potential for negative effects as a result of Project closure.
Reporting Requirements:	Required updated Doris North Socio-Economic Monitoring Plan to be submitted to the NIRB at the same time as the K-SEMC.

NEW Term and Condition No. 42	**42**
Category:	Socio-Economic Impacts
Responsible Parties:	The Proponent, Hope Bay Socio-Economic Working Group, Kitikmeot Socio-economic Monitoring Committee (K-SEMC)
Project Phase:	End of Operations, Temporary or Final Closure
Objective:	To mitigate the potential socio-economic effects of temporary or permanent mine closure on the affected communities of Nunavut
Term or Condition:	Within six (6) months following an unanticipated temporary or final closure of the Project the Proponent shall, in collaboration with the Hope Bay Socio-Economic Working Group submit an updated Doris North Socio-Economic Monitoring Plan to the K-SEMC that will also include detail regarding specific measures that may mitigate the potential for negative effects as a result of the Project's temporary or permanent closure.
Reporting Requirements:	Required updated Doris North Socio-Economic Monitoring Plan to be submitted to the NIRB at the same time as the K-SEMC.

NEW Term and Condition No. 43	**43**
Category:	Socio-Economic Impacts
Responsible Parties:	The Proponent, Hope Bay Socio-Economic Working Group, Kitikmeot Socio-economic Monitoring Committee (K-SEMC)
Project Phase:	End of Operations, Temporary or Final Closure
Objective:	To mitigate the potential socio-economic effects of temporary or

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	permanent mine closure on the affected communities of Nunavut
Term or Condition:	Two (2) years prior to the planned Final Closure of the Project, the Proponent shall submit to the NIRB an updated Human Resource Plan and Wellness Strategy for the Project that includes a Workforce Transition Strategy designed to mitigate the potential negative effects of Project closure on the affected communities of Nunavut.
Reporting Requirements:	Updated Human Resource Plan and Wellness Strategy submitted to the NIRB in accordance with the timelines prescribed.

NEW Term and Condition No. 44	**44**
Category:	Socio-Economic Impacts
Responsible Parties:	The Proponent, Government of Nunavut, the Kitikmeot Inuit Association
Project Phase:	All Phases
Objective:	To support co-ordination and collaboration of education and training initiatives with Government of Nunavut Initiatives
Term or Condition:	Within six (6) months following an unanticipated temporary or final closure of the Project the Proponent shall, the Proponent shall submit to the NIRB an updated Human Resource Plan and Wellness Strategy for the Project that includes a Workforce Transition Strategy designed to mitigate the potential negative effects of Project closure on the affected communities of Nunavut.
Reporting Requirements:	Updated Human Resource Plan and Wellness Strategy submitted to the NIRB in accordance with the timelines prescribed.

NEW Term and Condition No. 45	**45**
Category:	Socio-Economic Impacts
Responsible Parties:	The Proponent, Government of Nunavut
Project Phase:	All Phases
Objective:	To support co-ordination and collaboration of education and training initiatives with Government of Nunavut Initiatives
Term or Condition:	To the extent that such communications are consistent with and not limited by the Proponent's obligations under the 2015 Hope Bay Inuit Impact and Benefit Agreement (IIBA), the Proponent shall share information with the Government of Nunavut, Department of Education with respect to the Proponent's youth employment initiatives in their Human Resources Plan, and other programs that may relate to education and will, to the extent possible integrate the Proponent's activities into the existing Department of Education program, and communication and delivery plans.

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Reporting Requirements:	Collaboration and integration initiatives to be included in the Proponent's annual reporting to the NIRB.

NEW Term and Condition No. 46	**46**
Category:	Socio-Economic Impacts
Responsible Parties:	The Proponent, Government of Nunavut
Project Phase:	All Phases
Objective:	To support co-ordination and collaboration of education and training initiatives with Government of Nunavut Initiatives
Term or Condition:	To the extent that such communications are consistent with and not limited by the Proponent's obligations under the 2015 Hope Bay Inuit Impact and Benefit Agreement (IIBA), the Proponent shall provide the Government of Nunavut (GN) and the NIRB information regarding the labour force needs of the Project as it proceeds: ▪ the title and number of positions required by department or work area; ▪ the potential start dates; and ▪ to the level of education required (with reference to the specific positions); ▪ whether on-the-job or other forms of training and certification will be required (with reference to the specific positions).
Reporting Requirements:	To be included in the Proponent's annual reporting to the NIRB or when the Proponent anticipates significant changes in labour force needs for the Project.

NEW Term and Condition No. 47	**47**
Category:	Socio-Economic Impacts
Responsible Parties:	The Proponent, Hope Bay Socio-Economic Working Group , Kitikmeot Socio-economic Monitoring Committee (K-SEMC)
Project Phase:	All Phases
Objective:	To assess the effects of the Proponent's education and training initiatives in the affected Nunavut communities
Term or Condition:	To the extent that such communications are consistent with and not limited by the Proponent's obligations under the 2015 Hope Bay Inuit Impact and Benefit Agreement (IIBA), the Proponent shall share relevant data (quantitative and qualitative) concerning the implementation and success of training and education programs, with other socio-economic monitoring initiatives including the Hope Bay Socio-Economic Working Group and the

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	Kitikmeot Socio-Economic Monitoring Committee.
Reporting Requirements:	Collaboration and integration initiatives to be included in the Proponent's annual reporting to the NIRB.

NEW Term and Condition No. 48	**48**
Category:	Cultural, Archaeological and Paleontological Impacts
Responsible Parties:	The Proponent, Government of Nunavut, Department of Culture and Heritage (GN-DCH)
Project Phase:	All Phases
Objective:	To ensure that all archaeological resources that the Proponent identifies in the project development area are fully documented
Term or Condition:	By February 28th of each year when there are significant footprint changes to the project development area or an archaeological permit is requested, the Proponent will provide the GN-DCH with a series of maps and tables indicating the current status of all archaeological sites within the project development area. The Proponent shall consult with the GN-DCH to establish the contents of the maps and tables that must be submitted.
Reporting Requirements:	Recognizing that these detailed maps are to remain confidential, the Proponent is only required to submit this information to the applicable Government of Nunavut representative (Territorial Archaeologist or designate)

NEW Term and Condition No. 49	**49**
Category:	Socio-economic Impacts
Responsible Parties:	The Proponent, Government of Nunavut, Nunavut Housing Corporation, Kitikmeot Socio-economic Monitoring Committee
Project Phase:	All Phases
Objective:	To monitor whether the predictions of Project-induced effects of in-migration remain accurate and mitigation measures intended to limit these effects are sufficient
Term or Condition:	If the Government of Nunavut and the Nunavut Housing Corporation develop an anonymous voluntary housing survey, the Proponent shall make the survey available to Nunavummiut site personnel and the Proponent will return any completed surveys to the Government of Nunavut ***Commentary:*** It should be noted that interpretation of the results, modifications to the surveys and any reporting of the results remain the responsibility of the authors of the survey, the Government of Nunavut and

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	Nunavut Housing Corporation.
Reporting Requirements:	N/A

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Appendix A: Record of Proceedings

Project Proponent:	TMAC Resources Inc. P.O. Box 44 95 Wellington Street West, Suite 1010 Toronto, ON M5J 2N7
Date Project Description Received:	June 23, 2015
Positive Conformity Determination Received from the Nunavut Planning Commission:	n/a
Dates of Hearings:	Day 1: April 12, 2016, Cambridge Bay, NU
	Day 2: April 13, 2016, Cambridge Bay, NU
	Day 3: April 14, 2016, Cambridge Bay, NU
Board Members Present:	Elizabeth Copland, Chairperson
	Guy Alikut, Member
	Phillip Omigmakyok (Kadlun), Member
Board Staff:	R. Barry, Executive Director
	T. Arko, Director, Technical Services
	K. Gillard, Manager, Project Monitoring
	S. Amuno, Technical Advisor II
	N. Lear, Environmental Administrator
	L. Atatahak, Secretary
Board Legal Counsel:	T. Meadows
Interpreters:	J. Tuktoo-Lacasse
	J. Panioyak
	N. Amautinaur
Court Reporters:	S. Anderson, Dicta Court Reporting K. McLeod,, Dicta Court Reporting
Sound Technician:	R. Dempster, PIDO Productions

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Parties:	
Proponent:	
TMAC Resources Inc.	J. Roberts, Vice President, Environment A. Buchan, Director of Community Relations I. Evalik, IIBA Liaison S. Hamm, Project Manager M. Rykaart, Engineering Consultant D. Chubb, Environmental Consultant L. Bol, Environmental Consultant M. Henry, Environmental Consultant N. Bishop, Environmental Consultant C. Kowbel, Legal Counsel
Nunavut Water Board	S. Aredes, Technical Advisor
Kitikmeot Inuit Association:	S. Anablak, President P. Emingak, Executive Director J. Roesch, Senior Hope Bay Project Officer G. Clark, Director of Lands/Environment J. Donihee, Legal Counsel
Government of Nunavut	F. Baikie, Department of Environment B. Pirie, Department of Environment E. Zell, Department of Economic Development and Transportation D. Dylan, Legal Counsel
Canadian Northern Economic Development Agency	T. Simmons, Project Manager
Department of Justice (Canada):	T. Carroll, Legal Counsel
Fisheries and Oceans Canada:	G. Williston, Senior Fisheries Biologist J. Marentette, Fisheries Biologist
Indigenous and Northern Affairs Canada:	K. Costello, Director Resource Management F. Ngwa, Environmental Assessment Coordinator T. Fast, Socio-Economic Analyst R. Hoos, Consultant C. Fyfe, Consultant
Natural Resources Canada:	R. Besner, Senior Environmental Assessment Officer
Transport Canada	A Gudmondson, Environmental Officer
Community Representatives:	

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Cambridge Bay	J. Haniliak Sr
Kugaaruk	B. Nirlungayuk
Gjoa Haven	S. Hiqiniq
Bathurst Inlet	J. Akoluk

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APPENDIX B: List of Exhibits from Doris North Project Certificate No. 003 Amendment Application Public Hearing

Exhibit	Exhibit Description	Date	Party Tendering Exhibit
1	Hard Copy PowerPoint Presentation Revisions to Amendment Application No. 1 of Project Certificate 003 NIRB Public Hearing- April 2016 INTRODUCTION AND OVERVIEW Inuktitut (version without maps—version with maps filed as Exhibit 28)	April 12, 2016	TMAC Resources Inc. (TMAC)
2	Hard Copy PowerPoint Presentation Revisions to Amendment Application No. 1 of Project Certificate 003 NIRB Public Hearing- April 2016 INTRODUCTION AND OVERVIEW Inuinnaqtun (version without maps—version with maps filed as Exhibit 29)	April 12, 2016	TMAC
3	Hard Copy PowerPoint Presentation Revisions to Amendment Application No. 1 of Project Certificate 003 NIRB Public Hearing- April 2016 INTRODUCTION AND OVERVIEW English	April 12, 2016	TMAC
4	Hard Copy TMAC Summary of Potential Amendments to Project Certificate No. 003 Terms and Conditions and Appendices and New Project Terms and Conditions [as at April 10, 2016]	April 12, 2016	TMAC
5	Hard Copy PowerPoint Presentation Revisions to Amendment Application No. 1 of Project Certificate 003 NIRB Public Hearing- April 2016 ATMOSPHERIC ENVIRONMENT Inuktitut	April 12, 2016	TMAC

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Exhibit	Exhibit Description	Date	Party Tendering Exhibit
6	Hard Copy PowerPoint Presentation Revisions to Amendment Application No. 1 of Project Certificate 003 NIRB Public Hearing- April 2016 ATMOSPHERIC ENVIRONMENT Inuinnaqtun	April 12, 2016	TMAC Resources Inc. (TMAC)
7	Hard Copy PowerPoint Presentation Revisions to Amendment Application No. 1 of Project Certificate 003 NIRB Public Hearing- April 2016 ATMOSPHERIC ENVIRONMENT English	April 12, 2016	TMAC
8	Hard Copy PowerPoint Presentation Revisions to Amendment Application No. 1 of Project Certificate 003 NIRB Public Hearing- April 2016 TERRESTRIAL ENVIRONMENT Inuktitut	April 12, 2016	TMAC
9	Hard Copy PowerPoint Presentation Revisions to Amendment Application No. 1 of Project Certificate 003 NIRB Public Hearing- April 2016 TERRESTRIAL ENVIRONMENT Inuinnaqtun	April 12, 2016	TMAC
10	Hard Copy PowerPoint Presentation Revisions to Amendment Application No. 1 of Project Certificate 003 NIRB Public Hearing- April 2016 TERRESTRIAL ENVIRONMENT English	April 12, 2016	TMAC
11	Hard Copy Table 4.3-1 Caribou-specific Protection Measures during All Seasons	April 12, 2016	TMAC

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Exhibit	Exhibit Description	Date	Party Tendering Exhibit
12	Hard Copy PowerPoint Presentation Revisions to Amendment Application No. 1 of Project Certificate 003 NIRB Public Hearing- April 2016 FRESHWATER ENVIRONMENT Inuktitut	April 12, 2016	TMAC Resources Inc. (TMAC)
13	Hard Copy PowerPoint Presentation Revisions to Amendment Application No. 1 of Project Certificate 003 NIRB Public Hearing- April 2016 FRESHWATER ENVIRONMENT Inuinnaqtun	April 12, 2016	TMAC
14	Hard Copy PowerPoint Presentation Revisions to Amendment Application No. 1 of Project Certificate 003 NIRB Public Hearing- April 2016 FRESHWATER ENVIRONMENT English	April 12, 2016	TMAC
15	Hard Copy PowerPoint Presentation Revisions to Amendment Application No. 1 of Project Certificate 003 NIRB Public Hearing- April 2016 GROUNDWATER ENVIRONMENT Inuktitut	April 12, 2016	TMAC
16	Hard Copy PowerPoint Presentation Revisions to Amendment Application No. 1 of Project Certificate 003 NIRB Public Hearing- April 2016 GROUNDWATER ENVIRONMENT English	April 12, 2016	TMAC

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Exhibit	Exhibit Description	Date	Party Tendering Exhibit
17	Hard Copy PowerPoint Presentation Revisions to Amendment Application No. 1 of Project Certificate 003 NIRB Public Hearing- April 2016 MARINE ENVIRONMENT Inuktitut	April 12, 2016	TMAC
18	Hard Copy PowerPoint Presentation Revisions to Amendment Application No. 1 of Project Certificate 003 NIRB Public Hearing- April 2016 MARINE ENVIRONMENT English	April 12, 2016	TMAC Resources Inc. (TMAC)
19	Hard Copy PowerPoint Presentation Revisions to Amendment Application No. 1 of Project Certificate 003 NIRB Public Hearing- April 2016 PUBLIC PARTICIPATION AND ENGAGEMENT Inuktitut	April 12, 2016	TMAC
20	Hard Copy PowerPoint Presentation Revisions to Amendment Application No. 1 of Project Certificate 003 NIRB Public Hearing- April 2016 PUBLIC PARTICIPATION AND ENGAGEMENT Inuinnaqtun	April 12, 2016	TMAC
21	Hard Copy PowerPoint Presentation Revisions to Amendment Application No. 1 of Project Certificate 003 NIRB Public Hearing- April 2016 PUBLIC PARTICIPATION AND ENGAGEMENT English	April 12, 2016	TMAC

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Exhibit	Exhibit Description	Date	Party Tendering Exhibit
22	Hard Copy PowerPoint Presentation Revisions to Amendment Application No. 1 of Project Certificate 003 NIRB Public Hearing- April 2016 SOCIO-ECONOMICS Inuktitut	April 12, 2016	TMAC
23	Hard Copy PowerPoint Presentation Revisions to Amendment Application No. 1 of Project Certificate 003 NIRB Public Hearing- April 2016 SOCIO-ECONOMICS Inuinnaqtun	April 12, 2016	TMAC
24	Hard Copy PowerPoint Presentation Revisions to Amendment Application No. 1 of Project Certificate 003 NIRB Public Hearing- April 2016 SOCIO-ECONOMICS English	April 12, 2016	TMAC Resources Inc. (TMAC)
25	Hard Copy PowerPoint Presentation Revisions to Amendment Application No. 1 of Project Certificate 003 NIRB Public Hearing- April 2016 ACCIDENTS AND MALFUNCTIONS Inuktitut	April 12, 2016	TMAC
26	Hard Copy PowerPoint Presentation Revisions to Amendment Application No. 1 of Project Certificate 003 NIRB Public Hearing- April 2016 ACCIDENTS AND MALFUNCTIONS English	April 12, 2016	TMAC

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Exhibit	Exhibit Description	Date	Party Tendering Exhibit
27	Hard Copy PowerPoint Presentation Kitikmeot Inuit Association Technical Submission Doris North Project Certificate Amendment Application English	April 13, 2016	Kitikmeot Inuit Association (KIA)
28	Hard Copy PowerPoint Presentation Revisions to Amendment Application No. 1 of Project Certificate 003 NIRB Public Hearing- April 2016 INTRODUCTION AND OVERVIEW Inuktitut (version of Exhibit 1 with maps added)	April 13, 2016	TMAC Resources Inc. (TMAC)
29	Hard Copy PowerPoint Presentation Revisions to Amendment Application No. 1 of Project Certificate 003 NIRB Public Hearing- April 2016 INTRODUCTION AND OVERVIEW Inuinnaqtun (version of Exhibit 2 with maps added)	April 13, 2016	TMAC
30	Hard Copy PowerPoint Presentation Reconsideration of Project Certificate #003 for Doris North Gold Mine Amendment Proposal Environment and Climate Change Canada Inuktitut and English	April 13, 2016	Environment and Climate Change Canada (ECCC)
31	Hard Copy PowerPoint Presentation Reconsideration of Project Certificate #003 for Doris North Gold Mine Amendment Proposal Environment and Climate Change Canada Inuinnaqtun and English	April 13, 2016	Environment and Climate Change Canada (ECCC)
32	Hard Copy PowerPoint Presentation Doris North Gold Mine Project Presentation to the Nunavut Impact Review Board Fisheries and Oceans Canada Inuktitut	April 13, 2016	Fisheries and Oceans Canada (DFO)

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Exhibit	Exhibit Description	Date	Party Tendering Exhibit
33	Hard Copy PowerPoint Presentation Doris North Gold Mine Project Presentation to the Nunavut Impact Review Board Fisheries and Oceans Canada Inuinnaqtun	April 13, 2016	DFO
34	Hard Copy PowerPoint Presentation Doris North Gold Mine Project Presentation to the Nunavut Impact Review Board Fisheries and Oceans Canada French	April 13, 2016	DFO
35	Hard Copy PowerPoint Presentation Doris North Gold Mine Project Presentation to the Nunavut Impact Review Board Fisheries and Oceans Canada English	April 13, 2016	DFO
36	Hard Copy, PowerPoint Presentation, Final Hearing on TMAC Resources Inc.'s proposed Amendment to the Doris North Gold Mine Project Indigenous and Northern Affairs Canada (INAC) Inuktitut and English	April 13, 2016	Indigenous and Northern Affairs Canada (INAC)
37	Hard Copy, PowerPoint Presentation, Final Hearing on TMAC Resources Inc.'s proposed Amendment to the Doris North Gold Mine Project Indigenous and Northern Affairs Canada (INAC) Inuinnaqtun and English	April 13, 2016	INAC
38	Hard Copy PowerPoint Presentation Revisions to Amendment Application No. 1 of Project Certificate 003 NIRB Public Hearing- April 2016 MARINE ENVIRONMENT Inuinnaqtun	April 13, 2016	TMAC

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Exhibit	Exhibit Description	Date	Party Tendering Exhibit
39	Hard Copy PowerPoint Presentation NRCan's Final Hearing Presentation on Permafrost & Groundwater (Hydrogeology): TMAC's Resources Inc.'s Amendment Application for the Doris North Gold Mine Project Inuktitut	April 13, 2016	Natural Resources Canada (NRCan)
40	Hard Copy PowerPoint Presentation NRCan's Final Hearing Presentation on Permafrost & Groundwater (Hydrogeology): TMAC's Resources Inc.'s Amendment Application for the Doris North Gold Mine Project Inuinnaqtun	April 13, 2016	NRCan
41	Hard Copy PowerPoint Presentation NRCan's Final Hearing Presentation on Permafrost & Groundwater (Hydrogeology): TMAC's Resources Inc.'s Amendment Application for the Doris North Gold Mine Project English	April 13, 2016	NRCan
42	Hard Copy PowerPoint Presentation Transport Canada Nunavut Impact Review Board Presentation of Technical Submission TMAC Resources Inc.'s Doris North Project Certificate Amendment Inuktitut	April 13, 2016	Transport Canada (TC)
43	Hard Copy PowerPoint Presentation Transport Canada Nunavut Impact Review Board Presentation of Technical Submission TMAC Resources Inc.'s Doris North Project Certificate Amendment French	April 13, 2016	TC

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Exhibit	Exhibit Description	Date	Party Tendering Exhibit
44	Hard Copy PowerPoint Presentation Transport Canada Nunavut Impact Review Board Presentation of Technical Submission TMAC Resources Inc.'s Doris North Project Certificate Amendment English	April 13, 2016	TC
45	Hard Copy PowerPoint Presentation TMAC Resources Inc.'s proposed Amendment to the Doris North Gold Mine Project Public Hearing Inuktitut - French	April 13, 2016	Government of Nunavut (GN)
46	Hard Copy PowerPoint Presentation TMAC Resources Inc.'s proposed Amendment to the Doris North Gold Mine Project Public Hearing Inuinnaqtun - English	April 13, 2016	GN
47	Hard Copy PowerPoint Presentation Revisions to Amendment Application No. 1 of Project Certificate 003 NIRB Community Roundtable- April 2016 SUMMARY PRESENTATIONS Inuktitut	April 13, 2016	TMAC Resources Inc.
48	Hard Copy PowerPoint Presentation Revisions to Amendment Application No. 1 of Project Certificate 003 NIRB Community Roundtable- April 2016 SUMMARY PRESENTATIONS Inuinnaqtun	April 13, 2016	TMAC Resources Inc. (TMAC)

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Exhibit	Exhibit Description	Date	Party Tendering Exhibit
49	Hard Copy PowerPoint Presentation Revisions to Amendment Application No. 1 of Project Certificate 003 NIRB Community Roundtable- April 2016 SUMMARY PRESENTATIONS English	April 13, 2016	TMAC
50	Hard Copy Map described as Figure 1 Barren-ground, Dolphin and Union island and boreal caribou calving grounds or calving sites in the Northwest Territories, Nunavut and northern Alberta (J.A. Nagy, unpublished data)	April 13, 2016	TMAC
51	Hard Copy PowerPoint Presentation Additional Slides Roberts Bay Discharge Pipe and Weights English	April 13, 2016	TMAC
52	Hard Copy PowerPoint Presentation Kitikmeot Inuit Association KIA Technical Review of TMAC's Amendment Application for the Doris North Mine Site Project English	April 14, 2016	Kitikmeot Inuit Association
53	Hard Copy PowerPoint Presentation Final Hearing on TMAC Resources Inc.'s proposed Amendment to the Doris North Gold Mine Project Indigenous and Northern Affairs Canada (INAC) English/Inuinnaqtun	April 14, 2016	Indigenous and Northern Affairs Canada (INAC)
54	Hard Copy PowerPoint Presentation Additional Slides Roberts Bay Discharge Pipe and Weights Inuktitut	April 14, 2016	TMAC Resources Inc. (TMAC)
55	Hard Copy PowerPoint Presentation Additional Slides Roberts Bay Discharge Pipe and Weights Inuinnaqtun	April 14, 2016	TMAC

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Exhibit	Exhibit Description	Date	Party Tendering Exhibit
56	Hard Copy Joint Submission on Suggested Terms and Conditions TMAC Resources Inc. and Government of Nunavut	April 14, 2016	TMAC
57	Hard Copy Joint Submission on Commitments TMAC Resources Inc. and Government of Nunavut	April 14, 2016	TMAC
58	Hard Copy TMAC Summary of Potential Amendments to Project Certificate No. 003 Terms and Conditions and Appendices and New Project Terms and Conditions [as at April 14, 2016] (Update of Exhibit 4 filed on April 12, 2016)	April 14, 2016	TMAC
59	Hard Copy Closing Statement of TMAC Resources Inc.	April 14, 2016	TMAC

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Appendix C: List of Acronyms

AANDC Aboriginal Affairs and Northern Development Canada
ᑲᓇᑕᒥ ᓄᓇᕗᑦᑲᕗᑐᓂᔪᓐᓇᖅ ᐅᑭᐅᕗᑦᑕᕗᑦᑐᒥᓂ ᐱᓕᕐᓂᓕᕆᔨᓂᖅᓂᔪᓐᓇᖅ

ARD Acid Rock Drainage
ᐅᓴᖃᐃᖅ ᐅᑦᖁᓇᖅᑐᕗᑦᑕᓐᓂ ᖃᐅᖅᓂᕆᔨᓂᐅᕐᓂᖅ

ATV All-Terrain Vehicles
ᓇᐅᕗᐅᑐᐃᓐᓇᕐᓇᖅᑐᖅ ᓄᓇᓕᐅᑎᖅ

CCG Canadian Coast Guard
ᑲᓇᑕᒥ ᐅᒥᐊᖏᐊᓂᔪᓐᓇᕗᐅᑦ

CEA Cumulative Effects Assessment
ᐊᕗᑐᑦᑕᐅᓕᖅᑲᓕᐅᕗᖓᑲᐅᓕᕐᓂᕗᒃ ᓇᓗᓇᐃᖓᐃᓂᖅᖢᒃ

COPC Constituents of Potential Concern
ᐃᓕᒧᑦᓗᑕᐅᖅᑲᓕᐅᕗᖓᑐᐃᓇᓇᐊᑦᓂ

DFO Fisheries and Oceans Canada
ᑲᓇᑕᒥ ᐃᖅᑲᓗᑎᓂᔪᓐᓇᖅ ᐃᒪᖏᐅᑕᑎᓂᔪᓐᓇᕐᓗᑦ

EC Environment Canada
ᑲᓇᑕᒥ ᐊᕐᑎᑎᓂᔪᓐᓇᖅ

EIS Environmental Impact Statement
ᐊᕐᑎᑎᒥᐅᑕᓄᖓᑦ ᐊᑦᑐᑦᑕᐅᓕᖅᑲᓕᐅᕗᖓᑐᐃᓇᓇᐊᖅᖢᓂᕐᓂᖅᓄᑦᓄᓕᒥᓂ ᐅᓂᒃᑲᓕᐊᖅ

EMP Environmental Management Plan
ᐊᕐᑎᑎᒥᐅᑕᓄᖓᑦ ᐊᐅᓕᑕᐅᓂᖅᓄᑦᓄᓕᒥᓂ <ᖅᓇᐅᑦ

FEIS Final Environmental Impact Statement
ᑭᖑᓪᓕᖅᓯᖅ ᐊᕐᑎᑎᒥᐅᑕᓄᖓᑦ ᐊᑦᑐᑦᑕᐅᓕᖅᑲᓕᐅᕗᖓᑐᐃᓇᓇᐊᖅᖢᓂᕐᓂᖅᓄᑦᓄᓕᒥᓂ ᐅᓂᒃᑲᓕᐊᖅ

GDP Gross Domestic Product
ᑲᓇᑕᒥ ᓂᐅᕕᐊᒃᖏᑎᖅᓄᑦᓄᓕᒥᓂ ᐱᓕᕆᔨᕐᑎᖅᓄᑦᓄᓕᓪᓕᓗ ᑲᑎᓪᓗᑎᒥᑦ ᑭᓇᐅᖅᓕᓕᐊᑦ

GHG Greenhouse Gas
ᓱᓕᖏᐊᓱᐊᑦ ᐅᖏᒃᓱᓯᓕᓕᐊᕐᐊᑎᖅᓴᒐ

GN Government of Nunavut
ᓄᓇᕘᑦ ᓴᖅᒪᖅᓴᒐ

HC Health Canada
ᑲᓇᑕᒥ ᐋᓐᓂᐊᖏᖅᓯᒪᔨᓂᔪᓐᓇᒃᑯᑦ

HTO Hunters and Trappers Organization
ᐊᓱᖅᓄᖅᑎᑦ ᑲᑐᔪᖏᑎᑕᖅᑎᑦ

IIBA Inuit Impact and Benefit Agreement
ᐃᓄᐃᑦ ᐊᒃᑐᖅᑕᐅᓂᐊᖏᓂᖅᓄᑦᓄᓕᒥᓂ ᐃᑲᔪᓱᐊᖏᖅᑕᕐᓂᓇᐅᑎᖅᓄᑦᓄᓕᓪᓕᓗ ᐊᖅᑭᕗᑎᓂ

IOL Inuit Owned Land
ᐃᓄᐃᑦ ᓄᓇᕗᑎᖅᑭᑦ

IPG Institution of Public Government
ᐃᓄᖅᓄᑦ ᓴᖅᒪᓕᖏᖅᖢᑲ

IR Information Request
ᑐᙵᖏᑎᑕᐅᑭᐊᑲᓂᓂᕐᒪᔪᑦ

KIA Kivalliq Inuit Association
ᑭᖅᓕᓂᕆᒥ ᐃᓄᐃᑦ ᑲᑐᔪᖏᑎᑎᑦ

LSA Local Study Area
ᓄᓇᓕᐅᔨᑦ ᖏᑲᓕᑎᔾᓂ ᖏᑲᐅᔪᙵᖏᖅᖢᖅᑐᖅ

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ML	Metal Leaching ᓴᖏᕋᖅᓴᐃᓪ ᕿᑭᓂᖅᑎᓇᓕᓪᓕᐊᓂᖓᓪᓕᐅᑦ
MT	Million tonnes ᒥᓕᐊᓐ ᑕᓐᓴ
Mt/a	Million tonnes per annum (year) ᒥᓕᐊᓐ ᑕᓐᓴ ᐊᕐᕿᔪᓕᒧᖅ
NGMP	Nunavut General Monitoring Program ᓄᓇᕗᒻᒥ ᑭᓯᑐᐃᓐᓇᕐᓂᖅ ᓯᓐᓂᖅᑐᕐᖅᑭᓪᓕᐊᓕᖓᓐᓂᖅᑕᐃᓇᐊᖏᓚᓐᓂᖅ ᖃᐅᔨᓕᕐᐊᖅᑭᑦᕐᓂᖅ
NIRB	Nunavut Impact Review Board ᓄᓇᕗᒻ ᐊᓯᑎᓕᓗᓴᖅᑯᑦ ᑲᑎᒪᔨᖏᑦ
NLCA	Nunavut Land Claims Agreement ᓄᓇᕗᓴᒥ ᓄᓇᒋᓂᕐᓂᒍᑦ ᐊᖏᑕᐅᑎᑦ
NNLP	No Net Loss Plan ᐃᕐᖅᓗᖅᑕᓪᓕᑦ ᐊᖅᑐᕐᑕᐅᓯᒪᕐᖅᓯᐅᓴᕐᖅᓴᐅᕐᕿᑐᓕᑦ ᓄᑖᓄᑦ ᐱᓕᓗᐊᓗᓴᐅᓂᐊᕐᖅᑐᓄᑦ ᑦᕐᓇᐅᑦ
NPC	Nunavut Planning Commission ᓄᓇᕗᒻᒥ ᑦᕐᓇᐃᔭᑦ
NRCan	Natural Resources Canada ᖃᓇᑕᒥ ᓄᓇᒥᐅᑕᓕᓕᓗᔭᑦ
NTI	Nunavut Tunngavik Incorporated ᓄᓇᕗᑦ ᑐᖓᓚᕕᖅ ᐃᓐᓇᐊᐳᓗᑎᑦ
NWB	Nunavut Water Board ᓄᓇᕗᒻ ᐃᒪᓕᓗᔭᑦ ᑲᑎᒪᔨᖏᑦ
NWMB	Nunavut Wildlife Management Board ᓄᓇᕗᒻᒥ ᐅᒪᔪᓕᓗᔨᕐᔪᐊᑦ ᑲᑎᒪᔨᖏᑦ
PC	Parks Canada ᖃᓇᑕᒥ ᒥᖖᔪᐃᓐᓄᓕᕕᓕᓗᔭᑦ
PHC	Preliminary Hearing Conference ᐃᓄᑎᐊᖅᑎᑦᓗᔪ ᐃᓄᐃᑦ ᑲᑎᒪᓚᑎᐅᓕᐊᓵᓕᓂᖓᓐᓂᓕᓂᖅ ᑲᑎᒪᓕᓂᖅ
RSA	Regional Study Area ᓄᓇᓕᑦ ᐊᕆᐅᑐᓄᓯᒪᐅᕐᓂᖓᓚᓐᓂ ᖃᐅᔨᓴᕐᕕᐅᔪᖅ
SARA	Species at Risk Act ᐅᒪᔪᑦ ᐊᑦᑕᓇᖅᑐᓄᑯᓕᑎᔪᓄᑦ ᒪᓕᑎᖅᔪᐊᖅ
SEMC	Socio-Economic Monitoring Committee ᐃᓄᓕᓕᓂᓂᖅ -ᐱᓪᓕᓕᐊᔪᓕᓕᓂᓂᕐᒧᖖᑎᔪᓕᑦᓗ ᓯᓐᓂᖅᑐᕐᖅᑭᓪᓕᐊᓕᖓᓐᓂᖅᑕᐃᓇᐊᖏᓚᓐᓂᖅ ᖃᐅᔨᓴᕐᐊᖅᑭᑦᕐᓂᖓᓚᓐᓄᓕᑦ ᖃᓇᑕᒥᓴᕐᓂᓕᕆᑦ
TC	Transport Canada ᖃᓇᑕᒥ ᐃᓚᕐᓂᔪᓕᓕᓗᔭᑦ
TDS	Total Dissolved Solids ᓯᑎᔪᕆᓱᑦ ᐊᐅᖅᓯᒪᔪᑦ ᖃᑎᑦᓗᑎᑦ
TK	Traditional Knowledge ᐃᓄᖓᓄᑦ ᑦᖃᐅᔨᒪᕗᐅᔪᑦ
VEC	Valued Ecosystem Component ᐅᒪᔪᓐᓇᖅᑐᒥᓯᑦ ᐊᐳᑎᖓᑦᑕᓗ ᐃᓄᖓᓄᑦ ᐱᓪᒪᓇᑎᑕᕗᐅᔪᑦ
VSEC	Valued Socio-Economic Component ᐃᓄᓕᓕᓂᓂᖅ -ᐱᓪᓕᑦᓕᐊᔪᓕᓕᓂᓂᕐᒧᖖᑎᔪᓕᑦᓗ ᐃᓄᖓᓄᑦ ᐱᓪᒪᓇᑎᑕᕗᐅᔪᑦ