Izok Corridor Project Proposal

SECTION 10

Table of Contents Page

10 CUMULATIVE AND TRANSBOUNDARY EFFECTS

10.1 Cumulative Effects Assessment

10.1.1 Approach

The potential contribution of the Izok Corridor Project to regional cumulative effects will be assessed in accordance with NIRB requirements. This assessment will follow the latest guidance and precedence of best practice for such assessments in various administrative jurisdictions in Canada.

The cumulative effects assessment will consider the most likely cause-effect pathways through which residual Project effects could interact with other past, existing and reasonably foreseeable projects and activities both in time and space. Given the remoteness of the Project Development area, likely means by which cumulative effects could occur include:

- Long-range transport of a residual Project effect on a Valued Ecosystem Component (VEC) (e.g., air or water pathways)
- Residual Project effects on a broad ranging VEC (e.g., wildlife species)
- Synergistic effects of the Project that could result in a disturbance on a natural feature within a larger region under land and resource management

Where the Project is predicted to result in a measureable or detectable residual effect on a VEC, the effect will be screened to determine if there is the potential for it to interact with similar effects of other projects or activities. If a cumulative effect could occur, the effect will be assessed in detail and its significance on the VEC determined.

The assessment will be spatially bound within regional study areas (RSAs) defined for each VEC, and temporally bound to consider the base case (i.e., existing cumulative effects prior to the Project), Project case (i.e., cumulative effects over and above the base case due to the Project), and future case (i.e., cumulative effects due to the Project in combination with all reasonably foreseeable future project and actions). For this assessment, a potential far future development scenario will also be considered to address the potential for additional resources to be discovered during the life of the Project. Given the lack of information regarding specific details of potential future developments, the assessment of a far future case will be, by definition, qualitative.

The cumulative effects assessment will be based on a description of the current status of regional cumulative effects of all past and present projects and activities in the RSA to establish the context for assessing the incremental contribution of the Project.

Applicable government plans (e.g., regional land use plans), programs and other initiatives will be identified and discussed in relation to contribution to mitigation and monitoring of cumulative effects.

10.1.2 Potential Biophysical Cumulative Effects

A list of candidate actions (e.g., exploratory mining, production mines, infrastructure and natural resource harvesting) will be prepared to assist in assessing possible cumulative effects on the terrestrial and marine environments in the Draft Environmental Impact Statement (DEIS). This will include past, present and reasonably foreseeable projects, activities and actions with residual environmental effects that could overlap spatially and temporally with residual Project effects. Separate project inclusion lists will be developed for the terrestrial and marine assessments based on the RSAs selected for marine mammals and vegetation, as they encompass the geographically broadest areas within which residual Project effects could occur.

The following sections identify potential pathways through which Project effects could overlap with effects of other projects and activities to cause more regional cumulative effects. A more detailed assessment of possible cumulative effects will be undertaken as part of the DEIS based on a more comprehensive review of each regional project or activity.

Air Quality

Changes to air quality from airborne dust and combustion emissions during construction and operation of the Izok and High Lake Mine sites, Izok Road and Grays Bay Port could be, under certain climatic conditions, sufficiently broad to interact with emissions from other existing and future projects and activities in the region. This includes air emissions from operations of equipment and vehicles, as well as emissions from marine transportation.

Noise and Vibration

Noise and vibration from Project facilities and activities could cause sensory disturbance to wildlife, which may act cumulatively with that of existing and future projects in the region. This applies to potential effects of equipment operation and vehicular traffic on terrestrial wildlife species, as well as marine vessel operations on marine wildlife.

Surface Water and Groundwater

There are no other past, existing or reasonably foreseeable future projects located within the local watersheds of the Izok Corridor Project. As such, the potential for cumulative effects on surface water and groundwater quality and quantity is expected to be unlikely. The exception may be induced developments that could occur in the region as a result of the building of the Project all-season road and port facilities.

Freshwater Aquatic Organisms, Fish and Fish Habitat

As with surface water and groundwater, there is no potential for Project effects on aquatic organisms, fish and fish habitat to interact cumulatively with effects of other regional projects or activities. Given that there has been limited historical use of the Project Development area for traditional fishing activities, it is unlikely that any residual effect of the Project would interact with these activities to cause a detectable or measurable regional effect on fish populations.

Landforms

Future development projects in the region would likely require the use of existing borrow and quarry sources (including eskers) for construction materials, which could act cumulatively to deplete these resources over the long term.

Soils and Vegetation

The Izok Corridor Project has the potential to affect soils and vegetation through direct loss associated with building of infrastructure, as well as through deposition of trace elements from air emissions. Although there are no other past, existing or foreseeable future projects that could act cumulatively with these effects, there is the possibility that future induced developments and activities that use the Project all-season road could lead to increased emissions, and greater effects on soils and vegetation.

Wildlife and Wildlife Habitat

Effects on wildlife and wildlife habitat could be cumulative if the Project and other actions physically remove or modify habitat, change movement patterns or cause direct mortality within the regional wildlife study area. Potential effects on caribou, grizzly bear, muskox and wolverine will be assessed in the DEIS.

Caribou are at greatest risk of being affected by regional cumulative effects due to their large seasonal migration patterns. Two herds (the Bathurst and Dolphin and Union herds) have the potential to be affected by the Project as a result of construction and operation activities. These effects have the potential to act cumulatively in parts of their ranges with similar effects from other human activity in the region.

Birds and Habitat

Effects on birds and bird habitat may be cumulative if the Project and other actions cause a change in habitat availability through direct loss of the habitat or sensory disturbance within the regional study area. While migratory birds have the greatest potential to be affected by multiple project and activities effects due to their large ranges, potential cumulative effects of raptors and upland breeding birds will also be assessed in the DEIS.

Marine Environment

Project effects on marine water and sediment quality and marine fish are likely to be spatially limited (e.g., vicinity of Grays Bay Port) and therefore the potential to interact cumulatively with other past, existing or future projects is expected to be minimal. However, these effects will be addressed in detail in the DEIS.

Marine shipping activities could cause increased risk of injury or mortality and a change in behaviour of some marine wildlife species (e.g., marine mammals and colonial nesting birds), which could act cumulatively with effects of other marine transportation activities in the region. However, the potential contribution of the Project to cumulative effects is anticipated to be relatively small given the projected number of vessel transits each year (16 return trips), use of established shipping lanes, and use of the open-water season to meet marine transportation requirements.

10.1.3 Potential Socio-economic Cumulative Effects

Cumulative effects on the socio-economic environment are anticipated to be both adverse and beneficial with overall positive outcomes on individual, family and community well-being. Any cumulative effects that occur will be the result of a complex interaction between the various effects of the Project with those of other developments, and their collective contributions to the social, cultural and economic changes or shifts occurring across Nunavut. This Project will be a strong driver for change in the Kitikmeot region.

Human Assets

The Izok Corridor Project will be another fly-in/fly-out mining operation in Nunavut that will require qualified management personnel, trades people and general labourers. One anticipated cumulative effect is competition for labour with the other mining operations in Nunavut. The demand for labour will likely result in sustained efforts to establish a stable, qualified workforce. One possible outcome of this could be increased enrolment in post-secondary educational programs. The response of Nunavummiut could be a desire to relocate to take advantage of educational and employment opportunities. Larger communities in the Kitikmeot region are anticipated to have the competitive advantage over smaller ones in attracting and/or retaining people.

Economic Assets

The Project, in combination with other developments across Nunavut, will create a greater number and a more diverse range of employment and business opportunities for all Nunavummiut. Multiple projects will act as a catalyst for increased local and regional economic development, resulting in new investment in the mining service industry across Nunavut. Total household income will increase and, over time, is expected to result in lower requirements for income support, and improve people's financial security. The financial capacity of various governments and organizations will also likely improve over time as revenue sources increase. Overall, this could manifest itself in a further shift from an economy based on traditional activity and government transfers to one that is more wage-based, competitive and entrepreneurial.

Given the vast geography of the Kitikmeot region, increased access to the land through the development of a road could make hunting and trapping further afield from communities more attractive, thereby maintaining the non-wage economy to some extent.

Physical Assets

Any cumulative effects on community infrastructure and services will depend on migration into the region and net changes in the population. Communities that experience population growth will experience increased demand for housing stock, community services and transportation infrastructure.

Social Assets

Cumulative effects on social assets could include potential loss of traditional harvesting areas, and physical disturbance to cultural, archaeological and paleontological resources. In the absence of effective and sustained initiatives by governments, Inuit organizations and others to maintain traditional

culture, the shift towards a wage economy and greater use of English will further affect Inuit traditional activities and knowledge over time. Any reduction of harvesting or sharing of harvest would represent an erosion of traditional culture as it is presently viewed by many Inuit. The corollary to this is that employment also provides the finances to allow participation in cultural activities.

In addition to changes in culture, the Project also has the potential to create divisions within the communities and a situation of haves and have-nots among community members. Development projects such as this have also been identified as causing family breakdowns when families are not adequately prepared.

MMG is committed to collaborating with stakeholders in developing and implementing mitigation measures through Project design, environmental protection plans, and adaptive management to limit any potential contribution of the Project to regional cumulative effects on the biophysical and socio-economic environments.

10.2 Transboundary Effects Assessment

10.2.1 Approach

Potential transboundary effects will be assessed in accordance with NIRB requirements. This assessment will identify those potential residual Project effects that could extend across or occur outside of the geographic boundaries of Nunavut. This includes cumulative effects that may spatially overlap other administrative jurisdictions, as well as Project effects that occur within other jurisdictions such as those associated with marine shipping along the western shipping route.

The assessment will also identify any existing or pending land and resource use management initiatives by other jurisdictions that may contribute to Nunavut or Project-based mitigation and monitoring of those effects.

10.2.2 Potential Biophysical Transboundary Effects

While most residual Project effects on the biophysical environment are expected to be localized (i.e., within close proximity to the Project footprint) and therefore within Nunavut boundaries, there is the potential for some effects to be transboundary in nature.

- Changes to air quality as a result of fugitive dust and atmospheric emissions from diesel combustion during mining and milling operations, air and ground transportation and marine transportation, which could extend into the NWT and contribute to global GHG emissions
- Effects on surface water and freshwater aquatic organisms from construction and operation of the Izok Mine, which is in close proximity to the Nunavut-NWT border
- Effects on wide-ranging wildlife species such as the Bathurst and Dolphin and Union caribou herds, grizzly bear, wolverine and several species of migratory birds
- Effects on marine mammals along the western shipping route in the NWT, such as the Eastern Beaufort Sea beluga whale population, bowhead whales of the Bering-Chukchi-Beaufort Sea stock, the Northern Beaufort Sea and Southern Beaufort Sea populations of polar bears, and ringed seals in Amundsen Gulf and the Beaufort Sea

10.2.2 Potential Socio-economic Transboundary Effects

The Izok Corridor Project has the potential to result in transboundary effects on traditional use of lands and waters for wildlife harvesting. This is due, in part, to the proximity of the Izok Mine site to the NWT border and the harvesting access afforded to Tlicho residents by the Tlicho Land Claim Agreement. Further, the western shipping route through the Northwest Passage could also affect the use of waterways by the Inuvialuit for their traditional activities. The Project also has the potential to result in transboundary effects by generating economic opportunities outside of Nunavut through purchases of goods and services from across Canada, use of Yellowknife as a point of hire, increased marine shipping of goods, and the potential for increased use of the Tibbitt to Contwoyto Winter Road.

MMG is committed to collaborating with stakeholders in developing and implementing mitigation measures through Project design, environmental protection plans, and adaptive management to limit any potential transboundary effects on the biophysical and socio-economic environments.