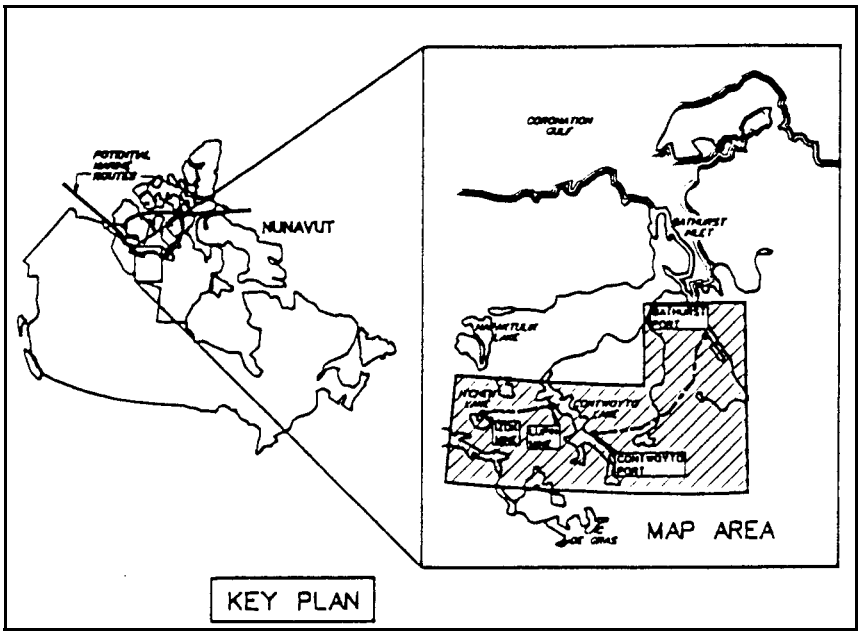
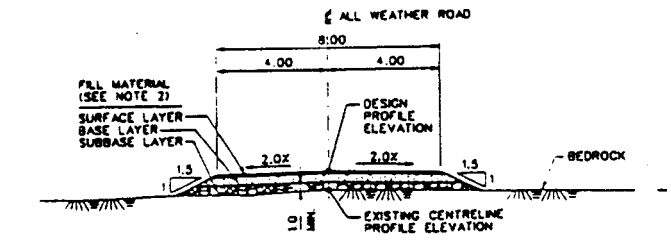


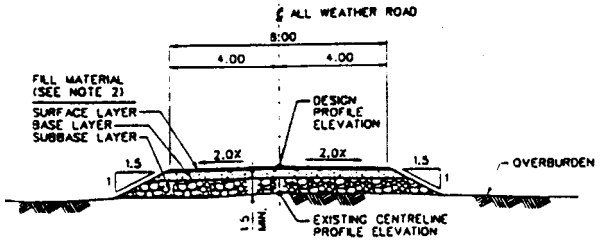
THE BATHURST INLET PORT AND ROAD PROJECT
PROJECT DESCRIPTION

SUBMITTED TO: KITIKMEOT INUIT ASSOCIATION
INDIAN AND NORTHERN AFFAIRS CANADA

BY: BATHURST INLET PORT AND ROAD JOINT VENTURE
MARCH 2002



TYPICAL ALL WEATHER ROAD SECTION
ON BEDROCK OR WELL-DRAINED GRANULAR SOILS
NTS



TYPICAL ALL WEATHER ROAD SECTION
ON ICE-RICH SOILS
NTS

EXECUTIVE SUMMARY

Bathurst Inlet Port and Road Project Description

This Project Description describes the construction and operation of the Project and the interactions of the Project with the environment.

The Project consists of a port on Bathurst Inlet connected to the Izok mineral deposit by a 211 km all weather road to Contwoyto Lake, the existing winter ice road and a summer barge system to Lupin Mine, and a 79 km all weather road from Lupin to Izok.

The Project lies entirely within the Kitikmeot region of Nunavut. This Project Description is submitted to the Kitikmeot Inuit Association and the Department of Indian and Northern Affairs, as the landowners in the Project area, for an environmental review under the Nunavut Land Claims Agreement, Article 12 Part 5.

The Project proponents are the Kitikmeot Corporation and Nuna Logistics Limited, both Inuit owned companies, who will form a Joint Venture corporation to build and operate the Project. As a shareholder in Nuna Logistics, the Kitikmeot Corporation will own 62.75% of the Project.

Project Construction

The Project requires the use of Federal Crown Lands and Inuit Owned Lands. The port is located on Crown Land and requires 150 hectares of space and 700,000 cubic meters of quarried materials for construction. The port site will include:

- a wharf to serve 50,000 tonne ice class vessels delivering fuel and bulk cargo and shipping out base metal concentrates from Izok;
- a dock to handle barges serving the Kitikmeot communities of Kugluktuk, Bathurst Inlet, Cambridge Bay, Umingmaktok, Gjoa Haven and Taloyoak;
- a 200 person camp and services;
- a 220 million litre diesel fuel tank farm;
- a truck and trailer maintenance shop;
- a 1, 200 meter airstrip.

Port construction will begin in September 2004 and be completed on September 2006.

The 290 km all-weather road passes over 148 km of Inuit Owned Land and 140 km of Crown Land. Road construction materials will be obtained from quarries adjacent to the roadway. Fifty-one quarries are proposed, 29 on Inuit Owned Land and 22 on Crown Land.

Road construction will occur in three phases; at the port it will begin in October 2004 and work toward Contwoyto Lake, at Contwoyto Lake it will begin in February 2005 and work toward the port. Lupin to Izok road construction will begin in February 2006 from Lupin and work toward the Izok Project. Road construction will be complete in October 2006.

Two barge terminals will be constructed on Contwoyto Lake. The terminal at kilometer 211 on the southeast shore of the lake will include a 20 person camp, a small maintenance shop and a truck parking area. The other terminal will be located at Lupin Mine on the northwest shore of the lake.

Project Operations

The Project's annual operating schedule will reflect the seasons of the arctic environment. Marine shipping will be completed between mid-July and late October. In the period, from six to ten round trips by 50,000 tonne ships will bring in approximately 225,000 tonnes of fuel and supplies for operating mines served by the Project and remove 300,000 to 470,000 tonnes of lead/zinc/copper concentrate from the Izok Project. Ice breaker support may be required as with other arctic projects, however, this shipping schedule can be accomplished without ice breaking to extend the normal open water season. Marine operations will also supply diesel fuel and general cargo to the Kitikmeot communities with three round trips by tug and barge from the port during the summer shipping season.

Road operations will also follow the arctic seasons. Winter road operations will run from January through April and connect with the existing Lupin winter road from Yellowknife to haul 185,000 tonnes of fuel and supplies to Ekati and Diavik Diamond Mines in the NWT. Accommodation and meals for drivers will be provided by the camp at the port. Operating the barge on Contwoyto Lake will permit hauling to Lupin and Izok in winter and summer. Fuel and supplies from the port to Lupin and Izok combined are 45,000 tonnes per year. The concentrate from Izok will range from 300,000-470,000 tonnes per year in the first ten years of Project operations. Summer barge operations will occur for 90 days in the mid-July to mid-October ice-free period. No hauling will occur during spring break-up from the end of April to mid-July and fall freeze-up from the end of October to January.

Project Interactions with the Environment

Project construction will require disturbance to approximately 670 hectares of terrestrial habitat, 2.3 hectares of marine habitat at the port, and 0.3 hectares of lake bottom in Contwoyto Lake for summer barge terminals. The road will cross 119 streambeds; 82 are intermittent streams (with no fish) that will be crossed with arched culverts or single span bridges that will not affect the normal stream channel. Support for the bridges will encroach into the stream channel at only three crossings. The effect of road construction on fish habitat will be negligible. On the land, animals will always have the right of way over traffic on the road. The most common animal in the Project area is caribou of the Bathurst caribou herd. During spring migration almost all of the animals in the herd could move through the Project area. No heavy hauling will be done in May and June so there will not be any significant interaction between traffic on the road and caribou during spring migration. The number of caribou along the road will be much less during the summer and winter hauling seasons. If hauling encounters periods of heavy caribou migration, hauling will be suspended until the migration has passed. Hunting by Project workers along the road or at the port will not be permitted. Recreational fishing by workers will be governed by the terms of the West Kitikmeot Land Use Plan.

The Project will be built and will operate in safe and clean ways that protect the animals and environment. The Project will also develop effective plans to protect the environment and animals from the effects of accidents that might occur at the port and along the road.

Economic Effects of the Project in the Kitikmeot Region

Project construction will occur over a 26 month period and create 3,600 man-months of employment and a payroll of $34.5 million. Project operations will create 800 man-months of employment every year (300 in summer and 500 in winter) and produce a payroll of approximately $3.5 million. The services of contracted truck drivers will add an additional payroll of $9 million per year. Much of the new employment opportunities can go to the workforce resident in the Kitikmeot Region; with aggressive training for the employment needs of the Project, most of the payroll money can stay in the region.

At current world fuel prices, the cost of fuel landed in Cambridge Bay from the port in Bathurst Inlet could be reduced by up to 35% of the 2002 price of fuel from Hay River. The cost of freight from the south by truck to the port on winter road and barge to Cambridge Bay would be competitive with freight costs via Hay River but the goods could arrive in the community three to five weeks earlier. The freight cost of the same goods shipped to Cambridge Bay from eastern Canada or Europe via the port would be less expensive by up to 70%.

These savings show the potential for the Project to reduce the cost of fuel and supplies for any commercial venture in the Kitikmeot communities, especially a mine in the Project area. It is expected that the Project will stimulate new mineral exploration and production in the Kitikmeot Region of Nunavut and so create many new employment and business opportunities for the residents and businesses of the region.

Nainarhimayuq

Kingaungmi Umianut Tuluktarvihak Apquhiugaharlu

Una unipkarniaqtuq havariyauniaqtumik nappaqtiriyuhat aulaliqqallu Tulaktarvihak Apqullu Atuqtaulikkat kanurlu aktumangmangat avatiptingnut.

Havariyauniaqtuq tuluktarvihak Kingaungmit tavunga Izokmi uyagaqtarviuyumayumit ataniaqtuq apqutikkut 211 km-mik takkiyumik ukiuk tamat angmaniaqtumik Tahiryuamut. Atalunilu ukiumi hikukkut apqunmut auyamilu umiakkut Lupin mut 79 km-lu ukiuq tamallu atuqtauniaqtumi apqunimi Lupin-mit Izok-mut.

Havariyauniaqtuq tamat Qitirmiut iluaniittuq Nunavunmi. Hamna havariyauyukhamut titiqqat tuniyauhimayut Qitirmiut Inuit Katimayinut Nunaqaqqaqtuliriyinullu nunaqaqtungmata havarviuyumayumi, avatilirinirmut qauyihaiyangini Nunavunmi Nunatarutip Ataagut, Ilulik 12, Ilanga 5.

Havariyauyuhami ilauyut Kitikmeot Kuapurisan Nuna Logistics Limited-lu, tamarmik nanminiriyauyuq Inuinnanit. Panariiklutik kuapurisaliurniaqtuk nappaqtirilutik aulayiulutiglu Havagvihami. Nanminiriyauqatauplutik Nuna Logistickuni, Kitikmeot Kuapurisan nanminiqarniaqtut 62.75% Havakhami.

Havarvihami Nappaqtauyukhat

Havariyauyukhaq nunamik aturiaqaqtuq nunanik nanminiriyauyunik Gavamatuqanit Inuinnanillu. Tulaktarvihak Gavamatuqat nunaganiinniaqtuq 150 hectares-nguyunik 700,000 cubic metres-niglu uyagaliaqtariaqaqtut nappatiriligumik. Tulaktarvihak imainniaqtut:

- tulaktarvik tulaktarvihak 50,000 tonne-nguyunut umianut hikuhiuqtaqtunut urhuryuanik angiyuniglu tamayanik uhivaktuhanik ahiit uhilutik utimut Izokmit uyagaktaqtauhimayunik;
- umainut uhiyaqtarvihaq Qitirmiunmi nunalingnut agyaqtaqtunik Kugluktumut, Kingaungmut, Ikaluktuttiamut, Umingmaktumut Urhuktumut Taloyuamullu;
- ikluqpaqarluni 200-nik inuqaqtaqtumik
- 220 miliat litre-mik angiyunik urhuryuaqarvihamik
- akhalutinik igluqpanullu havarvihamik
- 1,200 metre-nguyumik milvihamik.

Tulaktarvihaliuliniarhimayut Saptampa 2004 atulihaliqqat iniqtauluni Saptampami 2006-nguqqat.

Tamna apqutihak 290 km ukiuq tamat atuqtauttaqtuq 148-km-nik Inuinnait Nunaqutaitkurniaqtuq 140 km-milu Gavamatuqatkut Nunariyaittigut. Uyagalliaqtarniaqtut apquhiurutihanik apqutikhap hanianit. 51-nguniarnahugiyauyut uyagaliaqtarvihat, 29 Inuinnait nunaginit 22-ttauq Gavamat nunaginit.

Pingahuniaqtuq apquhiurniq: tulaktarvihamit apquhiulirlutik Aktupa 2004-mi Tahiryuamut. Tahiryuami apquhiulirlutik February 2005-mi tulaktarvihamut. Lupin-mit Izokmut apquhiulirlutik February 2006-mi. Iniqtauluni apqut Aktupami 2006-mi.

Malguuk umiaqarvihak nappaqtauniaqtuk Tahiryuami. Umiaqarvihak kilometre 211-mi Tununingani Tahiryuap tangmarviqarniaqtuq 20-nut inungnut, akhalutinik havarviqarluni akhalutinullu nutqarhimavihaqarluni. Aipaa umiaqarvihak Lupin uyagaqtarvianiinniaqtuq tahiup hivuani.

Havarvihap Aulanikhait
Havarvihap aulanihaa mihigimaniaqtuq tatqiqhiutingit ukiuktaqtumi maliglugit. Taryukkut umiat agyaqtarnialutik Julai qitiqqugaikpat Aktupap ngunuanut. Uvani, 6-nit kulinut utiktarlut umiaryuat 50,000 tonne-nguyut agyarniaqtut 225,000 tonnes-nik tamayanik urhuryuaniglu uyagaqtarvinut. Utimuttauq agyarlutik 300,00-nit 470,000-nut tonnes-nik lead-mik/zinc-miglu/kannguyaniglu Izok-mi uyagaqtaqtunit. Hikuhiutimit umiamit ikayuqtauyariqarniarunarhiut allatut ukiuktaqtumi havaktutut. Kihimi, hamna umiat aulavihat namaktaktuq hikuliqihimaittumik umiakkukharnaqtumik.Taryukkut aulayut agyaktarnaqtullu urhuryuanik tamayaniglu Kitikmeoni nunalingut pingahiuqturlutik umiat kalillutik tulaktarvingmit auyami.

Apqutikkuktullu malingniaqtut ukiuktami tatqihiutainik. Ukiumi apqutikkuklutik January-mit April-mut angumalutik apqutikkuktunik Lupin-mit Yallunaimut agyarlutik 185,000 tonnes-nikurhuryuanik tamayaniglu uyagaqtarvinut Ekati-mut Diavik-kunullu Nunatiami. Hiniktarvihaqaqtitauniaqtut nirivihaqarlutiglu akhalutuqtit tangmaqtarvingmi tulaktarvingmi. Umiakkutitinik Tahiryuami agyaktautauniaqtut Lupin-mit Izok-mut ukiumi auyamilu. Urhuryuat tamayallu tulaktarvingmit agyaqtauyukhat Lupin-mut Izok-mullu attauttimut uqqumaitkutilgit 45,000 tonnes-nik. Izok-mit uyaqqat agyaqtauniarungnahiut 300,000 – 470,000 tonnes ukiuk tamat hivullini kulini ukiuni aulanirnianit. Auyami umiakkut agyaqtarniaqtut 90-ni ubluni Julai –kitqanit Aktupap kitqanut hikuilrumi. Agyaqtarunaittut upingahami hikuliqitilugu April-nunguanit Julaip kitqanut ukiakhamilu hikutiliqtilugu Aktupap nunguanit January-mut.

Havariyauniaqtup Aktumaniit Avatimut
Havariyauniaqtup nappaqtirnia nunamik allanguqtiriniaqtuq 670-nguyunarhiyumik hectares-nik, 2.3hectares-nik taryumi tulaktarvihami, 0.3-niglu hectares-nik Tahiryuap tattip ataanit auyami umianut uhiyaivihanik. Apqutikhak 1190nik imarnik aulayunik ikakturniaqtuq; 82 nguyut ilaaniinaq kurluapaktut (iqaluittut) ikaqaqtarviqarniaqtut havigalingnik turhuanik imaq aulahimagiagani. Ikagaqtarviit tungavihait imarmiiniaqtut pingahuinani kurluaqtuni. Nunami, hugatyat an'ngutivaluillu hivulliuginarniaqtut ikagaqtavini apqunmi. Havarviuniaqtumi umayut amigaitqiyauyuq tuktut Kingaup tuktutainit.Upingahami an'ngutit aulaligangata Havakvigiyauniaqtukkukpattut. Uqqumaittumik agyaktarunaittut May-mi June-milu aktumanaitutmik akhalutit aulayunit apqunmi tuktullu upingahami aulayuni.Tuktuqarluarunaittuq apqutikkut auyami ukiumilu agyaqtartilugit. Agyaqtaqtut tuktukkukpallaalirumik, agyaqtaruiqhimalangniaqtut ikarhiglugit aulayut an'ngutit.Havaktut anngunahuaqtitauyunaitpiaktut apqunmi tulaktarvingmiluuniit. Iqaluhiurumayut maligiaqaqtut atuquyauniaqtunit Ualiniani Kitikmeot Nunap Atuqpauyutihani.

Havariyauniaqtuq nappaqtauniaqtuq aulataulunilu hapiknaittumik halummayumiglu hapummilugit hugatyat an'ngutihallu avatikpullu. Iniqtiriniaqtullu atuqtauyukhanik hapummiyutikhanik avatiptingnik hungatyaniglu an'ngutinik huyuqarniqqat tulaktarvingmi apqutikkuluuniit.

Pivalliutihauyuq Havariyakhak Kitikmeoni
Havariyauniaqtup nappaqtiqtauniaqtuq tatqihiutini 26-ni havaniktiyuttauluni 3,600-inuit tatqihiutinik-ittutut maniliurutaulunilu 34.5 miliat talanik. Havariyauyukhap aulania 800-nik inungnik tatqihiutinik –ittutut havaktittilutik ukiuq tamat (300 auyami 500-lu ukiumi). Akiliqtuilutiglu havaktimingnut 3.5 miliat talamik. Kantratigullu akhalutituqtit akiliuhiangit ilautilugit 9 miliat talauniaqtuq ukiuq tamat. Havakhat angmaniaqtut inungnut Kitikmeoni; ilihauyihimarlutiglu Havarvihami, taima akiliuhiakhat Kitikmeoniittangani.

Hadja nunaryuami urhuryuap akiinni, urhuryuaq tikittaurumi Ikaluktuttiamut tulaktarvingmit Kingaungmi akikliyumiktaqtuq 35%-kut hadja 2002-mi urhuryuap akianit Hay River-mit. Akhaluttikkut tamayat agyaktauyut autsaimit tulaktarvingmut apqutikkut umiakullu Ikaluktuttiamut atyikkutavyaginiaqtaa akkita uhityutainit Hay River-mit. Kihimi, tamayat tikinnarilutik nunalingnut pingahuni talimanut santinik. Atauttit

tamayat uhityutait Ikaluktuttiamut kivvatanit Kanatap Europe-miluuniit tulaktarvikkut akikitqiyaunia 70%-nguttaqtuq.

Hapkua akikitqiyauttarniit naunaitkutauyut Havariyauyukhaq akituvallarunaitkutauniaqtuq urhuryuanut tamayakhanullu angiyunik havagumayunik Kitikmeoni nunalingni, uyagaqtarvihamitut humiliqaq Havarvihami. Niuriugutauyuq Havariyauyumayuq nutaanik nalvarhiurumayunik uyagaqtarumatyunigluuniit Kitikmeoni Nunavunmi. Tavanga nutaanik havaakhaqautiluni nanminiqaqtunullu angmaumaluni inungnut nanminiqaqtunullu Kitikmeoni.

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1.0 INTRODUCTION

This Project Description for the Bathurst Inlet Port and Road Project is prepared as prescribed in Appendix B: Nunavut Impact Review Board (NIRB) General Requirements for a Project Description (NIRB, 1997). The format and sequence set out by NIRB has been adjusted to the extent required to avoid repetition. This Project Description along with related applications for land and water use are submitted for the purposes of Project screening by NIRB and also for developing guidelines for the benefit of the Project's proponent when preparing a Project Environmental Impact Statement (EIS) pursuant to the Nunavut Land Claims Agreement (NLCA) Article 12, Parts 4 and 5. A final Project Description will be submitted on completion of the remaining environmental baseline field studies and preparation of the Bathurst Inlet Port and Road Project EIS that meets the requirements of the guidelines issued by NIRB. The final Project Description will reflect any changes in the Project that may result from field conditions discovered in the field studies yet to be completed to meet the requirements of the EIS Guidelines. The scope and scale of the Project however, is not expected to change.

1.1 Background Information

The abundant mineral endowment of the Slave Geological Province (SGP) has been known for several decades. The SGP has produced minerals continuously since the 1930's. However, the full potential of this area has not yet been realized due, for the most part, to the lack of transportation infrastructure. In most cases, when mineral production was initiated in a new region of northern Canada it was associated with or preceded by new energy and /or transportation infrastructure: Con Mine in 1930 required both an airstrip and improved barge services on Great Slave Lake setting the stage for Giant Mine 15 years later; Con Mine also developed Bluefish Hydro and a power line corridor to Yellowknife and Discovery Mine; hydro power on the Taltson River was developed and a railroad was built from Alberta to serve the Pine Point Mine; Tundra Mine developed an airstrip and pioneered winter road development; Echo Bay Mines developed a winter road system and jet strip for Lupin Mine; the MV Arctic, a Canadian ice breaking cargo ship was built by the Canadian Government to service Nanisivik Mine; the Ekati mine, Diavik and Snap Lake diamond projects depend on the Lupin winter road developed by Echo Bay.

Developing new mineral resources in Nunavut could be assisted by developing new transportation routes and infrastructure to known mineral deposits in the Kitikmeot Region. Several studies of different routes in the region have been completed in the past 20 years. Common to all the studies for mineral industry transportation in the region is development of the Izok base metal deposit, 70 km west of Lupin. Unlike gold and diamond mines which can operate on one way overland transportation to resupply fuel needs, a base metal mine requires overland transportation infrastructure for incoming fuel and other cargo, and outgoing base metal concentrate. Because the concentrates must be moved long distances to overseas smelters and markets, the mine requires access to a marine port. In order to avoid the capital cost of bulk storage facilities for the concentrate at both the mine and at a marine terminal, an all season road between the mine and the marine terminal is optimum.

The first comprehensive analyses of transportation needs for the Izok Project were done by Metall Mining Corp. (now Inmet Mining Corp.) in 1993 as part of the Izok Project feasibility study. This study was based on a road to a marine port just east of Kugluktuk. This concept would have been costly and involve very difficult road construction conditions. Nuna Logistics prepared a transportation concept paper in 1998 that included preliminary road routes to a port site on Bathurst Inlet. A separate study by the GNWT Transportation Department in 1998/99 examined road route alternatives through the SGP that identified a route similar to that described by Nuna. In 1999/2000 the Kitikmeot Corporation sponsored a study by Nishi-Khon/SNC Lavalin that completed an economic analysis of the Bathurst Inlet/Izok transportation infrastructure. This analysis indicated commercial potential and recommended a detailed

project feasibility study. In June 2000 the stakeholders in the region, including governments, communities and industry formed a committee to move the Project forward. As part of this work the Government of Nunavut sponsored a scoping study of environmental issues as a complement to the route and economic analyses (Jacques Whitford Environmental Limited, 2001). The environmental scoping study recommended that environmental baseline studies be initiated so that a Project environmental impact statement could be developed for the Project as defined by the proposed feasibility study.

The Project feasibility study has been completed (Nishi-Khon/SNC-Lavalin and Kitikmeot Geosciences, 2002) and the environmental baseline studies are well under way; both are under the supervision of the Project Technical Committee comprising representatives from Kitikmeot Inuit Association, Kitikmeot Corporation, Nuna Logistics, Inmet Mining Corporation, the Hamlet of Kugluktuk, and the Government of Nunavut.

The costs and field support to complete the feasibility study and undertake field work for environmental and engineering studies were provided by cash and "in kind" contributions from: Billiton-BHP, Canadian Coast Guard, Diavik Diamonds, DIAND, Echo Bay Mines, Fednav Limited, Government of Nunavut, Hope Bay Joint Venture, Inmet Mining Corp., Kinross Gold Corp., Northern Transportation Company Limited (NTCL), Nuna Logistics Limited, and Tahera Corporation.

Findings of the feasibility study included:

- diesel fuel and bulk cargo supplied via the Bathurst Inlet Port and Road Project can be landed at the Ekati and Diavik diamond mines in the N.W.T. at the same or lower costs, and potentially on a more reliable schedule than is now possible from Edmonton via Yellowknife on the Lupin winter road;
- fuel supplied via the Port proposed by this Project can land fuel at significantly lower costs at Lupin and Izok than via the current Lupin winter road.;
- fuel from the Port in Bathurst Inlet can be landed in Kitikmeot communities at a significantly lower cost than is presently the case via Hay River in the N.W.T.;
- dry goods landed at the Port from southern Canada via the winter road through Yellowknife and Contwoyto Lake can be shipped to Kitikmeot communities for a landed cost that could be competitive to the current network via Hay River and Tuktoyaktuk.;
- freight costs for similar supplies for Kitikmeot communities from European suppliers could be landed in Cambridge Bay for less than one third the freight costs via Hay River or the Lupin winter road;
- goods by barge from the port in Bathurst Inlet could be landed in Kitikmeot communities 4 - 6 weeks earlier than is now the case.

The findings of the Project feasibility study have shown that the Project as proposed is much more than a transport system for the Izok Project. It is rather, infrastructure that is commonplace in southern Canada as essential public facilities; infrastructure that will facilitate a diversity of economic opportunities for the Kitikmeot communities plus provide improved transportation services to current diamond and gold mines, and prospective gold and base metal mines in the Kitikmeot Region of Nunavut.

This Project Description describes the Project's physical configuration, the environmental setting of the Project area, schedules for the Project's construction and operations, and the Project's interactions with the environment, as examined in the Project feasibility study. Figure 1 shows the locations of the port site and road alignment that were identified during the course of feasibility study field work in the summer of 2001.

1.2 Proponent Identification Information

The proponent for the Bathurst Inlet Port and Road Project is **Bathurst Inlet Port and Road Joint Venture.** Bathurst Inlet Port and Road Joint Venture will be owned (50% each) by Kitikmeot Corporation and Nuna Logistics Limited. Kitikmeot Corporation is wholly owned by the Kitikmeot Inuit Association. Nuna Logistics is an Inuit owned company with 51% owned by Kitikmeot Corporation and Nunasi Corporation (25.5% each) and the balance owned by Nuna Logistics management. By combining its direct and indirect interests in the joint venture, Kitikmeot Corporation will own 62.75% of the Project. The stated purposes of Kitikmeot Corporation follow:

Our Vision	A vibrant economic climate in the Kitikmeot Region of Nunavut.
Our Mission	To create a strong, viable and stable financial base for our businesses, for Inuit entrepreneurs and for employment opportunities for Kitikmeot beneficiaries of the Nunavut Land Claims Agreement.
Our Mandate	To be the Kitikmeot Inuit Association's economic development organization that develops businesses profiting Inuit of the Kitikmeot Region. Develop a business climate in which Inuit entrepreneurs and employees can benefit economically.
Our Objectives	Grow Kitikmeot Corporation's businesses and Joint Ventures to become the largest company in the Kitikmeot Region. Assist Inuit entrepreneurs start and grow their businesses. Provide opportunities for Inuit to find rewarding employment. Provide assistance for Inuit training to take advantage of business and employment opportunities.

1.3 Approval agencies and required approvals, licences, and permits.

Project construction will develop a marine port, 290 km of all-season road, and two barge terminals on Contwoyto Lake where it will interconnect with the Lupin winter road. Project operations will include:

- annual resupply of Kitikmeot communities with diesel fuel and other bulk cargo;
- annual resupply of fuel and other bulk cargo for Lupin and Izok mines in the west Kitikmeot region of Nunavut;
- annual resupply of diesel fuel to Ekati and Diavik diamond mines in NWT;
- remove base metal concentrate from the Izok Project to the Port for export.

All new development in Nunavut is subject to the review process set out in the NLCA. It is expected that on examination, the Project will be found to pose "...significant impact potential ..." (NLCA 12.4.1) and that an environmental review under the NLCA will be required. The permits, licences, and approvals required by the Project throughout its operating life and for its closure are enumerated below for each of the Projects stages: construction, operations, and abandonment. All the approvals required for each stage of the Project fall within the mandate of the NLCA and federal agencies in Nunavut. The applications to the Kitikmeot Inuit Association (land use), Nunavut Water Board (water use), and DIAND (land use), for

land and water use required for Project construction and operations are included in this Project Description as Appendix 4. It is expected that these regulators will refer this Project Proposal, and in time the Project EIS, to the Nunavut Impact Review Board (NIRB) for review under NLCA Article 12.

The existing Lupin winter road is an essential element to the operations of this Project. However, all new construction and all incremental interactions with the environment proposed by the Project lie entirely within Nunavut and so the environmental review is expected to be conducted by NIRB under NLCA Article 12 Part 5.

1.3.1 Construction Phase: Project proposal, environmental screening, and Project review

Nunavut Planning Commission ph. 867 983 2730 Robert Lyall, Chair

- Review Project for compliance with regional land use plan pursuant to NLCA Article 11 and 12.

The West Kitikmeot Regional Land Use Plan is in draft form and has been reviewed by the Project. The Project as proposed is configured to the extent possible to be in compliance with the Draft Plan. In the absence of an approved plan, the Project will not be reviewed by the Nunavut Planning Commission. (NLCA 12.3.5; 13.4.6).

Nunavut Water Board ph. 867 360 6338 Thomas Kudloo, Chair

- Project review and Water Use Licence pursuant to NLCA Article 13.

Water use and waste disposal by Project operations including the camps are subject to terms and conditions of a licence issued by the Nunavut Water Board (NWB) which also reviews civil works such as bridges that may encroach on water and water ways in Nunavut. A Water Use Application for the Project is included in Appendix 1 of this Project Description. NLCA 13.4.6 requires that the application and Project Description be referred to NIRB for screening to "determine whether it has significant impact potential."

Kitikmeot Inuit Association ph. 867 983 2458 Charlie Evalik, President

- Land use licence pursuant to NLCA Article 21 for commercial access, developing and operating quarries, and building roads on Inuit Owned Land (IOL).
- Surface lease pursuant to NLCA Article 21 for exclusive use of IOL for developing camps and transportation terminals.
- Negotiating an Inuit Impact and Benefit Agreement (IIBA) pursuant to NLCA Article 26.

Significant areas of IOL are affected by the Project as proposed. IOL is needed for pits and quarries, right-of-way for the road, and the camp and barge terminal on Contwoyto Lake. On receipt of the application (please see Appendix 4) to use IOL for Project purposes, it is expected that the application and Project Description will be referred to NIRB for screening. An IIBA between the Proponent and KIA will be required before any of the approvals for Project construction are valid (NLCA Article 26).

DIAND (Iqaluit) ph. 867 979 4501 Wilf Atwood, Reg. Director General

- Land use permit pursuant to Territorial Lands Act (Canada) for access to, and building roads on Federal Crown Land.
- Quarry leases and/or permits to develop and operate quarries on Federal Crown land.
- Surface leases pursuant to Territorial Lands Act (Canada) for exclusive use of Federal Crown lands to develop and operate camps and transportation terminals.

The port and about half of the proposed road alignment is on Federal Crown Land. Permits will be required for pit and quarry development; a lease, or perhaps outright purchase, will be required for the port, and a land use permit is needed for working along the alignment to build the road. The relevant applications are included in Appendix 4. It is expected that DIAND will forward the applications for the permits and leases, and this Project Description to NIRB for screening.

Nunavut Impact Review Board ph. 867 983 2691 Elizabeth Copland, Chair

- Project screening, EIS Guidelines, and Project Certificate pursuant to NLCA Article 12 Part 5.

The Project screening and review by NIRB can be done only at the request of parties such as KIA, DIAND, and the NWB. NIRB would then conduct a screening and report its findings to the Minister of DIAND. Included in those findings will be the NIRB view on the potential impact and the need for a review by NIRB (12.5) or by a Federal Panel (12.6). If NIRB finds that the Project should be reviewed by NIRB under Part 5, and the Minister concurs, NIRB would issue guidelines to the proponent for the preparation of the Project EIS (NLCA 12.5.2).

The proponent will review the Project in the context of completed baseline studies and preparation of the Project EIS. It is expected that the Project Description will be refined to reflect findings in the baseline studies and EIS. On refinement, the Project Description will be resubmitted to NIRB for final review and report of findings to the Minister. The Minster will advise NIRB of his concurrence, or otherwise, of the Project review report. On advice from the Minister, and completion of the process described in the NLCA (12.5.1 to 12.5.11) NIRB will issue a project certificate approving the Project including the terms and conditions that have been accepted or varied by the Minister (12.5.12).

Fisheries and Oceans Canada (Iqaluit) ph. 867 979 8009 Bert Hunt, District Manager

- Authorization for works affecting fish habitat pursuant to the Fisheries Act (Canada).
- Approval to construct water crossings for road route pursuant to the Navigable Waters Protection Act (Canada).
- Approval to construct barge terminals on Contwoyto Lake pursuant to the Navigable Waters Protection Act (Canada).

The primary concern of the Department is expected to be the effects of the Project construction and operations on fish habitat. Interactions between the Project and fish habitat will be at water crossings. A photographic record of each proposed water crossing and the crossing design type will be developed and submitted as supplementary information to this Project description.

Transport Canada (Winnipeg) ph. 204 984 1624 Peter Timonen Reg. Director General

- Certificate of ship safety for the tug and barge proposed for Contwoyto Lake pursuant to the Canada Shipping Act (Canada).

A review of the plan and design for the tug and barge is required prior to building the components that would be mobilized to Contwoyto Lake for final assembly and commissioning.

Echo Bay Mines Ltd. Lupin ph. 780 890 8760 Bill Danyluk, Mine Manager

- Approval to develop and occupy lands currently held by Lupin Mine under crown lease.

One barge terminal and the initial stretch of road from Lupin to Izok are on Lupin Mine lands leased from Canada.

1.3.2 Operations Phase: required operating licences and permits

Kitikmeot Inuit Association ph. 867 983 2458 Charlie Evalik, President

- Land use licence pursuant to NLCA Article 21 for operating roads, quarries, camps, and transportation terminals on IOL.
- Surface leases on Inuit Owned Lands pursuant to NLCA Article 21 for exclusive use to operate camps and transportation terminals.
- Implement IIBA pursuant to NLCA Article 26.

The permits and licences obtained for Project construction will be renewed for long term application to Project operations.

Nunavut Water Board ph. 867 360 6338 Thomas Kudloo, Chair

- Water Use Licence for camp needs and general Project purposes pursuant to NLCA Article 13.

The water use licences obtained for Project construction will be renewed for long term operations.

DIAND (Iqaluit) ph. 867 979 4501 Wilf Atwood, Reg. Director General

- Land use permit pursuant to Territorial Lands Act (Canada) for operating a toll road over Federal Crown Land.
- Surface leases pursuant to Territorial Lands Act (Canada) for exclusive use of crown lands to develop and operate camps and transportation terminals.
- Quarry leases and/or permits to operate quarries on Federal Crown Land.

The licences and permits obtained for construction will be renewed for operations including a mechanism for the long term occupation of crown land for a toll road right-of-way.

Transport Canada (Winnipeg) ph. 204 984 1624 Peter Timonen, Reg. Director General

- Certificate of ship safety for Contwoyto Lake tug and barge pursuant to the Canada Shipping Act (Canada).

Echo Bay Mines Ltd. Lupin ph. 780 890 8760 Bill Danyluk, Mine Manager

- Approval to develop and occupy lands currently held by Lupin Mine under crown lease.

The agreement reached for Project construction will be renewed for long term operations.

1.3.3 Closure and abandonment: approvals

Nunavut Impact Review Board ph. 867 983 2691 Elizabeth Copland, Chair

- approval for closure and abandonment plan as it affects lands and waters in Nunavut.

Nunavut Water Board ph. 867 360 6338 Thomas Kudloo, Chair

- approval for closure and abandonment plan as these affect water in Nunavut.

Kitikmeot Inuit Association **ph. 867 983 2458** **Charlie Evalik, President**

- approval for closure and abandonment plan for installations on IOL.

DIAND (Iqaluit) **ph. 867 979 4501** **Wilf Atwood, Reg. Director General**

- approval for closure and abandonment plan for installations on Federal Crown land.

1.4 Previous Environmental Assessments

No previous environmental assessments have been done on this Project. An environmental scoping study (Jacques Whitford Environmental Limited, 2001) was completed for this Project in preparation for the Project feasibility study mentioned above. Prior to that, a broader scoping study of a transportation corridor through the SGP was completed for the Department of Transportation, Government of the Northwest Territories (Ferguson Simek Clark, 1999).

Elements of this Project Description were originally developed in the Izok Project Environmental Evaluation by Metall Mining Corporation in 1993; the materials included in this Preliminary Project Description derived from that Project will be cited as "Metall 1993". Metall Mining has since been renamed and is now called Inmet Mining Corporation. Inmet is an active participant in the Project Technical Committee.

2.0 PROJECT DESCRIPTION

2.1 Project Title

Bathurst Inlet Port and Road Project

2.2 Type of Activity

An all season road connecting the Izok lead-zinc deposit with a marine shipping terminal on Bathurst Inlet is proposed. The marine shipping routes for this Project would use existing shipping lanes from the eastern arctic that have served Polaris Mine on Barrow Strait since 1980. Lead and zinc concentrates have been shipped from Polaris annually since 1982. The eastern route from Barrow Strait will go south through Peel Sound (Chart #7575), Franklin Strait (Chart #7573), Victoria Strait (Chart # 7784), cross Queen Maud Gulf, pass through Dease Strait, and enter Bathurst Inlet. The portion of the route from Barrow Strait to Queen Maude Gulf (Figure 1), a distance of approximately 650 km, is currently not a regular shipping route but has been used by summer tourist cruise ships "sailing the Northwest Passage". The remainder of the eastern shipping route, through Queen Maud Gulf, Dease Strait and into Bathurst Inlet, is used annually for the sealift resupply of Gjoa Haven and Taloyoak to the east, and Umingmaktok and Bathurst Inlet in Bathurst Inlet. The final 40 km of the route south of Bathurst Inlet community is also new but has been charted (Canadian Hydrographic Service chart #'s 7781, 7793). Shipping through the western arctic would follow routes that have been used for marine barge operations by Northern Transportation Company Limited for many years in annual resupply to Kitikmeot communities.

The proposed land route from Bathurst Inlet to the northeast shore of Contwoyto Lake crosses 210 km of tundra. An 69 km ice road in winter and barge in summer will cross Contwoyto Lake. The westerly barge terminal is at Lupin Mine (please see Figure 1). The road from Lupin to the Izok Project is 79 km.

The road will be single lane 8 m wide running surface with a 12 m wide passing turnout at 1 km intervals. The barge for summer operations on Contwoyto Lake will have 1,000 ton capacity for twenty 50 ton trailer units.

Winter road operations as proposed would include resupplying the diesel fuel and specific bulk cargo needs at Ekati and Diavik diamond mines south of Contwoyto Lake on the existing Lupin winter road. Winter road operations may also include shipments of general cargo from the south destined for Kitikmeot communities by way of a Bathurst Inlet based summer barge service. The summer barge operations will also ship diesel fuel to Kitikmeot communities.

2.3 Alternatives and Preferred Options

Previous studies have examined several road alignments from the SGP to a marine shipping terminal on Bathurst Inlet. The Izok Project investigated a port site 20 km east of Kugluktuk and a 270 km all-season road to the Izok Project base metal deposit (Metall Mining, 1993). Figure 2 shows the locations of these routes and road alignments; Table 1 summarizes physical characteristics and available cost estimates for these alternatives. The rationale for the current Project configuration is its reduced construction and operating costs; also, flatter topography over the length of the present road alignment will require less terrain disturbance for construction due to reduced borrow and quarry material needs. These factors also contribute to reduced capital costs for construction. The proposed Project alignment is also amenable to serving more sites currently active in Nunavut (Lupin, Jericho). It is also better aligned to serve other mineral deposits whose economic potential may be enhanced by the lower development and operating costs as a direct result of the Project. Also, the landed cost of diesel fuel at Ekati and Diavik diamond mines in the Northwest Territories from Bathurst Inlet by way of the Lupin winter road south of Contwoyto Lake will be less than the current supplies out of Edmonton via Yellowknife. Similarly, the

freight cost of general cargo into Kitikmeot communities procured offshore and brought in through the Bathurst Inlet Port is estimated to be 70% less than the current transportation system based out of Edmonton and shipped via Hay River.

Barge site and route requirements on Contwoyto Lake included:
- proximity to the road alignment and optimum water depth for barge operations (5 meters);
- suitable conditions to build a 1200 meter emergency airstrip along side the road near the barge site;
- a route with continuous water depth for safe tug and barge operations.

The port and barge sites and road alignments meet all these criteria. Also, this Project description addresses the issues raised in the draft West Kitikmeot Regional Land Use Plan by the Nunavut Planning Commission (1997) with respect to route selection for a transportation corridor (draft West Kitikmeot Regional Land Use Plan Appendix 6) and guidelines for developing a transportation corridor (draft West Kitikmeot Regional Land Use Plan Appendix 7).

No new and/or untried design and construction methods, or transportation techniques are contemplated for any aspect of the Bathurst Inlet Port and Road Project.

2.4 Project location and land status

All the elements of the Bathurst Inlet Port and Road Project are situated entirely within Nunavut. Figure 3, and Table 2 show the location and describe the areas of land ownership affected by the different elements of the Bathurst Inlet Port and Road Project, respectively. The Project and related infrastructure proposed will be on Inuit Owned Lands (IOL) owned by the Kitikmeot Inuit Association, Federal Crown land, or lands leased from the Government of Canada by Echo Bay Mines at Lupin.

Facilities on IOL include:
- Contwoyto barge site and airstrip -14.1 ha
- 149.1 km of road - 260.3 ha. (including 29 quarries and pits).

Facilities planned for Federal Crown land include:
- the Bathurst Inlet port site including camp and airstrip - 150.1 ha
- 138.7 km of road -217.6 ha. (including 22 quarries and pits).

The Lupin Mine lease will include:
- the Lupin barge terminal - 18.5 ha
- 11.7 km of road - 19.8 ha.

The locations of the proposed gravel pits and quarry sites for road construction materials are shown on Figure 4.

The barge route, 69 km, on Contwoyto Lake would be considered a right-of-way under federal jurisdiction. The Contwoyto Lake barge site and camp will be located within 5 km of the Lupin Mine winter road route which has been operated annually since 1981.

Table 1. Physical characteristics and cost estimates of road route alternatives*

	Km	Cost**	Collateral Benefit
Metall/Izok	270	$194.3 M	none
Nuna	235	$63.5 M	same as current Project Proposal+
GNWT (1999)	235	$114.8 M	same as current Project Proposal
Current Project	290	$112 M	accessible by 2 producing mines- Lupin and Ekati; 1 mine under development - Diavik; 1 mine under review- Jericho; 1 mine at feasibility study stage - Izok; 5 known potential mines- George Lake, Goose Lake, Hackett River, Gondor, Yava.

* data source: Ferguson Simek Clark, 2000.

** cost of road construction.

+ roadway approximately ½ the width of current design.

The design and construction technologies of all the alternatives examined to date are similar with the exception that the Nuna proposal had a narrower running surface. In every case a route alignment is proposed for an all-weather road built with local gravel and/or crushed rock over lying undisturbed tundra. The selection of the alignment and placement of materials would protect the underlying permafrost from thermal degradation. The road alignment connects a tidewater marine shipping port with inland mining locations. The port would handle incoming bulk materials, primarily diesel fuel, explosives, and grinding media, and outgoing base metal concentrates. The road would enable the near year-round movement of these bulk commodities to tidewater by conventional highway tractor/trailer haul units. The port would be resupplied with marine shipments of bulk goods on a shipping schedule determined by marine ice conditions, community concerns, and environmental considerations.

The preferred options for the Project were set by the Technical Committee to include specific criteria for the port site, the road alignment and the barge landing sites on Contwoyto Lake.

Port site selection criteria for the Project included the following:

- the port site should have a steep shoreline to 15 meter water depth to accommodate 50,000 tonne vessels carrying fuel, mineral concentrate and general bulk cargo;
- the port site ocean floor marine geotechnical conditions should support a closed cell sheet pile rock filled wharf;
- port site shoreline should provide rock foundations for shore side structures;
- the port should have an ice-free season of 100 - 110 days per annum;
- shore line features should provide a free vessel turning distance of 1400 meters, allowing ships to operate without tug support;
- the port site should also accommodate marine tug and barge units for community resupply;
- the port site should be close to local source of rock and granular construction materials;
- the site should have a nearby site that offers suitable conditions for a 1200 meter airstrip;
- the site should include room for future expansion.

Road route selection criteria included:

- the route should be accessible by current and potential mines;
- the route should have terrain slopes less than 8% to minimize “cut and fill” sites;
- the route should be in close proximity to rock and granular construction materials to keep construction haul distances under 10 km;
- the route should maximize surface and near-surface rock road base to reduce drainage pattern alteration;

- the route should minimize the number of water crossings to reduce construction costs and minimize interference with fish and fish habitat.

Table 2. Land status of port, road alignment, and barge sites.

Facility	Location	Land ownership	Disturbed Area (ha)		Total		Subsurface interests*
			Road	Quarry/Pit	IOL	Federal	
Port, camp, and airstrip	km 0	Federal Crown				150.1	Wheaton River Nunavut Ltd.
Port to Contwoyto Lake Road	km 0 - 2 .4	Federal Crown	3.2	2.0		5.2	Wheaton River Nunavut Ltd.
	km 2.4 - 20.2	IOL:BB-27/76J**	23.5	10.0	33.5		
	km 20.2 - 29.1	Federal Crown	11.7	4.0		15.7	
	km 29.1 - 34.5	IOL:BB16/76G, J	7.1	4.0	11.1		
	km 34.5 - 56.6	Federal Crown	29.1	10.0		39.1	
	km 56.6 - 59.7	IOL:BB16/76G, J	4.1	2.0	6.1		
	km 59.7 - 62	Federal Crown	3.0	0		3.0	
	km 62 - 66.4	Federal Crown	5.8			5.8	974143 N.W.T. Ltd.
	km 66.4 - 67.3	Federal Crown	1.2	2.0		3.2	
	km 67.3 - 70.7	IOL:BB16/76G, J	4.5	2.0	6.5		
	km 70.7 - 75.3	Federal Crown	6.1	2.0		8.1	
	km 75.3 - 85.1	Federal Crown	12.9	6.0		18.9	Pinnacle Resources Ltd.
	km 85.1 - 89.1	Federal Crown	5.3	2.0		7.3	
	km 89.1 - 90.6	Federal Crown	2.0	0		2.0	R.J. Major
	km 90.6 - 92.9	Federal Crown	3.0	0		3.0	
	km 92.9 - 93.2	Federal Crown	0.4	0		0.4	Echo Bay Mines Ltd.
	km 93.2 - 94.6	Federal Crown	1.8	0		1.8	C. Ronaghan
	km 94.6 - 95.1	Federal Crown	0.7	0		0.7	Echo Bay Mines Ltd.
	km 95.1 - 100.9	Federal Crown	7.6	0		7.6	C. Ronaghan
	km 100.9 - 114.5	IOL:BB04/76F	17.9	4.0	21.9		C. Ronaghan
	km 114.5 - 126.6	Federal Crown	16.0	4.0		20.0	C. Ronaghan
	km 126.6 - 149	IOL:BB05/76F	29.5	6.0	35.5		C. Ronaghan
	km 148.5 - 155.7	Federal Crown	8.8	2.0		10.8	
	km 155.7 - 164.8	IOL:CO17/76F	12	2.0	14.0		
	km 164.8 - 200.6	Federal Crown	47.2	8.0		55.2	Kennecott Cda. Exploration
	km 200.6 - 203.1	Federal Crown	3.3	0		3.3	Ltd.
	km 203.1 - 203.2	Federal Crown	0.1	0		0.1	Cominco Ltd.
	km 203.2 - 210.7	IOL: CO-12/76/E	9.9	2.0	11.9		
Sub-total			**277.7**	**74.0**	**140.5**	**361.3**	Aber Resources Ltd.

Facility	Location	Land ownership	Disturbed Area (ha)		Total		Subsurface interests*
			Road	Quarry/Pit	IOL	Federal	
Contwoyto barge site and airstrip	km 210.7	IOL: CO-12/76E			14.1		Aber Resources Ltd
Lupin barge site		Lupin Mine lease (federal)				18.5	Echo Bay Mines Ltd.
Lupin/Izok Road	km 0 - 4	Lupin Mine lease	7.2	0		7.2	Echo Bay Mines Ltd.
	km 4 - 6.8	Federal Crown	3.7	0		3.7	Snowpipe Resources Ltd, and Benachee Resources Inc.
	km 6.8 - 10.1	Federal Crown	4.3	2		6.3	Echo Bay Mines Ltd.
	km 10.1 - 11.7	Federal Crown	1.8	0		1.8	Snowpipe Resources Ltd, and
	km 11.7 - 12.8	IOL:CO-05/76E,L,86H	1.8	0	1.8		Benachee Resources Inc.
	km 12.8 - 14.5	IOL:CO-05/76E,L,86H	2.2	0	2.2		923185 N.W.T. Ltd.
	km 14.5 - 22.3	IOL:CO-05/76E,L,86H	10.3	4.0	14.3		Benachee Resources Ltd.
	km 22.3 - 25.8	IOL:CO-05/76E,L,86H	4.6	2.0	6.6		
	km 25.8 - 30.3	IOL:CO-05/76E,L,86H	5.9	2.0	7.9		Cominco Ltd.
	km 30.3 - 31.7	IOL:CO-05/76E,L,86H	1.8	0	1.8		Echo Bay Mines Ltd.
	km 31.7 - 33.2	IOL:CO-05/76E,L,86H	2.0	0	2.0		Snowpipe Resources Ltd, and Benachee Resources Inc.
	km 33.2 - 48.8	IOL:CO-05/76E,L,86H	20.6	6.0	26.6		
	km 48.8 - 49.7	IOL:CO-05/76E,L,86H	1.2	0	1.2		to be verified
	km 49.7 - 59.3	IOL:CO-05/76E,L,86H	12.7	6.0	18.7		
	km 59.3 - 60	IOL:CO-05/76E,L,86H	0.9	0	0.9		to be verified
	km 60 - 73.8	IOL:CO-05/76E,L,86H	18.2	6.0	24.2		
	km 73.8 - 77.1	IOL:CO-05/76E,L,86H	4.4	0	4.4		Inmet Mining Corp.
Sub-total			**103.6**	**28.0**	**126.7**	**37.5**	
Inuit Owned Land	± 150 km						
Federal Land	± 140 km						
Totals			**381.3**	**102.0**	**267.2**	**398.8**	

Total length: 287.8 km Total area: 666 ha

* indicates parties with mineral claims along segment of proposed Project road alignment.

** IOL = Inuit Owned Land; alphanumeric code is the specific block of IOL affected.

2.5 Site access and transportation methods

2.5.1 Marine access

Marine access to the proposed port site from the northeast will use existing shipping lanes that have served Polaris Mine near Barrow Strait since 1980. From Barrow Strait the route will go south through Peel Sound, Franklin Strait, Victoria Strait, cross Queen Maud Gulf, pass through Dease Strait, and enter Bathurst Inlet. The portion of the route from Barrow Strait to Queen Maude Gulf, a distance of approximately 650 km, is currently not a regular shipping route but has been used by summer cruise ships. The remainder of the shipping route, through Queen Maud Gulf, Dease Strait and into Bathurst Inlet, is used annually for the sealift resupply of Gjoa Haven and Taloyoak to the east, and Umingmaktok and the Bathurst Inlet community. The final 40 km of the marine route south of Bathurst Inlet community is also new. If it is necessary to carry base metal concentrates to Pacific Rim smelters, this will be via a western route by way of Coronation Gulf, Dolphin and Union Strait, Amundsen Gulf, and the Beaufort Sea. The western route is currently a commercial shipping lane used annually by Northern Transportation Company Limited in the annual marine resupply of the coastal communities of N.W.T. and Nunavut as well as resupplying oil and gas exploration activity on the Alaska North Slope.

2.5.2 Overland access

The transportation network proposed by the Project interconnects with the current Lupin winter road on Contwoyto Lake. The proposed land route from Bathurst Inlet to Izok crosses Contwoyto Lake by ice road in winter and barge in summer; the westerly barge terminal is to be located at Lupin Mine with the easterly barge terminal on the northeast shore of Contwoyto Lake approximately 65 km to the southeast of Lupin. The winter ice road on Contwoyto Lake is common to the current winter road between Yellowknife and Lupin Mine (Please see Figure 2). Bathymetric profiling of Contwoyto Lake in 2001 showed that the proposed barge route provides at least 5 m water depth for safe barge navigation along its entire route (EBA, 2001).

2.6 Project construction

All Project construction activities will be based at, or serviced from camps at the Bathurst Inlet Port site, Contwoyto Lake barge site, or Lupin Mine. The road will be built in three “spreads”, the initial spread from the port site south and west toward Contwoyto Lake; the middle spread from the Contwoyto barge site east and north to meet up with the initial spread, and the Izok spread from the Lupin Mine site west to the Izok Project property line. The overall construction schedule will proceed in a sequence that includes:

- port site development — fall 2004 to early winter 2005;
- road from km 0 (port) to km 126 — fall/winter of 2004 through to the fall/winter of 2005;
- road from Contwoyto to km 126 — winter of 2004/05 to late fall 2005;
- Contwoyto barge site — January to July 2005;
- Lupin barge site — July 2006;
- road from Lupin to Izok Project — late fall 2005 to late fall 2006 with demobilization in early 2007.

Figure 5 provides a schematic overview of this schedule; a more detailed Project construction schedule is provided in Appendix 3.

The initial shipment to start Project construction in September 2004 will include equipment and supplies for both port and road construction.

Mobile equipment	Equipment	Supplies
1 150T crane 1 50 T crane 1 Fuel tanker 2 Fuel trucks 3 CAT D 8 dozer 4 CAT 988 loader 1 25T fork lift 1 5 T fork lift 1 boat with motor 1 Hiabe truck 2 Excavator 2 Sand/plow trucks 2 CAT 14G graders 1 CAT 14H grader 1 CAT 16H grader 7 CAT 777 trucks 2 CAT 769 trucks 1 100T float and tractor 2 Tandem dump trucks 2 Water trucks 1 mechanics truck 1 tractor with low bed trailer 2 crew cab p/u trucks 1 Ambulance 1 Fire suppression unit 1 12 pax van 2 Service trucks 1 15 pax van 2 38 pax bus 1 drill 1 Air track with compressor 1 Tank drill 2 CAT d 10 dozers 2 CAT d 9 dozers 2 CAT 992 front end loaders 2 Agitator cement trucks	1 maintenance shop 1 spill abatement equipment trailer 4 power generators 2 heat recovery units switch gear 1 portable crushing and screening plant 1 Portable cement plant 1 200 person camp for port 1 60 person mobile camp with power plant, water treatment, and sewage treatment.	7 rolls geotextile 8 HDPE liner rolls with deploy equipment Sheet piling Steel for tanks Cement Bridges and decking 4 M liters diesel fuel

2.6.1 Port construction

The first shipment of materials for construction at the Bathurst Inlet port site as shown above will be shipped by marine barge from Hay River via Tuktoyaktuk to a staging site adjacent to the wharf site in the late summer of 2004. Functional accommodations and mess facilities for initial site work will be part of the barge shipment and will stay on site until the fall of 2005. Included in the initial shipment will be the camp, the construction equipment, construction materials for the dock, fuel and other bulk consumables for first year of camp, airstrip and port and road construction. The fuel will be stored in a NTCL fuel barge that will be "tied up" and allowed to "freeze in" at the port site cargo staging area.

Construction for the major components of the port site is proposed to proceed as follows:

- summer and fall 2004 -site development
  - install water supply.

C	fall 2004	-192 person construction camp, potable water supply, and sewage treatment; -install first 4 fuel tanks; -install permanent power supply;
C	winter 2004/05	-install fuel dispensing system;
C	winter/summer 2005	-construct wharf;
C	summer/fall 2005	-install remaining 8 fuel tanks;
C	summer 05 - fall 06	-concentrate storage site and building;
C	winter 2006/07	-site development complete and in operation.

The facilities at the port site will be built following standard construction methods for tundra terrain. Sites for development will be leveled by regular earth moving construction equipment laying down successive layers of gravel and crushed rock; in all cases care will be taken to ensure that permafrost integrity is not compromised, especially under built-up structures like the airstrip, camp buildings, and tank farm. Overall material needs for port construction are estimated to be 700,000 m^3 of quarried rock. The requirements for all site development needs at the port are in balance with the volume of quarried materials that must be removed for preparing the area at tidewater for the wharf and site development for the concentrate storage building. Rock for base course construction will be quarried using a standard drill, blast, and haul sequence. Rock for intermediate course and top dressing will be crushed to predetermined sizes and stockpiled for use as required.

The tank farm will be designed to include a perimeter berm and interior sumps to serve as the first line of protection in case of a large fuel spill. Also, the port site surfaces will be sloped so that all run off will pass through sedimentation ponds that can be controlled. In the event of an uncontrolled release of bulk materials that could be deleterious to marine environments, the run off would be trapped and the water treated before discharge - see Figure 6 for the configuration of the port site and related facilities. Final grades and drainage patterns will prevent site specific surface erosion on or adjacent to the port site and associated facilities.

The sheet pile for the wharf will be driven from the ice in the spring of 2005. On completion of the sheet pile installation, rock fill will be placed in the space between the shoreline and the sheet piling. The rock fill will compact the marine clay sediment, but it is possible however, that the rock fill will displace the marine clay in which case it will have to be excavated and hauled to a spoil pile which will be located near the beach opposite km 2.5 of the road.

2.6.2 Port to Contwoyto Lake road construction

The road will be built using standard road building methods for tundra terrain - pushing quarried rock and granular materials over the tundra after being laid down by “end dump” mine trucks. In all cases the quarries and borrow pits will be developed immediately adjacent to the road alignment (Figure 4). The road base, 1 - 2 meters thick, will consist of quarried rock produced by drill, blast, load, and haul methods. This rock for the road base will be in the 600 - 900 mm size range. It will be covered with quarried rock produced the same way but in the 150 - 200 mm size range. The final road surface will be 50 mm crushed rock. Road construction will run continuously with two shifts working 24 hours per day, 7 days per week. Road bed construction is expected to proceed at a rate of 10 km per month at each work camp; with two camps working (Port and Contwoyto camps) the rate of progress will be 20 km/month. Overall material needs for road construction from the port to Contwoyto Lake are estimated to be 4.6 M m^3.

Please see Figure 7 for a typical cross section of the road.

Road construction from the port to Contwoyto Lake will proceed as follows:

- fall/winter 2004 -rough grade construction km 0 - 42 including bridge at km 2.5;
- winter 2004/05 -mobilize camp and construction fleet to Contwoyto Lake;
- winter /spring 2005 -rough grade construction km 42 -103;
  -intermediate grade km 2.5 - 65;
  -dress km 2.5 - 65;
- winter/spring 2005 -place rough grade km 211 - 146;
- Spring/summer/2005 -place intermediate grade km 211 - 126;
- fall/winter 2005 -complete intermediate grade to km 126 and demobilize;
- summer/fall 2005 -dress km 211 - 65;
- fall 2005 -road to Contwoyto complete and demobilize.

The equipment fleet above will be supplemented with an additional road construction fleet that will begin work from Contwoyto Lake toward the port. It will be mobilized from Yellowknife on the Lupin winter road in January 2005 and consist of:

Mobile equipment	Equipment	Supplies
1 50T crane 1 Fuel tanker 2 Fuel trucks 2 Service trucks 1 Grader 1 CAT 16H grader 7 CAT 777 trucks 2 CAT 769 trucks 1 100T float with tractor 1 CAT D 6 wide pad 2 Water trucks 2 sand/snow plow trucks 1 Ferry 2 Crew cab p/u trucks 1 Boat with motor 2 15 pax van 1 38 pax bus 4 Air tracks with compressors 1 Tank drill 2 CAT D 10 dozers 2 CAT D 9 dozers 2 CAT D 8 dozers 2 CAT 992 loaders 1 CAT 988 loader 1 CAT 350 excavator 2 Cement agitator trucks	2 500,000 fuel tanks 1 spill abatement equipment trailer 1 portable crushing and screening plant 1 Portable cement plant 1 60 person mobile camp with power plant, water treatment, and sewage treatment.	cement Bridges and decking 2 M liters diesel fuel

Road construction workers will be based in a 60 person camp. It will be self contained with a skid mounted sewage treatment plant. It will be moved in response to progress in construction. Construction is expected to progress at a rate of 10 km/month and the camp is expected to move every 60 days. Table 3 provides the details for a typical road construction crew required to operate two 12 hour shifts.

Table 3. Road construction crew

Job	Quantity
Site supervisor	1
Road foreman	1
Quarry/pit foreman	1
Drill/blast crew	5
Crusher crew	3
Dozer/loader/grader operators	21
Truck drivers	13
Servicemen/labourers	6
Camp/catering	5
Total	56

Road construction will start with drilling and blasting rock at the quarry. The drilling/blasting pattern will be adjusted for the optimum size of blast rock required. Broken rock up to 900 mm size will be loaded into 90T truck for hauling to the end of the road and dumping the rock for final placement by dozers pushing the rock to advance the road's base course. A portable crushing and screening plant operating in the quarry will produce the -150 mm size crushed rock road material for the intermediate course, and the -50 mm material that will be stockpiled for final top dressing of the road. The crushers will not operate in the coldest months (December through February).

The rate of advance of the road is estimated to be 10 km/month and it is expected that the drills and crushers will be move every 30 days to reduce the haul distances for laying down the base and intermediate courses of rock. Quarrying, hauling, and placing rock at the end of the road will have continuous construction activity that could occupy a linear distance of up to 20 km. with the mobile camp located up to 20 km back of the active quarry.

2.6.3 Contwoyto Lake barge sites

Construction at the Contwoyto Lake barge sites will commence during the winter of 2005 as soon as the Lupin winter road from Yellowknife is operational. The barge site will be built with coarse and crushed rock on the same site development principles as the road and proceed on the following schedule:

- winter 2005 -marshal camp, fuel and construction equipment at start of Lupin winter road season;
  -set up camp and parking area;
- summer 2005 -construct barge landing;
- winter 2005/06 -mobilize barge modules from port to Contwoyto Lake;
- summer 2006 -assemble tug and barge;
  -launch tug and barge.

The barge landing and parking area at Lupin will be built in the summer of 2006.

2.6.4 Lupin Mine to Izok Project road construction

The equipment mobilized to the Contwoyto Barge site in January 2005 will be transferred to Lupin as soon as ice cover on Contwoyto Lake permits in the winter of 2005-06. Building the final spread of the overall Project will proceed as follows:

- winter/spring 2006 -rough grade km 8 - 79;
- spring/summer -intermediate grade km 8 - 79;
- summer 2006 -dress km 8 - 79.

Overall material needs for road construction from Lupin to the Izok Project will be 1.6 M m^3.

2.6.5 Construction labor force

The construction labor needs identified in the Project feasibility study are provided in Table 4.

Table 4: Construction labor force requirements.

Month/Year	2004		2005		2006	
	Port	Road	Port	Road	Port	Road
January			50	77	0	25
February			68	154	0	62
March			68	153	0	62
April			46	165	0	79
May			61	169	0	79
June			64	179	0	79
July	38		75	188	0	84
August	65		82	144	0	81
September	192		83	144	0	31
October	186	33	83	138		
November	115	57	0	77		
December	60	77	0	0		
Sub-total	656	167	680	1588	0	582
Total overall						3673

The construction work force "fly in/fly out" work rotation will be 21 days on and 7 days off. The total estimated payroll for Project construction will be $ 32.4 million (2002 dollars).

2.7 Project Operations

Project operations will have a rhythm dictated by the seasons of the annual Arctic cycle. The shipping season may be variable from year to year but is expected to last approximately 110 days per year beginning as early as mid-July and running into late October. A pair of 50,000 tonne dwt ice class vessels are expected to operate in concert to deliver 200 M liters of diesel fuel plus selected bulk cargo materials destined for the various communities and mines served by the Project. These ships will in turn remove the accumulated Izok concentrate of up to 470,000 tonnes per year. Most of the Izok concentrate will be shipped out via the eastern marine route, however it is possible that individual shipments of 50,000 tonnes may be shipped into the Asia/Pacific market via the western route. Summer shipping will also include barges from the port to Kitikmeot communities with fuel and general cargo. Table 5 shows the estimated volumes of cargo that is expected to be handled through the port in a typical year in the first 10 years of Project operations.

Table 5. Estimate of annual volume of cargo passing through the port in years 1 - 10.

	Imports		Exports	
Destination/Source.	Fuel (000's L)	Supplies (t)	Fuel (000's L)	Supplies/conc. (t)
Lupin	14030	4704		
Ekati	100080	20000		
Diavik	56204	9408		
Jericho	8640	2664		
Izok	17853	7872		339271
Hope Bay	7200		7200	
Gjoa Haven	4200	80	4200	80
Cambridge Bay	6240	150	6240	250
Kugluktuk	3624	110	3624	110
Taloyoak	2280	60	2280	80
Bathurst Inlet	54		54	
Umingmaktok	60		60	
Total	220465	45048	23658	339791

2.7.1 Port Operations

A typical year of operations at the port will see from 300,000 to 470,000 tonnes of Izok concentrates handled through the port, and 220 M liters of fuel delivered to the port in 6 to 10 voyages (round trips) through the Inlet. The time required to unload and reload a ship will be 48-72 hours. Marine barges will load 23.7 million liters of fuel and 520 tonnes of general cargo for delivery to Kitikmeot communities in 3 barge movements.

As soon as marine ice conditions permit, expected to be mid-July to early August, the 50,000 tonne vessels will begin to arrive at the port in Bathurst Inlet. The shipping season is expected to last 110 days per year and 6 to 10 voyages per shipping season are planned to remove the base metal concentrate before the end of October. In-bound freight will also include other bulk goods like lubricants, cement, reagents, and explosives for the various mining operations served by the Project. Camp capacity at the Port will have accomodations for 200; 30 persons will meet the port's work force to receive the concentrate, load fuel tankers, load the trailers hauling other bulk goods to the sites served by the Project, and maintain and manage the port and road. The remaining camp's accommodations capacity will be required for the contract drivers for the trucks hauling between the port and mine sites served by the Project. Port maintenance will involve site management services such as water, sewage, garbage, and road work including snow removal in winter and dust suppression in summer. Basic truck and trailer maintenance services will be provided by a local team of mechanics and service personnel.

2.7.2 Road Operations

Road operations will consist of two separate activities, road maintenance by Project personnel and hauling by trucks and drivers contracted directly by the mining company requiring their services. Road maintenance crews based at the port will maintain the road to the Contwoyto lake barge site. The crew based at the Contwoyto camp will service the southerly portion of the Contwoyto Lake ice road crossing in winter.

The road will operate for a 90 day summer season from mid-July to mid-October when Contwoyto Lake is passable by barge, and a 100 day winter ice road season from mid-January to late April. All trucks and drivers for fuel, cargo, and concentrate hauling will be supplied by contract truckers. The Project will control and monitor traffic via radio communications and GPS tracking. Load and speed restrictions will be regulated by Project "highway patrols"; loads will be 90 tonne B-trains traveling at speeds not exceeding 60 km/hr.

Road operations will remove fuel and other bulk supplies from storage at the port, and deliver Izok concentrate on a schedule constrained by ice conditions on Contwoyto Lake. Summer haulage will be by B-trains (90 tonnes) traveling up to 60 km/hr. The barge will be a roll on/roll off operation, with 2 independent fleets of 8 and 16 tractors operating between Izok and Lupin, and Contwoyto and the port respectively. Winter operations will have the same load restrictions on the road as summer loads, but hauling on the Contwoyto Lake ice road will be restricted to single trailers traveling at a maximum speed of 40 km/hr. The Contwoyto Lake barge parking area will, like the summer, be a temporary parking location for trailers. All road haul operations to other mines served by the Project will be winter only. Up to 60 tanker units will be required to disperse the 200 M liters of diesel to the participating mines sites. It is expected that the majority of the tanker fleet will be active seasonally, arriving from Yellowknife when the Lupin winter road opens and return at the end of its operating season. It is expected that fuel tanker units will operate 24 hours per day during the winter ice road season until all the fuel is delivered. Drivers off shift will use accommodations in the main camp at the port.

The road surface will be maintained in both summer and winter. Summer activities will consist primarily of light grading and watering for dust suppression. In winter, maintenance will consist of snow removal where required, and sanding icy portions. Sand and crushed rock for road maintenance will be taken from borrow pits adjacent to the road alignment. Please see Figure 4 for borrow site locations. Camp size at the Contwoyto Lake barge site is expected to be 20 persons for road maintenance and emergency services.

2.7.3 Contwoyto Lake barge operations

It is expected that the barge will be owned and operated by a contractor. It will be pushed by a tug and travel at 20 km/hr. The operating season will be 90 days beginning mid to late July. The barge will have the capacity to carry 10 B-trains (1,000 tonnes) which will be loaded /unloaded onto/off the barge by service tractors at the Lupin and Contwoyto Lake road terminals for hook-up and haul to the Port or returning empty to Izok.

2.7.4 Contwoyto Lake winter ice road operations

The ice road will be "built" by crews and equipment based both at Contwoyto and Lupin. The main route running the length of Contwoyto Lake is well established; the spur to the Contwoyto barge site and road terminal will be similar to the barge route in that a 5 meter water depth is required to allow for sufficient ice thickness and adequate water depth below to accommodate the flexing in the ice sheet associated with heavy loads approaching land. Initial snow clearing over the 30 m wide ice road is expected to begin in mid-December with the minimum ice thickness of 1.5 m for light loads being achieved by late December. Full loads are not expected to cross Contwoyto Lake until mid-January. Load and speed restrictions will be regulated by Project "highway patrols". Load and speed restrictions on the ice road of Contwoyto Lake will require that only 45 tonne single trailer loads be hauled at speeds not exceeding 40 km/hr.

2.7.5 Operations labor force requirements

The port and road operations phase work force is shown in Table 6.

Table 6: Bathurst Inlet Port and Road operations work force* requirements

Function	Quantity		Location
	Summer	Winter	
Project General manager	1	1	Cambridge Bay
Controller	1 (part time)	1	Cambridge Bay
Purchasing agent	1	1	Cambridge Bay
Accountant	1	1	Cambridge Bay
Secretary/clerk	1	1	Cambridge Bay
Personnel/Safety	1	1	Cambridge Bay
Site manager	1	1	Port
Equipment operators	6	2	Port
Labourers	4	2	Port
Catering	4	3	Port
Security/Emergency measures/coms	3	1	Port
Barge captain	1	0	Contwoyto camp
Deck hands	2	0	Contwoyto camp
Site foreman	1	1	Contwoyto camp
Equipment operators	2	2	Contwoyto camp
Drivers	3	3	Contwoyto camp
Catering	2	2	Contwoyto camp
Security /EMT	3	1	Contwoyto camp
Road maintenance. operators	7	3	Port
Drivers	2	8	Port
Labourers	3	1	Port
Lupin site foreman	1	1	Lupin
Road maintenance. operators	5	2	Lupin
Drivers	3	2	Lupin
Labourers	3	1	Lupin
Security/EMT	3	1	Lupin
Port maintenance mechanic	2	1	Port
Port serviceman	1	1	Port
Electrician	1	1	Port
Instrument tech.	1	0	Port
Haultruck mechanic	3	3	Port
Haultruck serviceman	2	1	Port
Haultruck mechanic	2	2	Lupin
Haultruck serviceman	1	1	Lupin
Total	78	53	

* work force on site on a daily basis.

The Project operations work force in the field will have a “fly in/fly out” work rotation of 21 days on and 7 days off. The total payroll for the operations workforce is estimated to be $3.5 million (2002 dollars). An

additional $9 million will be paid for contract services of the drivers for contracted trucks hauling bulk supplies and concentrate for a total estimated annual operating payroll of $12.5 million.

2.8 Project schedule: decommissioning

2.8.1 Quarries

Quarries and pits will be developed at locations that allow drainage and so should remain dry. Quarries that are not required for maintaining the road during operations will be contoured and abandoned on completion of road construction. At no time during the construction or operations of the Project will active erosion of any terrain on or adjacent to the port and road and associated lands be allowed to proceed unchecked or alter natural drainage patterns in adjacent lands.

2.8.2 Port and barge sites

It is expected that the Project will be in use for many generations in the future, nevertheless, the Project proponents acknowledge that non-renewable resources are finite and that some day the road and associated facilities may no longer be required. Closure and abandonment will include removal of all imported materials and structures, treating all contaminated soils, contouring all surfaces to reduce the possibility of erosion, and to enhance the natural revegetation of all terrestrial surfaces disturbed or altered by the Project.

2.8.3 Road

It is expected that the road will be in use for many generations in the future, nevertheless, the Project proponents acknowledge that non-renewable resources are finite and that some day the road and associated facilities may no longer be required. Closure and abandonment will include removal of all water crossings, contouring all surfaces to reduce the possibility of erosion, and to enhance the natural revegetation of all terrestrial surfaces disturbed or altered by the road.

2.9 Environmental protection and contingency plans

The major components of the Project from construction, through operations, and into decommissioning will have direct interactions with the environment. The effects of construction on the tundra terrain will be observable for many years. Under normal operating conditions, there will be no further long term environmental effects. There is, however, always the chance for accident and human error which pose risk of negative environmental effect to the Project sites and adjacent lands and waters. Table 7 provides an overview of the environmental management system (EMS) that will be developed by the Project in preparation for obtaining Project approvals. The EMS will implement the overall Bathurst Inlet Road and Port Project Environment Policy which is provided Appendix 1.

Table 7. Project/environment interactions and related features of the Bathurst Port and Road Project Environmental Management System.

Project activity	Interaction	Risk	Project EMS response
marine shipping	marine passage	loss of cargo, i.e. fuel, lubricants, explosives, concentrate,	-compliance with AWPPA.*
camp operations	-waste water discharge -garbage disposal	-contamination and erosion; -attract scavengers	-water treatment and controlled release; -incinerate all non-effluent waste and bury the ashes; -Project operations EMS.

unloading ship cargo	coastal habitats	fuel spill, cargo spill	- port site marine spill contingency and response plan.
pit/quarry development	terrain disturbance	erosion and slumping	-avoid ice rich sites; -protect ground thermal regime ; -contour final grades and surfaces; -construction operations EMS.
port site development	-terrain disturbance / shoreline disturbance	erosion and slumping / alter fish habitat	-avoid ice rich sites; -protect ground thermal regime ; -contour final grades and surfaces; - alter minimal area of coastal habitat; -construction operations EMS.
road construction	terrain disturbance water crossings acid rock drainage	erosion and slumping alter fish habitat change water quality	-avoid ice rich sites; -protect ground thermal regime; -contour final grades and surfaces; -construction operations EMS; -protect flow regime in water crossing design and construction. -construction operations EMS; -avoid high sulphide content rock for road construction; -blend low sulphide content rock with neutralizing rock.
barge site development	-terrain disturbance / shoreline disturbance	erosion and slumping / alter fish habitat	-avoid ice rich sites; -protect ground thermal regime; -contour final grades and surfaces; -develop minimal aquatic footprint; -construction operations EMS.
port operations	terrestrial/aquatic environments	-spills -dust	-spill contingency and response plan. -dust suppression.
haul road operations	-road traffic	-dust -spills of fuel, cargo, and concentrate -wildlife road kills	-dust suppression; -spill contingency and response plans; -spill equipment stationed along road route and on all trucks. -wildlife has right-of-way instructions to all drivers; -Project operations EMS.
barge operations	lake shipping	cargo/concentrate spill	-spill contingency and response plan.
loading ship/barge cargo	coastal habitats	cargo/concentrate spill	-port site marine concentrate spill contingency and response plan.

* AWPPA = Arctic Waters Pollution Prevention Act (Canada).

A comprehensive suite of contingency plans will be submitted in support of the Project EIS.

3.0 DESCRIPTION OF THE ENVIRONMENT

3.1 Terrain and geology

The landscape of the region is low relief tundra. The road alignment rises to 400 m asl near km 10 and remains in the 400 - 450 m asl range all the way to the barge site on Contwoyto Lake. The elevation of Contwoyto Lake is 445 m+/- (see NTS 76E). The route from Lupin to Izok starts at 500 m asl near Lupin and descends to around 425 m asl as it nears Izok (Izok Lake is 419 m asl - NTS 86H).

The bedrock and surficial geology of the Project region is typical of the Precambrian shield; bedrock outcrops are common, glacial land forms like eskers and drumlins are common with shallow lakes everywhere in sight. Examination of the lakes and other land forms along the alignment suggests that none of the lakes along the route are of great depth; similarly, the frozen tundra soils overlying the bedrock are a mere few meters thick for most of the alignment except in the area of the port where marine sediments of greater depth are expected in the first five km of the route (Nishi-Khon/SNC-Lavalin and Kitikmeot Geosciences, 2002).

The chemical composition of the rock types along the road alignment was investigated to assess the potential for acid generation (Rescan environmental baseline data report in preparation). Acid generation occurs when naturally occurring sulphur in the form of sulphide in native rock is exposed to, and combines with, oxygen from the air. The run off from area of rock with high sulphide content is usually mildly acidic. Acidic run off from man made structures of native rock can be mitigated by blending acid generating rock with basic rock so that the acidic run off is neutralized. A more satisfactory mitigation strategy would be to avoid using road building materials that show acid generation potential. The occurrence of rock with sulphide content that has the potential to produce acid drainage was noted along the road alignment at km 99 - 104 on the port/Contwoyto road and km 28 - 30.5 and 54 - 57 on the Lupin/Izok road.

The risk of earthquake hazard in the Project area is rated in the lowest risk category projected on a Canada wide scale (Adams et al. 1999).

3.2 Climate and permafrost

The climate of the Project area is characterized by short cool summers and long cold winters. Weather records from the Project area have been collected continuously since 1956 when a weather station was established on Contwoyto Lake near the proposed barge site. This weather station was shut down and records for the region were collected at Lupin since 1983. Figures 10 to 20, summarize the climate data collected at Contwoyto Lake, Lupin, and other locations in the Kitikmeot region.

Permafrost is a direct function of the prevailing climate over a long time. The presence of continuous permafrost in the terrain throughout the land portion of the Project shows the negative annual solar energy budget in the region with a mean annual temperature of -11 deg. C. The depth of permafrost generally in the Project region is estimated to exceed 300 m (National Atlas of Canada). The maximum depth of thawed soils at surface in the late summer will vary depending on the type of surface cover; on bare granular sites the depth of thaw can reach 2 m (Metall, 1993) while on moss covered sites the depth of thaw will be much less. Also, permafrost is expected to be absent under large bodies of water like Contwoyto Lake and from land immediately adjacent to, and under the port site at Bathurst Inlet.

The climate for the shipping route was described by Metall in the Izok Project Environmental Evaluation (1993). Climate records (Environment Canada) for Cambridge Bay, Jenny Lind Island, and Kugluktuk are summarized in Figures 14 to 20. Marine ice thickness analyses for Cambridge Bay and Kugluktuk were

Table 8. Fracture Sequence for the Coronation Gulf Region 1975-1991

EVENT	AVERAGE DATE OF OCCURRENCE	EARLIEST	LATEST
1) Cape Bathurst Polynya	May 2	April 3 (84,75)	May 25 (80)
2) Lambert Channel Polynya	May 10 [1]	March 24 (91)	May 30 (83)
3) Fracture of Western Amundsen Gulf	June 6 [2]	May 4 (77)	June 27 (79)
4) Fracture of Cache Point	June 23 [3]	June 10 (89)	July 5 (90)
5) Fracture of Eastern Amundsen Gulf	June 27 [4]	May 88 (77)	July 15 (79, 82)
6) Shore Lead Southern Coronation Gulf /Bathurst Inlet	July 8	June 27 (84)	August 8 (78)
7) Fracture/Melt of Western Coronation Gulf	July 11	June 30 (84)	August 8 (78)
8) Melt out of Simpson Rae and James Ross Straits	July 13	July 2 (84)	July 30 (86)
9) Fracture of Eastern Dease Strait	July 14	June 27 (75)	August 5 (78)
10) Fracture of Dolphin and Union Strait	July 15	July 2 (88)	August 5 (78)
11) Fracture of Central Prince of Wales Strait	July 17	July 2 (89)	August 4 (86)
12) Fracture of Eastern Coronation Gulf and Dease Strait	July 18	July 1 (84)	August 28 (78)
13) Shore Melt, Southern Queen Maud Gulf	July 18	July 3 (84)	August 5 (78)
14) Fracture of Southern Prince of Wales Strait	July 19	July 5 (84)	August 4 (86)
15) Fracture of Queen Maud Gulf	July 22	July 11 (84)	August 5 (78)
16) Fracture of Victoria Strait	July 25	July 9 (88)	August 22 (78)
17) Fracture of St. Roch and Rasmussen Basins	July 25	July 14 (84)	August 12 (78, 86)
18) Fracture of Northern Victoria Strait	August 1	July 16 (88)	August 28 (78)
19) Fracture of Peel and Larsen Sounds and M'Clintock Channel	August 5	July 20 (81)	August 28 (78)

[1] Did not consolidate in the winters of 1990/91, 1987/88, 1981/82, and 1980/81

[2] Did not consolidate in the winters of 1991/92, 1990/91, 1987188, 1986/87, 1984/85, 1982/1983, 1980/81, and 1977/78.

[3] Did not consolidate in the winter of 1987/88.

[4] Did not consolidate in the winters of 1991/92, 1987/88, 1980/81, and 1977/78

Metall Mining Corporation. 1993.

Table 9. Consolidation Sequence for the Coronation Gulf Region 1975-1991

EVENT	AVERAGE DATE OF OCCURRENCE	EARLIEST	LATEST
1) Shore-fast ice along Western M'Clintock	October 22	October 10 (76)	November 10 (83)
2) Consolidation of Peel Sound	October 30	October 10 (80, 76)	November 26 (83)
3) Consolidation of Central Prince of Wales Strait	November 1	October 12 (91)	November 19 (76)
4) Consolidation of St. Roch and Rasmussen Basins	November 2	October 12 (79)	November 20 (75)
5) Consolidation of Dease Strait	November 5	October 18 (78)	December 10 (88)
6) Consolidation of Bathurst Inlet	November 8	October 22 (86, 78)	November 20 (75)
7) Consolidation of Coronation Gulf	November 13	November 2 (78)	December 4 (80)
8) Consolidation of Southern Prince of Wales Strait	November 15	October 19 (79)	December 16 (80)
9) Consolidation of Western Queen Maud Gulf	November 15	October 22 (78)	December 11 (79)
10) Consolidation of Eastern Queen Maud Gulf	November 17	October 21 (86, 78)	December 11 (79)
11) Consolidation of Dolphin and Union Strait	November 29	November 12 (90)	January 12 (84)
12) Consolidation of Cache Point Channel	December 2 [1]	November 17 (90, 84)	January 12 (84)
13) Consolidation of Larsen Sound and M'Clintock Channel	December 4	October 23 (78)	January 3 (84)
14) Consolidation of Lambert Channel	December 13 [2]	November 17 (84)	February 1 (89)
15) Consolidation of Victoria Strait	December 31	November 28 (78)	February 1 (76)
16) Consolidation of Eastern Amundsen Gulf	February 17 [3]	December 2 (79)	April 12 (86)
17) Consolidation of Western Amundsen Gulf	March 22 [4]	February 28 (90)	April 30 (77)

[1] Did not consolidate in the winter of 1987/88

[2] Did not consolidate in the winters of 1990/91,1987188, 1981/82, and 1980/81.

[3] Did not consolidate in the winters of 1991/92, 1987/88, 1980/81, and 1977/78.

[4] Did not consolidate in the winters of 1991/92, 1990/92, 1987/88, 1986/87, 1984/85, 1982/83, 1980181, and 1977/78. Metall Mining Corporation. 1993.

prepared for the earlier Izok Project study Metall, 1993; (please see Figures 21 and 22). The ice regime of the shipping route is further described in Figures 23 to 25 which show the mean ice fracture dates, mid-September open water distribution, and early winter ice consolidation dates for the shipping route from Barrow Strait near Polaris Mine to Bathurst Inlet and west to the Beaufort Sea (Metall, 1993). Observations of spring ice conditions by residents of Bathurst Inlet community show that the marine ice cover recedes from mid-June to early July with the Inlet being clear of ice by mid-July. In the fall the marine ice cover may reach 10 cm by late October. This is significant in that a 10 cm ice cover is adequate for both a snowmobile and caribou to cross the Inlet (Sam Kapolak, Bathurst Inlet resident).

3.3 Air Quality

Data sets showing predevelopment air quality for the Project area are not available but will be developed as required for the Port site as well as the road. Data sets could be developed for both summer and winter seasons and reported with the Project EIS. The prevailing winds for the area are north to northwest and so air quality monitoring devices would be set up in appropriate locations to reflect the wind regime in relation to site configuration.

3.4 Hydrology

Mean annual precipitation throughout the Project region is 250 mm with roughly equal amounts as rain in summer and snow in winter (please see Figure 11 for precipitation records for Contwoyto Lake: 1956 to 1982). Despite these low, desert-like annual precipitation rates, the low topographic relief throughout the Project area combined with the presence of permafrost provide conditions for numerous tundra lakes and ponds in the region. The tundra hydrologic regime is characterized by moisture accumulation throughout the winter in the form of snow, rapid melt and run off in June, and significant evaporation and transpiration throughout the short cool summer that is accompanied by light showers and rain. It is not unusual for tundra streams to dry up for periods following spring run off. The annual stream flow profile for small basins typical of the Project area can be represented by the Gordon River basin (1,530 km^2) as shown in Figure 26 ; it flows into Bathurst Inlet from the southeast. This basin was monitored by Environment Canada beginning in 1977 (Environment Canada, 1992). The data show zero flow for the months of January, February, March and April; very low flow in May and peak flows in June dropping off sharply in July and returning to zero flow by December. The extreme flow events recorded for the Gordon River show that maximum instantaneous, and maximum daily flows (both recorded in June) are five times the mean daily flow for June. Mean annual water yield from run off for the entire basin for the Gordon River was 163 mm.

It is typical that summer evaporation and transpiration from tundra environments is roughly equal to summer precipitation, in the range of 100 - 150 mm (Environment Canada, 1978; UNESCO, 1976).

Detailed terrain analyses of the road alignment shows that 119 stream crossings will be required along its entire length. Figure 32 shows the road alignment in relation to drainage basins that would be bisected by the road.

3.5 Vegetation and wildlife habitat

The terrestrial habitat of the Project region is typical of subarctic tundra. The soils of the area are of glacial origin and are for the most part well drained, supporting numerous herb and shrub species including dwarf birch and arctic willow. Low lying areas support lush wetlands with sedges and cotton grass.

Several rare plant species have been reported for the subarctic region generally, and are listed in Table 10. Their presence and distribution is a primary focus of the plant and vegetation study of the Project area

that is in progress. None of the species indicated in Table 10 were noted in the 2001 field studies of the road alignment.

Table 10: Rare Plant Species Recorded Within or Near the Izok Lake-Bathurst Inlet Transportation Link

Scientific Name	Common Name	Habitat	Nearest Location
Braya glabella	Braya	mineral soil, damp tundra	near Bathurst Inlet area
Carex morrisseyi	Sedge	minerotrophic *Larix* fens	near the study area and towards Great Bear Lake and Hudson's Bay
Gentiana tendella	Gentian	local on sandy beaches and gravelly mud flats along the Arctic coast	near Bathurst Inlet
Mertensia drummondi	Drummond's Lungwort	sandy banks and eskers; not a seashore species	west of Bathurst Inlet near coast
Ranunculus pallasii	Pallas Buttercup	wet brackish meadow and slough, *i.e.* mainly along seacoast and estuaries.	near Bathurst Inlet and to west on coast

Source: GNWT 1999 in JWEL 2001

3.6 Fish and Wildlife

The Project area supports a complete assemblage of Arctic fish and wildlife species. Lists enumerating marine and terrestrial species of fish, birds, and mammals reported for the Project region indicating their preferred habitats, abundance, and distribution are provided in Tables 11-16. None of the populations of wildlife species that are likely to interact with any aspect of the Project are currently listed as "at risk" in Nunavut (Government of Nunavut, 2000; unpublished).

3.6.1 Fish - marine

The distribution of marine fish in Canada's arctic marine environments was documented in the Project scoping study (JWEL, 2001). Table 11 summarizes those findings on the species that may be present along the marine shipping route. Species appearing in **bold print** were confirmed to occupy the Project region in collections made during 2001 field studies (Rescan 2001; unpublished).

Table 11. Marine fish species, their habitat and economic status, along the marine shipping routes serving the Bathurst Inlet Port

Species	Habitat	Economic status
Arctic cod *Boreogadus saida*	pelagic - very common	subsistence
Polar cod *Arctogadus glacialis*	pelagic	subsistence
Toothed cod *Arctogadus borisovi*	pelagic	subsistence
Saffron cod *Eleginus gracilus*	pelagic	subsistence

Greenland cod *Gadus ogac*	pelagic	subsistence
Arctic charr *Salvelinus alpinus*	anadromous	subsistence and commercial
Lake trout *Salvelinus namaycush*	inshore anadromous	subsistence and commercial
Arctic Grayling *Thymallus arcticus*	inshore anadromous	recreational use
Lake whitefish *Coregonus clupeaformis*	inshore anadromous	subsistence
Broad Whitefish *Coregonus nasus*	inshore anadromous	subsistence
Inconnu *Stenodus leucicthys*	inshore anadromous	subsistence
Pacific herring *Clupea harengus pallasi*	anadromous	subsistence
Arctic cisco *Coregonus autumnalis*	anadromous	subsistence
Least cisco *Coregonus sardinella*	anadromous	subsistence
Capelin *Mallotus villosus*	inshore	subsistence
Rainbow smelt *Osmerus mordax*	anadromous	subsistence
Longnose sucker *Catostomus catostomus*	inshore anadromous	subsistence
Eelpouts - 9 species *Zoarcidae sp.*	benthic	
Berring wolffish *Anarhichas orientalis*	benthic	
Pricklebacks - 6 species *Sticheidae*	benthic	
Northern sand lance *Ammodytes dubuis*	pelagic	
Stout sand lance *Ammodytes hexapterus*	pelagic	
Ninespine stickleback *Pungitius pungitius*	inshore anadromous	

Fourhorn sculpin *Myoxocephalus quadricornis*	benthic	
Arctic alligatorfish *Aspidophoroides oirko*		
Atlantic poacher *Leptogonus decagonus*		
Leatherfin lumpsucker *Eumicrotreus derjugini*	benthic	
Atlantic spiny lumpsucker *Eumicrotremus spinosis*	benthic	
Gelatinous snailfish *Liparis fabricii*	benthic	
Dusky snailfish *Liparis gibbus*	benthic	
Kelp snailfish *Liparus tunicatus*	benthic	
Arctic flounder *Liopsetta glacialis*	benthic	
Starry flounder *Platichthys stellatus*	benthic	
Longhead dab *Limanda proboscidea*		

The conservation status of marine fish in Nunavut has not been assessed (Government of Nunavut, unpublished). Fish and fish habitat in Canada are protected under the Fisheries Act (Canada). Notes on the biology and economic status of marine fishes were taken from Stewart et al (1993).

3.6.2 Fish - freshwater

Numerous studies of the lakes and streams in the Slave Geological Province have provided information on the distribution of freshwater fish species there (Metall, 1993; JWEL, 2001). These reports were supplemented with information from Scott and Crossman (1973, Freshwater Fishes of Canada) for preparing the freshwater species list of fishes in the Project area. Studies by the Project continue to further refine the information on the distribution and abundance of species in the drainage basins bisected by the road. These data will be reported in support of the Project EIS.

The river basins bisected by the road alignment include the Coppermine (above Point Lake), Burnside and Back (Contwoyto Lake drains into both), Mara/ Burnside, and the upper reaches of the Western rivers. Numerous freshwater and anadromous fish species are known to occupy the region. Table 12 summarizes the species that may be present in the lakes, ponds, and streams adjacent to the road alignment. While there are currently no commercial or tourist operations that are located in the immediate vicinity of the Project's proposed facilities, some of the fish species in the region offer recreational opportunity for new commercial ventures that may arise in the future as a result of the Project.

None of the fish populations of the species in the region are listed as endangered or threatened (Government of Nunavut, 2000; unpublished). Species appearing in **bold print** were confirmed to occupy the Project region in collections made during 2001 field studies (Rescan 2001; unpublished).

Table 12: Freshwater fish species reported for the Project area and their conservation and economic status.

Species	Habitat/abundance	Conservation status *	Economic status / potential
Northern pike *Esox lucius*	lake and stream uncommon	secure	subsistence and recreational use
Longnose sucker *Catostomus catostomus*	lake	undetermined	subsistence use
Round whitefish *Prosopium cylindraceum*	lake and stream	undetermined	subsistence use
Lake cisco *Coregonus artedii*	lake and stream	secure	
Least cisco *Coregonus sardinella*	lakes and streams, anadromous	sensitive	
Arctic cisco Coregonus autumnalis	lakes and streams	sensitive	
Arctic charr *Salvelinus alpinus*	lake and stream, anadromous, common	sensitive	subsistence and recreational use
Lake trout *Salvelinus namaycush*	lake and stream, anadromous, common	secure	subsistence and recreational use
Arctic grayling *Thymallus arcticus*	lake and stream, common	sensitive	recreational use
Burbot *Lota lota*	lake	secure	
Ninespine stickleback *Pungitius pungitius*	lakes and streams	secure	
Slimy sculpin *Cottus cognatus*	lakes and streams	undetermined	

* the conservation status of freshwater fish in Nunavut as ranked in "Nunavut Wild Species Report, 2000" (Government of Nunavut, unpublished).

3.6.3 Birds

The bird species of the Project region include migratory and non-migratory species. Migratory birds may or may not be covered by the Migratory Birds Convention Act (Canada). Most raptor species are migratory and are not protected by the federal legislation but are covered by the Wildlife Act (Nunavut). This territorial statue is administered by the Government of Nunavut Department of Sustainable Development. The Migratory Birds Convention Act (Canada) is administered by Environment Canada. Tables 13 and 14 enumerate species that are covered by territorial and federal statute respectively;

providing as well some notes on distribution and economic value. The information in these tables was gleaned from Tahera (2001) and supplemented with information from Godfrey (1966, Birds of Canada). Most bird species resident in the region are summer visitors with no particular significance to the domestic economy of the communities in the region; those that do, however, are so indicated.

None of the bird species known to breed in the Project area are listed as endangered or threatened (Government of Nunavut , 2000; unpublished; GNWT, 2000;).

Table 13: Birds of the Project area protected by the Wildlife Act (Nunavut)

Species*	Distribution	Conservation status**	Economic status
Golden eagle *Aquila chrysaetos*	terrestrial; summer resident	sensitive	
Bald eagle *Haliaeetus leucocephalus*	terrestrial ; summer resident and migratory	accidental/vagrant	
Northern harrier *Circus cyaneus*	terrestrial; summer resident and migratory	sensitive	
Gyrfalcon *Falco rusticolus*	terrestrial; summer resident and migratory	secure	
Peregrine falcon *Falco peregrinus tundrius*	terrestrial; summer resident and migratory	may be at risk	
Rough-legged hawk *Buteo lagopus*	terrestrial; summer resident and migratory	secure	
Willow ptarmigan *Lagopus lagopus*	terrestrial; summer resident and migratory	secure	recreational and subsistence use
Rock ptarmigan *Lagopus mutus*	terrestrial; summer resident and migratory	sensitive	recreational and subsistence use
Raven *Corvus corax*	terrestrial year round resident	secure	
Snowy owl *Nyctea scandiaca*	terrestrial; summer resident and migratory	secure	
Short-eared owl *Asio flameus*	terrestrial; summer resident and migratory	sensitive	

* species appearing in **bold print** have been confirmed to breed in at least one location in the Project region

** the conservation status of birds Nunavut as ranked in "Nunavut Wild Species Report, 2000" (Government of Nunavut, unpublished).

Table 14: Birds of the Project area protected by the Migratory Birds Convention Act (Canada)

Species*	Distribution	Conservation status**	Economic status
Red-throated loon *Gavia stellata*	summer resident	secure	

Arctic loon *Gavia arctica*	summer resident	secure	
Yellow-billed loon *Gavia adamsii (Gray)*	summer resident	secure	
Tundra swan *Cygnus columbianus*	summer resident	secure	
White-fronted goose *Anser albifrons*	summer resident	secure	recreational and subsistence use
Canada goose *Branta canadensis*	summer resident	secure	recreational and subsistence use
Brant *Branta bernicla*	summer resident	secure	recreational and subsistence use
Green-winged teal *Anas crecca*	summer resident	undetermined	recreational and subsistence use
Northern pintail *Anas acuta*	summer resident	sensitive	recreational and subsistence use
Canvasback *Athya valisineria*	summer resident		recreational and subsistence use
Greater Scaup *Aythya marila*	summer resident	undetermined	recreational and subsistence use
Oldsquaw *Clangula hyemalis*	summer resident	secure	recreational and subsistence use
Common eider *Somateria mollissima*	summer resident	sensitive	recreational and subsistence use
King eider *Somateria spectabilis*	summer resident	sensitive	recreational and subsistence use
White winged scoter *Melanitta fusca*	summer resident	undetermined	recreational and subsistence use
Black scoter *Melanitta nigra*	summer resident		recreational and subsistence use
Surf scoter *Melanitta perspicillata*	summer resident		recreational and subsistence use
Red-breasted merganser *Mergus serrator*	summer resident	secure	
Common merganser *Mergus merganser*	summer resident		
Sandhill crane *Grus canadensis*	summer migrant	secure	

Lesser golden plover *Pluvialus dominica*	summer resident	secure	
Semipalmated plover *Charadrius semipalmatus*	summer resident	undetermined	
Lesser yellowlegs *Tringa flavipes*	summer resident	undetermined	
Ruddy turnstone *Arenaria interpres*	summer resident	secure	
Sanderling *Calidris alba*	summer resident	secure	
Semipalmated sandpiper *Calidris pusilla*	summer resident	sensitive	
Least sandpiper *Calidris minutilla*	summer resident	sensitive	
White-rumped sandpiper *Calidris fuscicollis*	summer resident	secure	
Baird's sandpiper *Calidris bairdii*	summer resident	secure	
Pectoral sandpiper *Calidris melanotos*	summer resident	secure	
Stilt sandpiper *Calidris himantopus*	summer resident	undetermined	
Common snipe *Gallinago gallinago*	summer resident	sensitive	
Red-necked phalarope *Phalaropus lobatus*	summer resident	sensitive	
Northern phalarope *Lobipes lobatus*	summer resident		
Pomarine jaeger *Stercorarius pomarinus*	summer resident	secure	
Parasitic jaeger *Stercorarius parasiticus*	summer resident	secure	
Long-tailed jaeger *Stercorarius longicaudus*	summer resident	secure	
Glaucous gull *Larus hyperboreus*	summer resident; colonial nesting on coastal cliffs and islands	secure	eggs are gathered
Thayer's gull *Larus thayeri*	summer resident; nesting on coastal cliffs and islands	not assessed	
Herring gull *Larus argentatus*	summer resident; colonial nesting on coastal cliffs and islands	secure	eggs are gathered

Sabine's gull *Xema sabini*	summer resident	secure	
Arctic tern *Sterna paradisaea*	summer resident	secure	
Common nighthawk *Chordeiles minor*	summer resident		
Horned lark *Eremophila alpestris*	summer resident	sensitive	
Cliff swallow *Hirundo pyrrhonota*	summer resident	secure	
Bank swallow *Riparia riparia*	summer resident		
Northern wheatear *Oenanthe oenanthe*	summer resident	undetermined	
Gray-cheeked thrush *Catharus minimus*	summer resident	secure	
American robin *Turdus migratorius*	summer resident	secure	
Water pipit *Anthus spinoletta*	summer resident	sensitive	
Yellow warbler *Dendroica petechia*	summer resident	undetermined	
Yellow-rumped warbler *Dendroica coronata*	summer resident	undetermined	
Blackpoll warbler *Dendroica striata*	summer resident	may be at risk	
American tree sparrow *Spizella arborea*	summer resident	sensitive	
Savannah sparrow *Passerculus sandwichensis*	summer resident	secure	
White-crowned sparrow *Zonotrichia leucophrys*	summer resident	sensitive	
Harris's sparrow *Zonotrichia querula*	summer resident	sensitive	
Lapland longspur *Calcarius lapponicus*	summer resident	secure	
Smith's longspur *Calcarius pictus*	summer resident	secure	

Snow bunting *Plectrophenaz nivalis*	summer resident	sensitive	
Common redpoll *Carduelis flammea*	summer resident	secure	
Hoary redpoll *Carduelis hornamanni*	summer resident	secure	

* species appearing in **bold print** have been confirmed to breed in at least one location in the Project region .

** the conservation status of birds in Nunavut as ranked in "Nunavut Wild Species Report, 2000" (Government of Nunavut, unpublished).

3.6.4 Mammals - terrestrial

All terrestrial mammals in Nunavut, including polar bear, are protected by the Wildlife Act (Nunavut). This territorial statute is administered by the Government of Nunavut Department of Sustainable Development. The distribution and economic status of mammals in the Project area is summarized in Table 15.

Table 15: Terrestrial mammals reported to occupy the Project area.

Species	Habitat and distribution	Conservation status*	Economic status
Masked Shrew *Sorex cinereus*	expected throughout Project area	not assessed	
Arctic hare *Lepus arcticus*	expected throughout Project area	secure	recreational and subsistence use
Arctic ground squirrel *Spermophilus parryii*	expected throughout Project area; inactive in winter	secure	occasional subsistence use
Tundra redback vole *Clethrionomys rutilus*	expected throughout Project area	undetermined	
Brown lemming *Lemmus sibiricus*	expected throughout Project area	secure	
Greenland collared lemming *Dicrostonyx torquatus*	expected throughout Project area		
Tundra vole *Microtus oeconomus*	expected throughout Project area	not assessed	
Wolf *Canis lupus*	expected throughout Project area	sensitive	recreational, subsistence and economic value
Arctic fox *Alopex lagopus*	expected throughout Project area	secure	economic value
Red fox *Vulpes vulpes*	expected throughout Project area	secure	economic value

Grizzly bear *Ursus horribilis*	expected throughout Project area; inactive in winter	sensitive	recreational, and economic value
Short-tailed weasel *Mustela erminea*	expected throughout Project area	secure	
Least Weasel *Mustela nivalis*	expected throughout Project area	not assessed	
Wolverine *Gulo luscus*	expected throughout Project area	sensitive	recreational, subsistence and economic value
Barren-ground caribou *Rangifer tarandus*	migratory; historic calving ground in Project area	secure	recreational, subsistence and economic value
Muskox *Ovibos moschatos*	expected throughout Project area	secure	recreational, subsistence and economic value

* the conservation status of terrestrial mammals in Nunavut as ranked in "Nunavut Wild Species Report, 2000" (Government of Nunavut, unpublished).

3.6.5 Mammals - marine

Marine mammals in the Project shipping lanes include the same species that the current marine shipping would encounter in Lancaster Sound and Coronation Gulf; seals, whales and walruses (Chapman and Feldhamer, 1982; JWEL 2001). These species are protected by the Fisheries Act (Canada) which is administered by the Federal Department of Fisheries and Oceans. . Table 16 enumerates the species that are reported for the eastern and western shipping routes, and for Bathurst Inlet and also indicates their conservation and economic status in the northern economy.

Table 16: Marine mammals reported for the shipping lanes serving the Bathurst Inlet port.

Species*	Distribution	Conservation status**	Economic status
Ringed seal *Phoca hispida*	throughout marine east and west shipping routes	secure	important subsistence use in coastal communities
Bearded seal *Erignathus barbatus*	throughout marine east and west shipping routes	secure	important subsistence use in coastal communities
Bowhead whale *Balaena mysticetus*	western route to Amundsen Gulf and eastern route to Lancaster Sound; endangered species	at risk	harvest in Nunavut by special permit of the Minister for DFO
Beluga *Delphinapterus leucas*	western route and eastern route in Lancaster Sound	sensitive	important subsistence use in coastal communities
Narwhal *Monodon monocerus*	eastern route in Lancaster Sound	secure	important subsistence use in coastal communities
Walrus *Odobenus rosmarus*	western route to Amundsen Gulf and eastern route to Barrow Strait	secure	important subsistence use in coastal communities

* species known to be resident in Bathurst Inlet are shown in **bold print**

** the conservation status of marine mammals in Nunavut as ranked in "Nunavut Wild Species Report, 2000" (Government of Nunavut, unpublished).

3.7 Traditional Knowledge

The Project area has been occupied by Inuit for many generations as shown by archaeological remains on the land. Inuit families living in Kitikmeot communities today lived at various locations in the Project area within the past 50 years and have an intimate knowledge of the land, the waters, and the fish and wildlife that they harvested. Two different projects have undertaken to document the traditional knowledge of elders in the region. The Naonaiyaotit Traditional Knowledge Project (NTKP) documented responses by elders from the West Kitikmeot Region of Nunavut to a set of 145 questions on 10 specific land based themes. The Tuktu Nogak Project focused on traditional knowledge of caribou. In both projects the resulting information was compiled in geographic referenced data bases. Access to the NTKP data base remains proprietary until the necessary verification of the data sets are completed. When both traditional knowledge data bases are accessible, the information that is relevant to the Project development sites and road alignment will be extracted and examined to ensure that Project plans are, or can be made to be, compatible with important features like burial sites and traditional carnivore dens that may be at risk of disturbance in the present alignment and site configurations. This information will be submitted in support of the Project EIS.

3.8 Heritage resources

A survey of heritage resources and archaeological sites along the proposed road alignment and at the port and barge sites was completed in July and August, 2001. The survey area included the entire Project area which focused on sites that showed a high potential in a preparatory study of land forms and other terrestrial features of the general area of the road and port, as well as previous archeological studies in the region. Specific objectives of the field work included confirming the location and condition of known sites in the Project area as well as recording new, previously unrecorded sites. Field work included an aerial overview of the Project area, foot traverses and visual inspections of areas with high potential, and shovel testing for the presence of artifacts and other evidence of human occupation (Fedirchuk McCullogh & Associates, 2001; unpublished).

An inventory of 101 heritage sites in the Project area was developed including:

- 5 precontact campsites
- 59 precontact artifact scatters
- 19 precontact isolated finds
- 3 caches
- 7 historical/traditional sites
- 5 mixed type sites.

Please see Figure 27 for the locations and distribution of known heritage sites in the Project area.

The heritage survey by archaeologists included a visit to the area by 3 elders each from Kugluktuk and Cambridge Bay on July 30. The tour with the elders included an overview of the field techniques used to locate and identify heritage sites as well a field trip and inspection of a previously known heritage site located near the Izok Project which includes the remains of 10 individual structures.

The work on heritage resources will continue in 2002 with a more detailed examination of proposed borrow and quarry sites as well as a thorough examination of the Port site and barge terminals. These data will be used for impact assessment and developing a heritage sites mitigation plan for use during Project construction.

3.9 Social and economic setting

A social, and economic profile of the Kitikmeot Region of Nunavut is provided in the Draft West Kitikmeot Regional Land Use Plan (1997). The traditional land use areas of each of the West Kitikmeot communities - Kugluktuk, Bathurst Inlet, Umingmaktok, and Cambridge Bay - were provided by the Nunavut Planning Commission and are shown in Figures 28 to 31 in relation to the proposed Project.

Census Canada data (collected in 1991) for the region showed a population of 4,385 with 3,920 Inuit comprising 89.4% of the overall population of the region. The largest communities in the West Kitikmeot Region are Cambridge Bay (population of 1,116 in 1991), and Kugluktuk (population 1,059 in 1991). The populations of each community were in periods of rapid growth in that both will double in size within a generation. The population projections for Cambridge Bay and Kugluktuk for 2005 are 1,581 and 1,556 respectively (Dillon, 2001). In both communities more than 50% of the population was less than 25 years of age and at the current rate of growth, that characteristic is unlikely to change. The social and economic profile of the region will be updated in the Project EIS based on the 2001 Census Canada data.

The draft West Kitikmeot Regional Land Use Plan emphasized the importance of traditional land based activities to the economy of the West Kitikmeot. The overall labor force of Cambridge Bay and Kugluktuk showed an unemployment rate of 23%. Both communities showed a significant number of adults with less than Grade 9 education.

Tables 14, 15, and 16 provide social and economic profiles prepared in a study of Kitikmeot communities for the Hope Bay Joint Venture (Hornal 2000; courtesy of Miramar Mining Corporation).

A more comprehensive description of the social and economic setting of the region is in preparation and will be submitted in support of the Project EIS. This will include an assessment of the capacity of the labour force and businesses in the region to participate in the construction and ongoing operations of the Project.

Table 17: Demographic Profile of Kitikmeot Communities.

	Kugluktuk	Cambridge Bay	Bathurst Inlet	Umingmaktok	Gjoa Haven	Taloyoak	Kugaaruk	Kitikmeot Region
Population[1,2,3,4]								
1998	1,267	1,413	15 [5]	51	957	729	539	4,971
1996	1,201	1,351	18	51	876	648	496	4,641
1991	1,059	1,116	18	53	783	580	409	4,018
Percent Change								
1996-1998	5	5	0	0	8.5	11	8.5	7.1
1991-1996	13.4	21	0	-4	12	12	2.1	15.5
Age of Pop. (1996)[6]								
Under 14 years	460	480	N/A	15	370	270	225	1,820
15 to 64	695	840	N/A	30	490	365	280	2,700
65 +	31	30	N/A	0	30	20	10	121
Ethnicity (1996) [6]								
% Aboriginal	88.8	76	100	100	95	94	95	88.5
% Non Aboriginal	10.4	24	0	0	5	6	5	11.5
Gender (1996)[4]								
Female	605	670	N/A	25	420	320	230	2,270
Male	590	685	N/A	30	460	330	265	2,360

1. GNWT Bureau of Statistics, 1999a. *(Numbers do no add due to rounding.)*
2. GNWT Bureau of Statistics, 1999b.
3 GNWT Bureau of Statistics, 1999c.
4. GNWT Bureau of Statistics, 1997.
5. R. Homal, Pers. Comm. 1999.
6. GNT Bureau of Statistics, 1999b

N/A Not available

Source: R. Hornal 2000

Table 18. Profile of working aged adults in Kitikmeot communities.

	Kugluktuk	Cambridge Bay	Bathurst Inlet	Umingmaktok	Gjoa Haven	Taloyoak	Kugaaruk	Kitikmeot Region
Population 15 yrs. & older (I 996)[1]	745	870	N/A	35	*510*	375	280	3,080
Level of Education of Working Age Population (1996) (Percent)[1]								
Less than Grade 9	38.3	23.0	N/A	N/A	46.1	45.3	55.4	38.3
High School W/O Certificate	19.5	18.4	N/A	N/A	16.7	18.7	14.3	17.9
High School Diploma	2.0	5.2	N/A	0	2.0	2.7	0	2.8
Trade or Other Certificate	31.5	39.7	N/A	N/A	30.4	25.3	21.4	32.0
University Without Degree	2.0	5.2	N/A	0	2.0	4.0	3.6	3.1
University Degree	6.7	8.6	N/A	0	3.9	4.0	3.6	5.8
Employment by Industry (1996) (Percent)[1]								
Goods Producing	15.7	16.0	N/A	N/A	4.1	4.5	6.7	13.0
Retail & Wholesale	11.2	12.0	N/A	N/A	16.3	25.0	20.0	14.9
Gov't., Education & Health	48.3	43.2	N/A	N/A	40.8	40.9	46.7	43.8
Other Services	24.7	30.4	N/A	N/A	34.7	18.2	33.3	28.1
Income Support (1998/99)[2]								
# of Cases in fiscal year 1998-99	1,437	1,246	2	96	1,828	1,113	830	6,550
Average $ Amount/Case/month	$590	$541	$826	$447	$628	$721	$725	$629
Income Support (1995/96)[3]								
# of Cases in fiscal year 1995-96	1,131	808	22	120	1,856	1,417	887	6,241
Average $Amount/Case/month	$550	$508	$676	$635	$730	$696	$726	$659
Number Tax Returns Filed in 1996[1]	590	700	N/A	N/A	410	330	250	2,480
Average Income in 1996[1]	$22,739	$32,143	N/A	N/A	$18,75	$21,303	$20,472	$23,985

1. GNT Bureau of Statistics, 1999b.
2. Ecklund, L., Pers. Comm., 2000.
3. GNWT Dept of Education, Culture & Employment, 1996.

N/A Not available

Source: R. Hornal 2000

Table 19. Labour force activity in Kitikmeot communities.

	Kugluktuk	Cambridge Bay	Bathurst Inlet	Umingmaktok	Gjoa Haven	Taloyoak	Kugaaruk	Kitikmeot Region
Persons 15 yrs. & over in 1999 [1]	821	935	N/A	N/A	539	416	324	3,035
Labour Force (I 999)	476	728	N/A	N/A	308	290	204	2,006
Employment Rate	42%	67.1%	N/A	N/A	34.9%	59.1%	48.8%	78%
Unemployment Rate	27.5%	13.9%	N/A	N/A	39%	15.2%	22.5%	22%
Participation Rate	58%	77.9%	N/A	N/A	57.1%	69.7%	63.0%	66.1%
Persons 15 yrs. & over in 1996 [2]	745	865	N/A	35	*505*	375	275	3,080
Labour Force (I996)	470	635	N/A	20	275	230	155	1,960
Employment Rate	53.0%	67.1%	N/A	42.9%	38.6%	49.3%	43.6%	33.9%
Unemployment Rate	14.9%	7.9%	N/A	N/A	29.1%	19.6%	22.6%	15.1%
Participation Rate	63.1%	73.4%	N/A	57.1%	54.5%	61.3%	56.4%	63.6%
Persons 15 yrs. & over Involved in Traditional Activities (1994)[4]								
% Hunted & Fished	56.1	28.3	N/A	38.2	60.6	86.2	96.5	57.8
% Made Crafts	30.7	15.1	N/A	29.4	20.1	39	5.8	23.8
% Trapped	7.3	7.1	N/A	32.4	9.6	13.3	15.8	9.8
Number of Working Age Residents Not Working But Wanting Work (I 999)[1, 3]								
	250	183	N/A	N/A	179	118	106	836
Number of Working Age Residents Not Working But Wanting Work (I 994)[4]								
	292	141	N/A	9	195	167	125	929
Employment Rate (1994) (% Employed)[4]								
% Aboriginal	30	54	N/A	32	37	41	42	41
% Non Aboriginal	80	94	N/A	N/A	88	72	100	87
% Female	29	63	N/A	19	31	41	40	43
% Male	45	68	N/A	44	47	45	46	57

1. GNT Bureau of Statistics, 1999a.
2. GNT Bureau of Statistics, 1999b.
3. GNWT Bureau of Statistics, 1999d.
4. GNWT Bureau of Statistics, 1994.

N/A Not available

Source: R. Hornal 2000

4.0 Public Consultation Process

The process of developing this Project has its roots in the Kitikmeot Region of Nunavut. The overall Community Advisory Committee to the Project is chaired by Mr. Charlie Evalik, President of KIA and includes representatives of the Kitikmeot communities, the HTO's, and Government of Nunavut. The details and technical aspects of the Project were developed under the supervision of the Project's Technical Committee described above. The Technical Committee has been active in consulting in the Kitikmeot region and on May 6 and 7, 2001 met with the mayors and municipal councils in both Kugluktuk and Cambridge Bay respectively. Also, elders from each of these communities visited heritage sites along the road alignment on July 30, 2001 as part of the Project's heritage resources study.

This Project Description was developed under the direction of the Project Technical Committee. It was reviewed in public meetings in Kugluktuk and Cambridge Bay in January and Gjoa Haven, Taloyoak, and Kugaaruk in March. A special meeting was held on January 15, 2002 in Cambridge Bay to review the Project with persons from Bathurst Inlet and to discuss concerns related to Project operations. A similar consultation process will attend the development of the Project EIS expected for late 2002. In these consultations, special emphasis has been placed on confirming local knowledge of the Project area, and also on community and local work force preparations for Project construction and operations.

It is understood that ongoing consultations and reporting both social, economic and environmental performance will be a feature of Project operations and that these activities may be requirements of an Inuit Impact Benefit Agreement between the Project and the Kitikmeot Inuit Association.

5.0 Project Environmental Effects

Interactions between the Project and the environment will occur during both construction and operations. Potential interactions during Project construction will span the full length of the Project, a distance of 290 km of road. Similarly, potential interactions during operations span the full length of the road.

A comprehensive suite of environmental baseline studies was initiated in 2001. Studies include water quality, fish populations, bird populations, small mammals, carnivores, and caribou and muskox. These studies will be completed and used to prepare to prepare the Project EIS.

5.1 Port and barge site construction

Port construction and operations will involve both the marine and terrestrial environment. The wharf will be a sheet pile rock filled structure extending into Bathurst Inlet 70 m to the 12 meter water depth. The terrestrial elements of the port include a 200 person camp, a 220 million liter tank farm, a concentrate storage building, a maintenance facility, and an airstrip (Figure 6).

Construction at the site will begin as soon as the construction fleet is delivered by barge in the fall of 2004. Construction will be completed 24 months later in the fall of 2006. Construction will require quarrying 700,000 m^3 of local rock to develop a level building site for the concentrate storage shelter. The rock will be removed by drill, blast, haul sequence. All the rock removed in developing the site for the concentrate storage building will be used to develop the remaining structures and roads at the port site. Much of the rock will be crushed to various sizes as required for site development.

Construction workers will be based at the 200 person camp at the port, a 42 person camp at Contwoyto Lake and at Lupin. These bases will support 1 or 2 mobile construction camps working on specific spreads of road between the port and Contwoyto Lake. Construction of the Lupin to Izok road will be based at Lupin supporting one mobile road construction camp. Mobile construction camps will typically house 60 workers. Mobile camps will relocate every 60 days. All combustible camp waste will be incinerated in a mobile industrial incinerator that will be moved with the camp. Sewage will be treated in a skid mounted sewage treatment plant prior to release onto the tundra. Non-combustible waste will be returned to the base camps for permanent disposal.

5.1.1 Air quality effects

Air quality at the port will be affected by several primary activities. Construction equipment exhaust contains greenhouse gasses. Quarrying, crushing, hauling, and placing rock produces dust.

5.1.2 Marine and freshwater effects

5.1.2.1 Marine

The wharf will extend into the marine environment 70 meters along approximately 225 meters of shoreline; 21,000 m^2 of seabed will be covered by crushed rock required to fill the sheet pile wharf. The sheet pile will be placed by driving it from the surface of the ice in the spring of 2005. The surface of the wharf will be 5 m above water level. A small crushed rock jetty will also be built to serve barge traffic between the port and Kitikmeot communities (Figure 6). It will extend 40 m into the marine environment to the 3 meter water depth and cover about 2000 m^2 of seabed. Environmental sampling at the port in August and September 2001 showed that 11 species of fish occur in the marine environment of the area (see Table 11 for marine fish species in the Project area). These data will be reported in support of the Project EIS.

5.1.2.2 Freshwater

Port construction does not encroach on any freshwater streams or water bodies. Potable water for camp needs will be produced by desalination. Port construction will not affect any freshwater fish populations.

Barge landings on Contwoyto Lake will require rock filled pushouts at km 211 of the road and at Lupin (Figures 8 and 9). Each pushout will be built to a depth that will allow the safe landing of a loaded barge - approximately 3 meters. Based on the bathymetry of the sites, approximately 1000 m^2 of lake bottom will be covered with rock at each site. The area that will be covered at each site includes the shoreline habitat that is subjected to annual ice scour and so only the deeper portion of the proposed pushout areas provide a stable benthic environment for aquatic life.

Data on these areas were collected in 2001 studies; eight fish species were captured in samplings at the proposed barge locations (see Table 12 for the species in the Project area). These data will be reported in support of the Project EIS.

5.1.2.3 Terrain

The port site is a well drained tundra upland that is covered in dryland tundra plants. Studies in 2001 included a terrain analysis for ecosystem mapping. The resulting maps will be used for designing and planning the environmental management system for the port area.

Facilities at the port will require tundra terrain alteration by placing blast and crushed rock for road and site development. Areas affected will be:

- 200 person camp, truck stop and power house: 3.7 ha
- concentrate storage site: 8.5 ha
- fuel tank farm: 110.8 ha
- fuel dispensing and load out station: 2.8 ha
- cargo lay down area: 4.0 ha
- airstrip and heliport: 7.8 ha
- ammonium nitrate storage: 4.0 ha
- sewage treatment plant: 0.1 ha
- service roads: 7.4 ha
- borrow pit and quarry: 1.0 ha.

The total area of altered terrestrial terrain at the port will be 150.1 ha.

5.1.2.4 Birds

The port area is habitat for migratory upland tundra breeding birds as well as ptarmigan and raptors (see Tables 13 and 14 for birds of the area). Preliminary surveys of the area in 2001 showed no concentration of breeding birds in the area nor any evidence of species designated for special conservation status. Raptor nesting at the port was not reported from 2001 studies. Further surveys are planned for the area. A full review of data and information from related literature will be developed and submitted in support of the Project EIS.

5.1.2.5 Mammals

The upland habitat of the port is suitable for lemmings, voles, ground squirrels and arctic hare, all of which should be expected there. Site construction therefore will change habitat used by rodents and hare in the port area.

Studies in 2001 did not identify any carnivore dens in the port area. The Project area is within the normal range of foxes, wolves, wolverine and grizzly bear. All should be expected in the area at any time of year other than grizzly in winter.

The port area is muskox range and they should be expected in all seasons.

Historic data on the distribution of the Bathurst caribou herd calving grounds show that the port site and adjacent lands were occupied for caribou calving of "medium density" in 1986. This was the only calving activity noted in the vicinity of the port area in fourteen surveys reported in the 1965 to 1996 period (Sutherland and Gunn, 1996). Bathurst herd calving grounds since 1996 have been 100 km or more to the west of the port site. Monitoring caribou use during the calving season of traditional calving grounds near the Prudhoe Bay oil development in Alaska showed that calving grounds continued to be used following initial oil field infrastructure (roads and pipelines) development on the calving ground (Dau and Cameron, 1986; LGL, 1994; Murphy and Lawhead, 2000).

5.2 Port operations

Annual activity cycles at the port will be determined by marine and Contwoyto Lake shipping conditions. The estimated mean annual volume that are planned to be handled at the port every year for the first 10 years of operations are in Table 20.

Table 20. Estimate of annual volume of cargo passing through the port in years 1 - 10.

	Imports		Exports	
Destination/Source	Fuel (000's L)	Supplies (t)	Fuel (000's L)	Supplies (t)
Lupin	14,030	4,704		
Ekati	100,080	20,000		
Diavik	56,204	9,408		
Jericho	8,640	2,664		
Izok	17,853	7,872		339,271
Hope Bay	7,200		7,200	
Gjoa Haven	4,200	80	4,200	80
Cambridge Bay	6,240	150	6,240	250
Kugluktuk	3,624	110	3,624	110
Taloyoak	2,280	60	2,280	80
Bathurst Inlet	54		54	
Umingmaktok	60		60	
Total	220,465	45,048	23,658	339,791

The number of barge trips for each of the Kitikmeot communities served by the barge from Bathurst Inlet is estimated to be 1 for Taloyoak, 2 Gjoa Haven and Kugluktuk , and 3 for Cambridge Bay**.**

The year round labor force of 30 for port operations will be based at the camp. The camp at the port will increase in response to cargo volumes on the road and may reach 200 in winter when the major fuel haul to all participating sites is under way.

5.2.1 Air quality effects

The dominant environmental effect of the land based activities at the port will be dust, noise, and exhaust emissions. Dust will be managed by an ongoing surface watering effort. Noise will be addressed initially by placement of buildings and roads so that port activities do not unduly disturb workers "off shift" who are sleeping. Exhaust emissions will be reduced by an overall fuel conservation effort including residual heat recovery in the power house for space heating.

5.2.2 Marine and aquatic interactions

5.2.2.1 Marine

Marine shipping activities will be completed within the normal "open water" period - usually up to 110 days beginning mid-July. The arrival date of the first vessel for the season will usually be dependent on ice conditions in Victoria Strait northeast of Queen Maude Gulf. Inbound cargo will include 45,048 tonnes of dry cargo (explosives, mining reagents, and grinding media) and 220.4 million liters of diesel fuel. Fuel will be transferred from ship to tank farm by two 12" diameter pipelines with a capacity of 5600 liters/min. Outbound cargo will consist of up to 470,000 tonnes of base metal concentrate in 10 ship loads and fuel and supplies for Kitikmeot communities. Resupply for the communities will require three barge movements from the port. The range of concentrate to be shipped will vary between 300,000 - 470,000 tonnes/year or 6 - 10 ship loads. Concentrate will be transferred to the ships by way of high volume bulk loader moving concentrate at 1500 tonnes per hour. The normal turn around time for a ship will be 48 - 72 hours. The last ship movement to/from the port will occur in late October. All shipping will be completed without the assistance of an ice breaker to extend the shipping season. The environmental interactions will be similar to those of the annual barge resupply to the communities of the Kitikmeot region of Nunavut, or the occasional cruise ship that has passed through the Northwest Passage in recent years. As with other developments in the Arctic, the Project will rely on ice breaker support to some degree during the shipping season, but the Project is not based on extending the normal shipping season.

Late season shipping is a concern raised by a hunter from Bathurst Inlet. A marine ice cover of four inches is sufficient to support both caribou and snowmobiles. Such conditions can be achieved in late October in some years. Concern is that if a ship were to make a transit through such ice and a snow fall obscure the track before the former ice thickness were to be reestablished, caribou crossing Bathurst Inlet could be lost through the thinner snow covered ice (Sam Kapolak, Bathurst Inlet).

Interaction with marine life will be the same as with any other form of shipping in arctic water. No concentration of marine wildlife is expected along the route that is not now exposed to arctic marine traffic.

5.2.2.2 Aquatic interactions

Port operations will not encroach on any freshwater streams or water bodies. Potable water for camp needs will be produced by desalination at a rate of 45,000 liters/day. Sewage will be treated by extended aeration, with effluent discharged directly to Bathurst Inlet in compliance with guidelines for marine sewage disposal.

Port operation will not have any significant interactions with the freshwater environment or fish populations of the port area.

5.2.3 Terrestrial interactions

All land based activities at the port will be contained to the 150 ha of the site development. The dominant activity will be truck traffic from the road to the fuel depot and to the concentrate storage building. It is expected that most of the fuel will be moved out in the January - April period that the Contwoyto ice road is in place. Also, 75% of the concentrate will be hauled during the Contwoyto ice road period. No cargo will be moving in either direction during the period that the ice road is impassable and the barge is laid up, expected to be late April to mid-July, and late October to mid-January when full ice road operations are expected to begin. The summer/fall hauling to/from the port via the barge on Contwoyto Lake will involve about 25% of the Izok concentrate and 15% of the total supplies for Lupin, Jericho, and Izok (see Tables 20 and 22). Dust management from road operations will be practised. Dust control for base metal concentrates handling at the port will be practised as required.

5.2.3.1 Birds

The port area is habitat for migratory upland tundra breeding birds as well as ptarmigan and raptors (see Tables 13 and 14 for birds of the area). Preliminary surveys of the area in 2001 showed no concentration of breeding birds in the area nor any evidence of species designated for special conservation status. Raptor nesting at the port was not reported from 2001 studies. Further surveys are planned for the area. A full review of data and information from related literature will be developed and submitted in support of the Project EIS.

Interactions of port operations with birds will be passive with no effects that are incremental to those of habitat alteration during construction.

5.2.3.2 Mammals

The upland habitat of the port is suitable for lemmings, voles, ground squirrels and arctic hare, all of which should be expected there.

Studies in 2001 did not identify any carnivore dens in the port area. The area is within the normal range of foxes, wolves, wolverine and grizzly bear. All should be expected in the area at any time of year other than grizzly in winter.

The port area is muskox range and they should be expected in all seasons.

Historic data on the distribution of the Bathurst caribou herd calving grounds show that the port site and adjacent lands were occupied for caribou calving of “medium density” in 1986. This was the only calving activity noted in the vicinity of the port area in fourteen surveys reported in the 1965 to 1996 period (Sutherland and Gunn, 1996). Bathurst herd calving grounds since 1996 have been 100 km or more to the west of the port site. Monitoring caribou use during the calving season of traditional calving grounds near the Prudhoe Bay oil development in Alaska showed that calving grounds continued to be used following initial oil field infrastructure (roads and pipelines) development on the calving ground (Dau and Cameron, 1986; LGL, 1994; Murphy and Lawhead, 2000).

Interactions of port operations with mammals will be passive with no effects that are incremental to those of habitat alteration during construction.

5.3 Environmental effects of road and Contwoyto Lake barge terminals construction

The total length of the proposed road will be 290 km. Construction will be spread over 24 months. It will be built in three sections; the first from the port (km 0) to km 126, from Contwoyto Lake (km 210) to km 126, and from Lupin to the Izok Project. Km 0 to km 126 will be built in the October 2004 to October 2005 period starting at the port. Km 210 - km 126 will be built in the January 2005 to October 2005 period starting from Contwoyto Lake as soon as the 2005 Lupin winter road allows mobilizing the construction equipment to Contwoyto Lake.

5.3.1 Air quality

The dominant environmental effect road and barge terminal construction will be dust, noise, and exhaust emissions. Construction noise will be mitigated by use of appropriate personal protective equipment. Dust will be produced from rock crushing and road construction. The working environment effects of dust, like noise, will be mitigated by use of appropriate personal protective equipment. Exhaust emissions will be reduced by an overall fuel conservation effort.

5.3.2 Aquatic environments

Field studies in 2001 found 10 species in the streams that cross the road alignment (see Table 12 for species of freshwater fish in the Project area).

The road alignment is such that construction will not encroach on any lakes other than Contwoyto Lake and the north arm of Itchen Lake at its westerly terminus. Numerous drainage basins however will be bisected by the road (Figure 32). Including the crossing at Itchen Lake, the alignment requires 119 water crossings.

The overall prerequisite in the preliminary design of each of the required water crossings was to avoid encroaching on the stream channel (other than during extreme flows) in streams known and expected to be fish bearing and so avoid disturbing potential fish habitat. The design for such crossings are either single span bridges or arched culverts. For crossings at intermittent streams that are not fish bearing, rock fords are proposed. These designs meet the above prerequisite for 116 of the 119 crossings. Instream abutments or double span bridges may be required at three locations: km 126.6 crossing the Mara River, km 165.5 on the port to Contwoyto portion of the road, and at km 61 of the Lupin to Izok road. Table 21 summarizes the location and preliminary design of each of the proposed water crossings for the alignment from the port to the Izok Project boundary. Also, Figures 33, 34, and 35 provide photographs and drawings of streams that show an example of each design type of water crossing proposed.

One crossing will require midspan support structures from the stream channel; the Mara River at km 126.5 requires a bridge of 60 meters, exceeding the limits of a single span. The crossing at Itchen narrows at km 61 of the Lupin Izok road will require abutments encroaching into Itchen Narrows to reduce the bridge length for a single span.

Water crossings of a rock ford design (67) will be built in winter when no flow is expected. Likewise, site development for crossings requiring bridges (31) and arch culverts (21) will be completed in late winter when working conditions improve but before stream flow is expected.

The environmental effects of water crossings along the road on aquatic life and particularly fish populations will be negligible. All data from field studies will be reported in support of the Project EIS.

Recreational angling is expected to occur by workers living at the camps at the port, the Contwoyto barge site, and at Lupin. Angling destinations by persons at the port are likely to be marine destinations on Bathurst Inlet. Contwoyto Lake will be used by anglers based at the Contwoyto barge site and at Lupin. There is an active angling community at Lupin mine which has been fishing on Contwoyto Lake for 20 years. It is expected that the species of choice by anglers will be lake trout and arctic charr. The draft West Kitikmeot Regional Land Use Plan recommends that recreational angling at resource development sites be restricted in a 5 km area "around the development site". The Project will develop a strategy so that employees and contractors will be in compliance with the plan.

Table 21. Location, watershed, and fish habitat characteristics for water crossings.

From Bathurst Inlet to Contwoyto Barge Terminal							
Final Road Chainage km	**Watershed Area km^2**	**Preliminary Habitat Quality Rating***	**Est Stream Depth design - 1:25 yr m**	**Est Streamflow design - 1:25 yr m^3/s**	**Crossing Type/Length Rock Fill**	**Arch**	**Bridge**
					m	**m**	**m**
2.5	66.4	High	0.45	16.38			20
3.0	1.1	Low		0.63	X		
7.7	6.8	High		2.68		X	
14.3	75.3		0.83	18.09			10
18.7	1.7			0.89	X		
21.5	1143.1	Low	0.98	156.68			50
24.8	0.7			0.44	X		
25.3	0.5			0.34	X		
28.5	3.4			1.55	X		
31.5	0.3	Medium		0.23		X	
31.9	42.7	Low	0.35	11.54			30
32.9	60.5	Medium	0.39	15.21			30
33.9	43.0	Low	0.32	11.60			30
35.2	2.7			1.29	X		
36.3	0.2			0.16	X		
36.9	0.4			0.28	X		
38.6	2.6			1.25	X		
40.2	9.5	Medium	0.22	3.50			20
41.5	6.1	Low		2.46	X		
42.8	2.0	Medium		1.02		X	
45.5	2.5			1.21	X		
48.0	9.9	Medium		3.62		X	
50.5	46.3	Low	0.59	12.30			20
52.4	3.6			1.62	X		
54.0	0.7			0.44	X		
56.8	5.2	Medium		2.17		X	
60.5	0.5			0.34	X		
61.6	0.2			0.16	X		
66.5	0.5			0.34	X		
67.5	6.2	High		2.49		X	
68.2	2.3	Low		1.14	X		
70.3	39.8	High	0.46	10.91			20

Final Road Chainage km	Watershed Area km^2	Preliminary Habitat Quality Rating*	Est Stream Depth design - 1:25 yr m	Est Streamflow design - 1:25 yr m^3/s	Crossing Type/Length		
					Rock Fill	Arch	Bridge
72.2	3.9			1.73	X		
73.2	1.6			0.85	X		
74.0	16.0	Low	0.42	5.29			10
75.1	6.3	Low		2.53	X		
77.0	0.5			0.34	X		
78.5	2.4			1.17	X		
81.7	1.6			0.85	X		
82.1	81.0	High	0.41	19.17			30
83.0	5.0	Low		2.10	X		
88.2	2.6	Low		1.25	X		
89.1	0.5			0.34	X		
89.3	1.0			0.59	X		
91.3	2.2			1.10	X		
92.0	4.2			1.83	X		
95.5	4.4			1.89	X		
96.8	0.4			0.28	X		
98.3	1.2			0.68	X		
100.9	3.9	Low		1.73	X		
101.1	2.6	High		1.25		X	
104.3	13.4	Low	0.23	4.60			30
110.8	23.8	Low	0.34	7.25			20
111.5	1.4	High	0.14	0.77			20
112.8	18.1	Medium	0.33	5.84			20
115.0	5.0			2.10	X		
116.9	1.3			0.72	X		
121.0	0.8			0.49	X		
121.3	1.2			0.68	X		
123.0	23.8			7.25	X		
126.5	1825.6	High	1.70	227.19			60
132.0	71.0	High	0.43	17.27			30
134.1	0.7			0.44	X		
141.8	1.9			0.98	X		
144.0	2.3			1.14	X		
144.9	1.0			0.59	X		
147.1	2.7			1.29	X		
149.0	28.8		0.42	8.44			20

Final Road Chainage km	Watershed Area km^2	Preliminary Habitat Quality Rating*	Est Stream Depth design - 1:25 yr m	Est Streamflow design - 1:25 yr m^3/s	Crossing Type/Length		
					Rock Fill	Arch	Bridge
153.0	0.6			0.39	X		
155.7	0.3			0.23	X		
157.0	0.7	Low		0.44	X		
157.2	0.8			0.49	X		
158.3	15.8	High	0.33	5.24		X	
165.1	4.2	Low		1.83	X		
165.5	66.9		0.26	16.47			60
166.4	0.1			0.09	X		
166.6	0.7	Medium		0.44		X	
167.7	13.5	High		4.63		X	
170.2	9.8	High		3.59		X	
174.1	8.7			3.26	X		
178.2	352.5	High	1.03	61.60			30
180.5	4.1	Low		1.80	X		
183.4	0.6	Low		0.40	X		
186.0	4.4	Low	0.32	1.89		3	
189.3	11.3		0.55	4.02		3	
190.8	0.8			0.49	X		
193.4	1.8			0.93	X		
195.3	0.3			0.23	X		
198.7	65.6	High	0.69	16.22			20
199.7	34.4	High	0.40	9.71			20
201.2	1.0	Medium		0.59		X	
203.7	12.4		0.26	4.32			10
205.2	1.5		0.20	0.81		3	
208.0	2.1			1.06	X		

Final Road Chainage km	Watershed Area km^2	Preliminary Habitat Quality Rating*	Est Stream Depth design - 1:25 yr m	Est Streamflow design - 1:25 yr m^3/s	Crossing Type/Length Rock Fill	Arch	Bridge
Table 21. continued From Lupin Mine to Izok Site							
8.9	20.9	High		6.55		84"arch	
12.5	9.0	Low		3.35		2	
15.0	14.2			4.82		2	
17.7	103.3	High	0.44	23.25			40
30.0	23.6	Low	0.34	7.21			20
31.0	0.9	Low		0.55	X		
31.3	3.8			1.67	X		
33.0	0.9			0.53	X		
36.4	77.9	High	0.44	18.58			30
38.7	2.9			1.36	X		
39.7	0.7			0.42	X		
40.9	33.0	High	0.27	9.41			30
49.5	36.8	High	0.26	10.24			30
51.2	1.6			0.85	X		
52.1	0.7			0.45	X		
54.9	0.9			0.52	X		
58.0	38.7	High	0.19	10.66			30
59.0	0.4	Low		0.28	X		
61.0	400+	High	0.59	81.29			60
68.3	2.3	High		1.12		X	
68.7	4.1	High		1.80		X	
69.6	3.4			1.56	X		
71.2	5.4	High		2.24		X	
73.1	0.5			0.31	X		
74.0	25.2	High	0.24	7.60			40

* Preliminary fish habitat rating by Rescan 2002 - preliminary data

5.3.3 Terrestrial environment interactions

Road construction will involve developing a series of granular pits (9 required) and quarries (41 required) along the entire road alignment as shown in Figure 4. Each pit or quarry will alter approximately 2 ha. of tundra terrain and habitat. A total of 6.2 million m^3 of rock and granular materials will be removed from these pits and quarries and placed on the right-of-way to build the road. Building the road with passing pullouts every 1,000 meters will cover 381.3 ha +/- of tundra habitat. The total terrain alteration along the alignment including quarries and barge terminals will be approximately 516 ha +/-. Studies in 2001 included a terrain analysis for ecosystem mapping. The resulting maps will be used for designing and planning the environmental management system for the road right-of way.

The rough base course of rock for the alignment will be laid down in winter and so reduce thaw penetration the following summer. The additional courses of -150 mm and -50 mm crushed rock are expected to ensure that the permafrost profile migrates into the base of the road to ensure terrain stability to the road bed.

5.3.3.1 Birds

The road alignment and barge terminals are habitat for migratory upland tundra breeding birds as well as ptarmigan and raptors (see Tables 13 and 14 for birds of the area). Preliminary surveys of the area in 2001 showed no concentration of breeding birds in the area nor any evidence of species designated for special conservation status. Raptor nesting along the road alignment was not reported from 2001 studies. Further surveys are planned for the area. A full review of data and information from related literature will be developed and submitted in support of the Project EIS.

Neither the road bed or any of the pits or quarries encroach on water bodies and so no shoreline water fowl nesting habitat is at risk. Quarry and pit development, and road bed construction may displace upland nesting birds.

5.3.3.2 Mammals

The habitats along the road and at the pits and quarries are occupied by lemmings, voles, ground squirrels and arctic hare, all of which were observed in the Project area during studies in 2001.

The Project area is within the normal range of foxes, wolves, wolverine and grizzly bear. All should be expected at any point along the alignment at any time of year except grizzly in winter.

Muskox occupy the tundra traversed by the proposed road alignment and are present the whole year.

Caribou of at least two herds occupy the area of the road alignment for part of the year. The Bathurst herd will migrate across the road alignment during the calving migration of the cows in April and May and the spring migration by the non-calving portion of the herd will occur a month later. Post calving aggregations ranging in size up to tens of thousands of cows with calves may spend brief periods in the vicinity of the alignment during the later part of June and into July. Small bands of mixed herds should be expected for the remainder of the summer until late August when most of the Bathurst herd is usually on ranges further south. The likelihood of interactions with the Bathurst herd for the remainder of the year, from the fall through the winter, is low. Figures 36 a - f show the distribution of Bathurst caribou for 1996 - 2000 as shown by satellite telemetry data courtesy of the West Kitikmeot Slave Study, and Dr. Ann Gunn and her colleagues in the Government of the Northwest Territories Department of Resources, Wildlife and Economic Development.

The area of the alignment near Nose Lake and vicinity was also shown to be part of the Queen Maud Gulf caribou herd range (Gunn et al, 2000). Unlike the Bathurst herd, the Queen Maud Gulf herd does not migrate south for the winter and telemetry locations from animals in that herd showed that the area east of Contwoyto Lake was occupied by animals of this herd in the summer of 1996 and 1997 and the winter of 1997.

Construction activities will generally be concentrated on specific portions of road, 20 - 30 km stretches accessible from the particular quarries that are active. Two construction crews at most will be active at any one time in the January - October 2005 period; one crew will build the Lupin to Izok road in the November 2005 - October 2006 period. Interactions of road construction operations with mammals generally will be passive with no significant effects on the animals. Interactions with caribou may be such that construction work will be slowed or temporarily halted to allow the caribou to pass through the construction zone. This will likely be the case during the calving and spring migrations. The "invasion" of a post-calving aggregation would make road construction impossible for a period of 12 - 36 hours if the animals decided to "settle in for a feed and a rest".

5.4 Environmental effects of road and barge operations

Road operations for Izok, Jericho, and Lupin cargos will be interrupted by the seasonal constraints of traversing Contwoyto Lake. Operations to Ekati and Diavik will be winter only as dictated by the accessibility to these sites on the Lupin winter road out of Yellowknife. The seasonal traffic estimated for the first 10 years of road operations to these locations is summarized by Table 22.

Table 22. Seasonal road traffic to sites serviced by the Bathurst Inlet Port and Road Project in years 1- 10

Destination	Summer Barge	Winter	Total Trucks
Lupin	156	470	626
Ekati	0	2,827	2,827
Diavik	0	1,695	1,695
Izok	1,259	3,777	5,036
Jericho	0	331	331
Total	1,415	9,100	10,515

Road maintenance crews will be based at the port and at Lupin. Systematic maintenance activities will involve surface grading and dust suppression in summer and snow removal and grading as required in winter. Surface materials will be added from time to time as needed which will require operating several quarries along the road and crushing rock to produce the -50 mm materials for surface dressing. This work would be done during the May - July period when hauling has been suspended because Contwoyto Lake is impassable.

5.4.1 Air Quality

Truck and barge operations will produce exhaust emissions. Exhaust emissions will be reduced by an overall fuel conservation effort. Summer road traffic will produce dust which will be managed by a road watering program.

5.4.2 Aquatic environment

There will be no direct interaction between the road and the aquatic environment. The flow at non-intermittent stream crossings will reach the level of the bridge or culvert abutments only at very high flows. However, water will be required for summer road maintenance and camp needs at the Contwoyto barge camp. A pumping station for dust suppression on the road will be located every 30 km where a

water tanker will reload for dust suppression watering. Only water bodies with active summer flows will be used for pumping stations and so prevent a draw down that could affect aquatic life.

The camp at the Contwoyto barge site will require 12,000 liters water/day for potable needs and emergency fire fighting. It will be drawn from Contwoyto Lake. Standard intake screens will be in place to prevent fish from entering the water intake. Sewage treatment will be by extended aeration with effluent discharged on the tundra "field".

There will also be the risk of base metal concentrate dust escaping from loads and settling on the tundra and entering the run off. This should be addressed by the Izok Project EIS at the time of Izok Project review.

5.4.3 Terrestrial environment interactions

The principle interaction between road traffic and the elements of the terrestrial environment will be dust, as discussed above.

5.4.3.1 Birds

The interactions with birds during road and barge operations will be passive and no incremental effects to those of the construction phase are expected.

5.4.3.2 Mammals

The interactions with mammals during road and barge operations will be passive and no incremental effects to those of the construction phase are expected. It is expected that the interactions will be reduced in that the season of active traffic will be considerably shortened during road operations. The following operating seasons are expected:

- winter road operations to Ekati, Diavik, Lupin, and Izok - 90 days beginning mid-January;
- barge operations on Contwoyto Lake - 100 days beginning mid-July.

This restricted operating season will reduce interactions between haul trucks and migrating caribou during the latter period of the cows' calving migration, the non-calving herd's spring migration, and the post-calving period.

There is a considerable body of information on the interactions between caribou herds and a resource development road. The Milne Point, Kuparuk and Prudhoe Bay oil fields in northern Alaska were developed on known caribou calving and post calving grounds of the Central Arctic Herd in the early 1980's. Caribou monitoring before and after oil field development (1978-81; 1982-1987) showed that the distribution of cows on the calving ground changed; cows with calves generally avoided areas within 2 km of a service road with "moderate to heavy traffic" for up to three weeks after the peak of calving. It is noteworthy that caribou in other sex and age classes used the area closer to the road avoided by cows with newborn calves. Also, the area of the oil fields continued to be used as a calving ground after the oil fields were developed with roads, pump jacks, and pipelines built and operating. Perhaps most significant of all, the herd grew throughout this period from 6,000 in 1978 to 23,400 in 1992 (LGL, 1994).

The Western Arctic Herd ranges over northwest Alaska. The Red Dog lead-zinc mine went into operation in 1989. The Red Dog ore body is owned by the Nana Corporation, one of the native corporations established in the Alaska land claim. The mine is operated by Teck-Cominco. It required a 100 km all-weather road to service the mine and remove the concentrate to a marine port on Kotzebue Sound. This road passes through winter range and crosses migration routes of the Western Arctic Herd

with a traffic volume of at least 60 return trips per day. Like the Central Arctic Herd, it has grown and multiplied by from 75,000 to 416,000 in the period between 1976 and 1991 (LGL, 1994).

The Porcupine herd is shared between NWT, Yukon, and Alaska. The Dempster highway cut through its winter range and crosses several major migratory routes in the NWT and Yukon. Prior to construction and operation of the Dempster highway a lot of concern was expressed for the future of the herd. The road opened in 1979. In the first ten years of operations from 1979 - 1989 the herd increased by 60% from 106,000 to 163,500 (LGL, 1994).

The Alaska monitoring study compared the response of these herds with a herd that did not have any major oil field development on its range, the Teshekpuk herd, also on the Alaska North slope. It also increased fourfold from 4,000 to 16,500 in the period from 1982 - 1989 (LGL, 1994).

In the NWT and Nunavut, the Lupin winter road cuts through the winter range of the Bathurst herd and crosses spring migration routes. In the period of winter road operations (1982 to the present) the herd has increased from estimates of 100 - 120,000 in 1979 to 360,000 in 2001 (GNWT, 1988).

The effects of road operations on caribou populations will be negligible. Hunting by Project personnel and the personnel of contractors will not be permitted. Figures 36 a - f show the distribution of the Bathurst herd from 1996 - 2000 as shown by telemetry data.

5.5 Lupin winter road

The Lupin winter road will continue to operate into the Project area and freight originating in Yellowknife will include non-bulk freight destined to all the sites served by the Bathurst Port Road including cargo destined for Kitikmeot communities hauled to the port .

5.6 Bathurst Inlet port and road operations effects on the social and economic environment of Kitikmeot

The Project construction phase and operations provide a significant potential for jobs to workers in the region. Project construction will create 3600 man-months of work over a 30 month period with a payroll of $34.5 M. Operations will create 800 man-months of employment (both seasonal and full time) with an annual payroll of $3.5 M. Payroll for contract drivers will create an additional annual payroll of $9 M.

Diesel fuel costs for each of the Kitikmeot communities served by the Project could be reduced by up to one third the current price. The costs of general cargo from Yellowknife via the port will be competitive to current freight costs via Hay River. The cost of freight on general cargo out of eastern Canada or Europe is estimated to be approximately 70% less than current freight costs via Hay River.

5.7 Bathurst Inlet port and road operations effects on the social and economic environment of the N.W.T.

It is expected that much of the seasonal hauling capacity required for the winter fuel haul from the port will be provided by a contracted fleet based outside of Nunavut that would roll through Yellowknife every January en route to the port. The tanker units would likely be loaded, discharge their cargo at a tankfarm en route and travel the remaining distance to the port empty. There is one aspect of the effects of the Project on the western Canadian economy that can be measured quite directly. All the cargo imported through the port destined for existing operations (Lupin, Ekati, Diavik) is cargo currently transported

through Yellowknife. Cargo destined to the port for export to Kitikmeot communities would continue to be procured in western Canada but pass through Yellowknife instead of being routed to Hay River. Cargo imported through the port destined for Izok and concentrate from Izok for export will be incremental in that without the port the Izok Project would not be commercially feasible. Table 25 summarizes the estimated volume of Project current cargo that would be rerouted as a result of the Project.

Table 25. Estimate of current annual cargo volumes rerouted through Project facilities

Destination	loads rerouted through Project	contents
Lupin	(630)	20 M L fuel; 8300 tonnes supplies
Ekati	(2800)	100 M L fuel; 20,000 tonnes supplies
Diavik	(1700)	57.6 M L fuel; 12,000 tonnes supplies
Kitikmeot communities	12	520 tonnes supplies
Net change	-5118 loads*	

(#) = loads rerouted away from current Lupin winter road.
1 load = 45 tonnes

5.8 Environmental effects on Public Health

No aspect of the Project's construction phase nor the operations phase touches directly on the public health of any communities in Nunavut or the N.W.T. Public health and industrial workplace health and safety needs at the camps and facilities operated by the Project will served by an industrial health professional "on site" at all times. This will complement the capacity that will be on site at Diavik, Ekati, Lupin and Izok to deal with emergencies anywhere in the Project's transportation network. Also, the camps and all related facilities will be operated in compliance with all public health standards in Nunavut.

6.0 CUMULATIVE ENVIRONMENTAL EFFECTS

Cumulative environmental effects will be addressed in the Project EIS. The sites and related activities in the region assessed for cumulative environmental effects will include ongoing operations and those proposed projects that have been submitted to agencies for environmental review. These include: Lupin Mine and the Jericho Diamond Project in Nunavut; the Ekati Diamond Mine, and the Diavik Diamonds Project in N.W.T. Non mining activities that will be included in the review of cumulative effects will include traditional harvesting and tourism (including outfitting) in Nunavut.

The overall incremental environmental effect of this Project will be building and operating a port and summer and winter road network between Bathurst Inlet and the Izok Project, and a winter road network between the port and the diamond mines in the N.W.T. Serving minesites increases the volume of the cargo on the Project's road but does not increase the environmental effects of the Project in that it directs existing cargo volumes to their destinations by way of a shorter and more economical route.

Ekati

By supplying bulk goods, including fuel, to Ekati the Project will reduce the number of loads on the southern portion of the Lupin winter road by 1700. Cargo destined to Ekati will include:

- fuel - 100 Million liters
- operating supplies - 20,000 tonnes

No new or additional environmental effects on the environment of either the West Kitikmeot region of Nunavut or the North Slave region of the N.W.T. should be introduced by moving these goods by a different route.

Diavik

The Diavik diamond mine in the North Slave region of the N.W.T. is currently under construction and is resupplied by the Lupin winter road. It is slated to go into production in 2003. The bulk goods that may be procured by way of the Bathurst Port and Road Project include:

- fuel - 57.6 Million liters
- operating supplies - 12,000 tonnes

The effect of this Project supplying bulk goods, including fuel, to Diavik will reduce the number of loads on the southern portion of the Lupin winter road by 1700. No new or additional environmental effects on the environment of either the West Kitikmeot region of Nunavut or the North Slave region of the N.W.T. should be introduced by way of sourcing these goods by way of a different route.

Lupin

Lupin Mine has been producing gold since 1982. The effect of this Project supplying bulk goods, including fuel, to Lupin will reduce the number of loads on the southern portion of the Lupin winter road by 630. The bulk goods that may be procured for Lupin by way of the Bathurst Port and Road Project include:

- fuel - 20 Million liters
- operating supplies - 8300 tonnes

No new or additional environmental effects on the environment of the West Kitikmeot region of Nunavut will be introduced by way of sourcing these goods by way of a different route.

Jericho

The Jericho Diamonds Project is located 3.5 km west of Contwoyto Lake 20 km northwest of Lupin. It is currently at the project review stage. It is proposed that the Jericho site would be served by a 32.5 km extension of the Lupin winter road. The configuration of this Project would not introduce any changes to the Jericho Project. Operationally, the Jericho Project may have access to the winter road over a slightly

longer period each winter compared to the current Lupin winter road season. The proposed volumes for annual resupply to the Jericho Project are estimated to be from 157 to 312 loads annually for an 8 year period (Tahera Corporation, 2001).

The social and economic effects of the Project on the Kitikmeot region include an infusion of employment and contracting opportunities for its residents. The construction phase is expected to create 3600 man-months of employment over a 30 month period. The payroll for construction will be an estimated $34.5 M.

Project operations will create 800 man-months of work annually (300 in winter and 500 in summer) directly. Annual payroll for Project employees during operations will be $3.5 M. The services for contracted drivers hauling on the road will add $9 M for a total estimated annual payroll of $12.5 M. The creation of new opportunities close to the traditional community of Bathurst Inlet may see a return of family members to the community who moved out in recent years due to lack of opportunity there (Page Burt, Naturalist at Bathurst Inlet Lodge, personal communications).

It is possible that a significant portion of the Project payroll can be retained by the region. In a study of potential social and economic effects of a gold mine in the Keewatin, it was estimated that in addition to the direct payroll to the region, government would benefit by $22,469. for every new job created in the region that was filled by a previously unemployed person. These benefits are a combination of tax revenue and saving in social program costs (Nexus, 1997).

The cumulative effects assessment in the Project EIS will describe expected effects of the Project in concert with existing and prospective activities indicated above, with traditional and historic activities on major VECs, and social, cultural and economic make-up of the Kitikmeot region of Nunavut. It will also review the expected effects on the winter road traffic between Yellowknife and the mining sites that have traditionally been resupplied entirely by the Lupin winter road.

7.0 MITIGATION MEASURES AND RESIDUAL IMPACTS

The risk of environmental effects from Project construction and operations relate to the direct interactions between the Project and elements in the environment. The interactions and related environmental risk outlined in Table 7 above will be elaborated on here.

The overall mitigation measures that will be practised are the product of a high level of environmental care and diligence by the proponent in all Project activities. Notwithstanding the best practice, and successful mitigation measures, some interactions between the Project and the environment will have residual impacts which are described for the relevant Project activity.

7.1 Air quality

Combustion of diesel and other hydrocarbon fuels will produce greenhouse gasses which cannot be avoided. The amount can be reduced by an aggressive energy conservation effort. The residual environmental effects of burning hydrocarbons are debatable but may include global warming.

7.2 Marine shipping

Marine shipping associated with the Project will take the form of 50,000 tonne vessels and barges serving Kitikmeot communities. All shipping will be done by commercial carriers operating in compliance with the relevant Canadian laws and regulations.

The Project will go beyond the specifics of the law in mitigating the effects of shipping through the Kitikmeot Region. The shipping season will be planned so that no ship movement is required during the time of potential early winter ice cover on Dease Strait and so avoid the risk of interfering with caribou migration from Victoria Island to the Kent Peninsula. Also, no ship movement will be planned for the spring when caribou return to Victoria Island. The first ship of the season is planned for an open water arrival and so Project shipping will not interfere with human travel on the spring ice either.

No residual impacts of marine shipping are expected.

7.3 Camp operations

Interactions at Project camps with the environment will involve water quality, waste management, and wildlife. All sewage at all camps will be will be treated to meet waste water quality standards prior to discharge. All combustible waste will be incinerated on a regular basis so not to attract scavengers; non-combustible waste will be disposed of either at a solid inert waste site or be shipped out. All hazardous wastes that cannot be disposed of by the Project (i.e. used oil can be destroyed on site by a waste oil burner) will be shipped out.

A “Bear Alert” program will be used at all camps to advise personnel when grizzly bear are sighted at or near a camp.

Project employees will probably engage in recreational angling but hunting by Project personnel will be prohibited. The policy on recreational angling by Project workers will be in compliance with the West Kitikmeot Regional Land Use Plan (when approved).

No residual impacts are expected to water quality, fish populations or wildlife populations as a result of camp operations. The remains of a solid inert waste site could be visible for many generations.

7.4 Unloading ship cargo

Handling marine bulk cargos has the attendant risk of spills with associated potential effects on coastal habitats. The first defence will be a code of best practice that will be followed by the commercial carriers and their staff. Next, the Project will adopt contingency plans that employ the best practice available for Arctic conditions.

No residual impacts are expected from normal port operations. Effective contingency plans and equipment with trained personnel will be in place to reduce the risk of residual impacts from accidents.

7.5 Pit /quarry development

Pits and quarries will alter an estimated 2 ha of tundra terrain at each site for a total of +/-102 ha at approximately 51 sites. Sites for pits and quarries will be selected with care so that the terrain disturbance can be contained to as small an area as possible. Quarries in sulphide bearing rock with a risk of acid generation in the quarry or by the rock on the road will be avoided. During operations, effective contingency plans will be in place to ensure that accidents do not result in residual impacts. On closure quarry and pit walls will be sloped to avoid progressive terrain alteration, but the visual effect of pit and quarry development will remain.

Residual impacts of pit and quarry development will be restricted to stable terrain alteration.

7.6 Port site development

Port site development, like quarry and pit development will involve terrain alteration on a large scale. It is estimated that the cumulative area of all development at the port will involve approximately 150 ha. A Project environmental management system will be in place to reduce the risk of environmental effects from normal operations. Contingency plans will be in place to ensure that accidents do not cause long terms impacts.

The residual impacts of port development will be the visual and inert. These effects of terrain alteration will be evident on the tundra for many years.

7.7 Road construction

Road construction will affect a total estimated 380 ha. The alignment has been selected for its benign effects on drainage basins and terrain features like eskers. Road construction, like pit and quarry development, will be attended by rigorous attention to good practice and effective contingency plans to reduce the risk of long term environmental effects from accidents.

The presence of the road will not have any long term negative impacts on water, vegetation, or wildlife. Water crossings will be designed to avoid the stream channel in fish bearing streams during normal flows. Caribou will use the road as insect relief during periods of heavy insect infestation. The presence of the road, like the presence of an esker, will be visible for many generations.

The residual impacts of road construction will be visual and inert. These effects of terrain alteration will be evident on the tundra for many years.

7.8 Barge site development

Barge site development is akin to port site development but on a much lesser scale. Total area of the two barge sites combined is estimated to be 33 ha.; three being over lake bottom. The lake bottom that will be

covered by rock is in the zone of ice scour and so the effect on fish habitat will be minimal. Like the road, barge site construction will be completed with care and diligence. The barge site parking area and pushouts, like the road, will be areas used by caribou as insect relief during periods of heavy insect infestation. The gentle terrain of the sites is such that the risk of progressive erosion is negligible

The residual impacts of barge site construction will be the visual and inert. These effects of terrain alteration will be evident on the tundra for many years.

7.9 Port site operations

Road operations at the port will produce dust in summer which will be subject to dust suppression by watering the surfaces. Contingency plans will address the risk of spills. Sedimentation ponds will be used as a back-up for spills that could affect the quality of run off water. These ponds will be located to collect run off so that it can be tested and held for treatment, if necessary, before entering Bathurst Inlet. No freshwater systems are at risk from port site run off. Dust suppression for concentrate handling will be installed by the Izok Project as required.

No residual impacts are expected from normal port operations; effective contingency plans and equipment with trained personnel will be in place to handle accidents.

7.10 Road operations

Road operations will produce dust in summer which will be suppressed by watering the road with water drawn from ponds and lakes along the road. Water bodies will be chosen so that the draw down for dust suppression does not risk the aquatic organisms in the water body.

All trucks carrying concentrate will be covered to prevent base metal contamination of the road way. All trucks operating on the road will be required to carry the basic spill kit to handle incidental spills. A contingency plan and a mobile spill kit will be on standby at all times to handle accidental spills like a truck roll over. The road environmental management plan will show the drainage pattern for both sides of the road for the entire right of way so that effective cleanup measures can be initiated with full knowledge of the natural lay of the land.

Wildlife will always have the right of way; in the event of continuous caribou migration across the road, travel may be suspended.

No residual impacts are expected from normal road operations; effective contingency plans and equipment with trained personnel will be in place to handle accidents.

7.11 Barge operations

The environmental risk associated with barge operations relates to spill and/or loss of cargo. Strict operating guidelines will be in place to address the weather consideration. Spill contingency and containment equipment will be on the barge to reduce the risk of significant loss in the event that a mishap occurs with a loaded barge on Contwoyto Lake.

No residual impacts are expected from normal barge operations; effective contingency plans and equipment with trained personnel will be in place to handle accidents.

7.12 Loading ship and barge cargo

The commercial carriers will be expected to employ best practice in their cargo handling. The experience of Polaris and Nanisivik will be used in developing handling procedures for loading concentrate and for related spill contingency plans.

Loading barges with deck cargo and fuel in holds will follow standard practice.

The port will be equipped with a full complement of spill containment and clean-up equipment.

No residual impacts are expected from normal port loading operations; effective contingency plans and equipment with trained personnel will be in place to handle accidents.

7.13 Contingency Plans

Contingency plans that are specific to potential risks inherent in Project construction and operations will be submitted with the Project EIS. Included will be contingency plans for:

- discharging fuel from ship to tank farm;
- tank frm operations and management;
- unloading bulk materials at the port;
- storage of hazardous materials at the port;
- hauling fuel and other hazardous goods on the road and Contwoyto lake Barge;
- hauling base metal concentrate on the road and Contwoyto Lake Barge;
- transferring concentrate from truck to storage and from storage to ship.

8.0 ABANDONMENT/DECOMMISSIONING PLANS

It is expected that the Project as examined in the feasibility study (Nishi-Khon SNC and Kitikmeot Geosciences, 2002) will enhance the economics of resource development in the West Kitikmeot in a very significant way for the long term. Decommissioning the Project is therefore not foreseen. It is accepted however that elements of the Project will change and that selective decommissioning will be required from time to time.

8.1 Quarries

Quarries that are not required for maintaining the road way during operations will be contoured and abandoned on completion of road construction. At no time during the construction or operations of the Project will active erosion of any terrain on or adjacent to the port and road and associated lands be allowed to proceed unchecked or alter natural drainage patterns in adjacent lands.

8.2 Road

It is expected that the road will be in use for many generations in the future, nevertheless, the Project proponents acknowledge that non-renewable resources are finite and that some day in the future sections of the road and associated facilities may no longer be required. Closure and abandonment will include removal of all imported materials and structures, treating all contaminated soils, contouring all surfaces to reduce the possibility of erosion and to enhance the natural revegetation of all terrestrial surfaces disturbed or altered by the Project.

8.3 Seasonal shutdown

The Project's operations plan will include seasonal, temporary, and permanent closure procedures.

Seasonal operations will include barge operations in summer and winter ice road operations in winter. The Contwoyto Lake barge will be laid up at Lupin every fall by pulling it up from the lake onto skids. Likewise, equipment used for building and operating the winter ice road on Contwoyto Lake will be laid up for the summer.

Temporary suspension of all operations might be associated with global economic factors that force the suspension of operations at all participating sites. One such factor could be a price increase of fuel oil to levels that make all mining in remote regions uneconomic. Contingency plans for such factors arising will be developed and submitted in support of the Final Project Description and Project EIS.

9.0 MONITORING AND MAINTENANCE PLANS

The Project will undertake environmental quality and public health monitoring programs as required by the Project's "licence to operate" for both the construction and operating phases. Monitoring programs are expected to be prescribed by the Project's environmental regulators for water quality generally and for public health issues specifically. Furthermore, the Project would explore collaboration with other industry parties and government in the event that a long term wildlife monitoring program were to be initiated in the Kitikmeot region of Nunavut.

The Project permitting approvals requirements includes that an Inuit Impact and Benefit Agreement be negotiated with the Kitikmeot Inuit Association. It is expected that a compliance and monitoring function will be included in that agreement.

10.0 LIST OF INFORMATION SOURCES

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Sam Kapolak, resident , community of Bathurst Inlet.

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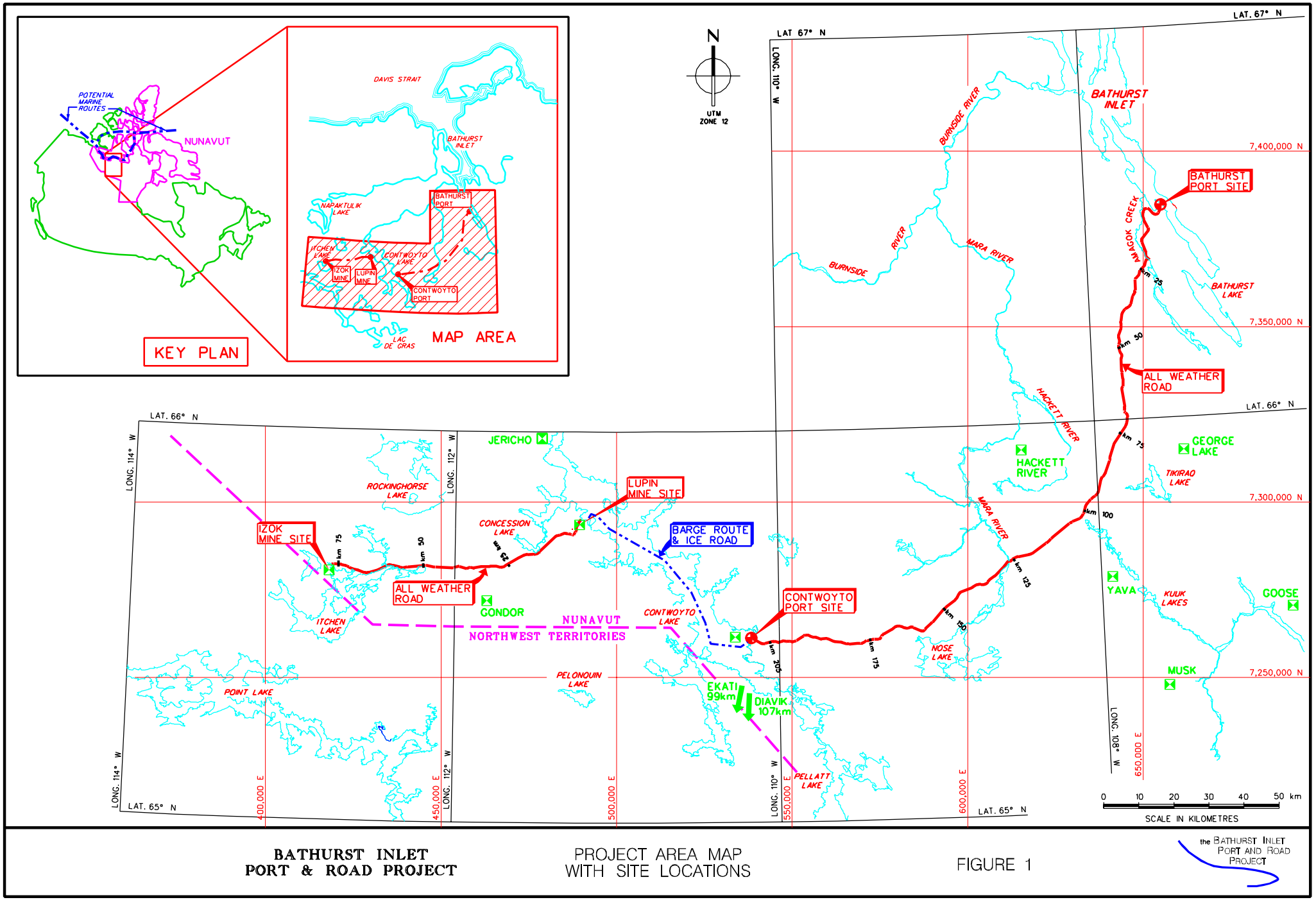
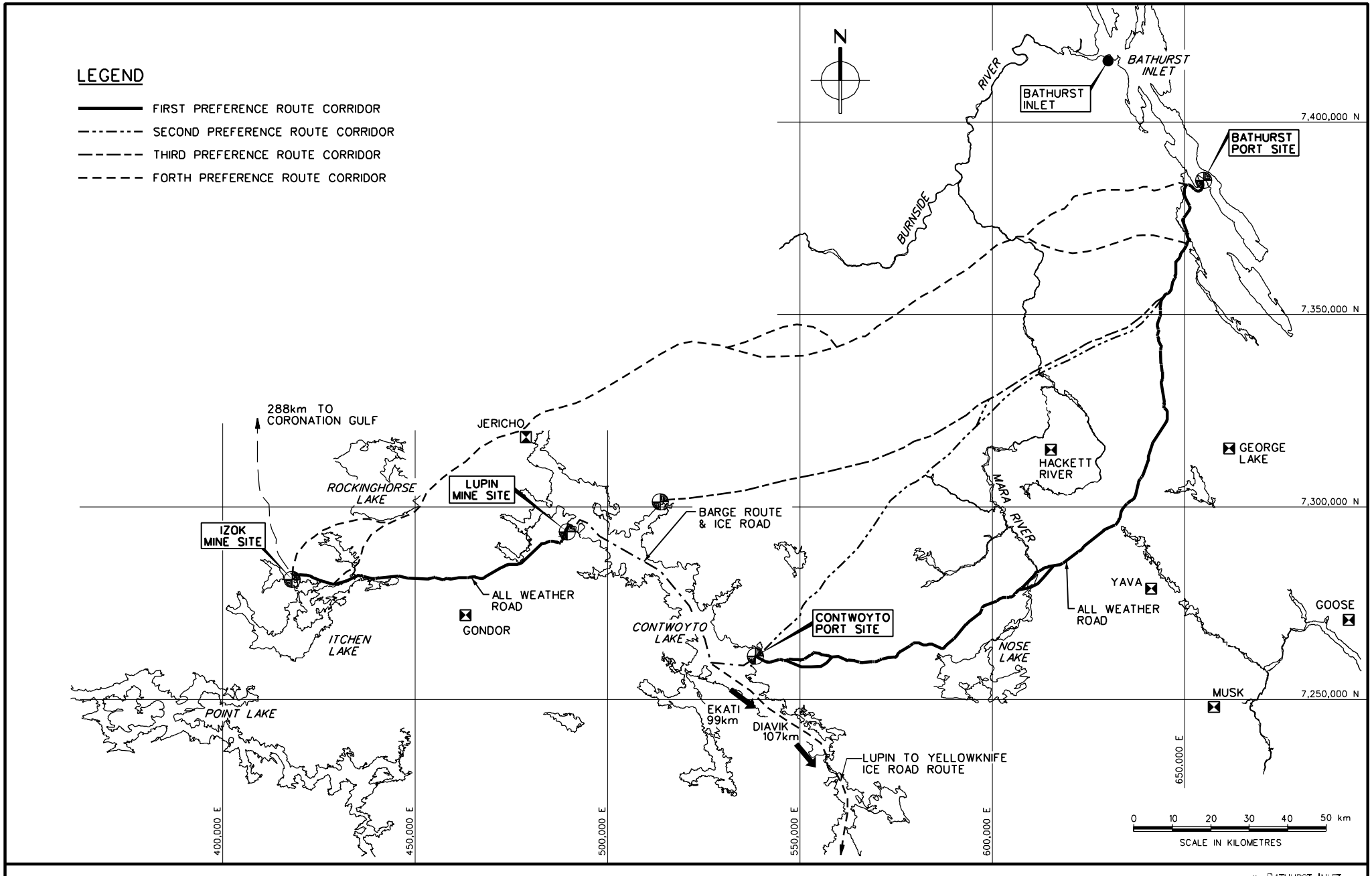


BATHURST INLET PORT & ROAD PROJECT

PROJECT AREA MAP WITH SITE LOCATIONS

FIGURE 1

the BATHURST INLET PORT AND ROAD PROJECT



BATHURST INLET PORT & ROAD PROJECT

ROUTE ALTERNATIVES REVIEWED SHOWING LUPIN WINTER ROAD ROUTE IN PROJECT AREA

FIGURE 2

the BATHURST INLET PORT AND ROAD PROJECT

NOTES:

1. MAPPING FROM GEOWEST ENVIRONMENTAL CONSULTANTS.
2. ZONE 12 UTM GRID SHOWN.
3. ALL WEATHER ROAD LAND OWNERSHIP JURISDICTION TABLE:

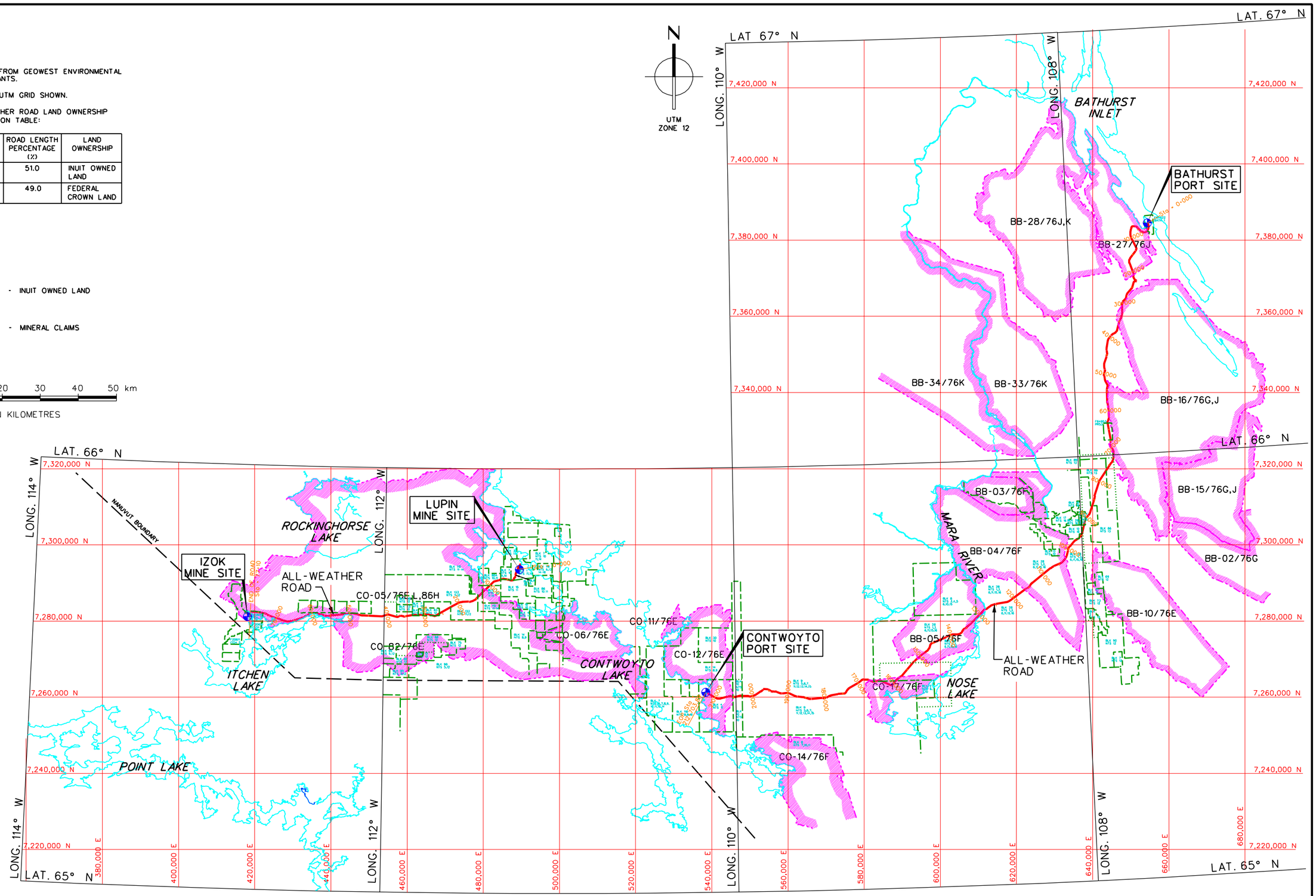
ROAD LENGTH (km)	ROAD LENGTH PERCENTAGE (%)	LAND OWNERSHIP
147.7	51.0	INUIT OWNED LAND
141.6	49.0	FEDERAL CROWN LAND

LEGEND:

- INUIT OWNED LAND
- MINERAL CLAIMS

0 10 20 30 40 50 km

SCALE IN KILOMETRES

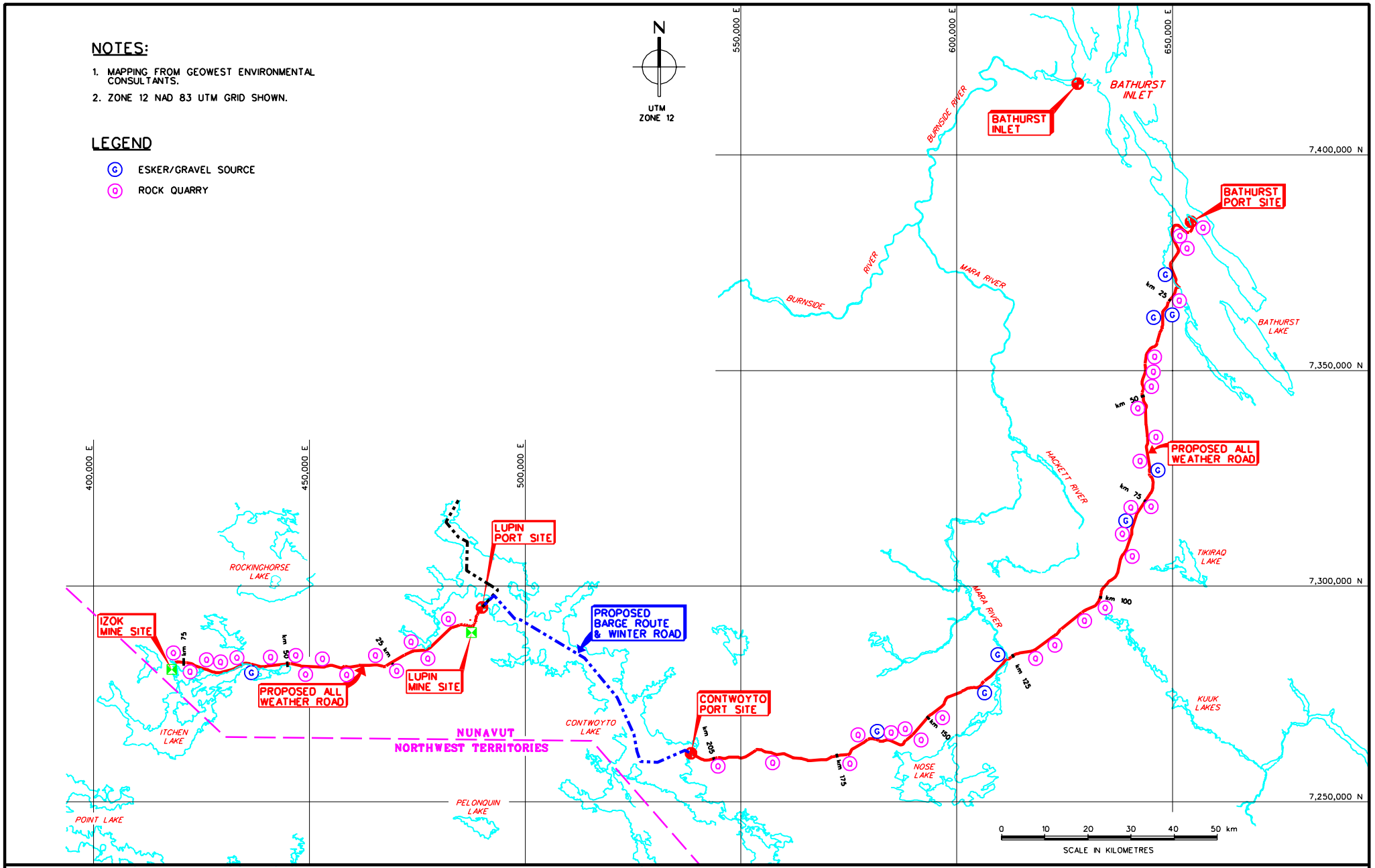


BATHURST INLET PORT & ROAD PROJECT

LAND USE AND OWNERSHIP OF ROAD ALIGNMENT

FIGURE 3

the BATHURST INLET PORT AND ROAD PROJECT

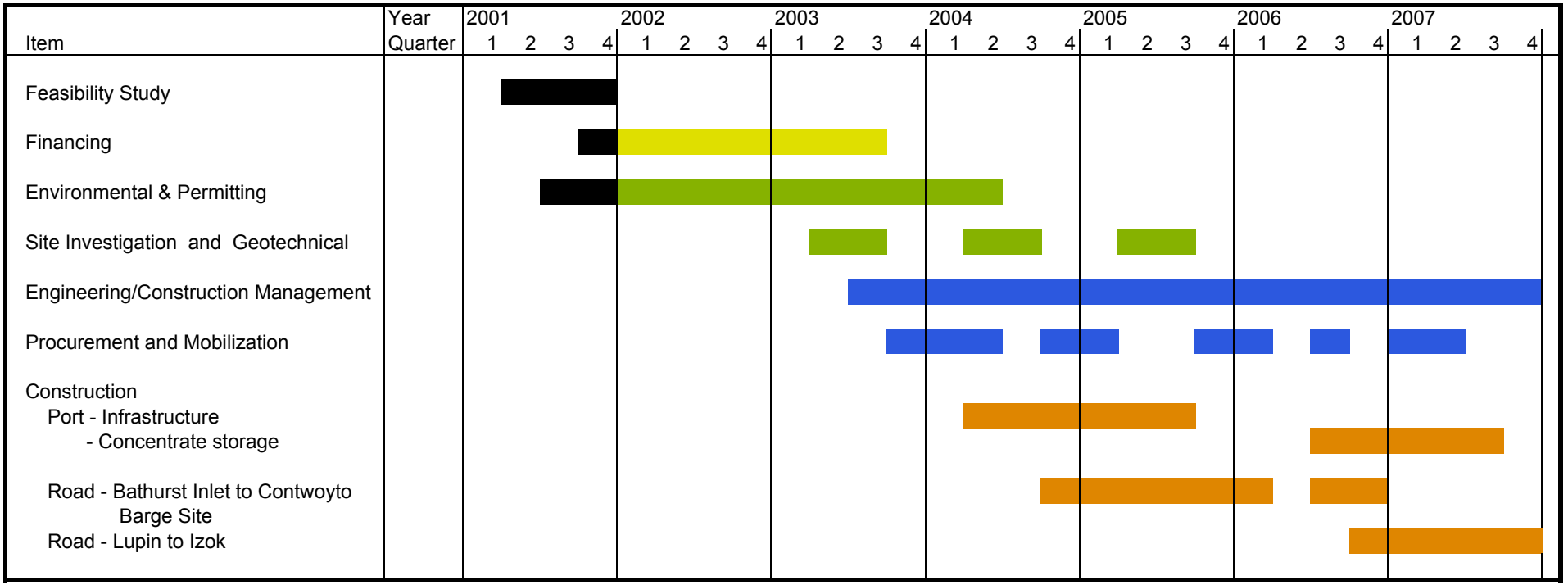


BATHURST INLET PORT & ROAD PROJECT

QUARRY AND BORROW PIT LOCATIONS FOR PROJECT CONSTRUCTION

FIGURE 4

the BATHURST INLET PORT AND ROAD PROJECT

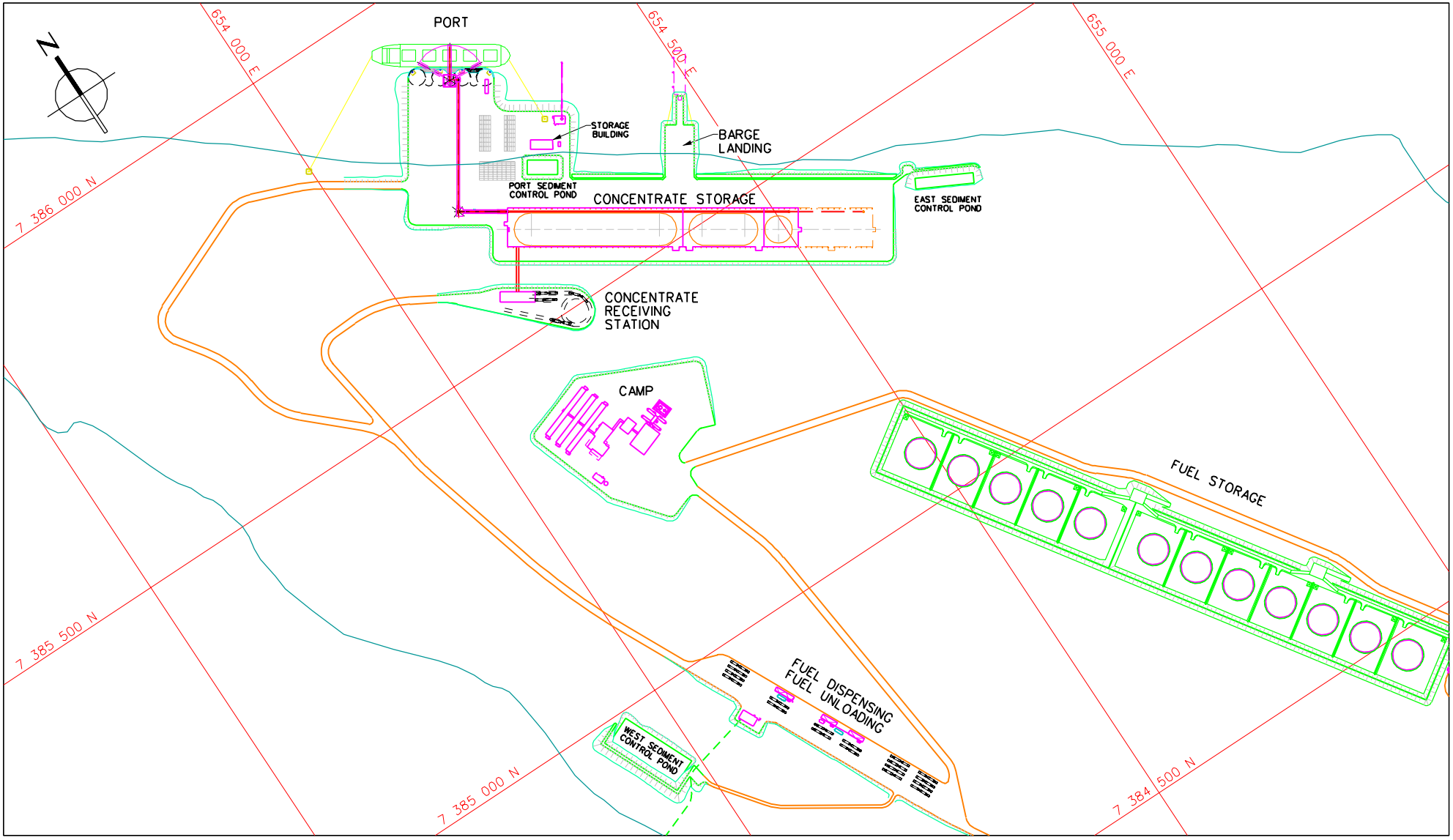


BATHURST INLET PORT & ROAD PROJECT

OVERALL PROJECT SCHEDULE

FIGURE 5

the BATHURST INLET PORT AND ROAD PROJECT

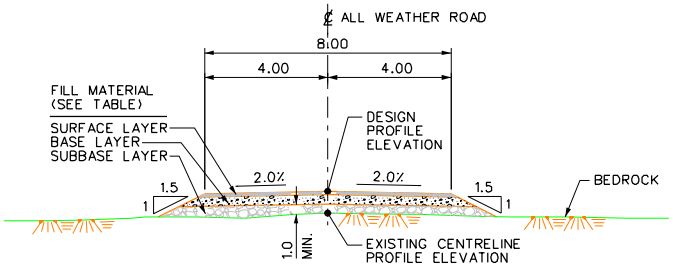


BATHURST INLET PORT & ROAD PROJECT

PORT LAYOUT

FIGURE 6

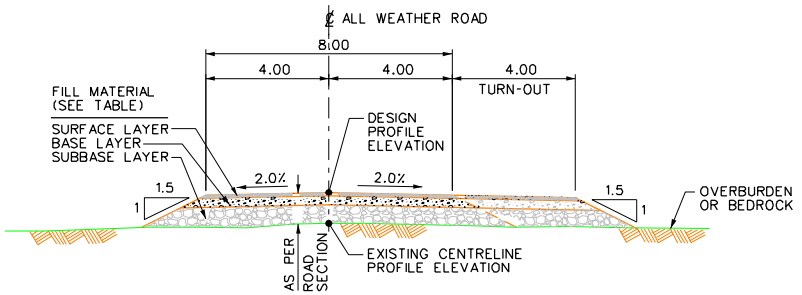
the BATHURST INLET PORT AND ROAD PROJECT



TYPICAL ALL WEATHER ROAD SECTION
ON BEDROCK OR WELL-DRAINED GRANULAR SOILS

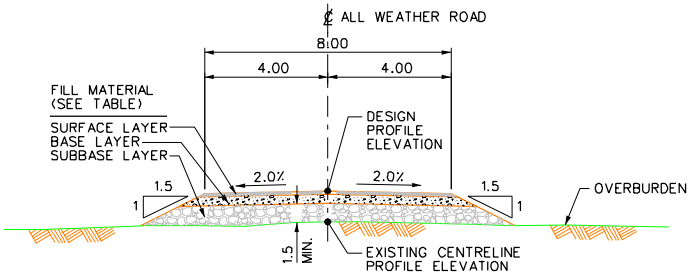
NTS

LAYER	THK.	MATERIAL DESCRIPTION
ALL WEATHER ROAD		
SURFACE	150mm	50mm CRUSHED ROCK
BASE	300mm	150mm CRUSHED ROCK
SUBBASE	0.6m TO 1.6m	600/900mm ROCK FILL



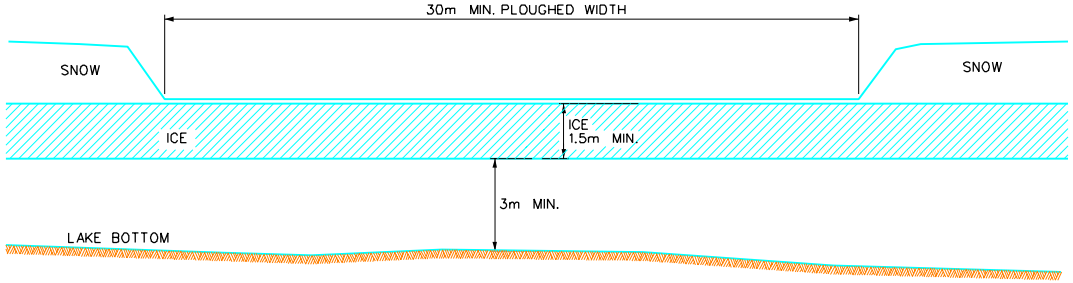
TYPICAL ALL WEATHER ROAD WITH TURN-OUT

NTS



TYPICAL ALL WEATHER ROAD SECTION
ON ICE-RICH SOILS

NTS



ICE ROAD SECTION

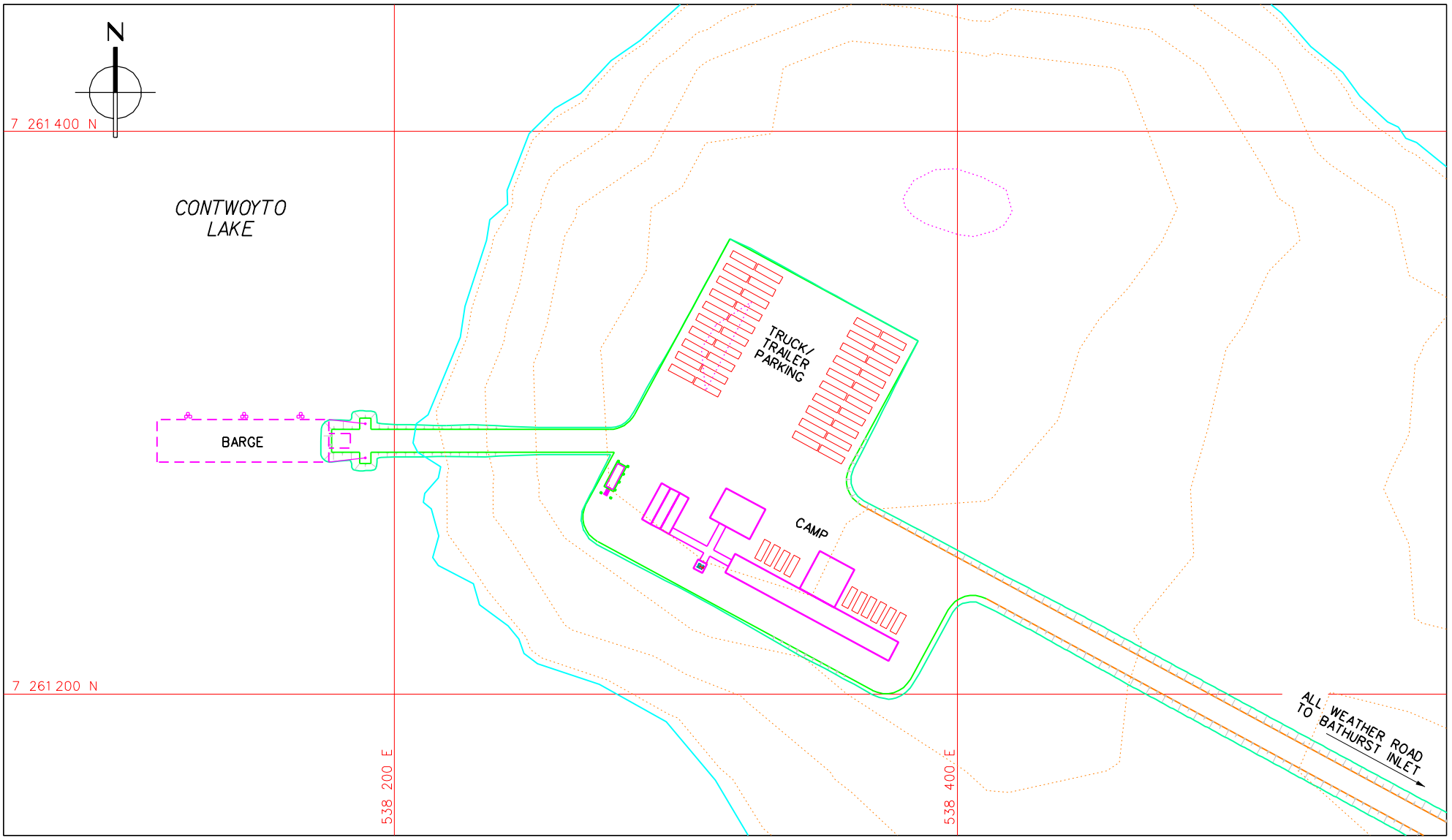
NTS

BATHURST INLET PORT & ROAD PROJECT

TYPICAL CROSS SECTION OF
ALL WEATHER ROAD & ICE ROAD

FIGURE 7

the BATHURST INLET PORT AND ROAD PROJECT

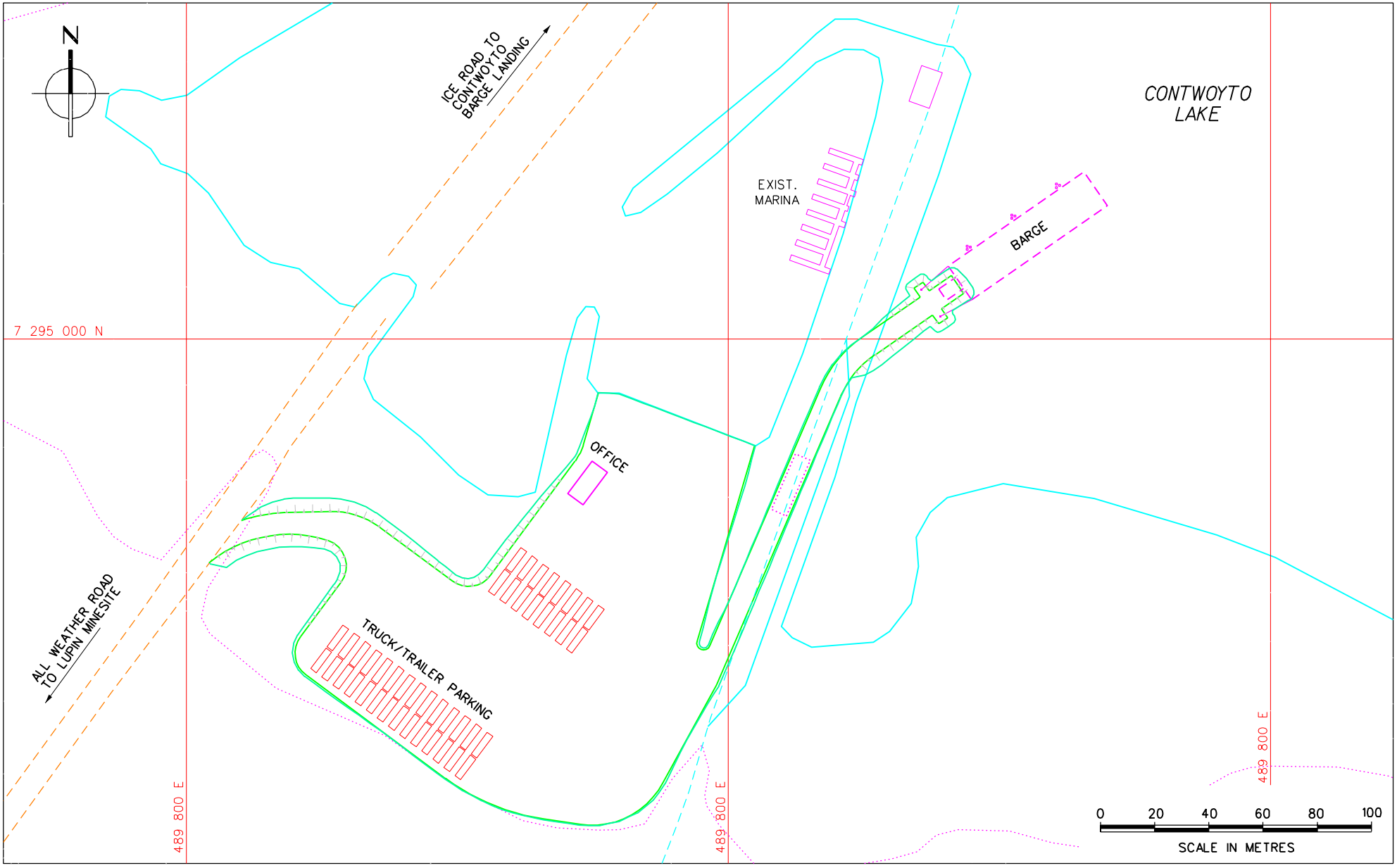


BATHURST INLET PORT & ROAD PROJECT

CONTWOYTO BARGE SITE LAYOUT

FIGURE 8

the BATHURST INLET PORT AND ROAD PROJECT



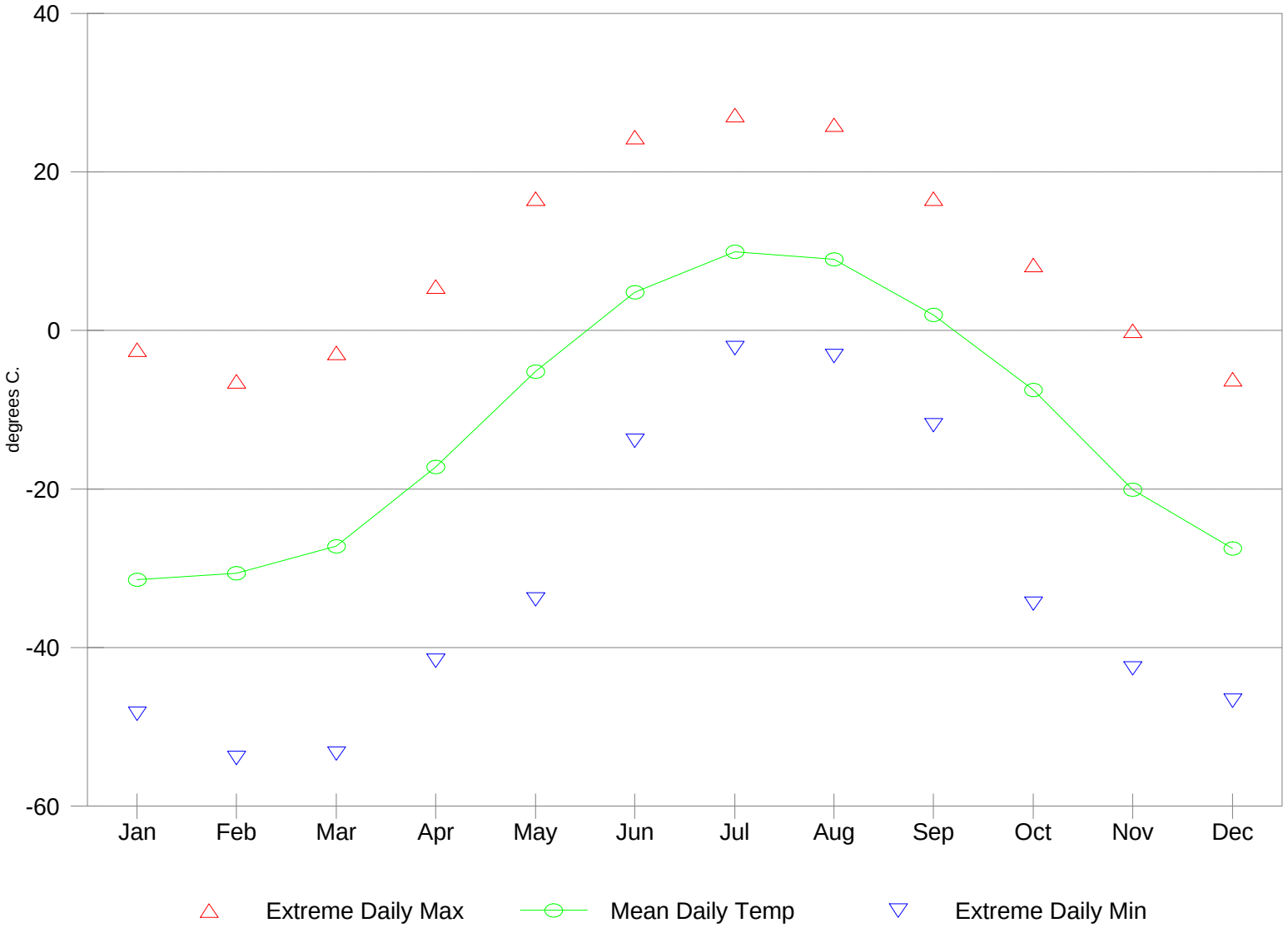
BATHURST INLET PORT & ROAD PROJECT

LUPIN BARGE SITE LAYOUT

FIGURE 9

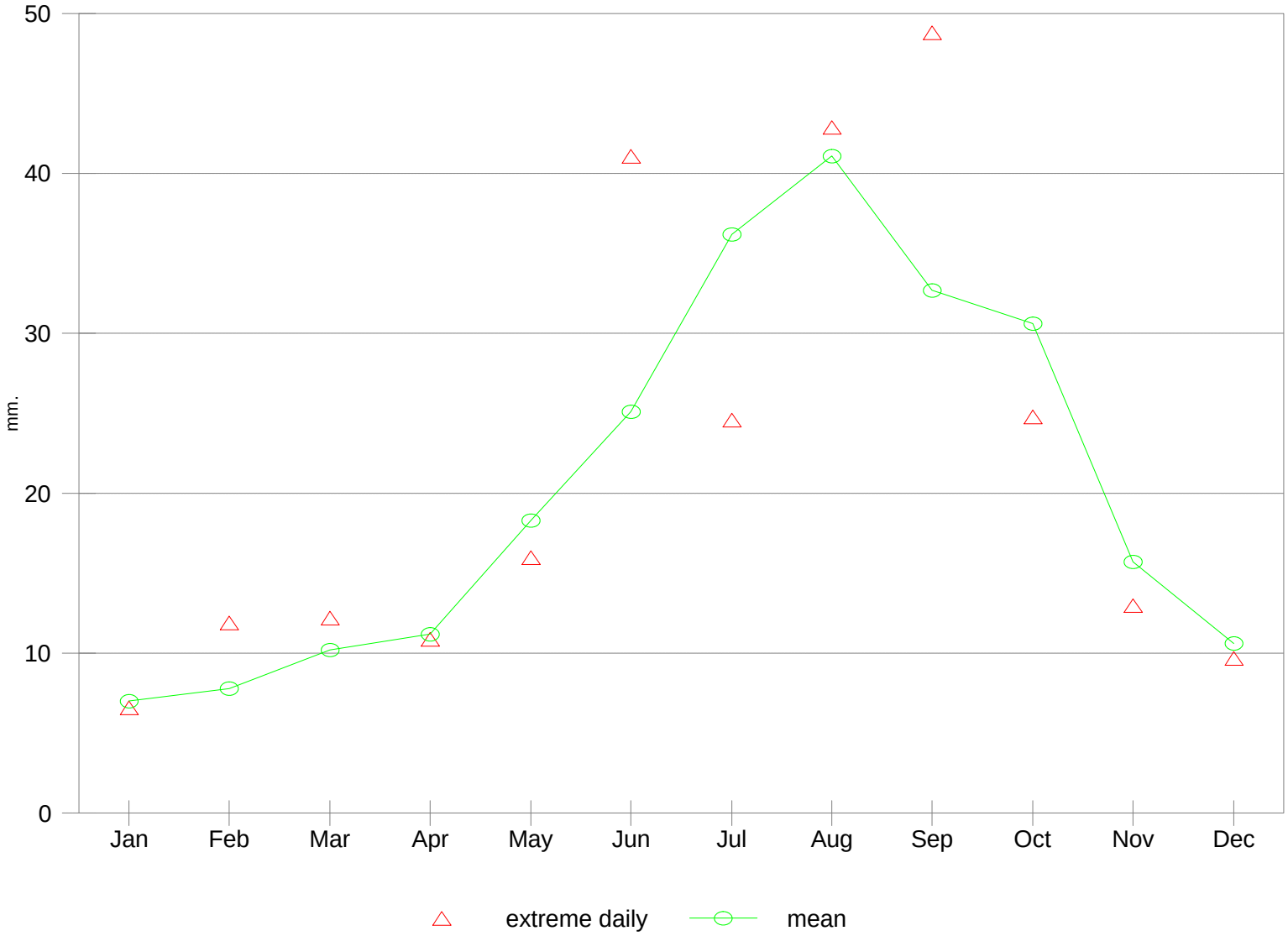
the BATHURST INLET PORT AND ROAD PROJECT

Figure 10. Contwoyto Lake Annual Temperature Profile: 1956 - 1982



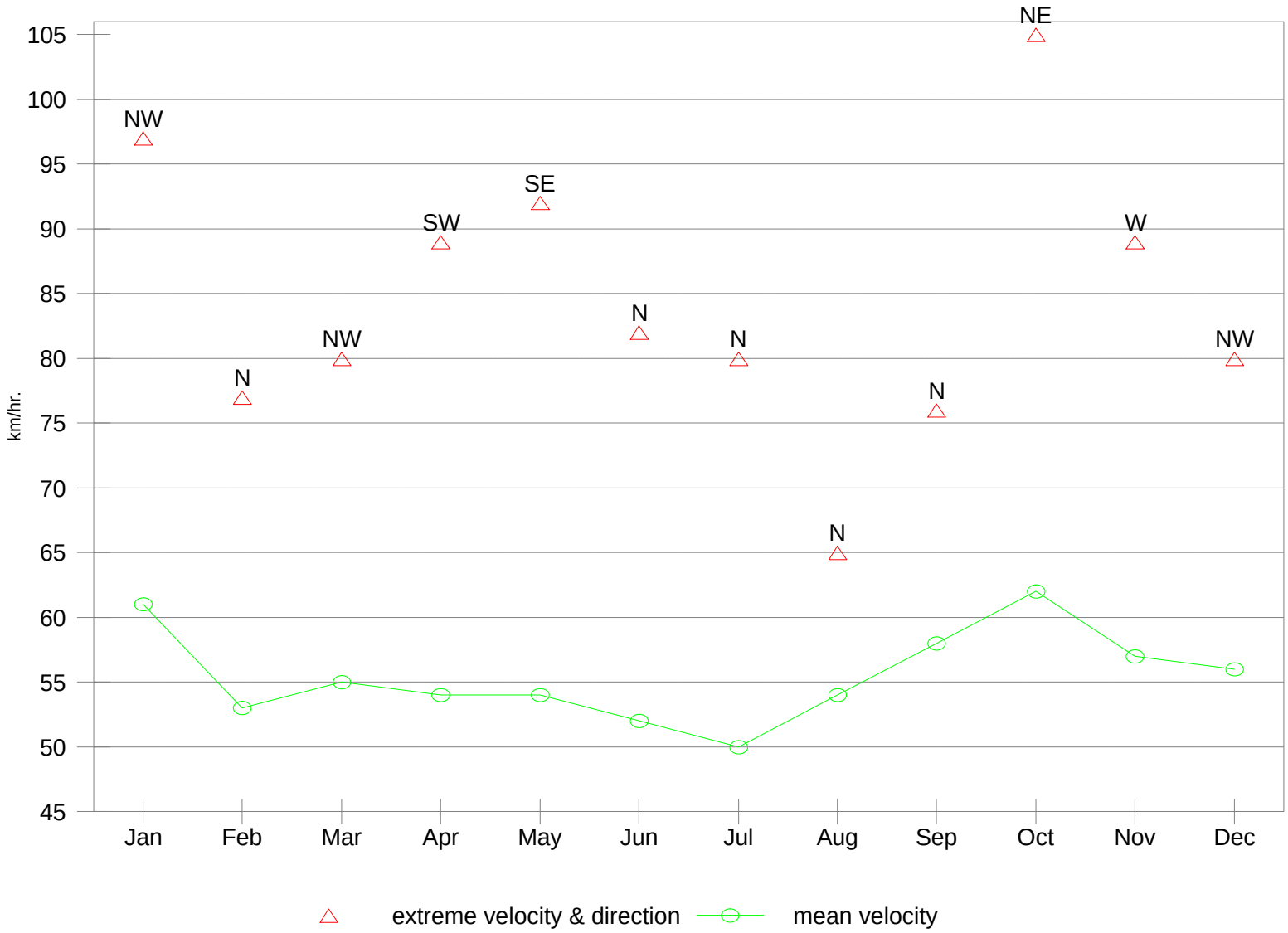
Source: Environment Canada 1994. Canadian Climate Data

Figure 11. Contwoyto Lake Annual Precipitation Profile: 1956 - 1982



Source: Environment Canada 1994. Canadian Climate Data

Figure 12. Contwoyto Lake Annual Wind Profile: 1956 - 1982

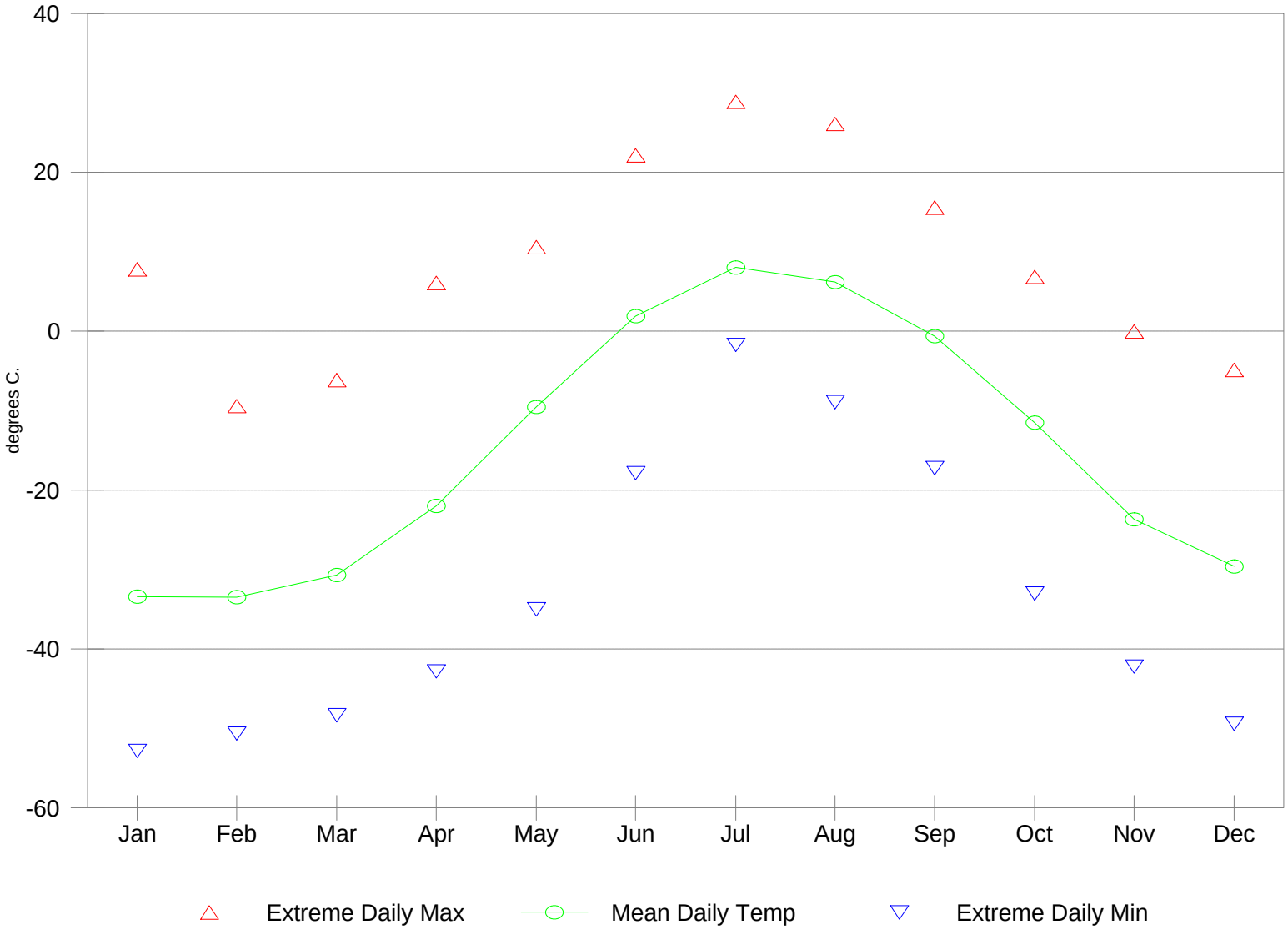


Source: Environment Canada 1994. Canadian Climate Data

Figure 13. Lupin Annual Temperature Profile: 1983 - 2001

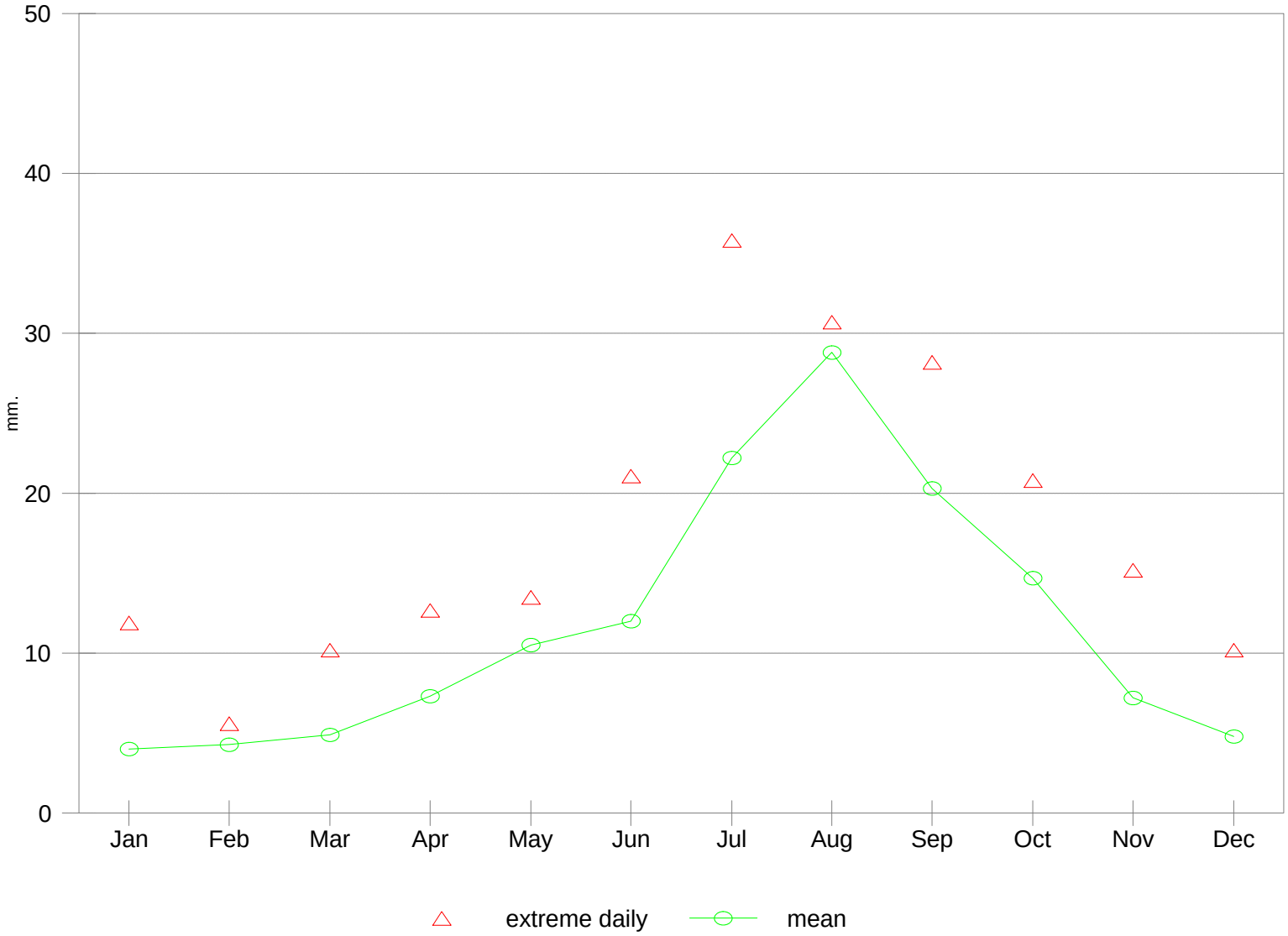
Source: SNC-Lavalin, 2001

Figure 14. Cambridge Bay Annual Temperature Profile: 1927 - 1993



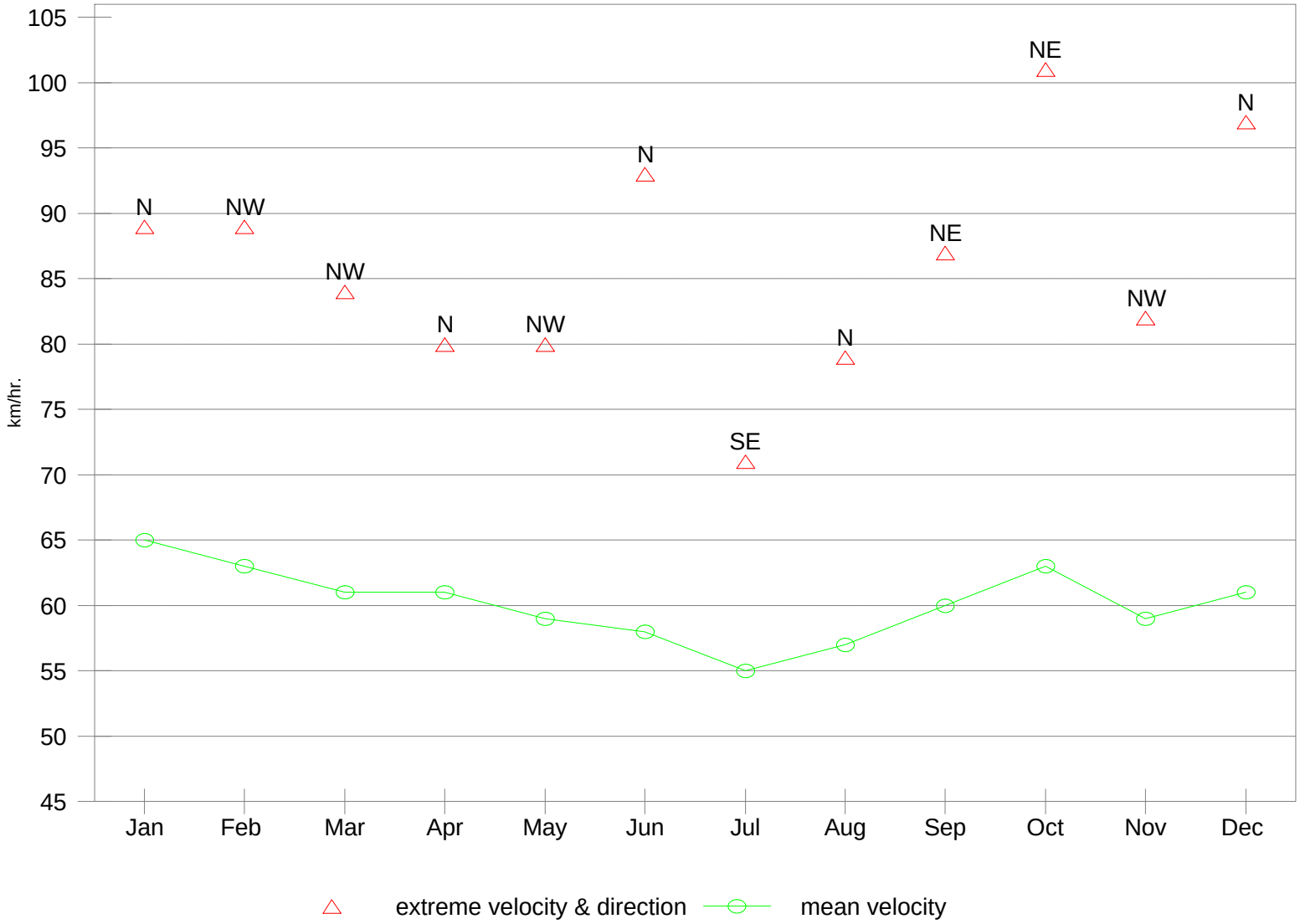
Source: Environment Canada 1994. Canadian Climate Data

Figure 15. Cambridge Bay Annual Precipitation Profile: 1927 - 1993



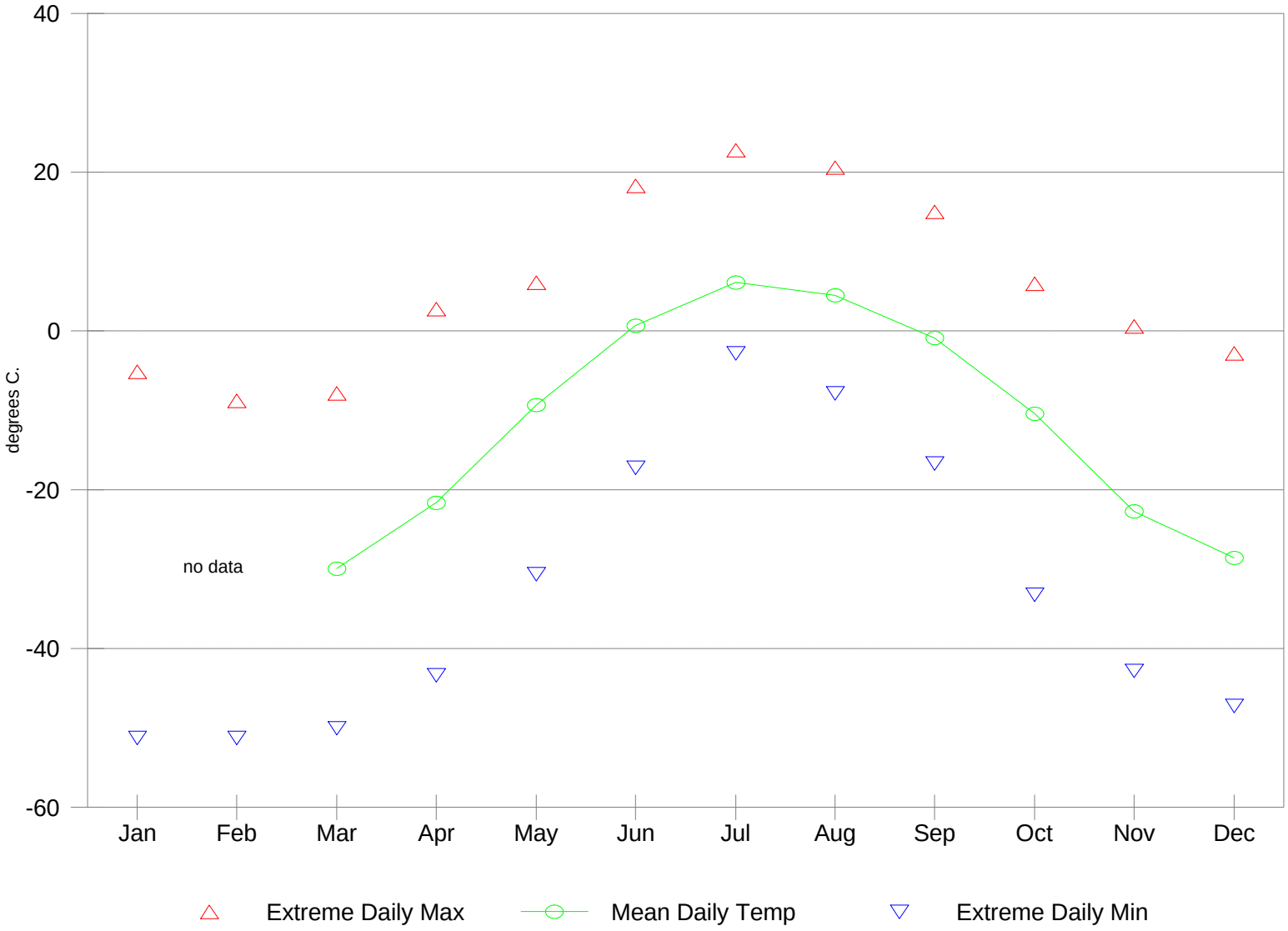
Source: Environment Canada 1994. Canadian Climate Data

Figure 16. Cambridge Annual Wind Bay Profile: 1927 - 1993



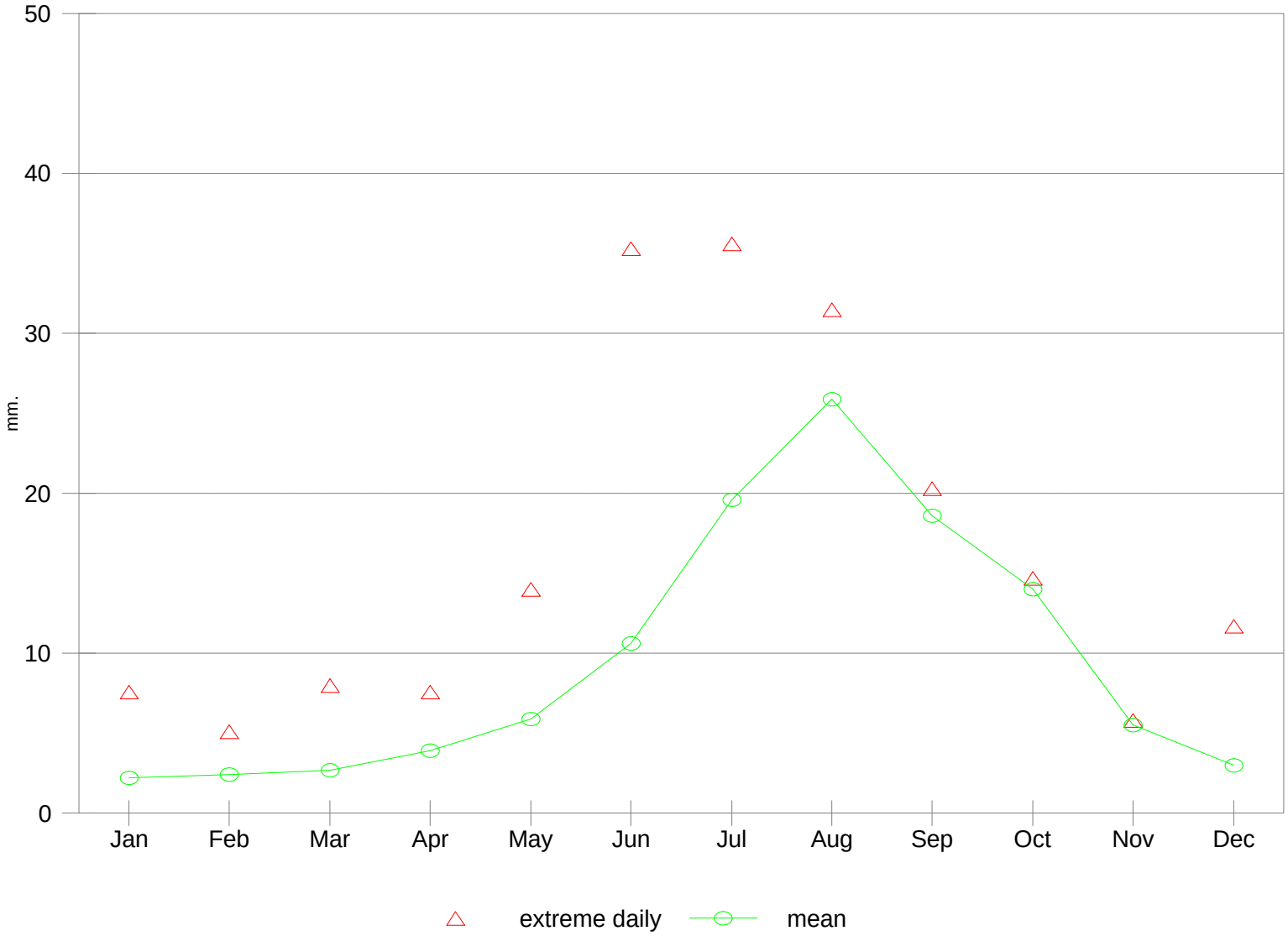
Source: Environment Canada 1994. Canadian Climate Data

Figure 17. Jenny Lind Island Annual Temperature Profile: 1955 - 1993



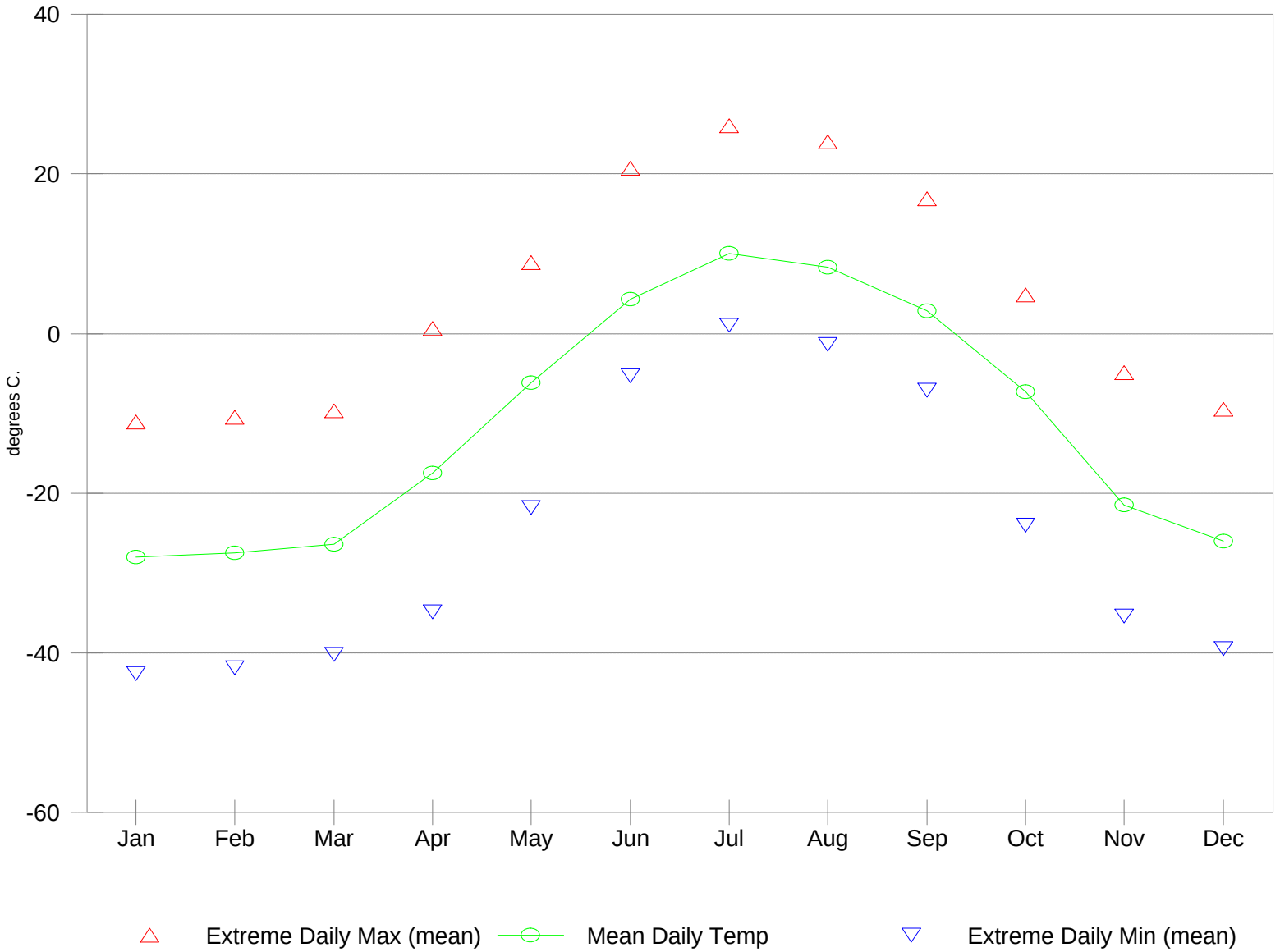
Source: Environment Canada 1994. Canadian Climate Data

Figure 18. Jenny Lind Island Annual Precipitation Profile: 1955 - 1993



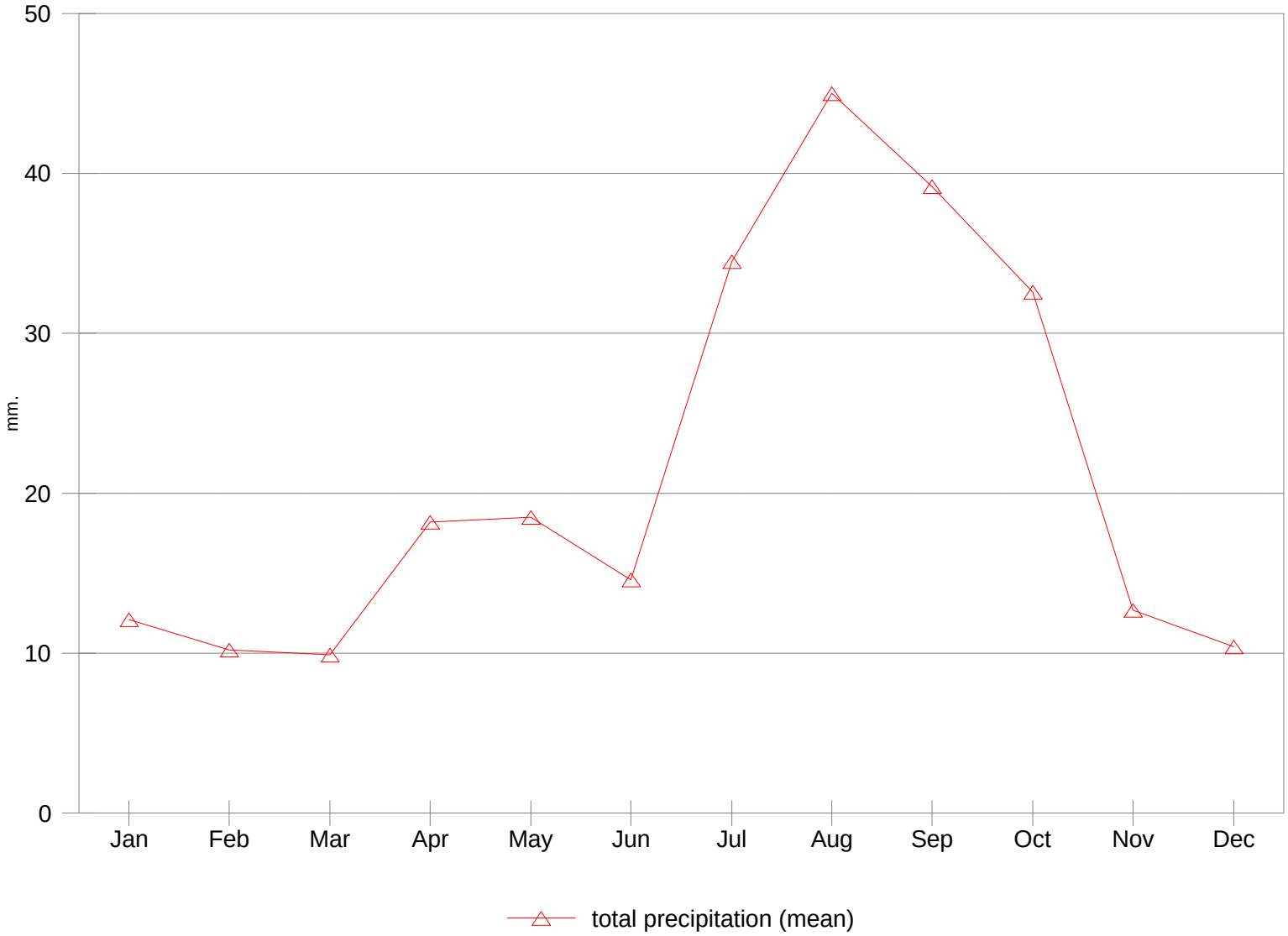
Source: Environment Canada 1994. Canadian Climate Data

Figure 19. Kugluktuk Annual Temperature Profile: 1977 - 1993



Source: Environment Canada 1994. Canadian Climate Data

Figure 20. Kugluktuk Annual Precipitation Profile: 1977 - 1993



Source: Environment Canada 1994. Canadian Climate Data

Figure 21. Ice Thickness - Cambridge Bay, Calculated Weekly (1958-1990) (Canarctic 1993a in Metall, 1993)

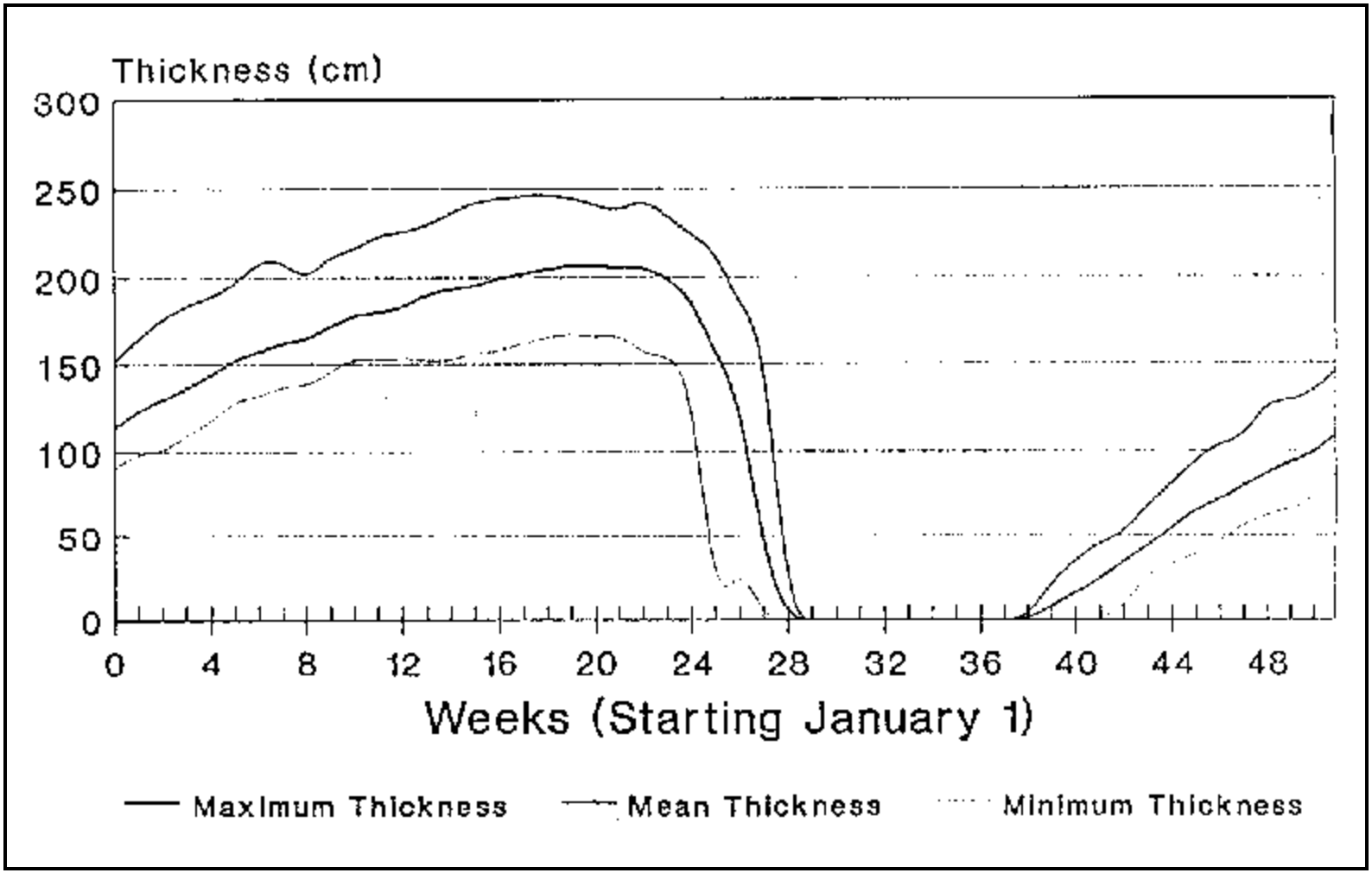


Figure 22. Ice Thickness - Kugluktuk, Calculated Weekly (1958 - 1988) (Canarctic 1993a in Metall Mining Corporation 1993)

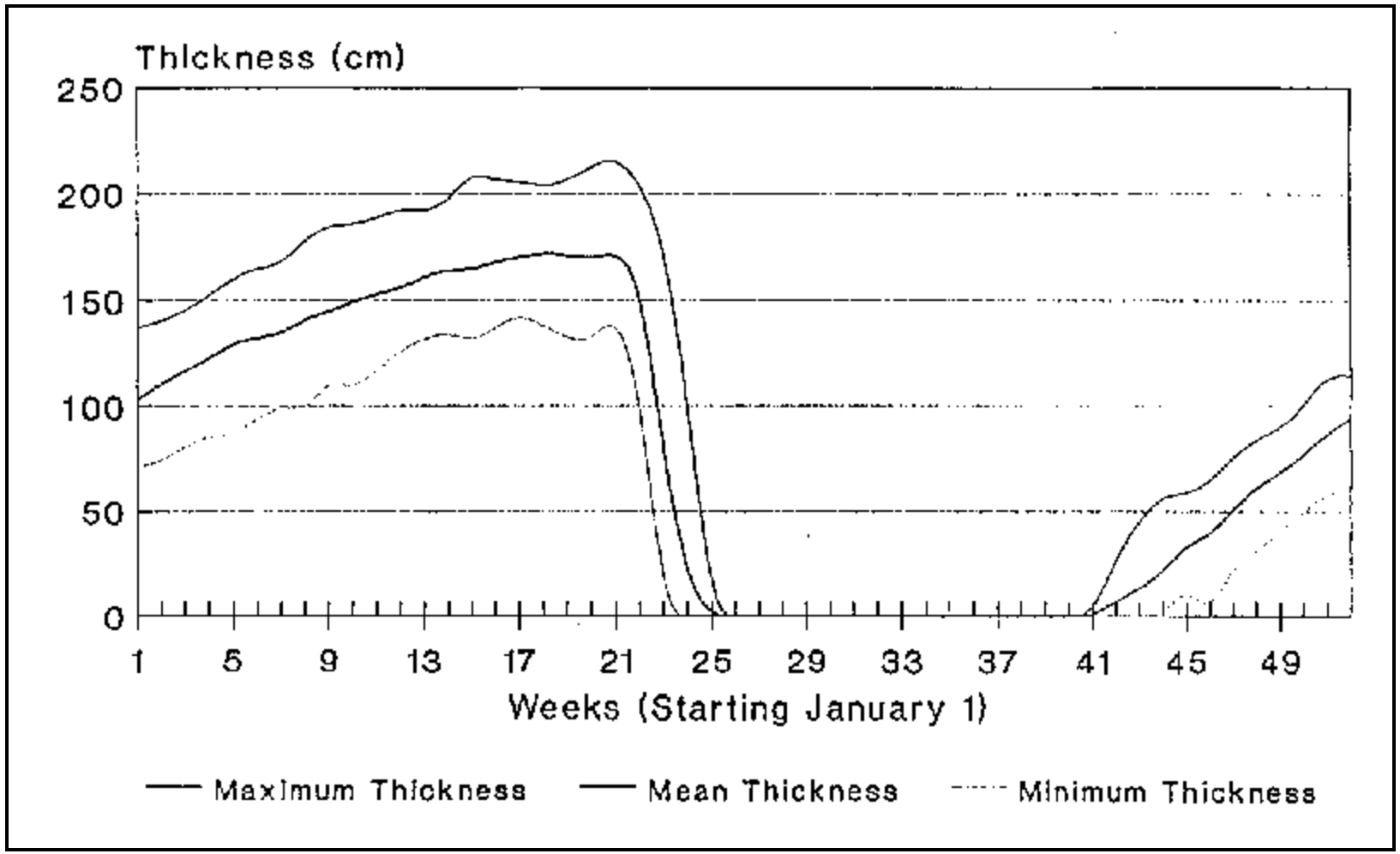


Figure 23. Annual average ice cover at minimum conditions during the mid-September period for the study region (Markham 1981 from Canarctic 1993a in Metall Mining Corporation, 1993

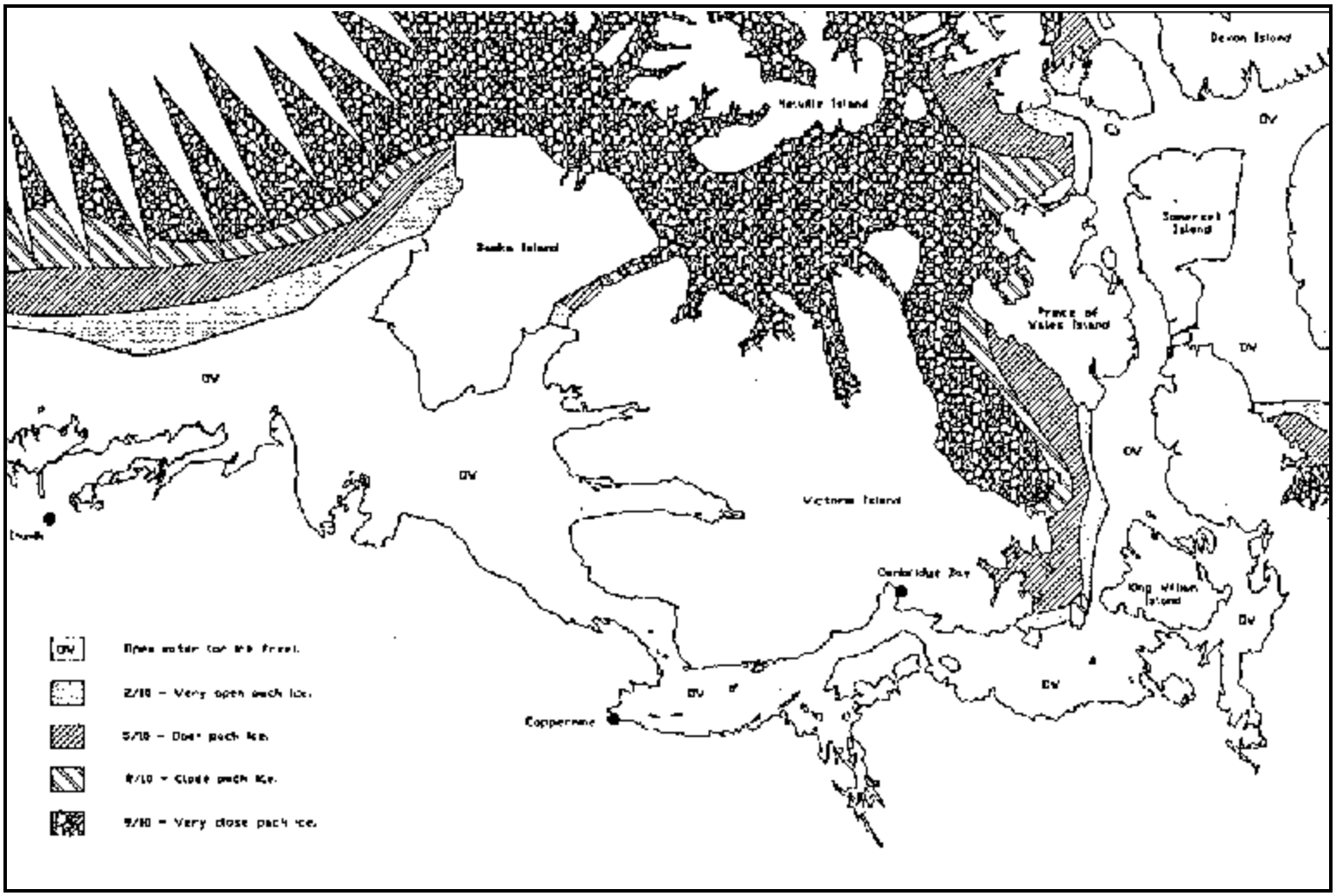


Figure 24. Fracture Sequence for Coronation Gulf Region (Canarctic 1993a in Metall 1993)

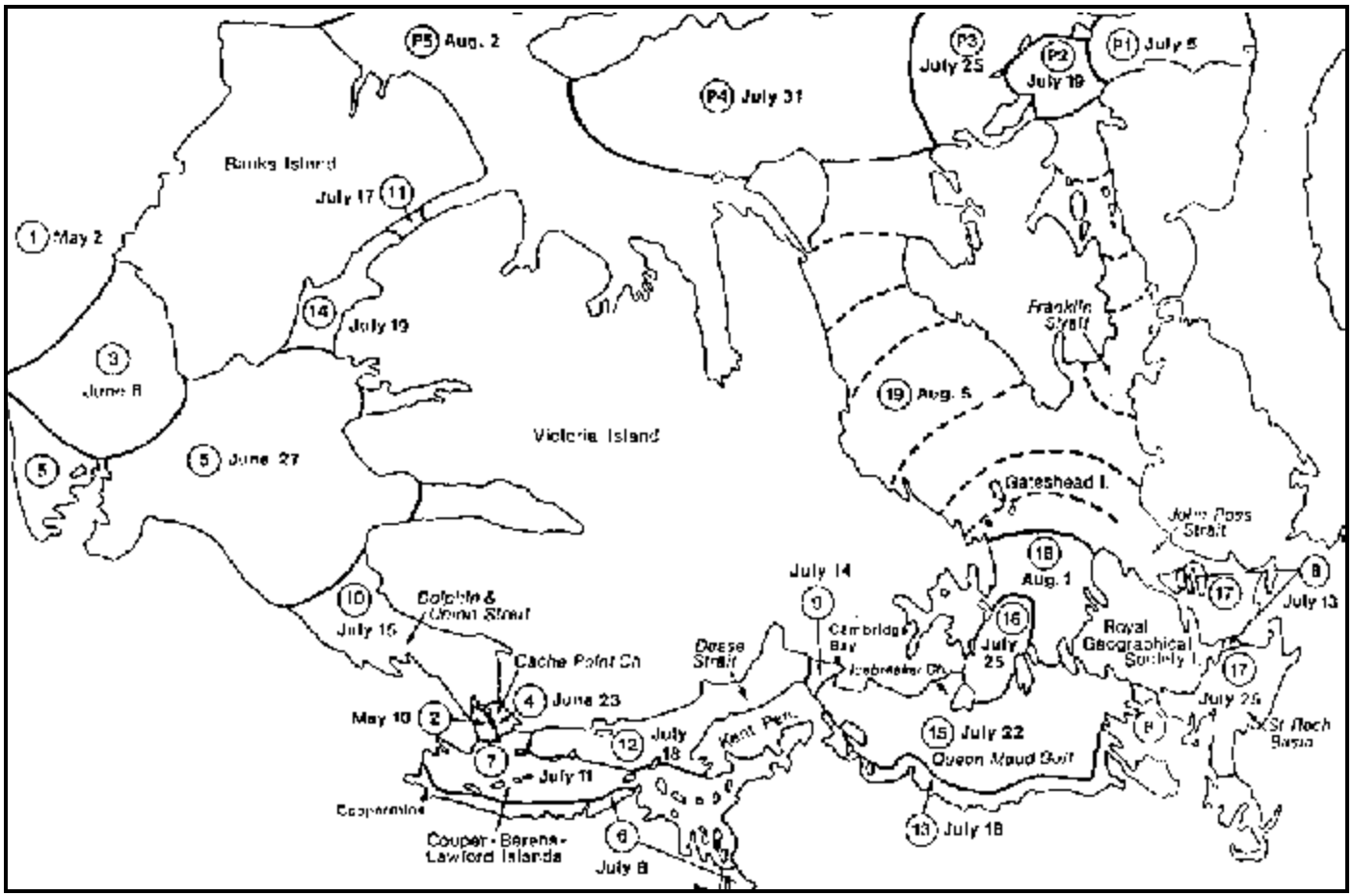


Figure 25. Consolidation Sequence for Coronation Gulf Region (Canarctic 1993a in Metall 1993)

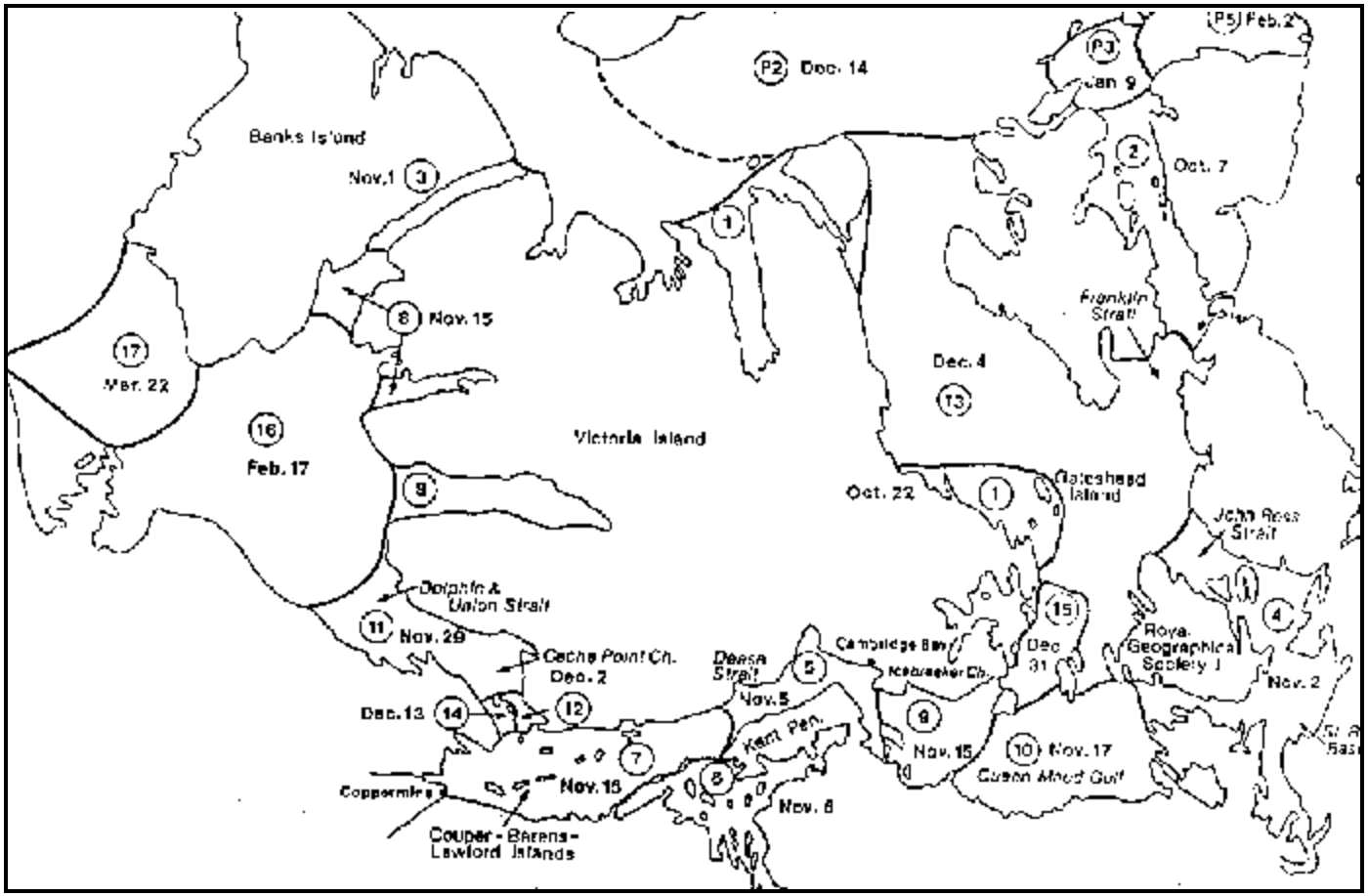
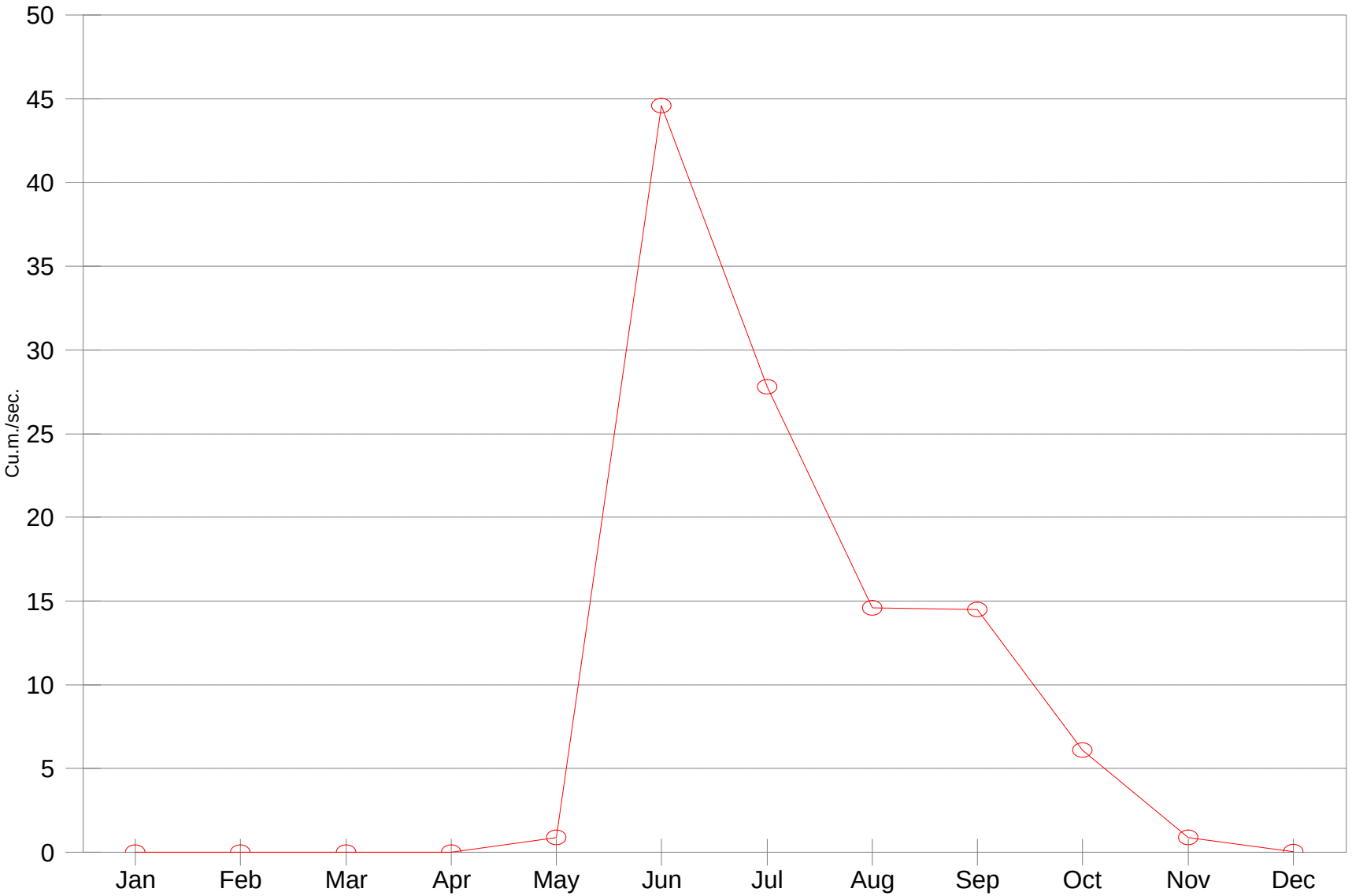


Figure 26. Mean Discharges (cu.m./sec) or the Gordon River, Nunavut (1977-1992)



Location: Lat 66 48 31 N. Long 107 06 13 W.

Drainage area 1530 sq.km.

Environment Canada. 1992. Historical Streamflow Summary Northwest Territorries. Inland Waters and Lands Western and Northern Region p.94

LEGEND

- 1 - ARCHEOLOGICAL SITE
- 2-4 - ARCHEOLOGICAL SITES
- 5-8 - ARCHEOLOGICAL SITES

N

UTM ZONE 12

BATHURST PORT SITE

km 0

BATHURST INLET

km 10

km 20

km 30

km 40

7,350,000 N

km 50

km 60

km 70

km 80

km 90

km 100

km 110

km 120

km 130

km 140

km 150

km 160

km 170

km 180

km 200

km 210

END OF ROAD km 212.7

ROCKINGHORSE LAKE

END OF ROAD km 77.1

IZOK MINE SITE

ALL-WEATHER ROAD

LUPIN MINE SITE

ITCHEN LAKE

CONTWOYTO LAKE

CONTWOYTO PORT SITE

MARA RIVER

NOSE LAKE

ALL-WEATHER ROAD

7,300,000 N

7,250,000 N

POINT LAKE

450,000 E

500,000 E

550,000 E

600,000 E

650,000 E

0 10 20 30 40 50 km

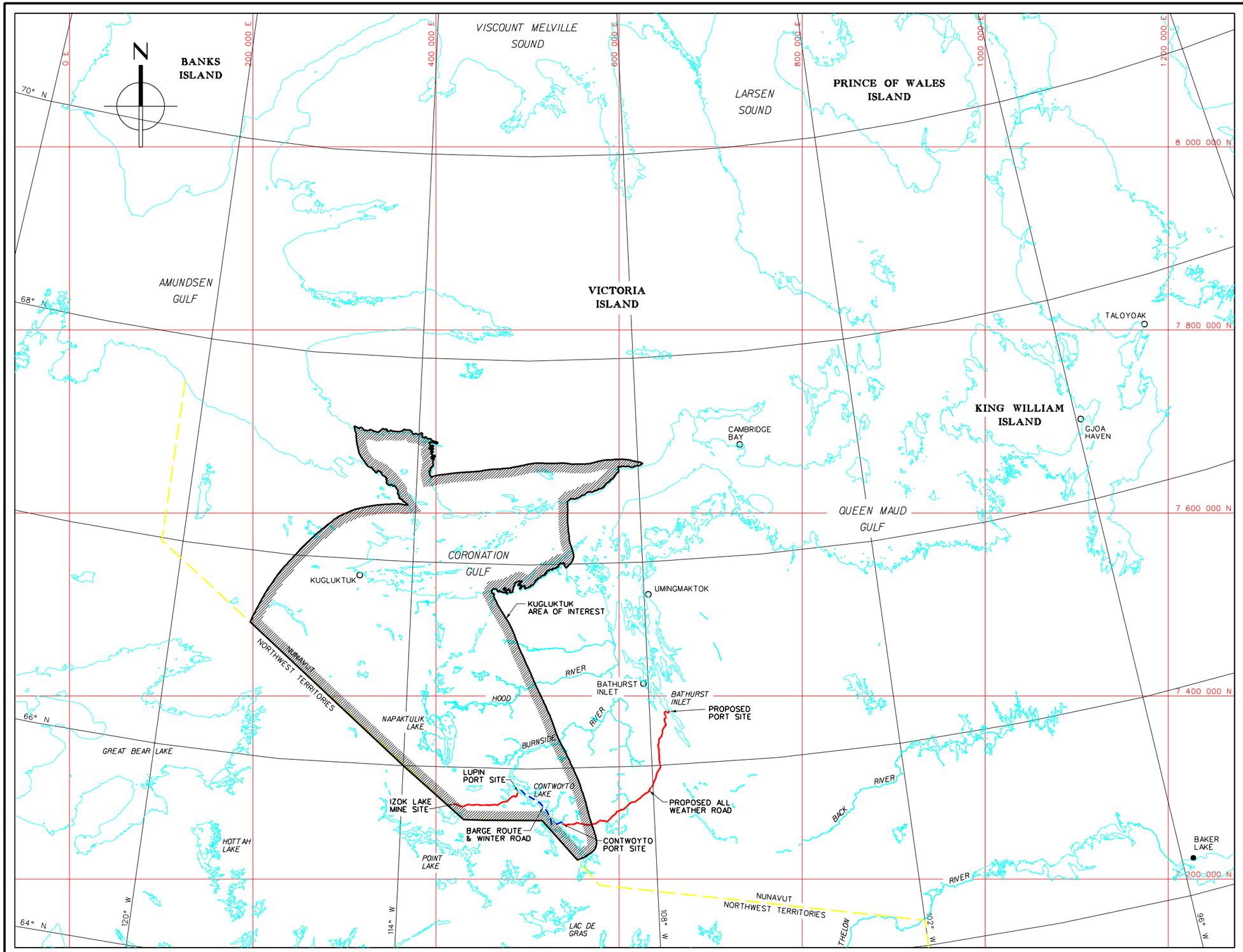
SCALE IN KILOMETRES

BATHURST INLET PORT & ROAD PROJECT

HERITAGE SITE LOCATIONS ALONG ROAD ALIGNMENT

FIGURE 27

the BATHURST INLET PORT AND ROAD PROJECT



NOTES:

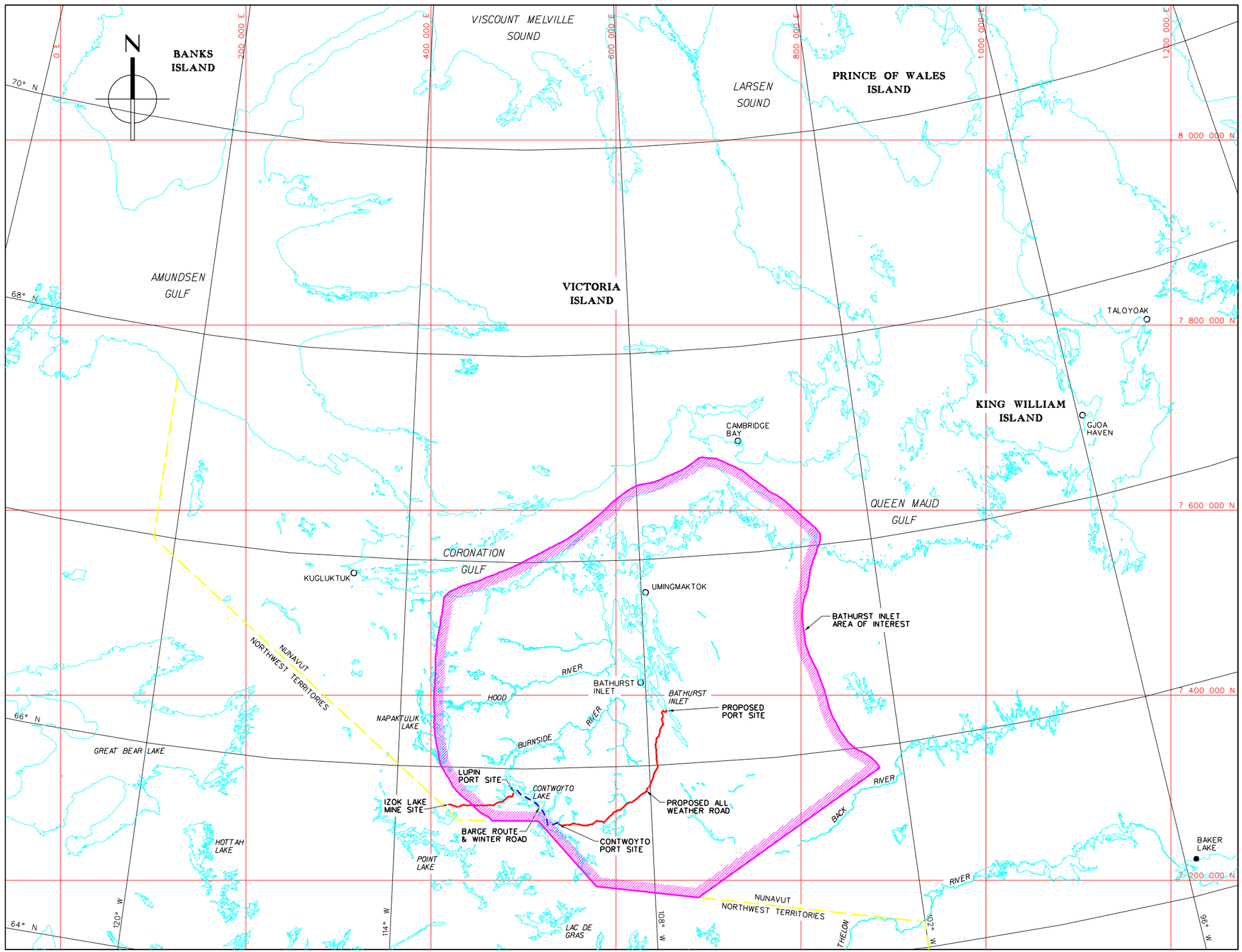
1. BASE MAPPING DERIVED FROM INFORMATION PROVIDED BY KITIKMEOT GEOSCIENCES LTD.
2. GRID SHOWN IS ZONE 12 UTM NAD 83.

BATHURST INLET PORT & ROAD PROJECT

KUGLUKTUK AREA OF INTEREST
(COURTESY NUNAVUT PLANNING COMMISSION)

FIGURE 28

the BATHURST INLET PORT AND ROAD PROJECT



NOTES:

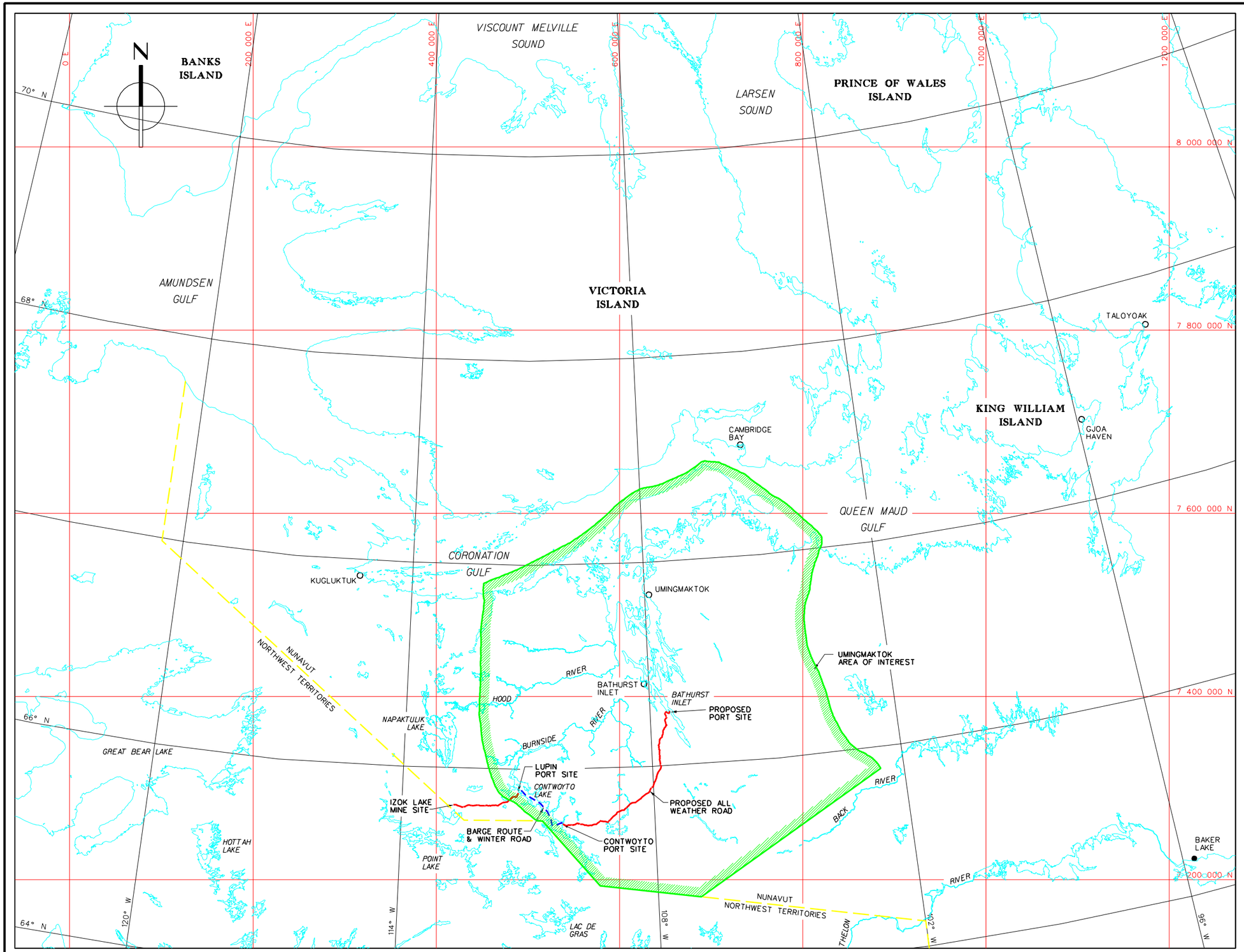
1. BASE MAPPING DERIVED FROM INFORMATION PROVIDED BY KITIKMEOT GEOSCIENCES LTD.
2. GRID SHOWN IS ZONE 12 UTM NAD 83.

BATHURST INLET PORT & ROAD PROJECT

BATHURST INLET AREA OF INTEREST
(COURTESY OF NUNAVUT PLANNING COMMISSION)

FIGURE 29

the BATHURST INLET PORT AND ROAD PROJECT



NOTES:

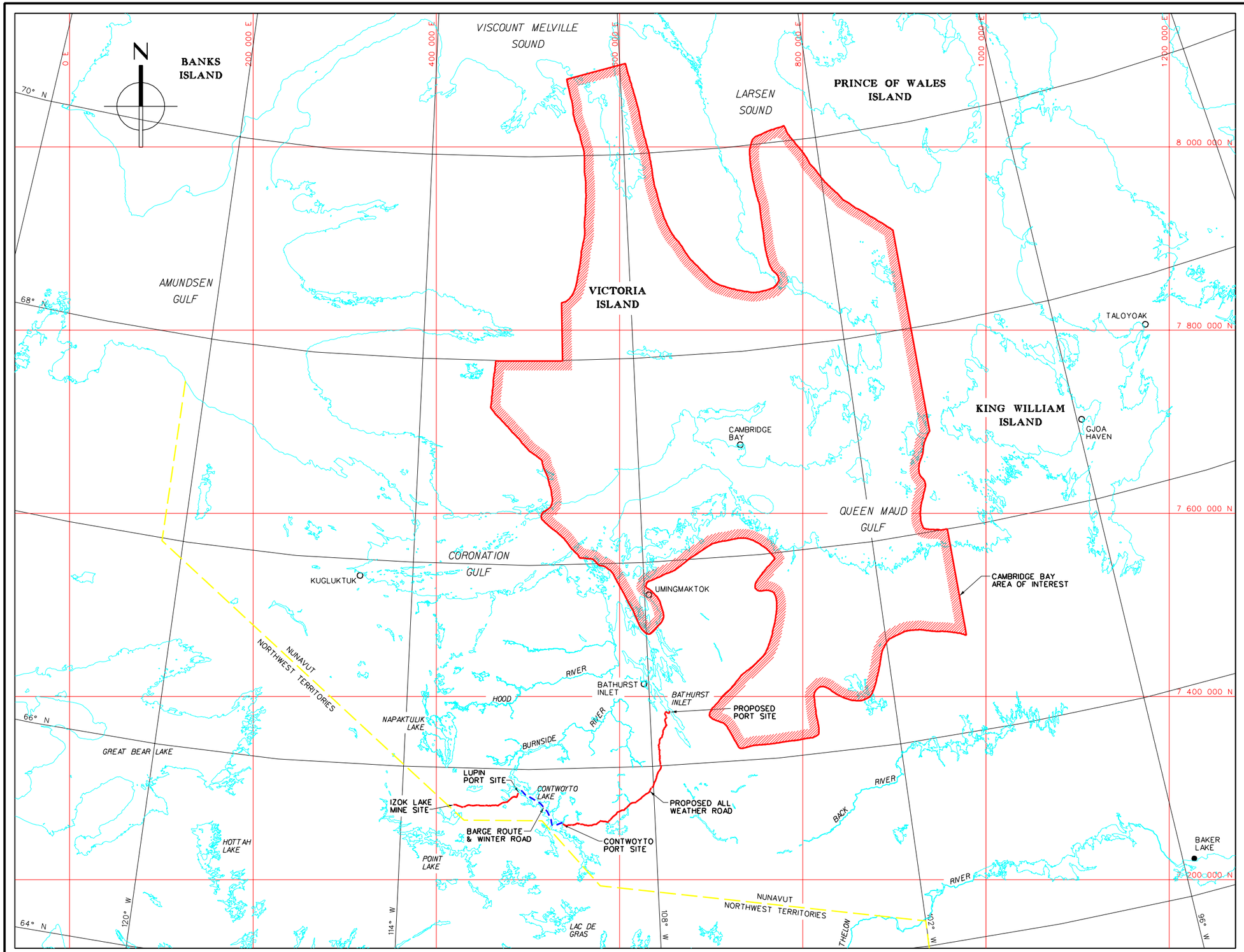
1. BASE MAPPING DERIVED FROM INFORMATION PROVIDED BY KITIKMEOT GEOSCIENCES LTD.
2. GRID SHOWN IS ZONE 12 UTM NAD 83.

BATHURST INLET PORT & ROAD PROJECT

UMINGMAKTOK AREA OF INTEREST
(COURTESY NUNAVUT PLANNING COMMISSION)

FIGURE 30

the BATHURST INLET PORT AND ROAD PROJECT



NOTES:

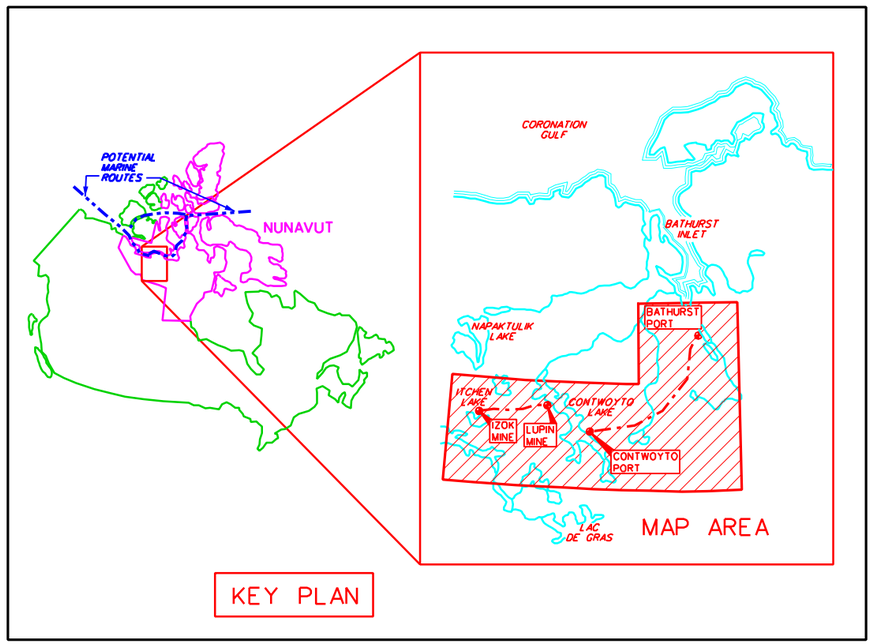
1. BASE MAPPING DERIVED FROM INFORMATION PROVIDED BY KITIKMEOT GEOSCIENCES LTD.
2. GRID SHOWN IS ZONE 12 UTM NAD 83.

BATHURST INLET PORT & ROAD PROJECT

CAMBRIDGE BAY AREA OF INTEREST

FIGURE 31

the BATHURST INLET PORT AND ROAD PROJECT



NOTES:

1. MAPPING FROM GEOWEST ENVIRONMENTAL CONSULTANTS.
2. ZONE 12 NAD 83 UTM GRID SHOWN.

LEGEND

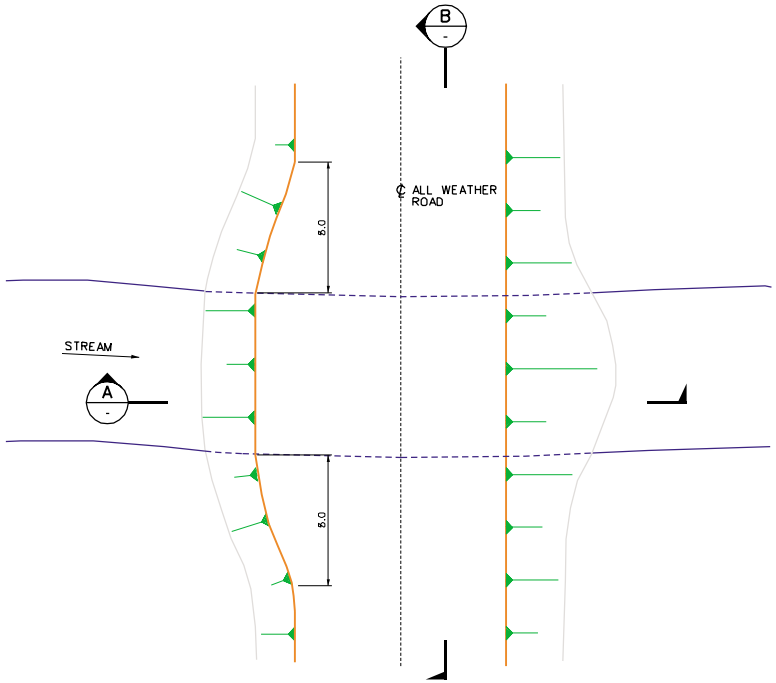
- - - DRAINAGE BASIN OUTLINE

BATHURST INLET PORT & ROAD PROJECT

DRAINAGE BASINS BISECTED BY THE ROAD

FIGURE 32

the BATHURST INLET PORT AND ROAD PROJECT

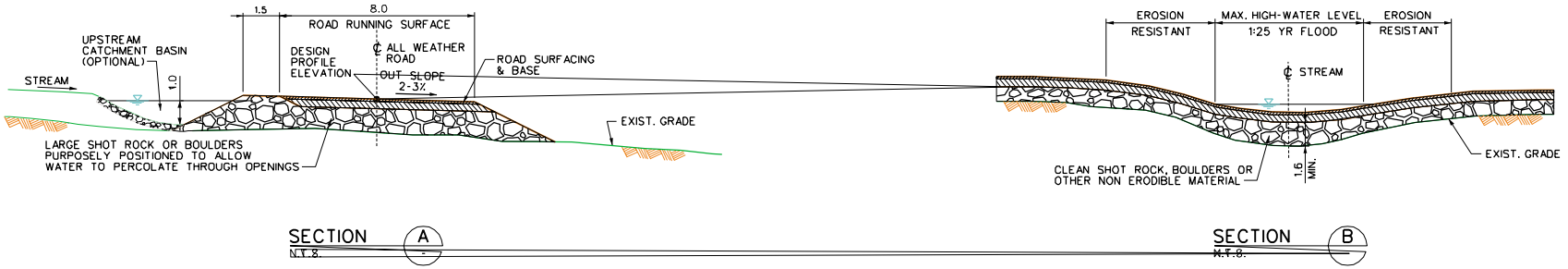


TYPICAL MINOR STREAM FORD CROSSING

M.T.S.

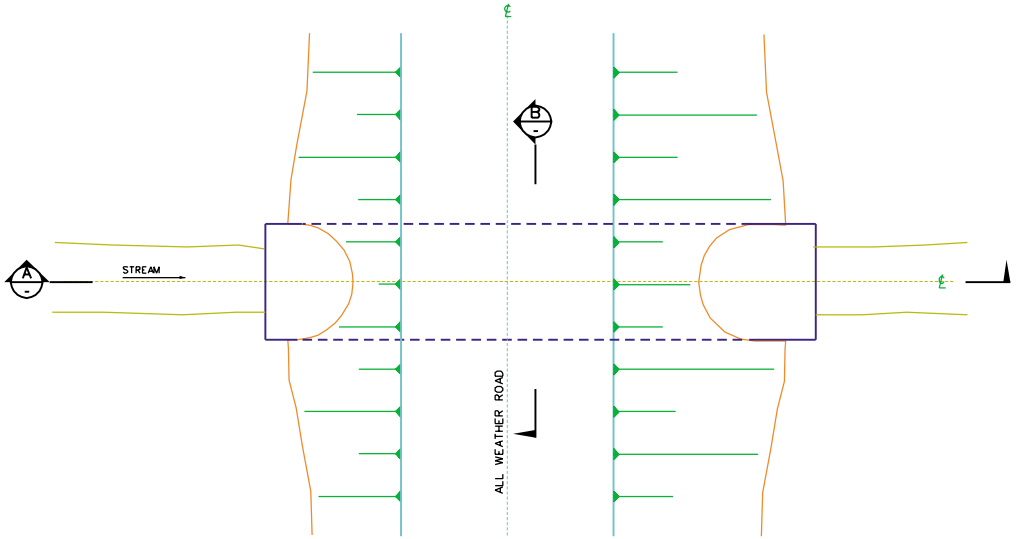
CATCHMENT AREA > 5 km²

TYPICAL LOCATION FOR A MINOR STREAM FORD CROSSING



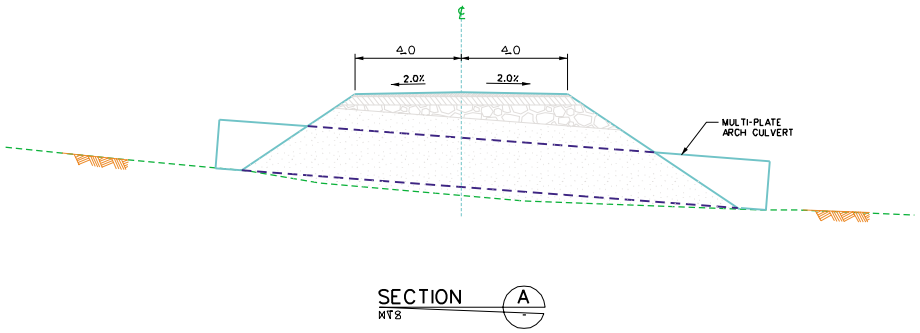
SECTION A
N.T.S.

SECTION B
N.T.S.

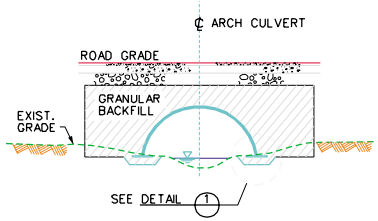


PLAN

TYPICAL STREAM FOR ARCHED CULVERT CROSSING



SECTION A
MTS



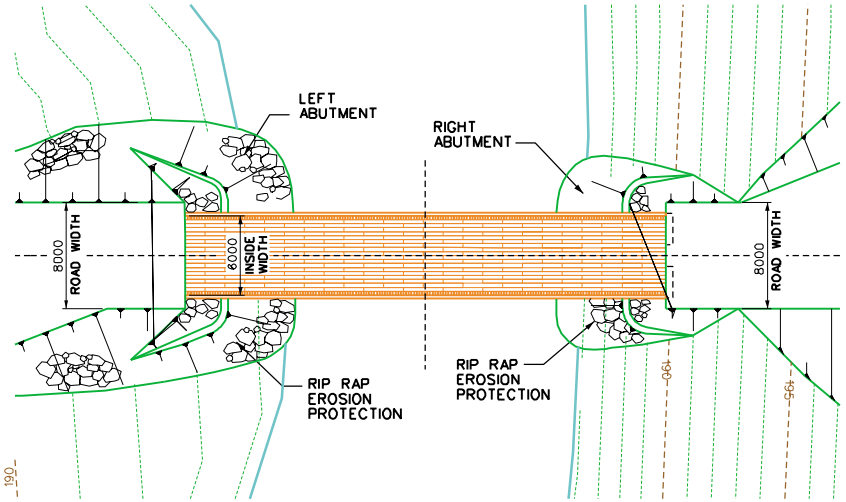
SECTION B
MTS

BATHURST INLET PORT & ROAD PROJECT

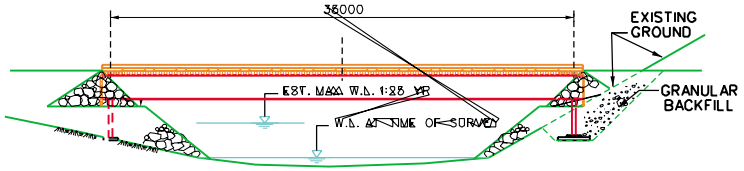
ARCH CULVERT WATER CROSSING

FIGURE 34

the BATHURST INLET PORT AND ROAD PROJECT



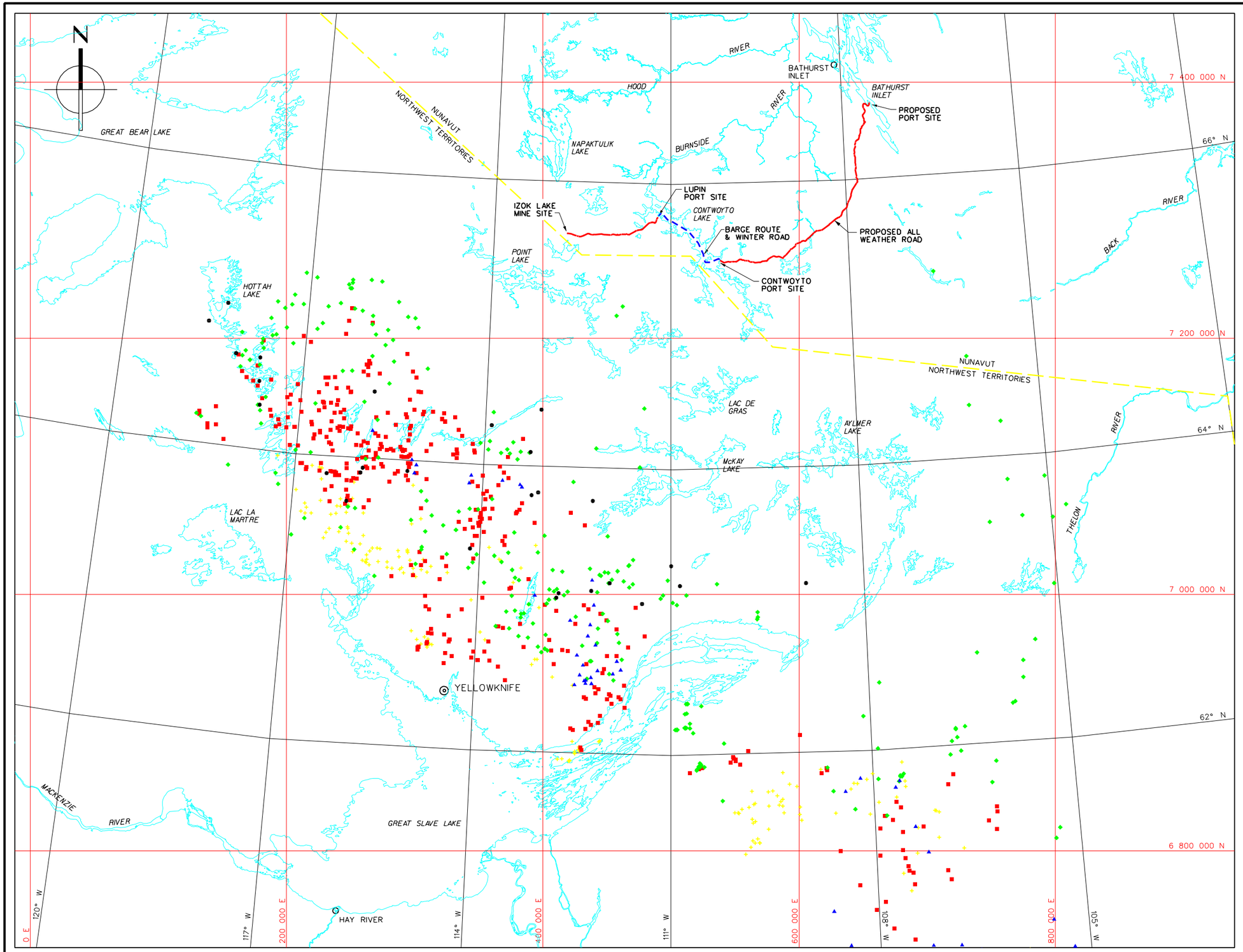
PLAN



ELEVATION

SINGLE SPAN BRIDGE WATER CROSSING
TYPICAL DETAILS

SINGLE SPAN BRIDGE WATER CROSSING
TYPICAL LOCATION



NOTES:

1. BASE MAPPING DERIVED FROM INFORMATION PROVIDED BY KITIKMEOT GEOSCIENCES LTD.
2. GRID SHOWN IS ZONE 12 UTM NAD 83.

LEGEND

CARIBOU DISTRIBUTION BY YEAR

- 1996
- 1997
- 1998
- 1999
- 2000

0 50 100 150 200

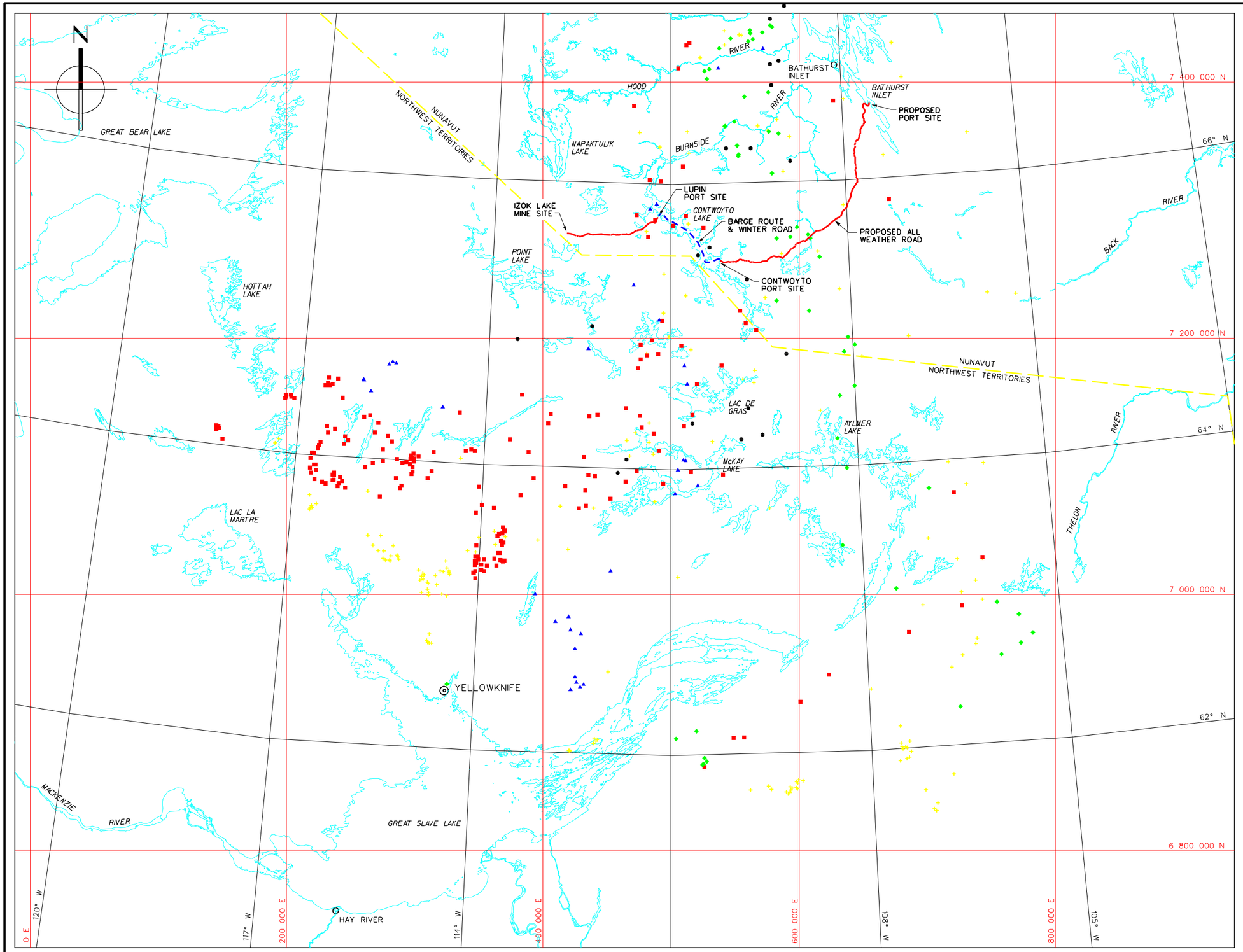
SCALE IN KILOMETRES

BATHURST INLET PORT & ROAD PROJECT

BATHURST CARIBOU HERD
WINTER DISTRIBUTION 1996 – 2000

FIGURE 36A

the BATHURST INLET PORT AND ROAD PROJECT



NOTES:

1. BASE MAPPING DERIVED FROM INFORMATION PROVIDED BY KITIKMEOT GEOSCIENCES LTD.
2. GRID SHOWN IS ZONE 12 UTM NAD 83.

LEGEND

CARIBOU DISTRIBUTION BY YEAR

- 1996
- 1997
- 1998
- 1999
- 2000

0 50 100 150 200

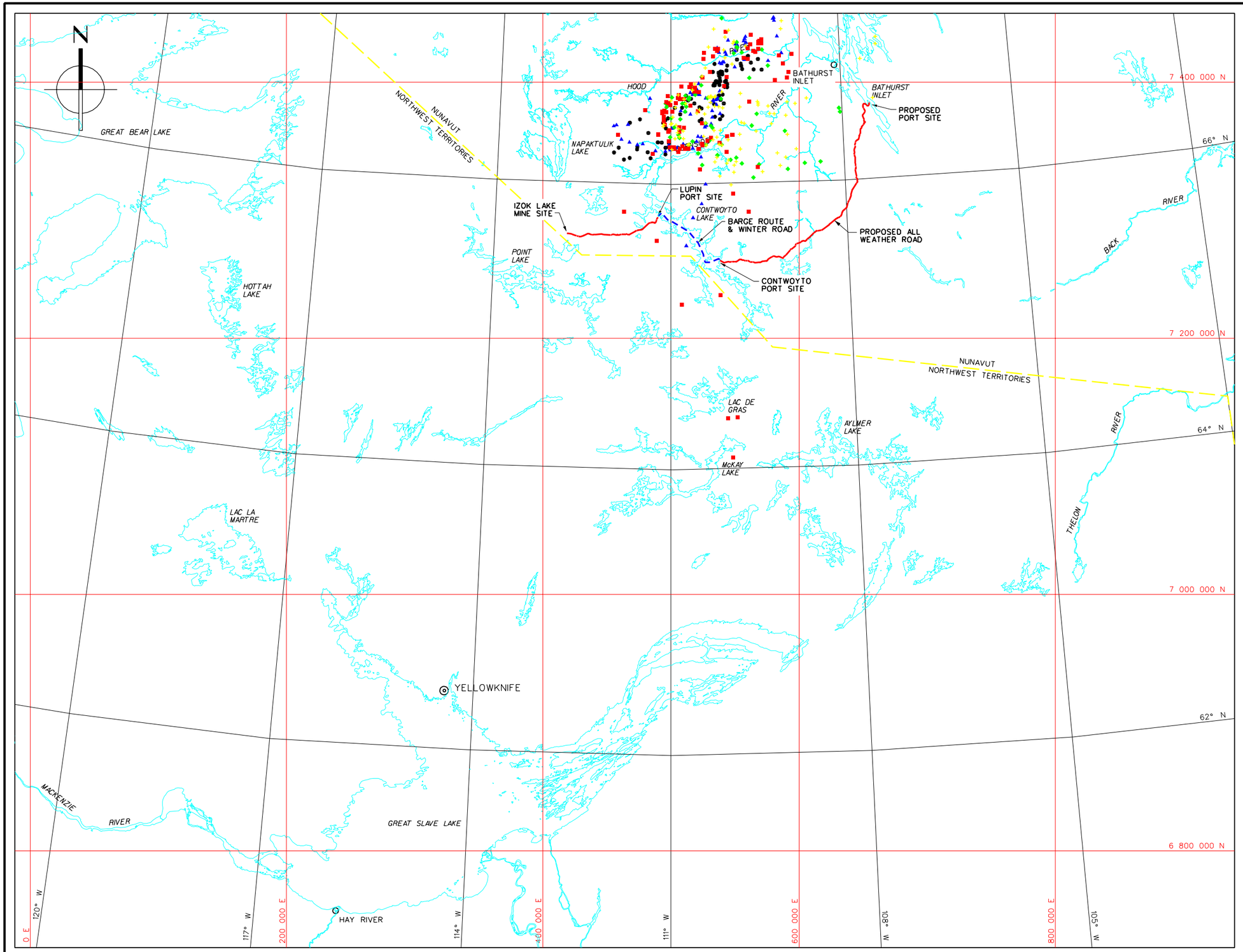
SCALE IN KILOMETRES

BATHURST INLET PORT & ROAD PROJECT

BATHURST CARIBOU HERD
SPRING MIGRATION 1996 – 2000

FIGURE 36B

the BATHURST INLET PORT AND ROAD PROJECT



NOTES:

1. BASE MAPPING DERIVED FROM INFORMATION PROVIDED BY KITIKMEOT GEOSCIENCES LTD.
2. GRID SHOWN IS ZONE 12 UTM NAD 83.

LEGEND

CARIBOU DISTRIBUTION BY YEAR

- 1996
- 1997
- 1998
- 1999
- 2000

0 50 100 150 200

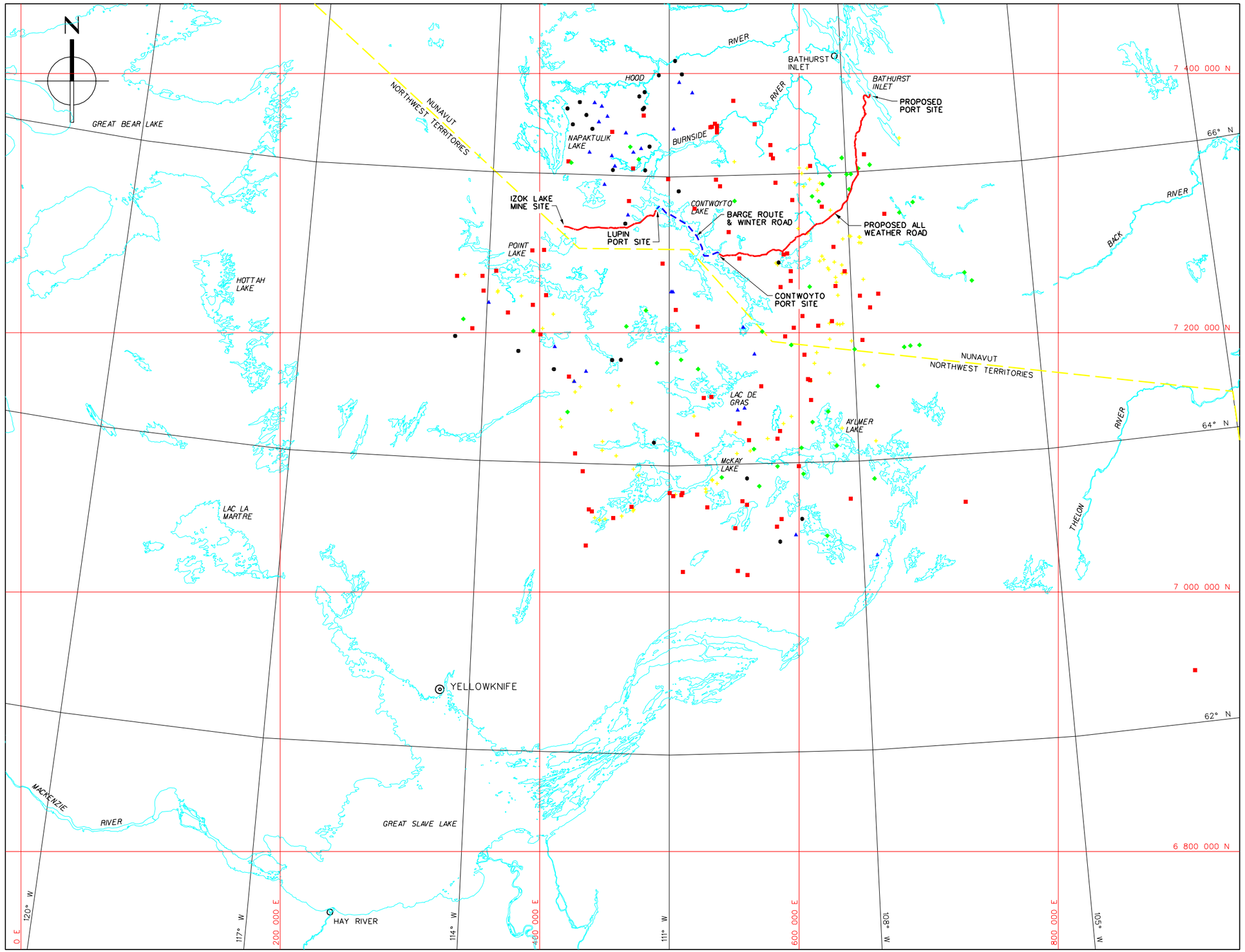
SCALE IN KILOMETRES

BATHURST INLET PORT & ROAD PROJECT

BATHURST CARIBOU HERD
CALVING DISTRIBUTION 1996 – 2000

FIGURE 36C

the BATHURST INLET PORT AND ROAD PROJECT



NOTES:

1. BASE MAPPING DERIVED FROM INFORMATION PROVIDED BY KITIKMEOT GEOSCIENCES LTD.
2. GRID SHOWN IS ZONE 12 UTM NAD 83.

LEGEND

CARIBOU DISTRIBUTION BY YEAR

- 1996
- 1997
- 1998
- 1999
- 2000

0 50 100 150 200

SCALE IN KILOMETRES

BATHURST INLET PORT & ROAD PROJECT

BATHURST CARIBOU HERD
POST CALVING DISTRIBUTION 1996 – 2000

FIGURE 36D

the BATHURST INLET PORT AND ROAD PROJECT

N

GREAT BEAR LAKE

NUNAVUT
NORTHWEST TERRITORIES

HOOD RIVER

BATHURST INLET

BATHURST INLET

PROPOSED PORT SITE

NAPAKTULIK LAKE

BURNSIDE RIVER

LUPIN PORT SITE

PROPOSED ALL WEATHER ROAD

CONTWOYTO LAKE

BARGE ROUTE & WINTER ROAD

IZOK LAKE MINE SITE

CONTWOYTO PORT SITE

HOTTAH LAKE

POINT LAKE

BACK RIVER

NUNAVUT
NORTHWEST TERRITORIES

LAC DE GRAS

AYLMER LAKE

McKAY LAKE

THELON RIVER

LAC LA MARTRE

YELLOWKNIFE

MACKENZIE RIVER

GREAT SLAVE LAKE

HAY RIVER

7 400 000 N

66° N

7 200 000 N

64° N

7 000 000 N

62° N

6 800 000 N

0 E

120° W

117° W

200 000 E

114° W

400 000 E

600 000 E

108° W

800 000 E

105° W

NOTES:

1. BASE MAPPING DERIVED FROM INFORMATION PROVIDED BY KITIKMEOT GEOSCIENCES LTD.
2. GRID SHOWN IS ZONE 12 UTM NAD 83.

LEGEND

CARIBOU DISTRIBUTION BY YEAR

- 1996
- 1997
- 1998
- 1999
- 2000

0 50 100 150 200

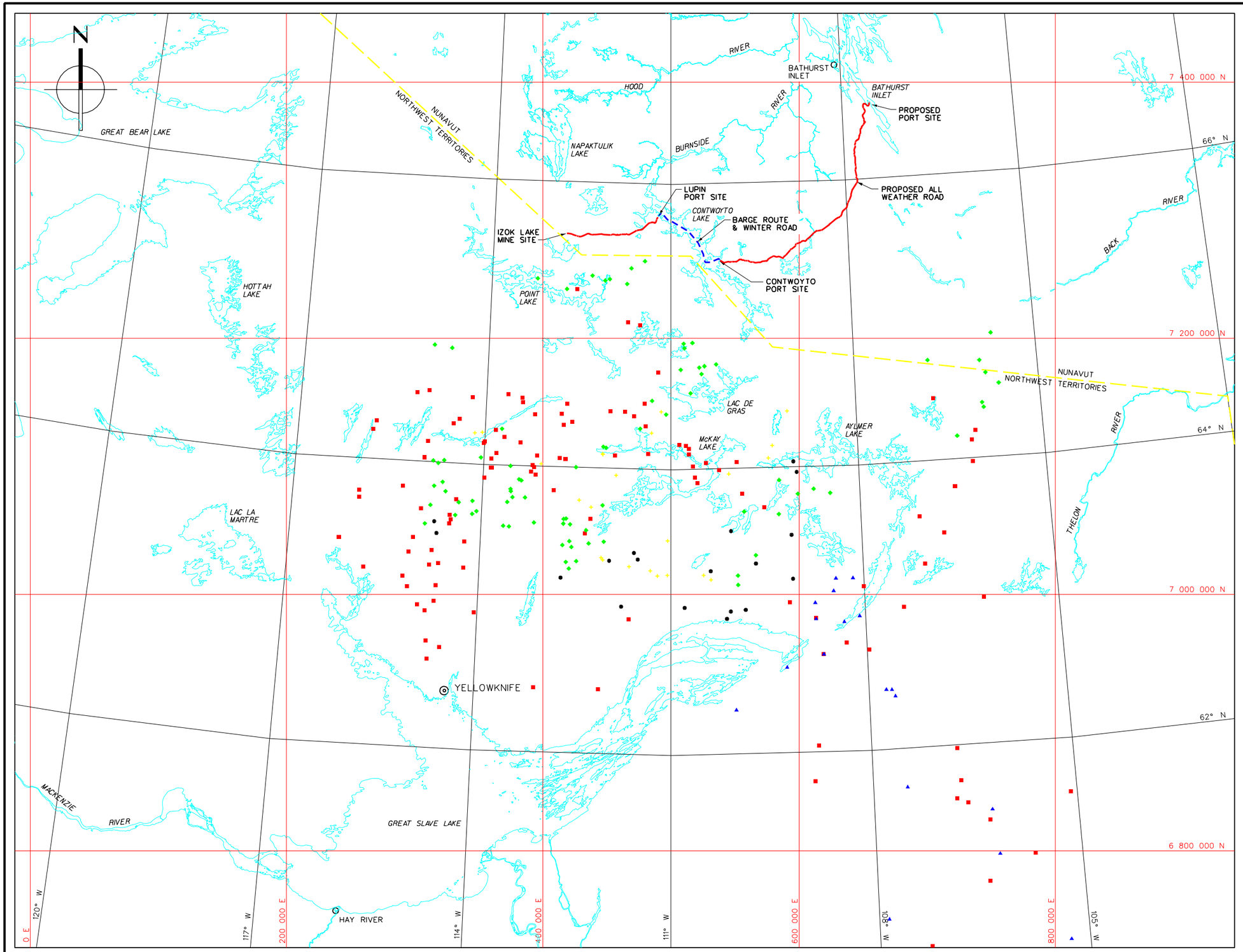
SCALE IN KILOMETRES

BATHURST INLET PORT & ROAD PROJECT

BATHURST CARIBOU HERD
LATE SUMMER DISTRIBUTION 1996 – 2000

FIGURE 36E

the BATHURST INLET PORT AND ROAD PROJECT



NOTES:

1. BASE MAPPING DERIVED FROM INFORMATION PROVIDED BY KITIKMEOT GEOSCIENCES LTD.
2. GRID SHOWN IS ZONE 12 UTM NAD 83.

LEGEND

CARIBOU DISTRIBUTION BY YEAR

- 1996
- 1997
- 1998
- 1999
- 2000

0 50 100 150 200

SCALE IN KILOMETRES

BATHURST INLET PORT & ROAD PROJECT

BATHURST CARIBOU HERD
FALL MIGRATION AND RUT DISTRIBUTION 1996 – 2000

FIGURE 36F

the BATHURST INLET PORT AND ROAD PROJECT

Appendix 1.

Bathurst Inlet Port and Road Joint Venture

Draft Environmental Policy

The purpose of the Bathurst Inlet Port and Road Project is to build and operate a transportation network in the West Kitikmeot Region of Nunavut to enhance the economic feasibility of resource development in the region for the benefit of the Inuit residents there. Port and road construction and operations will be conducted in a manner that protects the long term integrity of the tundra environment and the fish and wildlife populations it sustains. Every person and company that uses the Project's transportation network and facilities will be required to adhere to the Code of Good Conduct for Land Users in the region established by the Nunavut Planning Commission (1997).

Code of Good Conduct for Land Users*

1. The landscape of each camp and other land use sites will be restored to its original condition to the greatest degree possible. Water quality will be preserved and no substances that will impair water quality will be dumped in water bodies. When possible, and feasible, old sites will be restored to the natural state.
2. All land users shall assist communities and government(s) in identifying and protecting archaeological sites and carving stone sites.
3. As a general rule, low-level flights by aircraft at less than 300 meters should not occur where they will disturb wildlife or people. Where possible scheduled low-level flights will only take place after consultation with the appropriate communities. All land users are responsible for reporting to the appropriate authorities any illegal or questionable low level flight.
4. All activities on the land will be conducted in such a fashion that the renewable resources of the area in question are conserved.
5. Whenever practicable, and consistent with sound procurement management, non-resident land users will follow the practice of local purchase of supplies and services.
6. Non-resident land users will establish working relationships with local communities and respect the traditional uses of the land.
7. During the caribou calving, post-calving, and migrating season, land use activities should be restricted to avoid disturbing caribou, in general, and more specifically will be governed by caribou protection measures.
8. Artifacts must be left where they are found. All land users are responsible for reporting to the appropriate authorities the location of, or any removal or disturbance of artifacts.

* Source: Nunavut Planning Commission, 1997. West Kitikmeot Regional Land Use Plan (draft).

Appendix 2: General Requirements for a Project Description (NIRB, 1997).

APPENDIX B
NUNAVUT IMPACT REVIEW BOARD
GENERAL REQUIREMENTS FOR A PROJECT DESCRIPTION

Although the level of detail will vary with the scope of the project a description of the following elements should be included with a project proposal application.

In making its determination NIRB uses both traditional Inuit knowledge and recognized scientific methods. Throughout the document please cite whether information was gathered through Inuit knowledge or by recognized scientific methods.

1. BACKGROUND INFORMATION

- **Proponent Identification Information**
    - company name and mailing address;
    - phone and fax number;
    - contact person; and
    - field supervisor, phone number and/or radio phone number.

- **The Name of the Lead Authorising Agency and List of all Approvals, Permits and Licenses Required**
    - list the approvals, permits and licenses required (regulatory agency, contact name, address, phone number)

- **A List of Previous Environmental Assessments**
    - describe all prior relevant environmental assessments of the project (proponent name, type of operation, year operation began)

2. PROJECT DESCRIPTION

This section should describe in sufficient detail all aspects of the planning, designing, construction, operation, ongoing restoration activities, decommissioning, and post-decommissioning phases of the proposal including:

- **Title of Project**
- **Type of Activity**
- **Summary of Operation (purpose, nature of all activities)**
- **Preferred Option(s)**
    - include supporting rationale; and
    - evaluate any and describe any *alternatives* to the project and to the project components eg. alternative routes, alternative technologies.

- **Project Location**
    - indicate the ownership of land(s) that the project would be using (whether the project requires the use of Inuit Owned Lands, Crown land, Commissioner's land, or combination thereof);
    - a general location map and a map of adjacent area (1: 1,000,000 or 1:4,000,000); and
    - a location map of activities, facilities and camp(s), including off-site facilities such as roads, airstrips, camps and staging areas (include NTS maps at 1:250,000 and at 1:50,000 scale; provide latitude and longitude of primary activities).

- **Schedule**
    - timetable of activities including:
        - construction, operation and decommissioning schedules; and
        - the length of time of each activity.

- **Operations Plan**
    - site facilities and associated infrastructure (during all phases of project)
    - methods and processes involved;
    - technology to be used (including drills, pumps, chemicals, transportation, etc.)
    - detailed description of any new technology;
    - waste (describe all types, volumes, handling, disposal methods and alternatives including: garbage, sanitary and sewage wastes, brush and vegetation, overburden, waste rock, tailings);
    - water (sources, amounts and composition at different stages in the procesel-
    - energy (sources, amounts and alternatives) (e.g. types of fuels to be used and amounts; associated infrastructure (bermed tanks, etc.));
    - camp facilities; and
    - workforce.

- **Site Access and Transportation Methods**
    - existing or new access (land, air or sea);
    - staging areas; and
    - volumes, frequency, type and weight of vehicles.

- **Environmental Protection and Contingency Plans**
    - describe the types, volumes, handling, storage and disposal of all toxic substances;
    - describe types of pollution control systems and procedures, including safety systems and procedures, and the environmental and safety standards to be met by proponent;
    - describe any environmental management plans (such as acid rock drainage (ARD) control, erosion control, air and water quality control, wildlife management);
    - provide a spill contingency plan that outlines the response procedures to be followed and any onsite equipment to be used for emergency situations such as spills, fire, floods or other acts of nature.

3. DESCRIPTION OF THE ENVIRONMENT

The descriptions should encompass both scientific and traditional ecological knowledge.

- **Description of the Biophysical Environment**
    - site location, topography and geology, including: soils; geologic hazards: earthquakes, landslides, erosion, permafrost, acid rock drainage potential;
    - hydrology - drainage region and watershed, name of nearest creek, river or lake system; water quality and flow characteristics;
    - ecology -important flora and fauna, their habitats, distribution, migration routes and relationships to other species; rare and endangered species; ecological succession; existing envirotunental stresses;
    - a list of the *Valued Ecosystem Components,* including a list of all globally, nationally, provincially or locally rare, sensitive or protected species found in the project environment, and their significance;
    - climate -daily and monthly averages and extremes of temperature, humidity, wind speed and direction, precipitation and storms, violent weather; noise
    - an overview of traditional knowledge of the environment;
    - land use -traditional use areas; special land designation, commercial, industrial, residential, recreational; land capability; transportation routes and corridors (road, water, air); utilities and transmission lines; water resources; and
    - other imminent plans that will affect land use.

- **Description of the Social, Cultural and Economic Environments**
    - elements and features considered to be unique to the area and/or its inhabitants and their quality of life
    - list the affected communities, outpost camps, traditional use areas, camps an tourist facilities;
    - socioeconomic conditions (including lifestyle and types of employment)
    - historical, scenic, cultural and natural landmarks -registries of historical places; archaeological surveys

4. DESCRIPTION OF PUBLIC CONSULTATION PROCESS

- provide a summary of pre-submission consultation including;
    - organization(s) and person(s) consulted;
    - the response of the public to the project;
    - a description of the issues and concerns raised and the proponent's response to these concerns.
    - a list of the Valued Ecosystem and Valued Socio-Economic Components (VECS, VSCS) that were identified during consultation;
    - how the consultation has affected project design;
    - an outline of existing and planned information materials such as news releases, reports, bulletins, newsletters, brochures, audio-visual materials, other print and electronic advertisements or displays; and
    - any plans for future consultation activities and their timing.

- An "Executive Summary" document should-be provided to the affected communities and to NIRB written in the each community's preferred language (Inuktitut or Innuinaqtun).

N.B. An Inuktitut / Innuinaqtun speaking community liaison person may be beneficial t the public consultation process.

5.IDENTIFICATION OF ENVIRONMENTAL EFFECTS

This is a key section in which predicted environmental, social, cultural and economic effects of the project are summarized and discussed using both traditional and scientific knowledge. The potential effects should be identified in ten-ns of existing enviroranental, social, cultural and economic values.

- **Identification of Biophysical Environmental Effects**
    - describe potential effects on environment and resources
    - terrain
    - water (fresh water and marine)
    - vegetation
    - fisheries
    - wildlife
    - marine mammals
    - environmental health
    - heritage resources
    - other land uses/land users
    - describe the potential effects of the environment on the project (eg. floods, pennafros

- **Identification of Social, Cultural and Economic Effects**
- describe potential effects on communities, outpost camps, tourist facilities;
- describe potential effects on the social, cultural and economic environments(eg. impacts on traditional land use and hunting, trapping or fishing);
- describe impacts on women, men, children, elders, families;
- describe impacts on aesthetics;
- estimate the amount and type of labour required, over how long, and how this is to be met for all stages of the project cycle, including construction and operation of the project;
- describe plans to hire and train northerners, and specifically the Inuit;
- describe plans to contract local or Inuit owned companies to provide services or / and products to your operation;
- if applicable, indicate whether an Inuit Impact Benefit Agreement is in process or has been completed;
- describe expected requirements for local facilities and services (electricity, water, sewage, schools, health services, housing, roads, transportation, air traffic, weather forecasting and monitoring etc.);
- describe potential effects on cultural landmarks; and
- list benefits and drawbacks associated with the project

6. IDENTIFICATION OF CUMULATIVE ENVIRONMENTAL EFFECTS

- identify past. present and imminent projects and / or activities occurring in the area; and
- describe the impacts of past and present projects / activities in combination with the potential impacts of other imminent projects.

7. IDENTIFICATION OF MITIGATION MEASURES AND RESIDUAL IMPACTS

- Describe the measures which will be used to minimize or mitigate any identified harmful environmental, social, economic, cultural and cumulative impacts and enhance any beneficial effects.

8. ABANDONMENT/DECOMMISSIONING PLANS

- Describe the options for temporary, seasonal and **final** closure.

N.B. NIRB will uphold a "pack-it-in" - "pack-it-out" philosophy.

9. MONITORING AND MAINTENANCE PLANS

- Describe any monitoring plans and the schedule for submitting these monitoring reports to NIRB.

10. LIST INFORMATION SOURCES

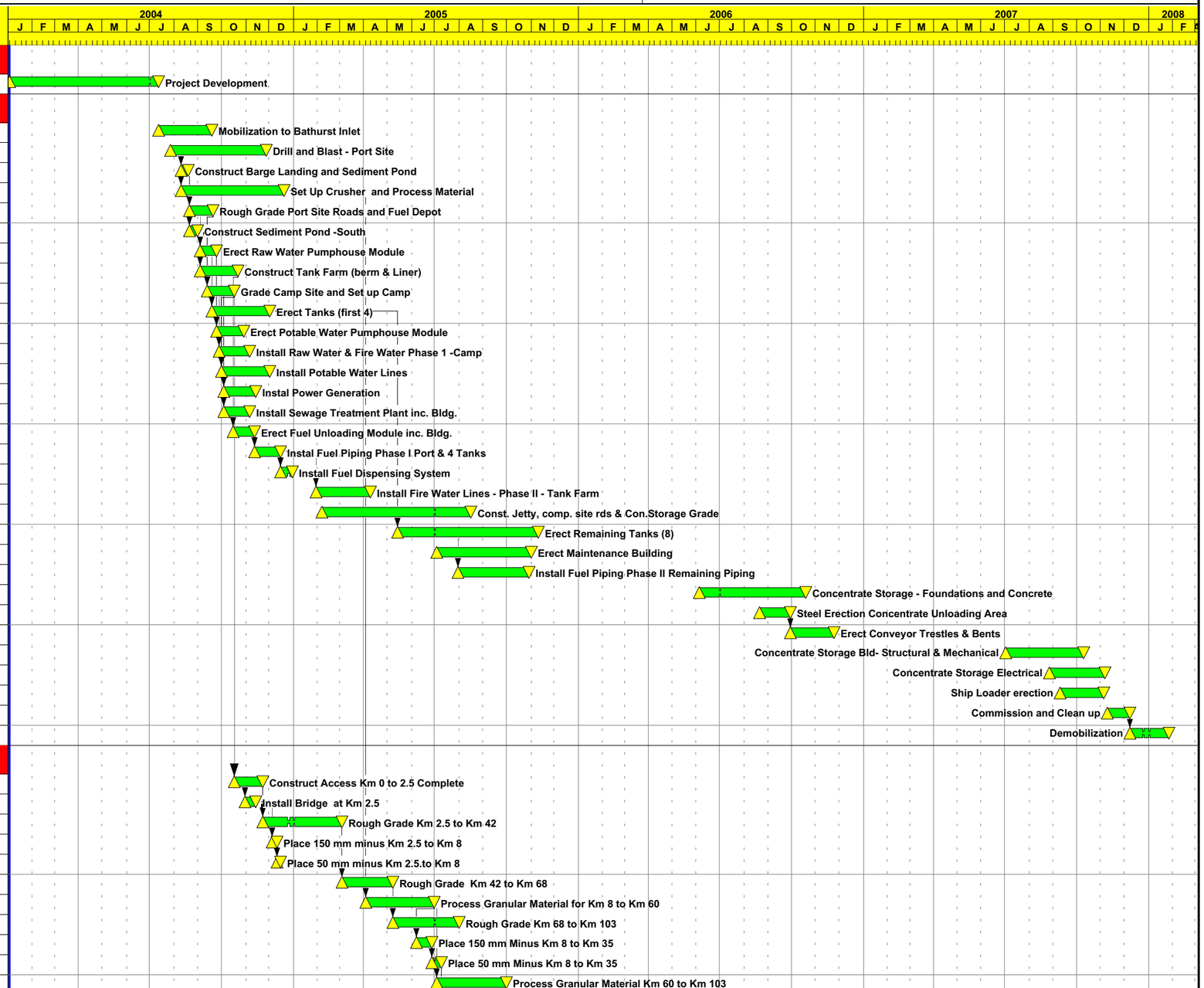
- list all information sources used in the preparation of the project description; and
- list any available documentation on any baseline data that has been collected.

Appendix 3. Detailed Project Schedule*

* The Project Schedule that appears as Appendix 3 of the CD version of the Bathurst Inlet Port and Road Project, Project Description is an updated version to the Project Schedule that accompanied the original Project Description filed with Kitikmeot Inuit Association and Indian and Northern Affairs Canada.

Appendix 3: Detailed Project Schedule
BATHURST INLET PORT AND ROAD

Activity ID	Activity Description	Orig Dur	Rem Dur	%	Early Start	Early Finish
Engineering						
1000	Project Development	191	191	0	03JAN04	12JUL04
Port Site Development						
2001	Mobilization to Bathurst Inlet	68	68	0	13JUL04*	18SEP04
2002	Drill and Blast - Port Site	124	124	0	27JUL04*	27NOV04
2003	Construct Barge Landing and Sediment Pond	10	10	0	10AUG04	19AUG04
2019	Set Up Crusher and Process Material	132	132	0	10AUG04	19DEC04
2005	Rough Grade Port Site Roads and Fuel Depot	30	30	0	21AUG04	19SEP04
2011	Construct Sediment Pond -South	10	10	0	21AUG04	30AUG04
2013	Erect Raw Water Pumphouse Module	21	21	0	03SEP04	23SEP04
2007	Construct Tank Farm (berm & Liner)	48	48	0	04SEP04	21OCT04
2006	Grade Camp Site and Set up Camp	35	35	0	13SEP04	17OCT04
2008	Erect Tanks (first 4)	75	75	0	18SEP04	01DEC04
2014	Erect Potable Water Pumphouse Module	35	35	0	24SEP04	28OCT04
2017	Install Raw Water & Fire Water Phase 1 -Camp	40	40	0	27SEP04	05NOV04
2018	Install Potable Water Lines	63	63	0	30SEP04	01DEC04
2009	Instal Power Generation	40	40	0	04OCT04	12NOV04
2010	Install Sewage Treatment Plant inc. Bldg.	33	33	0	04OCT04	05NOV04
2012	Erect Fuel Unloading Module inc. Bldg.	27	27	0	16OCT04	11NOV04
2016	Instal Fuel Piping Phase I Port & 4 Tanks	33	33	0	12NOV04	14DEC04
2020	Install Fuel Dispensing System	14	14	0	15DEC04	30DEC04
2025	Install Fire Water Lines - Phase II - Tank Farm	70	70	0	30JAN05	09APR05
2004	Const. Jetty, comp. site rds & Con.Storage Grade	190	190	0	07FEB05*	16AUG05
2015	Erect Remaining Tanks (8)	180	180	0	14MAY05	10NOV05
2021	Erect Maintenance Building	120	120	0	04JUL05*	31OCT05
2024	Install Fuel Piping Phase II Remaining Piping	91	91	0	31JUL05	29OCT05
2022	Concentrate Storage - Foundations and Concrete	135	135	0	05JUN06*	18OCT06
2032	Steel Erection Concentrate Unloading Area	40	40	0	21AUG06*	29SEP06
2042	Erect Conveyor Trestles & Bents	56	56	0	30SEP06	24NOV06
2023	Concentrate Storage Bld- Structural & Mechanical	100	100	0	03JUL07*	10OCT07
2043	Concentrate Storage Electrical	72	72	0	27AUG07*	06NOV07
2033	Ship Loader erection	56	56	0	10SEP07*	04NOV07
2026	Commission and Clean up	30	30	0	09NOV07*	08DEC07
2027	Demobilization	45	45	0	09DEC07	26JAN08
Access Road - Port to Km 103						
3001	Construct Access Km 0 to 2.5 Complete	35	35	0	18OCT04	21NOV04
3002	Install Bridge at Km 2.5	14	14	0	31OCT04	13NOV04
3003	Rough Grade Km 2.5 to Km 42	98	98	0	22NOV04	03MAR05
3013	Place 150 mm minus Km 2.5 to Km 8	6	6	0	05DEC04	10DEC04
3025	Place 50 mm minus Km 2.5.to Km 8	4	4	0	11DEC04	14DEC04
3005	Rough Grade Km 42 to Km 68	65	65	0	05MAR05	08MAY05
3004	Process Granular Material for Km 8 to Km 60	88	88	0	04APR05	30JUN05
3006	Rough Grade Km 68 to Km 103	84	84	0	09MAY05	01AUG05
3014	Place 150 mm Minus Km 8 to Km 35	20	20	0	07JUN05	26JUN05
3008	Place 50 mm Minus Km 8 to Km 35	12	12	0	27JUN05	09JUL05
3007	Process Granular Material Km 60 to Km 103	90	90	0	03JUL05	30SEP05



Start Date	02JAN04
Finish Date	26JAN08
Data Date	02JAN04
Run Date	14FEB02 08:16

Early Bar
Progress Bar
Critical Activity

BAT1

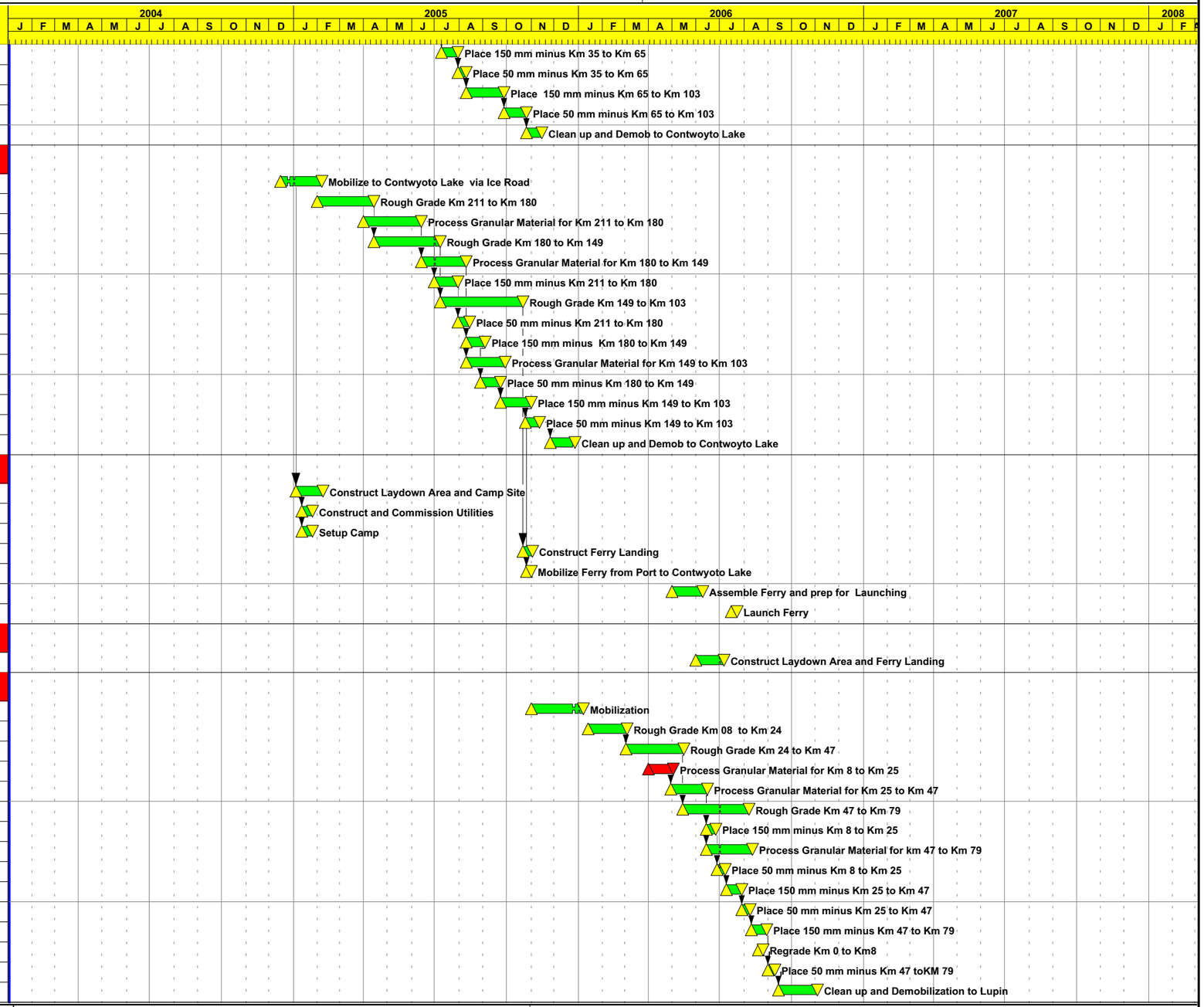
Sheet 1 of 2

Bathurst Inlet and Road Project

Date	Revision	Checked	Approved
11FEB02	Issued for Feasibility Study	D.T	

Appendix 3: Detailed Project Schedule
BATHURST INLET PORT AND ROAD

Activity ID	Activity Description	Orig Dur	Rem Dur	%	Early Start	Early Finish
3009	Place 150 mm minus Km 35 to Km 65	20	20	0	10JUL05	29JUL05
3010	Place 50 mm minus Km 35 to Km 65	12	12	0	30JUL05	10AUG05
3011	Place 150 mm minus Km 65 to Km 103	48	48	0	11AUG05	27SEP05
3012	Place 50 mm minus Km 65 to Km 103	28	28	0	28SEP05	25OCT05
3015	Clean up and Demob to Contwoyto Lake	21	21	0	26OCT05	15NOV05
Access Road - Contwyoto Lake to Km 103						
3100	Mobilize to Contwyoto Lake via Ice Road	50	50	0	15DEC04*	06FEB05
3102	Rough Grade Km 211 to Km 180	72	72	0	01FEB05*	13APR05
3103	Process Granular Material for Km 211 to Km 180	74	74	0	01APR05*	13JUN05
3104	Rough Grade Km 180 to Km 149	84	84	0	14APR05	07JUL05
3106	Process Granular Material for Km 180 to Km 149	57	57	0	14JUN05	10AUG05
3105	Place 150 mm minus Km 211 to Km 180	30	30	0	30JUN05	30JUL05
3108	Rough Grade Km 149 to Km 103	106	106	0	08JUL05	21OCT05
3107	Place 50 mm minus Km 211 to Km 180	15	15	0	31JUL05	14AUG05
3109	Place 150 mm minus Km 180 to Km 149	24	24	0	11AUG05	03SEP05
3110	Process Granular Material for Km 149 to Km 103	50	50	0	11AUG05	29SEP05
3111	Place 50 mm minus Km 180 to Km 149	25	25	0	29AUG05	22SEP05
3112	Place 150 mm minus Km 149 to Km 103	40	40	0	23SEP05	01NOV05
3113	Place 50 mm minus Km 149 to Km 103	18	18	0	25OCT05	11NOV05
3114	Clean up and Demob to Contwoyto Lake	30	30	0	26NOV05	27DEC05
Contwyoto Lake Ferry Landing						
4000	Construct Laydown Area and Camp Site	35	35	0	04JAN05*	07FEB05
4001	Construct and Commission Utilities	14	14	0	11JAN05*	24JAN05
4002	Setup Camp	14	14	0	11JAN05	24JAN05
4003	Construct Ferry Landing	12	12	0	22OCT05	02NOV05
4004	Mobilize Ferry from Port to Contwyoto Lake	7	7	0	26OCT05	01NOV05
4005	Assemble Ferry and prep for Launching	40	40	0	01MAY06*	09JUN06
4016	Launch Ferry	8*	8*	0	15JUL06*	22JUL06
Lupin Ferry Landing						
5000	Construct Laydown Area and Ferry Landing	35	35	0	01JUN06*	06JUL06
Access Road Lupin to Izok						
6000	Mobilization	64*	64*	0	01NOV05*	07JAN06
6002	Rough Grade Km 08 to Km 24	50	50	0	13JAN06*	03MAR06
6003	Rough Grade Km 24 to Km 47	74	74	0	03MAR06	15MAY06
6004	Process Granular Material for Km 8 to Km 25	31	31	0	01APR06*	01MAY06
6007	Process Granular Material for Km 25 to Km 47	47	47	0	30APR06	15JUN06
6010	Rough Grade Km 47 to Km 79	85	85	0	14MAY06	07AUG06
6005	Place 150 mm minus Km 8 to Km 25	12	12	0	14JUN06	25JUN06
6011	Process Granular Material for km 47 to Km 79	58	58	0	14JUN06	11AUG06
6006	Place 50 mm minus Km 8 to Km 25	10	10	0	27JUN06	07JUL06
6008	Place 150 mm minus Km 25 to Km 47	20	20	0	09JUL06	28JUL06
6009	Place 50 mm minus Km 25 to Km 47	10	10	0	30JUL06	08AUG06
6012	Place 150 mm minus Km 47 to Km 79	20	20	0	10AUG06	29AUG06
6001	Regrade Km 0 to Km8	5	5	0	20AUG06*	24AUG06
6013	Place 50 mm minus Km 47 toKM 79	10	10	0	31AUG06	09SEP06
6014	Clean up and Demobilization to Lupin	50	50	0	15SEP06	03NOV06



Start Date	02JAN04
Finish Date	26JAN08
Data Date	02JAN04
Run Date	14FEB02 08:16

Early Bar
Progress Bar
Critical Activity

BAT1 Sheet 2 of 2

Bathurst Inlet and Road Project

Date	Revision	Checked	Approved
11FEB02	Issued for Feasibility Study	D.T	

Appendix 4: Land Use and Water Use Applications

- Nunavut Water Board
- Kitikmeot Inuit Association
- Indian and Northern Affairs Canada
  - Crown Land 5 pages
  - Land Use 4 pages
  - Quarry 2 pages
  - Tank Farm 2 pages

NUNAVUT WATER BOARD
LICENCE APPLICATION FORM

Application for licence, amendment to licence, or renewal of licence

APPLICATION/LICENCE NO:
(Amendment or renewal only)

1. NAME AND MAILING ADDRESS OF APPLICANT

Bathurst Inlet Port and Road Joint Venture
C/O Nuna Logistics
666 Burrard St, Suite 340
Vancouver, BC V6C 2X8
Attn: A.J.Keen, Project Manager
Phone: 604-682-4667 Fax: 604-682-4473

2. ADDRESS OF HEAD OFFICE IN CANADA IF INCORPORATED

Note: Will be a 50/50 Joint Venture betweenKitikmeot Corporation and Nuna Logistics Limited.

Phone:_____ Fax:_____

3. LOCATION OF UNDERTAKING (describe and attach a map, indicating watercourse and location of any proposed waste deposits)

Bathurst Inlet to Contwoyto Lake//Contwoyto Lake to Itchen Narrows in Kitikmeot Region of Nunavut

Latitude:_____ Longitude:_____

4. DESCRIPTION OF UNDERTAKING (describe and attach plans)

Build and operate a commercial port and toll road; **please see Project Description provided.**

5. TYPE OF UNDERTAKING

X Industrial ? Power ? Agricultural
? Mining and Milling ? Conservation ? Recreation
? Municipal
? Other (describe): _____

6. WATER USE

X To obtain water ? Flood control
X To cross a watercourse ? To divert water
? To modify the bed or bank of a water ? To alter the flow of , or store, water
? Other (describe):_____

7. WASTE DEPOSIT (quantity, quality, treatment and disposal)

Port (construction and operations)

At port potable water will be by desalination; sewage will be treated prior to discharge to land field above Bathurst Inlet; all other water uses will take marine water from Bathurst Inlet.

Road Construction

Road construction will be from 60 person mobile camps with a 7500 litre p day water demand with sewage treated prior to discharge onto tundra field.

Contwoyto Lake Operations

At Contwoyto Lake, 20 person camp requirements will be an estimated 3,000 litres per day with sewage treated prior to discharge onto tundra field.

8. OTHER PERSONS OR PROPERTIES AFFECTED BY THIS UNDERTAKING (give name, mailing address and location; attach if necessary)

The Project will require the use of Inuit Owned Land and Federal Crown Land. No current and ongoing local or subsistence land uses have been noted in the course of field investigations to date. The Project Description provides locations of known heritage sites along the proposed road alignment.

9. PREDICTED ENVIRONMENTAL IMPACTS OF UNDERTAKING AND PROPOSED MITIGATION

Please see Project Description provided.

10. CONTRACTORS AND SUB-CONTRACTORS (name, address and functions)

11. STUDIES UNDERTAKEN TO DATE (attach list if necessary)

Please see Project Description provided; Project EIS to be submitted that meets requirements of EIS Guidelines requested.

12. PROPOSED TIME SCHEDULE

Start Date: **Septemeber 2004** Completion Date: **September 2006**

A.J.Keen P.Eng	Project Manager	*original signed by A.J.Keen P.Eng*	02/04/2002
Name (Print)	Title (Print)	Signature	(dd/mm/yy)

APPLICATION FEE	**Amount: $_____**	**Receipt No.:_____**
WATER USE DEPOSIT	**Amount: $_____**	**Receipt No.:_____**

KITIKMEOT INUIT ASSOCIATION
LANDS DIVISION
APPLICATION FOR ACCESS TO INUIT OWNED LAND

Office use only			
Category	Application No:	Accepted By:	Date Accepted:

To be completed by all applicants

1. Applicant's name and mailing address (Full name, no initials or abbreviations) **Bathurst Port and Road Joint Venture** (will be a 50/50 Joint Venture betweenKitikmeot Corporation and Nuna Logistics Limited) KC address: Box 18 Cambridge Bay, NU XOB OCO Nuna address: 9839-31 Ave. Edmonton, AB T6N 1C5	Fax no Telephone no. 867-983-2200 1-800-434-9434
2. Head Office address See above	Fax no. Telephone no.
3. Field supervisor and address if different from above	Telephone no. 604-682-4667 888-734-5773

4. Other personnel list (Subcontractors or contractors to be used)
Total no. of personnel: No. of person days:

5. Location of activities by map coordinates. Attach **ORIGINAL** maps and sketches.

Please see Project maps and drawings attached.

MAX Lat Min	MIN Lat Deg	MIN Lat Min	MAX Lat Deg
MAX Long Min	MIN Long Deg	MIN Long Min	MAX Long Deg

Coordinate of camp (if applicable) Lat. ____ º ____ ‘ ____ “ Long. ____ º ____ ‘ ____ “

6. Periods of operation including periods of seasonal shut down and periods of restoration.

Please see the Project Description attached inluding Appendix Three, the detailed Project construction schedule.

7. Period of access required (up to one or two years for licenses, depending on license level, up to five years for residential/recreational leases and level I and II commercial leases, and up to forty years for level III commercial leases)	Start date **September 2004**	Completion Date **September 2006**

8. Other rights, licenses, permits or leases related to this application. Provide proof of rights or indicate if in the process of applying for rights.

NTI Subsurface Right	**9** NRI Research License	**9** CWS Permit
DIAND Subsurface Right	**9** RWED Tourism License	**9** Other – Please Specify
X NWB Water License	**9** Explosives Permit	_____

Please see copies of applications to NWB and DIAND in Appendix Four of the Project Description

9. TYPE OF LAND USE ACTIVITY

Check off the appropriate land use activities.

Mining/Oil & Gas

staking and prospecting

9 exploration (geophys-grd/air)

9 drilling (diamond/ice, etc.)

9 bulk sampling

9 mine (open pit, undergrd, etc.)

9 bulk fuel storage

9 other: _____

9

Construction:

X camp

X building

X winter road

X all-season road

X quarrying

X bulk fuel storage

Tourism:

9 tourism facility

9 outfitting

9 other: _____

9

9

Municipality:

9
bulk storage of fuel

9
residential building

commercial

9
building

9
other: _____

9

Research:

9
Wildlife/fish/birds/marine

9
Survey (grd/aerial/collars)

9
Collection of species

9
Research station

9
Other: _____

9

Other:

9
Commercial harvest

9
Recreational camp

9
_____

9
_____

10. On a separate page, provide a NON-TECHNICAL project summary. This should include a non-technical description of the project proposal, no more than 300 words, in English and Inuktituk (Inuinaktun, in the West Kitikmeot). The project description should outline the project activities and their necessity, method of transportation, any structures that will be erected, expected duration of activity and alternatives considered. If the proposed activity fits into any long-term developments, please describe the projected outcome of the development for the area and its timeline.

Attached please find the Executive Summary to the Project Description in English, Inuinaktun, and Inuktitiut.

11. Attach a detailed project description as outlined in APPENDIX A.Please see Project Description attached. This document follows the guidleines preapred by NIRB for Project Descriptions in Nunavut.

12. The total area of Inuit Owned Land that is expected to be used or occupied in the construction and operation of the Project is estimated to be 274.4 ha. The proposed uses for these Inuit Owned lands are:

- **camp and barge landing at Contwoyto Lake with an estimated area of 14 ha is proposed to be covered by a commercial lease;**
- **5 borrow pits and 25 quarreis on Inuit Owned Lands are proposed and applied for.**

The volume of materials proposed for extractions from pits and quarries on Inuit Owned Lands is shown in Table 1.

Table 1. Volumes of rock and granular materials proposed for extraction from Inuit Owned Land.

Location	IOL Block	Material	Proposed Quantity
Port to Contwoytro Lake			
km 6	BB-27	rock	70,000 cm
7.5	BB-27	rock	15,000 cm
12	BB-27	rock	105,000 cm
17.5	BB-27	granular	45,000 cm
19.5	BB-27	granular	55,000 cm
28.8	BB-16	rock	46,000 cm
32	BB-16	rock	34,000 cm
34	BB-16	rock	32,000 cm
59.5	BB-16	rock	75,000 cm
68.5	BB-16	rock	60,000 cm
106	BB-04	granular	135,000 cm
127	BB-05	granular	105,000 cm
135	BB-05	granular	135,000 cm
149	BB-05	rock	105,000 cm
158	C0-17	rock	60,000 cm
165	C0-17	rock	120,000 cm
208	C0-12	rock	80,000 cm

continued next page

Lupin to Itchen Narrows

17	CO-05	rock	75,000 cm
20	CO-05	rock	95,000 cm
25	CO-05	rock	40,000 cm
29	CO-05	rock	80,000 cm
36	CO-05	rock	105,000 cm
41	CO-05	rock	45,000 cm
45	CO-05	rock	60,000 cm
54	CO-05	rock	60,000 cm
56	CO-05	rock	105,000 cm
58	CO-05	rock	30,000 cm
61	CO-05	rock	62,000 cm
71	CO-05	rock	225,000 cm

Total volume to be extracted from Inuit Owned Lands 2,259,000 cm

Each quarry site is estimated to be 2 ha in area for a potential 58 ha for the 29 quarries on IOL.

Land use fees: # of hectares used @ $50.00/hectare = **$2,900.00 for quarries**

Note: The land use fee is for the amount of land used on an annual basis.

---

13. a) The Applicant requests a Certificate of Exemption **9**

OR

b) The Applicant agrees to be bound by terms and conditions to be attached to the Inuit Land Use License or Lease.

Sign name in full: Anthony J. Keen (signature) *original signed by A.J.Keen P.Eng* (date) April 2, 2002

APPENDIX A

All applicants must provide a detailed project description that includes ALL of the following:

1. Outline project activities, their necessity, their expected duration and alternatives considered. If the proposed activity fits into any long-term developments, describe the projected outcome of the development for the area and its timeline.

2. Schedule of activities including both operations and shutdowns

3. Provide a preliminary plan showing the location of the lands proposed to be used and an estimate of their area in hectares. The preliminary plan should show the approximate location of all:

   i) existing or new lines, trails, rights-of-way and cleared areas proposed to be used in the exercise of the Right;

   Please see Bathurst Inlet Port and Road Project Description

   ii) buildings, campsites, air landing strips, air navigation aids, fuel and supply storage sites, waste disposal sites, excavations, ponds, reservoirs and other works and places proposed to be constructed or used during the exercise of the Right;

   Please see Bathurst Inlet Port and Road Project Description

   iii) manmade structures and works, including bridges, dams, ditches, highways, roads, transmission lines, pipelines, survey lines and monuments, air landing strips; all topographical and natural features, including eskers, rivers, streams, lakes, inland seas and ponds; and all areas of biological interest, including wildlife and fish habitat, specifically, calving, denning, spawning or nesting areas, identified in consultation with the NWMB, RWO, or HTO, as appropriate, that may be affected by the exercise of the Right; and

   Please see Bathurst Inlet Port and Road Project Description

   iv) the accurate location of all carving stone, archaeological sites, and archaeological specimens.

   Please see Project Description for locations of known heritage sites along the proposed road alignment; locations of carving stone deposits will be reported as and when these are found.

4. Provide a list of structures that will be erected.

Please see Bathurst Inlet Port and Road Project Description

5. Equipment to be used, indicating type and number, size and ground pressure and proposed use. Include all drills, pumps, vehicles etc.

Please see Bathurst Inlet Port and Road Project Description

6. Fuels to be used, capacity of containers and number of litres. Include diesel, gasoline, aviation fuel, propane and other fuel types. Describe method of fuel transfer.

Please see Bathurst Inlet Port and Road Project Description

7. Provide a copy of fuel spill contingency plan

Project contingency plans are in preparation and will be submitted with Project EIS.

8. Proposed disposal methods for garbage, sewage, grey water, overburden (organic soil, waste material, tailings etc.), hazardous waste and other waste products. Describe the acid rock drainage potential of waste rock materiel and testing methods, if applicable. List the type, estimated quantities and storage methods of any hazardous materials that are going to be stored on the property.

Please see Bathurst Inlet Port and Road Project Description

9. Describe the methods of transportation.

Please see Bathurst Inlet Port and Road Project Description

10. Indicate the components of the environment that are near the project area, as applicable. Include the type of species, the important habitat area (calving, staging, denning, migratory pathways, spawning, nesting etc.) and the critical time periods (calving, post-calving, spawning, nesting, breeding etc.). Also include information on eskers, communities and historical/archaeological sites.

Please see Bathurst Inlet Port and Road Project Description

11. Summary of potential environmental, wildlife and resource impacts and mitigation measures to be used. Describe the effects of the proposed program on lands, water, flora and fauna.

Please see Bathurst Inlet Port and Road Project Description

12. Reclamation cost analysis for advanced exploration activities.

To be developed in consultation with Kitikmeot Inuit Association.

13. Proposed reclamation plan, that includes, but is not limited to the proposed methods and procedures for the progressive:

    i) removal of all structures, equipment, and other manmade debris;

    ii) rehabilitation of the area to its previous standard of human utilization and natural productivity;

    iii) replacement of overburden and soil;

    iv) grading of the area back to is natural contours; and

    v) re-establishment, to the extent possible, of flora.

    Include information about on going site remediation throughout the duration of the project.

Please see Bathurst Inlet Port and Road Project Description

14. Provide information on the socio-economic aspects of these activities. In particular, please provide details on:

    i) How much money will be spent on this work?
    Please see Bathurst Inlet Port and Road Project Description

    ii) What percentage will go to Inuit firms or employees?
    Please see Bathurst Inlet Port and Road Project Description

    iii) How many jobs are available through this activity?
    Please see Bathurst Inlet Port and Road Project Description

    iv) How many Inuit employees will be hired?
    Please see Bathurst Inlet Port and Road Project Description

    v) What type of training opportunities for Inuit will be offered?
    Please see Bathurst Inlet Port and Road Project Description

In addition to the above requirements, COMMERCIAL LEASE APPLICANTS must provide the following information:

- If the land is surveyed, state the lot and block number. If unsurveyed, state the size of the parcel and general area. Provide a detailed description and detailed sketch of the area applied for.
- Describe the type of commercial use.

In addition to the above requirements, RESIDENTIAL/RECREATIONAL LEASE APPLICANTS must provide the following information:

- If the land is surveyed, state the lot and block number. If unsurveyed, state the size of the parcel and general area. Provide a detailed description and detailed sketch of the area applied for.
- For what purposes will the land be used? Describe any buildings or improvements on this land. What is the value of the improvements on the land and who is the owner of the improvements.
- Provide a list of improvements planned for construction, the value of these improvements and within how many months of the effective date of the lease these improvements be finished.

In addition to the above requirements, QUARRY LICENSE or QUARRY CONCESSION AGREEMENT applicants must provide the following information:

- A description by meters and bounds of the land applied for;
- The name of the specified substances that the applicant desires to remove from the area; and
- A sketch showing clearly the position of the parcel in relation to a survey monument, prominent topographical feature or other known point and shown in its margin, copies of the markings on the posts or cairns.

- If for commercial use, the description shall contain an affidavit sworn by the applicant setting forth:
  - i) that the land contains material of the kind applied for in merchantable quantities;
  - ii) that the volume of specified substances are required for a project that has been approved by the appropriate level of government; and
  - iii) that the applicant has obtained a contract for the delivery of those Specified Substances.

Please prepare this project description on a separate sheet of paper and attach it to your application form marked as APPENDIX A. Return the original, signed and dated application form, with attached APPENDICES A and B and all ORIGINAL maps of the area to the KIA Lands Office at Box 315, Kugluktuk, NT, X0E 0E0.

Indian and Northern Affairs Canada / Affaires indiennes et du Nord Canada

Application for Crown Land: *Demande visant des terres publiques*	*Office Use Only - Usage interne seulement : Application Number - Numéro de demande :*	

Note to the Applicant:

This form is the first step in your application for Federal Crown Lands.

Applications are reviewed by government agencies responsible for land use, and the regulation of activity in the NWT. This form is intended to help both you and government. It is not a legal document, but a means of providing the people who have to deal with your application information needed to decide on the application's merit. Most importantly, in filling out the form you will better understand some of the steps that have to be taken in planning and carrying out a successful enterprise.

You are advised to read the entire application form before you begin to fill it out. The amount of space provided for each question suggests the level of detail expected. However, you may be asked to supply further additional information. This is an application only, and in no way implies the granting of an approval to the applicant.

Note au demandeur :

Le présent formulaire est la première étape du processus de demande.

Les demandes sont examinées par des organismes gouvernementaux responsables de l'utilisation des terres et de la réglementation des activités dans les T. N.-O. Le formulaire aidera à la fois le demandeur et le gouvernement. Il ne s'agit pas d'un document légal, mais d'un moyen de donner aux personnes qui traiteront votre demande les renseignements nécessaires pour déterminer le bien-fondé de la demande. De plus, en remplissant la demande, vous comprendrez mieux certaines étapes de la planification et de la mise sur pied d'une entreprise vouée au succès.

Nous vous encourageons à lire le formulaire avant de commencer à le remplir. L'espace fourni pour chaque question donne une idée de la quantité de détails attendus. Cependant, vous devrez peut-être fournir des renseignements supplémentaires. Le formulaire n'est qu'une demande et ne signifie aucunement que le projet sera approuvé.

A. Information on Applicant - Renseignements sur le demandeur :

Name in Full Nom complet :	ANTHONY J. KEEN	Legal Age Âge légal :	
Address Adresse :	SUITE 340, 666 BURRARD ST., VANCOUVER, BC V6C 2X8		
Telephone Number: (h) N° de téléphone : (d) Telephone Number: (w) N° de téléphone : (t)	604-682-4667 888-734-5773	Occupation: Profession : Employer: Employeur :	PROJECT MANAGER
Name of Spouse: Nom du conjoint :		Occupation: Profession : Employer: Employeur :	

Information on Company, Corporation or Association - Renseignements sur l'entreprise, la société en nom collectif ou l'association :

Name of Company or Association Nom de la société ou de l'association :	BATHURST INLET PORT & ROAD JOINT VENTURE*				
Address: Adresse :	KITIKMEOT CORP.: BOX 18 CAMBRIDGE BAY, NU, X0B 0C0. NUNA: 9839 31 AVE, EDMONTON, AB T6N 1C5				
Are you registered at the NWT Companies Registry: Êtes-vous inscrit dans le répertoire des sociétés des T. N.-O.?	Yes: ☐ No: ☑ Oui : ☐ Non : ☐				
Telephone Number: Numéro de téléphone :	KC: 867-983-2200 NUNA: 1-800-434-9434	Type of Business: Type d'entreprise :	CONSTRUCTION & OPERATION OF PORT & ROAD PROJECT.	Date & Place of Incorporation: Date et lieu de la constitution en corporation	N/A.

Name and Address of person to whom Inquiries related to this application should be addressed - Nom et adresse de la personne à qui adresser les questions concernant la demande :

Name: Nom :	A.J. KEEN, P. ENG.	Telephone Number: Numéro de téléphone :	604-682-4667 1-888-734-5773
Address: Adresse :	SUITE 340, 666 BURRARD ST. VANCOUVER, BC V6C 2X8		

(Note: WILL BE A JOINT VENTURE BETWEEN KITIKMEOT CORPORATION AND NUNA LOGISTICS LIMITED) (50/50).

Indian and Northern Affairs Canada / Affaires indiennes et du Nord Canada

I hereby make application to: Lease: ☑ Purchase: ☐
Objet de la présente demande : Location ☐ Achat ☐

Lease with Purchase Option: ☐ Reserve (Govt. Only): ☐
Location avec option d'achat ☐ Réserve (gouv. seul.) ☐

Transfer (Govt. Only): ☐
Transfert (gouv. seul.) ☐

?

If two or more persons are applying for this land please signify the type of Tenancy desired:
Si plus de deux personnes font une demande pour ces terres, indiquez le type de tenance désiré :

Joint Tenancy: ☐ Tenancy in Common: ☐
Tenance conjointe ☐ Tenance commune ☐

Definition - Définitions :

Joint Tenancy - The primary purpose of Joint Tenancy is the right of survivorship, upon the death of one joint tenant, their interest passes to the other joint tenant automatically, and at length to the last survivor.
Tenance conjointe - L'objectif principal de la tenance conjointe est le droit de survie. À la mort d'un des locataires conjoints, ses intérêts vont automatiquement à l'autre locataire, et ce, jusqu'à sa mort.

Tenancy in Common - A form of ownership whereby each tenant (Owner or Lessee) holds an undivided interest in property. Upon the death of one of the individuals their property interest passes to their heirs.
Tenance commune - Une forme de propriété où chaque locataire (propriétaire ou preneur à bail) détient un intérêt indivis sur la propriété. À la mort d'un des individus, les intérêts vont à leurs héritiers.

Purpose the land is to be used for - Les terres seront utilisées à des fins :

Commercial/Commerciales : ☐ Industrial/Industrielles : ☑ Residential/Résidentielles : ☐ Other (specify)/Autre (spécifier) : ☐

B. COMMERCIAL/INDUSTRIAL APPLICATIONS - UTILISATION À DES FINS COMMERCIALES/INDUSTRIELLES:

Commercial applications may require approvals from the GNWT (Economic Development & Tourism), prior to this Department's issuing any approvals of this application.
Les utilisations à des fins commerciales peuvent exiger l'approbation du gouvernement des T. N.-O. (Développement économique et Tourisme) avant que le Ministère n'approuve la présente demande.

Type of industrial or commercial use (describe in detail) - Type d'utilisation industrielle ou commerciale (décrire en détail)

COMMERCIAL PORT AND TOLL ROAD

Are there any waste products produced by this use? YES: ☑ NO: ☐
Des déchets seront-ils produits? OUI : ☐ NON : ☐

If YES describe the type of waste, the volume of waste and the disposal method(s) to be used:
Si OUI, décrivez le type de déchets, le volume de déchets et la (les) méthode(s) d'élimination :

1. SEWAGE FROM CAMP - TO BE TREATED PRIOR TO DISPOSAL
2. WASTE OIL - TO BE CONSUMED IN WASTE OIL BURNER
3. GARBAGE TO BE INCINERATED

Are there any hazardous materials to be stored other than consumer goods? (Fuel, etc.) YES: ☑ NO: ☐
Des matériaux dangereux, autre que des biens de consommation (essence, etc.), seront-ils entreposés? OUI : ☐ NON : ☐

If YES please list the type, estimated quantities and storage method(s).
Si OUI, dressez la liste des matériaux, la quantité approximative et les méthodes d'entreposage.

SEE ATTACHED.

*(Hazardous materials as defined in the Transportation of Dangerous Goods Act and Regulations of the Workplace Hazardous Material Information System).
*(Les matériaux dangereux sont définis dans la *Loi de 1992 sur le transport des marchandises dangereuses* et dans le *Règlement sur le système d'information relatif aux matières dangereuses dans le lieu de travail.*)

C. PARCEL DESCRIPTIONS - DESCRIPTIONS DE LA PARCELLE :

General Description of Parcel (Hilly or Flat, Tree Cover, Soil Type) (if surveyed, state lot and block or group number. If unsurveyed, state size of parcel and general area).
Description générale de la parcelle (accidenté ou plat, couvert végétal, type de sol) (si arpenté, indiquer le numéro du lot et du bloc ou du groupe. Sinon , indiquer les dimensions de la parcelle et la région en général.)

UNSURVEYED ROLLING TUNDRA.
FOR AREAS SEE ATTACHED.

Indian and Northern Affairs Canada | Affaires indiennes et du Nord Canada

Project Description - Description du projet :

Briefly describe your general purpose and goals. This is your chance to explain in your own words, your plans and objectives.
Décrivez brièvement vos objectifs généraux. Expliquez vos plans et objectifs en vos propres mots.

SEE PROJECT DESCRIPTION ATTACHED.

Project Location - Emplacement du projet :

Provide an NTS map on a 1:50,000 scale indicating:

- Approximate boundaries of land area under application in metres/feet or milepost or road, is applicable
- Nearby water bodies
- Distance to nearest community
- Existing access if any
- Proposed new access routes
- Use of adjacent land
- Co-ordinates

Fournissez une carte SNRC ayant une échelle de 1:50 000 indiquant :

- Les limites approximatives de la superficie des terres utilisées en mètres/pieds (indiquer les limites kilométriques et les routes, le cas échéant)
- Les nappes d'eau environnantes
- La distance à la localité la plus proche
- Les routes d'accès existantes, le cas échéant
- Les nouvelles routes d'accès proposées
- L'utilisation des terres environnantes
- Les coordonnées

Indicate approximate area of land under application in hectares: Indiquez la superficie approximative, en hectares, des terres utilisées :	PORT & CAMP/AIRSTRIP 150.1 ha ALL WEATHER ROAD 248.7 ha
Standard NTS Map Co-ordinates: Coordonnées de la carte SNRC normalisée : SEE ATTACHED	Latitude:
Map Sheet Number: Numéro de la feuille topographique :	Longitude:

D. CONSTRUCTION PLANS - PLANS DE CONSTRUCTION :

Briefly describe any existing building and/or construction of facilities that you plan. Use your sketch for illustration.
Décrivez brièvement tout bâtiment existant ou la construction prévue d'installations. Utilisez votre croquis.

SEE PROJECT DESCRIPTION ATTACHED

Value of improvements already on the land:
Valeur des améliorations déjà apportées au site : N/A

Name of owner of improvements:
Nom du propriétaire des installations en question : N/A

Describe briefly your planned construction methods and materials:
Décrivez brièvement les méthodes et les matériaux de construction que vous prévoyez utiliser :

SEE PROJECT DESCRIPTION ATTACHED.

Outline your time schedule for your construction program. Indicate approximate starting, construction stage and completion times:
Donnez un aperçu du calendrier de votre programme de construction. Indiquez, de façon approximative, les dates correspondant au début et à la fin des travaux :

CONSTRUCTION TO BEGIN SEPTEMBER 2004 & COMPLETE OCTOBER 2006.

Describe existing and proposed methods of access, and transportation for your project:
Décrivez les méthodes d'accès et les moyens de transport existants et prévus pour votre projet :

MARINE ACCESS AT BATHURST INLET, WINTER ROAD ON CONTWOYTO LAKE. FUTURE AIRSTRIPS IN ADDITION TO EXISTING ACCESS.

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E. WATER - EAU :

Do you plan to use water at your facility(s)? If so, estimate the volume to be used per day:
Prévoyez-vous utiliser de l'eau dans vos installations? Si oui, quel en sera le volume approximatif par jour?

POTABLE WATER AT CAMPS
DUST SUPPRESSION ON ROAD.

Does your plan involve the alteration of any water course? (ie: construction of dams or diverting natural water flows) If so, describe the proposed changes:
Est-ce que votre plan prévoit la modification d'un cours d'eau? (c.-à-d. construction de barrages ou détournement d'un cours d'eau) Si oui, décrivez les changements prévus :

NO WATER COURSES WILL BE ALTERED.

How do you plan to dispose of - Comment prévoyez-vous éliminer :

Liquid Waste - les déchets liquides : SEWAGE TREATMENT

Solid Waste - les déchets solides : COMBUSTIBLE BY INCINERATION; NON-COMB., EXPORT.

If you have specific waste treatment equipment in mind, please describe it:
Si vous croyez utiliser de l'équipement spécifique pour le traitement des résidus, veuillez le décrire ci-dessous :

INDUSTRIAL INCINERATOR FOR GARBAGE; WASTE OIL BURNER FOR USED ENGINE OIL & LUBRICANTS.

F. OPERATIONS - EXPLOITATION :

Is your use: Year-round ☑ Or: Seasonal ☐
L'exploitation sera : Ouverte à l'année ☐ Ou Saisonnière ☐

If seasonal, give details - Dans le cas d'une exploitation saisionnière, donnez des détails :

How many year round residents will be living at the site: FLY IN/FLY OUT ROTATION FOR ALL WORKERS
Combien de résidants habiteront sur le site à l'année? :

G. RESOURCE CAPABILITY - CAPACITÉ DES RESSOURCES :

What other general resource activities are taking place on or near your proposed project area, e.g., does the area involve a trapline or any mining activity? Is it an access point for resident anglers, hunters, campers, etc. Is there a registered mineral claim on the project area?
Quelles autres activités générales relatives à des ressources auront lieu sur le site ou dans les environs de la région proposée, p. ex. est-ce que la région comprend des territoires de piégage ou des activités minières? Est-ce un point d'accès pour les pêcheurs, chasseurs, campeurs, etc. du coin? Y a-t-il une concession minière enregistrée dans la zone visée par le projet?

NO KNOWN SUBSISTENCE OR RECREATIONAL LAND USE IN AREA ON FULL TIME OR REGULAR BASIS.

Do you see any activity listed in your answer to the above affecting your operation, or is your operation a conflict to them? If so, how?
Parmi les activités susmentionnées, y en a-t-il qui auront des conséquences sur votre exploitation, ou est-ce votre exploitation qui leur sera préjudiciable? Si oui, de quelle façon?

No.

Do you plan on using your facilities for other than the applied for purposes? If yes, briefly describe alternate use.
Prévoyez-vous utiliser vos installations à d'autres fins que celles décrites ci-dessus? Si oui, décrivez-les brièvement.

No.

Indian and Northern Affairs Canada / Affaires indiennes et du Nord Canada

H. FINANCIAL CONSIDERATIONS - CONSIDÉRATIONS FINANCIÈRES :

Provide a brief description of the capital costs for your project:
Donnez une brève description des coûts d'immobilisation de votre projet : SEE ATTACHED PROJECT DESCRIPTION

Site Preparation: Préparation du site :	
Materials for initial construction: Matériaux pour la construction initiale :	TOTAL COST $215 MILLION ON BOTH CROWN AND IOL LANDS.
Construction Costs: Coûts de construction :	

Provide a time framework within which these capital costs will be incurred, ie: estimate costs per phase on your construction schedule (section D)
Donnez un calendrier dans lequel les coûts d'immobilisation seront inclus, c.-à-d. les coûts estimés par phase selon votre calendrier de construction (section D)

SEE "D" ABOVE.

Is there any additional information you wish to include:
Y a-t-il des renseignements supplémentaires que vous voulez inclure?

SEE PROJECT DESCRIPTION ATTACHED.

L. FEES - FRAIS :

Land Application Fee ($150.00) (except Government Agencies): Frais des demandes concernant les terres (150 $) (sauf pour les organismes gouvernementaux) :	$ 150.00
GST for all applications ($10.50) (except "Residential"): TPS pour toutes les demandes (10,50 $) (sauf dans le cas des terres utilisées à des fins "résidentielles") :	$ 10.50
TOTAL FEES SUBMITTED with this application: TOTAL DES FRAIS PAYÉS (paiement joint à la demande) :	$ 160.50

PLEASE MAKE CHEQUE/MONEY ORDER PAYABLE TO: "RECEIVER GENERAL FOR CANADA"
VEUILLEZ LIBELLER VOTRE CHÈQUE À L'ODRE DU "RECEVEUR GÉNÉRAL DU CANADA"

I hereby acknowledge and confirm that the filing of this application does not grant me any rights to take, occupy or use the land for which I have applied.
Je reconnais et confirme que le fait de remplir la présente demande ne me donne aucun droit d'occuper ou d'utiliser les terres visées ou d'en prendre possession.

I certify that the information I have given in this application is correct, to the best of my knowledge.
J'affirme que les renseignements fournis dans la présente demande sont corrects, au mieux de mes connaissances.

Signature of Applicant: Signature de demandeur :	A Keen P. Eng.	Date: April 2, 2002.
Signature of Joint Applicant: Signature du demandeur conjoint :		Date:

AFFIX COMPANY SEAL, IF APPLICABLE
APPOSER LE SEAU DE LA SOCIÉTÉ, LE CAS ÉCHÉANT

Indian and Northern Affairs Canada / Affaires indiennes et du Nord Canada

APPLICATION FOR LAND USE PERMIT
DEMANDE DE PERMIS D'UTILISATION DES TERRES

Office use only - Réservé pour usage interne seulement

Application fee - Droits de demande de permis	Land use fee - Droits d'utilisation des terres	General receipt no. - N° de reçu	Date	Class-Catégorie	Permit No.-N° de permis

To be completed by all applicants - A remplir par tous les requérants ▸ **New application** **Amendment**

1. Applicant's name and mailing address (Full name, no initials) - Nom et adresse du ou des requérant (s) Nom au complet, pas d'initiales)

BATHURST INLET PORT & ROAD JOINT VENTURE

Fax no. - N° de télécopieur

604-682-4473/888-734-5771

Telephone no. - N° de téléphone

604-682-4667/888-734-5773

2. Head office address - Addresse du siège social (SEE APPLICATION FOR CROWN LAND LEASE)

Fax no. - N° de télépieur

Telephone no. - N° de téléphone

Field supervisor - Chef de chantier — Radio telephone - Téléphone-radio — Telephone no. - N° de téléphone

A. J. KEEN — 604-682-4667 / 888-734-5773

3. Other personnel (Subcontractor, contractors, company staff, etc.) - Autre personnel (sous-Traitants, entrepreneurs, personnel desociété, etc.)

TOTAL:

4. Qualifications - Titres
refer to Section 21 - Territorial Land Use Regulations
consultez l'article 21 - du Règlement sur l'utilisation des terres territoriales

No(s) exploration permit mineral claims - if applicable
N°(s) des permis d'exploration minière, s'll y a lieu

a(i) ☐ a(ii) ☐ a(iii) ☐ b ☐ c ☑

5. a) Summary of operation (Describe purpose, nature and locations of all activities - refer to Section 22 (2) (b) - Territorial Land Use Regulations). (Use last page of form if additional room is required).
Résumé des opérations (exposez le but, la nature ainsi que l'emplacement de toutes les activités - consultez l'article 22 (2)(b) - du Règiement sur l'utilisation des terres territoriales). Utilisez la dernière page du formulaire si vous avez besoin d'espace supplémentaire).

PLEASE SEE PROJECT DESCRIPTION ATTACHED.

b) Please indicate if a camp is to be set up (Use last page to provide details).
Indiquez si un camp doit être aménagé (Utilisez la dernière page pour donner des détails).

PLEASE SEE PROJECT DESCRIPTION ATTACHED.

6. Summary of potential environmental and resource impacts (Describe the effects of the proposed program on land, water, flora & fauna and related socio-economic areas (Use separate pages if necessary)
Résumé des conséquences possiblies sur l'environnement et les ressources (décrire les effets du programme proposé sur les terres, l'eau, la flore etla faune et les domaines socio-économiques connexes (Utilisez des pages supplémentaires au besoin)

PLEASE SEE PROJECT DESCRIPTION ATTACHED.

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2-209 A (9-93) 7530-21-036-2872

7. Proposed restoration plans (please use last page if required) - Plans proposés de remise en état des terres (au besoin, utilisez la dernière page).

PLEASE SEE PROJECT DESCRIPTION ATTACHED.

8. Other rights, licenses or permits related to this permit application (mineral claims, timer permits, water licences, etc.)
Autres droits, autotisations ou permis associés à cette demande de permis (claims miniers, permis de coupe, permis d'exploitatoin hydraulique, etc.) INUIT LANDUSE LICENCE APPLIED FOR, TO KIA.
WATER USE LICENCE APPLIED FOR, TO NUNAUT WATER BOARD.

Roads: ☐ Is this to be a pioneered road? ☑ Has the route been laid out of ground truthed? ☐ Has funding been applies for i.e. RTAP?
Routes: Please provide details on back page / La tracé a-t-il été établi et le terrain nivelé ? / Avez-vous demandé du financement?
La route doit-elle être aménagée?
Donnez les détails sur la dernière page

9. Proposed disposal methods - Méthodes d'élimination proposées

a) Garbage: Ordures: INCINERATION

b) Sewage (Sanitary & Grey Water): Eaux usées (Eaux d'égoût et eaux ménagères) TREATMENT PLANT

c) Brush & trees: Brousailles et arbres:

d) Overburden (Organic soils, waste material, etc.): Terrain de recouvrement: (Dépôts organiques, déchets, etc.) ROAD BUILDING MATERIAL

10. Equipment (includes drills, pumps, etc.) (Please use last page if required)
Matériel (comprend foreuses, pompes, etc.) (Utilisez la dernière page au besoin)

Type & Number - Type et nombre	Size - Dimension	Proposed use - Utilisation proposée
PLEASE SEE PROJECT DESCRIPTION ATTACHED.		

11. Fuels - Combustibles	(✓)	Number of containers - Nombre de réservoirs	Capacity of containers - Capacité des réservoirs
- Diesel	✓	12	202 Million litres.
- Gasoline - Essence			
- Aviation Fuel - Carburant aviation			
- Propane			

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- Other			

12. Containment fuel spill contingency plans (Please attach separate contingency plan if necessary)
Plans d'urgence d'isolement de carburant en cas de déversement (veuillez joindre un plan d'urgence distinct au besoin)

FULL SUITE OF CONTINGENCY PLANS TO BE FILED WITH EIS.

13. Methods of fuel transfer (To other tanks, vehicles, etc.) - Méthodes de transfert des combustibles (vers d'autres réservoirs, véhicules, etc.)

CSA APPROVED PUMPS & CONTROLS.

14. Period of operation (includes time to cover all phases of project work applied for, including restoration)
Période d'opération (comprend toute période du début à la fin des projets, y compris la remise en érat)

PROJECT CONSTRUCTION SEPT. 2004 - OCT. 2006
PROJECT OPERATIONS 20+ YEARS.

15. Period of permit (up to two years, with maximum of one year extension) Start date - Date du début du projet Completion date - Date d'achèvement
Période du permis (valide pour une durée de deux ans et prolongation maximale d'un an) ➤ SEPT 2004 ➤ SEPT. 2007

16. Location of activities by map co-ordinates (attached maps and sketches)
emplacement de activités selon les coordonnées géographiques (cartes et esquisses ci-jointes)

N Lat Deg	MN Lat Min	MAX Lat Deg	MAX Lat Min
N Long Deg	MN Long Min	MAX Long Deg	MAX Long Min

Map Sheet No.
N°de feuille de carte ➤ PLEASE SEE PROJECT DESCRIPTION ATTACHE

17. Applicant - Requérant
Print name in full - Ecrie votre nom au complet en lettre moulée

➤ Aileen. (Signature) April 2/02. (Date)

18. Fees - Droits ☐ Class A $150.00 ☑ Class B $150.00

Land use fees: 398.8 Hectare @ $50.00 = $ 19,940.00
Droits d'utillsation des terres (Less than or equal to 2 ha.)

_____ Hectare @ $50.00 = $_____
(Each additional ha. Or portion of a ha. In excess of 2 ha.)

Total application and land use fees
Total des droits de demande de permis et d'utillisation des terres $ 20,090.00

Office use only - Réservé pour usage interne seulement

19. Calculation of area involved (including access, staging areas, airstrips, campsites, etc.)
Calcul des aires en cause (comprend l'accès, les aires de transit, les pistes d'atterrissage, les camps, etc.)

Total area (Ha.)	Less 2 hectares	TOTAL (For fee calculation)
Superficie totals	Moins 2 hectares (-2)	(Aux fine du calcul des droits)

20. Application checklist - Vérification de la demande

a) ☐ Application signed and dated
Demande signée et datée

f) ☐ Timber permit applied for
Permis de coupe du bois demandé

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b)	☐ Fees attached Droits ci-joints		g)	☐ Fees attached Droits ci-joints
c)	☐ Map included Carte incluse		h)	☐ Lease applied for Bail demandé
d)	☐ Address and telephone number Addresse et numéro de téléphone			
e)	☐ Screening report Rapport d'examen			

Accepted by - Acceptée par

Date

Indian and Northern Affairs Canada / Affaires indiennes et du Nord Canada

b)	☐ Fees attached Droits ci-joints		g)	☐ Fees attached Droits ci-joints
c)	☐ Map included Carte incluse		h)	☐ Lease applied for Bail demandé
d)	☐ Address and telephone number Addresse et numéro de téléphone			
e)	☐ Screening report Rapport d'examen			

Accepted by - Acceptée par

Date

Remarks - Remarques

Please use reverse page if additional space is required
Utiliser la derniere page sivous avez besoin d'espace supplementaire

Additional information (attach additional pages if necessary) - Renseignements additionnels (joindre des pages supplémentaires au besoin)

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APPLICATION FOR QUARRYING PERMIT
DEMANDE DE PERMIS POUR L'EXPLOITATION D'UNE CARRIÈRE

NAME - NOM : A.J. KEEAN
OCCUPATION - PROFESSION : PROJECT MANAGER
EMPLOYER - EMPLOYEUR : BATHURST INLET PORT & ROAD PROJECT.

I hereby apply for à Quarrying Permit for the purpose of taking:
Je demande un permis pour l'exploitation d'une carrière afin d'extraire :
2,340,000 cubic metres of - mètres cubes de ROCK
347,000 cubic metres of - mètres cubes de GRANULAR
_____ cubic metres of - mètres cubes de _____
FROM - DE : (Location of Pit- Emplacement de la carrière) : PORT AREA (700,000 m³) AND ROAD ALIGNMENT NTS MAP SHEET # - N° de la carte SNRC_____
Co-ordinates - Coordonnées PLEASE SEE ATTACHED DRAWINGS.

1. Is any part of the land occupied? And if so, by whom and for what purpose?
   Est-ce qu'une partie des terres est occupée? Si oui, par qui et à quelles fins?
   NO.

2. The only buildings or other improvements on the said lands are as follows:
   Bâtiments construits sur le site ou aux autres améliorations prévues :
   (A) Nature of improvements - Nature des améliorations : N/A
   (B) Value of improvements - Valeur des améliorations : N/A
   (C) Owner of improvements - Propriétaire des améliorations : N/A

3. The land is/~~is~~ not wooded (If wooded, describe species of trees and approximate size.)
   Les terres sont/ne sont pas boisées (Si elles sont boisées, décrire les espèces d'arbres et l
   approximative.)

4. The attached plan is a sketch plan of the said land as required by the Territorial Quarryin
   Un plan des terres susmentionnées est joint à la présente demande conformément au *Règ*
   l'exploitation de carrières territoriales.

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I enclose the required fees as indicated below:
J'inclus les droits de permis indiqués ci-dessous :

QUARRY PERMIT FEE
DROITS DU PERMIS D'EXPLOITATION.....$150.00 TOTAL $ 150.00
ROYALTIES ON SAND, GRAVEL LOAM.
REDEVANCES SUR LE SABLE,LE GRAVIER
ET LA TERRE BLANCHE
Per cubic metre - Par mètre cube :.....347,000.....$ 1.50 TOTAL $ 520,500
ROYALTIES ON OTHER BUILDING MATERIALS
REDEVANCES SUR LES AUTRES MATÉRIAUX DE CONSTRUCTION
Per cubic metre - Par mètre cube :.....2,340,000.....$ 1.25 TOTAL $ 2,925,000

TOTAL FEES - COÛTS TOTAUX : $ 3,445,650.00

DATE: April 2/02
SIGNATURE OF APPLICANT - SIGNATURE DU DEMANDEUR _____

Indian and Northern Affairs Canada | Affaires indiennes et du Nord Canada

INFORMATION REQUIRED TO REGISTER A STORAGE TANK SYSTEM
RENSEIGNEMENTS NÉCESSAIRES POUR ENREGISTRER UN SYSTÈME DE STOCKAGE

The following information, as identified in Schedule 1, is required under Section 6 and 7 of the Registration of Storage Tank Systems for Petroleum Products and Allied Petroleum Products on Federal Lands Regulations to register a storage tank system.
Les renseignements suivants, tel qu'indiqué dans l'annexe 1, sont nécessaires pour enregistrer un système de stockage en vertu des articles 6 et 7 du *Règlement sur l'enregistrement des systèmes de stockage de produits pétroliers et de produits apparentés sur le territoire domanial.*

1. Name of owner - Nom du propriétaire BATHURST INLET PORT AND ROAD JOINT VENTURE
2. Address of owner - Adresse du propriétaire (SEE APPLICATION FOR CROWN LAND)
3. Name of operator, if different than storage tank owner - Nom de l'exploitant, si différent du propriétaire du réservoir de stockage
4. Name of landowner, if different than storage tank owner - Nom du propriétaire foncier, si différent du propriétaire du réservoir de stockage GOVERNMENT OF CANADA
5. Type of facility - Type d'installation DIESEL FUEL TANK FARM AT TIDEWATER PORT.
6. Location of storage tank system, if different than address of owner, unless the system is intended to be in place for less than 60 days, whereupon the system may be registered as having one or multiple temporary unspecified locations
Emplacement du système de stockage, si l'adresse est différente de celle du propriétaire, à moins que le système soit mis en place pour moins de 60 jours, le système peut alors être enregistré comme ayant un ou plusieurs emplacements temporaires non spécifiés
BATHURST INLET, NUNAVUT.
7. Capacity of storage tank, or combined capacity of storage tanks if there are more than one in the storage tank system - Capacité du réservoir de stockage, ou capacité combinée des réservoirs de stockage si le système compte plus d'un réservoir
220 million litres in 12 Tanks
8. Type of petroleum product or allied petroleum product stored - Type de produits pétroliers ou de produits apparentés qui seront stockés DIESEL FUEL
9. Year of installation of each storage tank in the system - Année d'installation de chaque réservoir de stockage dans le système NEW INSTALLATION 2004 - 2006
10. Type of storage tank material for each storage tank in the system - Type de matériau utilisé pour chaque réservoir de stockage du système STEEL WELDED IN PLACE
11. Type of piping material - Type de matériau utilisé pour les canalisations ASTM WELDED STEEL PIPE ; CSA APPROVED.
12. Corrosion protection provided, if applicable - Protection contre la corrosion fournie, le cas échéant YES, AS REQUIRED FOR TANKS & PIPE
13. Type of pump or pumps - Type de pompe(s) CSA APPROVED, CENTRIFUGAL PUMPS
14. Type of leak detection - Type de système pour la détection des fuites DOUBLE WALLED PIPE & DETECTION
15. Internal linings, if any - Revêtement intérieur, le cas échéant BOTTOM & 1 METRE OF WALL.
16. Type of secondary containment - Type d'enceinte de confinement secondaire ENGINEERED BERM, HDPE LINER, COVERED ; SUMPS ; CAPACITY OF BERM 200% OF VESSEL
17. Number of location of monitoring wells - Nombre d'emplacements de puits de surveillance N/A ON PERMAFROST TERRAIN
18. Type of overfill protection - Type de protection en cas de débordement ALARM WITH AUTOMATIC SHUT OFF BACK UP.

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19. Type of volatile organic compound (VOC) emission control - Type de contrôle des émissions de composés organiques volatils (COV) N/A.

20. Manufacturer of each storage tank in the system - Fabricant de chaque réservoir de stockage du système STEEL WELDED IN PLACE BY OWNER.

Registrations for aboveground storage tank systems must also include - Pour faire enregistrer les réservoirs de stockage en surface, il faut également fournir les renseignements suivants :

21. Type of diking - Type de diguement GRANULAR BERM WITH HDPE LINER

22. Type of storage tank, whether horizontal or vertical - Type de réservoir de stockage, horizontal ou vertical WELDED STEEL BUILT IN PLACE.