MGM ENERGY ENVIRONMENTAL PROTECTION PLAN:

Langley K-30, Langley E-07 and Kumak I-25 Well Abandonment Program

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Table of Contents

List of Tables

1.0 INTRODUCTION

1.1 ISR Abandonment Program

The Inuvialuit Settlement Region (ISR) well abandonment program consists of the abandonment of three wells in accordance with Canada Energy Regulator (CER) requirements. Permanent bridge plugs and cement will be used to isolate the downhole zones and the casing will be cut & capped below ground level.

1.2 Purpose and Scope of the Environmental Protection Plan

Due to the limited nature and short duration of these operations and their relatively low environmental impact, this document reflects the scale of the operations.

The sections of the above document that are relevant to the operations planned for the well abandonment and equipment removal (e.g. waste management, fundamental mitigation measures, etc.) have been incorporated in this document to create a field site-specific reference.

MGM Energy (MGM), is a wholly owned subsidiary of Paramount Resources Ltd (Paramount). This MGM Energy Environmental Protection Plan (EPP) is a component of the Paramount Operational Excellence Management System (POEMS), which is required to fulfill regulatory requirements. MGM's EPP Program is developed and maintained, implemented and improved according to the POEMS (Management System). The POEMS sets procedures for how activities will be carried out while, at the same time, ensuring compliance with requirements for safety, environmental protection and conservation of resources.

The POEMS addresses the items listed below.

a) the policies on which the system is based;
b) the processes for setting goals for the improvement of safety, environmental protection and waste prevention;
c) the processes for identifying hazards and for evaluating and managing the associated risks;
d) the processes for ensuring that personnel are trained and competent to perform their duties;
e) the processes for ensuring and maintaining the integrity of all facilities, structures, installations, support craft and equipment necessary to ensure safety, environmental protection and waste prevention;
f) the processes for the internal reporting and analysis of hazards, minor injuries, incidents and near-misses and for taking corrective actions to prevent their recurrence;
g) the documents describing all management system processes and the processes for making personnel aware of their roles and responsibilities with respect to them;
h) the processes for ensuring that all documents associated with the system are current, valid and have been approved by the appropriate level of authority;
i) the processes for conducting periodic reviews or audits of the system and for taking corrective actions if reviews or audits identify areas of non-conformance with the system and opportunities for improvement;
j) the arrangements for coordinating the management and operations of the proposed work or activity among the owner of the installation, the contractors, the operator and others, as applicable; and

k) the name and position of the person accountable for the establishment and maintenance of the system and of the person responsible for implementing it.

1.3 Responsibilities and Roles

Roles associated with the ISR abandonment program are presented in Table 1. The President and Chief Operating Officer of Paramount ultimately is accountable for the program.

The Environmental Coordinator is responsible for development and maintenance of the MGM EPP Program and assists with implementation, though it is the Managers of the Drilling and Operations departments that are responsible for implementation. The Onsite HSE advisor will be responsible for the MGM EPP Program field implementation. The region Vice President (VP), is the President's designate for the Inuvialuit Settlement Region (ISR). As such, the VP is responsible for working with the Environmental Coordinator and Managers of the Drilling and Operations departments to ensure that the MGM EPP Program is being implemented and, if not, for ensuring issues are addressed. If necessary, the VP will request assistance from the President.

Table 1: Abandonment Program - Personnel Contact Information

Title	Name	Contact
Completions Field Supervisor	TBD	Telephone: Email:
Completions Supervisor	Louis Borbely	Telephone:403-531-8147 Email: louis.borbely@paramountres.com
Completions Superintendent	Don Jones	Telephone: 403-303-5967 Email: don.jones@paramountres.com
Road and Bridge Maintenance Supervisor	Bob Raduenz	Telephone: 780-915-6630 Email: kevlan1@telus.net
Construction Supervisor	James Bjorklund	Telephone: 403-206-3802 Email: james.bjorklund@paramountres.com
Director, HSE	Darren Erdely	Telephone: 403-290-3664 Email: Darren.erdely@paramountres.com
Manager, Health and Safety	Jim White	Telephone: 403-261-1205 Email: jim.white@paramountres.com
Director, Asset Management	John Hawkins	Telephone: 403-817-5074 Email: john.hawkins@paramountres.com
Environmental Coordinator	Larry Yoon	Telephone: 403-290-6242 Email: larry.yoon@paramountres.com
Director, Drilling & Completions	Andre Poitras	Telephone: 403-206-3895 Email: andre.poitras@paramountres.com
Manager, Drilling and Completions	Ron Hands	Telephone: 403-303-5957 Email: ron.hands@paramountres.com
Vice President	Geoff McMillan	Telephone: 403-290-3601 Email: geoff.mcmillan@paramountres.com
Regulatory and Community Affairs Advisor	Terence Hughes	Telephone: 403-206-3859 Email: terence.hughes@paramountres.com
Emergency Management Coordinator	Lona Loeppky-Hickman	Telephone: 403-206-3835 Email: lona.loeppky-hickman@paramountres.com
Onsite HSE Advisor	TBD	Telephone: Email:

2.0 HAZARD REVIEW

2.1 A Summary of Studies Undertaken to Identify Environmental Hazards and to Evaluate Risks Relating to the Proposed Work or Activity

The Canadian Environmental Assessment Act (CEAA) screening of the *North Langley, Winter 2003 Drilling Program* was reviewed to evaluate potential environmental risks associated with abandonment activities in the area. The following potential impacts and mitigative measures are summarized below.

Environmental Impacts Specific to Abandonment in the Inuvialuit Settlement Region

2.1.1 **Extent of Physical Footprint** - This project will use the existing wellsite and winter roads. If a camp is required, it will be located on an existing camp disturbance. Potential physical disturbance to the ground will be the short overland access to the wellsite.

The recommendations and requirements of the Land Use Permit will be followed, along with good environmental and industry practices.

Environmental risk or effect from this project:
Potential effects of the proposed work or activity on extent of physical footprint is predicted to have a negligible environmental consequence because there will be no new surface disturbance required for this specific project. MGM will ensure good environmental and industry practices are followed

2.1.2 **Water Quality** - The Review Board recognized previous public concern with the potential for destabilization and erosion of stream banks. MGM will ensure best current industry practices will be followed to ensure that such impacts are minimized. Recommendations and procedures from past and present screening documents will be used as a guideline. Debris will not enter or be disposed of into water bodies.

Environmental risk or effect from this project:
A potential environmental hazard from the suspension project is water contamination from a surface spill. Surface water effects are predicted to have a low environmental consequence because there will be no additional disturbance. Operations will be conducted in the winter, when cleanup of any spill will be facilitated prior to any contaminant entering the watershed. Groundwater effects are predicted to be negligible. MGM has in place an emergency response plan to respond to, report on and clean-up any spills of chemicals, fuels or other harmful substances. MGM will follow best industry practices to ensure that such emissions are minimized.

2.1.3 **Air Quality** - No flaring is planned as part of the project. A small low pressure, sweet gas head will likely be present in the casing and this will be vented as part of the well kill procedure at the beginning of operations. There is no H2S associated with this well(s).

Environmental risk or effect from this project:
There is negligible risk of air contamination due to the nature of the well and the planned operations.

2.1.4 **Wildlife** - Due to the short duration of the project, long term wildlife data collection, monitoring and cumulative effect assessment are not appropriate.

Environmental risk or effect from this project:
Effects to wildlife habitat are predicted to be negligible due to the fact there will be no increased land disturbance and the proposed work is of short duration.

2.1.5 **Abandonment and Restoration** - This program is the continuation of the program recommended by the Review Board during the initial approval. Immediate activities are the abandonment of five wells. Removal of surplus equipment and reclamation of the wellsite will occur as part of this program

Environmental risk or effect from this project:
Effects from suspension are predicted to be negligible due to the fact there will be no additional disturbance for the proposed work or activity, beyond the existing wellsite and access roads.

2.2 A Summary of the Measures to Avoid, Prevent, Reduce or Manage Environmental Risks

The measures to avoid, prevent, reduce or manage environmental risks are presented in the appendices below.

- Appendix 1: Fundamental Mitigation (including existing guidelines, best management practices and corporate procedures referenced therein); and
- Appendix 2: Task-specific Mitigation (including existing guidelines, best management practices and corporate procedures referenced therein).

3.0 APPLICABLE PROCEDURES

3.1 Critical Structures, Facilities, Equipment & Systems

Structures, facilities, equipment and systems critical to environmental protection are listed in Table 2. Systems in place for their inspection, testing and maintenance include:

• Rig inspection and certification program;

• Paramount Resources Drilling & Completions Supervisors Handbook; and

• Weekly completion of CAODC Drilling Rig and Service Rig Inspection Checklists while the rig is operating.

Table 2: List of Structures, Facilities, Equipment and Systems Critical to Environmental Protection

Structure, Facility, Equipment or System	Function
Blow-out Prevention and related systems	Blow-out prevention and related systems are designed to control underground pressure that has the potential to reach the surface and cause a blow-out.
Boilers	A closed pressure vessel with a furnace to burn coal, oil, or gas, used to generate steam from water.
Containment Tanks	A secondary containment system designed to contain leakage and prevent it from impacting the surrounding environment.
Completion fluid system	The main functions of completions fluids include providing hydrostatic pressure to prevent formation fluids from entering the well bore, keeping the mill cool and clean during milling of cement and mechanical plugs, carrying out cuttings and suspending the cuttings while milling is paused, and the assembly is brought in and out of the hole. The completion fluid used for a particular job is selected to avoid formation damage and to limit corrosion.
Shut down devices	Because of the size, speed, and risk involved in the use of rig assist snubbing units and service rigs, safety shutdown systems are used to stop pipe rotation in an emergency.

3.2 Chemical Selection

No “process chemicals” or “drilling fluid agents” will be used in this program.

3.3 Waste Management

A description of equipment and procedures for the treatment, handling and disposal of waste material is provided in Table 3 below.

Table 3: MGM Energy Abandonment Waste Stream and Waste Management Plan.

Because of the small volume of various wastes which may be generated during this activity, a combination waste bin will be provided, and a specialized waste management contractor will handle disposal of the contents at the end of the project

Waste	Storage	NWT Classification	BC Classification	AB Classification	AER Code	Shipping Name	Class	UN #	Packing Group	Disposal
Aerosol Cans (flammable)	Waste Bin-HAZ	HAZ	HAZ	DOW	WSTCGS	AEROSOLS, flammable	2.1	UN1950	-	Turnkey management ofHAZ waste provided by contractor
Aerosol Cans (non-flammable)	Waste Bin-HAZ	HAZ	HAZ	DOW	EMTCON	AEROSOLS, non - flammable	2.2	UN1950	-	Turnkey management ofHAZ waste provided by contractor
Barrels, Pails (Completely Empty)	Waste Bin	Non-HAZ	Non-HAZ	Non-DOW	EMTCON	-	-	-	-	Turnkey management of non-HAZ waste providedby contractor
Batteries (Dry Cell)	General Recyclable – Various [see *Guideline for the Management of Waste Batteries* (GNWT, 1998) for recommendation]	Non-HAZ	Non-HAZ	Non-DOW	BATT	-	-	-	-	Turnkey management of non-HAZ waste provided by contractor
Batteries (Dry Cell)		HAZ	HAZ	DOW	BATT	Batteries, dry, containing potassium hydroxide solid, electric storage	8	UN3028	III	Turnkey management of non-HAZ waste provided by contractor
Boiler Blowdown Water (contaminated with HAZ material - dependent on boiler chemicals)	Steel Tank	HAZ	HAZ	DOW	BLBDWT	Environmentally hazardous substance, liquid, N.O.S.	9	UN3082	III	Service rig contractor to arrange transport & disposal at licenced facility in BC or AB
Boiler Blowdown Water (non-contaminated with HAZ material)	Steel Tank	Non-HAZ	Non-HAZ	Non-DOW	BLBDWT	-	-	-	-	Service rig contractor to arrange transport & disposal at licenced facility in BC or AB
Cardboard	Stockpile	Non-HAZ	Non-HAZ	Non-DOW	-	-	-	-	-	Incinerate daily
Cement Returns	Retarded or diluted in steel tank	Non-HAZ	Non-HAZ	Non-DOW	Cement	-	-	-	-	Transport & disposal at licenced facility in BC or AB
Chemicals (inorganic)	Original Containers	HAZ	HAZ	DOW	INOCHM	Dependent on specific waste characteristics (consult TDG Regulations)				Contact Chemical Waste Exchange
Construction and Demolition Material (uncontaminated)	Stockpile	Non-HAZ	Non-HAZ	Non-DOW	CONMAT	-	-	-	-	Turnkey management of non-HAZ waste providedby contractor
Contaminated Debris and Soil (Chemical/Solvent/Oil/ Produced Water)	**Contact Paramount Environmental Dept**				SOILCH SOILCO SOILPW	Dependent on specific waste characteristics (consult TDG Regulations)				Contact Paramount Environmental Dept for approved landfill location
Filters – Lube Oil	Waste Bin-HAZ	HAZ (depending on flash point and BTEX content)	HAZ (depending on flash point and BTEX content)	DOW (depending on flash point and BTEX content)	FILLUB	Environmentally Hazardous Substance, Solid N.O.S. (lead)	9	UN3077	III	Turnkey management of HAZ waste provided by contractor
Grease Cartridges (Completely Empty)	Waste Bin- non HAZ	Non-HAZ	Non-HAZ	Non-DOW	EMTCON	-	-	-	-	Turnkey management of non-HAZ waste provided by contractor
Hydraulic and Transmission Oil	Waste Bin- non HAZ				HYDOIL	-	-	-	-	Turnkey management of non-HAZ waste provided by contractor

Waste	Storage	NWT Classification	BC Classification	AB Classification	AER Code	Shipping Name	Class	UN #	Packing Group	Disposal
Kitchen Waste	Temporary Waste Receptacle	Non-HAZ	Non-HAZ	Non-DOW	-	-	-	-	-	Incinerate daily
Incinerator (kitchen waste)	General & Industrial non- HAZ Waste	Non-HAZ	Non-HAZ	Non-DOW	INCASH	-	-	-	-	Turnkey management of non-HAZ waste (ash) provided by contractor
Lead Based Products (Pipe Dope/Greases)	Waste Bin-HAZ	HAZ	HAZ	DOW	LDDOPE	Dependent on specific waste characteristics (consult TDG Regulations)				Turnkey management of HAZ waste provided by contractor
Lubricating Oil (Hydrocarbon and Synthetic)	Above ground disposal tanks; L&P Disposal Receptacles	Non-HAZ (unless containing heavy metals such as Vanadium or Lead	Non-HAZ (unless containing heavy metals such as Vanadium or Lead	Non-HAZ (unless containing heavy metals such as Vanadium or Lead	LUBOIL	-	-	-	-	Turnkey management of HAZ waste provided by contractor
Metal (Scrap) (uncontaminated)	Industrial Recyclable – Scrap Metal	Non-HAZ	Non-HAZ	Non-DOW	SMETAL	-	-	-	-	Recycle location - TBD
Mud Sacks – Drilling	Waste Bin- non HAZ	Non-HAZ	Non-HAZ	Non-DOW	EMTCON	-	-	-	-	Turnkey management of non-HAZ waste provided by contractor
Pipe Dope Containers/Brushes (Completely Empty & Dry)	Waste Bin- non HAZ	Non-HAZ	Non-HAZ	Non-DOW	EMTCON	-	-	-	-	Turnkey management of non-HAZ waste provided by contractor
Sewage (Temporary Camps)	Sewage Sump or Storage Tank	Non-HAZ	Non-HAZ	Non-DOW	-	-	-	-	-	Transport & disposal at licenced facility in BC or AB
Thread Protectors – Casing/Tubing	Waste Bin- non HAZ	Non-HAZ	Non-HAZ	Non-DOW	THPROT	-	-	-	-	Turnkey management of non-HAZ waste provided by contractor
Wash Fluids - Water	Steel Tank	Testing Required			WSHWTE	Environmentally Hazardous Substance	9	UN3082	III	Transport & disposal at licenced facility in BC or AB
Water - Grey (Temporary Camp)	Sewage Sump or Grey water holding tank	Non-HAZ	Non-HAZ	Non-DOW	-	-	-	-	-	Transport & disposal at licenced facility in Inuvik or Tuktoyuktuk

Notes:

DOW: Dangerous Oilfield Waste HAZ: Hazardous

Packing Group: A group in which dangerous goods are included based on the inherent danger of the dangerous goods.

Packing Group I indicates great danger

Packing Group II indicates medium danger

Packing Group III indicates minor danger

3.4 Discharge Streams

Discharge streams into the natural environment resulting from the NWT Abandonment program are limited to minor air emissions (venting of head gas in casing). Discharge limits for grey & black water are not presented because the onsite supervisor trailer will be self-contained and there will be no discharge of any waste. Completions fluids (containing cement / bridge plug milling solids),) will be hauled to the nearest approved Class II Landfill in British Columbia or Alberta.

Table 4: Discharge Streams

Waste Stream	Discharge Location
Completions fluids and generated solids (milling of cement plugs, bridge plugs and possible casing debris)	Trucked out to approved waste facility, **Location:** Alberta or British Columbia **Facility Type:** Non-HAZ Industrial Landfill/ Special Waste Treatment **Facility Owner:** TBD
Minor amounts of sweet natural gas (casing head gas)	Vent to atmosphere

4.0 MONITORING COMPLIANCE

4.1 Monitoring Compliance with the EPP

The MGM EPP Program is developed and maintained, implemented and improved according to the POEMS. With respect to monitoring compliance with the MGM EPP Program, the POEMS requires regular inspections by Field Supervisors and Managers, an annual audit of the POEMS and an evaluation of Environmental Protection targets through environmental indicators. A summary of inspections, audits and indicators is provided in the subsequent sub-sections and full details can be found in section 3 of the POEMS.

4.1.1 Inspections

Inspections are designed to ensure that Field Supervisors and Managers make consistent checks of key components in their work areas and foster good working habits. MGM maintains procedures for inspections and for establishing and maintaining records of the results. Further information on inspections is provided in section 3 of POEMS.

4.1.2 NWT POEMS Audit

An annual POEMS audit, conducted by the HSE department is required to examine the overall implementation of the POEMS.

4.1.3 Improvement

Environmental indicators help answer the question, “Were the targets met?” Environmental data is collected, validated and presented annually by the Environmental Coordinator, allowing the review and modification of objectives/targets. MGM will record the extent to which planned objectives and performance criteria have been met and report to the corporation as a whole. The information may be made available to the public.

APPENDIX 1: FUNDEMENTAL MITIGATION

Fundamental mitigation includes essential measures to eliminate, or at least minimize, negative impacts to air, water, land, and terrestrial species and aquatic species during all activities undertaken as part of the MGM abandonment Project.

Note: Only those measures the may apply to the planned operations have been included.

a. LAND AND TERRESTRIAL SPECIES

Mitigation measures to minimize negative effects to land and terrestrial species are included in the existing guidelines, best management practices and corporate procedures.

Project-specific mitigation measures to minimize negative effects to land and terrestrial species are categorized and listed alphabetically below.

ACCESS MANAGEMENT	Motorized vehicles will travel on approved routes. The creation of ancillary access will be minimized. The recreational use of all-terrain vehicles (ATVs) and snowmobiles by construction personnel will not be permitted in the project area.
CLEANUP	Good housekeeping will be practiced. The target date for final cleanup will be immediately after the project is complete, when feasible, or as directed by the Land Use Inspector
EQUIPMENT MAINTENANCE – INVASIVE SPECIES	Construction and reclamation equipment (*i.e.*, equipment used to "break ground") will be cleaned before entering the ISR Project area to ensure weed free conditions. Similarly, materials such as pipe should be sourced from storage yards free of weeds. Equipment passing through areas identified as having a weed problem will be cleaned (e.g., steam/high pressure water, compressed air, etc.) prior to continuing work.
SNOW CLEARING	To minimize impact on wildlife species abundance, snow removal will be limited to only that necessary for safe and efficient work.
SOIL CONSERVATION – FROST DEPTH	On work areas free of timber, snow will be packed onto the rough, natural surface with light-weight tracked vehicles to drive frost into the ground. To achieve sufficient snow-pack depth, thus a protective surface barrier, corduroy may be added to the snow. As well, water may be used to build-up the protective surface barrier. When working on wet, muskeg or permafrost terrain, ensure sufficient frost penetration is present to avoid terrain damage. Recommended minimum frost depths are: (w) muskeg – 45 cm; (x) loam soils – 15 cm; (y) saturated silts or clays – 30 cm; and (z) sloughs or shallow water – 90 cm

	Erosion will be mitigated in areas disturbed by Project activities by various methods, as appropriate (e.g., check dams, contouring, cross ditches, cross berms, ditch plugs, diversion berms, positive drainage, seeding, silt fence, slash rollback, swales, etc.).

b. LAND USERS

Project-specific mitigation measures to minimize negative effects to land users are listed below.

LAND USERS	The appropriate the appropriate government and indigenous representatives will be notified by MGM of the construction schedule as soon as the schedule is determined. Ideally, this should be at least two (2) weeks prior to approved clearing. If possible, arrangements will be made with land users to clearly identify access routes and equipment (e.g., remove their traps and snares, etc.) in the vicinity of the right of way prior to clearing to ensure that they are protected during construction.
TRAILS	Trails will not be blocked.

c. WILDLIFE AND WILDLIFE HABITAT

Mitigation measures to minimize negative effects to wildlife and wildlife habitat are included in the existing guidelines and best management practices presented in the bulleted list below.

- GNWT. 2017. Safety in Grizzly and Black Bear Country. Department of Environment and Natural Resources.
- Canadian Pipeline Environment Committee. 2004. The pipeline industry and the Migratory Birds Convention Act.

Project-specific mitigation measures to minimize negative effects to wildlife and wildlife habitat are categorized and listed alphabetically below.

AVOIDANCE	Vehicle and equipment operators will be instructed to maintain appropriate speeds and to be aware of potential encounters with wildlife. If wildlife is encountered, it will not be fed or harassed and will be given an opportunity to disperse at its own rate. Pet dogs will be prohibited.
DENS / NESTS	Dens and nests, even if inactive, will not be knowingly disturbed if it can be avoided.
HUNTING	Project personnel are forbidden to carry firearms (except with written permission from MGM) and to hunt.
MONITORS	To minimize bear conflicts MGM will employ Inuvialuit wildlife monitors during all program activities.
REPORTING	Any incidents with nuisance wildlife or collisions with wildlife will be reported to GNWT, ENR. In the event that bear dens are encountered within the Project area, GNWT, ENR will be notified.
SNOW MANAGEMENT - WINDROWS	Should snow be removed from access corridors, windrows at the edges of the road will be constructed. The windrows will have gaps (8 m) at regular intervals (every 300 to 500 m) to allow animal movement and to provide escape routes.

d. SPECIES AT RISK OR SPECIES OF SPECIAL STATUS AND RELATED HABITAT

Project-specific mitigation measures to minimize negative effects to species at risk are categorized and listed below.

AQUATIC SPECIES No impacts on fish and fish habitat are anticipated. Mitigation will be developed using DFO measures to avoid causing harm to fish and fish habitat.

List of Potential Freshwater Fish found in the Program Area

Family	Species	Common Name
Esocidae	*Esox lucius*	Northern pike
Salmonidae	*Coregonus sardinella*	Least cisco (big-eye herring)
	C. autumnalis	Arctic cisco
	C. clupeaformis	Lake whitefish (humpack)
	C. nasus	Broad whitefish (whitefish)
	Prosopium cylindraceum	Round whitefish
	Salvelinus namaycush	Lake trout
	Stenodus leucichthys	Inconnu
	Thymallus arcticus	Arctic grayling
Cyprinidae	*Platygobio gracilis*	Flathead Chub
	Couesius plumbeus	Lake Chub
Osmeridae	*Hypomesus olidus*	Pond Smelt
Catostomidae	*Catostomus catostomus*	Longnose sucker
Gadidae	*Lota lota*	Burbot (loche)
Gasterosteidae	*Pungitius pungitius*	Ninespine stickleback
Cottidae	*Cottus cognatus*	Slimy sculpin

MARINE MAMMALS Open water demobilization activities will overlap with beluga whale movements in the outer Mackenzie Delta. Inuvialuit wildlife monitors will be present for all project activities. If whales are encountered a minimum distance of 100m will be enforced to prevent any human disturbances. It is not anticipated that program activities and barge staging will take place with the presence of beluga whales.

MIGRATORY BIRDS Program activities (staging and demobilization of barge) during the open water seasons will be confined to the water courses and take place between July to October for staging and late June to July of the following year for demobilizing of barges. On land activities will not take place during the time periods when migratory birds are present in the area for nesting, rearing, and feeding.

Species of Management Concern which may occur in the Program Area

Species	Latin Name	SARA Status[2]	COSEWIC Status[3]	NWT *Species at Risk Act* Status[1]	NWT General Status Rank[1]
Northern Pintail	*Anas acuta*	Not Listed	Not Listed	Not listed	Sensitive
Ruddy Turnstone	*Arenaria interpres*	Not Listed	Not Listed	Not listed	Sensitive
Short-eared Owl	*Asio flammeus*	Special Concern, Schedule 1	Special Concern (2008)	Not listed	Sensitive
Brant	*Branta bernicla*	Not Listed	Not Listed	Not listed	Sensitive
Sanderling	*Calidris alba*	Not Listed	Not Listed	Not listed	Sensitive
Dunlin	*Calidris alpina*	Not Listed	Not Listed	Not listed	Sensitive
Red Knot	*Calidris canutus islandica subspecies*	Special Concern; Schedule 1	Special concern (2007) (R179 - based on R156)	Not listed	At Risk
	Calidris canutus roselaari type	Threatened; Schedule 1	Threatened (2007; possibly in the NWT)	Not listed	At Risk
	Calidris canutus rufa subspecies	Endangered, Schedule 1	Endangered (2007)	Not listed	At Risk
Semipalmated Sandpiper	*Calidris pusilla*	Not Listed	Not Listed	Not listed	Sensitive
Buff-breasted Sandpiper	*Calidris subruficollis (Tryngites subruficollis)*	Special Concern, Schedule 1	Special Concern (2012)	Not listed	Sensitive
Long-tailed Duck (Oldsquaw)	Clangula hyemalis	Not Listed	Not Listed	Not listed	Sensitive
Rusty Blackbird	*Euphagus carolinus*	Special Concern, Schedule 1	Special Concern- (2006)	Not listed	Sensitive
Peregrine Falcon	*Falco peregrinus anatum/tundrius*	Special Concern, Schedule 1	Special Concern - 2007 (entire NWT)	Not listed	Sensitive
	Falco peregrinus anatum	No Status	Threatened - 2000	Not listed	Sensitive
	Falco peregrinus tundrius	Special Concern, Schedule 3	Special Concern (2000)	Not listed	Sensitive
Yellow-billed Loon	*Gavia adamsii*	Not Listed	Not At Risk (1997)	Not listed	Sensitive
Hudsonian Godwit	*Limosa haemastica*	Not Listed	Not Listed	Not listed	Sensitive
Black Scoter	*Melanitta americana (Melanitta nigra)*	Not Listed	Not Listed	Not listed	Sensitive
White-winged Scoter	*Melanitta fusca*	Not Listed	Not Listed	Not listed	Sensitive
Eskimo Curlew	*Numenius borealis*	Endangered, Schedule 1	Endangered - 1978 (R005), 2000 (R155), 2009 (R205)	Not listed	At Risk
Red-necked Phalarope	*Phalaropus lobatus*	Not Listed	Special Concern (2014)	Not listed	Sensitive

Species of Management Concern which may occur in the Program Area

Species	Latin Name	SARA Status[2]	COSEWIC Status[3]	NWT *Species at Risk Act* Status[1]	NWT General Status Rank[1]
American Golden-Plover	*Pluvialis dominica*	Not Listed	Not Listed	Not listed	Sensitive
Black-bellied Plover	*Pluvialis squatarola*	Not Listed	Not Listed	Not listed	Sensitive
Horned Grebe	*Podiceps auritus*	Special Concern, Schedule 1	Special Concern (2009)	Not listed	Sensitive
Bank Swallow	*Riparia riparia*	Threatened, Schedule 1	Threatened (2013_	Not listed	At Risk
Common Eider	*Somateria mollissima*	Not Listed	Not Listed	Not listed	Sensitive
King Eider	*Somateria spectabilis*	Not Listed	Not Listed	Not listed	Sensitive
Lesser Yellowlegs	*Tringa flavipes*	Not Listed	Not Listed	Not listed	Sensitive
Thick-billed Murre (Brünnich's murre)	*Uria lomvia*	Not Listed	Not Listed	Not listed	Sensitive

SOURCE:

[1] Department Environment and Natural Resources, Government of Northwest Territories (2016)

[2] Committee on the Status of Endangered Wildlife in Canada (COSEWIC) (2018)

[3] *Species at Risk Act* (SARA) (2018)

POLAR BEARS

The Tuktoyaktuk CCP notes that the outer Mackenzie Delta (322C, 323C), which overlaps the Program wellsite(s), provides denning habitat that is important to polar bears (October to March). Previous community consultation and project experience indicate that it is likely polar bears will be present in the Program area (KAVIK-AXYS 2004). To minimize bear conflicts MGM will employ Inuvialuit wildlife monitors during all Program activities. Dens and nests, even if inactive, will not be knowingly disturbed if it can be avoided.

TERRESTRIAL MAMMALS

To mitigate potential impacts to moose, wolverine, and furbearers; MGM will scout sites prior to undertaking activities that may impact active habitat. In the event that active natal denning habitat is observed near sites, activity will be minimized so as not to disturb the animals and the appropriate authorities will be notified.

Mobilization and demobilization activities will be on waterways or over ice. There is potential for interactions with harvesters and wildlife, but these are anticipated to have negligible effects as presence in any given area will be short-term. The Aklavik, Inuvik, and Tuktoyaktuk Hunters and Trappers committees will be informed of Program activities and interaction with harvesters will be avoided. To minimize wildlife disturbance, aircraft flights to the sites will be in accordance with the EISC Operating Guidelines and Procedures (2004).

Species of Management Concern which may occur in the Program Area

Species	Latin Name	SARA Status[2]	COSEWIC Status[3]	NWT *Species at Risk Act* Status[1]	NWT General Status Rank[1]
Wolverine	*Gulo gulo*	Special Concern, Schedule 1	Special concern (2014)	Secure	Sensitive
Barren-ground Caribou	*Rangifer tarandus groenlandicus*	Not Listed	Threatened (2016)	Threatened	Sensitive
Grizzly Bear (north western population)	*Ursus arctos*	Not Listed	Special Concern (2012)	Special Concern	Sensitive

SOURCE:

[1] Department Environment and Natural Resources, Government of Northwest Territories (2016)

[2] Committee on the Status of Endangered Wildlife in Canada (COSEWIC) (2018)

[3] *Species at Risk Act* (SARA) (2018)

e. WATER AND AQUATIC SPECIES

Mitigation measures to minimize negative effects to water and aquatic species and comply with the Fisheries and the Species at Risk Act are included in the existing guidelines and best management practices presented in the bulleted list below.

- DFO measures to avoid causing harm to fish and fish habitat: http://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures/measures-mesures-eng.html

Project-specific mitigation measures to minimize negative effects to water and aquatic species are categorized and listed alphabetically below.

FOREIGN MATERIAL	Trees will not be purposely felled into water bodies. Likewise, slash, debris, rocks and soil will not be knowingly introduced into a water body.
GRADING	Grade away from watercourses to minimize introduction of soil and organic debris. No windrowed or fill material shall be placed in the watercourses duringgrading.
SETBACK DISTANCES	MGM will observe setback distances of 100m from the edge of a disturbance to the edge of a watercourse / water body, except when a watercourse / water body is being crossed (see DFO Measures to Avoid Causing Harm to Fish and Fish Habitat). Where necessary, alternative setbacks will be determined through consultation with the Inuvialuit Water Board.
WATER WITHDRAWL FROM WATERCOURSES	Water will be withdrawn from watercourses, as per DFO Measures to Avoid Causing Harm to Fish and Fish Habitat: • the withdrawal of any water will not exceed 10% of the instantaneous flow, in order to maintain existing fish habitat and • water flow is maintained under the ice, where this naturally occurs. Equipment used for water withdrawal with employ fish screens.

Reference

Fisheries and Oceans Canada 2018. Measures to Avoid Causing Harm to Fish and Fish Habitat. Available online at: http://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures/measures-mesures-eng.html

Yukon Energy, Mines and Resources. 2006. Oil & Gas Best Management Practices Seismic Exploration. 37pp. Available online at: http://www.emr.gov.yk.ca/oilandgas/pdf/bmp_seismic.pdf

APPENDIX 2: TASK SPECFIC MITIGATION

Task-specific mitigation includes essential measures to eliminate, or at least minimize, negative impacts to air; land and terrestrial species and water and aquatic species during specific activities undertaken as part of the NWT Abandonment Project.

a. TEMPORARY CAMPS

Project-specific mitigation measures to minimize negative effects to the environment associated with temporary camps are categorized and listed alphabetically below.

LOCATION	Campsites will coincide with previously permitted land, on relatively level terrain 100m from any watercourse, where possible. No new campsites are planned.
CONSTRUCTION	Depending on the infrastructure required (e.g., trailers, sewage sumps, welding shop, vehicle parking, etc.), an area 40m x 70m to 100m x 100m will be cleared for temporary camps. Slash will be windrowed at the camp boundaries and used for rollback during site reclamation. Snow will be used to level minor irregularities on the surface as much as possible. Vehicles will be used to compact the insulating snow cover to promote deep frost penetration.
EROSION PREVENTION	Site stability at temporary campsites will be assessed within one year after construction. If unstable, appropriate corrective action will be undertaken as soon as practical to stabilize the site, thereby minimizing erosion.

APPENDIX 3: CLASS “A” LAND USE PERMIT AND TYPE (GNWT) and TYPE“B” WATER LICENCE (Inuvialuit Water Board)

APPENDIX 4: PROJECT MAPS

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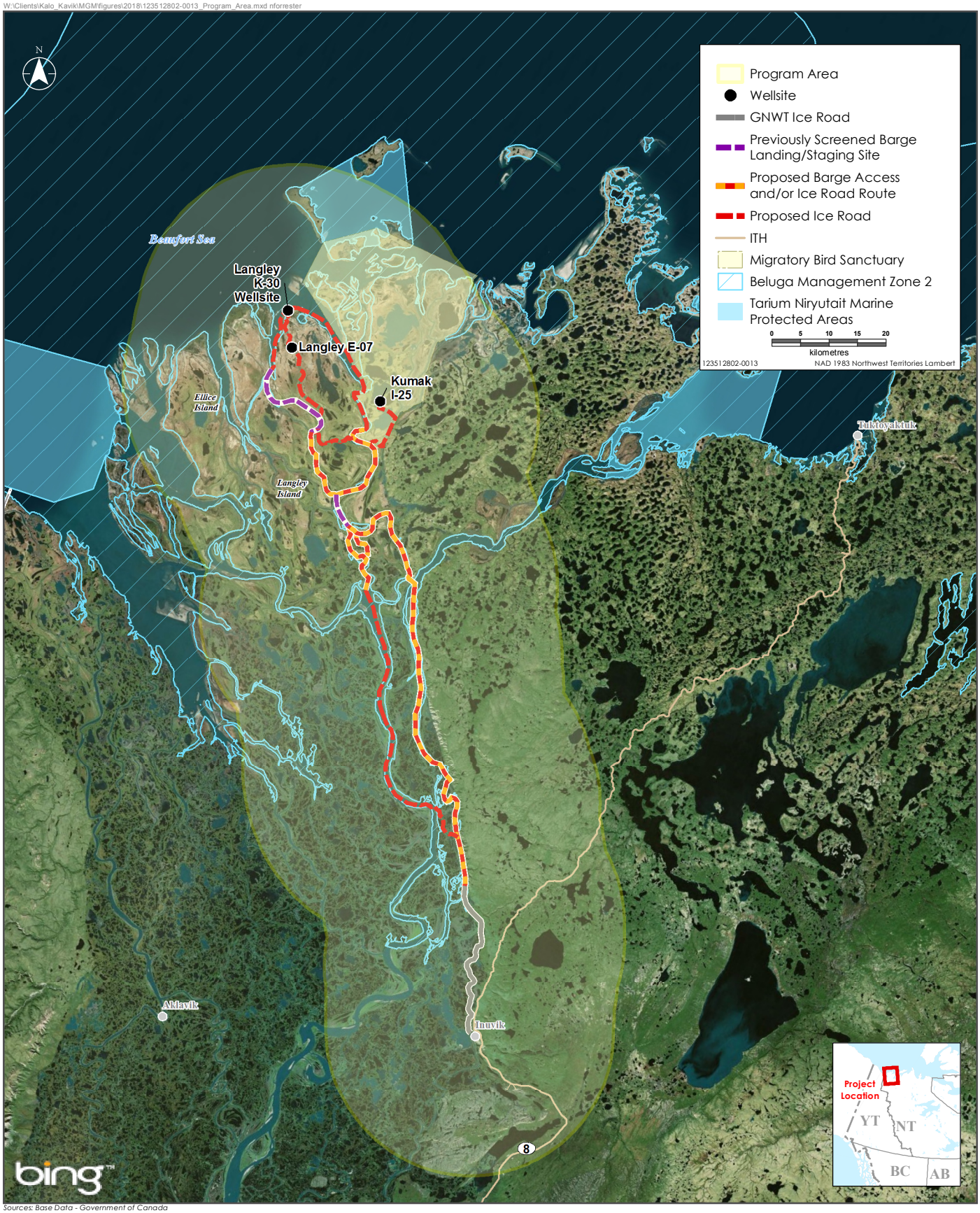

Sources: Base Data - Government of Canada
Service Layer Credits: © 2018 Microsoft Corporation Earthstar Geographics SIO

Disclaimer: This map is for illustrative purposes to support this Stantec project; questions can be directed to the issuing agency.

Program Area

KAVIK-STANTEC

MGM ENERGY

Figure 13-1

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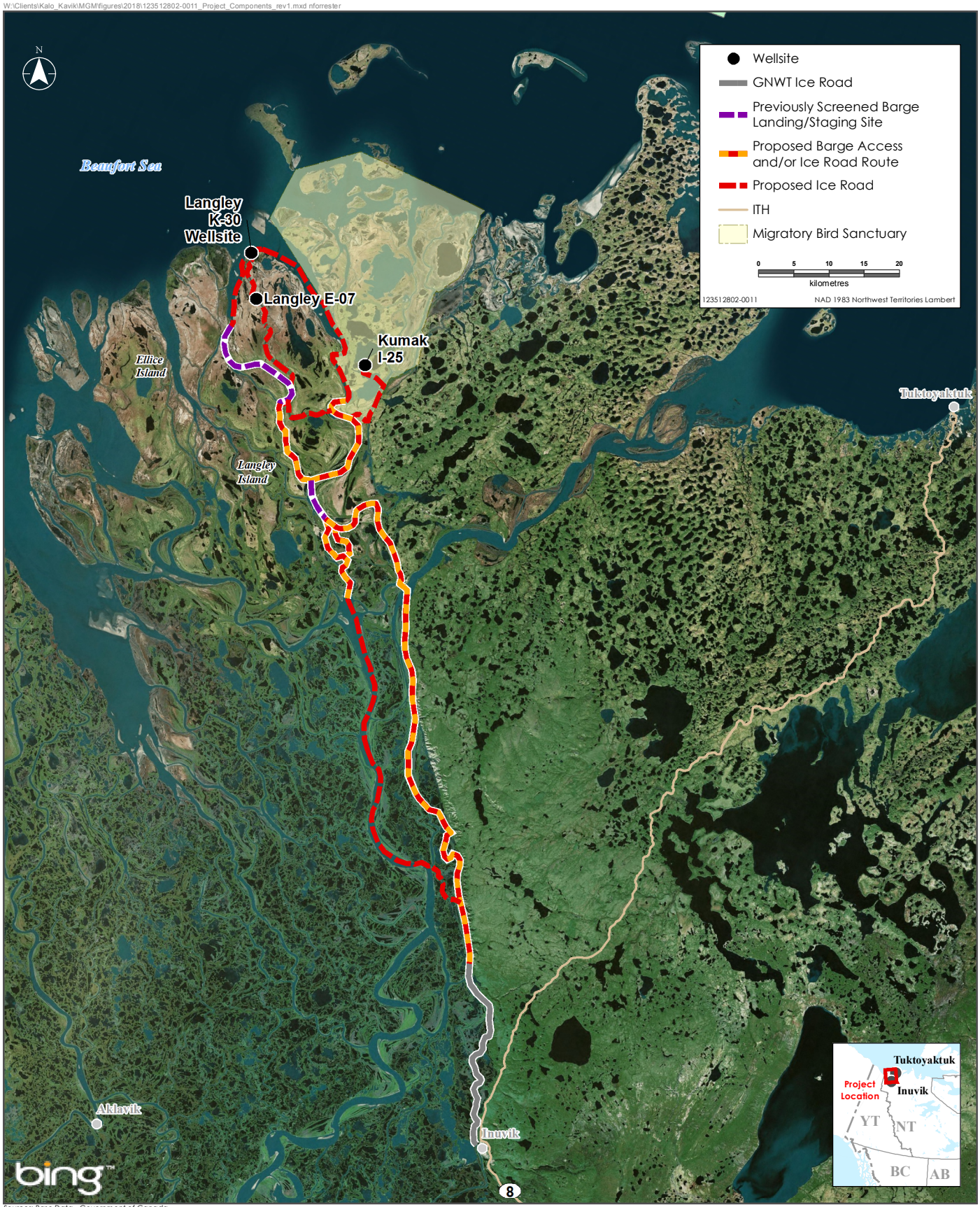

Sources: Base Data - Government of Canada
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Project Overview

KAVIK-STANTEC

MGM ENERGY

Figure 5-1