1. Project Overview

1.1. Introduction and Project Location

Worley Canada Services Ltd., operating as Worley Consulting, has been retained by the Government of Nunavut – Community & Government Services (GN-CGS) to support the detailed design of community harbours facilities in Grise Fiord (the Grise Fiord Community Harbour Project) and Resolute Bay (the Resolute Bay Harbour Community Harbour Project) in Nunavut. Dynamic Ocean Consulting Ltd (Dynamic Ocean is supporting Worley on the permitting requirements for the Project. To inform the detailed design phase, several field programs will be undertaken over the next few years, initiating in the 2024 open-water season. The intention of the field programs, will be as below:

- Conduct environmental, geoscience, geophysics, and archaeological baseline studies in each community.
- Perform a geotechnical program to confirm seabed and quarry rock conditions.
- Topographic and bathymetric surveys.
- Existing conditions or effects studies during or post-construction of the Community Harbours.

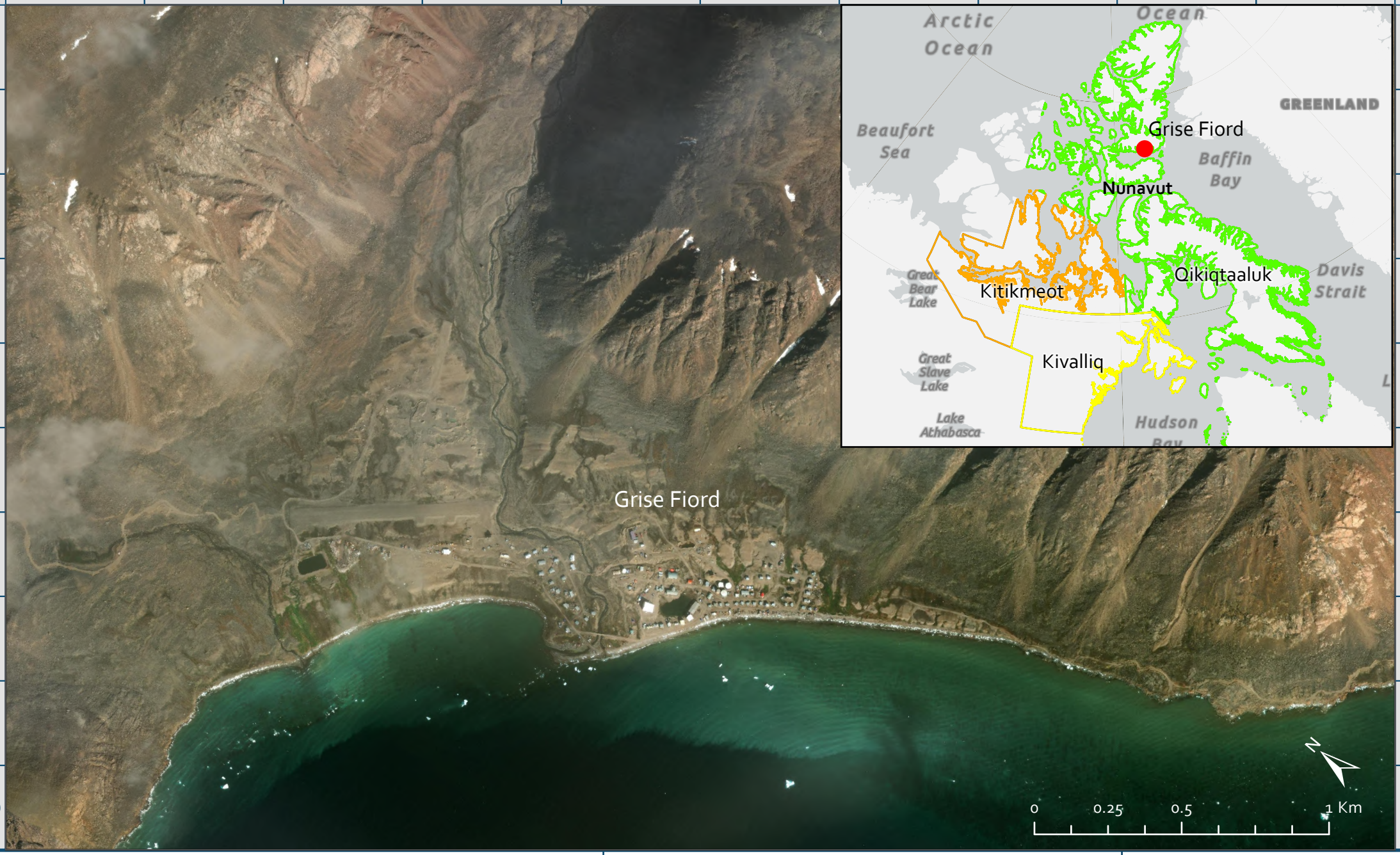
The Grise Fiord and Resolute Bay Community Harbour Projects will be permitted separately; however, the field programs to support them will be a single permit through the Nunavut Planning Commission (NPC) and the Nunavut Impact Review Board (NIRB) processes.

Grise Fiord and Resolute Bay are located on Ellesmere and Cornwallis Islands in the Qikiqtaaluk Region (see Table 1-1, Figure 1-1, Figure 1-2).

This letter provides the details for the field programs to fulfill the requirements for the NPC to review the Field Program to determine whether it complies with all terms and conditions of any applicable land use plans. The Project was submitted to the Nunavut Planning Commission (NPC, File No. 150430) on May 17, 2024 and the Conformity Determination was issued on June 4, 2024 (NPC, 2024) when the file was referred to the NIRB (File No. 125979).

Table 1-1: Field Program Locations

Location	Location Description	Latitude	Longitude
Grise Fiord	Located on the southern shore of Ellesmere Island in Jones Sound.	76° 25.001'N	82° 54.935'W
Resolute Bay	Located on the south shore of Cornwallis Island in Parry Channel.	74° 41.472'N	94° 51.549'W



Spatial Reference
Name: NAD 1983 CSRS UTM Zone 17N
GCS: GCS North American 1983 CSRS
Projection: Transverse Mercator
Map Units: Meter

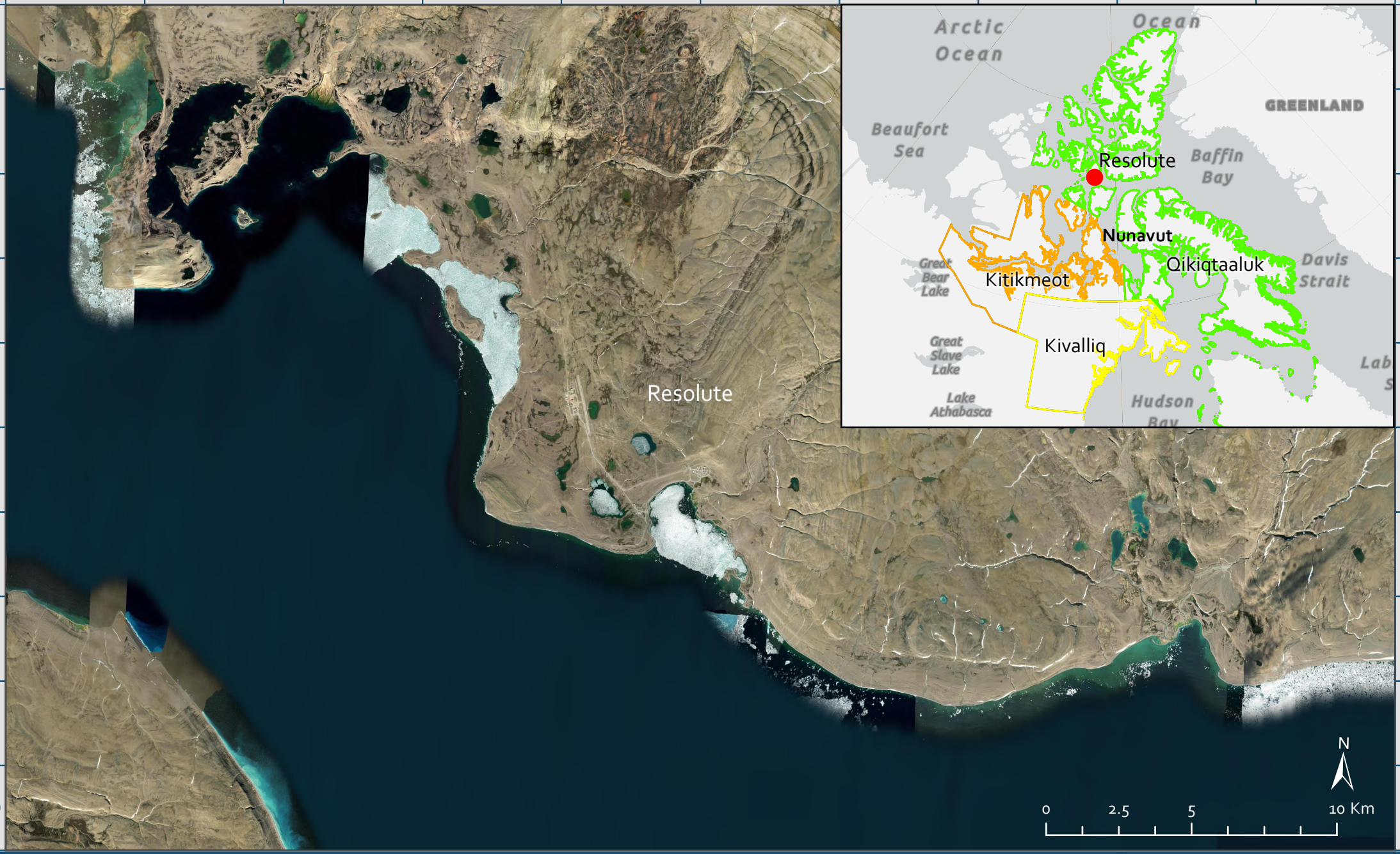
Figure 1-1 Grise Fiord, Nunavut Location

20240411-001	Drawn By : CK	Edited By: CK	Approved By: VBC

Nunavut

Dynamic Ocean Consulting Ltd.

worley
DELIVERING SUSTAINABLE CHANGE



Spatial Reference
Name: NAD 1983 CSRS UTM Zone 15N
GCS: GCS North American 1983 CSRS
Projection: Transverse Mercator
Map Units: Meter

Figure 1-2 Resolute, Nunavut Location

20240411-001	Drawn By : CK	Edited By: CK	Approved By: VBC

Nunavut

Dynamic Ocean Consulting Ltd.

worley

1.2. Project Name

Grise Fiord and Resolute Bay Field Program (hereafter referred to as the Field Program).

2. Proponent and Representative Details

Contact information for the proponent and representative are provided in Table 2-1.

Table 2-1: Proponent and Contact Information

Information Request	Details
Applicant: Government of Nunavut	
Applicant's Name	Justin McDonell – Project Manager, Capital Projects
Address	PO Box 1000 Station 200 Community and Government Services Iqaluit, Nunavut X0A 0H0
Telephone / Fax	1-867-975-5114
Email	JMcDonell@gov.nu.ca
Applicant Representative: Dynamic Ocean Consulting Ltd.	
Name	Victoria Burdett-Coutts, MSc RPBio Senior Marine Scientist and Regulatory Professional
Address	1490 Union Street Port Moody, British Columbia V3H 3X5
Telephone / Fax	1-778-839-2372
Email	Victoria@dynamicocean.ca

3. Project Description

3.1. Program Scope

Several field programs may be conducted in advance of, during and post-construction to support permitting and design components of the Project.

Field Program may consist of the following:

- Marine Field Study.
- Wildlife & Vegetation Field Study (potential).
- Geotechnical Field Study.
- Geophysics Field Study.
- Water and Sediment Quality Study.
- Archaeological Field Study.
- Topographic and Bathymetric Surveys.

3.2. Study Areas

Study Areas will be developed prior to mobilization into the field to encompass the following Project components:

- Community Harbour.
- Haul Road and Quarry.

There are two to three locations for each component (Community Harbour, Haul Road, Quarry) currently under consideration, where options may be refined prior to mobilization for the initial Field Program, or the initial Field Program will support refinement for the detailed design phase to proceed with a single location for each component. The Study Areas are collectively referred to as the Project Study Areas.

The predicted extent of the Study Areas is described in Table 3-1 and displayed in Appendix A.

Table 3-1: Field Program Study Areas

Location	Study Areas			Figure No. in Appendix A
	CH	Haul Road	Quarry	
Grise Fiord	1.4 km along shoreline fronting the community.	1 4 km^2 north of the community.	Three quarries of varying size.	Figure A-1
Resolute Bay	Location 1: 500 m along shoreline southwest of the community. Location 2: 1 km along shoreline fronting the community.	Approximately 3.3 km southeast of CH and 1.3 km southwest of CH	Location 1: 7 km northwest of CH Study Area. Location 2: 3.3 km southeast of CH Study Area. Location 3: 1.7 km southeast of CH Study Area.	Figure A-2

3.3. Field Programs

Field surveys are required to document existing conditions within the Project Study Areas and to support engineering design. A summary of the purpose and proposed methodology for each of the field studies is provided in Table 3-1.

Table 3-2: Field Components for the Grise Fiord and Resolute Bay Field Study

Program	Component	Survey Purpose	Field Methodology	Equipment Required	Transportation Mode	Program Study Area
Marine	Fish Habitat - Intertidal	A survey of the foreshore including the intertidal and subtidal areas will be conducted to confirm the fish habitat quality within the footprint of the proposed Community Harbour.	Intertidal surveys will be conducted at low tide to maximize the extent of seabed exposed. Transects will be established perpendicular to shore within the Community Harbour Study Area (impacted site) and outside the Community Harbour footprint (control site). A minimum of four transects will be completed but will depend on habitat characteristics observed on site. Field personnel will document substrate and habitat characteristics. Information gathered will include substrate type and composition, algae species identification, and relative abundance of marine invertebrates. Transects will be established perpendicular to the shoreline at regular intervals from the HHWM to the water line. Perpendicular transects facilitate the identification of transitions between habitat types, where zonation is a strong feature of intertidal communities for both rocky and sandy communities. A 1 m^2 quadrat will be spaced equidistantly along the transect line. The length of the transect will be determined by the number of habitat bands and the extent of intertidal, however will consist of a minimum of five quadrats per transect.	Transect line, quadrat, iPad, clinometer	On foot	Community Harbour
	Fish Habitat – Subtidal		A local boat operator will be subcontracted. Perpendicular and parallel to shore subtidal transects will be conducted using a VideoRay Pro 4 remotely operated vehicle (ROV). Field personnel will document substrate and habitat characteristics. Information gathered will include substrate type and composition, algae species identification, and relative abundance of marine invertebrates. Data collected from these surveys will be complimentary to the intertidal habitat surveys and allow for the creation of a habitat map.	ROV, iPad, depth sounder	Boat	Community Harbour
	Water Quality	Water quality analysis will be conducted to confirm water characteristics at the site. Samples sent to the laboratory for chemical analysis will be analyzed for the following: • Nutrients (ammonia, nitrate, nitrite, phosphate, total organic carbon). • Physical parameters (pH, total suspended solids). • Total metals. • Dissolved metals. Physicochemical parameters will include temperature, salinity, pH, turbidity and conductivity.	Water quality sample locations may be collected as required. When collected, each location will consist of a shallow (1 m below surface) and a deep (1 m above seabed) sample. Samples for chemical analysis will be collected using a 1.5 L Niskin bottle deployed from a boat. A Niskin sampler will be lowered over the side of the boat, the messenger deployed and the Niskin hauled back into the boat. Once at the surface, the water sample will be decanted into specific containers, supplied by an accredited laboratory. Sample containers will be labelled and immediately stored in coolers. Samples will be retained in coolers until they can be shipped to the south for laboratory processing. Physicochemical parameters may be collected to confirm a vertical profile for conductivity, temperature and depth (CTD). When undertaken, multiple casts will be conducted at each location to determine variations in parameters during tidal exchange.	CTD, Niskin sampler, depth sounder, iPad	Boat	Community Harbour

Program	Component	Survey Purpose	Field Methodology	Equipment Required	Transportation Mode	Program Study Area
	Sediment Quality	Sediment quality analysis may be conducted to confirm existing conditions of sediment. Sample analysis if undertaken will include: • Total organic carbon (TOC). • Total metals (suite of 32). • Polycyclic aromatic hydrocarbons (PAHs). • Polychlorinated biphenyls (PCBs). • Sediment grain size.	Sediment quality sample locations will be selected within and outside of the relevant Study Area(s). Samples will be collected either on foot or from a boat depending on if the area is intertidal or subtidal. Intertidal samples will be collected with a sterilized stainless-steel spoon and bowl. Subtidal samples will be collected using a ponar grab sampler (grab sampler) or by SCUBA divers. Physical characteristics of the sediment will be documented (e.g. colour, texture) and samples will be photographed. Samples will be retained in coolers until they can be shipped to an accredited laboratory for processing.	Petite ponar, iPad, depth sounder, SCUBA gear	Boat	Community Harbour
	Drogue	Collection of surface current data is required to characterize surface current patterns within the relevant Study Area(s). This data may further be used to calibrate the sediment dispersion model for the DAS site. Surface current speed and direction data will be collected using a surface drogue.	The drogues will be deployed in multiple locations near the Project and DAS site during a flood tide and an ebb tide. The position of the drogue will be recorded using an Automatic Identification System (AIS) attached to the drogue.	Drogue, AIS	Boat	Community Harbour
Terrestrial	Wildlife	A wildlife survey will be conducted to determine presence of wildlife (including species at risk and critical habitat) within the relevant Study Area(s). The wildlife survey will be composed of three parts: a) a general reconnaissance survey, b) breeding bird point counts, and c) coastal waterbird survey. As the boundaries of the Quarry and Haul Road Study Area(s) are not known at this time, the terrestrial biologist will initially work with the geoscientist to confirm which area is the most probable to assist in targeting their spatial focus.	The wildlife reconnaissance survey will consist of a meandering search across the entire Study Area (s). All wildlife species observed or detected (by tracks, scat, sign, and vocalizations) will be identified, recorded, and georeferenced using a handheld global positioning system (GPS). A general habitat assessment will be conducted and observations of important wildlife habitat or sensitive wildlife features (e.g. nests, dens, mineral licks) will be identified, recorded, and georeferenced. The breeding bird survey will consist of several point counts to document the bird species present, their abundance, and breeding status. Point counts will follow standard methodology (e.g. Ralph et al. 1995). All birds identified by sight and sound will be recorded including their distance from the observer and time of detection. The coastal bird survey will consist of transects along the shoreline. Counts will follow standard methodology (e.g. BSC and EC 2013). All birds identified by sight and sound will be recorded including their distance from the observer and time of detection.	Global positioning device (GPS), Binoculars, Spotting scope, Kestrel Pocket Weather meter, Tablet, Camera	On foot, vehicle or All-Terrain Vehicles (ATV)	Community Harbour, Quarry, Haul Road
	Vegetation	The purpose of the vegetation assessment is to determine the plant species, plant communities, and potential plant species or ecosystems at risk that occur within the relevant Study Area(s). The vegetation assessment will include a desktop review, field survey, and integration of local knowledge and values. Surveys will consist of an ecological land classification, a search for species at risk or key traditional use plants, and mapping of any weedy or invasive species.	Vegetation communities will be grouped based on similar characteristics such as vegetation species composition, moisture regime, topographical position, and hydrogeochemical characteristics. Vegetation communities will be delineated using a combination of field verification and desktop aerial imagery interpretation. Field verification will include plot-level surveys located in each vegetation community encountered. Plots will be positioned in homogeneous vegetation communities, representative of the typical composition in the polygon. Plots will be inset within varying plot sizes based on whether lichens, shrubs or trees are present. Plot size will range from 1 m x 1 m to 10 m x 10 m.	Quadrat, measuring tape, pin flags, plant press, iPad, hand lens	On foot, vehicle or ATV	Quarry, Haul Road

Program	Component	Survey Purpose	Field Methodology	Equipment Required	Transportation Mode	Program Study Area
		See description in wildlife section for targeting spatial extent.	Percent cover will be estimated to the nearest 1% for all species and assigned a cover of 0.5% for any species less than 1%. If species cannot be identified in the field, and the population size permits (1 in 50 rule), a voucher specimen will be collected for later identification in a herbarium. If any species at risk, key traditional use plants, or weedy or invasive species are identified, their population characteristics will be documented. Plot location will be recorded with GPS coordinates and photographed.			
Geotechnical	Quarry	A geotechnical survey is required to identify suitable quarry locations for sourcing the required fill and rock armour for the Community Harbour construction.	The survey will consist of a visual assessment of exposed bedrock and noting rock type, major structural defects, weathering and field estimate of rock strength. The surveyor will tag potential quarry locations and delineate possible quarry extents. This information may inform future environmental studies. Locations which are identified as potential for source rock, representative rock samples will be collected. The rock samples will be sent to a laboratory for strength and durability testing.	Geotechnical hammer, tape measure, hand lens	On foot, vehicle or ATV	Quarry, Haul Road
Geotechnical	Quarry	A (potential) geotechnical subsurface drilling program may be required to understand the type and variability of subsurface soil and/or rock conditions at a potential quarry.	Geotechnical boreholes (potential) will be drilled in the summer of 2024 within the footprint of Quarry 2. A track mounted rotary drill rig (CME 55) will be used to advance boreholes. The tracked rig will be able to move to / from each location on tracks. Boreholes will be advanced using water and/or mud rotary techniques with the borehole diameter ranging from approximately 100 to 150 mm. Samples will be collected at approximately 1.5 m intervals starting from the ground / seabed surface until rock is encountered. Drilling method will then switch to triple tube HQ3 diamond drilling techniques to obtain rock core samples.	Track Mounted Rotary Drill Rig (Drill Model: CME 55)	Track, Front End Loader, Truck, ATV, Foot	Quarry
Geophysics	Quarry	A (potential) geophysical survey is required in Grise Fiord to identify suitable quarry locations for sourcing the required fill and rock armour for the Community Harbour construction.	The survey (potential) will consist of undertaking seismic refraction within the footprint of Quarry 2 to understand overburden thickness and depth to bedrock. This information may inform future environmental and geotechnical intrusive studies.	Geometrics Geode, seismograph, geophones, firing rod and blank 8-gauge shotgun shells	On foot or ATV	Quarry
Geotechnical	Community Harbour	A geotechnical subsurface drilling program is required to understand the type and variability of subsurface soil and/or rock conditions underlying the proposed Community Harbour.	Geotechnical boreholes will be drilled in the summer of 2024 along the shoreline of the proposed Community Harbour and within the footprint of the Community Harbour in the spring of 2025. A track or skid mounted rotary drill rig (CME 55) will be used to advance boreholes. The tracked rig will be able to move to / from each location on tracks, whereas the skid mounted rig will require heavy equipment such as a dozer or front-end loader to move the rig into position. Boreholes will be advanced using water and/or mud rotary techniques with the borehole diameter ranging from approximately 100 to 150 mm. Samples will be collected at approximately 1.5 m intervals starting from the ground / seabed surface until rock is	Track Mounted Rotary Drill Rig (Drill Model: CME 55)	Track, Front End Loader, Truck, ATV, Snow Mobile, Foot	Community Harbour

Program	Component	Survey Purpose	Field Methodology	Equipment Required	Transportation Mode	Program Study Area
			encountered. Drilling method will then switch to triple tube HQ3 diamond drilling techniques to obtain rock core samples.			
Geophysics	Community Harbour	A (potential) geophysical survey is required in Grise Fiord to assess subsurface variability in the footprint of the proposed Community Harbour.	The survey (potential) will consist of undertaking Multichannel Analysis of Surface Waves (MASW) and Seismic refraction Survey within the footprint of the proposed craft harbor to assess variability in overburden materials and depth to bedrock. This information may be used to support the spring geotechnical investigation.	Geometrics Geode, seismograph, geophones, submersible hydro cable, firing rod and blank 8-gauge shotgun shells	Boat	Community Harbour
Archaeological	Archaeological	An Archaeological Impact Assessment (AIA) will be conducted	A Class II Nunavut Archaeologist Permit application has been acquired by Lifeways. The AIA of the Project will include pedestrian survey of the proposed Study Areas (s) and will target undisturbed areas. Transects will be conducted, the spacing of which will be determined based on characteristics of the landscape. Depending on the ground cover, assessment will involve visual inspection of all existing exposures, systematic and judgmental shovel testing of areas lacking exposure but with archaeological potential. All shovel tests (positive and negative) will be recorded using a GPS and all sites will be mapped, sketched and photographed. Should artifacts be recovered during the AIA, these will be cleaned, catalogued, identified, inventoried, and descriptions of each will be present in the final project report. All collected artifacts considered unstable will be discussed with the Lifeways conservator prior to transport for conservation.		Foot	Community Harbour (land portion), Quarry, Haul Road
Topographic Survey	Community Harbour, Quarry, Haul Road	Topographic and feature survey to be conducted.	Topographical conducted using standard surveying techniques and Unmanned Aerial Vehicles (UAVs).	Survey Equipment and UAVs	Foot, UAV	Community Harbour (land portion), Quarry, Haul Road
Bathymetric	Community Harbour	Bathymetric survey to be conducted to determine water depth and confirm Chart Datum (CD).	Survey will be conducted using multi-beam and GPS positioning system fixed on a boat. Tidal elevations res / tidal gauges.	Multi-beam survey equipment, GPS, RTK, pressure sensor	Boat	Community Harbour

4. Schedule

The Field Program will largely be undertaken in open water seasons, with the exception of the Geotechnical (Drilling) Program which may occur during the iced ocean condition. The initial 2024 existing conditions field program will be undertaken between July and September. Field programs will generally occur for a period of two to seven days.

5. Personnel

5.1. Proposed Research Team

The research team affiliated with the Field Program will be supported by personnel from Worley, Dynamic Ocean and AECOM. Field Teams will be lead by Cameron Knight (Dynamic Ocean, Cameron@dynamicocean.ca, 604-341-2642) and Jeff Gibson (Worley, Jeffrey.Gibson@Worley.com, 604-779-1884).

5.2. Opportunities for Local Participation

The research team will require local support such as wildlife monitors, field assistants, boat/operators, trucks, ATVs etc.

6. Consultation

6.1. Consultation Summary

Consultations have been conducted since the feasibility phase of the Community Harbour Projects and are designed to ensure that residents, hunters, fishers, and stakeholders are consulted using a variety of methods and materials. To date, six separate community visits from 2018 to 2022 have been conducted including meetings with the Hamlet, design workshops with the Hunter and Trapper Associations/Organizations (HTAs/HTOs), and Inuit knowledge (Inuit Qaujimajatuqangit [IQ]) workshops with elders and active hunters. Additionally, Open Houses were conducted in each community in May 2022 to provide all residents with a chance to learn about the Community Harbour concepts and construction plans and provide their feedback. Community notices were posted in the community, on the radio, and on Facebook 10 days prior to the Open Houses and again on the day of the public meetings. Presentation slides were projected and large-scale posters of the harbour layouts, quarry locations, haul routes, permitting processes, and photos depicting harbour equipment and construction activities were displayed.

The communities have been very engaged in the Community Harbour Projects and have provided valuable input into the harbour design concepts on numerous occasions. Collaborating with the community has allowed the Project team to gain an understanding of the local site conditions, specific needs, and priorities in Grise Fiord and Resolute Bay that was critical to the development of harbour concepts and preferred quarries and haul routes for each community. Meaningful consultation will be continued throughout the ‘life cycle’ of the Project, including during the detailed design and

construction phases, so that issues of concern can be identified and responded to in a timely manner and design and construction planning activities can be adjusted where possible to avoid and mitigate any adverse social or environmental effects.

The next round of community consultations is being planned for July 2024, before any field programs, and will focus on providing the communities with a project update and general overview, confirming preferred options for the Community Harbour layouts, quarries, and haul roads and discussing the field program activities including coordinating with the community for local support of workers and equipment for the field programs. Consultations will also focus on discussing the potential environmental and socio-economic effects and proposed mitigations as part of effective construction planning and to support permitting requirements. Another round of consultations will be conducted after the field programs to share field program results with the communities and discuss any refinements made to the harbour concepts based on previous consultations and results from the field programs.

6.2. Proposed use of Local and Inuit Knowledge (Inuit Qaujimajatuqangit – IQ)

Traditional land use and environmental knowledge workshops and interviews with local knowledge holders are planned to guide and complement the overall field baseline study. Verification meetings with knowledge holders will also be conducted after the field studies are complete to discuss the baseline results and verify that local knowledge has been accurately and appropriately interpreted and presented in the study.

Key knowledge holders to participate in the workshops will be determined by engaging with the HTO/HTA and the Nauttiqsuqtiit (guardians) in each community. Participants will represent a cross-section of knowledge holders and may include elders, active land users, HTO board members, guardians, traditional healers etc.

In advance of the workshops and interviews, the IQ facilitator will engage with the various discipline leads to confirm the information required for each component.

7. Project Map

See Figure 1-1, Figure 1-2

8. Land Use and Licensing

8.1. Land Use

Field-based studies.

Table 8-1: Land Use and Ownership

Administrative Boundary	Qikiqtaaluk Region
Planning Region	North Baffin
Land Use	Field activities which by NPC's descriptions would be most closely categorized as scientific research
Land Ownership	Municipal

8.2. Permitting

Table 8-2: Licenses and Permits Relevant to the Field Program

Permit	Regulatory Authority	Program Aspect	Status
Research Permit	Nunavut Research Institute (NRI)	All	Pending submission
Land Use Permit	Crown-Indigenous and Northern Affairs Canada (CIRNAC)	Community Harbour areas below the High Water Line (HWL)	Pending submission
Land Use Permit	GN-CGS	Activities at the quarry and Community Harbour that fall in GN CGS jurisdiction	To be confirmed if required
License to Fish for Scientific Purposes	Fisheries and Oceans Canada (DFO)	Collection of sessile invertebrates	Pending submission
Wildlife Research Permit	Ministry of Environment	Wildlife and Vegetation Field Study	Pending submission
Vegetation (wildlife) export permit	Ministry of Environment (Local Conservation Officer)	Vegetation Field Study	Pending submission
Class 2 Permit	Department of Culture and Heritage (C&H)	Archaeology	Separate applications for each location. Submitted 28-Mar-24

9. Material Use

9.1. Equipment

See Table 3-1.

9.2. Fuel Use

Not relevant.

9.3. Hazardous Materials

Small quantities of preservatives such as formalin, ethanol and hydrochloric acid are required to preserve water and sediment quality samples for the marine program.

- Hazardous Materials – Sample preservatives (less than 1 millilitre of acid per sample bottle), ethanol for benthic invertebrate preservation, fuel for support vehicles.
- Chemical Use – Sample preservatives (less than 1 millilitre of acid per sample bottle), ethanol for benthic invertebrate preservation.

10. Waste Management

- Waste Management – Environmental baseline studies will employ a 'pack in, pack out' policy in terms of waste management. Bulk waste is not anticipated during these studies. Some non-combustible waste will be created from consumables during sampling (bottles, bags, gloves, etc.).
- Sewage / Human Waste – the field crew will use existing facilities.

11. Environmental Management

Potential environmental effects and proposed mitigation measures are provided in Table 10-1.

Table 10-1: Feasibility Study Environmental Effects and Mitigation

Environmental Effect	Relevant Field Study	Mitigation
Disturbance of terrestrial and marine habitat and wildlife	All	Field personnel will be accompanied by local field assistants to confirm minimal disturbance to terrestrial and marine habitats and organisms.
Disruption of traditional use of proposed study area	All	Arrival of the research team will be advertised in advance of the field study. There is no aspect of works required that would modify the use

Environmental Effect	Relevant Field Study	Mitigation
		of terrestrial or marine areas by local people
Temporary sediment suspension	Marine – Sediment Quality	The footprint of the grab sampler is very small (<10 cm^2), so disturbance of sediment will be minimal
Disturbance of heritage resources	Archaeology	Measures are described in the Class 2 permit applications which have been submitted to the Department. Field documentation will include details relevant to complete site forms. In the event artifacts that are diagnostic in nature are discovered in subsurface contexts or that are threatened by current or near future site situation they will be collected, cleaned, identified and catalogued. The final report will follow the requirements defined in the Guidelines for Applicants and Holders of Nunavut Territory Archaeological and Palaeontology Permits.
Increased overall anthropogenic presence within Study Areas	All	The research team is small and are conducting non-invasive short term studies.

12. References

NPC. (2024). 150435 - Grise Fiord and Resolute Bay Field Program. Conformity Determination. June 4, 2024.

Appendix A: Supporting Figures

FILE LOCATION: U:\YVR\317086\54170_GON_GRISEFIORD\11_DRAWINGS\15_I_AND_E\02_MARINE\317086-54170-00-MA-FIG-1-2.DWG

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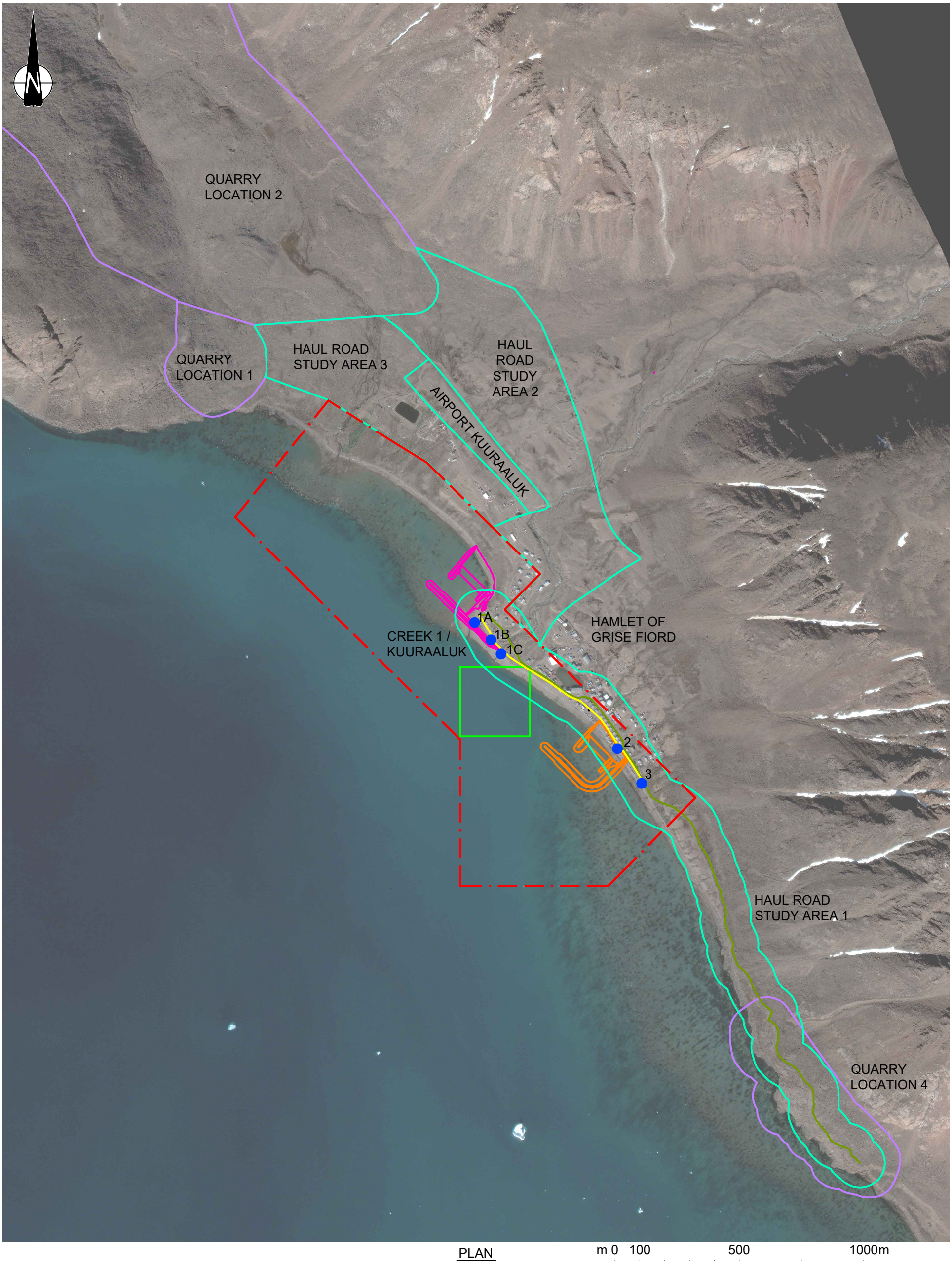

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Figure -1

LEGEND

SCH FOOTPRINT
- OPTION 1
- OPTION 2

POTENTIAL HAUL ROAD
- EXISTING ROAD/TRACK
- NEW HAUL ROAD

WATERWAY
- FRESH WATER CREEK

STUDY AREA
- COMMUNITY HARBOUR
- DISPOSAL AT SEA SITE
- HAUL ROAD
- QUARRY

GOVERNMENT OF NUNAVUT
GRISE FIORD COMMUNITY HARBOUR DEVELOPMENT
ENVIRONMENTAL AND SOCIO-ECONOMIC BASELINE SURVEY

PROJECT COMPONENTS AND STUDY AREAS
(QUARRY, HAUL ROAD, COMMUNITY HARBOUR, DISPOSAL AT SEA)

Date:	Drawn by:	Edited by:	App'd by:
16-MAY-24	JLC	JLC	VB

Worley Project Number: 317086-54170

DRG No: 1-2

REV: A

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USER NAME: jennifer.coppendale
ISSUING OFFICE: VANCOUVER, B.C.

QUARRY LOCATION 1
(APPROX. 7.0km
NORTHWEST SEE INSET)

HAMLET OF
RESOLUTE BAY

RESOLUTE BAY

QUARRY
LOCATION 3

QUARRY
LOCATION 2

PLAN
1:20000

QUARRY
LOCATION 1

TOP OF RUNWAY
(APPROX. 2.0km)

INSET
1:6000

m 0 100 200 300 m

1:6000

m 0 500 1000 m

1:20000

Figure -

LEGEND

SCH FOOTPRINT
- OPTION 1
- OPTION 2

POTENTIAL HAUL ROAD
- NEW HAUL ROAD

STUDY AREA
- COMMUNITY HARBOUR
- DISPOSAL AT SEA SITE
- HAUL ROAD
- QUARRY

GOVERNMENT OF NUNAVUT
RESOLUTE BAY COMMUNITY HARBOUR DEVELOPMENT
ENVIRONMENTAL AND SOCIO-ECONOMIC BASELINE SURVEY

PROJECT COMPONENTS AND STUDY AREAS
(QUARRY, HAUL ROAD, COMMUNITY HARBOUR, DISPOSAL AT SEA)

Date:	Drawn by:	Edited by:	App'd by:
16-MAY-24	JLC	JLC	VB

Worley Project Number: 317086-54175
DRG No: 1-2
REV: A

WPC_B_FSK

Appendix B: Project Description – English and Inuktitut

Worley Canada Services Ltd., operating as Worley Consulting, has been retained by the Government of Nunavut – Community & Government Services (GN-CGS) to support the detailed design of Community Harbour facilities in Grise Fiord and Resolute Bay in Nunavut. To inform the detailed design phase, several field programs will be undertaken over the next few years, initiating in the 2024 open-water season. This Project Description (PD) is specific to the field programs. The intention of the field programs, will be as below:

- Conduct environmental, geoscience, geophysics, and archaeological baseline studies in each location.
- Perform a geotechnical program to confirm seabed and quarry rock conditions.
- Topographic and bathymetric surveys.
- Existing conditions or effects studies during or post-construction of the CH's.

Surveys will be conducted in two Study Areas: the Community Harbour and the Haul Road and Quarry. Maps depicting the Study Areas for each community are provided in Appendix A, Figure A-1 and Figure A-2 in the attached Application Letter.

Field programs will largely be undertaken in open-water seasons, with the exception of the Geotech Drilling Program which may occur during the iced ocean condition. The initial 2024 existing conditions field program will be undertaken between July and September.

Consultations on the Community Harbour facilities have been ongoing since the feasibility phase and have included six separate community visits from 2018 to 2022 to conduct meetings with the Hamlet, design workshops with the Hunters and Trappers Associations/Organizations (HTAs/HTOs), Inuit knowledge (Inuit Qaujimajatuqangit [IQ]) workshops with elders and active hunters, and community open houses. Meaningful consultation will be continued throughout the 'life cycle' of the Projects, including during the design and construction phases so that issues of concern can be identified and responded to in a timely manner and design and construction planning can be adjusted where possible to avoid and mitigate any adverse social or environmental effects. The next round of consultations is being planned for July 2024, before any field programs, and will focus on providing the communities with a Project update and general overview, confirming preferred options for the Community Harbour layouts, Quarries, and Haul Roads and discussing the field program activities including coordinating with the community for local support of workers and equipment for the field programs.

ᓄᐊᓕ ᑲᓇᑕᒥ ᐱᔨᑦᑎᕋᖅᑎᒃᑯᑦ ᑎᒥᖓ, ᐊᐅᓚᑕᖅ ᐊᑎᖃᖅᑐᒃᑯᑦ ᓄᐊᓕ ᖃᐅᔨᒪᔨᑕᖏᑦ, ᑳᓐᑐᖅᑕᐅᕗᑦ ᓄᓇᕗᑉ ᒐᕙᒪᒃᑯᖏᓐᓄᑦ - ᓄᓇᓕᓐᓄᑦ ᒐᕙᒪᒃᑯᓐᓄᓪᓗ ᐱᔨᑦᑎᖅᑎᒃᑯᑦ (GN-CGS) ᐃᑲᔪᖅᓯᐃᓂᒻᒧᑦ ᐃᓗᐃᑦᑑᔪᓂᒃ ᓴᓇᐆᒪᔾᔭᑦ ᑎᑎᕋᐅᓯᒐᖏᓂᒃ ᓄᓇᓖᑦ ᐅᖅᑯᐃᕙᖏᓂᒃ ᐊᐅᓯᐃᑦᑐᒥ ᖃᐅᓯᐃᑦᑐᒥᓪᓗ ᓄᓇᕘᑉ ᖁᑦᑎᒃᑐᐊᓂ. ᑐᑭᓕᐅᕆᔭᐅᓕᕈᑎᒃ ᐃᓗᐃᑦᑑᔪᑦ ᐃᓗᓕᒃᓴᖏᑦ, ᖃᔅᓯᒑᓲᔪᓐᓂᑦ ᐃᓂᒃᓴᐅᔫᒃᑯᑦ ᖃᐅᔮᓵᖃᕝᕕᐅᑲᑕᓪᓗᑎᒃ ᑲᒪᒋᔭᐅᕙᓪᓕᐊᓗᑎᒃ ᐊᕿᒍᓂᒃ ᐊᒡᒋᖅᑐᓂᒃ, ᐱᒋᐊᖅᑕᐅᓗᓂ 2024 ᐊᐅᔭᖓᒍᑦ ᑐᕙᐃᔭᕇᕈᓂ. ᐅᓇ ᐱᔭᒃᓴᐅᑉ ᐅᓂᒃᑳᖓ (PD) ᑐᕌᖓᕗᖅ ᑖᒃᑯᓇᖓ ᖃᐅᔾᔫᒃᓴᐅᔪᓄᑦ. ᑐᕌᒐᕆᔭᕗᑦ ᑖᒃᑯᓈᓇ ᖃᐅᔨᓴᐃᓂᒃᑯᑦ, ᐃᒪᐃᑦᑑᓂᐊᖅᐳᑎᒃ:

- ᑲᒪᒋᔭᖃᓪᓗᑎᒃ ᐊᕙᑎᖓᑕ, ᓄᓇᐅᑉ ᐃᓕᖅᑯᓯᐊᑕ, ᓄᓇᐅᑉ ᐋᖅᑭᐅᒪᓂᐊ, ᐊᒻᒪᑦᑕᐅᖅ ᐃᑦᑕᓐᓂᓴᖅᑲᕝᕙᑦ ᕿᓂᖅᓴᖅᑕᐅᕙᓪᓗᑎᒃ ᐊᑐᓂ ᓂᕈᐊᕝᕙᒃᑯᒥᓇᕆᔭᒃᑯᑦ.
- ᐱᓕᕆᐋᖃᓪᓗᑎᒃ ᓄᓇᒧᑦ ᐱᔭᕆᑐᔪᓄᒃ ᖃᐅᔾᔮᖃᓐᓂᒻᒥᒃ ᐃᖅᑲᖓᑕ ᐅᖅᑯᐃᕙᖅᓴᐅᓪᓗ ᐅᔭᕋᖅᑯᑎᒃᓴᖏᑦ ᖃᓄᐃᑦᑑᓂᖏᓐᓂᒃ ᐃᓂᒃᓴᕆᔪᒪᔭᐅᔪᓂᑦ.
- ᓄᓇᐅᑉ ᖃᖓᓄᑦ ᑕᕆᐅᓪᓗ ᐃᖅᑲᖓᓅᖓᔪᑦ ᖃᐅᔨᓴᐃᓃᑦ.
- ᓴᖅᑮᔩᖅᑐᑦ ᐃᓕᖅᑯᓯᖏᑦ ᐅᕝᕙᓗ ᐊᒃᑐᐃᔪᑦ ᖃᐅᔨᓴᕆᔭᐅᔪᓂᒃ ᐃᓗᐊᒍᑦ ᓴᓇᔭᐅᓂᐊᑕ ᐅᕝᕙᓘᓐᓃᑦ ᑭᖑᓂᐊᑕ ᓴᓇᔭᐅᓯᒪᓕᕈᑎᒃ ᓄᓇᓖᑦ ᐅᖅᑯᐃᕙᖏᒃ.

ᖃᐅᔨᓴᖅᑲᓐᓂᕗᑦ ᑲᒪᒋᔭᐅᓂᐊᖅᑐᑦ ᒪᕐᕉᓐᓂᑦ ᖃᐅᔨᓴᒃᓴᐅᔪᓂᒃ ᐃᓂᐅᔫᒃ ᑖᔅᓯᒧᖓ: ᓄᓇᓕᐅᑉ ᐅᖅᑯᐃᕙᖓᓄᑦ ᐊᒻᒪᓗ ᐊᖅᑯᑎᒃᓵ ᐅᓯᑲᖅᑕᐅᑎᓄᑦ ᐅᔭᕋᓂᐊᕝᕙᒃᓴᖓᓗ ᑐᙵᕙᐅᔫᒃᓴᓂᒃ. ᓄᓇᙳᐊᑦ ᑕᑯᒃᓴᐅᑎᑦᑎᔪᑦ ᖃᐅᔨᓴᙳᓂᐊᖅᑐᑦ ᐃᓂᖏᓂᒃ ᐊᑐᓂ ᓄᓇᓕᐅᔫᓐᓄᑦ ᓴᖅᑮᔭᖅᑎᑕᑦ ᐅᐃᒍᖓ ᐃ ᐃᓗᐊᓂ, ᑕᑯᔭᒃᓴᖅ A-1 ᐊᒻᒪᓗ ᑕᑯᔭᒃᓴᖅ A-2 ᐃᓗᐊᓃᑦᑐᖅ ᐊᑕᔪᒥᒃ ᐅᒃᑐᑎᖅᑲᓐᓂᐅᑉ ᑎᑎᖅᑲᖓᓂᕐ.

ᓄᓇᒥᒃ ᖃᐅᔨᓴᖅᑲᓐᓂᕗᑦ ᐊᑐᖅᑲᑦᑕᓐᓂᐊᖅᑐᑦ ᐊᐅᔭᒃᑯᑐᐊᖅ ᓯᑯᐃᖅᓯᒪᓕᕈᓂ, ᑭᓯᐊᓂ ᑖᓐᓇ ᓄᓇᐅᑉ ᐃᓕᖅᑯᓯᐊᑕ ᓂᐅᖅᑑᑎᓂᖏᑦ ᑕᒪᓇᓕ ᑲᔪᓯᔪᓐᓇᖅᐳᑎᒃ ᓯᑯᓯᒪᓕᖅᑎᓪᓗᒍ ᐃᖅᑲᖓᓄᑦ ᖃᐅᔨᓂᒃ. ᓯᕗᓪᓕᖅᐸᖅ 2024 ᐃᓕᖅᑯᓯᐊᓄᑦ ᓴᖅᑮᖅᑐᓄᑦ ᑲᒪᒋᔭᐅᕙᓪᓕᐊᓗᓂ ᐊᑯᓐᓂᐊᑕ ᔪᓚᐃ ᐊᒻᒪᓗ ᓯᑎᐱᕆᐅᑉ ᐱᒋᐊᓐᓂᐊᓄᑦ.

ᑐᓴᕆᐋᕋᓯᐊᓐᓂᕗᑦ ᑖᒃᑯᓇᖓ ᓄᓇᓖᑦ ᐅᖅᑯᐃᕙᖏᑕ ᐱᖁᑎᔾᔪᐊᖏᓄᑦ ᑲᔪᓰᓐᓇᖅᓯᒪᕗᑦ ᑲᔪᓯᔪᒥᓇᓐᓂᐊᑕ ᕿᒥᕿᓂᐊᒍᑦ ᐃᓚᖃᖅᓯᒪᓪᓗᓂ ᐊᕝᕕᓂᓖᑦ (6) ᓄᓇᓕᓐᓄᑦ ᐳᓚᕋᓐᓃᑦ ᐊᑯᓐᓂᐊᑕ ᐊᕐᕌᒍᑦ 2018 ᑎᑭᓪᓗᒍ 2022 ᐅᐸᒍᑎᓪᓗᑎᒍᑦ Hᐋᒪᓚᒃᑯᑦ, ᓴᓇᐅᒪᓂᐊᑕ ᑎᑎᕋᐅᔭᕈᑎᖏᓐᓂᒃ ᐊᖑᓇᓱᒃᑐᓕᕆᔨᑦ ᑎᒥᖁᑎᖏᓐᓂᒃ/ᒥᑭᒋᐊᓐᓂᐊᖅᑎᓪᓗ ᑎᒥᖏᑕ (HTAs/HTOs), ᐃᓄᐃᑦ ᖃᐅᔨᒪᓂᖏ (ᐃᓄᐃᑦ ᖃᐅᔨᒪᔭᑐᖃᖏᑦ [IQ]) ᐃᓕᓐᓂᐊᖃᑎᒌᓐᓂᒃᑯᑦ ᑲᑎᒪᖃᑎᒋᓪᓗᑎᒍᑦ ᐃᓐᓇᑐᖃᖏᑦ ᐊᖑᓇᓱᒃᑎᓪᓚᕆᖏᓪᓗ, ᐊᒻᒪᑦᑕᐅᖅ ᓄᓇᓕᒻᒥ ᒪᑐᐃᖓᔪᓂᒃ ᑲᑎᒪᑎᑦᑎᕙᓪᓗᑕ. ᐋᑑᑎᖃᑦᑎᐊᖅᑐᖅ ᑐᓴᕆᐊᕋᓯᐊᓐᓂᖅ ᑲᔪᓯᑎᑕᐅᖏᓐᓇᕋᓱᒃᑐᖅ ᑖᒃᑯᐊ ᐊᐅᓚᓂᖃᖅᑎᓪᓗᒋᒃ "ᐆᒪᕙᐊᑕ ᐊᕐᕋᒍᖏᑦ" ᓴᓇᔭᐅᓂᐊᖅᑑᒃ, ᐃᓚᖃᖅᑲᓗᑎᒃ ᑎᑎᕋᐅᔭᒐᓇᔭᐅᔪᓂᒃ ᐊᒻᒪᓗ ᓴᓇᔭᐅᕙᓪᓕᐊᓕᖅᑎᓪᓗᒋᑦ ᑕᕝᕙᙵᑦ ᐃᓱᒫᓗᑎᒋᔭᑦ ᑲᒪᒋᔭᐅᑲᐅᖅᑐᖁᓪᓗᒋᑦ ᓇᓗᓇᐃᖅᑕᐅᓂᖏᑦ ᑲᒪᒋᔭᐅᓂᖏᓪᓗ ᓱᒃᑲᔪᒃᑯᑦ ᑎᑎᕋᐅᔭᕐᒐ ᓴᓇᔭᐅᒪᓂᐊᑕᓗ ᐸᖅᓇᒋᐊᖅᑲᔾᔮᖏᑦ ᐋᖅᑭᒋᐊᑲᐅᖅᑐᕈᓇᖅᑯᓪᓗᒋᑦ ᓴᓂᖅᑯᐃᓂᒃᑯᑦ ᑲᒪᒋᔭᖅᑲᓂᒃᑯᓪᓗ ᐱᐅᖏᑦᑐᑦ ᐃᓅᖅᑲᑎᒌᓄᑦ ᐊᕙᑎᒧᓪᓗᓐᓃ ᐊᒃᑐᐃᓂᖅᑲᓐᓂᓄᑦ. ᑭᖑᓪᓕᐅᔪᑦ ᓄᓇᓕᓐᓄᑦ ᑐᓴᕋᐊᕝᕙᒃᓴᕗᑦ ᐸᕐᓇᖑᓯᒪᓕᖅᑐᑦ ᔪᓚᐃ 2024ᒧᑦ, ᓯᕗᓂᐊᑕ ᖃᐅᔨᓵᒃᓴᑦ ᓄᓇᐃᓐᓇᖓᒍᑦ, ᓵᖓᔭᖅᑲᑦᑕᓂᐊᖅᑐᑦ ᓄᓇᓕᓐᓄᑦ ᐅᓂᒃᑳᑎᐊᓂᒻᒥᒃ ᓴᓇᔭᐅᓂᐊᖅᑐᑦ ᓇᒦᓕᓐᓂᖏᑕ ᑕᐅᑦᑐᐊᓗ, ᓱᓕᓂᕋᐃᔾᔪᑎᑦ ᓂᕈᐊᖅᑕᐅᓯᒪᔪᑦ ᓄᓇᓖᑦ ᐃᓄᖁᑎᖏᓐᓄᑦ ᐅᖅᑯᐃᕙᒋᓂᐊᖅᑕᖓᑕ ᐃᓂᓪᓚᖓᓂᖏᑕ, ᐅᔭᕋᒃᑕᕝᕙᒃᓴᕗᑦ ᐅᓯᑲᖅᑕᐃᔨᓪᓗ ᐊᖅᑯᑎᒋᖅᑲᑦᑕᓐᓂᐊᖅᑕᖏᓄᑦ ᐊᒻᒪᑦᑕᐅᖅ ᐅᖃᐅᓯᖃᓐᓂᒻᒧᑦ ᖃᐅᔨᓷᑦ ᐱᓕᕆᐋᖑᓂᐊᖅᑐᓂᒃ ᐃᓚᓕᒃ ᑐᑭᒧᐊᕆᐊᖃᕐᓂᖅᑲᓐᓂᒥᒃ ᓄᓇᓕᐅᔪᒥᒃ ᐃᖅᑲᓇᐃᔭᖅᑎᒃᓴᓄᓪᓗ ᐊᒻᒪᑦᑕᐅᖅ ᓴᓇᕿᑎᒃᓴᐅᒐᔭᖅᑐᓂᒃ ᖃᐅᔨᓇᔭᒃᓴᐅᔪᓄᑦ.

Appendix C: Letters of Support

Board of Directors
Nunavut Impact Review Board
Nunavut, Canada

May 29, 2024

To Whom It May Concern:

This letter is to inform you that the Iviq Hunters and Trappers' Organization (HTO) has been consulted on the proposed activities for the field program being planned in our community this summer and next spring in support of the Community Harbour for Grise Fiord.

A harbour is critical infrastructure essential for the safety and efficiency of boating and is currently lacking in our community. Considering that we, as hunters, rely on boating to feed our families and support our community, the construction of a community harbour is a welcome development. The proposed field program will support the development of the harbour.

We understand that a drilling program is being planned as part of a geophysics study to assess seabed and shoreline conditions are the proposed harbour site. We also understand that sediment, invertebrate, and plankton samples will be collected as part of the marine study.

We expect the research team to contact us prior to their arrival and to keep us up to date on their activities while in the community. We expect that local guides and field assistants will be hired during the field program and that the use of local equipment will be maximized as much as possible. We look forward to collaborating further with the Project team.

We are in full support of the field program proceeding as it will provide valuable data to inform the design and construction planning of our much-needed community harbour. We do not have any concerns about the field program impacting wildlife, fish or fish habitat or our ability to harvest.

If you have any questions, please do not hesitate to contact me at the HTO office.

Sincerely,

Amon Akeeagok

Chairperson – Iviq HTA

PO BOX 77
GRISE FIORD,
NUNAVUT X0A 0J0
TEL (867) 980-9959 FAX (867) 980-9052

Board of Directors
Nunavut Impact Review Board
Nunavut, Canada

May 29, 2024

To Whom It May Concern:

This letter is to inform you that the Hamlet of Grise Fiord has been consulted on the proposed activities for the field program being conducted in our community this summer and next Spring (2025) in support of the Community Harbour for Grise Fiord. The community of Grise Fiord currently does not have any harbour facilities. As part of the creation of the Tallurutiup Imanga Marine Conservation area, it was recognized that marine infrastructure is critical to community wellbeing as well as economic and social development. The construction of the community harbour will help to address the marine infrastructure deficit in our community. The proposed engineering, environmental and social baseline studies are a first step in the development of the harbour.

We understand that a drilling program is being planned as part of a geophysics study to assess rock quality and seabed conditions. We also understand that sediment, invertebrate, and plankton samples will be collected as part of the marine study.

We expect the research team to contact us prior to their arrival and to keep us up to date on their activities while in the community. We expect that local guides and field assistants will be hired during the field program and that the use of local equipment will be maximized as much as possible. We look forward to collaborating further with the Project team.

We are in full support of the field program proceeding as it will provide valuable data to inform the design and construction planning of our much-needed community harbour. We do not have any concerns about the field program impacting wildlife, fish or fish habitat or our ability to harvest.

If you have any questions, please do not hesitate to contact me at the Hamlet office.

Sincerely,

Meeka Kiguktak – Mayor

Hamlet of Grise Fiord