



Geotechnical and Environmental Baseline Studies for Iqaluit Port Development

Abandonment and Restoration Plan

21-Jun-16

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Burnaby BC V5C 6S7
Canada

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**Project No: 307071-01123-00-PM-PLN-0005 – Geotechnical and Environmental
Baseline Studies for Iqaluit Port Development: Abandonment and Restoration
Plan**

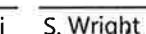
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Appendix List

Appendix 1: Study Area



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1 Introduction

1.1 Purpose and Scope

The purpose and scope of this Abandonment and Restoration Plan (ARP) is to present guidelines and procedures to restore the study site to a natural state equivalent to that prior to the geotechnical and environmental baseline studies (the Project).

Project personnel will be required to review this ARP during site orientation in order to inform staff of expectations and requirements.

The ARP is organized as follows:

- Section 1 – outlines the purpose, scope, and objectives of the ARP, and presents an overview of the Project, including the environmental setting
- Section 2 – presents summaries of environmental management plans related to the ARP
- Section 3 – outlines regulatory requirements and best management practices relevant to abandonment and restoration
- Section 4 – describes potential environmental impacts and procedures to mitigate such impacts
- Section 5 – describes monitoring, reporting and record keeping procedures to be implemented
- Section 6 – presents training procedures and communication protocols to be implemented

1.2 Project Overview

Geotechnical and environmental baseline studies are required to support the design of a proposed deep water port and upgrades to a municipal breakwater and boat ramp in Iqaluit, Nunavut. These studies will support engineering design, future preparation of an Environmental Assessment (EA), as per Article 12, Part 4 of the Nunavut Land Claims Agreement, and post-EA permitting.

Site coordinates for the municipal breakwater and boat ramp are approximately 68°30'41.45" W and 63°44'24.67" N (Appendix 1). The site coordinates for the deepwater port are approximately 68°31'29.07" W and 63°43'26.82" N.

Geotechnical and environmental baseline studies to be conducted include the following:

- Water and sediment quality
- Oceanography
- Fish and fish habitat
- Migratory and marine birds
- Terrestrial vegetation and rare plants
- Terrestrial landforms, soil and permafrost



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- Traditional Knowledge (Inuit Qaujimajatuqangit)
- Geotechnical investigations

The geotechnical and environmental baseline studies will focus on the areas surrounding the proposed deep water port site, municipal breakwater and boat ramp. These baseline studies will be conducted on federal Crown land, Municipal land, and Commissioner's land.

The proponent's contact information is as follows:

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1.3 Existing Site Conditions

The Project site consists of the marine environment, natural tundra habitat and, rocky shoreline.



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Related Environmental Management Plans

This ARP is one of four Environmental Management Plans (EMPs) to be referred to during the geotechnical and environmental baseline studies. The other EMPs include a Waste Management Plan, Wildlife Mitigation and Monitoring Plan, and Spill Prevention Plan. These plans should be read in conjunction with the ARP.

2.1 Waste Management Plan

A Waste Management Plan (WMP) has been prepared to identify, manage, and minimize the waste generated during geotechnical and environmental baseline studies. The WMP includes procedures to reduce or eliminate potential impacts associated with the baseline studies.

2.2 Wildlife Mitigation and Monitoring Plan

A Wildlife Mitigation and Monitoring Plan has been prepared to outline the environmental management requirements regarding both terrestrial and marine wildlife, and identify the regulatory requirements and necessary measures to manage or mitigate the potential impacts to wildlife.

2.3 Spill Prevention Plan

A Spill Prevention Plan has been prepared to document and describe the systems and procedures for handling, storing, and disposing of hazardous materials during the geotechnical and environmental baseline studies. This plan also presents procedures for managing spills of hazardous materials. Spills can result in harm to the field personnel and to the local environment.



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3 Regulatory Requirements and Best Management Practices

3.1 Federal Legislation

Through Environment and Climate Change Canada, the federal government's mandate is to preserve and enhance the quality of the natural environment, conserve Canada's natural resources, conserve and protect Canada's water resources, coordinate policies and programs, and address environmental issues on a national scale. Indigenous and Northern Affairs Canada, through the *Territorial Lands Act*, is responsible for the management of activities on Federal Crown Land in Nunavut. Additional federal acts that may apply to abandonment and restoration in Nunavut include:

- *Canadian Environmental Protection Act*
- *Fisheries Act*
- *Species at Risk Act*
- *Migratory Birds Convention Act*
- *Nunavut Waters and Surface Rights Tribunal Act*

3.2 Territorial Legislation

Jurisdiction over several territorial matters including wildlife management, land use planning and development, and natural resource management were granted to the territory by the Canadian government under the *Nunavut Land Claims Agreement*. Under this agreement, Institutions of Public Government (IPGs), including the Nunavut Impact Review Board (NIRB) and Nunavut Water Board (NWB) were created, both of which review and regulate activities pertaining to use or disturbance of the natural environment. This includes the use of water and collection of sediment, water, and biological samples.

Key pieces of territorial legislation also exist that provide the framework for the procedures by which the site areas will be restored. These include the following:

- *Environmental Protection Act*
- *Wildlife Act*
- *Public Health Act*
- *Safety Act*



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3.3 Best Management Practices and Guidelines

Key Best Management Practices for abandonment and restoration include:

- *A Best Practices Guide to Solid Waste Reduction* – Canadian Construction Association 2001
- *Environmental Guideline for the General Management of Hazardous Waste* – Nunavut Department of Sustainable Development 2002

3.4 Permits and Authorizations

The geotechnical and environmental baseline studies will require several permits and/or authorizations before proceeding. These include a variety of federal and territorial permits to allow for the collection of sediments, deployment of instruments, and land access.

A list of applicable federal permits/approvals is provided below:

- *Fisheries Act* Self-Assessment and, if required, a Request for Review (geotechnical drilling)
- *Fisheries Act* Licence to Fish for Scientific Purposes (invertebrate collection and retention)
- *Navigation Protection Act* Notice of Works (if required; barge placement during open water period)
- Indigenous and Northern Affairs Canada Class A land use permit (land use of Crown Land)

A list of applicable territorial and IPG permits/approvals is provided below:

- Nunavut Research Institute project registration
- Nunavut Planning Commission *Review/Determination*
- NIRB *Screening/Decision*
- NWB Type B Water Licence or Authorization (water use and waste disposal for geotechnical drilling program)



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4 Potential Environmental Impacts and Mitigation Measures

4.1 Environmental Impacts

Failure to return the study area to its pre-study condition can result in disturbances to wildlife, wildlife habitat, and the marine and terrestrial environment.

4.2 Mitigation Measures

4.2.1 General

The intent of the abandonment and restoration plan is to restore the Project site on completion of the geotechnical and environmental baseline studies. At the conclusion of the studies the Project site should be returned to an equivalent natural state as prior to study activities.

The following measures will be implemented by field personnel during the abandonment and restoration activities:

- Fuel, fluids or chemicals used will be removed from site
- Observation and avoidance of wildlife shall continue during abandonment activities
- All equipment used to conduct the studies will be removed and transported offsite
- Any spills will be cleaned-up and the area remediated and restored prior to completion of the Project

4.2.2 Geotechnical Studies

Geotechnical studies will include vibrocore and borehole drilling. Drilling activities will be conducted from an operational platform that will be placed over top of the selected sampling location. Drilling is planned to occur on land (quarry) and, depending on season, on ice and/or on a barge (subtidal sites). Vibrocores will be undertaken in intertidal areas. Hazardous products associated with the drilling program that have a potential to be leaked or spilled include diesel fuel, gasoline, hydraulic and lubricating oils, and engine coolants. Proper handling of these substances will enable successful abandonment and restoration upon completion.

The following restoration/mitigation measures will be implemented upon conclusion of the geotechnical studies:

- Remove marine drilling barge and support vessels from study area
- In-water marine equipment (drills, anchors, etc.) shall be removed prior to demobilization seasonally and at the outset of geotechnical studies so that nothing is disturbing the seabed when geotechnical studies are not performed



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- Drill holes will be appropriately filled and capped
- Drill cuttings shall be discharged to their marine or terrestrial origin within a small footprint

4.2.3 Environmental Baseline Studies

The environmental baseline studies will be conducted largely on foot or with a boat for the marine-based studies. Fuel use will be limited to the boat and crew vehicle. Chemical use will be limited to small quantities of preservatives. Crew will operate under a “pack in, pack out” policy with the intent to remove equipment and materials that were brought onto the site on completion of the studies. Bulk waste is not anticipated and deleterious spills are not likely. The in-water marine equipment (drogues, meters, etc.) shall be removed prior to demobilization seasonally and on completion of the baseline studies.



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5 Monitoring, Reporting, and Record Keeping

5.1 Monitoring

During closeout of the studies, field personnel will confirm that the study areas are restored to pre-study conditions.

5.2 Reporting

A final close-out memorandum shall be produced once the studies have concluded. No monitoring of the site will be required following closeout of the geotechnical and environmental baseline studies.

5.3 Record Keeping

Observations, field notes, checklists, inspection reports, including non-compliances or non-conformances and corrective action plans are to be maintained. Records shall be legible, identifiable, and traceable. Records may be recorded in hard copy as long as an electronic copy is also kept.



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6 Training, Competency, and Communications

6.1 Training and Competency

Prior to the commencement of field activities, site personnel will attend a site orientation. Environmental topics will be discussed regularly and all site personnel will be made aware of the conditions by which the study areas will be abandoned and restored. Such training will provide:

- Knowledge about the different types of wastes generated by the studies and their interaction with the local environment
- Knowledge about spill prevention
- Background on the relevant legislation and regulations that governs the how the site should be restored

Additional environmental and/or safety training will be provided depending on the requirements of the individual's specific assignment and the work to be performed. Environmental and safety topics, including site abandonment and restoration, will be discussed regularly at Health, Safety and Environment meetings, tailgate meetings, kick-off meetings, and work plan development. It is the responsibility of the field supervisor to provide the field team with this information. All records of personnel training will be maintained.

6.2 Communications

Field personnel will communicate directly with the field supervisor who in-turn will communicate with the Project Manager. If required, the Project Manager will communicate incidents/issues/concerns to the relevant regulatory bodies.



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Appendix 1: Study Area





Legend

- Study Area
- Shoreline
- Property Lot
- Road
- Creek

0 125 250 500
Metres



B SHEET SCALE: 1:15000 CUSTOMER:
OneWay
to zero harm
DATE: 15/06/2016
DRAWN: YM
EDITED: KR
APPROVED: MC



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IQALUIT PORT DEVELOPMENT
STUDY AREA

WORLEYPARSONS PROJECT No.:
307071-01123

FIG No.:
1

REV
0

Note:
Coordinate System: NAD 1983 UTM Zone 19N
Vertical Elevation Refers to Chart Datum

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