



Iqaluit Marine Infrastructure Project

Nunavut Impact Review Board – Small Craft Harbour
End of Construction Report

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We trust that this report satisfies your requirements as per Condition No. 3 of the Nunavut Impact Review Board (NIRB) Screening Decision Report (SDR) (Permit No. 17XN022).

If there are further questions or details required, please contact the undersigned, Laura Borden, at any time by email at laura@dynamicocean.ca or by phone at 604-928-0193 (mobile).

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Disclaimer & Limitations of the Report

The information presented in this document was compiled and interpreted exclusively for the purpose of compliance reporting to the Nunavut Impact Review Board (NIRB) for the Iqaluit Marine Infrastructure Small Craft Harbour Project (the SCH Project). Dynamic Ocean Consulting Ltd. (Dynamic Ocean) provided this report for the Government of Nunavut Transportation and Infrastructure Nunavut (GN-TIN) solely for the purpose noted above.

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Any questions concerning the information or its interpretation should be directed to Laura Borden.

Acronyms and Abbreviations

Acronym/Abbreviation	Definition
BWG	Boaters' Working Group
CEMP	Construction Environmental Management Plan
CCEMP	Contractor CEMP
CCME	Canadian Council of Ministers of the Environment
CGS	Community and Government Services
CIRNAC	Crown-Indigenous Relations and Northern Affairs Canada
CMZ	Compliance Monitoring Zone
CWP	Contractor Work Plan
DAS	Disposal At Sea
DFO	Fisheries and Oceans Canada
DG	Dangerous Goods
DSP	Deep Sea Port
Dynamic Ocean	Dynamic Ocean Consulting Ltd.
ECCC	Environment and Climate Change Canada
EDT	Economic Development and Transportation
EI	Environmental Inspector
EM	Environmental Monitor
EMPs	Environmental Management Plans
EnCMP	Environmental Compliance Monitoring Program
EZ	Exclusion Zone
FAA	Fisheries Act Authorization
FFHPP	Fish and Fish Habitat Protection Program
GN	Government of Nunavut
HTA	Hunters and Trappers Association
HWL	High-water line
ISQG	Interim Sediment Quality Guidelines
LUP	Land Use Permit
MMO	Marine Mammal Observer
MP	Monitoring Plan
MSP	Marine Safety Plan
NPC	Nunavut Planning Commission
NoW	Notice of Work

Acronym/Abbreviation	Definition
NES	Nunnata Environmental Services
NIRB	Nunavut Impact Review Board
NWB	Nunavut Water Board
QIA	Qikiqtani Inuit Association
SCH	Small Craft Harbour
SDR	Screening Decision Report
SEC	Sediment and Erosion Control
SRM Consulting	SRM Consulting
SRP	Spill Response Plan
TC	Transport Canada
The City	The City of Iqaluit
The Proponent	The Government of Nunavut
TIN	Transportation and Infrastructure Nunavut
TMP	Traffic Management Plan
Tower	Tower Arctic Ltd.
Worley Consulting	Worley Canada Services

Executive Summary

This report meets the requirements for the Final Report - Construction Condition 3 – Monitoring and Reporting Requirements – of the Nunavut Impact Review Board (NIRB) Screening Decision Report (SDR) for the Iqaluit Small Craft Harbour (SCH) (Permit No. 17XN022). Construction of SCH was underway through five open-water seasons, where construction was initiated in 2018 and substantial completion was reached in 2022. The facilities were operational in 2023. There were no non-compliances with the NIRB SDR during construction. A Table of Concordance is provided to confirm how compliance with the SDR has been met with reference to details throughout the Report.

Permit Conditions Tables of Concordance

The NIRB Iqaluit SCH Permit No. 17XN022 conditions are summarized in Table A. The Conditions are referenced to the relevant sections in the report for descriptions.

TOC 1: Permit Conditions

No.	Condition	Report Section
NIRB Recommended Project-Specific Terms and Conditions		
General		
1.	The Government of Nunavut (the Proponent) shall maintain a copy of the Project Terms and Conditions at the site of operation at all times.	Section 1.3
2.	The Proponent shall forward copies of all permits obtained and required for this project to the NIRB prior to the commencement of the project.	Section 1.3
3.	The Proponent shall operate in accordance with all commitments stated in correspondence provided to the Nunavut Planning Commission (NPC, Application to Determine Conformity, February 15, 2017), and the NIRB (Online Application Form, June 27, 2017, and Response to Comments, August 30, 2017).	Section 1.3
4.	The Proponent shall operate the site in accordance with all applicable Acts, Regulations and Guidelines.	Section 1.3
Water Use		
5.	The Proponent shall not use water, including constructing or disturbing any stream, lakebed or the banks of any definable water course unless approved by the Nunavut Water Board (NWB) or Fisheries and Oceans Canada (DFO).	No water was used for the SCH Project.
Waste Disposal		
6.	The Proponent shall keep all garbage and debris in bags placed in a covered metal container or equivalent until disposed of at an approved facility. All such wastes shall be kept inaccessible to wildlife at all times.	Section 3.1
Fuel and Chemical Storage		
7.	The Proponent shall store all fuel and chemicals in such a manner that they are inaccessible to wildlife.	Section 3.2

No.	Condition	Report Section
8.	The Proponent shall use adequate secondary containment or a surface liner (e.g., self-supporting insta-berms and fold-a-tanks) when storing barreled fuel and chemicals at all locations.	Section 3.2.2
9.	The Proponent shall ensure that appropriate spill response equipment and clean-up materials (e.g., shovels, pumps, barrels, drip pans, and absorbents) are readily available during any transfer of fuel or hazardous substances, at all fuel storage sites, and at all refuelling stations.	Section 3.2.3
10.	The Proponent shall remove and treat hydrocarbon contaminated soils on site or transport them to an approved disposal site for treatment.	Section 3.1
11.	The Proponent shall ensure that all personnel are properly trained in fuel and hazardous waste handling procedures, as well as spill response procedures. All spills of fuel or other deleterious materials of any amount must be reported immediately to the 24 hour Spill Line at (867) 920-8130.	Section 3.2
Wildlife - General		
12.	The Proponent shall ensure that there is no damage to wildlife habitat in conducting this operation.	Section 3.3
13.	The Proponent shall not harass wildlife. This includes persistently circling, chasing, hovering over pursuing or in any other way harass wildlife, or disturbing large groups of animals.	Workers were informed during the Contractor's induction training on requirements for appropriate wildlife management.
14.	The Proponent shall ensure that all project personnel are made aware of the measures to protect wildlife and are provided with training and/or advice on how to implement these measures.	See No. 13
Migratory Birds and Raptor Disturbance		
15.	The Proponent shall not disturb or destroy the nests or eggs of any birds. If nests are encountered and/or identified, the Proponent shall take precaution to avoid further interaction and or disturbance (e.g., a 100 metres buffer around the nests). If active nests of any birds are discovered (i.e., with eggs or young), the	Section 3.3.1

No.	Condition	Report Section
	Proponent shall avoid these areas until nesting is complete and the young have left the nest.	
16.	The Proponent shall minimize activities during periods when birds are particularly sensitive to disturbance such as migration, nesting, and moulting.	No wildlife features were identified, and activities did not interfere with sensitive periods such as migration, nesting, or moulting.
Ground Disturbance		
17.	The Proponent shall not move any equipment or vehicles unless the ground surface is in a state capable of fully supporting the equipment or vehicles without rutting or gouging. Overland travel of equipment or vehicles must be suspended if rutting occurs.	Section 3.5
18.	The Proponent shall implement suitable erosion and sediment suppression measures on all areas before, during and after conducting activities in order to prevent sediment from entering any waterbody.	Section 3.5
19.	All construction and road vehicles must be fitted with standard and well-maintained noise suppression devices and engine idling is to be minimized.	Engine idling was kept to a minimum throughout construction.
20.	The Proponent shall use water or other non-toxic and biodegradable additives for dust suppression as necessary to maintain ambient air quality without causing water to pool or runoff.	Section 3.6
Marine-Based Activities		
21.	The Proponent shall not deposit, nor permit the deposit of any fuel, chemicals, wastes (including wastewater) into any marine waters.	There were no harmful substances (i.e. fuel, chemicals) or wastes deposited in the marine environment throughout construction.
22.	The Proponent shall suspend all project activities should any dead fish or wildlife, or any injured wildlife be observed during any works or activities in and around the marine waters.	No injured or dead fish or wildlife were observed during construction.
23.	The Proponent shall implement measures designed to minimize disturbance to seabed sediments and benthic communities and marine wildlife when carrying out project activities within the marine environment.	Section 3.7 An offsetting plan was developed with Fisheries and Oceans Canada – Fish and Fish Habitat Protection Program (DFO-FHPP) to compensate to habitat loss or change due to the SCH Project.

No.	Condition	Report Section
24.	The Proponent shall implement suitable erosion and sediment suppression measures on all areas before, during, and after conducting activities in order to minimize turbidity plumes from the work site into the waterbody including the installation of silt screens.	Section 3.7.1
25.	Small Craft Harbour construction shall be carried out during periods when wind, wave and tidal conditions minimize the dispersion of silt and sediment from the work site.	Weather conditions did not impact the dispersion of silt and sediment from the work site.
Restoration of Disturbed Areas		
26.	The Proponent shall remove all garbage, fuel, and equipment upon abandonment and completion of the construction activities.	Section 3.11
27.	The Proponent shall complete all clean-up and restoration of the lands used prior to the end of each field season and/or completion of site construction.	Section 3.11
Other		
28.	The Proponent should engage with local residents regarding planned activities in the area and should solicit available Inuit Qaujimaningit and information regarding current recreational and traditional usage of the project area which may inform project activities. Posting of translated public notices and direct engagement with potentially interested groups and individuals prior to undertaking project activities is strongly encouraged.	Section 3.8.1, 3.10
29.	The Proponent shall ensure that project activities do not interfere with Inuit wildlife harvesting or traditional land use activities.	See No. 13
30.	The Proponent should, to the extent possible, hire local people and access local services where possible.	Locals were hired as Marine Mammal Observers (MMOs) and in some cases equipment operators
31.	The Proponent shall ensure that access to work areas is controlled and restricted to construction personnel. This should include the posting of signs noting hazards during construction activities.	Section 3.8.2, 3.10
32.	The Proponent should discuss potential implications of the project on on-land and marine traffic movement with the City of Iqaluit,	Section 3.9

No.	Condition	Report Section
	applicable territorial and federal government agencies, and local facility users before the implementation of the project.	
Monitoring and Reporting Requirements		
Environmental Management Plans – Constructions and Operations		
1.	Prior to the start of construction activities, the Proponent will provide the final Construction Environmental Management Plan to the NIRB including an updated Spill Contingency and Emergency Management Plans.	A Construction Environmental Management Plan (CEMP) was developed to support permitting. This was replaced by a Contractor CEMP (CCEMP), which met the minimum requirements outlined in the CEMP, for the construction phase of the SCH Project. Section 4
2.	The Proponent will provide to the NIRB copies of any new or updated operational plans associated with management of the site, especially the most recent Emergency or Spill Response Plan for the operation of the dock that would include, but not limited to, identification of signage at the site, description of any consultation measures to educate the public on commitments made for re-fueling, and requirement for spill control and reporting from usage of the small craft harbour.	Section 4.2
Final Report – Construction		
3.	The Proponent shall submit a comprehensive final report to the NIRB at the completion of construction activities and prior to operations. This report must contain the following information:	
	- A summary of activities undertaken during the construction phase, including: - The process undertaken to determine if contaminants were present in the dredged material (including whether on-site or laboratory testing was undertaken). - Mitigation measures undertaken if contaminants were identified. - Reasons for any installation of silt fences or other erosion control measures and location.	Section 3.4 (Sediment Contaminants); also see Appendix A (Figure A-1) Section 3.5 (Sediment and Erosion Control [SEC])

No.	Condition	Report Section
	- A log of wildlife observed in or near the project site, especially marine mammals, including: - Identification of the wildlife observed and a brief description of the animal or group's behaviour. - A description of mitigation activities undertaken, specifically stop work events, and the outcome of the encounter. - Discussions that occurred with any regulatory authorities regarding wildlife encounters, recommendations, and any updated procedures that resulted.	Section 3.3 (Wildlife Monitoring) and Appendix A (Table A-3)
	Description of any fuel spills and response measures undertaken to contain or clean up the spill.	Appendix A (Table A-2)
	A summary of how the Proponent has complied with terms and conditions contained within this Screening Decision Report, and all conditions as required by other authorizations associated with the project proposal.	This Report provides a summary of compliance with the terms and conditions of the SDR.

1 Introduction

This report provides a summary of construction activities for the Iqaluit Marine Infrastructure Small Craft Harbour (SCH) Project (the SCH Project), which meets Condition No. 3 of the Nunavut Impact Reviewing Board (NIRB) Screening Decision Report (SDR) – Monitoring and Reporting Requirements. The Table of Concordance (TOC 1) at the beginning of this Report references the SDR Conditions to describe compliance commitments that occurred during SCH Project construction.

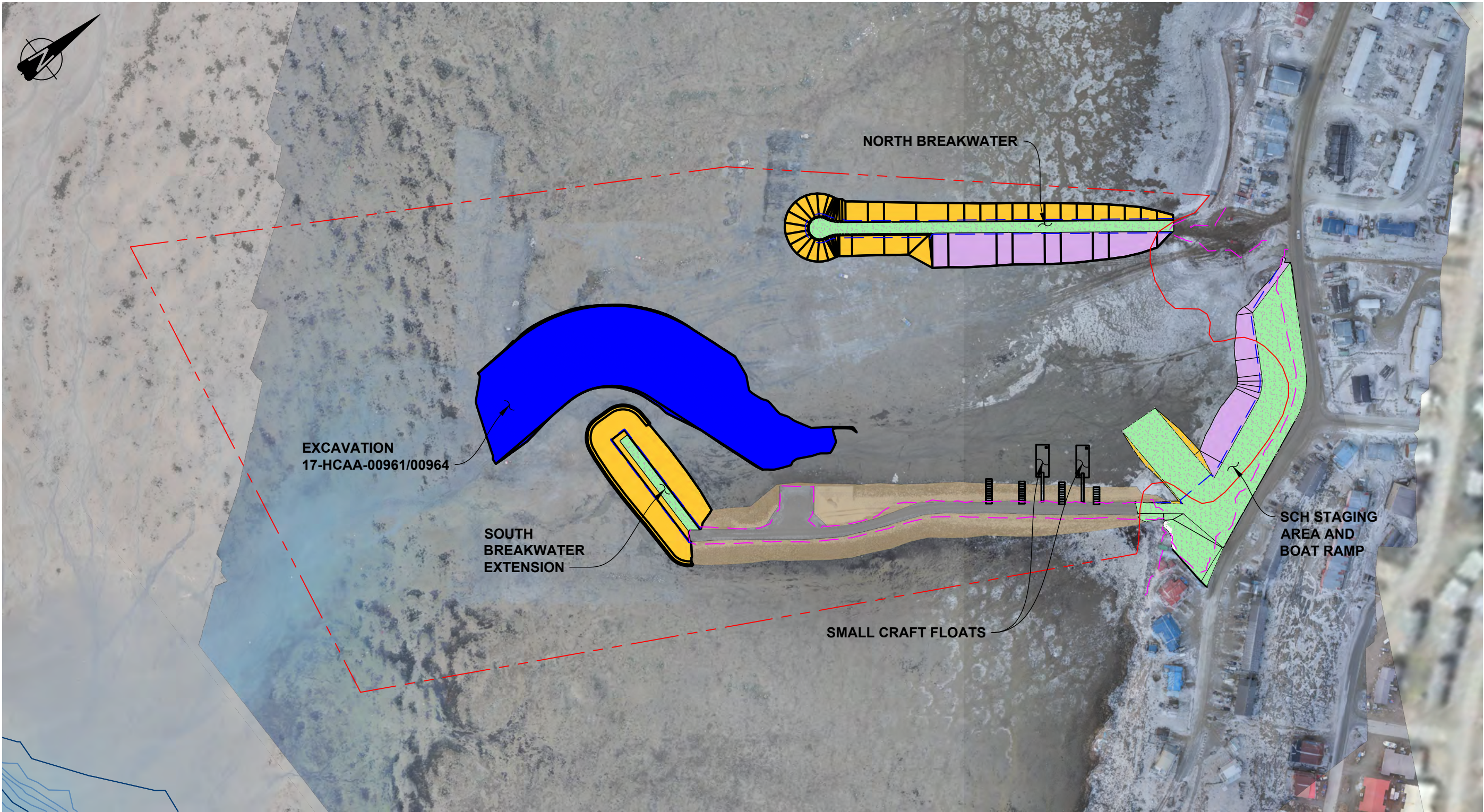
1.1 Background and Project Status

Construction of the SCH Project occurred during the open-water season (June to November) over a five-year period from 2018 to 2022. Substantial completion of the Project was reached at the end of the 2022 open-water season, and the facility has been operational since 2023. Construction was led by the Government of Nunavut (GN) - Community and Government Services (CGS) and ownership and responsibility were transferred to the GN - Economic Development and Transportation (EDT). Effective April 1, 2025, GN-CGS and GN-EDT merged, and are now referred to as the Departments of Transportation and Infrastructure Nunavut (GN-TIN). Consultant support for detailed design and regulatory permitting was provided by Worley Canada Services Ltd. (Worley Consulting, formerly Advisian) SRM Consulting Ltd. (SRM Consulting) and Dynamic Ocean Consulting Ltd. (Dynamic Ocean). Tower Arctic Ltd. (Tower) was the construction contractor.

1.2 Project Components

The SCH Project components are depicted in Drawing 1-1 and included:

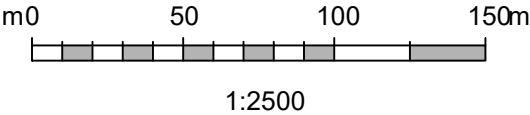
- Improvements and extension of the municipal breakwater.
- North breakwater.
- Two small craft floats.
- Staging area and boat ramp.
- Excavation of the boat basin.



PLAN
1:2500

LEGEND:

- | | | | |
|--|--|--|------------------------|
| | CIRNAC LUP BOUNDARY | | FILL OR CUT SIDE SLOPE |
| | HHWL: 11.7m CHART DATUM | | GRAVEL - DRIVEABLE |
| | HHWL PRE CONSTRUCTION: 11.7m CHART DATUM | | RIPRAP - NON-DRIVEABLE |
| | EXISTING BREAKWATER | | |



GOVERNMENT OF NUNAVUT
MUNICIPAL BREAKWATER EXPANSION
SCH PROJECT

PLAN



Date: 24-JAN-23	Drawn by: JLC	Edited by: JLC	App'd by: VBC
		Worley Project No. 307071-01148	
		FIG No. Drawing 1-1	REV B

"This drawing is prepared for the use of our customer as specified in the accompanying report.
Worley Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

1.3 Permits and Regulatory Compliance

Permits pertinent to the SCH Project are summarized in Appendix A (Table A-1). Tower was provided with copies of all permits and copies were kept on site during SCH Project construction.

The GN-TIN generated and maintained a Commitment Register which incorporated all permit conditions and Contractor Construction Environmental Management Plan (CCEMP) (Tower, 2018a) mitigations. The commitment register was used by the Environmental Inspector (EI) on behalf of the GN-TIN to confirm compliance throughout construction.

Environmental monitoring during in-water construction was a contractual requirement of Tower to confirm regulatory compliance (permits, CEMP). Worley Consulting was responsible for providing the EI to oversee compliance requirements of Tower on behalf of the GN-TIN. This role is undertaken under sub-contract to Dynamic Ocean by Victoria Burdett-Coutts with support from Laura Borden. Charlotte Mougeot (SRM Consulting) functioned as regulatory advisor to the GN-TIN.

In addition to permit conditions, the following documents were developed to maintain a record of regulatory compliance:

- GN-TIN Commitment Register.
- CCEMP (Tower, 2018a).
- Monitoring Plan (MP) (Tower, 2021a).
- Spill Response Plan (SRP) (Tower, 2021c).
- Fuelling Method (Tower, 2020).
- Tower Weekly Environmental Monitoring Reports.

The GN-TIN and their regulatory support team reviewed the Contractor Work Plans (CWPs) prior to the start of construction, and throughout construction when revisions occurred.

2 Construction Summary

Construction of the SCH Project consisted of primary and supporting construction activities. Primary construction was considered those activities specific to the construction of the SCH Project components (see Section 1.2), where supporting construction activities are those required to facilitate primary construction activities (e.g., crushing of rock).

A summary of construction activities for the SCH Project is provided in Table 2-1. Construction start and stop dates for specific activities are provided for each year of construction.

Table 2-1: Summary of Construction Activities

Construction Activity	Component	Construction Status			
		Start Date	Stop Date	Year	Year Complete
Infill	North Breakwater	20-Oct	11-Nov	2018	2019
		13-Jul	17-Nov	2019	
	Municipal Breakwater Extension	20-Oct	11-Nov	2018	2018
	Staging Area	24-Oct	5-Nov	2018	2022
		17-Jul	20-Jul	2019	
		14-Sept	18-Sept	2020	
		11-Sept	12-Sept	2022	
	Boat Ramp	24-Oct	5-Nov	2018	2022
		11-Sept	12-Sept	2022	
Stockpiling	Stockpiling	16-Oct	17-Nov	2019	NA
		27-Jul	09-Sept	2022	
Excavation	Boat Basin	19-Oct	09-Nov	2018	2019
	Access Channel	20-Oct	11-Nov	2018	2018
Installation of small craft floats	Installation of small craft floats	22-Aug	03-Nov	2022	2022
Installation of pre-fabricated stairs	Installation of pre-fabricated stairs	17-Jul	21-Jul	2020	2020
Geotechnical Drilling	Geotechnical Drilling	17-Aug	18-Aug	2021	2021

3 NIRB Compliance Requirements

A summary of compliance and environmental monitoring undertaken throughout the SCH Project, and which is pertinent to the NIRB, is provided in this section.

Types of monitoring performed throughout the SCH Project are summarized in Table 3-1.

Table 3-1: Monitoring Summary

Construction Activity	General	Turbidity	Marine Mammal Observer (MMO)	Acoustic (Fish)	Acoustic (Marine Mammal)	Sediment and Erosion Control (SEC)	Dust Control	Year(s) Conducted
Infill	✓	✓	✓	-	-	-	-	2018, 2019, 2020, 2022
Drilling	✓	-	-	-	-	✓	✓	2022
Geotechnical Drilling	✓	✓	-	-	-	-	✓	2021
Stockpiling	✓	-	-	-	-	✓	✓	2019, 2022
Fuel Management	✓	-	-	-	-	-	-	2018, 2019, 2020, 2021, 2022
Spill Response	✓	-	-	-	-	-	-	2018, 2019, 2020, 2021, 2022
Rock/Sediment Transport	✓	-	-	-	-	✓	✓	2019, 2020, 2022

Note: Check marks indicate that monitoring types were used for the corresponding construction activity

3.1 Waste Disposal

Tower was responsible for ensuring that all wastes (e.g., garbage, debris, scrap metal) were removed from Territorial lands to an approved landfill or disposal facility (Tower, 2018a). Debris was collected from the SCH and transported to the City of Iqaluit (the City) landfill. When stored at the work site, garbage was maintained in a way that prevented access by wildlife.

Disposal of Dangerous Goods (DG) consisted primarily of contaminated soils from minor oil spills that occurred at the SCH. The DGs were disposed of by Nunnata Environmental Services (NES) who are certified to handle the contaminated material.

3.2 Fuel and Chemical Storage

3.2.1 Dangerous Goods Storage

A storage area for DGs was established within Tower's laydown area and within the explosive's storage area (see Figure 3-1). Items were stored in designated shipping containers that were inaccessible to wildlife. A SRP was developed to outline procedures for secondary containment and spill prevention of DGs (Tower, 2021c).



LEGEND:

- Explosives storage area
- Contractor Camp Yard

SOURCES / NOTE:
WGS 84 / EPSG Canada Polar
Stereographic
Units: meters
Dynamic (relies on a datum which is not plate-fixed)
Celestial body: Earth
Based on World Geodetic System 1984 ensemble (EPSG:6326), which has a limited accuracy of at best 2 meters.

PROJECT: DSP-IQ

SYSTEM:

ASSET:

DISCIPLINE: Regulatory

REV	YYYY-MM-DD	DESCRIPTION	DRAWN	APPROVED
A	2023-08-27	DSP-IQ	C.Knight	
B	2023-09-19	DSP-IQ	C.Knight	

ISSUES / REVISIONS

VENDOR:

Dynamic Ocean Consulting Ltd.

Advisian

Nunavut

TITLE:

Figure 3-1 Explosives Storage Area and Contractor Camp Yard

SCALE:	SHEET 1 OF 1	DRAWING NO. 20230827-003	REV: B
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3.2.2 Refuelling and Fuel Storage

Fuel for the SCH Project was provided through existing fuelling facilities in Iqaluit as well as the use of Tower's own fuel truck. In addition, diesel and gasoline were stored in two 9,000 L fuel storage tanks in Tower's Laydown Area. A Fuelling Method CWP was developed to outline proper fuelling procedures (Tower, 2021c).

3.2.3 Spill Response

Tower developed a SRP as one of their CWPs (Tower, 2021c).

Tower's sequence of events to be followed in the event of spill are outlined below:

- Control the leak.
- Containment of the spilled product.
- Inform the supervisor.
- Recover contaminated material.
- File environmental report.

One general spill response station was established for the SCH. Smaller kits were available in all vehicles and equipment. All spills were immediately reported to the 24-hour Spill Line per Condition 11 of the Permit and spill reports were completed the same day. A summary of spills that occurred within the SCH Project site throughout construction is provided in Appendix A (Table A-2).

3.2.4 Equipment Inspections

As per the CCEMP (Tower, 2018a), equipment was required to be routinely inspected for leaks, cracked hoses and other conditions that could result in spills. Equipment was inspected prior to the start of each construction season and regularly throughout construction by the Tower Environmental Monitor (EM). Weekly equipment inspections were conducted by equipment operators and was documented in Tower's Weekly Environmental Monitoring Reports.

3.3 Wildlife Monitoring

No negative impacts to wildlife occurred during construction. Summaries of environmental monitoring activities for wildlife are provided in this section.

Monitoring types included:

- Pre-construction wildlife surveys.
- MMOs during in-water works.

Methodologies carried out by Tower for each of the monitoring types are provided in the respective section of the MP (Tower, 2021a).

3.3.1 Pre-Construction Wildlife Surveys

Pre-construction wildlife surveys did not occur in 2018 and 2019 due to the location of the SCH Project being in a municipal area, as per Tower's Weekly Environmental Monitoring Reports. However, from 2020 through 2022 surveys were conducted and observed species were limited to ravens and gulls. Summaries of pre-construction wildlife surveys are provided in Tower's Weekly Environmental Monitoring Reports and Appendix A (Table A-3).

3.3.2 Marine Mammals

The Tower EM trained the dedicated MMOs in procedures to be followed when marine mammals were observed in proximity to the construction site in relation to the relevant Exclusion Zone (EZ) (see Appendix 3 of Tower (2021a)). The majority of infill works at the SCH were conducted in out-of-water tidal conditions, thus MMO's were rarely required. No marine mammals were observed during construction activities at the SCH.

3.4 Sediment Contaminants

Sediment sampling took place during the permitting phase of the SCH Project to support upland disposal of sediments. A comprehensive sediment sampling and analysis program was undertaken in 2015 and 2016, where samples were collected from the load site (SCH excavation footprint) (see Appendix A (Figure A-1) for load site sampling locations). Laboratory analysis of sediment sample characteristics were compared against Environment and Climate Change Canada (ECCC) Disposal At Sea (DAS) Regulations (ECCC, 2018) and Canadian Council of Ministers of the Environment (CCME) Sediment Quality Guidelines, Interim Sediment Quality Guidelines (ISQG) (CCME, 2003) for marine environments.

Chemical analysis of sediment at the SCH showed that all sediment characteristics were below CCME ISQG and DAS regulation guideline limits (Advisian, 2017b).

3.5 Sediment and Erosion Control

Monitoring for SEC occurred for the activities described in Table 3-1. Monitoring for SEC was additionally undertaken from 30 June to 06 July 2020 (Week 3) following an incident on 30 June 2020, when a truck forded through a stream at the SCH. No fauna or flora were observed in the stream. A temporary wood bridge was installed over the stream from 02 July to 06 July 2020 to prevent trucks from fording through the stream while conducting work in the area. No erosion or turbidity plumes were observed, and no other SEC measures were required throughout the SCH Project.

Rutting did not occur due to SCH Project construction activities.

3.6 Dust Suppression

Dust was sometimes generated by trucks transporting materials between the SCH and Deep-Sea Port (DSP) sites. When required, dust suppression measures (e.g., calcium, water) were applied to the transport route. No dust suppression measures were required at the SCH specifically.

3.7 Marine-based Activities

3.7.1 Turbidity

Turbidity monitoring was carried out for construction activities that had the potential to result in sediment disturbance, using a combination of visual monitoring and water sampling. Tower's turbidity monitoring protocol is described in the MP (Tower, 2021a). For each of the activities outlined in Table 7-1 of the MP (Tower, 2021a), compliance monitoring was carried out at the start of each new construction activity. Compliance monitoring was conducted as follows:

- Visual observation.
- Turbidity sampling when plume exceeds 100 m (Compliance Monitoring Zone (CMZ)).

Following the initial turbidity sampling, the EM conducted visual monitoring of the construction activity for plumes. When plumes occurred, they were monitored by the EM for the duration of the plume, and

plume size and activity were documented. If plumes exceeded 100 m from the construction activity, turbidity sampling was undertaken. While occasional plumes did occur, no turbidity generated from the Project construction resulted in concerns for deleterious substances.

Silt curtains were not required during SCH Project construction.



Photo 3-1: Representative Turbidity Plume – 2020 Construction Season

Source: Photo 5-2 of Advisian (2020)

3.8 Other

3.8.1 Community Consultation

3.8.1.1 Government of Nunavut

Community engagement, including consultation with the Amaruq Hunter and Trappers Association (HTA) and Qikiqutani Inuit Association (QIA), was undertaken by the GN-TIN since the beginning of the design and permitting phases of the SCH Project in 2016. Collaboration with the Amaruq HTA was instrumental in designing the marine facilities in Iqaluit that would meet the needs and priorities of the community as well as ensuring that Inuit harvesting rights would not be affected by the SCH Project.

Further, consultation with the Amaruq HTA and QIA was conducted by the GN-TIN in 2021 for works associated with the undertaking of a geotechnical drilling program.

3.8.1.2 Tower Arctic Ltd.

Prior to SCH Project construction, Tower was required to develop a community consultation program. Community consultation was undertaken prior to and during each construction season to inform the community about planned construction activities and address any community concerns. Tower's community consultation program consisted of:

- Posting and distribution of pre-season construction information packages in town (e.g., post office information board, Facebook community group).
- Community open houses.
- Construction notices for specific construction activities with the potential to impact the community (posted online, on radio and around the City).
- Meetings with:
 - The City.
 - The Boaters Working Group (BWG).
 - The Amaruq HTA.
 - The QIA.

3.8.2 Community Construction Signs

English and Inuktitut signs and notifications were established at various locations and posted to Facebook in Iqaluit to notify the community about the SCH Project construction. The intention of the signs was to warn of potential hazards, and/or to notify of changes to marine access (Photo 3-2).



Photo 3-2: Demonstrative Community Access Signs

Source: (Advisian, 2020)

3.9 Cautionary Buoys

As a component of the Transport Canada (TC) Notice of Works (NoW) Approval, cautionary buoys were required to minimize navigational interferences and confirm marine users were informed of activities that may influence navigation routes. Tower stationed these buoys in the water at the start of construction, the buoys were temporarily removed due to ice conditions and reinstalled. The approximate location of the buoys is provided in Tower's Marine Safety Plan (MSP) (Tower, 2021b) and in Figure 3-2.

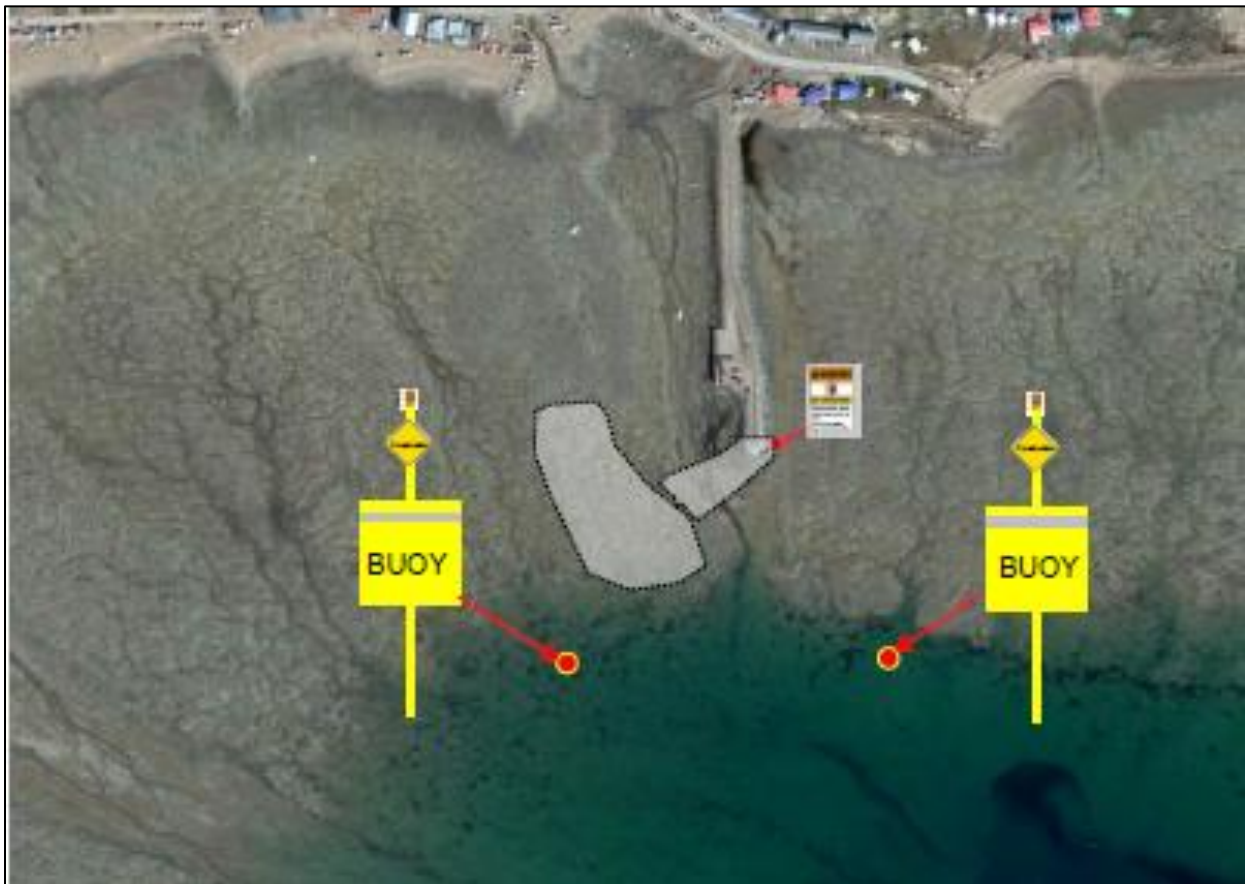


Figure 3-2: Location of Small Craft Harbour Cautionary Buoys

Source: Appendix 1 of Tower (2018b)

3.10 Community Access and Communication

Throughout construction Tower would post on Facebook to inform the community when construction began for the season and access was being restricted.

3.11 Restoration of Disturbed Areas

At the end of construction all marine equipment, including the barge, cranes, and tugboats were demobilized from Iqaluit. Land-based equipment was either demobilized or stored at Tower's camp yard (see Figure 3-1).

Tower was required to submit a check list at the end of each construction season. This can be found in the Appendix of the Fisheries and Oceans Canada - Fish and Fish Habitat Protection Program (DFO-FFHPP) annual construction reports and can be provided to the NIRB upon request.

No site restoration activities were undertaken at the SCH Project site as the SCH is permanent marine infrastructure.

4 Monitoring and Reporting Requirements

4.1 Monitoring Report

This Report provides a summary of compliance with the terms and conditions of the SDR. All monitoring activities undertaken throughout the SCH Project relevant to the SDR are summarized in Section 3. Wildlife logs are available in Appendix A (Table A-3), with further description of wildlife monitoring and mitigation available in Section 3.3.

4.2 Environmental Management Plans

Several Environmental Management Plans (EMPs) were developed for the SCH Project and were implemented through the CWP's developed by Tower (Table 4-1). Copies of EMPs and CWP's were submitted to the NIRB prior to the start of SCH Project construction and during construction following document updates.

An SRP was developed by Tower for the Project for the construction phase. The construction SRP was included in the CEMP, which was submitted to NIRB on 21 November 2018. Updated SRP's were submitted to NIRB prior to the start of construction season when updates were made.

See Table 4-1 for a detailed list of EMPs in place during construction.

4.2.1 Operational Environmental Management Plan

The GN-TIN are responsible for the management of all components of the Port of Iqaluit, which includes the SCH. The GN-TIN has produced a number of documents that address all aspects of the management, operation and maintenance of the Port of Iqaluit.

In October 2023, GN-TIN met with the Amaruq HTA and with the BWG. The BWG is a local group of boaters that was formed by the GN-TIN's Project Team to attend design workshops early in the design stage of the SCH and DSP Project. Both the Amaruq HTA and the BWG were consulted through the design and the construction phases (see Section 3.8.1). The October 2023 meeting was specifically held to obtain feedback from users of the SCH facilities following the first season of full use and discuss the protocol for finalizing the rules of operations of the facilities, including refueling and spill response.

The GN-TIN has extracted the small craft components of the "Port of Iqaluit Operations Manual, 2023 Edition" (Operation Manual) (GN-TIN, 2023) and finalized those components with the Amaruq HTA, which has been distributed to the BWG. Further, the GN-TIN has procured additional signage, safety equipment, spill kits, and waste receptacles which are located at the SCH.

Table 4-1: Small Craft Harbour Project - Environmental Management Plans

Report	Phase	Description	Developed By	Reference
CEMP	Permitting	The CEMP describes the mandates of pertinent AHJ associated legislation to confirm permit approvals and relevant compliance requirements for the construction of the SCH Project. This document details and outlines commitments, environmental effects and SCH Project-specific mitigation and monitoring measures implemented during construction to minimize negative effects to physical, biological and socio-economic features associated with construction.	Advisian	(Advisian, 2017a)
CCEMP	Construction	The Contractor developed a CCEMP to outline environmental management commitment.	Contractor	(Tower, 2018a)
MP	Construction	The Contractor developed a MP to detail how monitoring commitments outlined in the CEMP would be met during construction. This included wildlife (including marine mammal) monitoring, underwater noise monitoring and turbidity monitoring.	Contractor	(Tower, 2021a)
Traffic Management Plan (TMP)	Construction	The Contractor developed a TMP to manage land-based transportation between the DSP and SCH. This included: Outlining the requirements and management for site access, traffic within the SCH site and communication plans between pertinent personnel to address traffic management related concerns.	Contractor	(Tower, 2022)

Report	Phase	Description	Developed By	Reference
		Providing commitments for the community to access and use the SCH, including details on safety restrictions on access, and the process for interactions and controls with sea lift operators.		
MSP	Construction	The Contractor developed an MSP to outline safety management for marine-related construction. The plan included the requirements stipulated in the TC Approval received for the SCH Project.	Contractor	(Tower, 2021b)
SRP	Construction	The Contractor developed an SRP, which included: - Plans for responding to emergencies and accidental spills. - Outlined of spill response procedures in the event of emergencies consistent with BMPs, legislation, and GN procedures. - Outlined of a schedule for checking spill kits. - Specified spill response materials and spill kit contents, notification, and communication commitments. - Identified fuel storage locations and handling procedures.	Contractor	(Tower, 2021c)

4.3 Summary of Requirements

Construction activities undertaken are described in Section 2. A summary of requirements is provided in Table 4-2, and regulatory inspections conducted throughout the SCH Project construction is provided in Table 4-3.

Table 4-2: Summary of Requirements

Requirement	Summary
Activities	
Reasons for any installation of silt fences or other erosion control measures and location.	See in Section 3.5.
Wildlife	
The Proponent shall ensure that there is no damage to wildlife habitat in conducting this operation.	See Section 3.3.
The Proponent shall not harass wildlife. This includes persistently circling, chasing, hovering over pursuing or in any other way harass wildlife, or disturbing large groups of animals.	Workers were informed during the Contractor's induction training on requirements for appropriate wildlife management.
The Proponent shall ensure that all project personnel are made aware of the measures to protect wildlife and are provided with training and/or advice on how to implement these measures.	Workers were informed during the Contractor's induction training on requirements for appropriate wildlife management.
Fuel	
Description of any fuel spills and response measures undertaken to contain or clean up the spill.	See Section 3.2.3 and Appendix A (Table A-2)
Compliance	
A summary of how the Proponent has complied with terms and conditions contained within this SDR, and all conditions as required by other authorizations associated with the project proposal.	See Section 1.3

Table 4-3: Regulatory Inspections for the SCH Project

Year	Regulatory Authority	Personnel Attending	Title	Construction Week	Date
2018	DFO-FFHPP	Andrea Doherty	Senior Biologist	Week 5	28-Aug-18
		William Glass	Senior Fish and Fish Habitat Protection Biologist		
	TC	Laura Jones	Navigation Protection Officer	Week 11	10-Oct-18
	Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC)	Jonathan Mesher, LeeAnn Pugh, Laura Churchill, Jeremy Fraser	Resource Management Officer	Post construction	26-Nov-18
2019	DFO-FFHPP	Andrea Doherty	Senior Biologist	Weeks 14, 15	22-Sept-19 to 26-Sept-19
		Steven Cho	Fish and Fish Habitat Protection Biologist		
	TC	Laura Jones	Navigation Protection Officer	Week 12	05-Sept-19
	ECCC	Monika Trottier	Enforcement Officer	Week 7	01-Aug-19
		Curtis Didham	Enforcement Officer		
	CIRNAC	Johnathan Mesher	Resource Management Officer	Week 21	07-Nov-19
				Week 22	14-Nov-19

5 References

- Advisian. (2017a). Iqaluit Marine Infrastructure. Small Craft Harbour Construction Environmental Management Plan. Prepared for Government of Nunavut. Doc No: 307071-01148-02-EN-PLN-0003. June 2017. Rev 0.
- Advisian. (2017b). Iqaluit Marine Infrastructure Project: Marine Baseline Report. Prepared for Government of Nunavut. Doc No: 307071-01148-02-EN-REP-0003. 19 May 2017. Rev 1.
- Advisian. (2020). Iqaluit Project - 2020 Construction Season Annual Report. Prepared by Advisian. 28 January 2021. 149pp.
- CCME. (2003). Canadian Water Quality Guidelines for the Protection of Aquatic Life. Prepared by Canadian Council of Ministers of the Environment. 23pp. Available at: <https://ccme.ca/en/res/wqimanualen.pdf>. .
- ECCC. (2018). Characterization of Dredged Material for Open Water Disposal. Prepared by A. C. Environmental Protection Branch. June 2018. Available at: ec.immersionenmeratl-disposalatseaatl.ec@canada.ca.
- GN-TIN. (2023). Port of Iqaluit Operations Manual. Prepared by Government of Nunavut Transportation and Infrastructure.
- Tower. (2018a). Construction Environmental Management Plan (CEMP) - Iqaluit. Prepared for Government of Nunavut. Prepared by Tower Arctic Ltd. Doc No: TA-21808-WP-12-CEMP. 05 October 2018. Rev 2.
- Tower. (2018b). Marine Safety Plan. Work Plan. Document No. TA-21808-WP-0008. August 14, 2018. Revision 2.
- Tower. (2020). Iqaluit Marine Infrastructure Project - Fuelling Method Work Plan. Prepared for Government of Nunavut. Doc No: 15255-00331. 19 May 2020 Rev 2.
- Tower. (2021a). Iqaluit Marine Infrastructure Project - Environmental Monitoring Plan. Prepared for Government of Nunavut and Advisian. Prepared by Tower Arctic Ltd. Doc No: 15235-00290-TA. 04 August 2021. Rev 16.
- Tower. (2021b). Iqaluit Marine Infrastructure Project - Marine Safety Plan, Work Plan. Prepared for Transport Canada Navigation Protection Program and Advisian. Prepared by Tower Arctic Ltd. Doc No: TA-21808-WP-0008. 11 May 2021. Rev 5.
- Tower. (2021c). Iqaluit Marine Infrastructure Project - Spill Response Plan Work Plan. Prepared for Government of Nunavut and Advisian. Prepared by Tower Arctic Ltd. Doc No: TA-21808-WP-13-SPILL RESPONSE PLAN. 07 June 2021. Rev 9.
- Tower. (2022). Traffic Management Plan. Work Plan. Prepared for Government of Nunavut. Prepared by Tower. Doc No: TA-21808-WP-06- 2022 Traffic Management Plan. 17 June 2022. Rev 3.

Appendix A: Supporting Tables and Figures

Table A-1: Small Craft Harbour Project Permits

Regulatory Authority	Permit Type	Permit Number	Issued	Expiry	Permit Holder
Federal					
DFO	Fisheries Act Authorization (FAA)	17-HCAA-00961, 17-HCAA-00964	29-Mar-18	31-Dec-22	GN
		19-HCAA-00476	07-Oct-19	31-Dec-22	
TC	NoW	8200-2016-600095	29-Jun-18	-	
			26-Aug-19	-	
CIRNAC	Land Use Permit (LUP)	N2018X0009	21-Mar-18	01-Oct-23	
		N2018X0012	06-Jun-19	14-Aug-23	
Territorial					
Nunavut Planning Commission (NPC)	Territorial referral	148431	15-Feb-17	-	GN
NIRB	SDR	17XN022	15-Feb-17 (NPC referral)	End of Project	
			02-Oct-17 (SDR)		
			02-Oct-17 (Ministerial support)		
Designation Inuit Organization					
QIA	Right of Way Agreement (Beach Traffic Permit)	QX-2011	13-Jul-20	30-Nov-2020	Tower
Municipal					
The City	Development Permit	DP 17-060	15-May-18	-	GN

Table A-2: Construction Spill Summary

Occurrence No.	Date	Location	Spill Report No.	Summary	Corrective Action
2018					
There were no spills reported by Tower in the 2018 construction season.					
2019					
1	20 October	North Breakwater at the SCH	19-432	0.5 L of bio-degradable hydraulic oil spilled from a broken excavator hydraulic hose to the ground. Most of the oil was contained in the engine but some had run down the excavator and fell to the ground. Spill was below the high-water line (HWL) (9 m elevation) and during low tide. No spill occurred in the water.	Operator immediately placed absorbent on the ground to contain the oil. The spill was completely recovered using a shovel and stored in a 5 gallon bucket. The contaminated soil and absorbent were stored in Tower's used oil and absorbent container to be discarded at NES with other contaminated waste. The excavator was inspected and cleaned up.
2020					
1	26 June	SCH	20-20196	A hydraulic hose on excavator broke and spilled approximately 5 L of biodegradable hydraulic oil. Spill occurred above the most recent HWL. No oil reached the water.	The contaminated soil was completely recovered and placed in a drum. The contaminated soils and absorbents were stored in Tower Arctic Ltd. (Tower's) laydown and were later disposed of at an accredited facility
2021					
There were no spills reported by Tower in the 2021 construction season.					

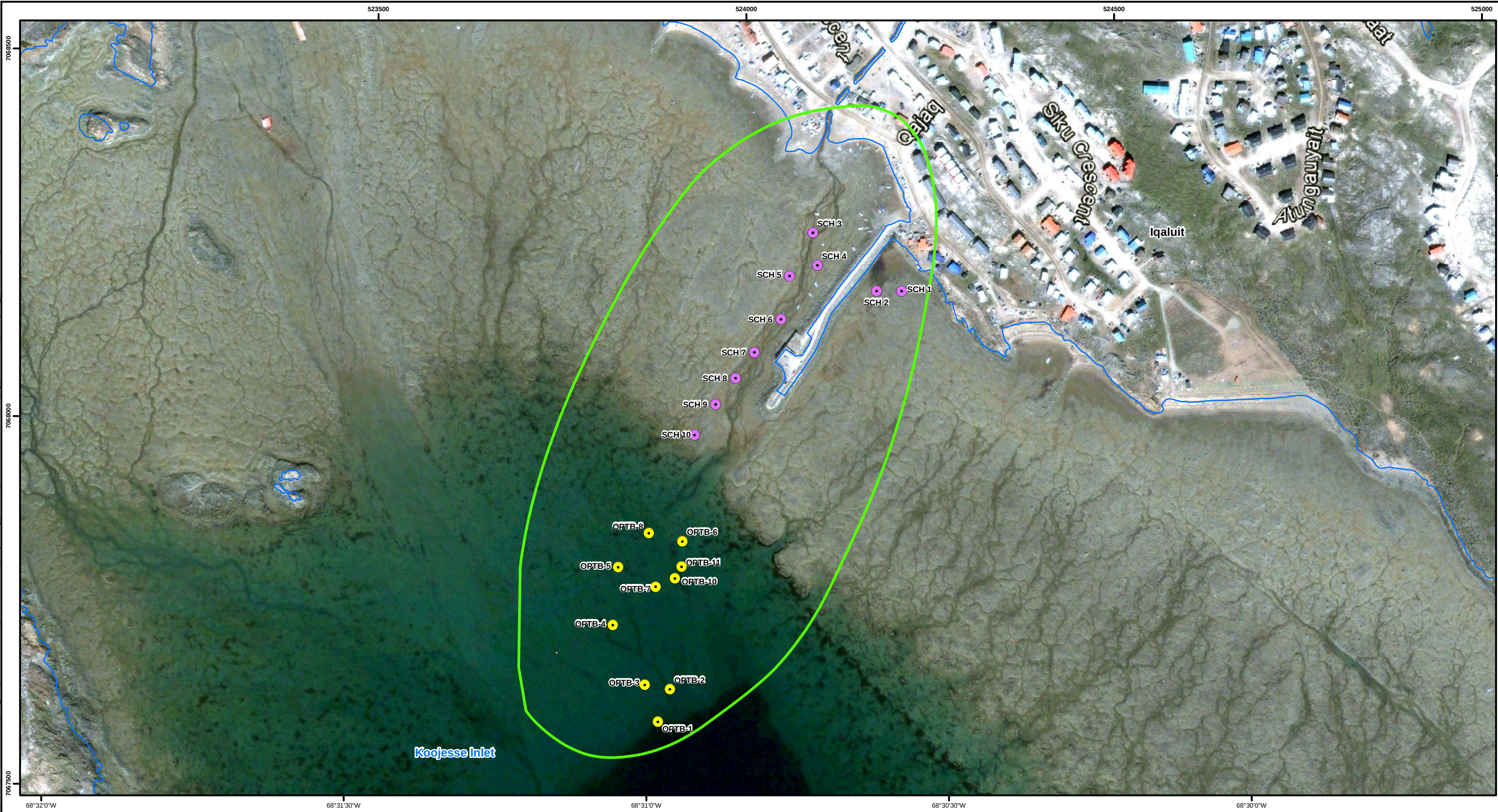
Occurrence No.	Date	Location	Spill Report No.	Summary	Corrective Action
2022					
1	9 September	SCH	2022457	<10 L of hydraulic oil leaked from the hose on the hammer of the drill.	The leak was quickly controlled and the hose was repaired. Everything was cleaned rapidly and disposed in a Quatrex bag. The leak occurred above the water line and the contaminated Quatrex will be disposed appropriately.

Source: Respective Tower EM Weekly Report

Table A-3: Pre-construction Wildlife Survey Summary

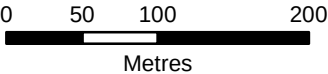
Date	Species	Number of Species Observed	Activity
2018			
Survey not conducted			
2019			
Survey not conducted			
2020			
20-May-20	Raven	1	Flying over
2021			
03-May-21	Seagull	1	Flying over
2022			
20-Apr-22	Raven	2	Sitting, Flying

FILE LOCATION: U:\YVR\307071\01148_GON NV\MarInfra\10_Eng\16_Geomatics\01_Mxd\Baseline Report\IQ_Marine_Baseline\2017-01-26_IQ_Sediment Sampling Locations SCH.mxd



Legend

- Small Craft Harbour Study Area
- 2015 Sediment Sampling Location
- 2016 Sediment Sampling Location
- Major Shoreline



Note:
- Coordinate System: NAD 1983 UTM Zone 19N
- Aerial Photo from Google Earth, 2006

B SHEET		CUSTOMER: 
OnewayTM to zero harm		
DATE:	25/05/2017	
DRAWN:	Y.M.	
EDITED:	k.R.	
APPROVED:	V.S.	
"This drawing is prepared for the use of our customer as specified in the accompanying report. WorleyParsons Canada Ltd. assumes no liability to any other party for any representations contained in this drawing."		

IQALUIT MARINE INFRASTRUCTURE BASELINE REPORT SEDIMENT SAMPLING LOCATIONS AT THE SMALL CRAFT HARBOUR		
WORLEYPARSONS PROJECT No: 307071-01148	FIG No: Figure A-1	REV 0