Berth 2 Shiploader Replacement Project

Construction Environmental Management Plan

PLAN-B2D2-0013

REV	DATE	REASON FOR ISSUE	CONTRIBUTORS				NBT APPROVER
2	Jul-14-23	For Use	HAT	DOC	ENV	BKL	Victoria Burdett-Coutts
1	Jun-23-23	For Use	HAT	DOC	ENV	BKL	Victoria Burdett-Coutts
0	Apr-24-23	For Use	HAT	DOC	ENV	BKL	Victoria Burdett-Coutts
A	Apr-24-23	For Review	HAT	DOC	ENV	BKL	Victoria Burdett-Coutts

Note: HAT=Hatfield, ENV=Envirochem, DOC=Dynamic Ocean Consulting, BKL=BKL

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ACRONYMS AND DEFINITIONS

ACRONYM	DEFINITION
ACM	asbestos containing materials
AFA	Application for Authorization
AIA	Archaeological Impact Assessment
AISR	Aquatic Invasive Species Regulations
AMP	Asbestos Management Plan
AOA	Archaeological Overview Assessment
Approved Facility	Provincially approved disposal facility
B1	Berth 1
B2	Berth 2
B2 Project	B2 Shiploader Replacement Project
B2D2 Project	Berth 2 Shiploader Replacement Project and Dumper 2 Potash Replacement Project
B3	Berth 3
BC	British Columbia
BCMEA	BC Maritimer Employers Association
BKL	BKL Consultants Ltd.
BML	below mudline
BMPs	Best Management Practices
BTEX	benzene, toluene, ethylbenzene, and xylenes
C12	Conveyor 12
C242	Conveyor 242
C243	Conveyor 243
C31	Conveyor 31
C32	Conveyor 32
C9	Conveyor 9
Cargill	Cargill Grain Terminal
CCEMP	Contractor Construction Environmental Management Plan
CCME	Canadian Council of Ministers of the Environment
CEMP	Construction Environmental Management Plan
CEPA	*Canadian Environmental Protection Act*
CEQG	Canadian Environmental Quality Guidelines
CFMP	Chance Find Management Plan
CD	chart datum
CMA	*Canada Marine Act*
CMPF	Contractor Management Plan for Fuel
CN	Canadian National Railway
CNWA	*Canadian Navigable Waters Act*
cSEL	Cumulative Sound Exposure Level

ACRONYM	DEFINITION
CSERP	Contractor Spill Prevention and Emergency Response Plan
CSR	Contaminated Sites Regulations
CWA	CWA Engineers Inc.
CWMP	Contractor Waste Management Plan (including hazardous waste)
CWTS	Coal Water Treatment System
D1	Potash Dumper No. 1
D2	Potash Dumper No. 2
D2 Project	D2 Potash Replacement Project
D661	Dumper 661
DAS	Disposal at sea
DBWTS	Dry Bulk Water Treatment System
DEP	Director of Engineering and Projects
DFO	Fisheries and Oceans Canada
DPC	Director of People & Community
DWT	dead weight tonnes
Dynamic Ocean	Dynamic Ocean Consulting Ltd.
ECCC	Environment and Climate Change Canada
EcoLogic	EcoLogic Consultants Ltd.
EHWP	Extended Hours Work Plan
EI	Environmental Inspector
EL	Elevation
EM	Environmental Monitor
EMA	*Environmental Management Act (BC)*
EMBC	Emergency Management BC
EMS	Environmental Management Systems
EMS-Tech	EMS-Tech Inc.
EnMCP	Environmental Monitoring Compliance Program
ENV	Ministry of Environment and Climate Change Strategy (BC)
Envirochem	Envirochem Services Inc.
EPH	Extractable petroleum hydrocarbons
EPSL	East potash shiploader
ESC	Erosion and Sediment Control
ESMS	Excavated Soil Management Standard
ESS	Environmental Systems Specialist
EZ	Exclusion Zone
FAA	*Fisheries Act* Authorization
FFHPP	Fish and Fish Habitat Protection Program
FIGQG	Federal Interim Groundwater Quality Guidelines
G3	G3 Terminal
GI	Ground Improvement

ACRONYM	DEFINITION
H&S	Heath & Sherwood (1964) Ltd.
ha	hectares
HADD	harmful alteration, disruption or destruction of fish habitat
Hatfield	Hatfield Consultants LLP
HBMA	Hazardous Building Materials Assessment
HCA	*Heritage Conservation Act*
HWL	high water line
HWR	Hazardous Waste Regulation
IAA	*Impact Assessment Act*
IAAC	Impact Assessment Agency of Canada
IL	Industrial Land Use
KWL	Kerr Wood Leidal
LCE	Lynn Creek Estuary
LEPH	light extractable petroleum hydrocarbons
LEX	LEX Engineering Ltd.
MBCA	*Migratory Birds Convention Act*
mbgs	metres below ground surface
MCSP	Marine Construction Staging Plan
MMO	Marine Mammal Observer
MMOZ	marine mammal observation zone
MMR	Marine Mammal Regulations
MMT	million metric tonnes
Mott MacDonald	Mott MacDonald Canada Ltd.
Musqueam	Musqueam Indian Band
MV	Metro Vancouver
NBT	Neptune Bulk Terminals (CANADA) Ltd.
NOAA	National Oceanic and Atmospheric Administration
NoW	Notice of Works
NPP	Navigation Protection Program
NRDE	Non-Road Diesel Emissions
NTU	Nephelometric turbidity units
PAH	Polycyclic aromatic hydrocarbons
PBX	PBX Engineering Ltd.
PCB	Polychlorinated biphenyls
PeakSPL	Peak Sound Pressure level
PEP	Provincial Emergency Program
PER	Project and Environmental Review
Project footprint	considered the maximum extent of the boundaries of the respective Project footprints for B2 and D2, respectively called the B2 and D2 Project footprints
QA/QC	Quality Assurance/Quality Control

ACRONYM	DEFINITION
QCA	QCA Systems Ltd.
QP	Qualified Professional
RA	Regulatory Authority
RFR	Request for Review
ROV	Remotely operated vehicle
RSA	Railway Safety Act
RWR	Railway Works Regulations
SAR	Species at Risk
SARA	*Species at Risk Act*
SLR	Sea Level Rise
SMP	Soil Management Plan
SPPP	Stormwater Pollution Prevention Plan
Squamish	Squamish Nation
SRR	Spill Reporting Regulations
Stantec	Stantec Consulting Ltd.
t/h	tonnes per hour
TC	Transport Canada
the Port Authority	Vancouver Fraser Port Authority
the Terminal	Located at 1001 Low Level Road, in the City of North Vancouver, British Columbia (BC) is a bulk materials handling venture of Canpotex and Teck Resources Ltd.
TMP	Traffic Management Plan
ToC	Table of Contents
Tsleil-Waututh	Tsleil-Waututh Nation
VHF	very high frequency
WaMP	Water Management Plan
WPSL	West Potash Shiploader
WQG	BC Water Quality Guidelines
WQO	Water Quality Objectives

1 INTRODUCTION

1.1 Neptune Terminal Location

Neptune Bulk Terminals (Canada) Ltd. (NBT) is on the north shore of Vancouver Harbour in Burrard Inlet's Inner Harbour and is approximately 6.0 km southeast from the Lions Gate Bridge and 2.5 km northwest from the Second Narrows Bridge (49° 18.218'N, 123° 2.913'W) (see Figure 1-1). NBT, located at 1001 Low Level Road, in the City of North Vancouver, British Columbia (BC), is a bulk materials handling venture of Canpotex Ltd. and Teck Resources Ltd. (the Terminal). The Terminal consists of covered and open stockpile storage areas, a rail yard, materials handling areas, and five shiploaders at three berths. The Terminal sits entirely in the Vancouver Fraser Port Authority (the Port Authority) jurisdiction and is operated under tenancy by NBT. The Terminal is bounded on the South by the Inner Harbour of Burrard Inlet, on the North by Low Level Road and commercial land-users, and on the West and East by neighbours Cargill Grain Terminal (Cargill) and G3 Terminal (G3) (see Figure 1-1). North of Low Level Road there are residential neighbours.

1.2 Terminal Description

Metallurgical coal is stored in open-air piles and exported through Berth 1 (B1), while potash is stored in two dry sheds and exported through Berths 2 (B2) and 3 (B3). Water is sprayed on coal piles and coal handling areas to dampen the surface and reduce wind- generated dust. Equipment washing stations are used to reduce spreading of coal dust around or off the grounds around the Terminal.

NBT has the capacity to export 22 million metric tonnes (MMT) of coal and 10.5 MMT of potash annually. Each product has associated storage yards or sheds at the Terminal and equipment for loading and unloading of railcars and vessels. NBT receives potash from inland potash producers via Canpotex unit trains which consists of 205 railcars. The railcars are staged on entry to the Terminal and then directed through either the existing Potash Dumper No. 1 (D1) or Potash Dumper No. 2 (D2) and delivered into a conveyor system feeding into the bulk storage buildings and to the B2 and B3 shiploading systems. D1 was upgraded in 2010 and has a capacity of 6,000 tonnes per hour (t/h) while D2, constructed in 1991, has a capacity of 4,000 t/h. B1, B2 and B3 can accommodate 250,000 dead weight tonnes (DWT), 125,000 DWT and 65,000 DWT sized vessels respectively. The existing B2 West Potash Shiploader (WPSL) and East Potash Shiploader (EPSL) were installed in 1969. The shiploaders are fed from the B2 potash surge bin via feed Conveyors Nos. 9 and 12 (C9, C12). The current B2 total loading capacity is approximately 5,000 t/h.

The land portion of the Terminal is approximately 29 hectares (ha), and the marine portion is comprised of four water lots (B, C, C1, C2) totaling approximately 10 ha (Figure 1-1).

1.3 Project Scope and Purpose

The B2 Shiploader Project (B2 Project) and the Dumper 2 Potash Replacement Project (D2 Project), collectively referred to as the B2D2 Project, are considered maintenance works to facilitate ongoing operations (see Sections 1.3.1 and 1.3.2 for the respective Project Descriptions). The Project footprint is considered the maximum extent of the boundaries of the respective Project footprints for B2 and D2. For the B2 Project, the Study Area was

defined as the Project footprint plus a 500 m buffer. This buffer is based on the potential exclusion zone (EZ) that will be applied during piling activity to mitigate potential effects of underwater noise on marine mammals. The B2D2 Project footprints and the B2 Study Area are depicted in Figure 1-1. An asset location map is provided in Drawing 1-1.

Given the entirely land-based nature of the D2 Project, the B2 and D2 Projects underwent regulatory review and permitting separately (see Section 1.7, Table 1-1). The B2 Project is currently being reviewed as a Category C project through the Port Authority (PER 21-068). The D2 Project was authorized by the Port Authority under a Category B permit which was issued on October 6, 2022 (PER 21-172). As the D2 Project has received its PER approval, this CEMP is specific to the B2 Project. The B2 CEMP will be revised in the future to be the B2D2 CEMP once the B2 Project has received regulatory approvals and prior to construction activities starting. A high level summary of the B2 and D2 Projects is provided in Sections 1.3.1 and 1.3.2. While the D2 Project will not be referenced further in the B2 CEMP, documents that apply to both aspects of the project (B2 and D2) during construction will be referred to as B2D2 (e.g., B2D2 Water Management Plan (WaMP)).

1.3.1 Berth 2

The B2 Project will replace the current B2 shiploader system. The B2 Project will consist of a new single travelling slewing potash shiploader, marine structures, and approach conveyors to replace the existing quadrant style WPSL and EPSL. The new shiploader will be capable of continuously loading vessels at up to 6,300 t/h, provide hatch coverage and vessel clearance through its ability to travel the face of the berth, have the ability to luff (up/down) and shuttle (in/out) the boom, as well as slew the machine parallel and clear of the berth face. To support the new shiploader system, new piles, marine structures, fenders, and associated equipment are required. Through the B2 Project preliminary engineering phase, the Port Authority expressed interest in replacing the existing sheet pile wall at B2 and the installation of stone columns. The sheet pile wall is a Port Authority asset. The rationale for this inclusion is based on schedule (to minimize berth disruption) and cost (to minimize multiple Contractor mobilizations, demolition/modifications to marine infrastructure) efficiencies. The sheet pile wall will be replaced with a combi-wall system to bring alignment with building code requirements and design for a 1 in 2475-year seismic event and to accommodate future Sea Level Rise (SLR) to the year 2100 (i.e., to satisfy the wave overtopping criteria for safe operation). The new combi-wall system includes piling (alternating king pile and sheet piles) adjacent to the existing sheet pile combi-wall and anchor rods, and an anchor wall and cope beam to support the north shiploader rail beam. Ground Improvement (GI) is required to stabilize the liquifiable soils in front and behind the combi-wall to achieve the seismic criteria. Vibro-replacement stone columns is selected as the preferred GI technique for this application.

General layout drawings of the B2 Project and the shiploader are provided in Appendix A, Drawings A-1, A-2 and A-3. These drawings are also available in Appendices E and F of the B2 Design Drawing Supplemental Report (NBT, 2023a).

1.3.2 Dumper 2

The D2 Project will replace D2, Conveyor No. 31 (C31), Conveyor No. 32 (C32), and associated C32 swivel chute system. The new Dumper 661 (D661) will largely be an in-kind replacement, with capacity increased from 4,000 t/h to 6,000 t/h to align with the D1 capabilities. The D661 hopper will extend approximately 6 m longer (total length of approximately 74 m) to facilitate the unloading of up to three rail cars at one time.

To facilitate construction of the B2D2 Project, modifications of the rail system are required. Rail modification construction activities are applicable to the B2 and the D2 Projects but are described in the D2 Project. Sections of rails 4, 5, 6 and 7 require modification, which will be removed and reinstated prior to and subsequent to the B2 construction.

General layout drawings are also available in Appendix B of the of the D2 Design Drawing Supplemental Report (NBT, 2022c).

1.4 Project Setting

The Terminal, developed in 1970, sits on a shoreline that has experienced industrial activity for the past century. A large portion of the Terminal has been developed on reclaimed land extending seaward (south) into Burrard Inlet from the historical shoreline. The historical shoreline runs parallel to the Canadian National Railway (CN) rail line at the North end of the Terminal. The land portion of the Terminal is relatively flat, largely paved, with product storage and rail areas, or areas covered with sand, ballast and/or gravel.

1.4.1 Terrestrial Setting

1.4.1.1 Vegetation and Wildlife

The nearest natural terrestrial features include trees and shrubs located outside of the Terminal on the North side of Low Level Road adjacent to residential and commercial areas. Vegetation and wildlife features are sparse within the Terminal. Wildlife that has been observed at the Terminal in previous surveys include the Canada goose (*Branta canadensis*) (Envirochem, 2020) and common pigeon (*Columba livia*). Investigations through available desktop resources have no documented wildlife features.

1.4.1.2 Archaeological

The B2D2 Archaeological Review Letter (EcoLogic, 2022) indicated that the potential for previously unrecorded archaeological materials and deposits is

considered low in the B2D2 Project footprints (see Sections 5 and 6.5.17 for archaeological effects, mitigation and monitoring measures).

Within the Terminal boundaries, several archaeological studies have been conducted for previous projects such as the Coal Capacity Project (PER 12-066) (Port Authority, 2013) , and is as follows:

- Archaeological Overview Assessment (AOA) (Inlailawatash Limited Partnership, 2012).
- Archaeological monitoring, as recommended in the AOA, during environmental sampling and geotechnical tests for the Coal Capacity Project (Inlailawatash Limited Partnership, 2017).
- Archaeological monitoring during drilling and excavations associated with dumper pit construction at Laydown 3 for an Archaeological Impact Assessment (AIA) (Kleanza, 2019).

None of the previous studies have identified archaeological materials within, or in direct proximity to the B2D2 Project footprint. These studies are further summarized in the Archaeological Overview Section of the Archaeological Review Letter (EcoLogic, 2022).

1.4.1.3 Groundwater and Soil

Contaminated soils have been previously encountered at the Terminal. To properly manage historical and present-day soil contamination both on- and off-site, a NBT Excavated Soil Management Standard (ESMS) (NBT, 2022f) was prepared by NBT. The NBT ESMS governs sampling, handling, disposal, and delivery of soil/aggregate and is followed for construction and operations projects that involve ground disturbance to manage known and unforeseen areas of contamination.

Preliminary soil characterization programs have been carried out at B2 (Advisian, 2021a) and D2 (Advisian, 2021b), as below:

- B2: Five investigation locations (three marine, two terrestrial) were sampled. Sediment samples were collected from the marine locations at depths ranging from 0 metres below ground surface (mbgs) to 2 mbgs. Soil samples were collected from the terrestrial locations at ground surface and at a depth of 1 mbgs. Samples were analyzed for metals and polycyclic aromatic hydrocarbons (PAH). Select metal and PAH concentrations in sediment samples were greater than the Canadian Council of Ministers of the Environment (CCME) marine sediment quality guidelines (CCME, 1999b). Metal and PAH concentrations in the terrestrial soil samples were less than BC Contaminated Site Regulation (CSR) Industrial Land Use (IL) standards (Contaminated Sites Regulations BC).

- D2: Four boreholes were advanced within or in proximity to the D2 Project footprint, with samples collected to a maximum depth of 6.7 mbgs. Benzene, toluene, ethylbenzene, pH, and nickel were documented in select samples at concentrations greater than the applied BC CSR IL standards and/or CCME Industrial guidelines.

Kerr Wood Leidal (KWL) is responsible for an annual groundwater monitoring program at NBT. The 2020 annual monitoring report (KWL, 2021) was reviewed to provide an indication as to the potential groundwater quality that may be encountered at B2 and D2. Three wells are located within or in proximity B2 and D2, and were sampled for total/dissolved metals, ammonia, extractable petroleum hydrocarbons (EPH), light extractable petroleum hydrocarbons (LEPH), benzene, toluene, ethylbenzene, and xylenes (BTEX), PAH, polychlorinated biphenyls (PCB), and/or fluoride. Elevated concentrations of total/dissolved metals were noted at these three groundwater wells in comparison to the applied screening criteria, which included Federal Interim Groundwater Quality Guidelines (FIGQG), Canadian Environmental Quality Guidelines (CEQG), CSR Aquatic Life Standards, and BC Approved Water Quality Guidelines (WQG). Overall, based on the annual groundwater monitoring conducted at NBT, it appears that the B2D2 Projects may encounter groundwater with elevated total/dissolved metal concentrations.

A detailed soil sampling program (hereafter referred to as the B2 Groundwater and Soils Investigation) (Advisian, 2022) was conducted by Advisian in May, 2022 to characterize soils located within the B2 excavation footprint and install groundwater wells to support groundwater characterization (see Section 3.4, Drawing 3-2 for footprint details). No further investigation is planned for D2. The B2 Groundwater and Soils Investigation informed the development of a B2D2 Soil Management Plan (SMP) and B2D2 WaMP, both developed by Envirochem Services Inc. (Envirochem). The B2D2 SMP (Envirochem, 2022d) provides recommendations for soil segregation, storage, reuse and/or disposal during the construction (described in Section 1.7.2, Table 1-2). The B2D2 WaMP (Envirochem, 2023) provides the Contractor with a framework to effectively manage water during construction from both surface (e.g., precipitation, wash water) and ground sources throughout construction (described in Section 1.7.2, Table 1-2).

1.4.1.4 Terminal Surfaces and Stormwater Discharge Pathways

The NBT Stormwater Pollution Prevention Plan (SPPP) (NBT, 2022g) was developed by Envirochem to support NBT operations. The NBT SPPP outlines surfaces and stormwater discharge pathways for the Terminal. The Terminal is comprised primarily of impervious surfaces (e.g., pavement, buildings/roofs, roads, coal storage areas), with pervious surfaces, including rail beds, circling the Terminal. Stormwater is conveyed though six different catchment areas as follows:

- Terminal areas associated with coal handling and storage operations which direct runoff to the Coal Water Treatment System (CWTS). This includes coal stockpile areas as well as primarily impervious areas associated with coal operations (i.e., coal dumpers, B1, heavy duty maintenance shop, overpass, etc.). The CWTS utilizes settling basins, a purification pond, and a pH and flocculant treatment system prior to discharge to the Burrard Inlet under Effluent Discharge Permit PE-06898 issued through the BC Ministry of Environment and Climate Change Strategy (BC ENV) (refer to Section 2.2.2, Table 2-2 for a summary of existing NBT operational permits).
- Terminal areas associated with potash handling and storage operations which direct runoff to the Dry Bulk Water Treatment System (DBWTS). This includes primarily impervious areas associated with potash vessel loading operations (B2 and B3) as well as the inner circle area. The DBWTS utilizes treatment ponds and a treatment system prior to discharge to the sanitary sewer under Waste Discharge Permit SC-100002-NSSA issued by Metro Vancouver (MV) (refer to Section 2.2.2, Table 2-2 for a summary of existing NBT operational permits).
- Impervious northwest portion of the Potash Shed No. 1 roof, from which runoff is collected in catch basins and collection sumps located along the base of the building, and then discharged to Burrard Inlet via the CWTS discharge point.
- Impervious non-industrial activity areas (e.g., potash shed roofs and access road, portions of the overpass ramp, and the northern access road) that drain into Burrard Inlet through a City of North Vancouver 54” stormwater outfall at B3 with no stormwater treatment.
- Pervious rail beds circling the Terminal which promote stormwater infiltration.

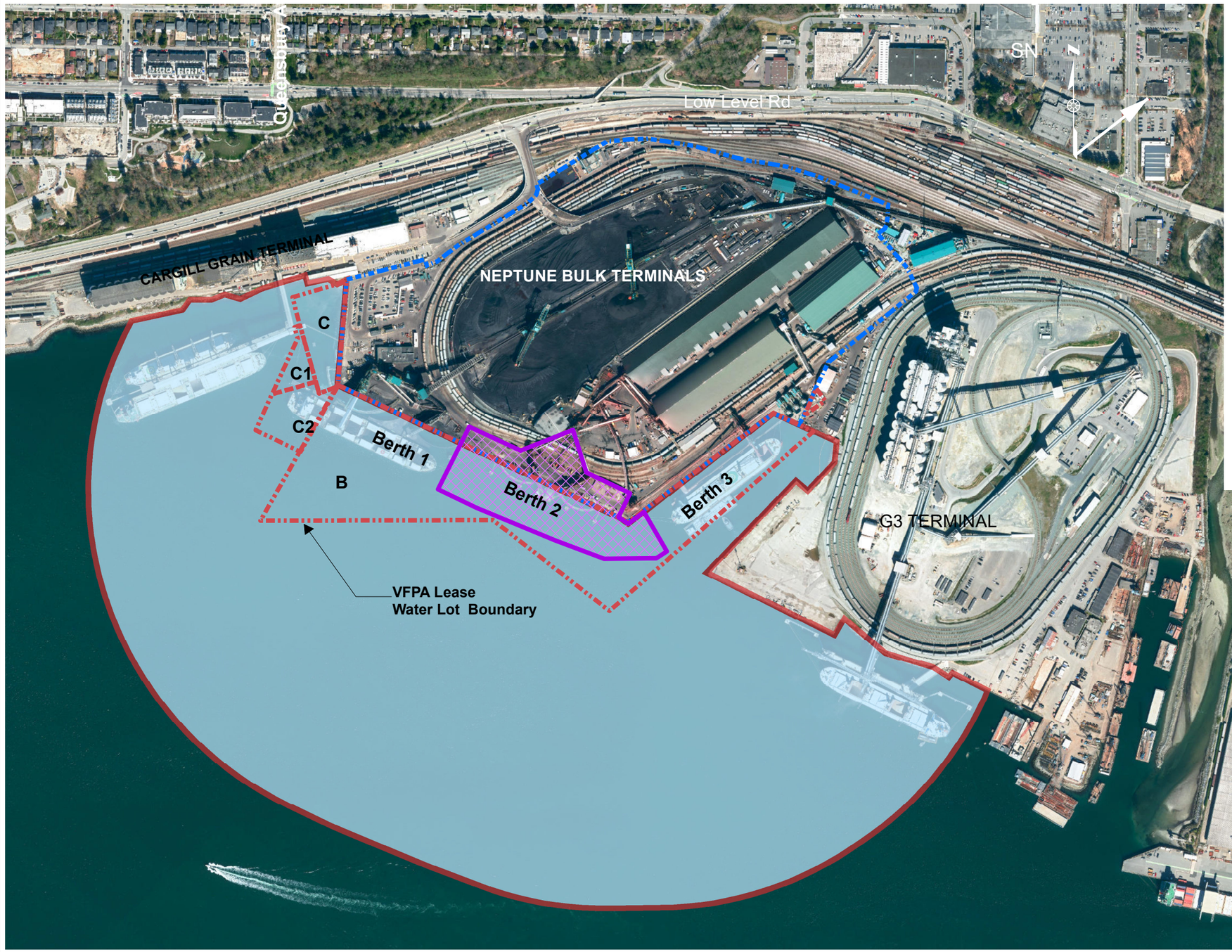
- Impervious parking area located on the western portion of the Terminal that drains into Burrard Inlet through a storm outfall equipped with an oil/water separator.

1.4.2 Marine Setting

The NBT waterfront is bounded to the North by sheet pile walls on the Terminal berth face within reclaimed land areas. The sheet pile walls extend to the North at B1 and to the East from B1 to B3. The sheet pile wall extends seaward into depths of approximately -12 m chart datum (CD), sloping to -15 m CD at individual berth pockets.

Existing marine fish and fish habitat conditions within the B2 Project Study Area were characterized through a combination of desktop and field studies. Several project specific subtidal surveys have been undertaken using a remote operated vehicle (ROV) and surface supply dive team (NBT, 2023f). Results of this study were generally consistent with a previous site-specific subtidal study by Stantec (2018), where the substrate was primarily hard substrates (cobble, boulder) in shallow depths (5 to 10 m CD) and transitioned to silt/mud in a seaward direction with increasing depth (-15 to -18 m CD).

Species biodiversity was generally homogenous, with higher densities considered to be due to an association with hard substrates, either on scour protection (rip rap, filter rock) or on the vertical surfaces of the berth (e.g., anthropogenic structures such as the steel sheet pile wall/bulkhead and piles). Overall habitat quality observed in the B2 Project Study Area (as described in Section 1.3 and detailed in Figure 1-1) was considered low quality with the exception of a small area west of the existing WPSL where bull kelp was observed in the summer survey. More details on existing conditions of the B2 seabed are provided in the B2 Marine Fish and Fish Habitat Existing Conditions Report (NBT, 2023f).



LEGEND

- Property Line
- Water Lot Boundary
- Berth 2 Project Footprint
- Berth2 Study Area

SC ALE:

0 35 70 140 210 280 (m)

Scale: 1:6,000

SOURCE / NOTE:
- Aerial image is downloaded from Google EarthPro.(2021)

PROJECT:

SYSTEM:

ASSET:

DISCIPLINE

REV	YYYY-MM-DD	DESCRIPTION	DRAWN	APPROVED

ISSUES/REVISIONS

VENDOR

envirochem

ISSUED AS RECORD COPY (YES/NO) NO

Neptune TERMINALS

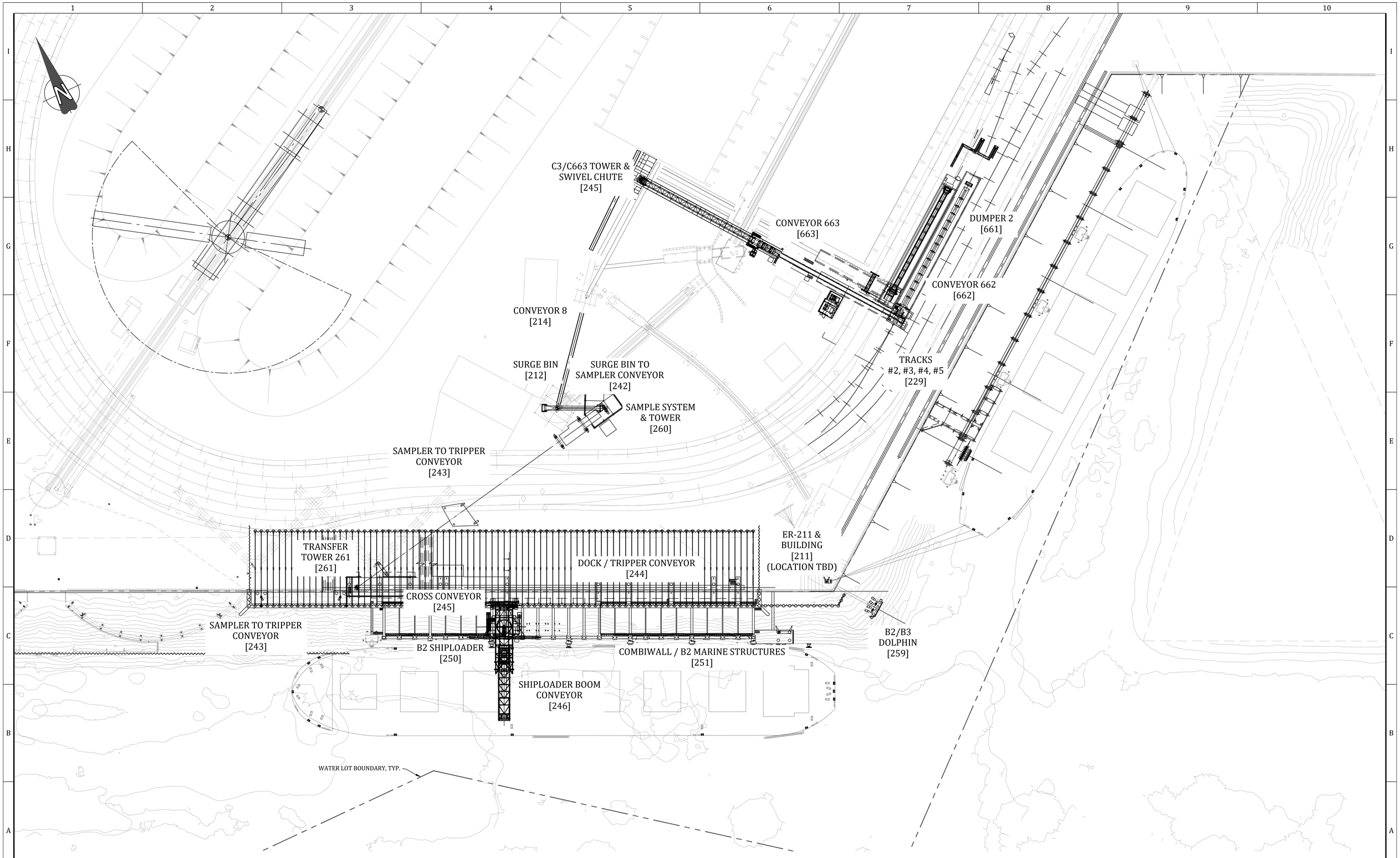
TITLE:

Project Site, Berth 2 Footprint and Study Area

Figure 1-1

SCALE:	SHEET	OF	DRAWING NO:
1:6000	1	1	

Document Name: Project Site, B2 Footprint and Study Area



PLAN
1:750

PROJECT / W.O.:	B2D2 PROJECT				
SYSTEM:	POTASH				
ASSET:	299				
DISCIPLINE:	MULTIPLE				
DRAWING NO.	DRAWING DESCRIPTION / TITLE				
REFERENCE DRAWINGS / DESIGN STANDARDS					

REV	YYYY-MM-DD	DESCRIPTION	DRAWN	APPROVED
A	2022-04-26	FOR INFORMATION	KM	DL

ISSUES / REVISIONS

ENGINEERING SEAL:

VENDOR:

OEM:

ISSUED AS RECORD COPY? (YES/NO) NO

Neptune TERMINALS

TITLE:
B2D2 PROJECT
POTASH ASSETS
SITE PLAN

Drawing 1-1

SCALE:	SHEET	OF	DRAWING NO.	REV:
SHOWN	1	1	DWG-B2D2-220427-01	A

1.5 Design and Regulatory Oversight

NBT provides overall Project regulatory management oversight via Dynamic Ocean Consulting Ltd. (Dynamic Ocean). NBT has retained Envirochem Services Inc. (Envirochem), Hatfield Consultants LLP (Hatfield) and BKL Consultants Ltd. (BKL) to support Project permits and approvals. EcoLogic Consultants Ltd. (EcoLogic) supports the B2D2 Project as the Professional Archaeologist, as a sub-consultant to Envirochem.

Engineering design is provided by the following firms:

B2 Project

- Advisian:
  - B2 Marine Structures and Combi-Wall.
- EMS-Tech Inc. (EMS-Tech):
  - B2 Shiploader Design.
- LEX Engineering Ltd. (LEX), PBX Engineering Ltd. (PBX), and QCA Systems Ltd. (QCA):
  - Electrical and Instrumentation Design.
- Heath & Sherwood [1964] Ltd. (H&S) and CWA Engineers Inc. (CWA):
  - Conveyors and Galleries.
  - Rail Yard
- Mott MacDonald Canada Ltd. (Mott MacDonald):
  - Rail yard design.

1.6 Document Scope

This document is the Construction Environmental Management Plan (CEMP) for the B2 Project and has the following objectives:

- Target mandates of pertinent Regulatory Authorities (RAs) and associated legislation to confirm project permit approvals and relevant compliance requirements (see Section 2).
- Outline mitigation and monitoring measures to be implemented to minimize negative effects to physical, biological, and socio-economic features associated with construction activities.
- Identify commitments made during consultation, confirm adherence to relevant Best Management Practices (BMPs) (see Section 6.1).
- Confirm consistency between the B2 CEMP and existing NBT compliance documents (see Section 1.7.2, Table 1-2)
- Mitigate risk to NBT operations permits as a result of construction activities.

The B2 CEMP was developed in alignment with BMPs summarized in Section 6.1 and the with following guidance:

- Port Authority: 'Project & Environmental Review – Guidelines – Construction Environmental Management Pan' (Port Authority, 2021c).
- Tsleil-Waututh Nation (Tsleil-Waututh): 'Construction Environmental Management Plan Requirements' (Tsleil-Waututh, 2022).

The B2 CEMP is an evolving document and will be updated as required based on changes to proposed construction activities, acquisition of regulatory approvals or as informed through consultation with Indigenous Groups and stakeholders. Both operational and construction aspects of the Terminal are considered and mitigated by the policies of the NBT Environmental Management System (EMS) Manual (NBT, 2022e) and the requirement for a CEMP is identified within the NBT EMS for construction related aspects. Permits and approvals for the B2 Project, as they are received, will be provided in Appendix B.

1.7 Supporting Documents

Supporting documentation (in addition to this B2 CEMP) that will inform RAs during their respective reviews are summarized in Section 1.7.1, Table 1-1. Documents which support mitigation and monitoring management that will be used in combination with this B2 CEMP are summarized in Section 1.7.2, Table 1-2. The projects (B2 and D2) are collectively referred to as the B2D2 Project, however at times are referenced collectively or separately depending on whether compliance documentation is pertinent to one or both project aspects.

NBT has been and will be continuing to engage with Indigenous Groups through their respective project referrals processes, which include the Tsleil-Waututh, Squamish Nation (Squamish), and the Musqueam Indian Band (Musqueam). All Project related compliance documentation, in addition to those that will be contractor developed (see Table 1-2) will be shared with interested Indigenous Groups.

1.7.1 Regulatory Approvals

Documentation required to support regulatory approvals are summarized in Table 1-1.

1.7.2 Berth 2 Construction Environmental Management Plan Compliance Documents

Several documents have been developed to support regulatory compliance commitments for the B2 Project (see Table 1-2).

These documents can be made available to RAs, Stakeholders, and Indigenous Groups upon request. Documents available at the time of the Port Authority application will be uploaded to the Port Authority portal.

Table 1-1: Documentation to Support Regulatory Approvals

REGULATORY AUTHORITY	DOCUMENT TITLE	PERTINENT DATES	REFERENCE
Fisheries and Oceans Canada – Fish and Fish Habitat Protection Program (DFO-FFHPP)	Request for Review (RFR) application.	Submitted December 29, 2021.	(NBT, 2021a)
	B2 Marine Fish and Fish Habitat Existing Conditions Report (B2 Existing Conditions Report).	Submitted February 8, 2022. Revised for *Fisheries Act* Authorization (FAA) application on September 27, 2022.	(NBT, 2023f)
	RFR Supplemental Report (21-HPAC-01537).	Submitted February 18, 2022.	(NBT, 2022b)
	DFO Response: DFO File #21-HPAC-01537 – Shiploader Replacement, Burrard Inlet, North Vancouver – Authorization Required.	Received May 16, 2022.	(DFO, 2022a)
	FAA application form.	FAA Application for Authorization (AFA) submitted on February 14, 2023; assigned to a referrals biologist on February 20, 2023.	(NBT, 2023d)
	Application for Authorization (AFA) Supplemental Report.		(NBT, 2023e)
	Lynn Creek Estuary (LCE) Offsetting Plan.	A component of AFA package	(NBT, 2023n)
	Lynn Creek Estuary Complementary Measures Report		(NBT, 2023i)
	Lynn Creek Estuary Marine Fish and Fish Habitat Existing Conditions Report (LCE Existing Conditions Report).		(NBT, 2023k)
	Lynn Creek Estuary Construction Environmental Management Plan (LCE CEMP).		(NBT, 2023j)
	Lynn Creek Estuary Offsetting Basis of Design Report.		(NHC, 2023b)

REGULATORY AUTHORITY	DOCUMENT TITLE	PERTINENT DATES	REFERENCE
Port Authority	B2 Port Authority PER (Project and Environmental Review) Preliminary Project Review Application and Response (PER 21-068).	Submitted April 28, 2021; Response received June 4, 2021.	(Port Authority, 2021b)
	B2 Port Authority PER Category C application (PER 21-068).	A component of PER package	(NBT, 2022a)
	Berth 2 Project. Vancouver Fraser Port Authority – Category C – Out of Hours Construction Approval Application for the B2 Project (PER 21-068).		(NBT, 2023p)
	B2 Groundwater and Soils Investigation – Category A (PER 22-051).		(Port Authority, 2022)
	B2 Shiploader Replacement Design Drawings Supplemental Report (Preliminary Design Phase).		(NBT, 2023a)
	Lynn Creek Estuary Offset Project – Request to Conduct Construction Outside of Vancouver Fraser Port Authority Standard Work Hours (PER 21-068).		(NBT, 2023m)
	Project Description for the Lynn Creek Estuary Offset Project	Submitted on January 31, 2023; a Submission Checklist received on February 23, 2023	(NBT, 2023o)
	Lynn Creek Estuary Offset Project – Category C - Vancouver Fraser Port Authority – Project and Environmental Review Permit Application (PER 21-068).	A component of PER package	(NBT, 2023l)
	B2D2 Technical Archaeology Review.		(EcoLogic, 2022)
	Berth 2 Dumper 2 Chance Find Management Plan		(EcoLogic, 2023a)
	Lynn Creek Estuary Chance Find Management Plan		(EcoLogic, 2023b)

REGULATORY AUTHORITY	DOCUMENT TITLE	PERTINENT DATES	REFERENCE
	Preliminary Project Sedimentation Assessment for the LCE Offset Project	A component of PER package	(NHC, 2023a)
	Indigenous Groups Consultation and Stakeholder Engagement Summary		(NBT, 2023h)
Transport Canada (TC)	B2 TC Notice of Works (NoW) Application (TC No. 2008-500781-7).	Submitted April 1, 2022. Amendment received July 18, 2022.	(Transport Canada, 2022)

Table 1-2: Documentation to Support Compliance During Construction

DOCUMENT TITLE	DESCRIPTION	TERMINAL / PROJECT	PRODUCED BY	REFERENCE
B2D2 Contractor CEMP (CCEMP)	The Contractor will be responsible for the development of the Environmental Monitoring Compliance Program (EnMCP) (see Section 6.2), their Qualified Professional (QP) will be responsible for the development of a B2D2 CCEMP which will at a minimum meet the requirements stipulated in B2D2 CEMP and the commitments identified in any issued B2D2 permits/approvals.	B2D2 Project	Contractor	To be developed upon contract award and prior to construction.
NBT Environmental Management System (EMS) Manual	Environmental management policy, programs, and procedures are outlined in NBT's EMS Manual. The NBT EMS Manual is prepared in accordance with the International Standard for Environmental Management Systems ISO 14001: 2015 (ISO 14001) and includes the following: • Identification of the significant environmental aspects of NBT's operations and describe procedures and strategies for managing the aspects. • Outline of the relevant compliance obligations to which NBT subscribes and highlight the compliance and reporting terms that need to be met. • Identification and definition of the roles, responsibilities and authority of personnel involved in environmental management. • Provide guidance to management, staff, and Contractors for maintaining high standards of environmental management at NBT. • Provide guidance on training and staff development in environmental management. • Provide protocols for audits and senior management review. • Provide guidance on quality assurance/quality control (QA/QC) procedures for sampling. • Provide guidance on procedures for continuous improvement. • Identification of the needs and requirements of other interested parties in the NBT EMS including those of employees, Unions, BC Maritimer Employers Association (BCMEA), the Port Authority, Metro Vancouver (MV) and BC ENV Strategy.	Terminal	NBT	(NBT, 2022e)
NBT Gasoline and Diesel Re-Fuelling Procedure	Re-fuelling and spill response procedures that must be undertaken during construction and operational activity at the Terminal are outlined in NBT's Gasoline and Diesel Re-fuelling Procedure document.	Terminal	NBT	(NBT, 2020a)
B2D2 Contractor Management Plan for Fuel (CMPF)	A B2D2 CMPF will be developed by the Contractor which will outline mitigation measures intended to provide adequate protection of the environment from construction-related fuels and products during construction. Whether the B2D2 CMPF is an independent document or a component of the B2D2 CCEMP will be a Contractor led decision. The B2D2 CMPF will at a minimum meet the commitments outlined in Section 6.6.2, Table 6-18, relevant commitments stipulated in the NBT Gasoline and Diesel Re-Fuelling Procedure (NBT, 2020a), and outline: • Fuel storage location and handling procedures. • Refuelling equipment and procedures. • Designated refuelling areas.	B2D2 Project	Contractor	To be developed upon contract award and prior to construction.

DOCUMENT TITLE	DESCRIPTION	TERMINAL / PROJECT	PRODUCED BY	REFERENCE
B2D2 Archaeological Chance Find Management Plan (CFMP)	The archaeological B2D2 CFMP was developed by EcoLogic on behalf of NBT and outlines procedures and response protocols (see Section 6.7.12) to be followed in the event that archaeological or cultural materials are encountered during construction activities on property owned, leased, or managed by NBT. Supporting information is provided regarding relevant legislation as well as examples of typical archaeological or cultural materials that may be encountered (e.g., lithic artifacts, bone artifacts, burial sites, shell deposits, etc.). The B2D2 CFMP was developed in consideration of the guidelines available by the Tsleil-Waututh, Squamish, and the Port Authority, Archaeological Chance Find Procedure (Port Authority, 2021d).	B2D2 Project	EcoLogic	(EcoLogic, 2023a)
B2D2 Water Management Plan (WaMP)	The B2D2 WaMP was developed by Envirochem on behalf of NBT and will provide the Contractor with a framework to effectively manage construction water (i.e., groundwater and surface water) throughout the B2D2 Project duration. The B2D2 WaMP identifies the B2D2 Project construction activities requiring water management and present applicable management measures including erosion and sediment control (ESC) considerations, dewatering methodologies, conceptual water treatment design, surface water and groundwater management, project water quality discharge objectives and discharge locations, and water quality monitoring requirements. The B2D2 WaMP also incorporates data management procedures and include adaptive management actions (i.e., corrective actions, action triggers, and contingencies).	B2D2 Project	Envirochem	(Envirochem, 2023)
B2D2 Contractor Spill Prevention and Emergency Response Plan (CSERP)	The Contractor will develop a B2D2 CSERP which will identify their plans for responding to emergencies and accidental spills. The B2D2 CSERP will outline the spill response materials and spill kit contents required during construction activities, the response procedures in the event of emergencies, and notification/communication commitments. The B2D2 CSERP will outline a schedule for checking spill kits, which will at a minimum be weekly. The Contractor will maintain a verification checklist to document contents inspections. The B2D2 CSERP will be in compliance with pertinent legislation (e.g., BC Spill Response Regulations [SRR]) and will be in alignment with the NBT Storage and Handling of Hazardous Wastes Manual (NBT, 2020b) and Hazardous Waste Disposal Procedure (NBT, 2021b), in addition to the measures described in Section 6.6.1, Table 6-17. Whether the B2D2 CSERP is an independent document or a component of the B2D2 CCEMP will be a Contractor led decision.	B2D2 Project	Contractor	To be developed upon contract award and prior to construction.
NBT Excavated Soil Management Standard (ESMS)	The NBT ESMS provides a standard operating practice that outlines roles and responsibilities and governs sampling, handling, and disposal of excavated and delivered soil/aggregate. Protocols are provided for excavated soil, soil delivered to site and soil transportation. The NBT ESMS also outlines requirements for analysis and comparison to applicable regulations and/or guidelines to confirm if excavated soil can be re-used or needs to be disposed offsite. The NBT ESMS will be complemented by the B2D2 SMP, developed for project specific soil management. Measures to manage contaminated soil are further described in Section 6.5.8, Table 6-8.	Terminal	NBT	(NBT, 2022f)
NBT Hazardous Waste Disposal Procedure NBT Storage and Handling of Hazardous Wastes Manual	The NBT Storage and Handling of Hazardous Wastes Manual (NBT, 2020b) and the NBT Hazardous Waste Disposal Procedure (NBT, 2021b) outlined commitments to be made by NBT personnel and their Contractors during construction and operational activities. These documents outline pertinent legislative commitments, roles and responsibilities and reporting requirements for the use, storage and disposal of materials categorized as hazardous waste.	Terminal	NBT	(NBT, 2020b, 2021b)
B2D2 Hazardous Building Materials Assessment (HBMA) Reports	HBMAs were conducted to support B2D2 Project demolition activity as per WorkSafeBC demolition guidelines (WorkSafeBC, 2015). Site investigations were undertaken to inspect structures planned for demolition and to collect samples where necessary, and separate reports were developed for the B2 and D2 Project (Envirochem, 2022b, 2022c).	B2 Project D2 Project	Envirochem	(Envirochem, 2022b, 2022c)

DOCUMENT TITLE	DESCRIPTION	TERMINAL / PROJECT	PRODUCED BY	REFERENCE
	Hazardous and potentially hazardous materials were identified through visual inspection and bulk sampling of suspect materials, including potential asbestos-containing materials (asbestos was identified at the Old Stores Building in the B2 HBMA), lead in surface coatings, polychlorinated biphenyls (PCB) in light fixtures and electrical transformers, mercury in florescent light tubes, silica in concrete and cinderblock, ozone depleting substances in air conditioning units, hydraulic oils, and lumber preservatives in dock and dolphin structures. Recommendations are provided in the B2D2 HBMA reports, including the potential development of exposure control plans, inspections, sampling, and following proper disposal methods.			
NBT Asbestos Management Plan (AMP)	As per the BC Occupational Health and Safety Regulation (Occupational Health and Safety Regulations, 2021), a NBT AMP (Envirochem, 2022a) was developed to safely remove and work around asbestos material identified during the B2 HBMA (Envirochem, 2022c). The NBT AMP brings awareness to all workers at the Terminal (including construction personnel) of the location, quantity, and risk of exposure of asbestos containing materials (ACM). The NBT AMP includes: • An inventory (location/quantity/condition) of the asbestos containing materials at the Terminal; • An exposure risk assessment based on the condition and the accessibility of the material; and • Procedures for handling asbestos containing materials.	Terminal	Envirochem	(Envirochem, 2022a)
Contractor Hazardous Waste Management Plan and Waste Management Plan (CWMP)	A CWMP will be developed by the Contractor, should they require one, which will address hazardous and other waste: • Hazardous waste: requirements will outline commitments for the storage, handling, transportation, and disposal of hazardous waste material that may be encountered during construction. The commitments must be in alignment with the Storage and Handling of Hazardous Wastes Manual (NBT, 2020b), NBT Hazardous Waste Disposal Procedure (NBT, 2021b), and the NBT AMP (Envirochem, 2022a), in addition to the measures described in Section 6.6.3, Table 6-19. • Other waste: describe waste materials anticipated to be encountered during construction, waste sorting requirements, processes for tracking percentages of waste materials being reused/recycled, specifying destinations for waste materials, and other applicable waste management measures in alignment with the measures described in Section 6.6.3, Table 6-19. Whether the CWMP is an independent document or a component of the B2D2 CCEMP will be a Contractor led decision.	B2D2 Project	Contractor	To be developed upon contract award and prior to construction.
NBT Storm Water Prevention Plan (SPPP)	The NBT SPPP identifies potential stormwater issues at NBT (e.g., on-site product shiploading, coal water treatment, fuel storage and handling, etc.), inferred levels of risk of potential pollutants releasing into the environment, and applicable mitigation measures and management strategies (e.g., maintenance, containment, training, sampling programs, etc.). These findings are supported by a site inventory (i.e., a summary of existing stormwater infrastructure, potential pollutant sources/activities, potential sensitive receptors, and pollutant pathways) and a hydrologic assessment for sub-catchment areas. The NBT SPPP also includes considerations for plan implementation through responsible persons, audits to support tracking the NBT SPPP effectiveness, and adaptive management measures.	Terminal	Envirochem (on behalf of NBT)	(NBT, 2022g)
B2D2 Soil Management Plan (SMP)	The B2D2 SMP provides the Contractor with a framework to effectively manage excavated soil throughout the B2D2 Project duration. The B2D2 SMP identifies the B2D2 Project construction activities requiring soil management, summarizes the findings of soil characterization investigations, and presents recommendations for further soil characterization, soil segregation, storage, reuse, and disposal. The B2D2 SMP complements	B2D2 Project	Envirochem	(Envirochem, 2022d)

DOCUMENT TITLE	DESCRIPTION	TERMINAL / PROJECT	PRODUCED BY	REFERENCE
	the NBT ESMS, and incorporates information obtained from the B2 Groundwater and Soils Investigation conducted by Advisian.			
B2D2 Traffic Management Plan (TMP)	The B2D2 TMP will be developed by the Contractor to manage land-based transportation to and from the B2 and D2 Project sites. The B2D2 TMP will outline requirements and management for site access, traffic within the Terminal, and communication plans between pertinent project personnel to address traffic management related concerns as it pertains to project activities and terminal operations. At a minimum, the B2D2 TMP will include the following: • Identify traffic routing from the NBT entrance to the B2 and D2 Project sites and identify preferred times for major movements. • Driver training and safety awareness. • Project specific speed limits and compliance with existing NBT traffic safety and protocols. • Availability of adequate lighting and visibility for project personnel and vehicles. • Traffic control measures at intersections. • Management and notification procedures for temporary closures and Terminal exclusion areas, including installation and maintenance of substantial fencing or barriers to close construction areas from adjacent operational Terminal traffic.	B2D2 Project	Contractor	To be developed upon contract award and prior to construction.
B2D2 Extended Hours Work Plan (EHWP)	The B2D2 EHWP will be developed by NBT with support from BKL and will provide noise management requirements during construction occurring outside of the Port Authority's standard working hours. The B2D2 EHWP will be provided to the Port Authority no less than 30 business days prior to the planned start date of construction activities occurring outside of standard working hours. BKL will recommend a noise 'threshold' for construction activities occurring outside of the Port Authority's standard working hours, which will be informed by: • NBT previous construction experience for noise levels generated by activities occurring outside of the Port Authority's standard working hours. • Data analysis from historical out of hours time periods using the NBT on-site and off-site noise monitoring stations. • The British Standards BS 5228-1:2009 (British Standards Institute, 2009). The B2D2 EHWP will outline noise monitoring commitments for B2D2 construction activities occurring outside of standard working hours, and will include: • Construction activities and frequency of occurrence for out of hours activities. • Mitigation and monitoring requirements. • Noise monitoring methodologies to be undertaken in real time and autonomously at the NBT on site and offsite monitoring stations. • Communication requirements between the B2 and D2 Projects. • Procedures to be followed if noise exceedances occur for the determination on if stop works or adaptive management is required (see Sections 6.5.11 and 6.7.8).	B2D2 Project	NBT, BKL	In development, to be finalized prior construction (NBT, in progress).
NBT Environmental Complaint Procedure	The NBT Environmental Complaint Procedure provides procedures for documenting, investigating, responding to, and following up with complaints received from the community.	Terminal	NBT	(NBT, 2022d)

DOCUMENT TITLE	DESCRIPTION	TERMINAL / PROJECT	PRODUCED BY	REFERENCE
B2 and LCE Public Engagement Plan	The B2 and LCE Public Engagement Plan outlines and documents NBT's goals and commitments to conducting thorough public engagement for the B2 Project. The plan will outline the types of activities, opportunities, and materials developed to request feedback from the public on the B2 Project's construction-related impacts, mitigations, and activities. The B2 and LCE Public Engagement Plan will be developed in accordance with the Port Authority's PER Guidelines for Public Engagement (Port Authority, 2023b), and will include: • Overview of the B2 and LCE Offset Project. • NBT's goals and objectives for undertaking public engagement. • Description of the communities affected, including target audiences and possible impacts of the B2 and LCE Project during construction. • Planned public engagement opportunities, including opportunities to provide feedback through NBT's website (neptuneterminals.com), email contact information, newspaper ads, distribution of a notice to invite community members located within 700 m of the Terminal.	B2 Project	NBT	(NBT, 2023c)
Indigenous Consultation and Stakeholder Engagement Report	The Indigenous Consultation and Stakeholder Engagement report summarizes the consultation and engagement activities NBT has conducted with Indigenous Groups and pertinent Stakeholders for the B2 and LCE Offset Project.	B2 Project	NBT	(NBT, 2023h)

Note: The B2 CEMP will be revised in the future to be the B2D2 CEMP once the B2 Project has received regulatory approvals, and before the B2D2 Project goes to tender. However, documents that will support both project aspects during construction will be referred to as B2D2 (e.g., B2D2 WaMP).

1.8 Roles and Responsibilities

1.8.1 Key Project Personnel

NBT will maintain an active key Project personnel list throughout the construction of the B2 Project. Responsibilities are described in Table 1-3 and key B2 Project contacts are provided in Table C-1, of Appendix C. Project and Terminal emergency contacts are provided in Table C-2 and C-3 of Appendix C.

Table 1-3: Project Roles and Responsibilities

ROLE	RESPONSIBILITY
NBT	
NBT Environmental Manager	Responsible for the overall environmental management of the B2 Project.
	Develop a responsibilities matrix to define responsibility delegation to alternate NBT personnel.
	Provide the Contractor with a copy of the B2 CEMP.
	During construction, confirm compliance with the permits/approvals issued by RAs (e.g., Port Authority, DFO-FFHPP, TC), legislation (e.g., Regulations, Acts), contract documents, this B2 CEMP, and guidelines and BMPs (Section 6.1).
	Retains the authority and the responsibility to issue stop works orders (see Section 6.10) to cease any construction activities that are deemed unsafe, environmentally unsound, or non-compliant.
	Confirm the lead EM/marine mammal observer (MMO) who will be considered a QP. Consultants and/or Contractors undertaking the QP role will submit resumes and qualifications to the DEP (Director of Engineering and Projects). NBT can share associated documentations with RAs and interested Indigenous Groups.
	Will confirm a Communication Plan has been developed to confirm necessary communications between the Contractor(s), NBT personnel, environmental personnel and interested Indigenous Groups are appropriate.
	Confirm that any complaints received are communicated as indicated in the respective PER approvals and with the NBT Environmental Complaints Procedure (NBT, 2022d).
	In advance of B2 Project commencement, notifications to neighbours will follow the conditions stipulated in the PER approval.
	Confirm a plan is in place for the B2 Project reporting commitments (see Section 6.8) to be understood, as either a NBT or Contractor responsibility. If NBT, the NBT Environmental Manager will be responsible for assigning tasks to a delegate. If the

ROLE	RESPONSIBILITY
	Contractor, the NBT Environmental Manager will be responsible for confirming the Contractor has effectively communicated a delegate.
	Review and confirm that documents developed by the Contractor meet functionality and compliance with this B2 CEMP and other NBT compliance documents (see Section 1.7.2, Table 1-2).
	Assess potential risks during planning and construction, and review, observe, and report on environmental issues and mitigation related to construction activities.
	Verify that Contractor personnel are updated on the environmental conditions, approvals, and regulatory requirements as required.
	Review of the mitigation and monitoring measures outlined within this B2 CEMP.
	Maintain and share up to date versions of this B2 CEMP and other applicable guidelines and BMPs (as described in Section 6.1).
	Confirm that the B2 Project contact list as described in Table C-1, Appendix C is current throughout construction.
	Report incidents and non-compliances as required. Alternatively, be responsible for confirming appropriate delegate(s) are overseeing this responsibility (e.g., Contractor, EI).
Director of People & Community (DPC)	Responsible for communication with the public, Indigenous Groups and Stakeholders.
	Coordinate on-site visits by interested Indigenous Group to facilitate compliance monitoring when requested.
	Will confirm an appropriate plan is in place for communication and coordination with interested Indigenous Groups and the environmental monitoring team.
Environmental Systems Specialist (ESS)	The NBT Environmental Manager will delegate responsibilities to the ESS as required.
Environmental Inspector (EI) / Regulatory Lead	The NBT Environmental Manager will delegate responsibilities to the EI and/or Regulatory Lead as required.
Project Manager	Reviews the construction schedule and communicates with the NBT Environmental Manager and DPC as required
	Confirm communications occur as required between the B2 and D2 projects (e.g., schedule/equipment for out of hours activities).

ROLE	RESPONSIBILITY
	Confirm that a Notice of Works (NoW) is submitted to Canadian National Railway (CN) to communicate the interface between the B2D2 project and CN operations.
	The NBT Environmental Manager will delegate responsibilities to the Senior Project Manager as required.
	Develop a responsibilities matrix to define responsibility delegation to alternate NBT personnel.
	Confirm that details provided in Table C-1, Appendix C are updated appropriately with future B2 CEMP revisions.
Assistant Project Manager	Undertake tasks as required from the Project Manager.
B2 Area Lead	Undertake tasks as required from the Project Manager, engage with the Contractor as required to confirm compliance commitments are maintained.
Consultants	
Archaeologist	Should further archaeological investigations be required, the Professional Archaeologist will obtain the appropriate approvals and permits as required from pertinent Indigenous Groups and RAs in advance of any archaeological program.
	Work with pertinent Indigenous Groups to develop field methodologies and provide Indigenous Groups with the opportunity to contribute and comment on any reports or archaeological analysis.
	Ensure that archaeological work meets or exceeds heritage management plans of Indigenous Groups.
	Work collaboratively with the archaeological monitor of pertinent Indigenous Groups to ensure the protection of archaeological and heritage sites.
Contractor	
Project Manager	Provide NBT with a responsibilities matrix to assign roles and responsibilities outlined in this section.
	Verifying required permits, licenses, and approvals are in place prior to the start of the construction activities and comply with them throughout construction.
	Review the B2 CEMP with construction personnel and sub-contractors prior to commencing work.
	Develop contractor related documents as required (see Section 1.7.2, Table 1-2).
	Developing project-specific Work Procedures that comply with requirements of appropriate RAs and recognized BMPs in construction safety.

ROLE	RESPONSIBILITY
	Cooperate with the Environmental Monitor (EM) appointed for the work. Comply with written or verbal instructions with respect to conducting activities in compliance with the mitigation measures outlined in this B2 CEMP.
	Correct any deficiencies and any non-compliance issues upon direction from the EM, whether written or verbal. Corrections shall be made as soon as reasonably possible.
	Confirm that appropriate communication has occurred for non-compliances and accidental spills (see Sections 6.6.1, 6.8.2, 6.8.3).
	Review of construction schedules and procedures for potential implications on construction personnel health and safety, site security and environmental effects.
	Control access to the construction zone for authorized personnel and sub-contractors.
	Appoint a spill coordinator who has knowledge of spill mitigation, containment, and reporting procedures to the NBT as per Section 6.8.2. Whether this role requires a dedicated position or can be assumed as a dual tasking (e.g., by the EM) will be a Contractor decision with appropriate justification provided for the position.
	Will confirm that the spill coordinator is appropriately reporting any incidents to the NBT Environmental Manager.
	Have an appropriate equipment inspection program in place to confirm that equipment brought to the Terminal is in good working order. Equipment inspection records will be provided to NBT upon request.
	Confirm an appropriate plan is in place for communication with the EM/MMO and the construction personnel which includes: • Pile driving operator response to stop works if sound exceedances occur (see Section 6.7.5). • Emergency response and communication. • General communication for all compliance aspects with the EM.
Contractor's Lead EM (QP)	
Environmental Monitor (EM)	Will be appropriately qualified to be considered as a QP with experience in marine construction monitoring.
	Develop the B2D2 CCEMP (see Section 1.7.2, Table 1-2) and confirm that appropriate compliance requirements are appropriately met throughout construction, and that construction personnel understand compliance requirements pertinent to their scope of work.

ROLE	RESPONSIBILITY
	Provide leadership to the Contractor's construction staff about the importance of meeting regulatory requirements and complying with industry and company BMPs and standards.
	Provide independent verification of the implementation of NBT commitments and obligations and monitor general environmental compliance.
	Review, complete and submit EM reports to the NBT Environmental Manager.
	Confirm that all non-compliances or unanticipated environmental effects are reported to the NBT Environmental Manager immediately.
	Confirm any EMs who support environmental monitoring are appropriately qualified to do so.
	Confirm an appropriate data management plan is in place for the collection of monitoring data (e.g., turbidity, underwater sound) and to confirm appropriate documentation is maintained for the monitoring programs outlined in Section 6.8.1.
	Direct the NBT or Contractor's PM to stop a construction activity if the activity is deemed to pose a risk to the environment (stop work described in Section 6.10).
Marine Mammal Observer (MMO)	Will be experienced in the identification and behaviours of marine mammals expected to be in Burrard Inlet.
	Will be provided with an unobstructed view of the exclusion zone (EZ) during underwater sound producing activities.
	Will have experience in operating a calibrated hydrophone to interpret the data and determine measurements of underwater sound (dB). Will also have experience with pile installation projects.
	Will have authority to stop work during pile driving if exceedances to overpressure or underwater sound thresholds are reached (stop work described in Section 6.10, sound thresholds described in Section 6.7.5). In addition, the MMO will have authority to temporarily suspend works if marine mammals enter the EZ (described in Section 6.7.4).

2 REGULATORY FRAMEWORK

Legislation pertinent to the B2 Project are described in this section, with guidelines and BMPs described in Section 6.1. As the Terminal is located on federal lands within the Port Authority jurisdiction, environmental review and regulatory approvals for projects are legislated under the *Canada Marine Act* (CMA) and the *Impact Assessment Act* (IAA).

2.1 Acts and Regulations

Legislation relevant to the B2 Project includes but is not limited to:

- CMA
- *Canadian Navigable Waters Act* (CNWA).
- IAA.
- *Fisheries Act.*
- Aquatic Invasive Species Regulations (AISR).
- *BC Environmental Management Act* (EMA) including the BC Contaminated Sites Regulation (CSR), SRR, Hazardous Waste Regulation (HWR).
- *BC Heritage Conservation Act* (HCA).
- *BC Wildlife Act.*
- *Canadian Environmental Protection Act, 1999* (CEPA).
- *Canada Shipping Act.*
- City of North Vancouver Noise Control Bylaw No. 8885[1].
- Collision Regulations.
- *Migratory Birds Convention Act* (MBCA).
- Marine Mammal Regulations (MMR).
- *Railway Safety Act* (RSA), Railway Works Regulations (RWR) and Notice of Railway Works Regulations.
- *Species At Risk Act* (SARA).
- Sections 32, 33, 58[1] governs the protection of endangered or threatened species.
- Transportation of Dangerous Goods Act and Regulations (Federal and Provincial).
- Greater Vancouver Sewerage and Drainage District Sewer Use Bylaw No. 299

[1] Followed as a measure of best practice, but NBT compliance requirements are through the Port Authority as the B2D2 Project is located within Federal jurisdiction.

2.2 Permitting and Approvals

2.2.1 Project Permits and Approvals

Several federal and provincial permits are required for the B2 Project construction. A detailed outline of the applicable B2 Project permits and compliance requirements are provided in Table 2-1.

2.2.2 Existing Operational Permits and Approvals

NBT has three operations permits related to air and water discharges. These permits are not specifically required for the B2 Project, but it is critical that B2 Project construction activities do not affect NBT's compliance with these permits. Existing operational permits are described in Table 2-2.

Table 2-1: Project Permitting and Approval Requirements

LEGISLATION	REGULATORY AUTHORITY	FEDERAL, PROVINCIAL, MUNICIPAL	DESCRIPTION	CONSTRUCTION ACTIVITY	PERMIT/APPROVAL	PERMIT/COMPLIANCE REQUIRED	
						B2	D2
Permits and Approvals							
CMA IAA *(Impact Assessment Act)*	Port Authority Impact Assessment Agency of Canada (IAAC) [specific to IAA registry public posting]	Federal	The CMA establishes the Port Authority and assesses protection for the environment and safeguards the economic objectives of local, regional, and national governments. Permitting processes are required by owners or tenants conducting projects on Port Authority lands. Project information will be posted to the IAA Registry for public review for the respective projects.	All construction on the Terminal has potential to impact Federal lands owned by the Port Authority.	PER Permit (Category B, C)	Yes: Category C (PER 21-068)	Yes: Category B (PER 21-172); Permit received October 6, 2022.
CMA	Port Authority	Federal	As above – excluding IAA Registry posting.	B2 Groundwater and Soils Investigation.	PER Permit (Category A)	Yes: Category A – PER 20-051	NA
CNWA, Collision Regulations	TC	Federal	Regulation of works with the potential to obstruct or interfere with navigation through the Navigation Protection Program (NPP). Owners of works who propose to construct, place, alter, rebuild, remove, or decommission works that are in, on, over, under, through or across any navigable water may be required to apply for an approval.	Marine construction with the potential to impact marine navigation.	Approval	Yes: Approval amendment received (TC No. 2008-500781-7 | Registry No. 5388)	No
Fisheries Act	DFO-FFHPP	Federal	Protection of fish and fish habitat under Section 34.4[1] and Section 35[1]. Section 34.4[1], prohibition against causing the death of fish, by means other than fishing. Section 35[1], prohibition against causing the harmful alteration, disruption, or destruction of fish habitat (HADD).	Marine construction with the potential to impact fish and fish habitat.	RFR or *Fisheries Act* Authorization (FAA)	RFR: Yes FAA: Yes (HPAC- 21-HPAC-01537)	No
Compliance Requirements							
AISR	DFO-FFHPP	Federal	Prevention of the spread or introduction of aquatic invasive species in BC.	Marine construction equipment has the potential to introduce aquatic invasive species. There is no machinery or equipment being used for the B2 Project that will be travelling from international waters.	No	Yes	No

LEGISLATION	REGULATORY AUTHORITY	FEDERAL, PROVINCIAL, MUNICIPAL	DESCRIPTION	CONSTRUCTION ACTIVITY	PERMIT/APPROVAL	PERMIT/COMPLIANCE REQUIRED	
						B2	D2
MMR	DFO-FFHPP	Federal	Prohibits the disturbance (e.g., feed, interact with, trap, tag) of marine mammals.	During in-water work, there is the potential to encounter marine mammals.	No	Yes	No
MBCA	Environment and Climate Change Canada (ECCC)	Federal	Prohibits inadvertent harming, killing, disturbance or destruction of migratory birds, nests, and eggs.	Various construction activities will overlap with the bird nesting period (March 1 to August 31, see schedule in Section 3.5). Natural habitat is limited, and anthropogenic disturbance reduces likelihood of nesting at the Terminal; however, some tolerant species such as Canada geese have previously been found to nest.	No	Yes	Yes
BC Wildlife Act	Ministry of Forests [BC]	Provincial	Defines wildlife including native and some non-native amphibians, reptiles, birds, and mammals, including the designation of wildlife species at risk (SAR) (e.g., endangered, threated, or vulnerable status). Regulates the protection of wildlife from direct harm. Protects the majority of bird species and their nests.	During construction there is the potential to encounter nesting birds. No loss or alteration of vegetation or land-based habitat is anticipated.	No	Yes	Yes
SARA *(Species at Risk Act)*	DFO-FFHPP, ECCC	Federal	Sections 32, 33, and 58[1] govern the protection of threatened, endangered or species of special concern. Under SARA, it is an offence to: • Kill, harm, or harass a listed species. • Damage or destroy a residence of a listed wildlife species. • Damage critical habitat of a listed species.	During construction there is low potential to encounter nesting at risk birds or or other SAR. No critical habitat will be lost or altered.	No	Yes	Yes
Fisheries Act (Section 36)	ECCC	Federal	Pollution prevention provisions including the prohibition of depositing deleterious substances into waters frequented by fish.	Construction activities above and below the high-water line (HWL) including demolition, pile installation, concrete pours, and equipment operation have potential to impact fish-bearing waters. Land-based construction activities also have the potential to release deleterious substances through erosion and/or spills.	No	Yes	No
Parks Canada Agency Act IAA	Parks Canada BC Archaeological Branch (HCA)	Federal, provincial	Regulates the protection of cultural and archaeological resources and sites on federal lands and governs the process for chance finds of cultural materials or features during projects resulting in physical disturbance.	Activities that have ground disturbance potential, such as excavations, pile driving, and stone column installation have the potential to impact fill.	No	Yes	Yes

LEGISLATION	REGULATORY AUTHORITY	FEDERAL, PROVINCIAL, MUNICIPAL	DESCRIPTION	CONSTRUCTION ACTIVITY	PERMIT/APPROVAL	PERMIT/COMPLIANCE REQUIRED	
						B2	D2
BC HCA[2]							
Canada Shipping Act	TC, DFO-FFHPP	Federal	Regulates pollution prevention and response measures in addition to various other shipping related items including vessel registration, safety, navigation services, and accidents.	Marine construction will involve the use of barges, tugboats, and work skiffs. The potential for accidental spills is managed through the B2D2 CSERP (see Table 1-2).	No	Yes	No
Collision Regulations	TC	Federal	Governs safe passage, rights of way, crossing and overtaking, lights, shapes, sound signals and fog signals for vessels.	Marine construction will involve the use of barges, tugboats, and work skiffs.	No	Yes	No
BC EMA and associated regulations including the BC CSR), SRR, and HWR	BC ENV	Provincial	The EMA regulates protections for the environment including hazardous waste confinement, storage, disposal, and transportation (HWR), the quality of environmental media including soils, groundwater, vapour, and sediment (CSR) as well as requirements and thresholds for spill reporting and environmental emergencies (SRR).	Excavation activities may encounter contaminated soil and groundwater which would be subject to the CSR. Construction activities may also generate or encounter hazardous wastes (e.g., waste oil, soil, effluent, etc.) regulated under the HWR. Excavation activity will be managed through the NBT ESMS and B2D2 SMP (see Table 1-2).	No	Yes	Yes
CEPA*, 1999*	ECCC	Federal	Protects the environment, and the health and well-being of Canadians through pollution prevention and addresses potentially dangerous chemical substances.	Construction activities create the potential to release pollution and wastes into the environment through fuelling, emissions, and potential spills. Management of deleterious substances and potential spills will be through numerous plans, including the B2D2 CMPF, B2D2 CSERP, the NBT Storage and Handling of Hazardous Wastes Manual, the NBT Hazardous Waste Disposal Procedure, and the CWMP (see Table 1-2).	No	Yes	Yes
Transportation of Dangerous Goods Act and Regulations (Federal and Provincial)	TC, BC ENV	Federal, provincial	Regulates the handling and transportation of dangerous goods.	Construction activities may require the use of dangerous goods (e.g., compressed gasses, flammable liquids, etc.). Management of dangerous goods will be through the B2D2 CMPF, NBT's Gasoline and Diesel Re-Fuelling Procedure, and the NBT Storage and Handling of Hazardous Wastes Manual.	No	Yes	Yes
Greater Vancouver Sewerage and Drainage District Sewer Use Bylaw No. 299	Greater Vancouver Sewerage and Drainage District	Municipal	Protects sewers and sewer facilities owned or under the control or jurisdiction of the Greater Vancouver Sewerage and Drainage District from damage.	Construction activities such as excavations, dewatering, tremie pours, and water line installations can generate contaminated water requiring management.	No	Yes	Yes

[2] The BC HCA has no jurisdiction on Federal lands; however, it is followed as a best practice by the Port Authority (Port Authority, 2021a)

Table 2-2: Existing Operational Permits

LEGISLATION	PERMITTING AUTHORITY	PURPOSE	PERMIT NO.	DATE OF ISSUE	DATE OF LAST AMENDMENT
BC EMA	BC ENV	Authorization for effluent discharges from the CWTS into Burrard Inlet under provisions of the EMA. This permit includes limits of maximum rate of discharge (per day) and benchmark criteria for the effluent discharge characteristics.	Effluent Discharge Permit PE-06898	March 7, 1986	February 3, 2004
Greater Vancouver Sewerage and Drainage District Sewer Use Bylaw No. 299	MV	Authorization for effluent discharges from NBT's DBWTS into the sanitary sewer under provisions of the Greater Vancouver Sewerage & Drainage District Sewer Use Bylaw No. 299, as amended. This permit provides authorized (concentration) discharge limits for various chemical parameters.	Waste Discharge Permit SC-100002-NSSA	November 1, 1991	July 14, 2011
Greater Vancouver Regional District Air Quality Management Bylaw No. 1082	MV	Authorization for discharges of air contaminants to the atmosphere from the bulk commodities at NBT (including coal and potash).	Air Quality Management Permit GVA 0081	November 30, 1992	September 23, 2016

3 CONSTRUCTION ACTIVITY AND PROJECT SCHEDULE

Engineering design, construction activities, schedule, equipment, and site staging are discussed in this section. The B2 Project has not yet gone to tender and thus a Contractor has not been awarded the work.. While some aspects of construction planning may change, this is not expected to change predicted environmental effects and mitigation management. This will not impact regulatory compliance commitments as the roles and responsibilities are described in Section 1.8, Table 1-3, where NBT is ultimately responsible for confirmation of compliance.

A list of relevant design drawings for construction activities is provided in Section 3.1, Table 3-1 and can be viewed in the Design Drawing Supplemental Report (NBT, 2023a). Summaries of construction activity are provided in Sections 1.3.1, 3.2.1 and Table 3-2 for the B2 Project Scheduling, equipment requirements, and site access information is presented in Sections 3.5, 3.6, and 3.7 respectively.

3.1 Engineering Design

Engineering design for the B2 Project has been supported by several consultants (see Section 1.5).

Design drawings are included in the B2 Design Drawing Supplemental Report (NBT, 2023a) as summarized in Table 3-1.

Table 3-1: Design Drawings for Berth 2 Project

COMPONENT	DRAWING NO	DRAWING TITLE	PRODUCED BY	B2 DESIGN DRAWING REPORT APPENDIX NO
NBT Site Plans	Lease Plan No. 2015-079	Neptune Bulk Terminals (Canada) Ltd. Lease Areas	Port Authority	Appendix A
	09-917-1-008	Site (Basic Layout)	NBT	
	09-900-1-029-30	Neptune Bulk Terminals Emergency Response Plan		
	09-917-1-008	Fire Hydrants		
B2 Site Plans	307071-00041-03-MA-DGA-1500	Existing Site Plan and Demolition Plan	Advisian	Appendix B
	317071-00041-03-MA-DGA-1501	General Arrangement		
	317071-00041-02-MA-DGA-1590	Landside Excavation Phases and Laydown Plan and Marine Construction Equipment Plan		
B2 Buildings, Structures, and Equipment	317071-00041-03-MA-DGA-1540	Conveyor 244 Foundations – Plan and Details	Advisian	Appendix C
	317071-00041-03-MA-DGA-1542	Transfer Tower 261 Foundations – Plan and Sections		
	317071-00041-03-MA-DGA-1570	Conveyor C243 Support Foundations - Plans and Details		
	317071-00041-03-MA-DGA-1573	Transfer Tower 260 Foundations – Plan and Details		
	317071-00041-03-MA-DGA-1574	Electrical Room 211 – Plan and Sections		
	317071-00041-03-MA-DGA-1576	Landside Excavations and Laydown – Plan and Sections		
	21028-244-55-001	Conveyor 244 General Arrangement	CWA	Appendix D

COMPONENT	DRAWING NO	DRAWING TITLE	PRODUCED BY	B2 DESIGN DRAWING REPORT APPENDIX NO
	21028-244-55-002	Conveyor 244 General Sections – Sheet 1		
	21028-244-55-003	Conveyor 244 General Sections – Sheet 2		
	21028-244-55-004	Conveyor 244 Data Sheet		
	21028-244-55-005	Conveyor 244 Tail End and Camelback Area General Arrangement – Sheet 1		
	21028-244-55-006	Conveyor 244 Tail End and Camelback Area General Arrangement – Sheet 2		
	21028-244-55-007	Conveyor 244 Drive and Take-Up Area General Arrangement – Sheet 1		
	21028-244-55-008	Conveyor 244 Drive and Take-Up Area General Arrangement – Sheet 2		
	21028-244-55-009	Conveyor 244 Drive and Take-Up Area General Arrangement – Sheet 3		
	21028-244-55-010	Conveyor 244 Drive and Take-Up Area General Arrangement – Sheet 4		
	21028-244-55-011	Conveyor 244 Head End Area General Arrangement		
B2 Marine Structures	317071-00041-03-GE-DGA-1000	Cover Sheet and Drawing List	Advisian	Appendix E
	317071-00041-03-GE-DGA-1001	Design Criteria		
	317071-00041-03-GE-DGA-1002	General Notes		
	317071-00041-03-MA-DGA-1501	General Arrangement		

COMPONENT	DRAWING NO	DRAWING TITLE	PRODUCED BY	B2 DESIGN DRAWING REPORT APPENDIX NO
	317071-00041-03-MA-DGA-1502	Mooring Arrangement – Panamax Pinchat		
	317071-00041-03-MA-DGA-1503	Marine Structures Mooring Arrangement – Handy and Handymax Class		
	317071-00041-03-MA-DGA-1504	Scour Protection Removal and Dredging - Plan		
	317071-00041-03-MA-DGA-1505	Scour Protection Removal and Dredging -Sections		
	317071-00041-03-MA-DGA-1506	Ground Improvement – Plan and Sections		
	317071-00041-03-MA-DGA-1507	Scour Protection – Plan and Sections		
	317071-00041-03-MA-DGA-1508	Scour Protection – Sections		
	317071-00041-03-MA-DGA-1510	Shiploader Foundation – Plan		
	317071-00041-03-MA-DGA-1511	Shiploader Foundation – Typical Sections		
	317071-00041-03-MA-DGA-1512	Marine Structures – Pile Plan – Sheet 1		
	317071-00041-03-MA-DGA-1513	Marine Structures – Pile Plan – Sheet 2		
	317071-00041-03-MA-DGA-1514	Marine Structures – Pile List		
	317071-00041-03-MA-DGA-1515	Shiploader Foundation – Pile Typical Details		
	317071-00041-03-MA-DGA-1516	Shiploader Foundation – Pile Caps – Sheet 1		
	317071-00041-03-MA-DGA-1517	Shiploader Foundation – Pile Caps – Sheet 2		

COMPONENT	DRAWING NO	DRAWING TITLE	PRODUCED BY	B2 DESIGN DRAWING REPORT APPENDIX NO
	317071-00041-03-MA-DGA-1518	Shiploader Foundation – Pile Caps – Sheet 3		
	317071-00041-03-MA-DGA-1519	Shiploader Foundation – Pile Caps – Sections		
	317071-00041-03-MA-DGA-1520	Shiploader Foundation – Pile Caps – Details		
	317071-00041-03-MA-DGA-1521	Shiploader Foundation – Rail Beams - Details		
	317071-00041-03-MA-DGA-1522	Shiploader Foundation – Rail Beam Walkways - Plan		
	317071-00041-03-MA-DGA-1523	Shiploader Foundation – Rail Beam Walkways - Details		
	317071-00041-03-MA-DGA-1524	Fender Panel and Mooring Hook Platform – Sections and Details		
	317071-00041-03-MA-DGA-1525	Service Platform – Plan		
	317071-00041-03-MA-DGA-1526	Service Platform – Sections and Details – Sheet 1		
	317071-00041-03-MA-DGA-1527	Service Platform – Sections and Details – Sheet 2		
	317071-00041-03-MA-DGA-1530	Combi-Wall – Sections and Details		
	317071-00041-03-MA-DGA-1531	Combi-Wall – Details		
	317071-00041-03-MA-DGA-1532	Combi-Wall – Walkway – Plan and Details		
	317071-00041-03-MA-DGA-1533	Shore Mooring 3 – Plan and Details		
	317071-00041-03-MA-DGA-1534	Berth 1 Temporary Mooring Arrangement - Plan		

COMPONENT	DRAWING NO	DRAWING TITLE	PRODUCED BY	B2 DESIGN DRAWING REPORT APPENDIX NO
	317071-00041-03-MA-DGA-1535	Berth 1 Temporary Mooring Dolphin – Plan and Details		
	317071-00041-03-MA-DGA-1536	Berth 1 Temporary Mooring Dolphin Walkway – Plan and Details		
	317071-00041-03-MA-DGA-1537	Berth 1 Pony Wall Modifications – Plan and Sections		
	317071-00041-03-MA-DGA-1550	East Gangway Landing Platform – Plan and Sections		
	317071-00041-03-MA-DGA-1551	East Gangway Landing Platform – Details – Sheet 1		
	317071-00041-03-MA-DGA-1552	East Gangway Landing Platform – Details – Sheet 2		
	317071-00041-03-MA-DGA-1553	East Gangway Landing Platform – Walkway – Plan and Details		
	317071-00041-03-MA-DGA-1554	East Gangway Landing Platform – Walkway - Details		
	317071-00041-03-MA-DGA-1555	West Gangway Landing Platform – Sheet 1		
	317071-00041-03-MA-DGA-1556	West Gangway Landing Platform – Sheet2		
	317071-00041-03-MA-DGA-1560	Mooring Dolphin – Plan and Details		
	317071-00041-03-MA-DGA-1561	Mooring Dolphin Walkway – Plan and Details		
	317071-00041-03-MA-DGA-1564	Miscellaneous Details – Sheet 1		
	317071-00041-03-MA-DGA-1565	Miscellaneous Details – Sheet 2		
	317071-00041-03-MA-DGA-1577	Construction Sequence - Sections		

COMPONENT	DRAWING NO	DRAWING TITLE	PRODUCED BY	B2 DESIGN DRAWING REPORT APPENDIX NO
	01-MA-DSK-0004	Combi-Wall Concept Design Ground Improvement		
	20091-G001 – Sheet 1	B2 Shiploader 250 Overall General Arrangement and Sections (Sheet 1)	EMS Tech	Appendix F
	20091-G001 – Sheet 2	B2 Shiploader 250 Overall General Arrangement and Sections (Sheet 1)		
	20091-G002 – Sheet 1	Site Plan and Elevation Arrangements (Sheet 1)		
	20091-G002 – Sheet 2	Site Plan and Elevation Arrangements (Sheet 2)		
	20091-G005 – Sheet 1	B2 Shiploader 250 Access Arrangement (Sheet 1)		
	20091-G005 – Sheet 2	B2 Shiploader 250 Access Arrangement (Sheet 2)		
	20091-G009 – Sheet 1	B2 Shiploader 250 Operating Positions and Clearances (Sheet 1)		
	20091-G009 – Sheet 2	B2 Shiploader 250 Operating Positions and Clearances (Sheet 2)		
B2 Lot Grading and Utilities	317071-00041-02-MA-DGA-1580	Marine Structures Site Drainage – Plan	Advisian	Appendix G
	317071-00041-02-MA-DGA-1581	Marine Structures Site Drainage – Elevation		
	317071-00041-02-MA-DGA-1582	Marine Structures Site Drainage – Pipe Support Details		
B2 Lot Utilities	23-0747-GA-002	Civil Underground Utilities - General Notes	Binnie	NA – Please refer to the document titled 'Berth 2 Watermain Temporary and Permanent Works' (NBT, 2023g)
	22-0747-UT-010	Civil Underground Utilities – Existing Site Plan		
	22-0747-UT-020	Civil Underground Utilities – Existing Removals		

COMPONENT	DRAWING NO	DRAWING TITLE	PRODUCED BY	B2 DESIGN DRAWING REPORT APPENDIX NO
	22-0747-UT-101	Civil Underground Utilities – Watermain General Arrangement		
	22-0747-UT-110	Civil Underground Utilities – Watermain Plan & Profile – Sheet 1		
	22-0747-UT-111	Civil Underground Utilities – Watermain Plan & Profile – Sheet 2		
	22-0747-UT-150	Civil Underground Utilities – Watermain Typical Details– Sheet 1		
	22-0747-UT-152	Civil Underground Utilities – Watermain Plan & Profile – Sheet 2		

3.2 Construction

Construction activities for the B2 Project are described in this section, with an asset location figure shown in Drawing 1-1. High level construction activities for the B2 Project are described in Sections 3.2.1 with further details provided in Table 3-2.

3.2.1 Berth 2

The construction activities for the B2 Project will occur within the B2 water lot and on land (see B2 Project footprint in Figure 1-1). Within the water lot, construction activities will occur above and below the HWL. B2 Construction activities are summarized below:

- Berth demolition, including excavation (e.g., shiploader, conveyors, quadrant beams, wharfhead, sheet pile wall including anchor rods and anchor wall, existing dolphins, walkways, shore mooring, and associated upland buildings, structures, and foundations).
- Pile driving (Installation/removal).
- Drilling to support pile installation/removal (potential).
- Berth construction (e.g., service platform installation, marine structure installation, combi-wall installation including anchor rods and anchor wall, gangway landing platform installation, Conveyor No. 242 (C242), Conveyor No. 243 (C243), gallery installation, and shiploader installation).
- Concrete (cast-in-place and pre-cast).
- Scour protection removal/displacement and reinstatement/installation.
- Dredging.
- Infill.
- Stone column installation (GI).
- Electrical and controls installation.
- Water main realignment and installation.

Table 3-2: Berth 2 Construction and Demolition Summary

ACTIVITY NO	CATEGORY (REPAIRS, INSTALLATION, DEMOLITION)	ACTIVITY	ACTIVITY DETAIL	CONSTRUCTION DETAILS	ABOVE/BELOW HWL	IN/OUT-OF-WATER (IF BELOW HWL)	DRAWING NO
1A	Construction	Supporting construction activities (Mobilize, demobilize, supporting construction activity)	Mobilization, use of, and de-mobilization of marine equipment.	Marine-based equipment is expected to be required throughout construction. It is expected that several derricks and material barges/scows will be staged on-site and will be moved by tugs. When in use, derricks will be spudded. The Contractor will be required to submit a construction staging plan subsequent to contract award, pending Project permit and approval requirements. It is expected that equipment staging can be undertaken within the existing NBT water lot (see Section 3.7).	Below	Not relevant, mobilization of equipment	NA
1B	Construction	Supporting construction activities (Installation of temporary steel pipe falsework piles)	It is expected that installation of temporary steel pipe falsework piles is required to support construction and for the installation and offloading of the new shiploader.	To be a Contractor decision, but temporary piles likely installed with a vibratory hammer. Temporary piles will be removed subsequent to activity completion. The number of piles required is not known at this time and will be a Contractor decision.	Below	In	To be in Contractor Construction Staging Plan
2	Demolition	Pile removal	Creosote-treated timber piles (vertical, fender, batter) and steel pipe piles will be removed (see Table 3-3 for details).	Piles will be removed with a vibratory hammer, and the Contractor will be instructed to fully remove piles. However, depending on logistical constraints, the piles may be cut below mudline (BML). All creosote-treated piles will be removed from site and transported to a provincially approved disposal facility (approved facility). The Contractor will be required to provide a disposal certificate (see Section 6.6.3, Table 6-19).	Below	In	317071-00041-03-MA-DGA-1500: Existing Site and Demolition Plan
3	Demolition	Water lot	The existing wharf head, quadrant beams, EPSL and WPSL, dolphins, and walkways will be demolished prior to commencing the construction of the new marine structures.	Removal of existing decking will be performed with marine-based equipment and the decking components will be removed, contained on a barge, and subsequently taken from site for disposal at an approved facility. All demolition materials will be removed from site and transported to an approved facility. The Contractor will be required to provide a disposal certificate (see Section 6.6.3, Table 6-19).	Below	In and out	317071-00041-03-MA-DGA-1500: Existing Site and Demolition Plan
4A	Demolition	Land-based	Demolition of existing bulkhead wall and upper and lower anchor rods (supported by excavation activities), shore moorings, store building and foundation, sump, pumps and accessories, pedestrian overpass foundation, C9 and C12 foundations, electrical room 27 foundation, cathodic protection shed	Completion of land-based demolition will be performed with land-based equipment. Demolition of upland building and structure foundations will require excavation; the excavation depths are detailed within drawings and summarized in Section 3.4.1. Shallow concrete foundations and tiebacks as outlined within drawings will be removed only.	Above	Out	317071-00041-03-MA-DGA-1500: Existing Site and Demolition Plan

ACTIVITY NO	CATEGORY (REPAIRS, INSTALLATION, DEMOLITION)	ACTIVITY	ACTIVITY DETAIL	CONSTRUCTION DETAILS	ABOVE/BELOW HWL	IN/OUT-OF-WATER (IF BELOW HWL)	DRAWING NO
			foundation, dock office foundation, shiploader pivot foundation.	All demolition materials will be contained and removed from site for disposal at an approved facility. The Contractor will be required to retain and provide disposal certificates (see Section 6.6.3, Table 6-19 for waste management mitigation measures).			
4B	Construction	Land based	Temporary watermain construction	To allow for the construction of B2, it is necessitated that the existing watermain is cut and removed to facilitate the construction of the sheet pile wall for the B2 Project. A temporary watermain will be re-routed around the B2 Project area, under the railway line/temporary road, around the existing stores building, and back into the existing watermain. The temporary watermain alignment will go around the existing stores building in the eastern portion to allow the greatest flexibility for construction sequencing. One hydrant in the B2 area will be removed and relocated outside of the construction area. The permanent watermain will be installed as described in Activity 20.	Above	NA	Please refer to the document titled 'Berth 2 Watermain Temporary and Permanent Works' (NBT, 2023g)
5	Demolition	Scour protection removal	The existing scour protection slope protection located between the existing bulkhead wall and berth pocket (see Table 3-4 for B2 Project footprint) will be temporarily displaced or removed to facilitate GI stabilization (Stone columns, see Activity No. 14; see Activity No. 7 for scour protection reinstatement). The existing scour protection diameter ranges from 300 mm to 900 mm diameter with occasional boulders of 1,500 mm diameter.	It is expected that scour protection removal will be conducted with a crane mounted on a barge using a clamshell bucket. The scour protection will be disposed of off site.	Below	In	317071-00041-03-MA-DGA-1504 to 317071-00041-03-MA-DGA-1506: Scour Protection Removal and Dredging – Plan, Scour Protection Removal and Dredging – Sections, Ground Improvement – Plan and Sections. 317071-00041-01-MA_DSK-0004: Combi-Wall Concept Design Ground Improvement
6	Demolition	Dredging	Sediment removal will be required to stabilize the slope for scour protection placement (see Activity No. 7). There is currently a 1:1.5 slope between the combi-wall and the berth line, which may be an unstable surface for scour protection. The slope will be dredged to a 1:1.75 slope and material will be disposed at an approved facility	It is expected that dredging will be conducted with a crane mounted on a barge using a clamshell bucket. Sediment will be treated as contaminated and disposed at an approved facility. The dredge area completely overlaps with the temporary scour protection removal area (see Table 3-4,Drawing 3-1). Approximately 4200 m^3 of dredged sediments will be disposed of at an approved facility; there are no plans for disposal at sea (DAS).	Below	In	317071-00041-03-MA-DGA-1507 and 317071-00041-03-MA-DGA-1508: Scour Protection – Plan and Sections, Scour Protection – Sections
7	Construction	Scour protection reinstatement	Subsequent to the installation of the stone columns (Activity No. 14) and the piles (Activity No. 8), new scour protection will be	See Activity No. 5. Reinstatement activity will utilize the same equipment and methodology as during scour protection removal	Below	In	317071-00041-01-MA_DSK-0004: Combi-

ACTIVITY NO	CATEGORY (REPAIRS, INSTALLATION, DEMOLITION)	ACTIVITY	ACTIVITY DETAIL	CONSTRUCTION DETAILS	ABOVE/BELOW HWL	IN/OUT-OF-WATER (IF BELOW HWL)	DRAWING NO
			installed. See Table 3-4 for B2 Project footprints				Wall Concept Design Ground Improvement 317071-00041-03-MA-DGA-1506 to 317071-00041-03-MA-DGA-1508: Ground Improvement – Plan and Sections, Scour Protection – Plan and Sections, Scour Protection – Sections
8A	Construction	Pile installation (water lot)	Steel pipe piles will be installed both in the water lot and on land. See Table 3-3 for detail on the type and quantity of piles.	Pile driving is expected to require both vibratory and impact pile driving. Piles will initially be installed with a vibratory hammer to the extent feasible, and an impact hammer will likely be used to drive to final depth.	Below	In	317071-00041-03-MA-DGA-1500: Existing Site and Demolition Plan
8B				Drilling may be required to advance the pile and/or fill piles with concrete to increase the piles bending capacity, if needed. Drilling may also support pile removal.			
9	Construction	Pile installation (land-based)		Refer to Activity No. 8.	Land-based	NA	317071-00041-03-MA-DGA-1540: Conveyor 244 Foundations – Plan and Details 317071-00041-03-MA-DGA-1542: Tranfer Tower 261 Foundations – Plan and Sections 317071-00041-03-MA-DGA-1570: Conveyor 243 Support Foundations - Plan and Details 317071-00041-03-MA-DGA-1573: Transfer Tower 260 Foundations – Plan and Details

ACTIVITY NO	CATEGORY (REPAIRS, INSTALLATION, DEMOLITION)	ACTIVITY	ACTIVITY DETAIL	CONSTRUCTION DETAILS	ABOVE/BELOW HWL	IN/OUT-OF-WATER (IF BELOW HWL)	DRAWING NO
10	Construction	Pile installation (water lot)	The combi-wall is constructed of steel pipe piles (king piles) and AZ sheet piles. Piles are expected to be installed using a combination of vibratory and impact methods. The king piles and AZ sheet piles will be driven to elevation (EL) -80.0 m CD. and -30.0 m CD respectively. The piles will be coated on the water side with an anti-corrosion coating (Interseal 670HS), from the top of the pile down to 2 m embedment into the seabed.	Refer to Activity No. 8.	Below	In	317071-00041-03-MA-DGA-1500: Existing Site and Demolition Plan 317071-00041-03-MA-DGA-1510 to 317071-00041-03-MA-DGA-1514: Shiploader Foundation – Plan, Typical Sections, Pile Plan Sheet 1, Pile Plan Sheet 2, Pile List
11	Construction	Berth Construction (water lot, fender installation, gangways)	Nine fenders (approximately 5 m x 2 m) will be installed at the new berth locations. Service platform will be installed in the center of the marine structure. Gangway landing platform will be installed at the east end of the marine structure.	To be installed with marine-based equipment. Fenders are below the HWL but it is expected they would be installed in out-of-water tidal conditions.	Above and below	In and out	317071-00041-03-MA-DGA-1500: Existing Site and Demolition Plan 317071-00041-03-MA-DGA-1501: General Arrangement
12	Construction	Berth Construction (shiploader offload and installation, land-based)	The new steel shiploader (weighing approximately 1,500 tonnes; 30 m (H) x 60 m (L) x 34 m (W)) will be installed on rails parallel to the combi-wall and marine structure.	The shiploader will be fabricated off-site and offloaded onto the marine structure with marine-based equipment.	Above	Out	20091-G-001: B2 Shiploader 250 Overall General Arrangement and Sections (Sheet 1 and 2) 20091-G-002: Site Plan and Elevation Arrangements (Sheet 1) 20091-G-005: B2 Shiploader 250 Access Arrangement (Sheets 1 and 2) 20091-G-009: B2 Shiploader 250 Operating Positions and Clearances (Sheet 1 and 2)

ACTIVITY NO	CATEGORY (REPAIRS, INSTALLATION, DEMOLITION)	ACTIVITY	ACTIVITY DETAIL	CONSTRUCTION DETAILS	ABOVE/BELOW HWL	IN/OUT-OF-WATER (IF BELOW HWL)	DRAWING NO
13	Construction	Berth Construction (conveyor installation, land-based)	C243 from the existing Potash surge bin will be installed and connected to a C244 adjacent to the berth (see Drawing 1-1). Conveyor foundations will be installed on land-based piles.	Conveyor sections will likely be fabricated off-site and installed on top of land-based piles with marine-based equipment where accessible and land-based equipment otherwise.	Above	Out	317071-00041-03-MA-DGA-1501: General Arrangement
14	Construction	Stone Column Installation (water lot)	Stone columns, 1 m in diameter (to be confirmed in field trial), will be installed in the marine environment. See Zone A through C in Drawing 01-MA_DSK-0004.	Stone column installation will be completed using a 'bottom feed' technique with a nominal spacing of 3 m on an equilateral triangular grid. Feeder probe inserted BML with air and water injection until target depth reached. Gravel will then be backfilled from bottom upwards.	Below	In	01-MA_DSK-0004: Combi-Wall Concept Design Ground Improvement
15	Construction	Stone Column Installation (land-based)	Stone columns, 1 m in diameter (to be confirmed in field trial), will be installed in on the land portion of B2. See Zone D and E in Drawing 01-MA_DSK-0004.	Stone column installation will be completed using a 'bottom feed' technique with a nominal spacing of 3 m on an equilateral triangular grid.	Above	Out	01-MA_DSK-0004: Combi-Wall Concept Design Ground Improvement
16	Construction	Concrete works (pre-cast)	Installation of pre-cast concrete units consisting of pile caps, rail beams, deck panels and fender panels.	Pre-cast concrete units will be constructed off-site, then transported to site and installed using marine-based equipment.	Above	Out	317071-00041-03-MA-DGA-1515 to 317071-00041-03-MA-DGA-1524
17	Construction	Concrete works (cast-in-place)	Reinforced pile top plugs, pile cap and deck second and third stage concrete pours will be completed on site as cast-in-place works.	Concrete trucks will transport wet concrete to the B2 Project site by land. Concrete pours will use marine equipment for above water works.	Above	Out	
18	Construction	Infill	Infill will be placed between the combi-wall and the existing bulkhead wall. Infill area overlaps with the scour protection removal area and land-based stone column footprint.	Likely to be done with marine-based equipment with controlled backfills in stages and compacted as required. Infill is considered an out-of-water activity, as it will be placed behind the constructed combi-wall and isolated from the marine environment.	Above	Out	01-MA-DSK-0004: Combi-Wall Concept Design Ground Improvement
19	Construction	Anchor wall and tie rods	Anchors rods for the combi-wall will be tied into the anchor wall.	Likely to be done with land-based equipment. This is considered an out-of-water activity, as it will be placed behind the constructed combi-wall and isolated from the marine environment.	Below	In and out	01-MA-DSK-0004: Combi-Wall Concept Design Ground Improvement
20	Construction	Permanent watermain	Permenant Watermain Installation.	Following construction, a permenant watermian will be installed through the B2 area with the addition of various water connection points and an additional hydrant added. The temporary watermain will be capped and abandoned.	Above	NA	Please refer to the document titled 'Berth 2 Watermain Temporary and Permanent Works' (NBT, 2023g)

Table 3-3: Berth 2 Pile Installation and Removal (Type, Quantity)

PILE TYPE	PILE SIZE		INSTALLATION[a]	DEMOLITION
	mm	inches		
Timber piles (vertical, fender, batter) (water lot)	356	14		160
Steel pipe piles (water lot)	508	20		28
	610	24		21
Steel pipe piles (Conveyor 243) (land-based)	1067	42	10	
Steel pipe piles (Transfer Tower 260) (land-based)	1067	42	8	
Steel pipe piles (Conveyor 244) (land-based)	1219	48	11	
Steel pipe piles (Transfer Tower 261) (land-based)	1219	48	3	
Steel pipe piles (Rail Beam) (water lot)	1219	48	31	
Steel pipe piles (Mooring Dolphin) (water lot)	1067	42	8	
Steel pipe piles (king piles) (water lot)	1219	48	79	No demolition of piles for combi-wall
Sheet piles (king piles) (water lot)	AZ sheet piles	-	153	
Steel pipe piles (anchor wall) land-based)	1219	48	69	
Sheet piles (anchor wall) (land-based)	AZ sheet piles	-	136	

Note:

A Pile installation quantities sourced from drawings 317071-00041-03-MA-DGA-1512 and 317071-00041-03-MA-DGA-1513.

3.3 Demolition

Demolition activities are a key part of construction in order to facilitate the upgrades to B2 Project components. High level demolition activities for the B2 Project are described in Sections 3.3.1, with further details provided in Table 3-2.

3.3.1 Berth 2

Demolition activities are discussed in Activity Nos. 2, 3, 4, and 5 of Table 3-2 and include removal of existing piles, existing berth infrastructure (e.g., WPSL and EPSL, quadrant beams), existing land-based infrastructure (e.g., bulkhead wall, anchor rods, conveyors, foundations, and buildings), and rip-rap removal/temporary displacement from the water lot.

Hazardous material types, quantities, and recommendations are discussed in the B2 HBMA (Envirochem, 2022c).

A demolition plan for B2 has been presented by Advisian in the following drawing (see Table 3-1 for table of contents [ToC]), drawing provided in Appendix B of the B2 Design Drawing Supplemental Report (NBT, 2023a):

- 317071-00041-03-MA-DGA-1500.

3.4 Project Footprints and Excavation

Seabed and land-based footprints for construction, excavation to support construction and demolition, and dredging are described in this section.

The B2D2 SMP provides guidance on soil management for storage, re-use or off-site disposal characterization of the material in the planned excavation areas (Envirochem, 2022d). NBT intends to reuse soil which meets the criteria set out in the NBT ESMS (NBT, 2022f) and the recommendations of the B2D2 SMP (Envirochem, 2022d). Soil that does not meet the criteria will be disposed of at an approved facility. Dredged sediments will be treated as contaminated and disposed at an approved facility. See Section 6.5.8, Table 6-8 for additional information.

3.4.1 Berth 2

3.4.1.1 Water Lot

A summary of construction activities that will result in interactions with the seabed, with footprints (m^2) are provided in Table 3-4. Definition of seabed interactions for destruction and alteration categories are provided in Section 4.4, Table 4-2. A graphical depiction of seabed interactions for the demolition and construction phase is provided in Drawing 3-1.

There is no excavation associated with B2 water lot construction. Dredging is described in Table 3-2, Activity No. 6.

3.4.1.2 Land-Based

A summary of construction activities that will result in ground disturbance is provided in Table 3-5and is depicted in Drawing 3-2. The B2 ground disturbance footprints to support construction are due to foundation supports for infrastructure, pile driving and stone column installation.

The majority of the ground disturbance is comprised of excavation required (approximately 200 m long, 30 m wide [6,000 m^2], and 5 m deep) to expose existing anchor rods for demolition, allow installation of new anchor rods for the combi-wall, and to facilitate stone-column installation.

Table 3-4: Berth 2 Seabed Footprint (Water lot)

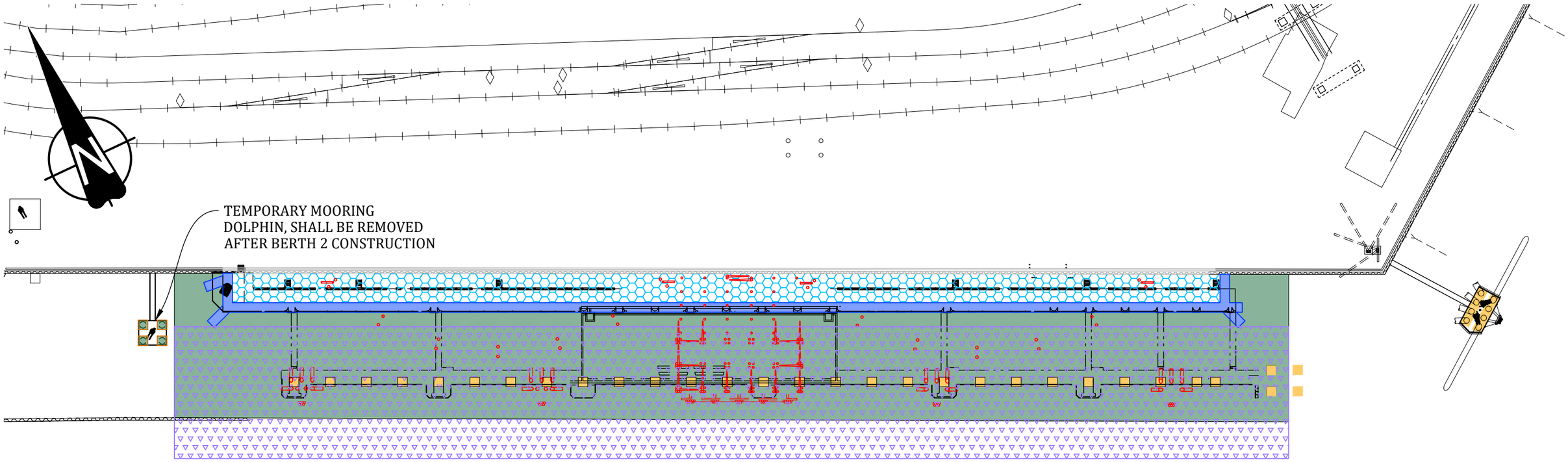
PROJECT COMPONENT [c]	COMPONENT COUNTED	COMPONENT FOOTPRINT (m^2)	AREA WITHOUT OVERLAP (m^2)	TEMPORARY FOOTPRINT COUNTED (m^2)	HADD (DESTRUCTION, NEGATIVE ALTERATION) FOOTPRINT COUNTED (m^2)
Scour protection removal, dredging, stone columns, and scour protection reinstatement	Scour protection reinstatement	4,838	692	4,535[d]	-
Stone column installation	Stone column installation	5,111	1,450	1,450	-
Scour protection removal and infill	Infill	1,011	-	-	1,011
Scour protection removal and permanent pile installation	Permanent pile installation	126	-	-	126
Sheet pile wall installation	Sheet pile wall installation	384	-	-	384
Scour protection removal, temporary pile installation and removal, scour protection reinstatement	Scour protection removal	13	-	-	-
Pile removal and scour protection installation [e]	Scour protection installation	21	-	-	-
			Total Project footprint	**5,985**	**1,521**

[c] See Drawing 2-1 for a visual depiction of the Project footprint and the overlapping Project components.
[d] Determined by (5,111 – 1,450) + 692.
[e] Removal of creosote-treated piles can be considered a positive alteration; however, positive alteration is not discussed within this table as there is no footprint associated with this alteration category.

Table 3-5: Berth 2 Land-Based Footprints for Construction

ACTIVITY NAME	ACTIVITY NO	FOOTPRINT (M^2)	DRAWING TITLE	DRAWING NO
Stone column installation	15	5,465	Combi-Wall Concept Design Ground Improvement Berth 2 Land-Based Footprint	01-MA-DSK-0004 03-EN-DGA-6002
Steel pipe piles and sheet pile installation	9	Piles are included in stone column footprint	Marine Structures Existing Site and Demolition Plan	317071-00041-03-MA-DGA-1500
Anchor wall and tie rods	19	Footprint included in stone column and infill area	Berth 2 Shiploader Project Combi-wall Concept Design Ground Improvement	317071-00041-01-MA-DSK-0004
Building foundations (various)	12, 13	218	Appendix C drawings of the Design Drawing Report Berth 2 Shiploader Project Marine Structures General Arrangement Berth 2 Land-Based Footprint	All. Also see Drawing 3-2 317071-00041-03-MA-DGA-1501 03-EN-DGA-6002

Note: see Drawing 3-2 for visual depiction of footprint.



PLAN
1:750

LEGEND:

- SCOUR PROTECTION REMOVAL, DREDGING, AND INSTALLATION
- STONE COLUMN INSTALLATION (GI)
- INFILL AREA AND SCOUR PROTECTION REMOVAL
- PILES TO BE INSTALLED (PERMANENT) AND SCOUR PROTECTION REMOVAL
- SHEET PILE WALL TO BE INSTALLED (PERMANENT)
- PILES TO BE INSTALLED (TEMPORARY)
- PILES TO BE REMOVED

m 0 10 20 30 40 m

1:750

PRELIMINARY
DO NOT USE FOR CONSTRUCTION
Last Saved: Jul. 11/23 11:02am

NOTES:

1. FOR DIFFERENTIATION OF OVERLAPPING FOOTPRINTS, SEE TABLE 3-6 IN B2D2 CEMP.

DRAWING NO.	DRAWING DESCRIPTION / TITLE	PROJECT / W.O.:	REV	YYYY-MM-DD	DESCRIPTION	DRAWN	APPROVED
REFERENCE DRAWINGS / DESIGN STANDARDS		SYSTEM:	A	2023-03-15	ISSUED FOR PERMITTING	AAL	AMT
		ASSET:	ISSUES / REVISIONS				
		DISCIPLINE:					

REVISION IN PROGRESS

ENGINEERING SEAL:

VENDOR: Advisian 317071-00041

OEM:

ISSUED AS RECORD COPY? (YES/NO) NO

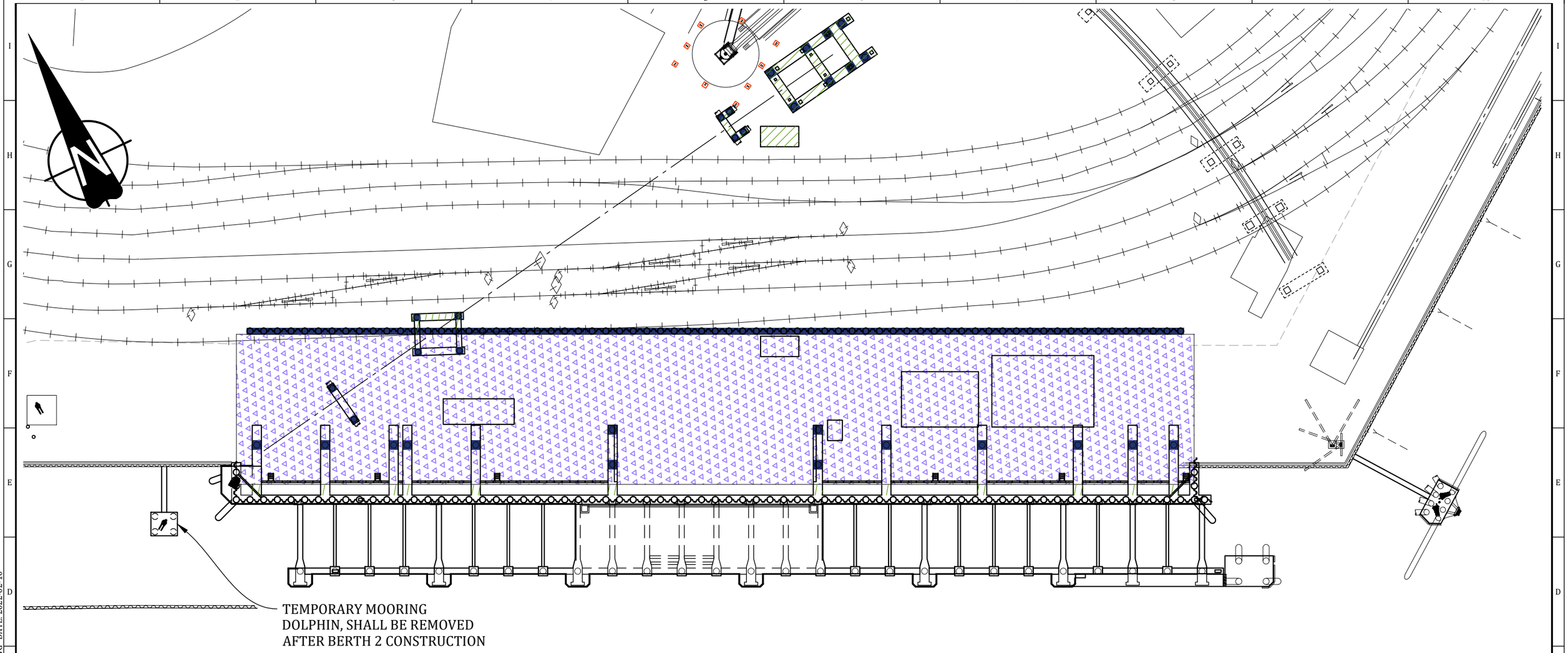
Neptune TERMINALS

TITLE: BERTH 2 SEABED CONSTRUCTION ACTIVITIES

Drawing 3-1

SCALE:	SHEET	OF	DRAWING NO.	REV:
N.T.S.	1	1	03-EN-DGA-6001	A

I:\VVR\317071\00041_NEP_B2SHIPLFDN\11_DRAWINGS\14_ENV_PLANNING\307071-00041-03-EN-DGA-6001.DWG DATE: 2022-02-10



PLAN
1:750

LEGEND:

- FOUNDATION FOOTPRINT OUTSIDE OF STONE COLUMN INSTALLATION (218m^2)
- STONE COLUMN CONSTRUCTION (GI) (5465m^2)
- PILES TO BE INSTALLED

NOTES:

1. FOR DIFFERENTIATION OF OVERLAPPING FOOTPRINTS, SEE TABLE 3-6.

m 0 10 20 30 40 m

1:750

PRELIMINARY
DO NOT USE FOR CONSTRUCTION
Last Saved: Mar. 06/23 1:54pm

REV	YYYY-MM-DD	DESCRIPTION	DRAWN	APPROVED
A	2023-03-DD	ISSUED FOR PERMITTING	AAL	AMT

REVISION IN PROGRESS

ISSUES / REVISIONS

PROJECT / W.O.:
SYSTEM:
ASSET:
DISCIPLINE:

DRAWING NO. | DRAWING DESCRIPTION / TITLE
REFERENCE DRAWINGS / DESIGN STANDARDS

ENGINEERING SEAL:

VENDOR: Advisian Worley Group 307071-00041
"This drawing is prepared for the use of the contractual customer of Worley Canada Services Ltd. and Worley Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."
OEM:

ISSUED AS RECORD COPY? (YES/NO) NO

Neptune TERMINALS

TITLE:
FIGURE 3-2: BERTH 2 LAND-BASED FOOTPRINT

Drawing 3-2

SCALE:	SHEET	OF	DRAWING NO.	REV:
N.T.S.	1	1	03-EN-DGA-6002	A

U:\VVR\307071\00041_NEP_B2SHIPLFDN\11_DRAWINGS\14_ENV_PLANNING\307071-00041-03-EN-DGA-6002.DWG DATE: 2022-02-10

3.5 Schedule

B2 Project construction is scheduled to occur over two phases of construction to minimize the requirement for in-water construction activity outside of the Fisheries and Oceans Canada (DFO) recommended least-risk window (Area 28 – Burrard Inlet: August 16 to February 28) (DFO, 2014):

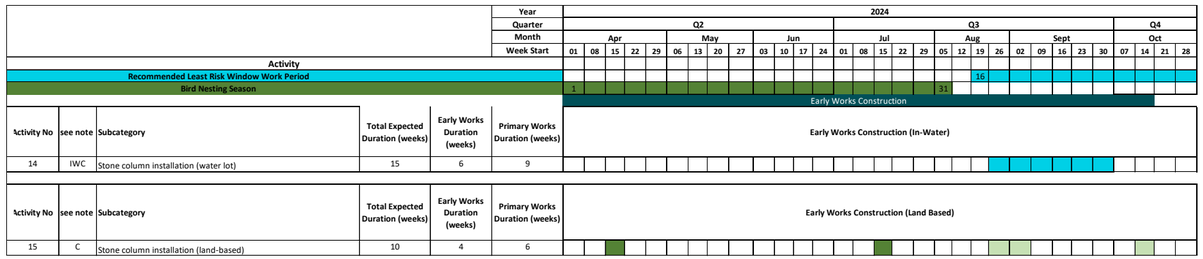
- Land Based Early Works are scheduled to occur intermittently from April 2024 to October 2024 (seven months) as allowed by during breaks in NBTs' Potash Operations Schedule.
- In-water Early Works are schedule to occur only within the DFO least-risk window from August 16, 2024, to February 28, 2025.
- Primary Construction is scheduled to occur between July 2025 and January 2027 (19 months).

Berth 2 will remain operational during the Early Works phase. Construction will be limited to those activities that do not require Berth 2 to be completely out of operation (as will occur during the Primary Construction Phase). A project schedule is presented in Table 3-6.

A portion of B2 in-water constuction activities may be required to occur outside of the DFO least-risk window. While efforts are underway to continue to consolidate the schedule through construction phasing and minimize in-water activities from March 1 to August 15, flexibility on the schedule will be required in order to minimize disruption to Terminal operations during the B2 Project construction. Occurrence of in-water activities outside of the least-risk window will be minimized to the extent feasible, and schedules and construction strategies are being explored to concentrate completion of in-water project components within the least-risk window, including completing non-piling activity during nightshifts (i.e., outside of the Port Authority's standard work hours), and scheduling project activities that can be completed in out-of-water tidal conditions (i.e., in the dry) to outside of the least-risk window.

B2 Project construction will primarily occur within the Port Authority's standard work hours (Monday to Saturday, 7:00 a.m. to 8:00 p.m., none on Sundays/holidays). However, authorization for construction outside of the Port Authority's standard work hours will be required for critical path activities Project activities proposed to occur outside of standard working hours are described in the NBT's request to conduct construction outside of standard work hour application (NBT, 2023p), which was prepared based on the guidance provided in the Port Authority document titled 'Project & Environmental Review – Guidelines – Construction Outside of Regular Work Hours' (Port Authority, 2023a) and with support from BKL (see Section 4.8). A B2D2 EHWP (NBT, in progress) is in development with support from BKL to provide noise management requirements during construction occurring outside of the Port Authority's standard working hours (see Table 1-2). Proposed mitigations for construction activity noise, both within and outside of regular construction hours are provided in Section 6.5.11 Table 6-11, and noise monitoring measures are described in Section 6.7.8.

Table 3-6: Berth 2 Water lot and Land-Based Construction Activities Planned Schedule and FisheriesLia, and Oceans Canada Recommended Least-Risk Windows



Activity No	see note	Subcategory	Total Expected Duration (weeks)	Early Works Duration (weeks)	Primary Works Duration (weeks)
		Early Works Construction (In-Water)			
14	IWC	Stone column installation (water lot)	15	6	9

Activity No	see note	Subcategory	Total Expected Duration (weeks)	Early Works Duration (weeks)	Primary Works Duration (weeks)
		Early Works Construction (Land Based)			
15	C	Stone column installation (land-based)	10	4	6

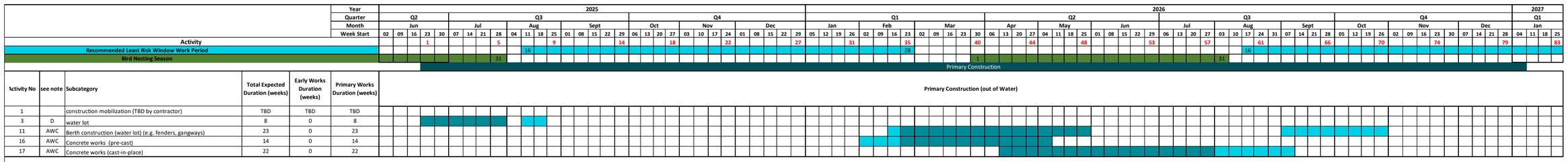
water lot construction activities outside of least risk window

water lot construction activities within least risk window

Land-based construcon activities outside of bird nesting window

Land-based construction activities within bird nesting window

Note:
AWC = Above Water Construction, IWC = In Water Construction,
C = In Land Construction, D = Demolition



Activity No	see note	Subcategory	Total Expected Duration (weeks)	Early Works Duration (weeks)	Primary Works Duration (weeks)
		Primary Construction (out of Water)			
1		construction mobilization (TBD by contractor)	TBD	TBD	TBD
3	D	water lot	8	0	8
11	AWC	Berth construction (water lot) (e.g. fenders, gangways)	23	0	23
16	AWC	Concrete works (pre-cast)	14	0	14
17	AWC	Concrete works (cast-in-place)	22	0	22

Activity No	see note	Subcategory	Total Expected Duration (weeks)	Early Works Duration (weeks)	Primary Works Duration (weeks)
		Primary Construction (In-Water)			
2	D	pile removal	6	0	6
5	D	Scour removal/temporary displacement)	2	0	2
6	D	Demolition (Dredging)	3	0	0
7	IWC	Scour protection reinstatement	4	0	4
8	IWC	Pile installation (water lot) (pipe piles)	12	0	12
10	IWC	Pile installation (water lot) (pipe piles [King piles], sheetpiles)	29	0	29
14	IWC	Stone column installation (water lot)	15	6	9
18	IWC	Infill	2	0	2

Activity No	see note	Subcategory	Total Expected Duration (weeks)	Early Works Duration (weeks)	Primary Works Duration (weeks)
		Primary Construction (Land Based)			
4A	D	Land-based	4	0	4
4B	C	Temporary Watermain	4	0	4
9	C	Pile installation (land-based)	13	0	13
12	C	Berth Construction: Shiploader offload and set in place	4	0	4
13	C	Berth Construction: Conveyor installation	28	0	28
15	C	Stone column installation (land-based)	10	4	6
19	C	Anchor wall and tie rods (water lot)	0	0	0

3.6 Equipment

Equipment requirements for the B2 Project are described in this section.

3.6.1 Berth 2

The B2 marine-based construction activities will be carried out using conventional marine construction methods and equipment from either a floating barge or from land, depending on site access available to the Contractor. Marine vessel traffic would include a barge mounted crane for pile installation, materials barges, work skiffs/punts, tugs to assist in barge movement, and a delivery barge for the new shiploader. B2 land-based construction activities will be carried out using conventional land-based demolition and construction methods including cranes(s), excavators, miscellaneous equipment (e.g., telehandlers, scissor lifts), and trucks (e.g., flat deck delivery trucks, tandem dump trucks, etc.). Potential equipment required to support construction is summarized in Table 3-7.

Table 3-7: Expected Equipment on Site for Berth 2

EQUIPMENT	ACTIVITY
Vibratory hammer	Pile installation and removal.
Impact hammer	Pile installation.
Bubble curtains	Pile installation and removal.
Spud Barge	General Construction (e.g., pile installation/removal, scour protection removal and reinstatement).
Materials Barge	General construction.
Delivery Barge	For delivery of the new shiploader.
Barge mounted or crawler crane	pile installation, pre-cast concrete and berth construction (e.g., fenders), stone column installation.
Cranes	Demolition and construction / installation (e.g., conveyor).
Pile drilling and cleanout equipment	Pile installation and removal.
Clamshell bucket	Scour protection removal and reinstatement/installation.
Excavators	Demolition and scour protection removal and reinstatement.
Telehandlers and scissor lifts	General construction.
Tandem dump trucks	Demolition (e.g., soil removal).

EQUIPMENT	ACTIVITY
Flat deck delivery trucks	Demolition and construction – removal of material and delivery of construction material and prefabricated construction components.

3.7 Site Access, Mobilization and Staging

The Terminal will remain operational throughout the B2 Project construction. However, temporary interruptions may occur in order to facilitate construction. The Contractor will be responsible for developing a B2D2 TMP to manage land-based (see Section 1.7.2, Table 1-2). Site access, mobilization and staging is described in Section 3.7.1.

3.7.1 Berth 2

Site access and materials delivery is expected to be required with both land- and marine-based equipment. Marine-based equipment is expected to fit within the boundaries of the NBT water lot (see Figure 1-1). The Contractor will be required to provide a construction staging plan for their land- and marine-based construction and staging area. However, in advance of that, a draft construction staging plan has been developed to support Port Authority approvals (NBT, 2023b). The intention of this CEMP is to confirm to the Port Authority that the marine staging during B2 construction will remain with NBT's water lot. A Constractor drafted Marine Construction Staging Plan (MCSP) will be developed and provided ot the Port Atuhority and other interested RAs or Indigenous Groups prior to construction.

4 POTENTIAL ENVIRONMENTAL EFFECTS

Construction activities as described in Table 3-2 have the potential to impact the environment. Potential effects due to B2 construction activities are described in the following sections and are summarized in Table 4-1. Archaeological effects are described in Section 5.

Table 4-1: Potential effects due to the Berth 2 and Dumper 2 Project Construction

EFFECT	SECTION
Disturbance, injury, or mortality to fish and marine mammals due to underwater sound	4.1
Marine water quality degradation	4.2
Physical damage to marine fauna (Crushing, burial, or mortality)	4.3
Accidental introduction of Invasive species	4.4
Marine-based habitat modification, through destruction and alterations (negative, positive, neutral)	4.5
Land-based habitat modification	4.6
Contaminated Soil, Sediment, Surface Water, and Groundwater	4.7
Construction and noise vibration	4.8
Air quality	4.9

4.1 Injury Due to Underwater Sound from Marine Based Activities

There are currently no federal underwater sound disturbance criteria in Canada; however, underwater sound threshold guidance is provided by the National Oceanic and Atmospheric Administration (NOAA) (NOAA, 2018), and by DFO-FFHPP through letters to avoid and mitigate and FAAs.

The B2 Project will take a conservative approach and require acoustic monitoring for fish and marine mammal underwater acoustic thresholds regardless of the sound source (e.g., impulsive [impact] vs continuous [vibratory]) to confirm recommended regulatory compliance. Acoustic monitoring will be required at all times during impact pile driving and confirmatory measurements during vibratory pile driving (see Section 6.7.5). Subsequent to the implementation of mitigation measures, underwater sound levels generated during the B2 Project are not expected to exceed thresholds that result in disturbance, injury, or death to fish or marine mammals (see Section 6.7.5 Table 6-21 for Project sound thresholds). Marine mammals likely to be present within the B2 Study Area during construction are harbour seals (NBT, 2023f). However, concurrent with the underwater acoustic monitoring, marine mammal observation will be conducted by a qualified MMO to confirm appropriate

EZs are maintained during piling activity and thus no negative effects to marine mammals due to underwater sound is expected. Injury to fish due to underwater sound is unlikely as species sensitive to barotrauma (e.g., rockfish) have not been documented within the B2 Study Area and species present are likely to vacate the construction area.

The B2 Project will employ “stop work” (see Section 6.10) and adaptive management measures should underwater sound threshold exceedances be observed. Further to this, there will be a ‘warning’ system implemented where actions can be taken prior to exceedances occurring by confirming ‘trigger thresholds’ (use of a lower sound threshold) as described in Section 6.7.5 Table 6-21.

Minimum requirements for the acoustic monitoring program and marine mammal monitoring program are provided in Sections 6.7.4 and 6.7.5 respectively. Due to B2 Project sequencing, pile driving is planned to occur within and outside of DFO’s recommended least risk window (see Table 3-6). NBT acknowledges the potential environmental effects of completing in-water construction activities outside of DFO’s recommended least risk window and is leading an innovative study to understand marine mammal presence in the waters fronting the Terminal through the development of an autonomous hydrophone program (AH Program). The NBT AH Program will utilize available technologies to study the presence of marine mammals in proximity to B2 and will be initiated in 2023.

4.2 Marine Water Quality Degradation

Degradation of marine water quality has the potential to occur due to accidental spills, pH changes associated with cast-in-place concrete construction activities, or due to turbidity generated through seabed interactions (e.g., scour protection removal/reinstatement, pile installation/removal, stone column installation, and clamshell bucket interaction during dredging). However, effects are expected to be minimal, and monitoring measures will be in place to respond to concerns through a physio-chemical monitoring program for turbidity and pH.

For stone column installation, the potential for increased turbidity is due to the interaction of the probe with the seabed material, and not related to the introduction of material BML (see description in Table 3-2, Activity No. 14). The EM will implement a turbidity and pH monitoring program to prevent exceedance of the Burrard Inlet Water Quality Objectives, BC WQG and CCME Canadian Environmental Quality Guidelines, as described in Section 6.7.3 and 6.7.7, respectively. A B2D2 CSERP (see Section 1.7.2, Table 1-2 and Section 6.6.1.2, Table 6-17) will be in place during all construction activities to minimize the likelihood of the release of a deleterious substance into the marine environment.

4.3 Physical Damage to Marine Organisms (Crushing, Burial or Desiccation)

The removal of existing timber and pipe piles may result in the desiccation of sessile or slow-moving organisms on those structures (i.e., barnacles, anemones). Similarly, infilling behind the combi-wall and installation of pipe piles and localized activities associated with side-casting (i.e., localized use of a clamshell bucket or equivalent for dredging and to remove and/or relocate large debris preventing pile installation) may result in the crushing or burial of sessile or slow-moving organisms. However, the fish habitat in B2 Project Study Area was largely considered low quality, with isolated areas of high quality habitat west of the existing

shiploader due to presence of bull kelp (NBT, 2023f). A fish salvage program will be undertaken prior to commencement of B2 demolition activities to remove larger invertebrates from the seabed footprint and creosote-treated piles (see Section 6.7.9).

Due to the relatively limited footprint of the piles, infilling, and dredging, physical damage effects are anticipated to have negligible effect to the productivity of species in Burrard Inlet. Sessile organisms (e.g., barnacles) will recolonize and establish on the new coated steel piles associated with the replacement B2 infrastructure and along the new combi-wall. Effects of dredging will be temporary, and it is expected that similar species assemblages from neighbouring habitats will recolonize.

4.4 Accidental Introduction of Invasive Species

In the absence of natural predators, invasive species (e.g., terrestrial and/or marine plants, animals, insects, etc.) can often out-compete native species, causing disruption and harm to existing ecosystems. Accidental introduction of invasive species can occur via movement of construction equipment on- and off-site.

As vegetation is not present within the B2 Project footprint, land-based invasive species are not anticipated to be encountered during the B2 Project, thus segregation and disposal methods specific to invasive species are not required. Mitigation measures will be implemented to reduce the likelihood for the import/export of invasive species from the Terminal as described in Section 6.5.5, Table 6-5.

4.5 Marine Habitat Modifications

Types of habitat modification include alteration and destruction (see Table 4-2). Alteration is broken into temporary and permanent categories, and permanent is considered as negative, neutral, or positive. Seabed habitats within the B2 Project footprint were largely considered low quality with the exception of the habitat west of the existing shiploader due to presence of bull kelp (see Section 4 of the Existing Conditions Report) (NBT, 2023f). DFO-FFHPP has determined that the B2 Project will result in harmful alteration, disruption, or destruction (HADD) of fish habitat, due to the permanent loss of habitat from the seabed footprint (B2 Project footprint is depicted in Section 3.4.1, Drawing 3-1). The HADD determination for what will be required to be offset through habitat restoration or construction is further described in the AFA Supplemental Report (NBT, 2023e)

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Table 4-2: Seabed Habitat Modification Categories and Associated Project Component

TERM	DESCRIPTION		PROJECT COMPONENT
ALTERATION: MODIFICATIONS TO SEABED HABITAT WHERE THE SUBSTRATE REMAINS BELOW THE HIGH WATER LINE (HWL).			
Temporary Alteration	Short-term (i.e., months) where substrate/habitat will be returned to a state similar to conditions pre-construction.		Installation of stone columns and dredging are considered temporary alterations (see schedule in Section 3.4 of the B2 CEMP). Stone columns will be installed below the seabed and thus the habitat will remain available to fish following construction. Dredging will be a temporary disturbance with no change in habitat availability/type following construction. The temporary loss of this area of fish habitat is not expected to have negative effects on Burrard Inlet fish species. Neighbouring habitats are similar, and species are likely to recolonize the habitat following disturbance. Scour protection (i.e., boulders) provides habitat for marine vegetation and invertebrates. The existing scour protection located between the existing bulkhead wall and berth pocket will be temporarily removed. Subsequent to the installation of the stone columns and the piles, the scour protection will be reinstated, or new scour protection will be installed.
Permanent Alteration	Alteration to fish habitat of a spatial scale, duration, or intensity that diminishes or improves the ability of fish to use such habitats in order to carry out one or more of their life processes (e.g., nursery habitat, feeding).		
	Positive	Seabed habitat after construction is higher quality than it was before construction (habitat gain).	Removal of creosote-treated piles is considered to be a positive permanent alteration. No new creosote-treated timber piles will be installed for the B2 Project and a total of 160 creosote-treated timber piles will be removed. All creosote-treated piles and associated waste will be collected and disposed of at an approved facility during demolition. Replacement of creosote-treated timber piles with steel pipe piles will have a positive environmental effect, as the steel piles will provide vertical hard structure for marine organisms to colonize.
	Negative	Seabed habitat after construction is lower quality than it was before (habitat loss).	There are no areas in the B2 footprint that are considered negative alteration. All footprint that contributed to the HADD is destruction.

TERM	DESCRIPTION	PROJECT COMPONENT
Destruction		Habitat destruction will occur due to elements of B2 Project construction, including steel pile installation and infilling; however, the footprint is relatively small in comparison to available habitats in nearby areas (see Table 3-4).

4.6 Land-Based Habitat Modification

Vegetation is not present within the B2 Project footprint, and vegetation removal is not anticipated as a required activity. However, past projects at NBT have encountered nesting Canadian Geese even in the absence of vegetation. For example, three active nesting sites were observed during a field survey conducted in April 2020 including one located on the concrete B1 quadrant beam (Envirochem, 2020). Terrestrial wildlife management mitigation measures are described in Section 6.5.6, Table 6-6 and a bird nest survey will be conducted prior to demolition of structures (see Section 6.7.6).

4.7 Contaminated Soil, Sediment, Surface Water, and Groundwater

Contaminated soil, sediment, surface water, and groundwater have the potential to impact both human and ecological wellbeing through physical exposure and/or degradation of habitat.

Management of land-based construction water/runoff (i.e., surface water), dewatering of excavation (i.e., groundwater and potentially seawater), and ESC will be through the B2D2 WaMP (Envirochem, 2023). The B2D2 WaMP summarizes environmental benchmarks, discharge locations, sampling requirements, data management, and corrective action plans for managing water generated during land-based construction. The B2D2 WaMP will be supported by the NBT SPPP, which provides guidelines for limiting surface water flow as well as prevention and treatment of contaminated surface water at the Terminal (NBT, 2022g). Surface water and groundwater management mitigation measures are provided in Section 6.5.8, Table 6-8; ESC mitigation measures are described in Section 6.5.9, Table 6-9.

Management of soil and sediment during land-based excavation will be managed through the NBT ESMS and B2D2 SMP (Envirochem, 2022d; NBT, 2022f). Together, the NBT ESMS and B2D2 SMP provides protocols for management of soil during excavation activity, including procedures for handling, sampling, disposal, and analysis. Contaminated soil management mitigation measures are described in Section 6.5.8, Table 6-8. Dredged sediments will be considered as contaminated and will be placed in a sealed scow and disposed of at an approved facility. Mitigation and monitoring measures will be implemented during dredging to minimize sedimentation (see Section 6.5.8, Table 6-8 and Section 6.7.3).

4.8 Construction Noise and Vibration

The construction schedule is described in Section 3.5, with activities that are proposed to occur outside of the Port Authority's standard work hours described in the B2 application (NBT, 2023p). BKL supported the application through computer modeling to predict potential noise levels compared to a proposed noise criteria (BKL, 2022).

A B2D2 EHWP is currently in development by NBT with support from BKL (NBT, in progress). The B2D2 EHWP will provide management requirements for construction occurring outside of standard working hours and will be finalized prior to construction.

Noise and vibration mitigation and monitoring measures are described in Section 6.5.11, Table 6-11 and Section 6.7.8.

4.9 Air Quality

Air emissions from vehicular/equipment exhaust and dust generated by construction activities can pose environmental effects and create a nuisance/hazard to construction personnel and surrounding neighbours. Extended periods of dry weather can exacerbate the problem. Air quality and machinery and equipment mitigation measures are described in Section 6.5.10, Table 6-10 and Section 6.5.12, Table 6-12 respectively.

5 ARCHAELOGICAL RESOURCES EFFECTS

An archaeological site is defined as a location that contains artifacts, features, materials, or other physical evidence of past human habitation or use regardless of age if they have cultural heritage (historical) or archaeological value.

The B2 Project is located within Federal jurisdiction and is not subject to provincial cultural heritage legislation such as the *HCA*. However, the Port Authority considers the requirements outlined in the HCA as best practices to use when managing potential archaeological finds (Port Authority, 2021d). Thus, the recommendations made for the B2 Project are consistent with the policies outlined by the Archaeology Branch of the Province of BC and is designed to meet standards set forth in the *HCA*.A Technical Archaeological Review for the B2 Project activities was completed by EcoLogic (EcoLogic, 2022). The review indicated that the potential for previously unrecorded archaeological and deposits to be low within the B2 Project footprint. Additionally, previous archaeological studies (see Section 1.4.1.2) have not identified archaeological materials within or in direct proximity of the B2D2 Project footprint.

Marine-based activities will potentially impact intact submarine deposits (should they exist); however, none of the B2 Project activities will be occurring in areas documented of having elevated archaeological potential. Similarly, land-based activities anticipated to generate subsurface disturbance are expected to occur only to the extent of the existing imported fill present at the B2 Project footprint and will not come into contact with any potential buried intact sediments. The construction activities are also located more than 200 m from the pre-industrial shoreline.

Generally, the proposed B2 construction activities will be occurring in an area of low archaeological potential, and it is considered unlikely that the proposed construction activities will encounter or impact any archaeological materials should they be present. However, due to the nature of archaeological materials these possibilities cannot be entirely ruled out. As such, it is recommended that all subsurface works associated with the proposed development proceed under the B2D2 CFMP (EcoLogic, 2023a). Additional archaeology mitigation measures are described in Section 6.5.17, Table 6-15.

6 ENVIRONMENTAL MANAGEMENT

6.1 Guidelines and Best Management Practices

Guideline and BMPs that will be incorporated into operational procedure include:

- 2022 Management Measures to Protect Southern Resident Killer Whales (DFO, 2023).
- A Field Guide to Fuel Handling, Transportation and Storage (MWLAP, 2002).
- Asbestos Handling Procedures (NBT, 2012).

- átl'ka7tsem/Howe Sound Biosphere Region Best Management Practices for Marine Docks (SFN, 2021).
- BC Approved Water Quality Guidelines (WQG) (BC ENV, 2021a).
- Burrard Inlet Action Plan (KWL, 2017).
- Burrard Inlet Water Quality Objectives (WQO) (BC ENV, 2022).
- Canadian Environmental Quality Guidelines (CEQG) (CCME, 2022).
- Develop with Care 2014: Environmental Guidelines for Urban and Rural Land Development in British Columbia (BC FLNROD & BC ENV, 2014).
- DFO: Fish and fish habitat protection policy statement (DFO, 2019).
- DFO: Land Development Guidelines for the Protection of Aquatic Habitat (DFO, 1993).
- DFO: Measures to protect fish and fish habitat (DFO, 2022b).
- DFO: Projects near water: BC marine/estuarine timing windows for the protection of fish and fish habitat (DFO, 2014).
- Federal Interim Groundwater Quality Guidelines (FIGQG) (ECCC, 2012).
- Government of Canada's Archaeological Heritage Policy Framework (Parks Canada, 1990).
- Guidelines for Raptor Conservation during Urban and Rural Land Development in British Columbia – 2013 (BC FLNROD & BC ENV, 2013).
- Guidelines to reduce risk to migratory birds (Government of Canada, 2021).
- NBT: Environmental Complaint Procedure (NBT, 2022d).
- NBT: Environmental Management System Manual (NBT, 2022e).
- NBT: Excavated Soil Management Standard (NBT, 2022f).
- NBT: Gasoline and Diesel Re-Fuelling Procedure (NBT, 2020a).
- NBT: Hazardous Waste Disposal Procedure (NBT, 2021b).
- NBT: Storage and Handling of Hazardous Wastes (NBT, 2020b).
- NBT: Stormwater Pollution Prevention Plan (NBT, 2022g).
- NBT: Water Management Plan (Envirochem, 2023).
- NOAA: 2018 revision to technical guidance for assessing the effects of anthropogenic sound on marine mammal hearing (version 2.0) (NOAA, 2018).
- Parks Canada Guidelines for the Management of Archaeological Resources (Parks Canada, 2005).
- Squamish Nation Culturally Significant Vegetation (SFN, 2022).
- Squamish Nation Guidelines for Archaeological Chance Find Management 2020 (SFN, 2020).
- Tsleil-Waututh Nation Construction Environmental Management Plan Requirements (Tsleil-Waututh, 2022)
- Tsleil-Waututh Nation Stewardship Policy (Tsleil-Waututh, 2019).
- Vancouver Fraser Port Authority – Archaeological Chance Find Procedure (Port Authority, 2021d).
- Vancouver Fraser Port Authority – Non-Road Diesel Emissions Program (Port Authority, 2020).

- Vancouver Fraser Port Authority – Project & Environmental Review Guidelines – Developing Your Stormwater Pollution Prevention Plan (Port Authority, 2015).
- Vancouver Fraser Port Authority – Project & Environmental Review Guidelines: Construction Environmental Management Plan (Port Authority, 2021c).
- Vancouver Fraser Port Authority – Project & Environmental Review Guidelines: Construction Outside of Regular Work Hours (Port Authority, 2023a).

6.2 Environmental Monitoring Compliance Program

An EnMCP will be designed and implemented by the Contractor with oversite from NBT. The NBT Environmental Manager will be responsible for confirming the EnMCP is managed appropriately, and that the CCEMP outlines the commitments specified in this B2 CEMP, as well as conditions stipulated through pertinent approvals.

6.3 Notifications, Engagement and Consultation

6.3.1 Regulatory Authorities

Notifications will be sent as required by RAs through permits and approvals. The B2D2 CCEMP will be updated to confirm requirements from the Port Authority, DFO-FFHPP, and TC.

6.3.2 Indigenous Consultation

NBT supports early engagement with Indigenous Groups and has provided the opportunity to discuss the B2 Project to the Tsleil-Waututh, Squamish and Musqueam, with communications currently underway with all three Indigenous Groups. The B2 Project strategy will be to maintain an open dialogue with these Indigenous Groups through all stages of project planning and construction. Indigenous Groups who request it will be provided with all notifications and reports that are provided to RAs (e.g., incident reporting, weekly reports, non-compliances).

NBT will also support DFO-FFHPP and the Port Authority through their respective consultation processes as required.

6.3.3 Public Comment

As part of the PER process, a public commenting period will be undertaken for the B2 Project (Category C, PER 21-068) and the LCE Offset Project, which is being reviewed as a component of the B2 Project. Public commenting will be led by the Port Authority and will include the 30-day posting on the IAA Registry. The public will have the opportunity through this process to comment and to provide community knowledge.

6.3.4 Public Engagement

Public engagement for the B2 Project will also be required to be undertaken by NBT for community members located within 700 m of the Terminal. As the LCE Offset Project is being reviewed as part of the B2 Project, community members will also have the opportunity to provide feedback on the LCE Offset Project as part of the B2 public engagement requirement. Public engagement will occur over a period of 20 business days and the public engagement strategy will be detailed in the B2 and LCE Public Engagement Plan (NBT, 2023c) (see Table 1-2). A Public Engagement Summary and Consideration Report will be developed to summarize the feedback received and how it has been considered, in addition to identification of any proposed mitigations and commitments. This report will be posted on the NBT's website (neptuneterminals.com) and provided to the Port Authority for posting.

6.3.5 Neighbour Notice

As part of the B2 Project PER Review, NBT expects that a condition of the PER approval will be to send a construction notice to adjacent residents and businesses based on a spatial proximity map notifying the community of the B2 Project. NBT will be responsible for generating a notice for Port Authority review and approval prior to distributing the notice on the timeline indicated in the Port Authority PER approval.

6.4 Avoidance Measures

The construction activities are for improvements to an existing Terminal; thus, complete avoidance is not possible in order to maintain the Terminal's functionality.

6.5 Mitigation Measures and Environmental Specifications

Mitigation measures for the proposed construction activities and its applicability to the respective B2 Project are presented in the following sections. While mitigations are assigned to a subject heading, there are times when mitigations are pertinent to multiple aspects of construction. The QP will be responsible for confirming that appropriate measures are followed throughout all aspects of construction. Procedures for Emergency Response, Fuel Management and Waste Management are provided in Section 6.6, which will be supplemented by Contractor developed plans (see Section 1.7.2, Table 1-2).

6.5.1 General

General mitigation measures are described in Table 6-1.

Table 6-1: General

NO	DESCRIPTION
G1	An EM will be on-site as described in Section 6.7.
G2	An MMO will be present during pile driving as described in Section 6.7.4.

NO	DESCRIPTION
G3	If injury or mortality to marine mammals or fish is observed, there is a Duty to Notify DFO immediately through the DFO-Pacific Observe, Record, and Report phone line (toll-free) at 1-866-845-6776. The Port Authority and interested Indigenous Groups will also be notified (see Table C-2, Appendix C).
G4	All in-water work will cease in the event of fish kill/injury to marine organisms or HADD is observed near the B2 Project until the EM can provide guidance for the continuation of works. See Section 6.10 for stop work procedures.
G5	Stop work procedures will be implemented if any non-compliance concerns arise that cannot be managed through adaptive management (see Section 6.10).
G6	The DPC or their delegate will engage with interested Indigenous Groups to confirm the opportunity to be present on-site is provided. Indigenous Groups will be requested to provide a point of contact to facilitate efficient communication. Advanced notice will be required so as to confirm appropriate safety training for on-site presence.
G7	The NBT Environmental Manager will confirm that the Contractor has reviewed NBT developed Terminal plans and procedures, and that documents developed by the Contractor meet functionality and compliance with this B2 CEMP and other NBT compliance documents (see Section 1.7.2, Table 1-2 for document commitments).
G8	The EM will advise the B2 Project team if construction activities have caused or are likely to cause an environmental incident and make recommendations for corrective action. Any changes to the compliance procedures will be documented through appropriate adaptive management communications (Section 6.9).
G9	The EM will have a data management program in place to confirm appropriate documentation is maintained for the monitoring programs outlined in Section 6.8.1 (e.g., turbidity, underwater sound).
G10	The NBT Environmental Manager will be responsible for reporting incidents and non-compliances as required. Alternatively, the NBT Environmental Manager will be responsible for confirming appropriate delegate(s) are overseeing this responsibility (e.g., Contractor, EI).
G11	A Communication Plan will be implemented to confirm necessary communications between the Contractor(s), NBT (NBT Environmental Manager, EI, DPC), environmental personnel and interested Indigenous Groups are appropriate.
G12	Complaints will be immediately forwarded to the NBT Environmental Manager, and notification and a response summary will be sent to the Port Authority within two days of the complaint.
G13	Personnel will be adequately trained and will use appropriate personal protective equipment.
G14	Copies of issued permits will be on-site and readily available.
G15	Work shall comply with requirements of applicable laws, legislation and BMPs (see Sections 2.1, 6.1), as well as compliance with recommendations or conditions outlined in pertinent RA approvals (e.g., Port Authority, DFO-FFHPP, TC).
G16	Construction-related restrictions, conditions, or mitigation measures that are in the B2 CEMP and part of RA approvals (the Port Authority, DFO-FFHPP, TC) will be communicated to construction personnel by the Contractor's QP and/or the EM (e.g., through tailgate and pre-construction meetings) (roles and responsibilities are described in Section 1.8.1, Table 1-3).

NO	DESCRIPTION
G17	Construction activities will be in compliance with existing NBT operational permitted discharges (e.g., CWTS, DBWTS, air emissions) or the monitoring programs associated with these permits (see Section 2.2.2, Table 2-2).
G18	The construction schedule will be provided to interested Indigenous Groups in advance of construction.

6.5.2 Fish and Fish Habitat

Fish and Fish Habitat mitigation measures are described in Table 6-2. Further measures to protect fish are described in Section 6.7.5 (Underwater Sound).

Table 6-2: Fish and Fish Habitat

NO	DESCRIPTION
FFH1	In-water activities or associated in-water structures will not interfere with fish passage or result in the stranding or death of fish.
FFH2	Soft-start procedures will be implemented during all impact pile driving activities. The B2D2 CCEMP will provide methodological details on soft start procedures.
FFH3	The Contractor shall be ready to implement appropriate adaptive management measures (e.g., bubble curtains) during all pile driving that result in exceedance of the 10 m fish underwater sound threshold (see Section 6.7.5, Table 6-21 for threshold description).
FFH4	A bubble curtain will be deployed for all impact pile driving of piles larger than 24 inches regardless of acoustic profiles.
FFH5	Acoustic monitoring will be conducted (confirmatory for vibratory; at all times for impact) to confirm underwater sound due to the B2 Project does not exceed underwater sound thresholds (see Section 6.7.5, Table 6-21 for threshold description).
FFH6	The MMO and the EM will establish a communication plan with each other and with the Contractor, so that stop work procedures can be effectively communicated. A plan will also be established such that a warning can be communicated as sound levels approach the threshold.
FFH7	Pile driving must occur in conditions suitable for the MMO to observe the full extent of the EZ, or the MMO must employ appropriate equipment to maintain compliance with the EZ (e.g., passive acoustic monitoring, night vision).
FFH8	Any debris that enters the marine environment, including during maintenance works, will be retrieved, and disposed at an approved facility. Dredged sediment will be placed into a sealed scow, treated as contaminated, and disposed at an approved offsite facility.
FFH9	Barges or other vessels will not ground on the foreshore or seabed or otherwise disturb the foreshore or seabed (including disturbance as a result of vessel propeller wash).

6.5.3 Marine Mammals

Marine Mammal mitigation measures are described in Table 6-3. Further measures to protect marine mammals are described in Sections 6.7.4 (EZ) and 6.7.5 (Underwater Sound).

Table 6-3: Marine Mammals

NO	DESCRIPTION
MM1	The EZ will be set and maintained as described in Section 6.7.4.
MM2	Stop work procedures will be implemented should any underwater sound exceedances be observed (see Section 6.10). Works may only resume once adaptive management measures or expansion of the EZ have been implemented.
MM3	Pre-pile driving monitoring (before construction or when stopped for more than 30 minutes) of the EZ shall be undertaken as described in Section 6.7.4.2.
MM4	If marine mammals are observed in the EZ during pre-pile driving monitoring, or if a marine mammal enters the EZ, pile driving activity must cease and only resume if the animal is seen leaving the EZ or has not been sighted for 30 minutes.
MM5	Compliance with the MMR.
MM6	Activities shall cease if there is risk of physical harm to a marine mammal from direct contact. Activities shall only resume once there is no longer a risk of injudry to marine mammals from direct contact. Monitoring is described in Section 6.7.4.

6.5.4 Sensitive Habitat Features and Species

There are no identified sensitive habitat features in the B2 Project Study Area. No impacts to SAR are expected as long as mitigation measures are followed. In the event that SAR are encountered, mitigation measures are described in Table 6-4.

Table 6-4: Sensitive Habitat Features and Species at Risk

NO	DESCRIPTION
SHFS1	If any SAR are observed during construction, the EM will immediately be notified. The EM will document species, abundance, and behaviour, and provide notification to the Port Authority.
SHFS2	Adaptive management shall be implemented if there is a risk of construction activities interfering with SAR. Stop work procedures will be implemented if construction activities may cause harm to any identified SAR (see Section 6.9).

6.5.5 Invasive Species Management

Invasive species management measures are described in Table 6-5.

Table 6-5: Invasive Species Management

NO	DESCRIPTION
IS1	The Contractor shall ensure that all construction equipment has been thoroughly washed prior to arrival at the Terminal. Upon leaving the Terminal, equipment must either exit through the designated wheel wash facilities or be manually washed.
IS2	Marine equipment will abide by necessary regulations and no equipment used for the B2 Project will be travelling from international waters.
IS3	The Contractor shall verify that any fill material brought to the Terminal is free of invasive species.
IS4	If the Contractor or EM observed *Sargassum muticum* during construction, the Contractor or EM will contain and remove the invasive seaweed for appropriate disposal.
IS5	Rocks, including rip-rap, colonized by *Sargassum muticum* will not be re-used.

6.5.6 Vegetation and Terrestrial Wildlife Management

Vegetation is not present within the B2 Project footprints, and vegetation removal is not anticipated as a required activity. Wildlife mitigation measures are described in Table 6-6.

Table 6-6: Terrestrial Wildlife Management

NO	DESCRIPTION
WM1	Structures to be demolished will be inspected by a QP for the presence of active bird nests if removal is to occur during the bird nesting period (March 1 to August 31) (BC FLNROD & BC ENV, 2014). The bird nest inspection methodology and a list protected species is detailed in Section 6.7.6.
WM2	The B2 Project footprint will be maintained free of wildlife attractants (e.g., garbage, wood debris, food, and odorous materials), potential nesting materials, and potential nesting sites (e.g., infrequently disturbed areas, open-ended pipes, or culverts).
WM3	Reflective bird scare tape will be used in select areas where geese are observed or where potential nesting material is present (e.g., gravel or sand). Deterrents can only be used prior to nesting; once nesting has taken place, no deterrents may be placed.
WM4	The Contractor shall confirm all construction personnel are aware of the possibility of encountering nests during the bird nesting period, particularly during demolition activities (e.g., demolition of buildings, shiploaders, conveyors, etc.). For all active or potentially active nests identified, the Contractor will stop work and immediately notify the EM.
WM5	Should active nests be found during the sweep, a buffer zone will be established as described in Section 6.7.6. This area will be maintained as a prohibited entry zone (i.e., no-go zone) until the young have naturally left the vicinity of the nest.

6.5.7 Water Quality

Water Quality mitigation measures are described in Table 6-7. Further measures to protect water quality are described in Sections 6.7.3 (Turbidity) and 6.7.7 (Concrete). Land-based water quality (i.e., surface water and groundwater) mitigation measures are addressed in Section 6.5.8, Table 6-8.

Table 6-7: Water Quality

NO	DESCRIPTION
WQ1	The EM will confirm that no "in-water" construction activities result in exceedances of WQGs outside of the B2 Project footprint. Turbidity and concrete monitoring will be carried out as described in Section 6.7.3, Table 6-20 and Section 6.7.7.
WQ2	The Contractor shall not, directly, or indirectly; (a) deposit or permit the deposit of a deleterious substance of any type into water frequented by fish in a manner contrary to Section 36(3) of the *Fisheries Act;* or (b) adversely affect fish or fish habitat in a manner contrary to Section 35(1) of the *Fisheries Act.*
WQ3	Construction activities and water sampling will be conducted in accordance with the B2D2 WaMP (Envirochem, 2023), such that no contaminated water or other effluents potentially harmful to marine life enters the marine environment. Contaminated water or effluent may include silt-laden water, concrete wash water, site run-off, oil/fuel spills, sewage, etc.
WQ4	The EM will be on-site during all in-water concrete cast-in place activities below the HWL and at the start of concrete cast-in place activities to confirm that concrete formwork is secure, and that concrete does not enter the marine environment. Monitoring will be conducted as described in Section 6.7.7.
WQ5	Construction activities involving the use or demolition of concrete, cement, mortars, grout, and other construction materials containing Portland cement or lime will be conducted so that direct or indirect deposit of sediment, debris, concrete (cured or uncured), and concrete fines into the marine environment are avoided.
WQ6	Water that has contacted uncured or partly cured concrete or Portland cement or lime-containing construction materials shall not be permitted to enter the marine environment.
WQ7	Containment facilities shall be provided at the site for the wash-down water from concrete delivery, concrete pouring, and other equipment and activities as required.
WQ8	All concrete forms will be constructed in a manner which will prevent fresh concrete or cement-laden water from leaking into the surrounding marine environment.
WQ9	When pouring concrete, all spills of fresh concrete must be prevented. If concrete is discharged from the transit mixer directly to the formwork or placed by wheelbarrow, proper sealed chutes must be constructed to avoid spillage. If the concrete is being placed with a concrete pump, all hose and pipe connections must be sealed and locked properly to ensure the lines will not leak or uncouple. The Contractor will confirm that concrete forms are not filled to overflowing.
WQ10	The Contractor will use anti-washout additives in the concrete to increase setting time and to confirm that the concrete mix used is appropriate for works below the HWL.

NO	DESCRIPTION
WQ11	The Contractor will implement adaptive management measures (e.g., carbon dioxide bubbler systems) if required for concrete works if there are exceedances of pH as described in Section 6.7.7.

6.5.8 Contaminated Soil, Sediment, Surface Water, and Groundwater Management

Contaminated Soil, Sediment, Surface Water, and Groundwater Management mitigation measures are described in Table 6-8.

Table 6-8: Contaminated Soil, Sediment, Surface Water and Groundwater Management

NO	DESCRIPTION
CSM1	For management of contaminated soils, the Contractor will adhere to the NBT ESMS (NBT, 2022f) and the B2D2 SMP (Envirochem, 2022d). This includes considerations for soil storage, re-use, soil quality characterization, and disposal documentation.
CSM2	For management of contaminated surface water and groundwater, the Contractor will adhere to the B2D2 WaMP (Envirochem, 2023), which summarizes environmental benchmarks, discharge locations, water sampling requirements, data management, and corrective action plans for surface water and groundwater management.
CSM3	Dredged sediment will be placed into a sealed scow, considered as contaminated, and disposed of at an approved upland facility.
CSM4	Dredged sediments will be tested as described within the B2D2 SMP (Envirochem, 2022d) to determine the appropriate upland disposal facility.
CSM5	Entrained water during dredging activities collected within the sealed scow will not be returned to the marine environment. If required, the Contractor will collect all water into appropriately sized storage tanks for testing and disposal. No de-watering will occur.
CSM6	Dredging activity shall be monitored as per Section 6.7.3 to minimize project generated sedimentation. Should there be water quality concerns during dredging activity, adaptive mitigations shall be implemented as per Section 6.9, such as slowing down dredging activity (decreasing dredge cycles).
CSM7	Soil entrainment or cross-contamination with dry bulk commodities will be avoided.
CSM8	Imported materials must be verified to be free of contaminants prior to arrival at the Terminal by the Contractor. Records will be maintained by the Contractor and be available upon request by NBT.

6.5.9 Erosion and Sediment Control

ESC mitigation measures are described in Table 6-9.

Table 6-9: Erosion and Sediment Control

NO	DESCRIPTION
ESC1	To support the NBT SPPP (NBT, 2022g), the B2D2 WaMP (Envirochem, 2023) will be implemented to limit surface water flow and prevent or treat contaminated surface water at the Terminal.
ESC2	The Contractor will have appropriate supplies on site to manage predictable ESC events, such as, but not limited to: silt fencing, straw,mulch, gravel for check dams, etc. Sufficient ESC repair and replacement materials will be readily available during construction. Prior to work beginning, the EM will review the installation and approve the placement and use of ESC measures.
ESC3	Construction activities shall follow the ESC measures outlined in the B2D2 SMP (Envirochem, 2022d) and BMPs, including those outlined in the Land Development Guidelines for the Protection of Aquatic Habitat Manual (DFO, 1993).
ESC4	ESC measures will be developed as part of work planning, consistent with the scale of the disturbance and anticipated weather conditions; the ESC measures will be implemented in advance of and throughout construction.
ESC5	The surface run-off will be diverted away from exposed soils at construction areas. ESC measures will be implemented and inspected in accordance with the B2D2 WaMP (Envirochem, 2023) and the B2D2 SMP (Envirochem, 2022d).
ESC6	Catch basins near soil-disturbing activities and along soil import/export haul routes must be protected by screens or socks.
ESC7	Stockpiles and materials laydown areas will be designated consistent with the B2D2 SMP (Envirochem, 2022d), and have a minimal slope and have appropriate ESC measures in place to minimize direct or indirect deposit into the marine environment.
ESC8	Vehicle traffic will be limited around exposed soils, and vehicle washing water will be captured and directed to a water treatment system with oil-water separation.
ESC9	Swamp pads shall be utilized during operation of tracked equipment to minimize disturbance to exposed soil.

6.5.10 Air Quality

Air Quality mitigation measures are described in Table 6-10.

Table 6-10: Air Quality

NO	DESCRIPTION
AQ1	There will be no idling of vehicles and construction equipment when not in use. Idling is allowed for a period of no more than 2 minutes in a 60-minute period when equipment is in use. Some exemptions to this can be referenced in the Port Authority Non-Road Diesel Emissions (NRDE) program (Port Authority, 2020) if reviewed and approved by NBT.
AQ2	Machinery, equipment, and stationary emission sources (e.g., diesel generators) will be well maintained in good working order and operated at optimal loads to minimize emissions, and all equipment and vehicles will have properly functioning emission control systems (if applicable).
AQ3	Stationary emission sources such as diesel generators will only be used as necessary and will be shut off when not in use.
AQ4	No burning of oils, rubber, tires, and any other material will take place at the site.
AQ5	Dust-generating activities will be minimized as much as possible, especially during windy periods. Fugitive dust will be controlled such that it is not visible beyond the property line and not tracked out beyond 8 m on roadways.
AQ6	Dust control on existing access roads will be managed with the application of water, as practicable, or a sweeper truck.
AQ7	Material loads entering or exiting the site that could create dust will be covered as appropriate.
AQ8	Unless otherwise stated, a NBT speed limit of 30 km/h shall be adhered to by construction equipment and vehicles to reduce dust mobilization.

6.5.11 Noise and Vibration

Noise and Vibration mitigation measures are described in Table 6-11. Further measures to address noise and vibration is described in Section 6.7.8.

Table 6-11: Noise and Vibration

NO	DESCRIPTION
VN1	Conduct construction activities within the Port Authority's standard work hours (Monday to Saturday, 7:00 a.m. to 8:00 p.m., with no work permitted on Sundays or holidays) with the exception of approved/permitted construction activities outside of standard work hours (described in Section 3.5).
VN2	A construction notice will be distributed as outlined within conditions stipulated in the PER approval.
VN3	Noise monitoring will be conducted for activities confirmed through the respective PER approvals to confirm effectiveness of mitigation measures. Monitoring will be performed as per the B2D2 EHWP (see VN4) and as described Section 6.7.8.
VN4	A B2D2 EHWP (NBT, in progress) will be developed and will outline a rationale and method for monitoring construction noise and a stop work procedure to be followed by NBT and their Contractor(s) for working outside of Port Authority standard working hours.

NO	DESCRIPTION
VN5	Mitigation measures for activities occurring outside of Port Authority standard work hours will include: • Where possible and safe to execute, barge and piling equipment is to be placed to obstruct the dominant sound path between the source and the receptor of the noise. • Removing unnecessary chains associated with the piling activities that generate noise. • Utilizing the quietest practical frequency of the vibratory hammer to achieve the pile driving desired. • Passive noise monitoring systems being checked by the Contractor and/or EM regularly to verify that noise levels at the property boundary are in compliance with the thresholds described in Section 6.7.8 and Section 3.2 of the B2D2 EHWP (NBT, in progress). • Lighting will be positioned away from residences, placed at low levels, and focused only on work areas, enabling the crews to perform work safely. • The expected crew size will be limited to only required personnel and is not expected to exceed the number of personnel present during daytime activities. • NBT will provide monthly updates detailing the anticipated construction activities and proposed working hours. This information will be provided to the Port Authority and will be posted on the NBT website (neptuneterminals.com). • Where possible and safe to do so, diesel engines will be shut off when not in use, electrically powered equipment will be preferentially used, back-up alarm volumes will be lowered when appropriate and used in combination with strobe lights, black screens will be used during welding activity, use of high-noise power tools will be avoided, use of synthetic hammers instead of steel hammers, and any concrete installation activity will be completed with a crane and bucket. • No impact pile driving will occur outside of standard working hours. • Noise monitoring will be conducted as described in Section 3.3 of the B2D2 EHWP (NBT, in progress). • Any complaints received will be investigated to confirm whether the source of noise originated from the B2 Project and managed as per the NBT Environmental Complaints Procedure (NBT, 2022d).
VN6	Should noise non-compliance occur, the following additional mitigation measures may be implemented: • Use of noise shrouds for the vibratory equipment. • Implementation of a noise barrier. • Confirming proper operation and function of compressors and equipment. • Temporarily stopping the activity and resuming during normal construction hours. • Any noise levels observed to be non-compliant with pertinent permits and approvals will be communicated to the Port Authority in accordance with the conditions stipulated in the respective PER approvals.
VN7	Equipment will be properly maintained and fitted with exhaust and muffler systems.
VN8	Engines will be turned off when not in use or reduced to idle.
VN9	NBT will monitor Terminal noise complaints to confirm any that are due to the B2 Project construction. If noise complaints are received, the effectiveness of mitigation measures will be reviewed.

6.5.12 Machinery and Equipment

Machinery and Noise mitigation measures are described in Table 6-12. Measures to limit air quality impacts associated with operation of machinery and equipment are described in Table 6-10.

Table 6-12: Machinery and Equipment

NO	DESCRIPTION
ME1	Equipment will be inspected prior to the commencement of construction to confirm it is in good operating condition, free of fluid leaks and invasive species. Equipment and vehicles will be inspected daily, or as recommended by the equipment manufacturer, to confirm equipment is being maintained appropriately. The Contractor will be responsible for maintaining inspection logs, which will be provided to NBT, RA, or interested Indigenous Group upon request.
ME2	Fuel-filled machinery will carry spill containment kits as described in Section 6.6.2, Table 6-18.
ME3	Every piece of machinery and equipment brought to site must have a dedicated spill tray. The spill tray is to be put in place when the equipment is not in use or positioned in one location for work.
ME4	When maintenance is required near the marine environment (i.e., within 30 m), a spill containment kit shall be immediately accessible.
ME5	Regular equipment maintenance shall be performed as per manufacturer's requirements or as required to confirm all equipment is in good working order. The Contractor will be responsible for maintaining appropriate maintenance records and will be available upon request.
ME6	Temporary construction lighting will reduce light-spill by pointing lights downward (90° to the vertical where possible) and placing task lighting close to the B2 Project footprints.
ME7	Marine equipment operators will exhibit appropriate lights and day shapes, monitor very high frequency (VHF) channels used for marine communications and traffic services, be familiar with vessel movements and not obstruct line of sight to navigational aids.
ME8	All NRDE used by the Contractor shall be reported by the Contractor as required under the NRDE Program (Port Authority, 2020) through the use of the Port Authority declaration form.
ME9	NRDE must be tier 3 or above and use low-sulphur diesel.
ME10	Refuelling procedures as described Section 6.6.2, Table 6-18 shall be followed.

6.5.13 Site Access, Mobilization, and Laydown Areas

Site Access, Mobilization, and Staging information is summarized in Section 3.7. The Contractor will be required to provide a B2D2 TMP (see Section 1.7.2, Table 1-2) and an updated construction staging plan for their land- and marine-based construction and staging areas, which will incorporate the mitigation measures described in Table 6-13.

Table 6-13: Site Access, Mobilization and Laydown Areas

NO	DESCRIPTION
SAML1	The Contractor will be responsible for developing and implementing a B2D2 TMP (see Section 1.7.2, Table 1-2).
SAML2	Mobilization will be planned to minimize the number of trips to and from the Terminal.
SAML3	Construction and staging areas will be kept in good order, tidy during activities, and left in the same condition or better at the end of the B2 Project.
SAML4	ESC measures will be in place should land-based staging areas be located within 30 m from Burrard Inlet (see Section 6.5.9).
SAML5/TC1	While not working, marine equipment will be moored such that it does not obstruct charted Aids to Navigation and does not obstruct navigation.
SAML6	No deep-sea vessels shall be berthed or un-berthed at the B2 pocket while marine construction equipment is staged or working in the same berth pocket.
SAML7	The Contractor will provide a construction staging plan for the B2Project.
SAML8	Equipment will not block egress from the site or internal roadways without planning and permission by NBT.
SAML9/TC2	Marine equipment in operation must not prevent vessels from navigating past the B2 Project site.
SAML10/TC3	Any false works, silt curtains, construction material or debris etc. are to be completely removed from the waterway subsequent to construction completion.
SAML11/TC4	Navigational warning actions shall be taken by contacting the Canadian Coast Guard in advance of start date. Submissions can be made via email to NavWarn.MCTSPrinceRupert@innav.gc.ca or by phone at (250) 627-3070.

6.5.14 Underground Utilities

Underground Utilities mitigation measures are described in Table 6-14.

Table 6-14: Underground Utilities

NO	DESCRIPTION
UU1	Abandoned utilities must be removed from the site and capped from the property line; construction trailers may not connect to underground utilities without consent or a building permit from the Port Authority.

6.5.15 Concrete Works and Grouting

Concrete works and grouting are required for the B2 Project activities and are addressed in the water and sediment quality mitigation measures (Section 6.5.7, Table 6-7) and concrete monitoring measures (Section 6.7.7).

6.5.16 Marine Works

Marine works are addressed in the fish and fish habitat, marine mammal, and water quality mitigation measures (see Section 6.5.2, Table 6-2, Section 6.5.3, Table 6-3, and Section 6.5.7, Table 6-7 respectively), and monitoring measures including visual, turbidity, marine mammal EZs, underwater sound, concrete, and fish salvage (see Sections 6.7.2, 6.7.3, 6.7.4, 6.7.5, 6.7.7, and 6.7.9 respectively).

6.5.17 Archaeological Resources

Archaeological Resource mitigation measures are described in Table 6-15 and includes the chance find management program with procedures described in detail in Section 6.7.12 (see B2D2 CFMP (EcoLogic, 2023a) for further detail).

Table 6-15: Archaeological Resources

NO	DESCRIPTION
ARC1	All construction activities are to proceed under the B2D2 CFMP (EcoLogic, 2023a).
ARC2	Should any potential archaeological resources be encountered, work in the immediate area will cease, the site will be staked or flagged, and any spoil material must not be moved.
ARC3	Should any potential archaeological resources be encountered, a professional archaeologist, the Port Authority, NBT, Indigenous Groups, and the provincial Archaeology Branch shall be contacted for direction immediately.
ARC4	Indigenous Groups will be provided the opportunity to have an archaeological monitor present during construction works.

6.5.18 Communication

Communication commitments are stipulated in various components of this B2 CEMP but have been repeated in Table 6-16 to clearly outline communication commitments.

Table 6-16: Communication Commitments

NO	DESCRIPTION
C1	Pertinent RAs and interested Indigenous Groups will be notified of environmental incidents within 24 hours.
C2	The Contractor will immediately notify NBT and the EM. NBT or their QP will be responsible for notification to the relevant RAs, interested Indigenous Groups or Stakeholders, including the Port Authority and Port of Vancouver Operations Centre, of hazardous spills and to confirm the spill reporting meets provincial and federal requirements.
C3	The PM will be responsible to confirm that appropriate CN is appropriately notified of the interface between the B2 Project construction activities and CN operations.
C4	Public engagement activities will be undertaken for the B2 Project as per the B2 Public Engagement Plan (NBT, 2023c), see Table 1-2. A notification will be distributed to community members located within 700 m of the Terminal to provide feedback. See Section 6.3.3 for further details.
G3	If injury or mortality to marine mammals or fish is observed, there is a Duty to Notify DFO immediately through the DFO-Pacific Observe, Record, and Report phone line (toll-free) at 1-866-845-6776. The Port Authority and interested Indigenous Groups will also be notified (see Table C-2, Appendix C).
G6	The DPC or their delegate will engage with interested Indigenous Groups to confirm the opportunity to be present on-site is provided. Indigenous Groups will be requested to provide a point of contact to facilitate efficient communication. Advanced notice will be required so as to confirm appropriate safety training for on-site presence.
G8	The EM will advise the B2 Project team if construction activities have caused or are likely to cause an environmental incident and make recommendations for corrective action. Any changes to the compliance procedures will be documented through appropriate adaptive management communications (Section 6.9).
G10	The NBT Environmental Manager will be responsible for reporting incidents and non-compliances as required. Alternatively, the NBT Environmental Manager will be responsible for confirming appropriate delegate(s) are overseeing this responsibility (e.g., Contractor, EI).
G11	A Communication Plan will be implemented to confirm necessary communications between the Contractor(s), NBT (NBT Environmental Manager, EI, DPC), environmental personnel and interested Indigenous Groups are appropriate.
G12	Complaints will be immediately forwarded to the NBT Environmental Manager, and notification and a response summary will be sent to the Port Authority within two days of the complaint.
G16	Construction-related restrictions, conditions, or mitigation measures that are in the B2 CEMP and part of RA approvals (the Port Authority, DFO-FFHPP, TC) will be communicated to

NO	DESCRIPTION
	construction personnel by the Contractor's QP and/or the EM (e.g., through tailgate and pre-construction meetings) (roles and responsibilities are described in Section 1.8.1, Table 1-3).
G18	The construction schedule will be provided to interested Indigenous Groups in advance of construction.
SHFS1	If any SAR are observed during construction, the EM will immediately be notified. The EM will document species, abundance, and behaviour, and provide notification to the Port Authority.
WM4	The Contractor shall confirm all construction personnel are aware of the possibility of encountering nests during the bird nesting period, particularly during demolition activities (e.g., demolition of buildings, shiploaders, conveyors, etc.). For all active or potentially active nests identified, the Contractor will stop work and immediately notify the EM.
VN2	A construction notice will be distributed as outlined within conditions stipulated in the PER approval.
SAML7	The Contractor will provide a construction staging plan for the B2 Project.
ARC3	Should any potential archaeological resources be encountered, a professional archaeologist, the Port Authority, NBT, Indigenous Groups, and the provincial Archaeology Branch shall be contacted for direction immediately.
ME7	Marine equipment operators will exhibit appropriate lights and day shapes, monitor very high frequency (VHF) channels used for marine communications and traffic services, be familiar with vessel movements and not obstruct line of sight to navigational aids.
SAML11/TC4	Navigational warning actions shall be taken by contacting the Canadian Coast Guard in advance of start date. Submissions can be made via email to NavWarn.MCTSPrinceRupert@innav.gc.ca or by phone at (250) 627-3070.
SERP 7	The Contractor will provide a figure in the B2D2 CSERP which graphically depicts planned spill containment and clean-up supply locations for the B2 Project. This figure shall be posted at appropriate locations on site and kept up to date if locations change.
SERP 13	The spill coordinator and Contractor will provide immediate response to emergencies and incidents and notify the NBT Environmental Manager. The NBT Environmental Manager will notify appropriate RAs and will engage with the DPC for communication with interested Indigenous Groups. All emergencies and incidents will be reported as described in Section 6.8.
SERP 16	Incident reporting procedures are described in Section 6.8.2.
FM2	The Contractor will provide a figure in the B2D2 CMPF which graphically depicts planned refuelling locations and fuel storage (if required) for the B2 Project.
WM10	Hydrocarbon products and other hazardous wastes potentially present during construction activities will be identified, stored, and handled in accordance with the associated Workplace Hazardous Materials Information System (WHMIS) and Safety Data Sheets (SDS). SDSs will be kept on-site and made available to all construction team members. A list of hazardous materials can be provided to RAs or interested Indigenous Groups if requested.

6.6 Procedures

Several plans will be developed by the Contractor to outline the procedures required for commitments to emergency response and communication, spill response, fuel management and waste management. The Contractor will develop these plans to outline the B2 Project commitments, which will be reviewed and approved by the NBT Environmental Manager in advance of construction (see Section 1.8.1, Table 1-3). See Section 1.7.2, Table 1-2 for minimum requirements for each respective plan.

These following sections outline procedures are applicable to the B2D2 Project.

6.6.1 Emergency Response

An emergency response plan allows for the rapid response of emergency services and/or containment and clean-up of environmental emergencies. Emergency response and spill prevention measures are to be included in the B2D2 CSERP, which will be further supported with the B2D2 CMPF (see Section 1.7.2, Table 1-2) and the Gasoline and Diesel-Refuelling Procedure (NBT, 2020a). Minimum commitments for the B2D2 CSERP pertinent to emergency communication and spill response are described in Sections 6.6.1.1 and 6.6.1.2.

6.6.1.1 Emergency Communication

Efficient and concise communication reduces potential risk to construction personnel, the public, property, and the environment in the event of emergencies. In the event of a release of deleterious substances (as defined by the BC SRR) to water or to land that is over the volume for the listed schedule of BC SRR, communication with RAs will be followed as described in Section 6.8.2. The NBT EMS Manual (NBT, 2022e) Appendix I.7 details the Reportable Volumes for Spills to the Environment and is provided as Table C-4, in Appendix C.

The B2 Project and NBT emergency contact list is provided in Tables C-2 and C-3, Appendix C respectively.

6.6.1.2 Spill Response Plan

Spill response measures to be included in the B2D2 CSERP are described in Table 6-17. Mitigation measures specific to fuel management are described in Section 6.6.2. Procedures for proper handling and storage of hazardous materials are described in Section 6.6.3. Roles and responsibilities described below are summarized in Section 1.8.1, Table 1-3.

Table 6-17: Spill Emergency Response and Prevention

CATEGORY	NO	DESCRIPTION
General	SERP 1	The Contractor will develop and adhere to a B2D2 CSERP including NBT's Reportable Spill Volumes (Table C-4 in Appendix C) and Spill Report Form (Table C-5 in Appendix C).
	SERP 2	Implement a B2D2 CSERP to avoid a spill of deleterious substances.
Training and Responsibility	SERP 3	All construction personnel shall be trained in the spill prevention and response, including the use of hazardous materials during site induction and subsequent toolbox talk sessions.
	SERP 4	The spill coordinator will keep an inventory of hazardous materials required for the B2 Project on site.
	SERP 5	All construction personnel will be familiar with the location and use of spill response equipment, including the deployment and use of spill booms.
	SERP 6	The B2 Project will be required to undertake no less than two environmental emergency drills for every year of construction. These will be organized by the QP with approval and coordination assistance from the NBT Environmental Manager and the EM.
Spill Response Materials	SERP 7	Appropriate spill containment and clean-up supplies shall be available and kept at accessible locations during construction (see SERP9). The Contractor will provide a figure in the B2D2 CSERP which graphically depicts planned spill containment and clean-up supply locations for the B2 Project. This figure shall be posted at appropriate locations on site and kept up to date if locations change.
	SERP 8	Spill response materials are required to be readily available when working on the B2 Project. These materials include, but are not limited to: • Spill kits. • Containment booms. • Personal protective equipment (e.g., nitrile gloves, safety glasses, suits). • Fire extinguishers. • Shovels.
	SERP 9	Spill kits will be inspected on a basis outlined within the B2D2 CSERP and refilled immediately after use.
	SERP 10	The B2D2 CSERP will specify the contents of spill kits for land and marine based activities.
	WQ3/SERP 11	Construction activities will be conducted in accordance with the B2D2 WaMP (Envirochem, 2023), such that no contaminated water or other effluents potentially harmful to marine life enters the marine environment. Contaminated

CATEGORY	NO	DESCRIPTION
Spill Response Procedures		water or effluent may include silt-laden water, concrete wash water, site run-off, oil/fuel spills, sewage, etc.
	SERP 12	The Contractor will utilize environmentally sensitive (e.g., biodegradable/food-grade/ environmentally friendly) oils, hydraulic fluids and lubricants that are non-toxic to marine life and that are readily biodegradable in equipment and machines unless the Contractor can demonstrate it is accepted by the Port Authority, or that it is not feasible because of: • Unavailability of biodegradable/food-grade/environmentally friendly oils and lubricants. • Technical performance issues/constraints. • Negative impacts on equipment. • Other reasons deemed acceptable to the Port Authority.
	SERP 13	The spill coordinator and Contractor will provide immediate response to emergencies and incidents and notify the NBT Environmental Manager. The NBT Environmental Manager will notify appropriate RAs and will engage with the DPC for communication and with interested Indigenous Groups. All emergencies and incidents will be reported as described in Section 6.8.
	SERP 14	Initial response to the spill will at a minimum include the following: • Stop work. • Maintain your own safety and the safety of others. • Wear personal protective equipment, such as nitrile gloves and safety glasses. • Identify the spilled materials and refer to the material data safety sheet to determine if human health or ignition hazards exist. • If possible and safe to do so, contain the spill by any safe means possible (e.g., plug leak, close/isolate leaking valve). • Obtain assistance of others. • Begin containment of the spill and stop it from spreading. • Clean up the spilled substance using available supplies from the on-site spill kits. • If the spill is to water, use measures such as installing sorbent rolls as floating booms to contain the spill and sorbent pads to soak up the material. • Report the spill as described in Section 6.8.2.
	SERP 15	All reportable incidents will be documented and investigated by NBT to determine the cause. The incident reports will be prepared by the EM. Additional mitigation or updates to this B2 CEMP will be implemented to prevent the recurrence of any similar event.
Reporting	SERP 16	Incident reporting procedures are described in Section 6.8.2.

6.6.2 Fuel Management

The Contractor will develop a B2D2 CMPF for the B2 Project, incorporating commitments as described in Table 6-18. This will be further supported with the B2D2 CSERP (see Table 1-2) and the Gasoline and Diesel-Refuelling Procedure (NBT, 2020a) (see Section 1.7.2, Table 1-2). Fuel management is important to provide mitigation measures to manage fuel use during construction. Roles and responsibilities described below are summarized in Section 1.8.1, Table 1-3.

Table 6-18: Fuel Management

CATEGORY	NO	DESCRIPTION
B2D2 CMPF	FM1	The Contractor will develop a B2D2 CMPF (described in Section 1.7.2, Table 1-2), which will be inclusive of the commitments made in the Gasoline and Diesel-Refuelling Procedure (NBT, 2020a) and the applicable portions of the Storage and Handling of Hazardous Waste Procedure (NBT, 2020b).
	FM2	The Contractor will provide a figure in the B2D2 CMPF which graphically depicts planned refuelling locations and fuel storage (if required) for the B2 Project.
	SERP 4	The spill coordinator will keep an inventory of hazardous materials required for the B2 Project on site.
Training	FM3	Construction personnel responsible for refuelling of equipment and machinery will be familiar with the spill response training procedures and response measures described in Section 6.6.1.2, Table 6-17.
	FM4	Construction personnel responsible for refuelling of equipment and machinery will be familiar with refuelling procedures, including awareness of and compliance with the no-go areas for fuelling (Figure D-1, in Appendix D), and additional precautions to be taken for fuelling near or over water.
Fuel Handling Guide	FM5	Fuelling Contractors if on-site at the Terminal on behalf of the Contractor must be in compliance with fuelling procedures outlined in the Gasoline and Diesel-Refuelling Procedure (NBT, 2020a) and the Storage and Handling of Hazardous Waste Procedure (NBT, 2020b).
	FM6	Fuel handling, storage, and labelling procedures shall be consistent with A Field Guide to Fuel Handling, Transportation and Storage (the Field Guide) (MWLAP, 2002). If there are discrepancies between this B2 CEMP and the Field Guide, the Contractor will follow the more conservative, unless approved otherwise by the Port Authority.
	FM7	Spill trays shall be in place and a spill containment kit shall be immediately accessible in the event of an accidental spill.
	FM8	All fuel-carrying equipment will be accompanied with spill prevention, containment, and clean-up materials that are suitable for the volume of fuels carried.
	FM9	Fuel storage and refuelling facilities will be equipped with drip trays, or other secondary containment of 110% of the fuel stored.

CATEGORY	NO	DESCRIPTION
	FM10	Portable fuel tanks (e.g., jerry cans) will be stored within leak-proof secondary containment with absorbent pads with a capacity of 110% of its volume.
	FM11	Fuel storage, including secondary containment, shall be kept free and clear of collected rainwater and snowfall. Accumulated water in the containment shall be removed regularly, to not diminish the capacity of the containment.
Fuelling	FM12	For the B2 Project, fuelling and maintenance of equipment will be required to occur on (e.g., barge) or near the marine environment. Industry standard measures will be in place to minimize or prevent spills to the marine environment. If any fuelling occurs in or on the marine environment secondary containment shall be utilized.
	FM13	Fuel transfer lines will be equipped with check valves to prevent spillage in case of equipment failure.
	FM14	While refuelling, the operator will stay with the fuel nozzle. Vehicles and equipment will be shut off while refuelling.
	FM15	Refuelling trucks shall be equipped with meters and auto-shutoff ability to prevent over-filling.
	FM16	Refuelling shall be conducted on impermeable surfaces where possible.
	FM17	Designated fuelling areas will be required for all refuelling occurring within 30 m of Burrard Inlet and will be described in the B2D2 CMPF (see Section 1.7.2, Table 1-2).

6.6.3 Waste Management

Waste from construction activities has the potential to adversely affect the marine and terrestrial environments. The Contractor will develop a CWMP to reduce this risk of potential adverse effects. The mitigation measures outlined in Table 6-19 will be implemented and included in the CWMP. The CWMP will also be in compliance with the Hazardous Waste Disposal (NBT, 2021b) and Storage and Handling of Hazardous Wastes (NBT, 2020b) procedures, in addition to the NBT AMP (Envirochem, 2022a) (see Section 1.7.2, Table 1-2). Roles and responsibilities described below are summarized in Section 1.8.1, Table 1-3.

Table 6-19: Waste Management

CATEGORY	NO	DESCRIPTION
Waste Management	WM1	The Contractor must adhere to applicable legislation for handling, transporting, and disposing of waste material (including hazardous waste) in accordance with Provincial (*BC EMA,* BC HWR, SRR) and Federal (*Transportation of Dangerous Goods Act*) legislation.
	WM2	Under no circumstances will waste materials be deliberately introduced into the marine or terrestrial environment, and any that does accidentally will be retrieved.
	WM3	Contractors shall separate and store waste materials and recyclable materials in appropriately labelled, covered, and secured containers on-site.
	WM4	All waste will be collected and transported off-site for disposal and/or recycling at an approved facility by a barge or by truck according to applicable legislation, guidelines, and BMPs.
	WM5	The acceptance criteria of the approved disposal and/or recycling facility will be confirmed by the Contractor. The Contractor will be required to provide a disposal certificate.
	WM6	All waste material will be removed in a timely matter to prevent the attraction of wildlife (e.g., birds).
	WM7	Used petroleum products, including their empty containers, will be collected by the Contractor, and transported to a licensed recycling facility in approved storage containers following applicable regulations.
Training	WM8	The Contractor will provide on-site staff with training in the use of hazardous materials and the location and use of spill kits and containment booms.

CATEGORY	NO	DESCRIPTION
Hazardous Waste	WM9	Hazardous Waste to be managed in accordance with the CWMP (see Section 1.7.2, Table 1-2) including the NBT Storage and Handling of Hazardous Wastes Procedure (NBT, 2020b),the NBT Hazardous Waste Disposal Procedure (NBT, 2021b), and the NBT AMP (Envirochem, 2022a).
	WM10	Hydrocarbon products and other hazardous wastes potentially present during construction activities will be identified, stored, and handled in accordance with the associated Workplace Hazardous Materials Information System (WHMIS) and Safety Data Sheets (SDS). SDSs will be kept on-site and made available to all construction team members. A list of hazardous materials can be provided to RAs or interested Indigenous Groups if requested.
	WM11	The Contractor will provide separate labelled containers for potentially hazardous waste such as oily rags and hydrocarbon absorbent pads. Liquid hazardous waste will be contained in appropriate leak-proof labelled containers and stored in dedicated and secure storage areas with at least 110 % capacity for secondary containment.
	WM12	Sorbent materials or soils saturated with hydrocarbons (greater than or equal to 3% by weight) are classified as hazardous waste under the BC CMA and will be managed by the Contractor accordingly.
	WM13	Planning for demolition will consider the NBT Asbestos Handling Procedure (NBT, 2012) and generation and disposal of hazardous waste will be the Contractor's responsibility and meet or exceed the standard of care of NBT's Storage and Handling of Hazardous Waste Procedure (NBT, 2020b).
Excavated Soils	WM14	Off-site disposal of soils will follow applicable regulations and contract specifications for transport and handling including the NBT ESMS (NBT, 2022f). Soil not suitable for re-use will be disposed at an appropriate disposal facility as outlined in the B2D2 SMP (Envirochem, 2022d).
Dredgegate	WM15	All dredgeate will be treated as contaminated and be disposed at an approved facility. Off-site disposal will follow applicable regulations and contract specifications for transport and handling including the NBT ESMS (NBT, 2022f).
Portable toilets	WM16	Portable toilets staged on marine-based barges or near water (<30 m from Burrard Inlet) will be appropriately secured. Sewage from portable toilets will be disposed of in an approved sewage disposal facility on an as-needed basis.
Documentation	WM17	The Contractor shall maintain waste disposal manifests (e.g., for hazardous waste and/or transportation of dangerous goods manifests) consistent with NBT's Hazardous Waste Disposal Procedure (NBT, 2021b) (if applicable) and provide these to NBT or the EM upon request. Disposal

CATEGORY	NO	DESCRIPTION
		records can be shared with pertinent RAs and interested Indigenous Groups upon request.
	WM18	The percentage of waste materials being reused or recycled will be tracked/documented by the Contractor.

6.7 Monitoring Measures

The EM/MMO will be present as described below and responsible for carrying out the monitoring measures outlined below. The EM will be considered a QP or will be under the direction of a QP.

The EM/MMO is expected to be on-site as follows:

- During in-water activities.
- During out-of-water or over water activities as considered to be higher risk.
- At all times during pile driving activities.
- At all times during in-water cast-in-place concrete pours that occur within the water lot.
- At all times during major water management events as specified in the B2D2 WaMP (Envirochem, 2023).
- A minimum of two times per week.

The same person may carry out the EM and MMO roles if it is determined that the scope of works can be managed by one person. In such a case, the MMO must confirm that they have unobstructed views of the EZ from acoustic monitoring locations. The EM/MMO may also liaise with environmental representatives from interested Indigenous Groups.

6.7.1 General

The general monitoring responsibilities of the EM are described in Section 1.8.1, Table 1-3. More specific monitoring measures are described below:

- Conduct regular monitoring (twice weekly at a minimum) with additional presence based on the sensitivity of the construction activities.
- Undertake monitoring during in-water construction activities as described in the following sections and during any other high-risk activities such as equipment encroachment near marine environments or those associated with emergency events.
- Visual monitoring of construction for potential risks to marine species or any fish spawning/migration activity (e.g., seal or gull activity).
- Monitor and adaptively manage work procedures.
- Routinely check to ensure equipment used for construction are in good working condition.

- Routinely check that the required emergency response materials (e.g., spill kits) are readily available on-site.
- Ensure construction personnel are aware of and trained in emergency response procedures and knowledgeable on the B2D2 CSERP and in Section 6.6.1.
- Report any non-compliances or unplanned events immediately to the Contractor (as per Section 6.8.3).
- Prepare monitoring reports as described in Section 6.8.

6.7.2 Visual

Visual monitoring of construction will be ongoing for signs of stressors on marine species, fish kills, or any fish spawning/migration activity. All works will cease in the event of schooling herring, fish kill/injury, stress, or HADD to marine fish habitat observed near works until the EM, the Port Authority, and DFO-FFHPP can provide guidance for the continuation of work.

6.7.3 Turbidity

During in-water construction activities and in the event there are concerns/considerations for effects to water quality based on visual monitoring, turbidity monitoring will be conducted based on the Burrard Inlet WQO (BC ENV, 2022), provincial BC ENV (BC ENV, 2021a) and federal (CCME) (CCME, 1999a) WQG for turbidity (See Table 6-20).

Compliance monitoring will be undertaken if there are visual concerns for turbidity and as requested by RAs or through Indigenous consultation. The EM will confirm an appropriate compliance monitoring zone in the B2D2 CCEMP (e.g., 30 m from the source). If visual observations of turbidity extend beyond this zone, compliance monitoring will be undertaken. Where turbidity compliance is relative to a background measurement, the EM will select an appropriate reference/background sample location that is not affected by the construction activities. Reference samples will be collected within one hour and on the same tidal cycle as the compliance sample.

Table 6-20: Turbidity Guideline and Criteria

GUIDELINE	CRITERIA
ENV approved WQG	During clear flows: change from background of 8 NTU at any one time for a duration of 24 hours or change from background of 2 NTU at any one time for a duration of 30 days. When background is between 8 and 50 NTU, during high flows or in turbid waters: change from background of 5 NTU at any time. When background is greater than 50 NTU, during high flows or turbid waters: change from background of 10%.
Burrard Inlet WQO	5 NTU maximum increase over background.
CCME	For clear flow water: maximum increase of 8 NTUs from background levels for short-term exposure (e.g., 24-h period). Maximum average increase of 2 NTUs from background levels for a longer-term exposure (e.g., 30-day period). For high flow or turbid waters: maximum increase of 8 NTUs from background levels at any one time when background levels are between 8 and 80 NTUs. Shall not increase more than 10% of background levels when the background is > 80 NTUs.

Source: BC ENV (2021a, 2022); CCME (1999a)

6.7.4 Marine Mammal Exclusion Zones

Exclusion Zones will be implemented for pile driving, dredging, and scour protection installation activities. Should different EZ sizes be required through compliance requirements or as stipulated in the FAA for other activities, the following EZs will be implemented.

6.7.4.1 Size

Exclusion Zone (EZ) for Pile Driving

Two separate EZs will be monitored as below:

- Cetaceans (whales, dolphins, and porpoises) – Initial size to be 500 m.
- Pinnipeds – initial size to be 150 m.

The hydrophone will be used at the boundaries of these EZs to confirm if they need to be expanded or reduced based on acoustic thresholds for underwater sound during pile driving.

Should underwater sound levels measured at the initial EZs be below the thresholds presented in Section 6.7.5, Table 6-21, the following minimum EZs will be maintained:

- Killer whales – 400 m.
- Cetaceans (excluding killer whales) – 200 m.
- Pinnipeds – 20 m.

It is expected that pinnipeds frequenting the Burrard Inlet are habituated to the existing underwater soundscape, and thus the marine mammal threshold may not be reasonably pertinent this group. Regardless of the acoustic profiles, the EM may take the decision to maintain a minimum EZ of 50 m for pinnipeds if there is evidence that they are disturbed by pile driving activities.

Exclusion Zone for Dredging, Scour Protection and Stone Column Installation Activity

Dredging,scour protection and stone column installation activities are not expected to generate underwater noise in excess of the Burrard Inlet ambient soundscape. However, a 20 m EZ for these activities will be implemented to prevent injury due to physical interaction with construction equipment. A 50 m marine mammal observation zone (MMOZ) will be implemented to allow for early detection of marine mammals during these activities and will allow the MMO to initiate communications with the Contractor to warn of a potential requirement to implement stop work procedures. Should marine mammals be observed within the MMOZ, the MMO will discuss with the Contractor for the implementation appropriate adaptive management measures to prevent physical interactions between marine mammals and construction equipment.

6.7.4.2 Monitoring

The MMO will conduct a 30-minute pre-pile driving observation period to confirm no marine mammals are within the respective EZs. The pre-pile driving observation period will be conducted prior to the start of all pile driving activities each day or when pile driving activity has stopped for more than 30 minutes.

6.7.5 Underwater Sound

Recommended underwater sound thresholds are provided in Table 6-21. Should DFO-FFHPP provide different recommendations for underwater sound thresholds, those will replace these recommendations. Acoustic monitoring will be conducted at a location that is safe for the acoustic technician and at an appropriate distance to meet the compliance requirements of DFO-FFHPP.

The hydrophone(s) used for the B2 Project will be calibrated as per manufacturer recommendation, and the calibration certificate will be made available to NBT upon request. The hydrophone will be capable of real-time monitoring, and raw data files can be made available upon request. The Contractor and EM will confirm an appropriate plan in advance of construction if additional equipment is required to

allow the hydrophone to record 'real time' when monitoring at 10 m from the sound source.

Monitoring of underwater sound will be conducted as follows:

- Continuous real time acoustic monitoring during all impact pile driving.
- Confirmatory acoustic real time acoustic monitoring during vibratory pile driving, where acoustic monitoring will be discontinued after full installation of three piles and resumed should there be changes to pile type or size or sediment type (i.e., hardness) to re-confirm underwater sound generated by the B2 Project.
- Specific to stone column installation, confirmatory acoustic monitoring will be conducted for installation of one full stone column at the 20 m EZ boundary to confirm underwater sound generated by stone column activity is below marine mammal thresholds (as per Table 6-21).

Underwater sound monitoring will initially focus on the fish thresholds (see Table 6-21), and then on determination of the marine mammal EZ. Acoustic measurements for fish will be collected at 10 m from the sound source. Acoustic measurements for marine mammals will be collected at the EZ boundaries as described in Section 6.7.4.1. However, if the underwater sound does not exceed the marine mammal threshold at the 10 m from the sound source, additional measurements will not be considered necessary.

Outside of B2 Project regulatory commitments, NBT is undertaking an acoustic monitoring program to understand the acoustic soundscape in the vicinity of the Terminal. The hydrophone study will consist of real time and autonomous continuously recording systems and will be deployed in the winter of 2023. This system will allow for the collection of underwater sound data in advance of, and throughout construction to better understand underwater sound that is natural and anthropogenic. During construction, NBT expects to have a detailed understanding of the localized acoustic soundscape and will further monitor sound contributions due to the B2 Project.

Table 6-21: Acoustic Thresholds for Marine Mammals and Fish

TYPE	THRESHOLD	EXCEEDANCE ACTION
Marine Mammal	160 dB re 1µPa rms at the EZ boundary	The size of the EZ will be re-established such that underwater sound observed at the EZ boundary is below the marine mammal threshold.
Fish	206 dB re1 µPa Peak Sound Pressure Level (PeakSPL) at 10 m	Work must be halted. Pile driving may only resume once bubble curtain(s) or other sound attenuating devices are deployed to reduce B2 Project-generated sound.

In addition to monitoring for thresholds to manage for stop work procedures and adaptive management, the following will be implemented:

- Early warning detection: An early warning detection sound level of 204 dB re1 µPa PeakSPL; this will provide the EM a time period to warn the Contractor and proactively implement additional adaptive mitigation measures.
- Cumulative Sound: The cumulative sound metric (186 dB re 1µmPa^{2}s cumulative sound exposure level (cSEL)) will also be measured simultaneously to PeakSPL at 10 m from the sound source by the MMO. Based on the MMO experience for a decision on if activity has generated potential impacts to fish, a decision will be taken on whether works can continue or whether additional adaptive management is required.

6.7.6 Bird Nest Monitoring

Vegetation removal is not required for the B2 Project, however there is the potential for nests to occur on structures. This section outlines the methodology to be undertaken during demolition activities. While nesting is not expected outside of the active nesting period (March 1 to August 31) (BC FLNROD & BC ENV, 2014) a pre demolition nest survey will be undertaken regardless of season. The survey will be undertaken by an individual who will be considered QP.

The survey requirements include:

- Undertaken no earlier than seven days prior to demolition of structures.
- Occur for a minimum of 30 minutes in the early morning hours (e.g., when there is typically an increase in territorial singing and foraging activities).
- If there is evidence of nesting behaviour (e.g., singing birds returning to a specific location on a structure), the EM will use binoculars from an appropriate standpoint to draw further conclusions.

Additional monitoring measures will be undertaken as followed during the active nesting period (March 1 to August 31):

- An inspection will be conducted to confirm no nests are present prior to moving or using vehicles or equipment that have been stationary and unused for more than three days.
- For any newly constructed infrastructure, an inspection should be undertaken to confirm no nests have established prior to initiating new work if no construction activity has occurred in proximity to the structure within the last three days.

If a nest is identified, the EM shall immediately notify the Contractor(s) and NBT. If the species is protected under the *MBCA*, *BC Wildlife Act*, or SARA, the EM will then establish an appropriate no-disturbance setback area / buffer zone based on the observed alert distance and flush distance as per the guidelines to reduce risk to migratory birds (Government of Canada, 2021). Nests of species listed under Schedule 1 of the Migratory Birds Regulations, 2022 and of species protected year-round by the BC *Wildlife Act* (e.g., eagle, peregrine falcon, gyrfalcon, osprey, heron and burrowing owl) may not be destroyed or disturbed without appropriate permits and authorizations.

In the event a bird is not present at the nest to determine the alert distance and flush distance, potentially disturbing work within the vicinity of the nest should be halted until the bird returns to the nest and a suitable species-specific barrier can be determined by the EM. The area is to be avoided until the young have naturally left the vicinity of the nest. Demolition activities will be rescheduled as necessary.

6.7.7 Concrete pH

pH will be monitored during in-water concrete works to confirm compliance with the BC ENV WQG (BC ENV, 2021a) and CCME (CCME, 2022), which for in the marine environment is a pH range of 7.0 to 8.7 for the Inner Harbour of the Burrard Inlet. The Burrard Inlet WQO does not specify a pH range for the Inner Harbour; however, the B2 Project will also monitor the marine environment consistent with the pH ranges outlined for Central Harbour (6.5-8.5) (BC ENV & Tsleil-Waututh, 2022). In the event of a concrete spill or any other exceedance of pH ranges, the following measures will be undertaken.

The EM will monitor any in-water concrete pours as below:

- In advance of the in-water concrete pours, the EM will perform baseline pH monitoring immediately seaward of the concrete form.
- The EM will repeat the pH monitoring at appropriate intervals subsequent to the commencement of the in-water concrete pour.
- The EM will conduct compliance pH monitoring as required (e.g., accidental concrete release into the marine environment).

- Deployment of the CO_2 bubbler system should concrete material enter the marine environment.

6.7.8 Noise Monitoring

Noise monitoring will be conducted as outlined in the B2D2 EHWP (NBT, in progress), and will utilize the NBT on-site and off-site noise monitoring stations, both autonomously and in real time.

- A system will be developed where an NBT personnel will receive communications (e.g., text, emails) when there is a noise level exceedance (to be described in the B2D2 EHWP). A decision will be taken to determine if the noise exceedance is reasonably due to the B2 construction activities occurring outside of the Port Authority standard working hours. If the noise exceedance is determined to be a non-compliance, the NBT personnel will take corrective actions to either stop work or engage with the Contractor to confirm noise levels will be managed in accordance with the B2D2 EHWP.
- The B2D2 EHWP will provide details on the plan for autonomous and real time monitoring to be conducted during B2 construction. The B2D2 EHWP will identify a responsibilities matrix for personnel responsible for the monitoring activities.
- The B2D2 EHWP will identify actions to be followed should a noise complaint be received, to confirm if the complaint is reasonably attributable to the B2D2 construction. Activities undertaken will be in compliance with the existing NBT Environmental Complaint Procedure (NBT, 2022d).

6.7.9 Fish Salvage

A fish salvage program will be undertaken within five days of the start of demolition of the B2 marine infrastructure. The objective of the salvage program will be to remove larger invertebrates (e.g., crabs, sea stars, sea urchins) from the seabed footprint and creosote-treated piles. Specific methodologies to be undertaken will be developed through discussions with DFO-FFHPP and interested Indigenous Groups. Appropriate approvals (e.g., License to Fish for Scientific Purposes) will be in place prior to the salvage program. All salvaged animals will be immediately relocated to Neptune's western water lot into an area that is suitable for their survival and will not subject them to further impacts due to in-water construction.

6.7.10 Surface Water and Groundwater Management

Surface water and groundwater management will require specific monitoring measures (e.g., verifying influent sources to the water treatment system(s), field measurements, water quality sampling, etc.). These monitoring measures are included in the B2D2 WaMP (Envirochem, 2023).

6.7.11 Soil and Sediment Management

Excavated soil and dredged sediment will require specific monitoring measures (verifying soil storage procedures, visual/olfactory inspection of uncharacterized material, potential supplemental testing/characterization if necessary, documenting material loads). These monitoring measures are outlined in the B2D2 SMP (Envirochem, 2022d).

6.7.12 Archaeological Chance Find Monitoring

It is unlikely that archaeological materials will be present in the B2 Project footprints. It is also considered unlikely that the proposed construction activities will encounter or impact any archaeological materials should they be present (see Section 5). Consistent with the intent of the *HCA*, the Contractor is advised that if unanticipated cultural materials or features including, but not limited to, lithic (stone) artifacts, bone artifacts, culturally modified trees, shell deposits, burial sites, or human remains are encountered during construction, the Contractor will follow the B2D2 CFMP (EcoLogic, 2023a), which includes the following:

- Work in the immediate area will cease, the site will be staked or flagged, and any archeological materials and/or spoil material must not be moved.
- Professional archaeologist must be contacted.
- Port Authority, NBT, Indigenous Groups and provincial Archaeology Branch, shall be contacted for direction as soon as possible.
- After contacting the parties listed (above), the following possible outcomes may result:
    - There may be no further concerns regarding the incident and work may resume.
    - Photographs of the potential archaeological or cultural heritage materials may be requested.
    - Site visit by a professional archaeologist may be required.

Indigenous Groups will be provided the opportunity to be present during construction activities. If archaeological materials are confirmed, Indigenous Groups will be contacted. Archaeological emergency contacts are provided in Tables C-1, in Appendix C. If human remains are found, the archaeologist will contact the RCMP and local Coroner's Office. The archaeologist will then inform the client when work may recommence in the vicinity of the find and inform all involved Indigenous Groups of any mitigative measures to be taken, if necessary.

6.8 Reporting

The EM will prepare a weekly monitoring report summarizing the information presented in summary construction reports (see Section 6.8.1). Monitoring summaries will be available for submission if requested to the Port Authority, DFO-FFHPP, interested Indigenous Groups, and other RAs.

6.8.1 General

The EM will prepare a summary construction report consisting of details for each site visit conducted by the EM and/or MMO. The weekly summaries will, at a minimum, contain:

- Description of activities and identification of construction activities that are; within the water lot (below HWL [in, out-of-water], above the HWL, over water) and on land.
- Photographs of construction and status (e.g., percent complete).
- Name(s) of EM/MMO on-site.
- Date.
- Weather conditions and visibility.
- Equipment used and its condition.
- Environmental meeting notes (including tailgate) and key issues discussed.
- Design updates and construction activities for that period.
-
- Sampling data (turbidity, acoustics, pH, etc.), including raw data files (if conducted).
- Water and/or soil quality samples collected (if applicable).
- A summary of the marine mammal species observed with behaviours and location relative to EZs.
- Pile installation record (Pile ID, type, hammer type and energy, activity start/stop time, work stoppages).
- Documented off-site material movement (e.g., loads of contaminated soil, demolition material).
- Summary of environmental issues (e.g., spill, underwater threshold and turbidity exceedances, non-compliance with the CEMP) and mitigation measures, including corrective actions, implemented in response to these issues during the reporting period.

6.8.2 Incident Reporting

Spill and emergency response procedures are described in Section 6.6.1 and Section 6.6.1.2, Table 6-17. In the event of an emergency that is reportable under the CEPA, *1999* and through the SRR , the Contractor will adhere to the incident reporting requirements outlined in the following sections. Pertinent RAs and interested Indigenous Groups will be notified of environmental incidents within 24 hours.

A reportable incident is defined as an incident resulting in:

- A potential/actual contravention of legislation. According to Section 64 of CEPA*, 1999*, substances are considered harmful if they are entering or could enter the environment in quantities or concentrations or under conditions that:
  - Have or may have an immediate or long-term harmful effect on the environment or its biological diversity.
  - Constitute or may constitute a danger to the environment on which life depends.
  - Constitute or may constitute a danger to human life or health in Canada.
- As per a potential/actual contravention of a permit/approval condition.
- As defined in the BC SRR.
- A significant non-compliance with the B2 CEMP resulting in environmental effect, including injury or mortality to fish and marine mammals.
- Adaptive management measures implemented, and results of additional monitoring triggered by the exceedance can be submitted to DFO-FFHPP if requested.

6.8.2.1 General Notifications and Reporting Requirements

B2 Project notification and reporting will be as follows:

- The Contractor will immediately notify NBT and the EM.
- NBT or their QP will be responsible for notification to the relevant RAs, interested Indigenous Groups or Stakeholders, including the Port Authority and Port of Vancouver Operations Centre.
- Should a spill of deleterious substances occur, the Contractor will confirm the spill reporting details meet provincial and federal reporting requirements. Appendix I.7 in the NBT EMS Manual (NBT, 2022e) details the Reportable Volumes for Spills to the Environment, and is provided as Table C-4, in Appendix C. The NBT spill reporting form is provided in Table C-5, in Appendix C.

Any spill of a deleterious substance that enters the watercourse will be immediately reported to:

- NBT.
- EM.
- Provincial Emergency Program (PEP)/Emergency Management BC (EMBC) 24-hour phone line at 1-800-663-3456.
- Interested Indigenous Groups.

6.8.2.2 Spill Reporting Regulation

The SRR under the *BC* EMA identifies externally reportable quantities for certain substances. The EM will follow the SRR requirements for:

- Initial immediate reporting following occurrence (typically a verbal report).
- Update to Minister Report (as soon as possible on request of minister or at least once every 30 days after the date that the spill began) (written report).
- End-of-Spill Report (written report) submitted within 30 days following the emergency response completion date of a spill.
- The following document for the Ministry of BC ENV Strategy titled “On the Management of Environmental Emergencies” can be used as a guide for regulatory spill reporting (BC ENV, 2021b).

6.8.2.3 Incident Report

The EM will prepare an Environmental Incident/Non- Compliance Report in the event of a spill. The following information will be collected as it may be required when reporting a spill to regulatory agencies and will be included in the Environmental Incident/Non-Compliance Report:

- Reporting person's name and telephone number.
- Name of the owner of the product that spilled or leaked and phone number.
- Name and phone number of the person who caused the spill or leak.
- Date and time of the spill or leak.
- Description of the spill or leak.
- Location of the spill or leak.
- Receiving environment description.
- Type of material spilled and quantity.
- Source of spill or leak.
- Description of the response and when it occurred.
- Percent of material recovered.
- Details of further action required.
- If the spill or leaked product is contained, and if not, where is it flowing.
- Recommendations for preventative/mitigation measures.
- Names of other persons or agencies advised concerning the spill or leak.

6.8.3 Non-Compliance

In the event of non-compliance or potential non-compliance with the B2 CEMP and applicable regulatory permits, the EM/MMO has the authority to implement procedures (see Section 6.10) until the appropriate adaptive management measures (see Section 6.9) can be implemented.

6.9 Adaptive Management

During the B2 Project, it may be necessary to modify methodology and address site conditions not initially foreseen. Should adaptative measures be required, the EM, in conjunction with the Contractor, interested Indigenous Groups and NBT, will develop an update to the methodology. The EM will then evaluate any additional potential environmental effects or regulatory requirements. Mitigation and/or monitoring measures will be updated.

6.10 Stop Work Procedure

The EM will have authority to implement stop work procedures where activities are adversely affecting, or will adversely affect, the environment or archaeological resources. Indigenous Groups representatives can discuss any concerns with the EM, and an Ecologic archaeologist will work collaboratively with the Indigenous Group's representative to ensure the protection of archaeological and heritage sites. The EM will issue any stop works as required and will also make recommendations in the field for avoiding and mitigating effects.

7 CONTRIBUTIONS

Regulatory professionals from Envirochem and NBT (through Dynamic Ocean) have contributed to developing this B2 CEMP.

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Supporting information was provided by BKL and EcoLogic for noise and archaeological related mitigation measures, respectively.

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REFERENCES

Advisian. (2021a). Berth 2 Shiploader Replacement Sediment and Soil Characterization Report. Prepared for: Neptune Bulk Terminals (Canada) Ltd. Doc No: 307071-00041-00-EN-REP-0001. April 8, 2021. Rev. 0.

Advisian. (2021b). Potash Dumper No. 2 Replacement. Limited Soils Assessment. Prepared for: Neptune Bulk Terminals (Canada) Ltd. Doc No: 317086-36588-00-CA-REP-0001. September 20, 2021. Rev. 0.

Advisian. (2022). Berth 2 Groundwater Investigation and Preliminary Dewatering Assessment. Prepared for: Neptune Bulk Terminals (Canada) Ltd. Doc No: 317071-00041. August 18, 2022. Rev. A.

Aquatic Invasive Species Regulations. SOR/2015-121. Enabling Act: *Fisheries Act*. Available at: https://laws-lois.justice.gc.ca/eng/regulations/sor-2015-121/FullText.html. Last amended: June 4, 2021

BC ENV. (2021a). Approved Water Quality Guidelines: Aquatic Life, Wildlife & Agriculture - Guideline Summary. Water Quality Guidelines Series, WQG-20. Available at: https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/waterquality/water-quality-guidelines/approved-wqgs/wqg_summary_aquaticlife_wildlife_agri.pdf. Accessed: June 2023.

BC ENV. (2021b). On the Management of Environmental Emergencies. March 2021. Available at: https://www2.gov.bc.ca/assets/gov/environment/air-land-water/spills-and-environmental-emergencies/docs/materials/fact_sheet_spill_reporting.pdf#:~:text=If%20a%20spill%20occurs%2C%20or%20is%20at%20imminent,%28EMA%29%20identifies%20the%20requirements%20for%20spill%20reporting.%20The Accessed: January 2022.

BC ENV. (2022). Burrard Inlet Water Quality Objectives. Available at: https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/water-quality/water-quality-objectives/south-coast-region-water-quality-objectives/burrard-inlet-water-quality-objectives Accessed: June 2023.

BC ENV, & Tsleil-Waututh. (2022). Water Quality Objectives for Burrard Inlet. Water Quality Objective Series, WQO-02. Prov. B.C., Victoria B.C. Available at: https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/water-quality/water-quality-objectives/south-coast-region-water-quality-objectives/burrard-inlet-water-quality-objectives. Accessed: June 2023.

BC FLNROD, & BC ENV. (2013). Guidelines for Raptor Conservation during Urban and Rural Land Development in British Columbia - 2013. Available at: https://www2.gov.bc.ca/assets/gov/environment/natural-resource-stewardship/best-management-practices/raptor_conservation_guidelines_2013.pdf. Accessed: November 2022.

BC FLNROD, & BC ENV. (2014). Develop with Care 2014: Environmental Guidelines for Urban and Rural Land Development in British Columbia. Available at: https://www2.gov.bc.ca/gov/content/environment/natural-resource-stewardship/laws-policies-standards-guidance/best-management-practices/develop-with-care. Accessed: June 2023.

BKL. (2022). Re: Supporting Letter for Rationale for Extended Construction Hours for the Berth 2 Project. Prepared for: Neptune Bulk Terminals (Canada) Ltd. Doc No. 0292-22B-R0. September 12, 2022. Rev. 0.

British Standards Institute. (2009). Code of practice for noise and vibration control on construction and open sites - Noise. BS 5228-1:2009+A2:2014.

Canada Shipping Act. S.C. 2001, c. 26. Last amended: July 30, 2019. Available at: https://laws-lois.justice.gc.ca/eng/acts/c-10.15/.

Canadian Environmental Protection Act. SC 1999, c. 33. Available at: https://laws-lois.justice.gc.ca/eng/acts/c-15.31/. Last amended: May 1, 2021.

Canadian Navigable Waters Act. RSC 1985, c. N-22. Available at: https://laws-lois.justice.gc.ca/eng/acts/n-22/. Last amended: October 4, 2019.

CCME. (1999a). Canadian Council of Ministers of the Environment. Turbidity CCME Summary Table: Turbidity factsheet. Available at: http://stts.ccme.ca/en/index.html?lang=en&factsheet=219. Accessed: January 2023.

CCME. (1999b). Guidance for the Derivation of Canadian Sediment Quality Guidelines for the Protection of Aquatic Life. Available at http://ceqg-rcqe.ccme.ca/download/en/221. *Canadian Council of Ministers of the Environment 1995 - CCME EPC-98E*, 35.

CCME. (2022). Canadian Environmental Quality Guidelines (CEQGs). Available at: https://ccme.ca/en/current-activities/canadian-environmental-quality-guidelines Accessed: January 2023.

City of North Vancouver. (2021). Noise Control Bylaw, 2021, No. 8885. Available at: https://www.cnv.org/-/media/City-of-North-Vancouver/Documents/Bylaws/Consolidated/8885-C.pdf.

Collision Regulations. C.R.C., c. 1416 Enabling Act: Canada Shipping Act, 2001. Last ammended, January 29, 2014 Available at: https://laws-lois.justice.gc.ca/eng/regulations/c.r.c.,_c._1416/.

Contaminated Sites Regulations BC. Reg. 375/96. Enabling Act: BC Environmental Management Act. Last amended July 7, 2021 by B.C. Reg. 179/2021. Current to Februrary 2022. Available at: https://www.bclaws.gov.bc.ca/civix/document/id/complete/statreg/375_96_00.

DFO. (1993). Land Development Guidelines for the Protection of Aquatic Habitat. September 1993. Available at: http://www.sxd.sala.ubc.ca/9_resources/fed_%20files/fed%20land%20development%20guidelines.pdf Accessed: February 2022.

DFO. (2014). British Columbia Marine/Estuarine Timing Windows for the Protection of Fish and Fish Habitat - South Coast and Lower Fraser Areas Available at: https://www.dfo-mpo.gc.ca/pnw-ppe/timing-periodes/bc-s-eng.html#area-28 Accessed: July 2023.

DFO. (2019). Fish and Fish Habitat Protection Policy Statement. August 2019. Available at: https://www.dfo-mpo.gc.ca/pnw-ppe/policy-politique-eng.html. Accessed: March 2023.

DFO. (2022a). DFO Response: DFO File #21-HPAC-01537 - Shiploader Replacement, Burrard Inlet, North Vancouver - Authorization Required. Received: 16 May 2022.

DFO. (2022b). Measures to Protect Fish and Fish Habitat. Available at: https://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures-eng.html. Accessed: March 2023.

DFO. (2023). Management Measures to Protect Southern Resident Killer Whales. Last updated 13 June 2023. Available at: https://www.pac.dfo-mpo.gc.ca/fm-gp/mammals-mammiferes/whales-baleines/srkw-measures-mesures-ers-eng.html Accessed: June 2023.

ECCC. (2012). Guidance Document on Federal Interim Groundwater Quality Guidelines for Federal Contaminated Sites. November 2012. Available at https://www.esdat.net/Environmental%20Standards/Canada/Fed/Fed%20Interim%20GW%20En14-91-2013-eng.pdf. Accessed: March 2022.

EcoLogic. (2022). Technical Archaeological Review of the Berth 2 Shiploader Replacement and Dumper 2 Replacement Projects, North Vancouver, BC. Prepared for: Neptune Bulk Terminals (Canada) Ltd. April 14, 2022. Rev. 2.

EcoLogic. (2023a). Archaeological Chance Find Management Plan. Prepared for: Neptune Bulk Terminals (Canada) Ltd. January 23, 2023. Rev2.

EcoLogic. (2023b). Lynn Creek Estuary Offset Project Archaeological Chance Find Management Plan. Prepared for: Neptune Bulk Terminals (Canada) Ltd. April 24, 2023. Rev0.

Envirochem. (2020). Canada Goose Nest Survey Program. Prepared for: Neptune Bulk Terminals (Canada) Ltd. April 15, 2020.

Envirochem. (2022a). Asbestos Management Plan. Prepared for: Neptune Bulk Terminals (Canada) Ltd. August, 2022. Rev. 0.

Envirochem. (2022b). Hazardous Building Materials Assessment. Neptune Bulk Terminals – Potash Dumper 2. Prepared for: Neptune Bulk Terminals (Canada) Ltd. April 2, 2022. Rev. 2.

Envirochem. (2022c). Hazardous Building Materials Assessment. Neptune Bulk Terminals. Berth 2 Potash Shiploader. Prepared for: Neptune Bulk Terminals (Canada) Ltd. August 15, 2022. Rev. 1.

Envirochem. (2022d). Soil Management Plan Berth 2 Shiploader Replacement and Dumper 2 Replacement Projects. Prepared for: Neptune Bulk Terminals (Canada) Ltd. June 2, 2023. Rev. 1.

Envirochem. (2023). Conceptual Water Management Plan Berth 2 Shiploader Replacement and Dumper 2 Replacement Projects. Prepared for: Neptune Bulk Terminals (Canada) Ltd. July 10, 2023. RevF.

Environmental Management Act. Chapter 53 [SBC 2003]. Available at: https://www.bclaws.gov.bc.ca/civix/document/id/complete/statreg/03053_00.

Fisheries Act. RSC 1985, c F-14. Available at: https://laws-lois.justice.gc.ca/eng/acts/f-14/. Last amended: August 28, 2019.

Government of Canada. (2021). Guidelines to reduce risk to migratory birds. December 20, 2021. Available at: https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds/reduce-risk-migratory-birds.html#toc3. Accessed: July 2022.

Greater Vancouver Regional District. Air Quality Management Bylaw No. 1082, 2008. Available at: http://www.metrovancouver.org/boards/Bylaws1/GVRD_Bylaw_1082.pdf.

Greater Vancouver Sewerage and Drainage District. Sewer Use Bylaw No. 299, 2007. Available at: http://www.metrovancouver.org/boards/Bylaws1/GVSDD_Bylaw_299.pdf.

Hazardous Waste Regulations. (2021). Hazardous Waste Regulation B.C. Reg. 63/88. Enabling Act: BC Environmental Management Act. Last amended March 11, 2021 by B.C. Reg. 64/2021. Available at: https://www.bclaws.gov.bc.ca/civix/document/id/complete/statreg/63_88_00.

Heritage Conservation Act. (1996). Chapter 187 [RSBC 1996]. Available at: https://www.bclaws.gov.bc.ca/civix/document/id/complete/statreg/96187_01.

Impact Assessment Act. SC 2019, c. 28. Available at: https://laws.justice.gc.ca/eng/acts/I-2.75/index.html. Last amended: August 28, 2019.

Inlailawatash Limited Partnership. (2012). Neptune Terminals Allison Coal Terminal Expansion Project. Archaeological Overview Assessment. Prepared for: Neptune Bulk Terminals (Canada) Ltd. September 20, 2012.

Inlailawatash Limited Partnership. (2017). NBT Projects Archaeological Assessment, West Quadrant Shiploader Design Update. North Vancouver, British Columbia. Prepared for: Neptune Bulk Terminals (Canada) Ltd. October, 2017.

Kleanza. (2019). Monitoring and assessment of drilling, excavations, and archaeological sampling for the Alison Project dumper pit construction at Laydown 3, Neptune Bulk Terminals, North Vancouver, BC. Prepared for: Neptune Bulk Terminals (Canada) Ltd. January 14, 2019.

KWL. (2017). Burrard Inlet Action Plan: A science-based, First Nations-led initiative to improve the health of the Burrard Inlet ecosystem by 2025. Prepared for: Tsleil-Waututh Nation. October, 2017.

KWL. (2021). Neptune Bulk Terminals (Canada) Ltd. Annual Groundwater Sampling Program 2020 Results Report. Prepared for: Neptune Bulk Terminals (Canada) Ltd. April 29, 2021.

Migratory Birds Convention Act. SC 1994, c. 22 Available at: https://laws-lois.justice.gc.ca/eng/acts/m-7.01/. Last amended: December 12, 2017.

Migratory Birds Regulations (2022). SOR/2022-105. Available at: https://laws-lois.justice.gc.ca/eng/regulations/SOR-2022-105/. Last amended: July 31, 2022. Enabling Act: *Environmental Violations Administrative Monetary Pentalties Act; Migratory Birds Convention Act, 1994; Canada National Parks Act*.

MWLAP. (2002). A Field Guide to Fuel Handling, Transportation and Storage. 3rd Edition. February 2002. Available at: https://www2.gov.bc.ca/assets/gov/environment/waste-management/industrialwaste/industrial-waste/oilandgas/fuel_handle_guide.pdf Accessed: Februray 2022.

NBT. (2012). Asbestos Handling Procedures. Doc No: 09-900-6-019-02. Feb 1, 2012.

NBT. (2020a). Gasoline and Diesel Re-Fuelling Procedure. Doc No: PRO-NBT-18011_09-919-6-001. April 7, 2020. Rev 9.

NBT. (2020b). Storage and Handling of Hazardous Wastes. Doc No: 09-900-6-029. April 7, 2020. Rev. 3.

NBT. (2021a). Fisheries and Oceans Canada. Request for Review Form and Design Concept Drawings. Submitted to DFO-FFHPP on December 29, 2022 through Envirochem Services Inc. RFR form developed by Envirochem. Concept Design Drawings developed by Advisian.
NBT. (2021b). Hazardous Waste Disposal Procedure. Doc No: PRO-NBT-150529. Oct 20, 2021. Rev. 1.
NBT. (2022a). B2 Project - Vancouver Fraser Port Authority – Category C – Project and Environmental Review Permit Application (PER 21-068). Doc No: LET-NBT-220328-B2. Nov 21, 2022. Rev. 2.
NBT. (2022b). Berth 2 Shiploader Replacement Project. Fisheries and Oceans Canada - Fish and Fish Habitat Protection Program. Request for Review Supplemental Report. Doc No: REP-NBT-2202202. Feb 17, 2022. Rev. 1.
NBT. (2022c). D2 Design Drawing Report. Doc No: REP-B2D2-220314-B2 Design Drawing Report. August 22, 2022. Rev. 1.
NBT. (2022d). Environmental Complaint Procedure. Doc No: PRO-NBT-191029. January 21, 2022. Rev. 2.
NBT. (2022e). Environmental Management System Manual. Doc No: 09-900-6-026. March 21, 2022. Rev. 12.
NBT. (2022f). Site Standard. Excavated Soil Management Standard. Doc No: STD-NBT-090916. February 18, 2022. Rev. 6.
NBT. (2022g). Stormwater Pollution Prevention Plan. Prepared for: Neptune Bulk Terminals (Canada) Ltd. Doc No: PLAN-NBT-220401. June 2, 2022. Rev. 1.
NBT. (2023a). B2 Design Drawing Report. Doc No: REP-B2D2-0003. April 24, 2023. Rev1.
NBT. (2023b). B2 Project - Vancouver Fraser Port Authority – Category C – Project and Environmental Review Permit Application (PER 21-068). Doc No: LET-VFPA-0003. July 14, 2023. Rev5.
NBT. (2023c). Berth 2 and Lynn Creek Estuary Offset Project Public Engagement Plan. Doc No: PLAN-B2D2-0011. April 24, 2023. Rev2.
NBT. (2023d). Berth 2 Shiploader Fisheries Act Authorization Application. Doc No: FORM-DFO-220524. February 15, 2023. Rev. 0.
NBT. (2023e). Berth 2 Shiploader Replacement Project Application for Authorization Supplemental Report. Doc No: REP-B2D2-0001. July 14, 2023. Rev3.
NBT. (2023f). Berth 2 Shiploader Replacement Project. Marine Fish and Fish Habitat Existing Conditions Report. Doc No: REP-B2D2-0004. July 14, 2023. Rev4.
NBT. (2023g). Berth 2 Watermain Temporary and Permanent Works. Doc No: REP-VFPA-0001. July 14, 2023. Rev0.
NBT. (2023h). Indigenous Consultation and Stakeholder Engagement Report. Doc No: REP-NBT-0006. July 14, 2023. Rev1.
NBT. (2023i). Lynn Creek Estuary Complementary Measures. Doc No: REP-DFO-0001. July 14, 2023. Rev0.
NBT. (2023j). Lynn Creek Estuary Construction Environmental Management Plan. B2D2 Project. Doc No: PLAN-B2D2-0010. July 14, 2023. Rev3.

NBT. (2023k). Lynn Creek Estuary Fish and Fish Habtiat Existing Conditions Report. B2D2 Project. Doc No: REP-B2D2-0002. July 14, 2023. Rev2.

NBT. (2023l). Lynn Creek Estuary Offset Project – Category C - Vancouver Fraser Port Authority – Project and Environmental Review Permit Application (PER 21-068). Doc No: LET-VFPA-0007. July 14, 2023. Rev3.

NBT. (2023m). Lynn Creek Estuary Offset Project – Request to Conduct Construction Outside of Vancouver Fraser Port Authority Standard Work Hours (PER 21-068). Doc No: LET-VFPA-0006. July 14, 2023. Rev3.

NBT. (2023n). Lynn Creek Estuary Offsetting Plan. B2D2 Project. Doc No: PLAN-B2D2-0008. July 14, 2023. Rev3.

NBT. (2023o). Project Description for the Lynn Creek Estuary Offset Project. Doc No: LET-VFPA-0005. January 26, 2023. Rev0.

NBT. (2023p). RE: B2 Project - Vancouver Fraser Port Authority – Category C – Request to Conduct Construction Outside of Vancouver Fraser Port Authority Standard Work Hours for the B2 Project (PER 21-068). Doc No: LET-VFPA-0001. July 14, 2023. Rev5.

NBT. (in progress). Extended Hours Work Plan. Doc No: PLAN-B2D2-0005. In progress.

NHC. (2023a). Lynn Creek Estuary Offset Sedimentation Assessment. Doc No: LET-NHC-LCE Sedimentation Modelling. June 12, 2023. Rev3.

NHC. (2023b). Lynn Creek Estuary Offsetting Basis of Design Report. July 14, 2023. Rev3.

NOAA. (2018). Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing. (Version 2.0): Underwater Thresholds for Onset of Permanent and Temporary Threshold Shifts. Available at: https://tethys.pnnl.gov/sites/default/files/publications/NMFS2018.pdf Accessed: January 2022.

Notice of Railway Regulations. SOR/91-103. Enabling Act: *Railway Safety Act*. Available at: https://laws-lois.justice.gc.ca/eng/regulations/sor-91-103/.

Occupational Health and Safety Regulations. (2021). B.C. Reg. 296/97. Enabling Act: Workers Compensation Act. Last amended December 1, 2021 by B.C. Reg. 222/2021. https://www.bclaws.gov.bc.ca/civix/document/id/complete/statreg/296_97_00.

Parks Canada. (1990). Archaeological Heritage Policy Framework - 1990. Available at: https://www.pc.gc.ca/en/docs/pc/poli/arch Accessed: March 2022.

Parks Canada. (2005). Guidelines for the Management of Archaeological Resources: Available at: https://www.pc.gc.ca/en/docs/pc/guide/gra-mar/index Accessed: March 2022.

Port Authority. (2013). Neptune Bulk Terminals Ltd. Neptune Coal Capacity - Allison Project. January 23, 2013. PER 2012-066.

Port Authority. (2015). Project & Environmental Review Guidelines - Developing Your Stormwater Pollution Prevention Plan. July 2015 at: https://www.portvancouver.com/wp-content/uploads/2017/04/VFPA-PER-Stormwater-Pollution-Prevention-Plan-Guidelines-FINAL-2015-07-09.pdf Accessed: March 2023.

Port Authority. (2020). Non-Road Diesel Emissions Program. Available at: https://www.portvancouver.com/environmental-protection-at-the-port-of-vancouver/climate-action-at-the-port-of-vancouver/nrde/. Accessed: January 2022.

Port Authority. (2021a). Archaeological Chance Find Procedure. July 19, 2021. Available at: https://www.portvancouver.com/wp-content/uploads/2021/09/2021-07-19-Vancouver-Fraser-Port-Authority-Archaeological-Chance-Find-Procedure-1.pdf. Accessed: March 2023.

Port Authority. (2021b). Berth 2 Shiploader Replacement Project & Environmental Review Application Submission Requirements, PER No. 21-068. Vancouver Fraser Port Authority. June 4, 2021.

Port Authority. (2021c). Project & Environmental Review Guidelines - Construction Environmental Management Plan (CEMP). September 2021. Available at: https://www.portvancouver.com/wp-content/uploads/2021/09/2021-09-16-CEMP-Guidelines-Update.pdf. Accessed: January 2023.

Port Authority. (2021d). Project and Environmental Review Guidelines - Demolition. January 31, 2022. Available at: https://www.portvancouver.com/wp-content/uploads/2022/02/2022-02-03-PER-Guideline-Demolition.pdf. Accessed: November 2022.

Port Authority. (2022). Neptune Bulk Terminals Ltd. Neptune Berth 2 Groundwater and Soils Investigation Project. Submitted: 20 April 2022. Recieved: not received yet. PER 22-051.

Port Authority. (2023a). Project and Environmental Review Guideline - Construction Outside of Regular Work Hours. March 2023. Available at: https://www.portvancouver.com/wp-content/uploads/2023/03/2023-03-09-PER-Guideline-Construction-Outside-Regular-Work-Hours.pdf. Accessed: March 2023.

Port Authority. (2023b). Project and Environmental Review Guidelines - Public engagement. January 2023. Available at: https://www.portvancouver.com/wp-content/uploads/2023/01/2023-01-20-PER-guidelines-public-engagement.pdf. Accessed: February 2023.

Railway Safety Act. R.S.C. 1985, c. 32 (4th Supp.). Last amended: September 2, 2022. Available at: https://laws-lois.justice.gc.ca/eng/acts/r-4.2/.

SFN. (2020). Guidelines for Archaeological Chance Find Management. Revised: January 13, 2021.

SFN. (2021). Átl'ka7tsem/Howe Sound Biosphere Region Best Management Practices for Marine Docks. June 13, 2021.

SFN. (2022). Squamish Nation Culturally Significant Vegetation.

Species at Risk Act. S.C. 2002, c. 29 Available at: https://laws.justice.gc.ca/eng/acts/s-15.3/. Last amended: February 3, 2022.

Spill Reporting Regulations. B.C. Spill Reporting Regulations. B.C. Reg. 187/2017. Enabling Act: BC Environmental Management Act. Last amended: December 5, 2017 by B.C. Reg. 221/2017. Available at: https://www.bclaws.gov.bc.ca/civix/document/id/complete/statreg/187_2017.

Stantec. (2018). Berth 2 Marine Survey Report. Prepared for: Neptune Bulk Terminals (Canada) Ltd. June 14, 2018.

Transport Canada. (2022). Approval. NPP File no. 2008-500781.

Transportation of Dangerous Goods Act [Federal]. S.C. 1992, c. 34. Last amended Aug 28, 2019. Available at: https://laws-lois.justice.gc.ca/PDF/T-19.01.pdf.

Transportation of Dangerous Goods Act [Provincial]. (1996). Chapter 458 [RSBC 1996]. Available at: https://www.bclaws.gov.bc.ca/civix/document/id/complete/statreg/96458_01.

Transportation of Dangerous Goods Regulations [Federal]. SOR/2001-286. Enabling Act: Transportation of Dangerous Goods Act, 1992. Last amended: December 21, 2022. Available at: https://laws-lois.justice.gc.ca/eng/regulations/sor-2001-286/.

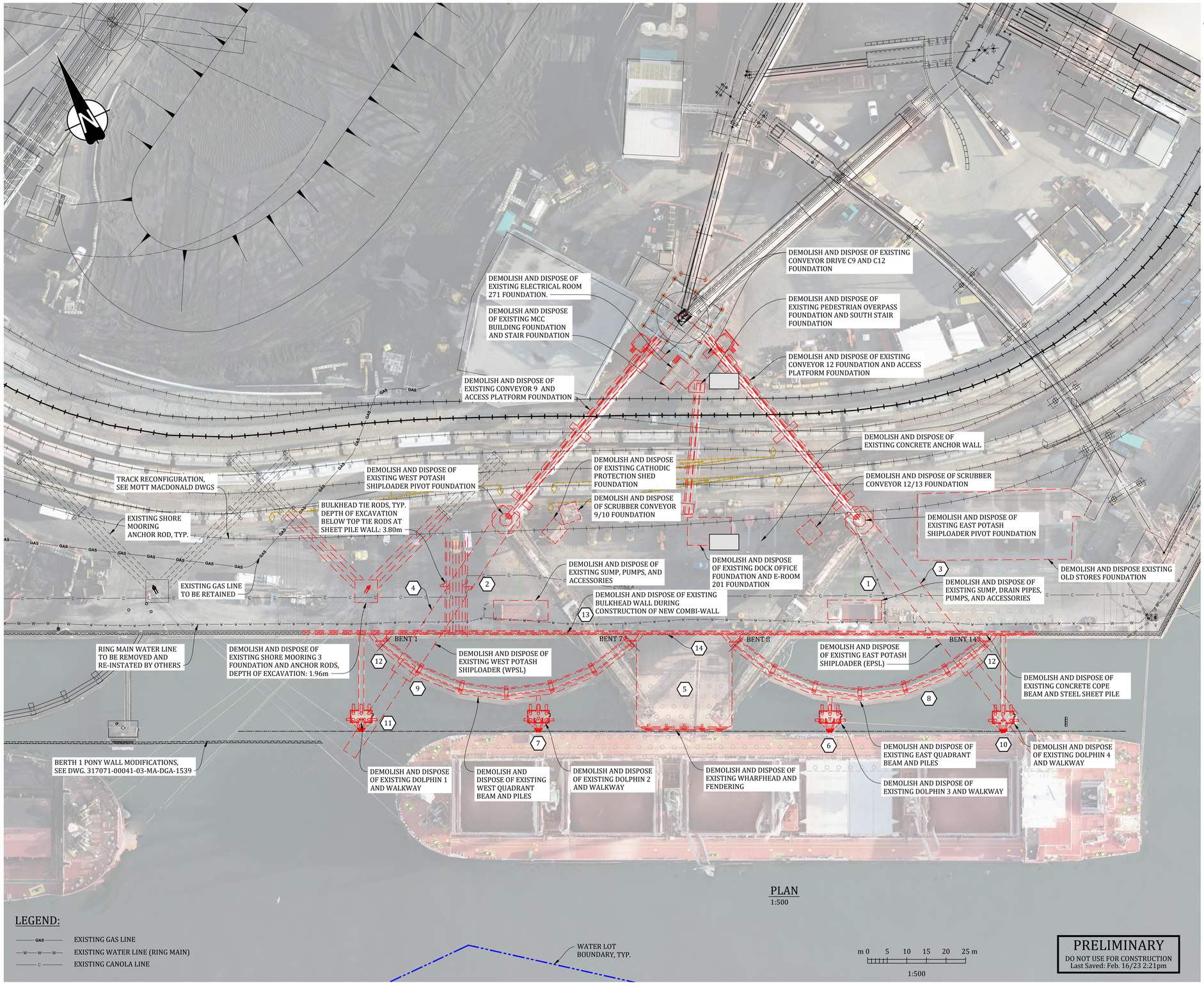
Transportation of Dangerous Goods Regulations [Provincial]. B.C. Reg. 203/85. Enabling Act: BC Transport of Dangerous Goods Act. Last amended by B.C. Reg. 231/2002. Available at: https://www.bclaws.gov.bc.ca/civix/document/id/complete/statreg/203_85/.

Tsleil-Waututh. (2019). Subject: Treaty Negotiations - Proposed Stewardship Policy from the Tsleil-Waututh Nation.

Tsleil-Waututh. (2022). Tsleil-Waututh Nation. Construction Environmental Management Plan Requirements. January 2022.

WorkSafeBC. (2015). Section 20.112 Hazardous materials. OHS Regulation Part 20: Construction, Excavation and Demolition. Available at: https://www.worksafebc.com/en/law-policy/occupational-health-safety/searchable-ohs-regulation/ohs-regulation/part-20-construction-excavation-and-demolition#SectionNumber:20.112. Accessed: September 2022.

APPENDIX A: GENERAL ARRANGEMENT DRAWINGS



PLAN
1:500

LEGEND:

- GAS — EXISTING GAS LINE
- W — W — W — EXISTING WATER LINE (RING MAIN)
- C — EXISTING CANOLA LINE

m 0 5 10 15 20 25 m
1:500

PRELIMINARY
DO NOT USE FOR CONSTRUCTION
Last Saved: Feb. 16/23 2:21pm

MARINE DEMOLITION SEQUENCING FOR REFERENCE:

STEP:

1. POSITION EAST POTASH SHIPLOADER (EPSL) IN PARKED POSITION TO THE WEST TOWARDS THE EXISTING WHARFHEAD.
2. POSITION WEST POTASH SHIPLOADER (WPSL) IN PARKED POSITION TO THE EAST TOWARDS THE EXISTING WHARFHEAD.
3. PERFORM IN WATER WORKS NECESSARY TO REMOVE EPSL. REMOVE EPSL.
4. PERFORM IN WATER WORKS NECESSARY TO REMOVE WPSL. REMOVE WPSL.
5. REMOVE WHARFHEAD.
6. REMOVE DOLPHIN 3 AND WALKWAY.
7. REMOVE DOLPHIN 2 AND WALKWAY.
8. REMOVE EAST QUADRANT BEAM FROM BENTS 14 TO 9 (PROCEED FROM EAST TO WEST).
9. REMOVE WEST QUADRANT BEAM FROM BENTS 2 TO 6 (PROCEED FROM WEST TO EAST).
10. REMOVE DOLPHIN 4 AND WALKWAY.
11. REMOVE DOLPHIN 1 AND WALKWAY.
12. REMOVE REMAINING QUADRANT BEAM SECTIONS.
13. REMOVE ALL ONSHORE DEMOLITION WORK.
14. REMOVE BULKHEAD WALL DURING CONSTRUCTION OF COMBI-WALL.

* CONTRACTOR SHALL BE RESPONSIBLE FOR DEMOLITION SEQUENCING

NOTES:

1. FOR DESIGN CRITERIA AND GENERAL NOTES, SEE DWG. 317071-00041-03-GE-DGA-1001, AND 1002.
2. FOR SCOUR PROTECTION REMOVAL AND DREDGING, SEE DWG. 317071-00041-03-MA-DGA-1504.
3. THE MARINE DEMOLITION SEQUENCING IS A PROPOSED SEQUENCE FOR CONDUCTING THE WORK. THE MARINE DEMOLITION SEQUENCING AND THE ORDER OF ACTIVITIES SHALL BE DEVELOPED BY THE CONTRACTOR.
4. LOCATION OF RING MAIN PIPES ARE AS SHOWN ON BINNIE DWG. 74-059-UT-010, DATED DECEMBER 18TH, 2020. LOCATION OF RAILS AS SHOWN ON UNDERHILL DWG. L-157C, DATED APRIL 24, 2020.
5. FOR BOTH EXISTING SUMPS, DEMOLISH, DISPOSE, AND BACKFILL UNDERGROUND DISCHARGE LINE AND TRENCH FROM SUMP TO EXISTING SHIPLOADER PIVOT FOUNDATION.
6. RETAIN ONE OF THE EXISTING DOLPHIN RUBBER FENDERS (WITH BRACKET) THAT IS IN THE BEST CONDITION TO BE RE-USED FOR NEW MOORING DOLPHIN.

		PROJECT / W.O.:	B2 MARINE WORKS					
		SYSTEM:	POTASH					
		ASSET:	221	A	2023-02-16	ISSUED FOR CLIENT REVIEW	AAL	AMT
DRAWING NO.	DRAWING DESCRIPTION / TITLE	DISCIPLINE:	STRUCTURAL	REV	YYYY-MM-DD	DESCRIPTION	DRAWN	APPROVED
REFERENCE DRAWINGS / DESIGN STANDARDS				ISSUES / REVISIONS				

ENGINEERING SEAL:

VENDOR: Advisian Worley Group 317071-00041

OEM:

VENDOR P2P:

ISSUED AS RECORD COPY? (YES/NO) NO

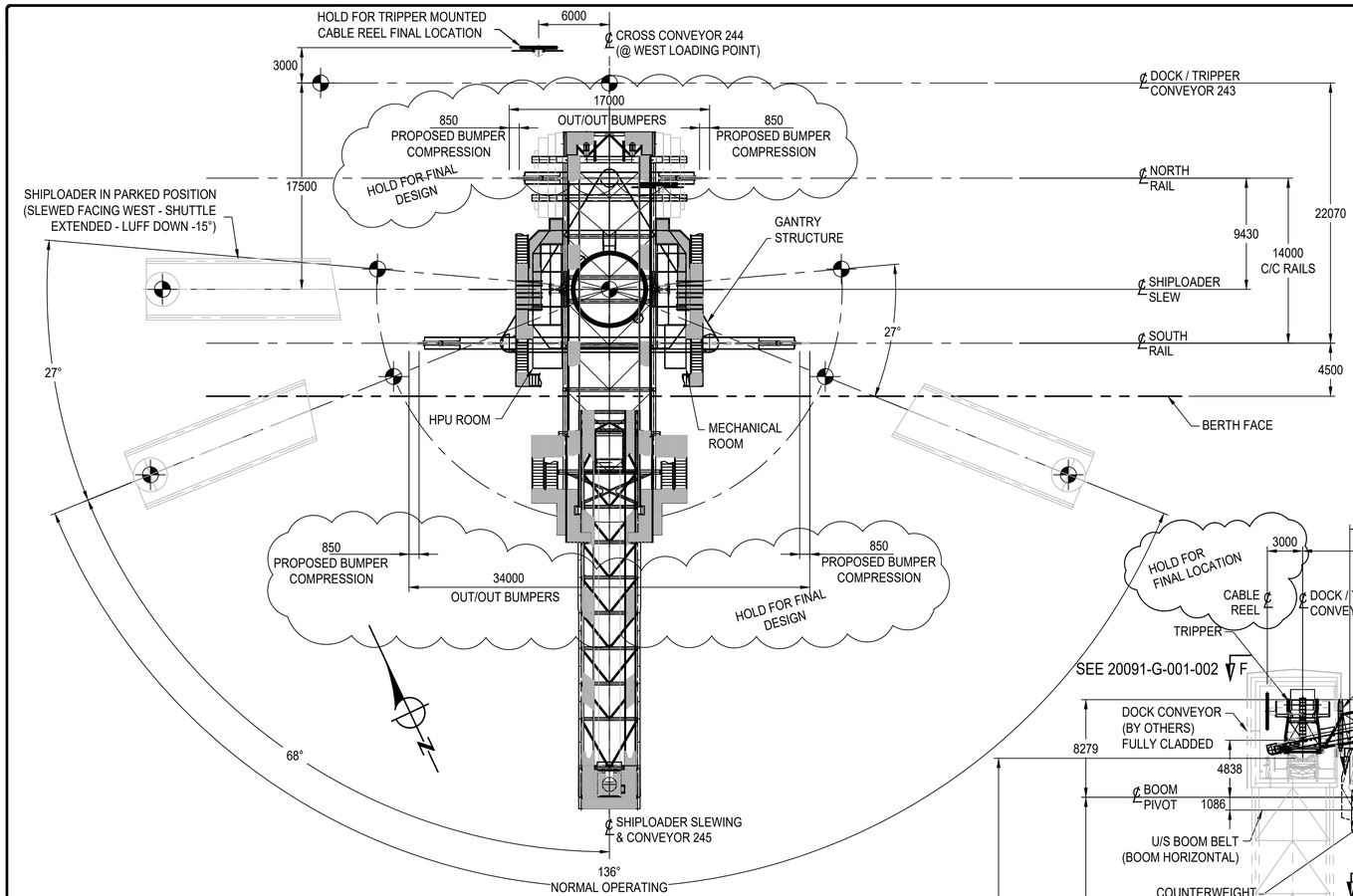
Neptune TERMINALS

TITLE:
BERTH 2 SHIPLOADER PROJECT - MARINE AND CIVIL
EXISTING SITE PLAN AND DEMOLITION PLAN

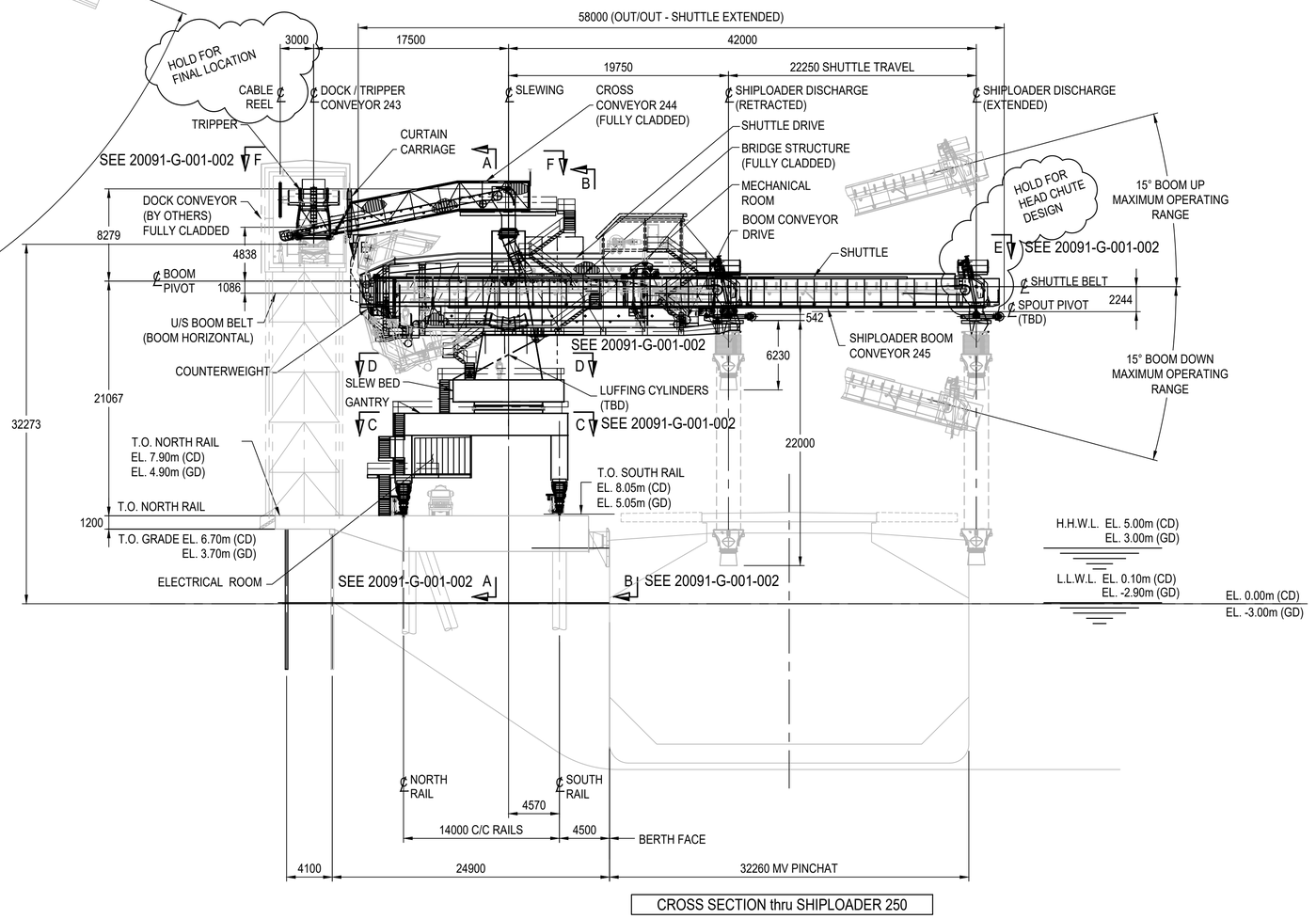
SCALE:	SHEET	OF	DRAWING NO.	REV:
SHOWN	1	1	317071-00041-03-MA-DGA-1500	A

U:\YVR\317071\00041_NEP_B2SHIPLFDN\11_DRAWINGS\15_LAND_E\02_MARINE\317071-00041-03-MA-DGA-1500.DWG DATE: 2023-02-16

GENERAL ARRANGEMENTS DRAWING LIST:



SHIPLOADER PLAN VIEW



CROSS SECTION thru SHIPLOADER 250

1. CD = CHART DATUM
   GD = GEODETIC DATUM
2. ELEVATIONS ARE REFERENCED TO HYDROGRAPHIC (TIDE AND CHART) DATUM. CHART DATUM IS 3.0m BELOW GEODETIC DATUM AS PROVIDED IN VANCOUVER FRASER PORT AUTHORITY (VFPA) "SOUNDINGS BOOK - BURRARD INLET". VFPA DRAWING "NEPTUNE TERMINALS", PLAN NO. H2017-006, SHEET 21 OF 32, DATED MARCH 2017.
3. EXISTING BENCHMARK LOCATIONS WERE TAKEN FROM ADVISIAN SITE PLAN DRAWING 04-MA-DGA-001 AND 04-MA-DGA-002.

DRAWING NO.	REFERENCE	REV.	REVISION DESCRIPTION	BY	CHKD	DATE
X						
		C	GENERAL UPDATE / REVISED PER CLIENT COMMENTS	TJB	RDD	OCT. 01/21
		B	GENERAL UPDATES / REVISED PER CLIENT COMMENTS	TJB	RDD	JUN. 30/21
		A	ISSUED FOR CLIENT REVIEW	TJB	RDD	MAY 31/21

THIRD ANGLE PROJECTION

SCALE (A1 Sheet): 1:250
DATE: MAY 27, 2021
DRAWN BY: TJB
CHECKED BY: RDD

STATUS: *NOT FOR CONSTRUCTION*

PROJECT: NEPTUNE - BERTH 2 NEW SHIPLOADER

EMS - TECH INC.®
mobile equipment and bulk material handling systems
BELLEVILLE - ONTARIO - CANADA
PHONE 613-966-6611 FAX 613-966-6710

OWNER/OPERATOR: Neptune TERMINALS

DRAWING TITLE: B2 SHIPLOADER 250 OVERALL GENERAL ARRANGEMENT AND SECTIONS

DRAWING NUMBER	SHT.	CONT.	REV.
20091-G-001	1	2	C

BELT FEEDER 241

NBTC_2020_BM1

TRANSFER TOWER 260

C242 FOUNDATION, TYP.

DEPTH OF EXCAVATION AT CONVEYOR DRIVE C9 AND C12: 0.4m

℄ SHORE MOORING 2

℄ SHORE MOORING 3

66m±

159m±

C242 FOUNDATION

AZ24-700 BARRIER SHEET PILE WALL

COMBI ANCHOR WALL, 1219Ø x22 WALL STEEL PIPE PILE, 2-AZ28-700 SHEET PILE, TYP.

110Ø FORGED ROD ANCHOR (500/660MPa GRADE) WITH UPSET THREAD, C/W ARTICULATED TURNBUCKLE, TYP.

AS500-9.5 BARRIER SHEET PILE WALL

AZ24-700 BARRIER SHEET PILE WALL

29m±

33.00m

36.676m | 3.798m | 1.412m | 16.500m | 13.415m | 13.415m | 2.683m | 13.415m | 26.830m | 40.245m | 13.415m | 18.781m | 18.781m | 10.732m

C242 FOUNDATION

0+650

APPROX. STA. 614

℄ EXISTING SPW, APPROX.

℄ NORTH RAIL BEAM, COMBI WALL

6.4m

14.00m

℄ NEW MOORING DOLPHIN 2

℄ SOUTH RAIL BEAM

0+350 | 0+400 | 0+450 | 0+500 | 0+550 | 0+600

WALKWAY WITH STAIR

COMBI WALL, 1219Ø x32 WALL STEEL PIPE PILE, 2-AZ28-700 SHEET PILE, TYP.

-12.0 -13.0 -14.0 -15.0 -16.0 -17.0 -18.0 -19.0

WALKWAY, TYP.

SERVICE PLATFORM, UNLOADING LOCATION FOR SHIPLOADER

LADDER, 6 REQ'D @ 30m MAX. SP.

B.O. SOUTH RAIL BEAM PILES @ EL. -85m, TYP.

BERTH FACE

CAP PIPE WITH STEEL PLATE, C/W HALF PIPE BULLRAIL ON TOP OF COMBI WALL, TOP OF BULLRAIL EL. 6.40m

A 0006 | B 0006 | C 0006 | D 0006 | E 0006

MOBILE GANGWAY

GANGWAY LANDING PLATFORM

RO/RO AREA APPROX. STA. 375

APPROX. STA. 575

PANAMAX CLASS BULK CARRIER MV PINCHAT

25.80m | 27.22m | 34.00m | 27.20m | 27.20m | 27.20m | 13.50m

℄ EXISTING DOLPHIN 1 | ℄ FENDER 1 | ℄ FENDER 2 | ℄ FENDER 3 | ℄ FENDER 4 | ℄ FENDER 5 | ℄ FENDER 6 | ℄ FENDER 7

T.O. COPE BEAM EL. 7.5m
T.O. KING PILES EL. 6.1m
B.O. KING PILES EL. -80.0m
11.5m

RO/RO AREA
T.O. COPE BEAM EL. 6.7m
T.O. KING PILES EL. 5.3m
B.O. KING PILES EL. -80.0m
24.0m

T.O. COPE BEAM EL. 7.5m
T.O. KING PILES EL. 6.1m
B.O. KING PILES EL. -80.0m
190.5m

T.O. KING PILES EL. 6.1m
B.O. KING PILES EL. -80.0m
21.0m

T.O. KING PILES EL. 6.1m
B.O. KING PILES EL. -80.0m
16.0m

WATER LOT BOUNDARY, TYP.

FOR FUTURE RAIL BEAM EXTENSION

PLAN
1:400

m 0 5 10 15 20 m
1:400

PRELIMINARY
DO NOT USE FOR CONSTRUCTION
Last Saved: Jan. 26/22 11:33am

DRAWING NO.	DRAWING DESCRIPTION / TITLE
REFERENCE DRAWINGS / DESIGN STANDARDS	

PROJECT / W.O.: B2 MARINE WORKS
SYSTEM: POTASH
ASSET: 221
DISCIPLINE: STRUCTURAL

REV	YYYY-MM-DD	DESCRIPTION	DRAWN	APPROVED
B	2022-01-24	ISSUED FOR CONCEPT DESIGN	AAL	AMT
A	2021-12-22	ISSUED FOR CLIENT REVIEW	AAL	AMT

ISSUES / REVISIONS

ENGINEERING SEAL:

VENDOR: Advisian (Worley Group) 3170 71-00041
"This drawing is prepared for the use of the contractual customer of Worley Canada Services Ltd. and Worley Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

OEM:

ISSUED AS RECORD COPY? (YES/NO) NO

Neptune TERMINALS

TITLE:
BERTH 2 SHIPLOADER PROJECT
COMBI-WALL CONCEPT DESIGN
GENERAL ARRANGEMENT

SCALE:	SHEET	OF	DRAWING NO.	REV:
SHOWN	1	1	01-MA-DSK-0002	B

APPENDIX B: PROJECT PERMITS AND APPROVALS

Berth 2 Project Permits and Approvals

Transport Canada Navigation Protection Program – *Canadian Navigable Waters Act* Approval (TC No. 2008-500781-7 | Registry No. 5388)

Transport Canada Transports Canada

Navigation Protection Program (NPP)
820-800 Burrard Street
Vancouver BC
V6Z 2J8

Your file:
Our file: 2008-500781
Registry number: 5388

APPROVAL

OWNER: **Jurgen Franke/Neptune Bulk Terminals (Canada) Ltd.**
1001 Low Level Road
North Vancouver British Columbia V7L 1A7
Canada

SITE LOCATION: **Located in Vancouver Harbour, approximately at 49° 18' 14 N, 123° 3' 11 W, located on unsurveyed foreshore or land covered by water being part of the bed of Burrard Inlet, Block A, Plan VAP1274RX, District Lot 272, Land District 1 & 36, City of North Vancouver, in the Province of British Columbia.**

WORK(S):

- **Marine terminal**

As per the application (detailed above) to the Minister of Transport, submitted pursuant to the *Canadian Navigable Waters Act*, for an approval of the work per the attached plan(s) (11), the Minister hereby approves the work pursuant to subsection 7(6) for the above mentioned work, in accordance with the following terms and conditions:

1. The works are to be constructed or installed in accordance with the reviewed plans.
2. The CNWA Approval and its Terms and Conditions shall be posted at an easily accessible place at the worksite.
3. Navigational Warning action shall be taken by contacting the Canadian Coast Guard in advance of your intended date of commencement. Submissions can be made via email to NavWarn.MCTSPrinceRupert@innav.gc.ca, or by phone at (250) 627-3070.
4. Construction equipment used in conjunction with this project shall be stored in such a manner that it does not obstruct charted Aids to Navigation and does not obstruct navigation.
5. Equipment used in operation must not prevent vessels from navigating past the site.
6. Any false works, silt curtains, construction material or debris, etc. are to be completely removed from the waterway.

SIGNED ON July 18, 2022
at the NPP regional office of Pacific

Conal Kavanagh
NPP Officer
Programs Group
Transport Canada
Pacific Region
For the Minister of Transport

Canada

Vancouver Fraser Port Authority, Category C, PER 21-068

Not Issued at Time of CEMP R1

Fisheries and Oceans Canada – Fish and Fish Habitat Protection Program (DFO-FFHPP) – *Fisheries Act* Authorization

Not Issued at Time of CEMP R1

APPENDIX C: SUPPORTING TABLES

Table C-1: Key Project Personnel

Title	Name	Phone	Email
Neptune Bulk Terminals			
Vice President of Health, Safety and Environment	Brad Walker	778-888-9190	bwalker@neptuneterminals.com
Director of Community & Stakeholder Engagement	Lisa Dooling	604-968-4804	ldooling@neptuneterminals.com
Environmental Manager	Nora Romkema	778-951-6004	nromkema@neptuneterminals.com
Environmental Systems Specialist	Stacey Bell	604-785-6759	sbell@neptuneterminals.com
Project Manager	Dan Lovell	406-885-0337	dlovell@neptuneterminals.com
Assistant Project Manager	Campbell Alexander	604-812-6133	calexander@neptuneterminals.com
Environmental Inspector/Regulatory Lead	Victoria Burdett-Coutts	778-839-2372	vburdett-coutts@neptuneterminals.com
Area Lead – B2	Colin Reddin	604-992-3025	creddin@neptuneterminals.com
Area Lead – D2	Tom Hildahl	604-828-9518	thildahl@neptuneterminals.com
Regulatory Authorities			
Port Authority	Taisha Mitchell	236-558-6785	Taisha.Mitchell@portvancouver.com
DFO-FFHPP (RFR)	Rebecca Barrick	236-330-3053	Rebecca.Barrick@dfo-mpo.gc.ca
DFO-FFHPP (FAA)	Sara Jossul	236-334-3806	Sara.Jossul@dfo-mpo.gc.ca
Transport Canada	Conal Kavanagh	604-418-0337	conal.kavanagh@tc.gc.ca
Contractor(s)			
To be updated subsequent to contract award (e.g., Contractor Project Manager)			
Environmental Consultants			
Envirochem	Tony Di Nino	778-991-7103	tony@envirochem.com
	Fiona Tsun	604-349-0523	fiona.tsun@envirochem.com
Hatfield	Stewart Wright	604-375-9118	swright@hatfieldgroup.com
	Becca Kordas	604-926-3261	rkordas@hatfieldgroup.com
Professional Archaeologist			
Senior Archaeologist – EcoLogic Consultants Ltd.	Greg Morrissey	604-537-5615	gmorrissey@ecologicconsultants.com

Title	Name	Phone	Email
Engagement Lead			
One-Eighty – D2, B2 land portion	Mary Mioska	778-772-6267	mmioska@one-eighty.ca
Hatfield – B2 water lot	Robin Sydneysmith	604-365-8285	rsydneysmith@hatfieldgroup.com
QP – Environmental Team			
Lead EM	To be provided once confirmed		
Primary On-site EM			
MMO			
Engineering Team			
Design Engineer – Marine Works (Advisian)	Atelka Turney	604-868-3335	atelka.turney@advisian.com
Design Engineer – Conveyors and Galleries (CWA)	Kevin Wong	604-218-7515	kevin.wong@cwaengineers.com
Design Engineer – Shiploader (EMS)	Jim Lindsay	613-391-7123	james.lindsay@ems-tech.net
Design Engineer – Electrical (PBX)	David Black	604-314-6426	david.black@pbxeng.com

Table C-2: Project Emergency Contacts

Emergency	Name	Number
Facility	Fire, Ambulance, Police	911
	Neptune Site Security	604-985-7461 Local 250
	Neptune Site First Aid Attendant	Site Radio Channel #2 or Local 222
For observations of injured, stranded, entangled, or dead marine mammal or sea turtle	BC Marine Mammal Response Network (Observe, Record, Report)	1-800-465-4336 DFO.ORR-ONS.MPO@dfo-mpo.gc.ca VHF Channel 16
If injury or mortality to marine mammals or fish is observed, there is a Duty to Notify DFO immediately	DFO-Pacific Observe, Record, and Report phone line (toll-free)	1-800-465-4366 1-866-845-6776.
	Port Authority	PER@portvancouver.com
Archaeological chance find	Port Authority	PER hotline at 604.665.9047 PER Team at PER@portvancouver.com
	BC Archaeological Branch	1-250-953-3334

Emergency	Name	Number
Spill Reporting for all regulatory reportable spills to land and water	Emergency Management BC (EMBC) and Environment Canada	1-800-663-3456
Search and rescue incident	Canadian Coast Guard	250-413-8933 1-800-567-5111 (Toll Free) VHF Channel 16
Additional Spill Response /Reporting Contacts	Canadian Coast Guard (For an oil spill into water)	1-800-889-8852
	Land Response – CEDA Reactor Ltd	604-540-4100 (Emergency) 604-540-4100 (Non-Emergency)
	Land Response – McRae's Septic Tank Service	604-856-8344 (Emergency) 1-888-894-4411 (Toll Free)
	Marine Response - WCMRC	604-294-9116 (Emergency) 604-293-2384 (Non-Emergency)
	Vancouver Pile Driving	604-986-5911 (Emergency) 604-986-5911 (Non-Emergency)
Death of fish (Non-Emergency Contact)	DFO Fish and Fish Habitat Protection Program	1-866-845-6776 ReferralsPacific@dfo-mpo.gc.ca
Port Emergencies (security threats, access issues), and marine vessels	Port Metro Vancouver (24/7 Operations Centre / Harbour Master Office)	604-665-9086
For water and sewerage emergency only	PAH (Greater Vancouver Regional District)	604-444-8401
For unauthorized air discharges and discharges to sewer		604-436-6777 (07:30 to 23:30 hrs) 604-643-8488 (23:30 to 07:30 hrs)
For Health & Safety Emergencies	WorkSafe BC Prevention Emergency Line	604-276-3301 1-888-621-7233 (Toll Free)
For Health & Safety Emergencies	Human Resources and Skills Development Canada (HRSDC)	1-800-641-4049
Additional notification	I.L.W.U. Local 500	604-254-7131
	I.L.W.U. Local 514	604-298-9684
	CN Rail Lynn Creek Yardmaster	604-903-7133
	Cargill Terminal Security	604-990-2554
	BC Hydro Emergency Line	1-888-769-3766

Emergency	Name	Number
	Fortis BC	1-800-663-9911
	City of North Vancouver – Sewer and Water Emergency	604-987-7155 (Daytime) 604-988-2212 (After Hours)

Table C-3: Other Neptune Contacts for 24 Hour Reporting

TITLE	NAME	PHONE NUMBER
24-hr Neptune Reporting		
Operations Head Foreman		604-983-4446 (Office) 604-968-4787 (Cell) Site Radio Channel #1 or #2
Additional Off Hours/Graveyard		604-968-2936 Site Radio Channel #1 or #2
Operations Superintendents	Coal	604-841-8373 Site Radio Channel #1
	Potash/Dry Bulk	604-841-8373 Site Radio Channel #4/5
	Troy Litowsky	604-968-4783
	Troy Wingerak	604-968-6101
	Tony Cross	778-245-9050
	Lyndsey Thorley	778-887-6033
	Molly Matthews	604-313-3661
	Chris Wentworth	604-848-8156
	Brad Palm	778-689-0096
	Scott Fleming	604-209-2988
	James Cross	778-836-8621
Mechanical Maintenance Superintendents	Iain Higginson	604-992-3191 Site Radio Channel #3
	Ryan Loi	604-209-3398 Site Radio Channel #3
Electrical Maintenance Superintendents	Jason Girard	778-990-4804 Site Radio Channel #3
	Konrad Sander	604-619-3556 Site Radio Channel #3

TITLE	NAME	PHONE NUMBER
Operations Manager	Dave Foy	604-983-4443 (Office) 604-968-5872 (Cell)
Assistant Operations Manager	Jatinder Sidhu	778-877-0638
Maintenance Manager	William Robinson	778-873-2021
Assistant Maintenance Manager	Carmine Hendren	778-887-2069
Health & Safety Manager	Jonathan Unrau	604-818-2986
Vice President – Operations	Craig Olley	604-619-8522
Vice President – Health, Safety & Environment	Brad Walker	778-888-9190
Neptune President	Duane Kipling	604-831-6455
Communications – Public Relations National Public Relations – Crisis Team	Nicola Lambrechts	604-970-9113

Table C-4: Reportable Volumes for Spills to the Environment

ID	FLUID	ACTIVE INGREDIENT	PACKAGING	SPILL THRESHOLD[6]	POSSIBLE LOCATIONS
1	Deleterious Substance7F[7]	Any	None	Any amount	Burrard Inlet
2	Listed substance8F[8]	Any	Various	Any amount	Burrard Inlet
3	Antifreeze	90-99% ethanediol (ethylene glycol)	205 Litre Drum	5 L Note 4	Heavy Duty Shop
4	R-134A, R-22, R- 410 A	Refrigerant	Unit reservoirs	10 kg	HVAC Units
5	Gasoline or Diesel Fuel (Class 3)	Fuel	Tanks	100 L	Mobile Equipment
6	Varsol (Class 3)	70-100% Mineral Spirits	205 Litre Drum	100 L	Lube Shed
7	Waste Oil	Oil	5000 Litre Drum	100 L	Lube Shed Tank
8	New Oil (e.g., Automatic Transmission Fluid, XD3 0W – 40 Oil, Essa Trans 30 Oil, Univis Bio 40 Oil, Mobilgear SGC – 150 Oil	Oil	205 Litre Drum to 2400 Litre Totes	100 L	Lube Shed
9	Fluid Film Liquid A	Oil	205 Litre Drum	100 L	Oil Storage Facility (OSF)
10	Soil-Cement	Acrylic and Vinyl Acetate polymer	1000 Litre Tote	200 L	Near Gas Fuelling Station
11	Aerosol Paint (Class 2.1)	Light Hydrocarbons	12 to 16 oz cans	10 kgs	Stores
12	Flammable Paint (Class 3)	Solvents	Open Pail, etc.	100 L	Outside Construction

[6] The listed reportable volumes do not apply to spills within the confines of the CWTS or DBWTS catchment area, nor inside any storage sheds or buildings, unless there is a risk of the spill reaching the environment, i.e., via storm drains. Limits are based on the definition of deleterious substance in the *Fisheries Act,* the Transportation of Dangerous Goods Regulations, and the BC SRR), as amended or replaced from time to time.

[7] As per *Fisheries Act:* A deleterious substance is substance that, if added to any water, would degrade, alter, or form part of a process of degradation or alteration of the quality of that water, so that it is rendered or is likely to be rendered deleterious to fish or fish habitat or to the use by man of fish that frequent that water.

[8] as per BC SRR: A substance listed in the Schedule of the BC SRR identified as Items 1 to 24 (in the schedule) but not including item 25 natural gas. This may include but not limited to dangerous goods from Class 1 to Class 9, hazardous wastes as defined in the HWR such as waste oil, PCBs, and leachable toxic waste, or other substances which can cause pollution or are deleterious as described in Footnote No. 9 above

ID	FLUID	ACTIVE INGREDIENT	PACKAGING	SPILL THRESHOLD[6]	POSSIBLE LOCATIONS
13	Corrosive Resins (Class 8)	Epoxy Resin	500ml to 38 L containers	5 kg or 5 L	Stores
14	Lead Acid Battery (Class 8)	Lead and Sulphuric Acid	Size of battery	5 kg or 5 L	Stores
15	Caustic Soda 25% (Class 8)	Sodium Hydroxide	Tote	5 kg or 5 L	CWTS and Purification Pond (TP10)
16	Envirobind PCW and 834F	Soap + tackifier agent	Tote or Tank	200 kg or 200 L	Empty Coal Cars and Coal Barge
17	Coagulant: Carbonet CK-311	Polyaluminum Chloride	Tote	5 kg or 5 L	Coal Water Treatment Plant
18	Flocculent: Carbonet CE-633	Anionic Polyacrylamide	Tote	5 kg or 5L	Coal Water Treatment Plant
19	Coal9F[9]	None	Bulk	200kg	Shiploaders
20	Potash10F[10]	None	Bulk	Any Amount	Shiploaders

Source: I6 of NBT (2022e).

[9] Even though coal is non-toxic, not deleterious and not a transportation of dangerous goods-controlled substance, Neptune elects to consider that in sufficient quantity, this product may “cause pollution”. Coal is thus classified as an Item 24 Substance, in the Schedule to the BC SRR with a reportable level of 200 kg.
[10] See Footnote No. 11 above.

Table C-5: Spill Report Form

INCIDENT INFORMATION:	
Date of Incident: Time of Incident: Date of Investigation:	Investigation Team: Name: Position:

PERSON REPORTING INCIDENT:			
Name:	Man #:	Job Title:	Years of Experience:

TYPE OF INCIDENT:

☐ Fuel Spill ☐ Other Spill ☐ Water Pollution/Contamination ☐ Breach of Permit Conditions

☐ Uncontrolled Air Emission ☐ Management of Waste ☐ Explosion ☐ HVAC Release

☐ Damage to Vegetation or Fauna ☐ Excessive Noise ☐ Near Miss

☐ Other Type of Incident (please describe):

Other/Additional Comments:

TYPE OF IMPACT:

☐ Effects on Natural Environment of Land ☐ Controlled/Uncontrolled Discharges to Water

☐ Controlled/Uncontrolled Emissions to Air Wastes ☐ Noise, Dust, Vibration, Odour

☐ Contamination ☐ Health and Safety (i.e., any injuries) ☐ Solids and Other

☐ Other Type of Impact (please describe):

Other/Additional Comments:

INCIDENT SPECIFICS:
Incident Location:
Distance to nearest stream, water bodies, sensitive areas (as applicable):
Material Type:
Material Quantity:
Weather Conditions:
Cause(s) and Effect(s) of Incident:
Witness Names and Statements *(attach extra sheets if necessary)*:

Description & Estimate of Property Damage:

ITEM #	CORRECTIVE ACTION	PERSON RESPONSIBLE	TARGET DATE	COMPLETED (INITIAL)

Is this a reportable incident? ☐ Yes ☐ No

Please refer to Table I6 of Environmental Management System Manual for Reportable Volumes for Spills to the Environment (as applicable).

Agencies contacted in the event of a reportable incident:	NOTES:
☐ BC Spill Reporting Hotline (1-800-663-3456) ☐ Environment Canada (604-666-6100) ☐ Transport Canada (604-666-2955) ☐ CANUTEC [Canadian Transport Emergency Centre] (613-996-6666) ☐ ICBC (1-800-910-4222) ☐ Police/Fire Dept. (911) ☐ Others:	

Other comments/actions taken:

Measures to be implemented to prevent/minimize this type of incident from occurring again:

Report completed by:	Phone #:
Title:	Date:

Source: I7 of NBT (2022e).

Table C-6: Water Quality Thresholds for the Berth 2 Project

PARAMETERS	MOST STRINGENT (PROJECT DISCHARGE OBJECTIVE)	BRITISH COLUMBIA APPROVED WATER QUALITY GUIDELINES (MARINE & ESTUARINE AQUATIC LIFE)	BRITISH COLUMBIA WORKING WATER QUALITY GUIDELINES (MARINE & ESTUARINE AQUATIC LIFE)	BURRARD INLET WATER QUALITY OBJECTIVES (INNER HARBOUR)	CCME WATER QUALITY GUIDELINES FOR THE PROTECTION OF MARINE AQUATIC LIFE
Physical Tests					
pH	7 to 8.7	7.0 to 8.7	-	-	7 to 8.7
Total Suspended Solids	Clear Flows: + 25 mg/L (24-hr) + 5 mg/L (30-day) Background 25-100 mg/L: + 10 mg/L Background > 100 mg/L: + 10 %	Clear Flows: + 25 mg/L (24-hr) + 5 mg/L (30-day) Background 25-100 mg/L: + 10 mg/L Background >100 mg/L: + 10%	-	+ 10 mg/L	Clear Flows: + 25 mg/L (24-hr) + 5 mg/L (30-day) Background 25-250 mg/L: + 25 mg/L Background >250 mg/L: + 10%
Turbidity	Clear Flows: + 8 NTU (24-hr) + 2 NTU (30-day) Background 8 - 50 NTU: + 5 NTU Background > 50 NTU: + 10 %	Clear Flows: + 8 NTU (24-hr) + 2 NTU (30-day) Background 8 - 50 NTU: + 5 NTU Background > 50 NTU: + 10 %	-	+ 5 NTU	Clear Flows: + 8 NTU (24-hr) + 2 NTU (30-day) High Flows or Turbid Waters: + 8 NTU (Background 8-80 NTU) + 10% (Background > 80 NTU)
Total Metals					
Antimony (Sn3+)	270 µg/L	-	270 µg/L	-	-
Arsenic	2.4 µg/L (avg)	12.5 µg/L (Total As)	-	2.4 µg/L (avg)	12.5 µg/L (Long-term)
Beryllium	100 µg/L	-	100 µg/L	-	-

PARAMETERS	MOST STRINGENT (PROJECT DISCHARGE OBJECTIVE)	BRITISH COLUMBIA APPROVED WATER QUALITY GUIDELINES (MARINE & ESTUARINE AQUATIC LIFE)	BRITISH COLUMBIA WORKING WATER QUALITY GUIDELINES (MARINE & ESTUARINE AQUATIC LIFE)	BURRARD INLET WATER QUALITY OBJECTIVES (INNER HARBOUR)	CCME WATER QUALITY GUIDELINES FOR THE PROTECTION OF MARINE AQUATIC LIFE
Boron	1200 µg/L (Total B, Long-term)	1200 µg/L (Total B, Long-term)	-	-	-
Cadmium	0.12 µg/L	-	0.12 µg/L	0.12 µg/L (avg)	0.12 µg/L (Long-term)
Copper	1.3 µg/L (avg)	< 2 µg/L (Total Cu, Long-term) 3 µg/L (Total Cu, Short-term)	-	1.3 µg/L (avg)	-
Chromium (Cr6+)	1.5 µg/L	-	1.5 µg/L	-	1.5 µg/L (Long-term)
Chromium (Cr3+)	56 µg/L	-	56 µg/L	-	56 µg/L (Long-term)
Lead	< 2 µg/L (Total Pb, Long-term) 140 µg/L (Total Pb, Short-term)	< 2 µg/L (Total Pb, Long-term) 140 µg/L (Total Pb, Short-term)	-	2 µg/L (avg)	-
Manganese	100 µg/L	-	100 µg/L	-	-
Mercury	0.02 µg/L (avg) 2 µg/L (max)	See table in guidance	-	0.016 µg/L (avg) 2 µg/L (max)	0.016 µg/L (Long- term)
Nickel	0.8 µg/L (avg)	-	8.3 µg/L	0.8 µg/L (avg)	-
Selenium	2 µg/L (Long-term)	2 µg/L (Total Se, Long-term)	-	-	-
Silver	1.5 µg/L (Total Ag, Long-term) 3 µg/L (Total Ag, Short-term)	1.5 µg/L (Total Ag, Long-term) 3 µg/L (Total Ag, Short-term)	-	-	7.5 µg/L (Short-term)

PARAMETERS	MOST STRINGENT (PROJECT DISCHARGE OBJECTIVE)	BRITISH COLUMBIA APPROVED WATER QUALITY GUIDELINES (MARINE & ESTUARINE AQUATIC LIFE)	BRITISH COLUMBIA WORKING WATER QUALITY GUIDELINES (MARINE & ESTUARINE AQUATIC LIFE)	BURRARD INLET WATER QUALITY OBJECTIVES (INNER HARBOUR)	CCME WATER QUALITY GUIDELINES FOR THE PROTECTION OF MARINE AQUATIC LIFE
Vanadium	50 µg/L	-	50 µg/L	-	-
Zinc	10 µg/L (Total Zn, Long-term) 55 µg/L (Total Zn, Short-term)	10 µg/L (Total Zn, Long-term) 55 µg/L (Total Zn, Short-term)	-	10 µg/L (avg) 55 µg/L (max)	-
VOCs					
Benzene	110 µg/L (Long-term)	110 µg/L (Long-term)	-	-	110 µg/L (Long-term)
Chlorobenzene	25 µg/L	-	25 µg/L	-	25 µg/L (Long-term)
1,2-Dichlorobenzene	42 µg/L	-	42 µg/L	0.2 mg/L (avg) 2 mg/L (max)	42 µg/L (Long-term)
Ethylbenzene	25 µg/L (Long-term)	250 µg/L (Long-term)	-	-	25 µg/L (Long-term)
MTBE	440 µg/L (Short-term)	440 µg/L (Short-term)	-	-	5000 µg/L (Long-term)
Toluene	215 µg/L (Long-term)	-	-	-	215 µg/L (Long-term)
EPH/LEPH/HEPH and PAHs					
Acenaphthene	6 µg/L	6 µg/L	-	6 µg/L (avg)	-
Benzo(a)pyrene	0.01 µg/L	0.01 µg/L	-	0.01 µg/L (avg)	-
Chrysene	0.1 µg/L	0.1 µg/L	-	0.1 µg/L (avg)	-
Fluorene	12 µg/L	12 µg/L	-	12 µg/L (avg)	-
1-Methylnaphthanele	1 µg/L	1 µg/L	-	-	-
2-	1 µg/L	1 µg/L	-	-	-

PARAMETERS	MOST STRINGENT (PROJECT DISCHARGE OBJECTIVE)	BRITISH COLUMBIA APPROVED WATER QUALITY GUIDELINES (MARINE & ESTUARINE AQUATIC LIFE)	BRITISH COLUMBIA WORKING WATER QUALITY GUIDELINES (MARINE & ESTUARINE AQUATIC LIFE)	BURRARD INLET WATER QUALITY OBJECTIVES (INNER HARBOUR)	CCME WATER QUALITY GUIDELINES FOR THE PROTECTION OF MARINE AQUATIC LIFE
Methylnaphthanele					
Naphthalene	1 µg/L	1 µg/L	-	1 µg/L (avg)	1.4 µg/L (Long-term)
Eco-Toxicity Tests					
LC50 96-hr representative fish species	Pass - "deleterious substance" clause within the *Fisheries Act*	-	-	-	-
LC50 48-hr representative invertebrate species	Pass - "deleterious substance" clause within the *Fisheries Act*	-	-	-	-

Source: Table 6 of Envirochem (2023)

Table Note:

1. Long-term average values are intended to protect the most sensitive species and life stage against sub-lethal and lethal effects for indefinite exposures. An averaging period approach is used for these guideline values, which allows concentrations of a substance to fluctuate above and below the guideline provided that short-term maximum is never exceeded, and the long-term average is met over the specified averaging period. For the B2D2 Project, long-term average is defined as 30-day average over 5 samples (to be consistent with the B2D2 Project water quality sampling frequency of one sample per week, as outlined in Section 5.5 of the WaMP).
2. Total Suspended Solids and Turbidity objectives representat maximum increases from measured background concentrations.

APPENDIX D SUPPORTING FIGURES

SITE MAP (EMERGENCY RESPONSE)

GASOLINE TANK
MUSTER STN #8
MUSTER STN #7
MUSTER STN #1
FIRST AID AND AMBULANCE
MUSTER STN #6
MUSTER STN #5
DIESEL TANK
LUBE SHED
MUSTER STN #4
MUSTER STN #2
MUSTER STN #3
CBSA Sufferance Warehouse Secured Area

FLOATING DOLPHIN
TEMP. LUNCH ROOM
GUARD HOUSE
MARINA FLOAT
SHOPS & STORES (927)
OVERPASS SECURITY GATE
RAMP
PURIFICATION POND
MAIN POWER SUB STATION
WCSL (121)
BERTH #1
ECSL (120)
COAL STORAGE "B" SIDE
COAL STORAGE "A" SIDE
STACKER RECLAIMER (150)
STACKER RECLAIMER (110)
BOOM C/V (130) ELEV. C/V (129) WATER SPRAYS & SUCH (118)
STORAGE SHED #1
STORAGE SHED 1 (207)
TRIPPER
STORAGE SHED #2
STORAGE SHED #3 (365)
WPSL (220)
BERTH 2
EPSL (219)
BERTH #3
BERTH 3 S/L (722)
BERTH 3 SURGE BIN (724)
BERTH 3
BURRARD INLET
SEABOARD CROSSING
NEW COAL DUMPER
SITE NORTH
TRUE NORTH

LEGEND:

OXY ACETYLENE COMPRESSED GAS:
1. Maintenance Office - Beside Loci Pit
2. Heavy Duty Shop

NO RE-FUELING AREAS

RE-FUEL WITH CAUTION

EVACUATION ROUTE

MUSTER STATION

SPILL KITS:
1. R1/R2 Transfer Tower
2. Berth #3 Dock
3. Dock Office (Berth #3)
4. Dock Office (Berth #2)
5. Berth #1 Dock
6. Emergency Portable Trailer (Near Gas Tank)
7. ER-151 (Near Gas Tank)
8. Loci Rail Siding
9. Coal Dumper 101
10. Coal Water Treatment Plant
11. Potash Shed 1, Bay 11
12. Potash Shed 1, Bay 8
13. Potash Shed 1, Bay 5
14. Dry Bulk Treatment Pond 6
15. Heavy Duty Shop (Beside Fuel Tank)
16. C3/C31 Hydraulic Power Units (HPU Shed)
17. Coal Dumper 141

HAZARDOUS MATERIAL STORAGE:
1. Purification Pond
   Tote of 25% caustic solution
2. CWTS Plant
   (2) totes of coagulant & (2) flocculant

C:\USERS\GREYS\ONEDRIVE - NEPTUNE BULK TERMINALS (CANADA) LTD\09-900-1-029-33 SITE MAP EMERGENCY RESPONSE.DWG DATE: 2022-05-26

DRAWING NO.	DRAWING DESCRIPTION / TITLE
REFERENCE DRAWINGS / DESIGN STANDARDS	

PROJECT / W.O.: N/A
SYSTEM: SITE
ASSET: 900
DISCIPLINE: 1

REV	YYYY-MM-DD	DESCRIPTION	DRAWN	APPROVED
33	22/06/16	Modified Spill Kit Locations	KM	SB/JF
32	22/05/26	Modified Spill Kit Locations	KM	SB/JF
31	22/05/11	Modified Spill Kit Locations	KM	SB/JF
30	21/07/08	Modified Muster Station Locations	AF	KL/JF
29	21/05/18	Modified Muster Station Locations	AF	KL/JF

ISSUES / REVISIONS

ENGINEERING SEAL:

VENDOR:

OEM:

ISSUED AS RECORD COPY? (YES/NO) NO

TITLE:
NEPTUNE BULK TERMINALS (CANADA) LTD.
EMERGENCY RESPONSE PLAN

Figure D-1

SCALE:	SHEET	OF	DRAWING NO.	REV:
N.T.S.	1	1	09-900-1-029	33