

SEASPAN VANCOUVER DRYDOCK WATER LOT PROJECT

Vancouver Fraser Port Authority
Project and Environmental Review Application

Supplemental Report

April 14, 2021

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DISTRIBUTION LIST

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AMENDMENT RECORD

Issue	Description	Date	Approved by	
1	First draft version of Seaspan drydock VFPA PER – supplemental report	20210412	Stewart Wright Project Director	Rebecca Kordas Project Manager
2	Second version of Seaspan drydock VFPA PER – supplemental report	20210414		
			Stewart Wright Project Director	Rebecca Kordas Project Manager

LIST OF ACRONYMS

BC	British Columbia
BMP	Best Management Practices
CCME	Council of Canadian Ministers of the Environment
CD	Chart Datum
CEMP	Construction Environmental Management Plan
CO₂	Carbon Dioxide
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
DFO	Fisheries and Oceans Canada
HADD	Harmful Alteration, Disruption, or Destruction
MAPP	Methylacetylene-propadiene propane
MSDS	Material Safety Data Sheet
O₂	Dioxygen
PER	Project and Environmental Review
SARA	Species at Risk Act
UHP	Ultra High Pressure
VDC	Vancouver Drydock Company
VFPA	Vancouver Fraser Port Authority

1.0 INTRODUCTION

Seaspan ULC. (Seaspan) is requesting a permit from Vancouver Fraser Port Authority (VFPA) under the Project and Environmental Review (PER) process for a proposed drydock expansion (the Project) at the Vancouver Drydock Company (VDC) Limited facility, located at 203 East Esplanade in North Vancouver, British Columbia (BC). An overview Site Plan (1:5,000) is provided in Figure 1.

The Project involves the installation of a work pontoon and two additional drydocks (Figure 2, Appendix 1) on the west side of the deep-water outfitting pier. Currently, a Panamax drydock is permanently moored to the east side of the pier, and a self-contained drydock, the Seaspan Careen (131 m x 49 m), is moored to the west side of the pier. The Careen spends most of the time at this location but is infrequently transported to other Seaspan facilities, as required. Seaspan will be consolidating ship repair activities at VDC and is proposing to add the new infrastructure to better accommodate and service smaller vessels.

The Project is located at the north shore of the Burrard Inlet's Inner Harbour, along a manmade shoreline where wave exposure has been classified as protected (VFPA 2019a). The Project falls within VFPA managed federal waters and was the subject of a preliminary project enquiry (PER No. 20-189).







A Request for Review was submitted to Fisheries and Oceans Canada (DFO) on March 8, 2021 (Appendix 2). On April 7, the file was transferred to a Fish and Fish Habitat Protection Program biologist.

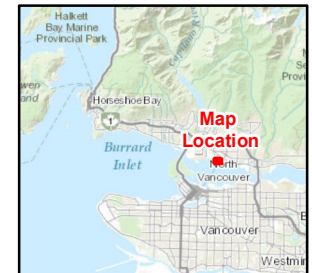
The purpose of this document is to provide supplemental information that fulfills the requirements outlined in the PER checklist, including references to other supporting documents, as required. A concordance table that acts as a guide to where the PER checklist requirements are covered and information can be found is provided (Table 1), and a contact list can be found in Appendix 3.

Figure 1 Project overview.



Legend

-  Bathymetry (Interval 10m)
-  Vancouver Fraser Port Authority Boundary
- Project Features**
-  Work Pontoon
-  New 100m Dry Dock
-  New 55m Dry Dock
-  Relocated Existing



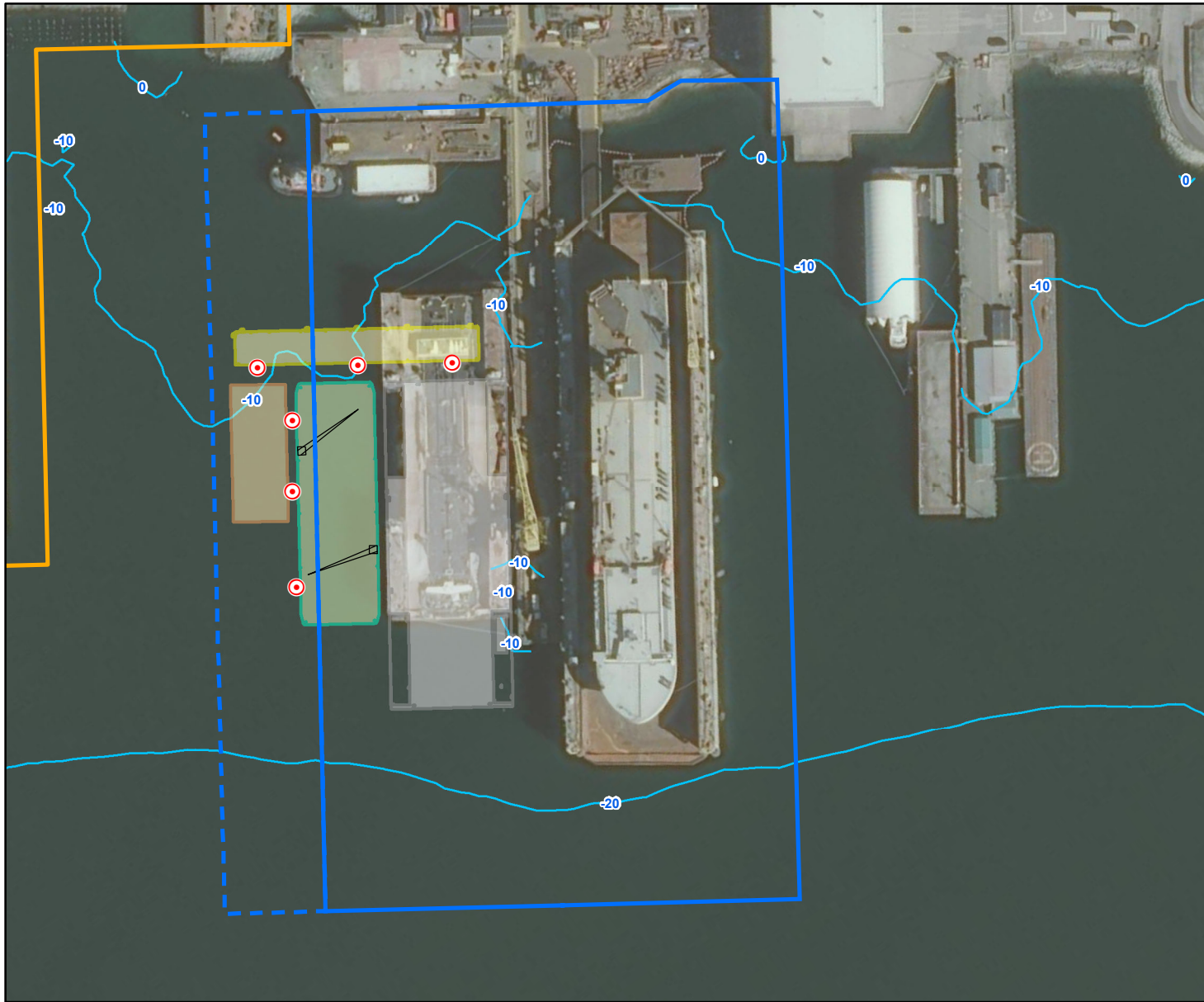
0 25 50 100 m
 Scale: 1:5,000
 Projection: NAD 1983 UTM Zone 10N

- Data Sources:
- a) Project features, water lot, Advisian 2021.
 - b) Bathymetry, DFO 2020.
 - c) Vancouver Fraser Port Authority Boundary, Port of Vancouver 2018.
 - d) GeoEye-01 50 cm, 15 March 2020, Esri Online Service.



Vancouver Dry Dock Water Lot Project

Figure 2 Project detail.

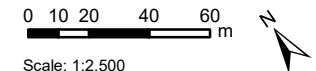
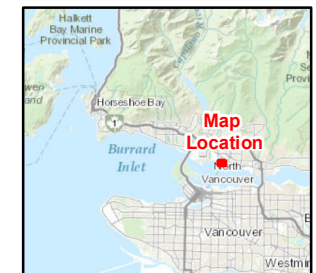


Legend

- Pile
- Crane
- Bathymetry (Interval 10m)
- Vancouver Fraser Port Authority Boundary
- Existing Water Lot Boundary
- Expanded Water Lot Boundary

Project Features

- Work Pontoon
- New 100m Dry Dock
- New 55m Dry Dock
- Relocated Existing Caren



Scale: 1:2,500

Projection: NAD 1983 UTM Zone 10N

Data Sources:

- a) Project features, water lot, Advisian 2021.
- b) Water lot boundaries, Seaspan 2021.
- c) Bathymetry, DFO 2020.
- d) Vancouver Fraser Port Authority Boundary, Port of Vancouver 2018.
- e) GeoEye-01 50 cm, 15 March 2020, Esri Online Service.



Vancouver Dry Dock Water Lot Project

2.0 APPLICATION CONCORDANCE

The requirements defined in the PER checklist for the Project have been copied into Table 1 for reference. The concordance of the application with these requirements is also provided.

A Construction Environmental Management Plan (CEMP) has been prepared for the Project as required under the PER checklist (Appendix 4). The CEMP is the primary document to guide overall environmental management and protection practices to be implemented for the duration of Project construction and fulfills most of the PER requirements. The CEMP follows the VFPA PER CEMP Guidelines (VFPA 2018) and will be provided to the construction contractor as the basis for developing work plans and associated Environmental Protection Plans.

Table 1 VFPA PER requirements.

Requirement	Description	Concordance
Section 1: General Submission Requirements		
Contact List	Provide one central contact list for all project team members, including name, title, address, and contact numbers.	Appendix 3: Contact List.
Section 2: Project Description Requirements		
General Scope	<p>Brief background of the applicant's company and business operations in the region.</p> <p>Description of the Project, including the purpose, use, and rationale.</p> <p>Description of the Project setting, including proximity to sensitive receptors such as schools or parks.</p> <p>Description of potential impacts to land, water, air, land and adjacent community and businesses, as a result of the project.</p> <p>List all studies that have been completed in support of the application.</p>	<p>An overview of the general scope of the project is provided in Section 3.1.</p> <p>Potential environmental effects as a result of the project are presented in Section 5.0.</p>
Operations	<p>Description of existing and proposed capacities and throughput including vehicular, truck, train and marine vessel traffic, hours of operations, peak hours, parking requirements.</p> <p>Description of the hours or operation of the terminal, both current and proposed, and any changes to employment expected.</p> <p>Description of the proposed increase in storage capacity of the terminal, and product throughput in tonnes per week, month, or year.</p> <p>Description of any potential environmental and community impacts that may result from the construction or operation of the project, and proposed mitigation strategies.</p>	<p>An overview of terminal operations is provided in Section 3.2.</p> <p>Terminal operations, including hours, will not change due to the Project.</p>

Table 1 (Cont'd.)

Requirement	Description	Concordance
Section 2: Project Description Requirements (Cont'd.)		
Construction	<p>Proposed construction period (start and finish), hours, and method of construction.</p> <p>Description of construction staging activities.</p> <p>If you anticipate the need to construct outside of the standard VFPA construction hours, this can be requested in the application.</p> <p>Should this information not be provided at the time of application, the request can be processed at a later date, but will be subject to a permit amendment.</p>	<p>An overview of construction is provided in Section 3.3, with further detail in Section 2.0 of the CEMP.</p>
Section 3: Drawing Requirements		
Location Plan	<p>Plan showing the relationship of the proposed Project to the surrounding area at a 1:5000 scale</p>	<p>Figure 1 Project overview and Appendix 1: Engineering Drawings.</p>
Site Plan	<p>Lease and property boundaries, easements and right of way.</p> <p>Legal high water mark where applicable.</p> <p>Location and dimensions of all existing and proposed buildings, structures, equipment, and marine structures.</p> <p>Access points including roadways, driveways, parking areas, walkways, berths, gangways, docks.</p> <p>Area of construction staging/laydown area.</p>	<p>Appendix 1: Engineering Drawings.</p>
Marine Structures	<p>Site plan specific to proposed marine works only. Identify existing marine structures and those intended to be removed or relocated or will be impacted.</p> <p>Dimensions, and cross-sections of front, rear and two sides of proposed marine structures including dolphins, piles, docks, piers, gangways, floats, fenders, bollards, rip rap, navigational lighting, navigation aids, ranges, dredging channels, dams, and areas to be filled etc.</p> <p>Dimensions and characteristics of proposed materials.</p> <p>Structures in relation to the tidal Higher High Water and Lower Low Water lines including water depth.</p> <p>Plan of proposed dock facility to include location and SWL of mooring securing points.</p> <p>Confirm the design vessel (maximum size that can be accommodated) at the berths on the plans.</p>	<p>Appendix 1: Engineering Drawings.</p>

Table 1 (Cont'd.)

Requirement	Description	Concordance
Section 3: Drawing Requirements (Cont'd.)		
Utilities	<p>Separate plans showing existing and proposed utilities. Proposed service connections to utilities or systems (water, sewer, storm water, power, gas), both above and below ground.</p> <p>Provide written confirmation of which other authorities or jurisdictions will need to provide consent or conduct works to establish connections to utilities, and confirmation that capacity exists within those 3rd party networks.</p> <p>The Applicant is responsible for location of all existing utilities. VFPA will provide known utility information.</p>	Section 3.2.1 and Appendix 5: Utilities Report.
Lighting Plan	Lighting shown on the site plan for all proposed exterior lighting including the location, type of bulbs, orientation, and level of illuminance.	Section 3.2.2 and Appendix 6: Lighting Report.
Section 4: Required Studies and Reports		
Hazardous Materials Handling	<p>Description of hazardous materials storage and handling methods & table of applicable regulations.</p> <p>Copies of any relevant material safety data sheets (MSDS) as it may related to products handled, used, or stored on the site.</p> <p>This item relates to operation and can be incorporated into the draft Spill Prevention and Emergency Response Plan listed below.</p>	<p>Seaspan has existing operational plans covering Hazardous Materials Handling at the VDC facility. These are summarized in Section 5.8.</p> <p>Hazardous Materials Handling during construction is described in Section 7.3 of the CEMP. This includes a Spill Prevention and Emergency Response Plan in Section 5.3 of the CEMP.</p>
Stormwater Pollution Prevention Plan	Description of daily terminal operations as they relate to storm water management, given the local climate and water capture and treatment systems.	Section 5.3.
Marine Traffic Study	Confirmation of the vessel sizes, maximum and minimum size of vessels that can be berthed in newly proposed drydocks, anticipated additional anchorage patterns if any and utilization periods and any other operational criteria.	Section 5.4.

Table 1 (Cont'd.)

Requirement	Description	Concordance
Section 4: Required Studies and Reports (Cont'd.)		
Noise Study	An assessment of how the proposed development will affect the noise levels experienced by the adjacent community. Submit the Noise Assessment Project Score sheet (PER Guidelines – Environmental Noise Assessment - Appendix II) to determine if further noise assessment will be required.	Section 5.5 and Appendix 7: Noise Assessment.
Air Assessment	Confirmation of air emission sources on site. While a full air assessment may not be required, please confirm what air emission sources are on site and whether a management plan to minimize emissions for existing drydock operations will be updated.	Section 5.6.
View and Shade Impact Analysis	An assessment and renderings of potential view impacts of the proposed development.	Section 5.7 and Appendix 8: Photos and Renderings for View and Shade.
Alternative Siting Options	An assessment of alternative siting options of proposed structures. Report should include rationales for each rejected option from an environmental, community and economic perspectives.	Section 4.0.
Construction Environmental Management Plan (CEMP)	Description of how the site will be managed during construction such that the work does not result in adverse impacts to the environment, heritage resources, public (municipal, stakeholders, community), Indigenous groups, and including potential effects from noise, vibration, light, dust emissions, or other deleterious discharges.	The CEMP will be submitted as part of this application (Appendix 4).
Biophysical Survey Report	An assessment of species and habitats that will be affected by project activities such as infilling, vegetation removal, or shoreline modification.	Appendix 9: Habitat Assessment.
Spill Prevention and Emergency Response Plan (on land and water)	Emergency Response plan as it relates to reportable spills. Inventory of hazardous materials anticipated to be handled or stored on site during normal operations. A description of spill prevention, containment and clean-up plan for hydrocarbon products (including fuel, oil and hydraulic fluid) and any other deleterious substances using standards, practices, methods and procedures to a good commercial standard, conforming to applicable laws.	Summarized in Section 5.8 and further detailed in Section 5.3 of the CEMP

Table 1 (Cont'd.)

Requirement	Description	Concordance
Section 4: Required Studies and Reports (Cont'd.)		
Spill Prevention and Emergency Response Plan (on land and water) (Cont'd.)	Description of proposed employee training, emergency response communication plan, emergency procedures, spill tracking and reporting, records of facilities inspections. Reference to appropriate spill containment and clean-up supplies available on site at all times and that all personnel working on the Project are familiar with the spill prevention, containment and clean-up plan.	Summarized in Section 5.8 and further detailed in Section 5.3 of the CEMP
Section 5: Consultation Requirements (documentation)		
Indigenous Groups	Provide all records of previous information sharing activities, agreements, or other interactions with Indigenous groups with respect to the proposed Project. Provide information on any known Indigenous interests in the Project area, if known.	Section 6.1.
Stakeholders	City of North Vancouver (CNV)	Section 6.2.
Public	The type of consultation activities that are required to be led by the Applicant for this project includes: <ul style="list-style-type: none"> Public Notification Public Consultation for a 20 business day period and which may include online meetings (due to COVID-19 restrictions), public notifications, website and online outreach. 	A 25 day engagement period has been adopted (as per VFPA's COVID-19 amended guidance), Section 6.3.
Public Consultation Materials	The Applicant is required to submit drafts of the following upon submission of a complete application: <ul style="list-style-type: none"> Public Consultation Plan (may revise from Preliminary Comment Period) Project website text and any online information Draft text of emails to existing list Newspaper advertisement copy Map or description of mail drop area Public notification letters Discussion Guide Feedback Form Display Boards and Presentations Coloured renderings, schematics or other visual representations of the Project Other materials to be used (i.e. videos, brochures) 	Appendix 10: Public Engagement Plan; Appendix 11: Communication Materials Package; Appendix 12: Water Lot Website Content.

Table 1 (Cont'd.)

Requirement	Description	Concordance
Section 5: Consultation Requirements (documentation) (Cont'd.)		
Port Community Liaison Committees	Submit draft presentation materials (i.e., presentation, brochures) for the North Shore Waterfront Liaison Committee	Presentation timing and materials to be agreed between Seaspan and VFPA
Draft Construction Communications Plan	<p>The proposed Project may have an impact on the adjacent community during the construction period, and therefore the applicant is required to notify area residents and the municipality prior to construction and/or demolition.</p> <p>The draft Plan should include a brief description of the proposed Project, background, construction timelines, considerations and challenges, engagement objectives, key audiences and stakeholders, key messages, contact information and public and stakeholder notification activities prior to construction and/or demolition. Also include a map of the notification area and mechanism to receive feedback and respond to/resolve issues during construction.</p> <p>Submission of a final plan will be required at a later date determined by staff.</p>	Appendix 13: Draft Construction Communications Plan.

3.0 PROJECT OVERVIEW

3.1 General Scope

The north shore of Burrard Inlet has a long history of shipbuilding, originating with the Wallace Shipyard (later renamed Burrard Drydock) in 1906. These facilities were just west of VDC's current location. In 1941, the shipyards expanded east to build four new berths and four new piers, including the VDC deep-water outfitting pier (Webb 1996). The VDC is a subsidiary of Seaspan ULC, which operates three major shipyards within the Pacific Northwest. The property on which the VDC operations are carried out are owned or leased by an affiliate of Seaspan ULC. VDC is capable of servicing large vessels in dry dock for service, outfitting, and repair.

Seaspan is proposing to consolidate ship repair activities at their VDC facility by adding new infrastructure to better accommodate and service smaller vessels. The Project involves the installation of a floating work pontoon and two additional drydocks on the west side of the existing deep-water outfitting pier (Figure 2). The work pontoon (Table 2) will be used to access the existing Careen and two new floating drydocks. Both new drydocks are fabricated from steel plate and are essentially smaller versions of the existing Careen. The larger one is approximately 100 m long x 30 m wide x 10 m deep, while the smaller one is approximately 55 m long x 22 m wide x 8 m deep. To make room for the arrangement of the new drydocks, the existing Careen will be moved 40 m to the south of its current position and there is a need to exercise the lease option to expand the existing water lot approximately 40 m to the west (Figure 2). The new drydocks are expected to operate on a two to three week cycle period with vessel repairs. Except for maintenance or other rare occurrences, the drydocks will remain at berth in their working location during their service life.

Table 2 Drydock characteristics.

	100 m Drydock	55 m Drydock	Work Pontoon
Lift Capacity (t)	4,500	1,200	n/a
Length (m)	100	55	98
Beam (m)	30	22	13
Depth (m)	10	8	4
Sidewall Height (m)	7	6	n/a
Maximum Draft (m)	8	6	n/a

The Project is located along the north shore of the Inner Harbour of Burrard Inlet at 203 East Esplanade (Figure 1) within water lots that have a contractual permitted use from the VFPA for ship repair, new vessel construction, and commercial marine transportation uses.

3.2 Operations

Both of the existing drydocks are intended for large displacement vessels and significant planning and organization is required to lift smaller vessels to maintain efficiencies with these drydocks. The Panamax and the Careen are moored on either side of the outfitting pier which is fully serviced with an 85 tonne rail-mounted crane. The Panamax permanently resides on the east side of the pier and

performs the largest vessel lifts (up to 36,000 tonnes displacement, 220 m length, 45 m beam, and 8.8 m draft). The Careen is moored to the west side of the pier and can lift vessels with 30,000 tonne displacement, 130 m length overall, 32 m beam, and 10 m draft. The Careen occasionally leaves the berth to pick up its cargo in deeper water or at other locations.

With the proposed additions of the 100 m and 55 m drydocks, VDC will achieve operational efficiency for midsize and smaller vessels with displacements of 4,500 tonnes and 1,200 tonnes, respectively (Table 2). Access to the new drydocks will be via a floating work pontoon which will be permanently moored perpendicular to and west of the outfitting pier allowing access to the north end of each new drydock and the Careen. The 100 m drydock will be moored parallel to the Careen approximately 4 m clear to the west and the 55 m drydock will be moored west of the 100 m drydock. The general arrangement of the expanded facility can be seen in Figure 2 and Appendix 1.

The work pontoon will be accessed from the fixed outfitting pier with a light ramp for the workers. Heavy ramps will be used between the pontoon and each drydock to allow heavier vehicle access such as manlifts and forklifts. Some of the heavy equipment used to service drydock vessels will reside on the work pontoon. The pontoon will be fully serviced with electrical, gas, air, and water connections at appropriate service stations along the south edge (Appendix 5). Lighting for nighttime operations will be from light poles installed on the north edge of the work pontoon as well as from lights installed on the wing walls of each of the drydocks.

Cranes will be installed on the 100 m drydock with sufficient reach to allow sequenced lifts from the 55 m drydock over to the Careen where the 85 tonne outfitting pier rail crane can pick up the load and place it on the pier for transport to the heavy machine shop or other service center in the yard (Figure 2).

There is no change to the maximum size vessel calling to the drydock facility. The frequency of vessels calling will increase proportionally to the number of drydocks in conjunction with their occupancy. It is expected the larger drydocks (existing Panamax and Careen) will be freed up to primarily handle larger vessels, while the new additions (100 m and 55 m drydocks) will service the midsize to smaller vessels.

The new drydocks will be permanently moored to new piles and lowering and raising operations are expected to take approximately 4 hours. The predicted occupancy of the drydocks is 80%. The north side of the work pontoon will also be used for fitting out of vessels that can be serviced while in the water.

The site currently operates from 07:00 to 22:30 daily with shift work schedules. With the increase in dry dock service provided, there is an expected 30% increase in personnel working on site. Office space requirements, lockers for the workers, and available parking are being addressed landside with other site enhancements including a new office building to replace the temporary structures currently in place. These new site efficiencies will accommodate the anticipated increase in employees associated with the new drydocks. These land-based upgrades are not part of this application.

3.2.1 Utilities

Utilities currently fed to the existing outfitting pier and drydocks include oxygen (O₂), breathable and compressed air, industrial and potable water, firewater, sanitary, and electricity. Primarily, these utilities are accessed through five utility stations placed along the length of the pier for access to the Caren on the west side and for any work being performed on the pier itself. The Panamax drydock on the east side of the pier has a utility riser installed to bring on board the required utilities at the northwest corner of the drydock. The Panamax runs its pumps using shore power. The Caren is powered by diesel. Steel cutting and welding require the use of three gasses: oxygen (O₂), carbon dioxide (CO₂), and MAPP (Methylacetylene-propadiene propane). Currently, the O₂ is line-fed while the CO₂ and MAPP are bottled.

The new infrastructure will require additional utility feeds to four new utility stations, which will be located on the south side of the new pontoon. Ramps to the drydocks are also on this side of the pontoon and these ramps may be used to carry the services from the new stations over to the drydocks. All of the existing utilities will be extended to include the new drydocks and two new lines carrying CO₂ and MAPP gases will be available as a replacement to the bottled containers presently used. These two new lines will be run within the existing utility corridor on the west side of the outfitting pier. In addition, electricity will be provided to the work pontoon and the new drydocks to power their new lights. Since the new drydocks have not yet been purchased, their pump's power source (electricity or diesel) is not yet known.

A Site Plan showing the utilities and reference structures is included in Appendix 5. All of the existing and proposed utility demands are fed by existing systems with sufficient capacity to address the new drydocks without any expansion from the source. The newly provided CO₂ and MAPP gasses will be line-fed from monitored tanks placed at a suitable location on site.

3.2.2 Lighting

New lighting will only be installed on the new work pontoon. Six 10.7 m tall square section light poles will be installed along the north side (Appendix 6). At the top of each pole, facing south, a fixed position dark sky friendly area light will be mounted to illuminate the pontoon and the access ramps to the three drydocks. At the top of each pole facing north, will be mounted an identical light at a 30-degree tilt, to provide floodlighting to support the berthing and installation of access walkways to vessels moored to the north side of the new work pontoon.

The area lights will be controlled by photocells for on/off control and will be fitted with a motion sensor on the underside to dim the lights when no motion is detected. These will provide lighting levels on the work pontoon to meet internationally recognized standards without affecting passing vessels in the inner harbour, existing lighting levels on-shore at the site, and adjacent properties.

The floodlights will be manually switched on/off at the base of each light pole. Photocells will not be employed. Each light will be fitted with a motion sensor on the underside to dim the lights when no motion is detected. Facing north with a tilt angle of 30 deg. these lights will illuminate the side of a moored vessel with no possibility of glare to passing vessels in the inner harbour and no possibility of direct glare observed from the shore or adjacent properties.

There will be no changes or additions to the existing floodlighting installation on shore. The deep-water outfitting pier has an 85 T crane which travels the full length of the pier, and as such there is no lighting mounted to the pier, and no new lighting proposed.

All existing and proposed new drydocks have lighting to support operation and work being carried out on vessels held on drydocks. Fixed lighting mounted on the new drydocks will be similar to the existing drydocks using floodlighting atop light poles mounted on the wingwalls of the docks. Pole heights will be 3 m to 4 m with floodlighting angled down and inward for project specific work within each drydock. Ambient lighting levels will be to appropriate standards for workers around the docked vessel and lights will be switchable from within the dry dock and at the base of each pole. It is assumed that eight light poles will be mounted on the 100 m drydock and six light poles will be mounted on the 55 m dock. Each light pole will contain two floodlights. Mobile lighting will be used within the drydocks for more intensity on smaller work areas where required, however these are not expected to be visible from observers on shore. Lights will be switched off when the drydock is not in use.

3.3 Construction

Project construction is anticipated to begin in October 2021 and be completed by January 2022. In-water work activities and construction activities will be undertaken during the Least Risk Window to protect fish in Burrard Inlet (i.e., August 16 to February 28 inclusive).

Project construction involves the following:

- Constructing six monopile moorings, including fendering and mooring connections and davit arms.
- Relocating the existing Careen drydock approximately 40 m south of its existing position on the west side of the existing pier. This requires no new construction.
- Receiving and mooring three new floating craft, with the assistance of tug/work boat(s):
 - One 98 m pontoon to provide floating access along the north end to the two new and one existing drydocks.
 - One 55 m long floating drydock;
 - One 100 m long floating drydock; and
- Minor fitting out works to the new pontoon, including:
 - Fitment and shore hook-up of utilities (e.g., power, lighting, welding gas, compressed air);
 - Fitment of new winches, fenders and mooring points;
 - Installing an access ramp from the existing outfitting pier to the pontoon; and
 - Installing access ramps from the pontoon to each of the drydocks.

The three new floating structures will be hauled in from off site and anchored in place by monopiles, using 1.2 m and 1.5 m diameter steel piles. Since the existing Careen will need to be moved, it will be situated past the south end of the outfitting pier and therefore will require a mooring line to the south end of the Panamax. The six new piles will be placed in water that ranges in depth from 8 m to 17 m below CD (Appendix 1). Piles will be driven into the substrate using vibratory hammers and, if necessary, impact hammers on spud-barge-mounted cranes. Temporary pilings (up to four per permanent mooring) may be required to facilitate positioning and straight driving. Such temporary piles, if needed, would be removed once the permanent piles are installed. Drilling may be required to advance piles depending on the density of the underlying till in the location of each pile. Once penetration depths are achieved, the piles will be cleaned out to facilitate concrete infill using tremie pour methods. Additional structural steel sections or reinforcing bar cages, if required, will be installed prior to the tremie process into the cleaned-out pile. Water inside the piles will be monitored and captured during infilling and disposed of off site to ensure it does not spill over into the surrounding marine environment (see further details in the CEMP). Concrete for filling inside of the piles will be supplied either from the support barge or pumped from delivery trucks that would arrive and drive onto the existing pier.

The piles will collectively occupy 12 m² of the seabed, which includes a 50% contingency. Collectively, the floating infrastructure has an area of 5540 m², including the work pontoon (1310 m²), the larger drydock (3020 m²), the smaller drydock (1210 m²). Access to the site and most of the Project work will be marine based on barges and/or other vessels resulting in little to no land-based activities or traffic. The only anticipated significant land-based component would be the delivery of concrete. If this option is exercised, seven to eight truckloads per pile would be required (maximum of 48 truckloads for the Project). The staging area will also be entirely marine-based.

Drawings specific to the proposed marine works are provided in Appendix 1. This includes existing marine structures. Drawings showing the existing and proposed utilities are included in Appendix 5. A lighting report showing exterior lighting that will be added to the work pontoon is included in Appendix 6.

4.0 ALTERNATIVE SITING OPTIONS

Several physical constraints limit the options for positioning of the new infrastructure within the VDC facility. The new floating structures need to be in fixed positions, moored using vertical pilings so that they can move up and down in the water to load and unload vessels. The drydocks will need to be in deep enough water to allow them to submerge to pick up their cargo. For efficiency of carrying out work and utilities distribution, all the vessels need to be moored within close proximity of each other with access ramps to move from one vessel to another.

Within the existing water lot boundaries, there is limited available space to effectively house the new drydocks. Consequently, there is a need to exercise the lease option to expand the existing water lot by 40 meters to the west. Figure 3 shows the existing site and water lot boundaries as well as the existing structures, floating and fixed, in place to facilitate present dry dock operations. The Panamax and Careen drydocks are on opposing sides of the fixed pier extending to the south and the 190 m water storage barge is moored against the wharf at the shoreline. On occasion, there is

a vessel docked against the water barge, as indicated in Figure 3, as well as the occasional barge on the east side of the Panamax when required.

With the additional 41 m extension to the west, the dimensions of the water lot would be 185 m wide (east-west) and 320 m from land to the southern boundary. This space is just sufficient to allow the inclusion of the two additional drydocks on the west side of the existing Careen. The work pontoon is necessary to access the new drydocks, to allow free movement of workers between land and the vessels being serviced. The discussion following describes why this site was selected within the water lot boundary.

Figure 3 Alternative siting plan.



Legend

- Bathymetry (Interval 10m)
 - Vancouver Fraser Port Authority Boundary
 - Existing Water Lot Boundary
 - Expanded Water Lot Boundary
- Alternative Siting Options**
- Existing Region
 - NoGo Region
 - Working Region



0 10 20 40 60 m

Scale: 1:2,500
Projection: NAD 1983 UTM Zone 10N

Data Sources:

- a) Alternative siting regions, water lot boundaries, Seaspan 2021.
- b) Bathymetry, DFO 2020.
- c) Vancouver Fraser Port Authority Boundary, Port of Vancouver 2018.
- d) GeoEye-01 50 cm, 15 March 2020, Esri Online Service.



Figure 3 also shows areas within the water lot where there is little to no likelihood of housing the new floating vessels (i.e., 'NoGo Regions'), and areas where the new vessels could reasonably be placed (i.e., 'Working Regions'). The following NoGo Regions have been identified with accompanying descriptions of why they would not be suitable areas to house the new floating drydocks:

- NoGo Region 1: The Panamax is fixed in its position and only moves up and down during operations to pick up its working cargo. To access the Panamax and stage equipment and materials, there is a fixed ramp and a working barge on the north side of the drydock. There is no ability to repurpose this area of the water lot and therefore it has not been considered for potential siting of the new vessels.
- NoGo Region 2: There is a strip of water lot on the east side of the Panamax measuring approximately 30 m in width, which is used on occasion to moor vessels against the Panamax. This region is not considered suitable for the new infrastructure for the following reasons:
 - The adjacent W-Building (immediately east of the VDC site) is a working shop creating blocks (major structural steel hull components) for shipbuilding. These blocks are loaded and off-loaded regularly thereby creating vessel traffic within that region. A permanently moored drydock in that zone would lead to operational difficulties in an already constrained area.
 - Access between land and a new drydock would be required and therefore additional marine structure would need to be provided from the shoreline. This structure would also get in the way of existing operations.
 - When the Panamax submerges to pick up its cargo, the adjacent drydock would need to be moved out of the way.
 - The new drydock would need its own pilings. The water in the area is shallow (< 5 m CD), so there is more potential to affect fish and fish habitat. Such pilings would also get in the way of traffic operations in the area.
- NoGo Region 3: This region is more exposed to wind and waves because it is further from the protection of the larger drydocks and outfitting pier. It is much closer to the navigation channel, which exposes the drydocks and the public to greater risk. Seaspan prefers to maintain a safety buffer marked by the south end of the Panamax to the navigation channel. The greater depths in this area (> 20 m below CD, Appendix 14) would also lead to a significant cost increase for mooring structures installed into the seabed. Consequently, this 50 m band south of the Panamax, for the full width of the water lot, was considered too costly and too risky given the navigational and exposure concerns.

Regions identified in Figure 3 as suitable working sites for installing the drydocks and work pontoon are labelled as Working Regions 1, 2, and 3. The following points are noted for each region regarding their suitability for housing the new drydocks.

- Working Region 1: This area is located near the shore immediately south of the 190 m water storage barge that supports existing drydock operations. The water depths in this region range between 0 m and 7 m below CD. If the new drydocks were placed in this region, dredging of the seabed would be required. This region also currently supports active vessel operations, which need to carry on in this area as its adjacent to the water barge. Finally, the visual impact of the new drydocks will be less intrusive positioned further offshore. For these reasons, Working Region 1 is not suitable for the expansion.
- Working Region 2: The water depth in this region varies between 7 and 16 m below CD and is suitable for dry dock activities without dredging. This is also a suitable depth for pile installation with negligible impact on fish and fish habitat. If the three new structures were added in the intended configuration (Figure 2), but around the Careen in its current position, there would not be sufficient space between the work pontoon and the 190 m water storage barge to maneuver vessels. With some adjustments (discussed below), Working Region 2 is considered potentially suitable for siting the new drydocks.
- Working Region 3: This region in deeper water (16 m to 20 m below CD). Piling in this depth is feasible although more expensive than in shallower waters. Concern for fish and fish habitat is negligible at these depths, and it is more than sufficient for the required drafts and submerging depths for the smaller drydocks. There is a bit more exposure to navigating vessels in this area, but still within Seaspan's safety buffer. Consequently, Working Region 3 is also considered potentially viable for siting the new drydocks but may bring increased cost.

A review of the Working Regions determined that a combination of regions 2 and 3 would be preferred. By moving the Careen south by approximately 40 m, the work pontoon would be a reasonable distance offshore making room for vessels to maneuver between the work pontoon and the water storage barge. This position is also suitable for pile installation from cost and fish and fish habitat protection perspectives. The new drydock positions west of the Careen are in water depths suitable for their operations and they fall within the expanded water lot boundary. Finally, by moving the Careen and the new drydocks further offshore, the visual, air, and noise impacts will be reduced.

5.0 POTENTIAL ENVIRONMENTAL EFFECTS

Construction will be marine-based and therefore the potential effects primarily relate to:

- Fish and fish habitat; and
- Marine mammals.

The following potential effects were also specifically raised in the PER checklist:

- Contamination from spills, hazardous materials, or stormwater pollution;
- Marine traffic impacts;
- Air emissions impacts; and
- Noise, view, and shade impacts to the neighbouring community.

5.1 Fish and Fish Habitat

The site is located within Burrard Inlet, the only aquatic receptor of the Project. Project works could potentially lead to effects on water quality, and fish and fish habitat. Activities that have the potential to cause adverse environmental effects on water quality and fish and fish habitat in a marine environment include:

- Noise from pile driving;
- Increased turbidity during pile installation; and
- Reduced water quality due to concrete works.

Dredging and infilling are not required during construction of the Project, and therefore the potential for resuspension of sediment is low.

Construction activities are not expected to cause permanent adverse impacts to fish or fish habitat if the mitigation measures and Best Management Practices (BMP) in the CEMP are followed. Death of fish and HADD (harmful alteration, disruption, or destruction) of fish habitat will be avoided via several mitigations, including a soft start to construction, installing mitigations to reduce underwater noise, and preventing adverse impacts to water quality. Because the construction will only take place during the Least Risk Window, the potential for adverse impacts to fish (i.e., salmon) will be minimized. The fish habitat within the site has been surveyed and determined to be low quality. This assessment is aligned with DFO's risk-based approach considering the sensitivity of the fish and fish habitat. Further information is provided in the following sections.

5.1.1 Underwater Noise

Underwater noise and vibration will occur during various in-water works, including pile driving during construction in the Project footprint. Driving of piles shall be initiated using a vibratory or drop hammer. Although a diesel or hydraulic hammer or other technology such as drilling may be required to install the piles. If sound pressures that exceed DFO thresholds are measured, or distressed, injured, or dead fish are observed following the initiation of pile driving, work will be halted

immediately and measures (i.e., bubble curtain) to reduce the sound pressure waves will be implemented before the work is resumed. Details can be found in Sections 4.7 and 8.1.1 of the CEMP (Appendix 4).

Operation of the new infrastructure and the increase in vessel traffic are not expected to exceed noise thresholds for the protection of fish and marine mammals. New vessels that will be using the new drydocks will be considerably smaller than those currently using the facilities.

5.1.2 Concrete Works

During Project works, wet concrete will be used to infill six piles. This process has the potential to affect the water quality of Burrard Inlet through the accidental release of concrete into the marine environment or the release of concrete contact water. Water inside the piles will be monitored and captured for safe disposal during infilling and disposed of off site to ensure it does not spill over into Burrard Inlet (see further details in the CEMP, Appendix 4).

Mitigation measures are included within the CEMP to manage the potential for spills of cement-laden water to avoid exceedances of Council of Canadian Ministers of the Environment (CCME) Water Quality Guidelines for pH and turbidity outside of the immediate work area. There are also commitments to environmental monitoring to check whether pH or turbidity levels exceed the criteria defined in the CEMP.

5.1.3 Effects on Fish Habitat

Hatfield Consultants completed a marine Habitat Assessment (Appendix 9) in March 2021 to support the DFO Request for Review under the *Fisheries Act* and *Species at Risk Act* (SARA) and this PER application. The Habitat Assessment included a desktop review of existing studies for the defined Study Area and the results of a marine field survey. Based on the data reviewed and collected, Hatfield prepared habitat maps and assessed the value of the habitat with the potential to be affected by Project works. Hatfield also assessed the potential for the death of fish and HADD to fish habitat. HADD is interpreted as “any temporary or permanent change to fish habitat that directly or indirectly impairs the habitat’s capacity to support one or more life processes of fish” (DFO 2019).

Hatfield assessed the quality of the habitat in the Study Area using a diver-based video survey and has determined that the habitat is of low quality. Habitat-forming algae, such as kelp, cannot grow in the Study Area due to the abundance of silt and the depth (i.e., lack of sufficient sunlight penetration). Hatfield does not believe there will be any change that temporarily or permanently changes fish habitat due to the addition of the floating structures. The drydock expansion has been designed to minimize contact with the seabed, and the structures themselves are expected to become colonized by invertebrates and algae which will very likely create more fish habitat than currently exists.

5.2 Marine Mammals

Several marine mammals have been observed in Burrard Inlet, including sea lions, porpoises, dolphins, and whales. Cetaceans (whales and dolphins) are infrequent visitors to Burrard Inlet (Haggarty 2001) although sightings are becoming more common. They are unlikely to occur in the

Study Area due to the shallow depths. Pacific harbor seals (*Phoca vitulina richardsi*) are common in Burrard Inlet and two were observed during the habitat assessment in January 2021 (Appendix 9). Harbour seals are not considered at risk by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and have no status under the SARA (Government of Canada 2019).

Marine construction activities may generate underwater noise with the potential to affect marine mammals. Mitigation will be implemented to prevent auditory injuries or enduring behavioural changes (i.e., area avoidance), specific to the method of pile driving being conducted. Preference shall be placed on the use of vibratory pile driving techniques wherever feasible, and impact pile driving methods shall not be used unless vibratory techniques are found unviable. If sound pressures that exceed DFO thresholds are measured, mitigation shall include the deployment of a bubble curtain adjacent to the point of pile driving and the implementation of a soft start. There are also commitments to marine mammal observation during construction to minimize impacts to wildlife (Appendix 4).

5.3 Stormwater Pollution Prevention Plan

As with the existing drydocks, the new structures will be self-contained, with any collected water from all (existing and new) drydocks discharged to the sewer when vessels are onboard. Existing Seaspan stormwater management procedures will be followed during the operation of the drydock. A standalone Stormwater Pollution Prevention Plan has not been prepared, due to the very limited stormwater management that is required on the new structures, as described below.

No wastewater will be generated by the proposed new structures. Stormwater will be treated as follows:

- While a vessel is dry docked on the new structures, stormwater and vessel washwater will flow north into a collection tank and will be pumped into a holding tank. The water is then processed through a two-step treatment plant where particulates are first filtered out using sand then metals are filtered using activated charcoal. The water is then pumped to the sewer under a Metro Vancouver permit.
- Once work is completed on a vessel, the vessel and drydock are washed down (wash water flows to the sewer, as described above), and the uncontaminated vessel and drydock are lowered into the sea to allow the vessel to depart.
- When there is no vessel on the drydock, uncontaminated stormwater will drain to the Inlet.

5.4 Marine Traffic Assessment

There is no public marine use or navigation within the VDC water lot other than Seaspan operations and therefore, the potential for interference with public navigation due to the water lot project is limited. A significant increase in marine traffic associated with the Project is not expected.

The marine traffic during construction is expected to be limited to the area where the new floating drydocks will be placed. The details of equipment will depend on the methodology adopted by the selected contractor. The main activity anticipated during construction will be the installation of six new piles. The installation will likely be completed using spud barges, jack-up barges, barge derricks, and other floating construction plants, which will increase the marine traffic locally and temporarily.

During operations, a minimum increase in vessel traffic is expected as only five vessels can be serviced at any one time (one on each of the four drydocks plus a vessel in the water on the north side of the work pontoon), and the expected turnaround time for a vessel in drydock is two to three weeks. The existing Careen and Panamax will handle larger vessels, while the two new smaller drydocks will service smaller vessels (Table 3). Vessels will arrive at the facility via the First Narrows. Dry docking and launching of the vessels will be done using tug assist and equipment on the drydocks. Seaspan's extensive knowledge of the local marine conditions and operations inside Burrard Inlet plays an important role in finding the best windows to dry dock and launch vessels, minimizing potential impacts to the nearby public harbour traffic.

The mooring plan for the new drydocks was determined considering operational and extreme conditions. The mooring study was conducted using Optimoor, an industry standard software. The mooring line arrangement during operational and extreme conditions is shown in Appendix 1. The two new floating drydocks are expected to be permanently moored at the facility.

No additional navigation aids are required for the Project. All traffic into and within the facility is managed through Seaspan's internal operations. No training requirements are needed from the Pacific Pilotage Authority. Any additional utilization patterns will be presented in updates to operational management plans provided by Seaspan.

Table 3 Existing and new drydock vessel capacity.

Drydock	Existing Panamax	Existing Careen	100 m Drydock	55 m Drydock
Length (m)	up to 220	up to 130	up to 95	up to 50
Beam (m)	up to 45	up to 32	up to 26	up to 18
Maximum Draft (m)	8.8* over keel	10 over keel	8 over keel	6 over keel
Vessel Lift Capacity (t)	36,000	30,000	4,500	1,200

Note: * in current configuration

5.5 Noise Assessment

During current operations, the majority of work on the larger vessels dry docked on the existing Careen and Panamax involves cleaning and painting of hulls and exterior top sides. Occasionally, sections of steel require replacement, which involves cutting out and replacing areas of the hull or superstructure. The most prevalent source of noise is Ultra High Pressure (UHP) washing, which utilizes compressors to provide water under very high pressure via hoses to nozzles manned by specially trained personnel on portable man lifts. The majority of the UHP noise occurs at the nozzles and where the water jets hit the steel hull or superstructure.

On average, roughly 3 to 5 days of UHP work is currently required on any given project and the average duration of a project (i.e., work on a given vessel) is about two weeks which equates to approximately 104 days per year per drydock. Work within the existing drydocks is generally limited to a day shift plus a second shift (from 07:00 to 22:45) but the majority of UHP work is carried out by subcontractors that do not work past 18:00. Work occurs less frequently on weekends.

The proposed new drydocks will be used for smaller vessels such as fish boats. The amount/duration of UHP washing would likely be less on these smaller vessels and it would generally be limited to the day shift (07:00 to 18:00). Typical activities on these boats would not generate a significant amount of noise. In fact, their presence could be beneficial in that they could partially shield noise originating from the Careen, from residences to the north. Some noise from some positions is likely to also be shielded by the vessel itself.

The Noise Assessment Project Score sheet was reviewed (Appendix 7) and the Project will exceed the threshold of 30 points that leads to the requirement for an environmental noise assessment report as per the PER Guidelines. To assess the degree of impact as a result of changes to noise due to a project, a comparison between a measured and modelled baseline condition has been made to a predicted future condition post Project (Appendix 7).

During construction, the noisiest activity will be pile driving. The CEMP includes mitigation measures and BMPs for noise in air and underwater, which shall be implemented to minimize noise emissions resulting from Project activities during construction.

5.6 Air Assessment

VDC has been working with Metro Vancouver to develop a permit for the air emissions associated with existing operations (Table 4). If the Water Lot Project is approved, the permit will be amended to include the new drydocks. Air emissions from the proposed additional drydocks will be identical to the existing drydocks and it is projected that the annual emission rates in the permit application will be sufficient to accommodate the new drydocks.

Table 4 Emission sources from existing and new drydocks.

Emission	Sources
Volatile organic compounds	Paint application
Metals	Paint application
Particulates	Vessel surface preparation (i.e., paint removal)

The CEMP includes mitigation measures and BMPs that shall be implemented to minimize air emissions resulting from Project activities during construction.

5.7 View and Shade Impact Analysis

View and shade impacts associated with the proposed development have been assessed based on the surrounding private and public living spaces.

Shading from the new drydocks and work pontoon will be restricted to the water lot. Relative to the existing structures (Careen, Panamax, and the outfitting pier), there is not expected to be any shade impact on private or public space. Some of the viewpoints selected show potential shading and its limited footprint on the water (Figure A8.2). Therefore, the primary effort for this analysis is focused on view impacts.

The selection of viewpoints for the impact analysis considers residents living north of Esplanade, residents living immediately west of VDC, public access points from the west, and water side views from the south and southeast. Some of the representative images are views at elevation and others displaying the viewpoint of the observer at street level. Figure 4 indicates the locations where photographs were taken to create renderings:

1. Public pier – looking east;
2. Shipyard square – looking southeast;
3. Public walkway – looking southeast;
4. Victory Ship Way – looking southeast;
5. From Esplanade Avenue – looking south;
6. From the intersection of St. Georges Ave and 5th St. – looking south;
7. Aerial water side – looking northwest;
8. Aerial land side – looking south;
9. Aerial water side – looking north; and
10. Aerial land side – looking southwest.

Figure 4 Existing Seaspan VDC and viewpoints. Numbers relate to the locations listed above.



Legend

- Viewpoint
- Viewpoint Direction
- Bathymetry (Interval 10m)
- Vancouver Fraser Port Authority Boundary

Project Features

- Work Pontoon
- New 100m Dry Dock
- New 55m Dry Dock
- Relocated Existing Carren



0 50 100 200 m
 Scale: 1:8,000

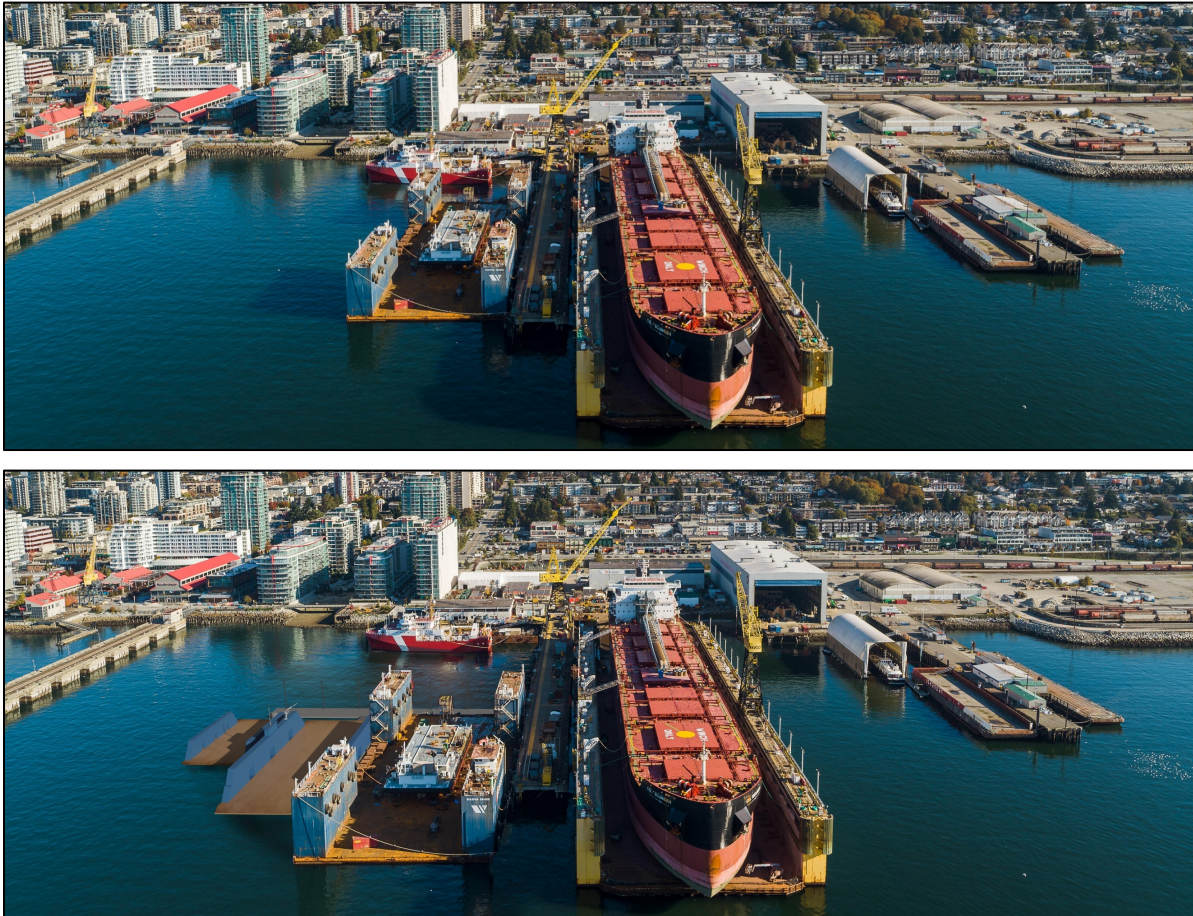
Projection: NAD 1983 UTM Zone 10N

- Data Sources:
- a) Project features, Advisian 2021.
 - b) Viewpoints and directions, water lot boundaries, Seaspan 2021.
 - b) Bathymetry, DFO 2020.
 - c) Vancouver Fraser Port Authority Boundary, Port of Vancouver 2018.
 - d) GeoEye-01 50 cm, 15 March 2020, Esri Online Service.



Images from the selected viewpoints show before and after representations of the Project (Figure 5 and Appendix 8). All new floating structures are significantly shorter than the adjacent Caren and Panamax. The wing walls of the larger 100 m drydock reach 8 m above the waterline, whereas the wing walls of the Caren are about twice as high (15 m above the waterline). Consequently, the new drydocks are not visible when viewing from east of VDC, looking west.

Figure 5 Aerial view of VDC facilities from the south, facing north. Current (top) and proposed (bottom) drydock infrastructure. Point 9 in Figure 4.



A minor change in the view is expected for observers directly to the north of the VDC facility. For example, viewers standing on Esplanade Ave. could just observe the new drydocks behind existing VDC buildings (Figure A8.5). The new infrastructure mostly covers the view of the water, but vessels aboard the drydocks would encroach on the view of downtown Vancouver on the opposite shore.

A minor change in the view will be observed from locations further northwest of VDC, for example on St. Georges street (e.g., at 5th street) since it is higher in elevation than the VDC facilities. The impact from this viewpoint is primarily on the amount of water covered by the new infrastructure (Figure A8.4). Because the new structures are relatively short, there is no impact on the view of the shoreline on the opposite side of the inlet (downtown/east Vancouver).

A change in the view is expected for observers west of VDC at street level and higher, for example from the end of the public pier, Shipyard Square, and Victory Ship Way (Figure 6 and Appendix 8). From these vantage points, the biggest impact is on the amount of water covered by infrastructure. The new drydocks will not block any scenery behind them (to the east), but rather, will blend in with the existing Careen. The work pontoon deck sits approximately a half meter above the waterline and will not obstruct the view of the outfitting pier and Panamax behind it although there may be equipment sitting on the pontoon that will be visible from the west side.

The new drydocks will come with their own lighting and new light posts will be installed on the work pontoon (see Section 3.2.2). The orientation and arrangement of these lights have been designed to minimize the light glare observed from shore (Figure 7).

Figure 6 View from Shipyard Square (west of VDC), facing southeast. Current (top) and proposed (bottom) drydock infrastructure. Point 2 in Figure 4.

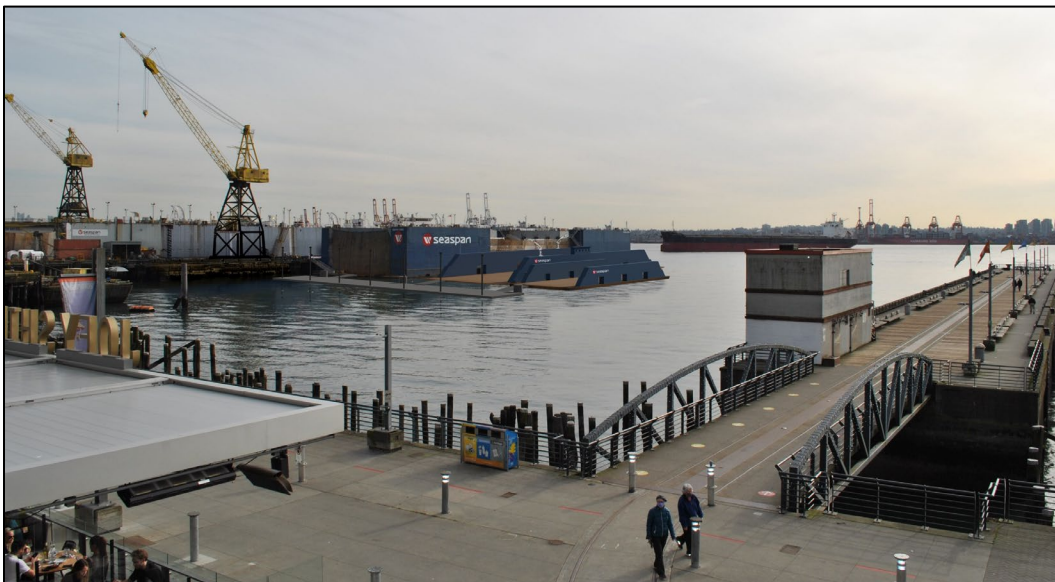
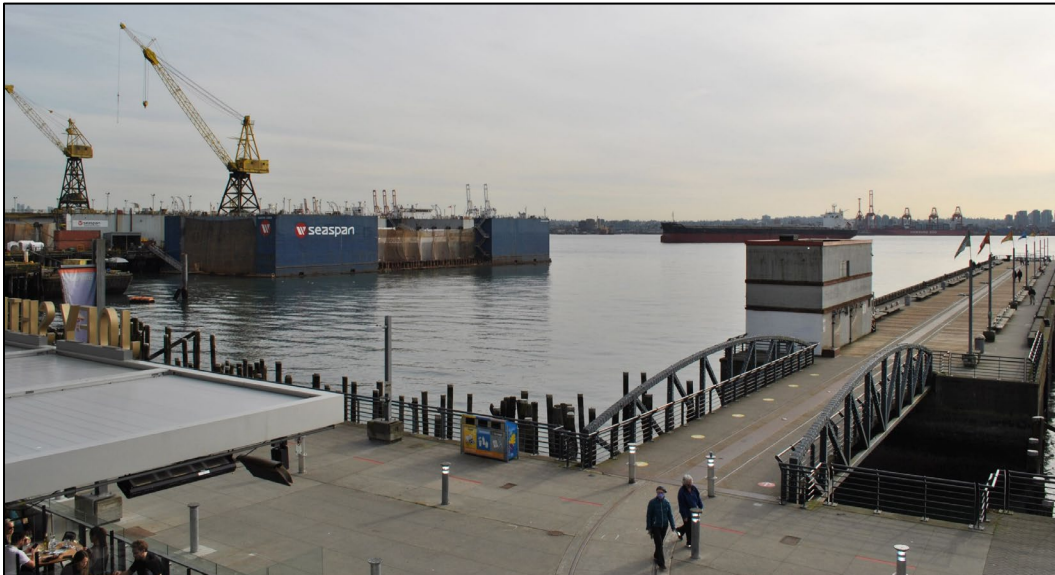


Figure 7 View from Shipyard Square (west of VDC), at night, with the proposed infrastructure. Point 2 in Figure 4.



5.8 Hazardous Materials Handling

Hazardous and potentially hazardous fuels, chemicals and other materials are likely to be on site during operations and construction. Hazardous materials anticipated to be handled or stored on site during normal operations include oil, adhesives, fuel, paint, solvent, batteries, compressed gas, cleaners, and resins. Copies of MSDS for hazardous materials to be used, handled, or stored on the site are available at the point of work of any hazardous material. Seaspan has existing BMPs in place for labelling, storage, handling, use and disposal of hazardous materials (Seaspan 2017), which align with existing regulations, standards, and guidelines (Table 5). In addition, hazardous waste management during construction is outlined in the accompanying CEMP (Appendix 4).

Table 5 Applicable regulations for hazardous materials handling.

Statute	Regulation / Guideline
BC Environmental Management Act	Hazardous Waste Regulation
Transportation of Dangerous Goods Act	Transportation of Dangerous Goods Regulations
Hazardous Product Act	Workplace Hazardous Materials Information System

5.9 Spill Prevention and Emergency Response Plan (on land and water)

Hazardous and potentially hazardous fuels, chemicals and other materials will be on site. Seaspan has existing BMPs in place for Spill Prevention, Response & Reporting (Seaspan 2017). Spill response procedures vary based on the quantity, type, and location of the substance and/or spill. All spills, regardless of type or volume, are to be reported to Seaspan and its Environmental Representative. Spills of flammable liquids, hydrocarbons, and oils >100 L are reportable to Emergency Management British Columbia. A detailed spill response plan is provided for construction in the CEMP (Appendix 4).

6.0 OVERVIEW OF ENGAGEMENT

6.1 Indigenous Interests

Seaspan understands that the VFPA will undertake consultation with Indigenous communities related to this permit application and welcomes the opportunity to participate in these activities as requested by our Indigenous neighbours and the VFPA.

As part of regular and ongoing communications with Indigenous communities, Seaspan will be providing a high-level overview of the proposed project, as part of a broader update on the various projects underway or planned at VDC and Vancouver Shipyards. These meetings are scheduled as follows:

- Squamish Nation – April 22, 2021
- Tsleil-Waututh Nation – April 13, 2021
- Musqueam Nation – To be determined

As per VFPA guidelines for Indigenous consultation, Seaspan understands Indigenous interests to include concerns, wants or aspirations for a wide range of issues related to the environment, social/education, economic development, etc. Seaspan is not aware of any known Indigenous interests in the proposed project area.

6.2 Stakeholders

6.2.1 City of North Vancouver

Seaspan proudly operates within the City of North Vancouver and regularly engages with elected officials and staff on VDC operations and activities. Seaspan has had ongoing dialogue with municipal officials, specifically related to the proposed water lot project, and welcomes the opportunity to continue these discussions as part of the permit technical assessment and review.

6.2.2 North Shore Waterfront Liaison Committee

Seaspan will request the opportunity to provide a project briefing to the North Shore Waterfront Liaison Committee at the next regularly scheduled meeting, once the VFPA confirms that the permit application is complete. It is our understanding that the next meeting will be in June 2021.

6.3 Public Engagement and Consultation

Seaspan recognizes the new floating drydocks will be close to nearby residential communities and has considered this as part of the proposed engagement activities. Seaspan will follow VFPA's specific requirements for Public Consultation as outlined in the PER checklist. This will allow full and complete public notification and sufficient opportunities for public engagement and feedback. Seaspan takes this responsibility seriously and has sought opportunities to further expand on those requirements – with a particular emphasis on creating accessible and engaging digital content in light of COVID-19 public health restrictions.

The approach to public engagement is described in detail in the Engagement Plan (Appendix 10), activities will include:

- Distribution of the project information package – digital & print;
- Feedback forms, available on the Seaspan website;
- A dedicated project email and phone line;
- Presentations to key stakeholders; and
- Online public information meetings.

Seaspan will provide notification to residents and businesses within a 1 km radius from the site. Ten days before the first scheduled public engagement meeting, the community will be notified of Seaspan's permit application and proposed public engagement activities. This notification will be distributed through:

- The Seaspan website;
- Newspaper advertisement;
- Direct mail (to approximately 7,200 residents and businesses);
- Social media (e.g., geo-tagged Facebook advertisements); and
- Email to such stakeholders as adjacent residential strata councils, nearby businesses, business associations, and adjacent terminals;

In addition to the project notice, Seaspan will prepare a comprehensive information package outlining the specifics of the project scope and proposed site activities. The package will be available by email and in print, on request. The information package will also be available on the Seaspan website.

Seaspan will host two live virtual community meetings three days apart to provide project information and address public questions. Recognizing the constraints of COVID-19, these meetings will be hosted on the Zoom platform. The VFPA requires a public consultation period of 25 business days during which public comment and feedback will be invited. Seaspan will collect all public feedback received during the engagement activities. An online form will be available on the Seaspan website as well as printed forms on request.

6.3.1 Public Consultation Materials

As requested in the PER checklist, Seaspan is pleased to provide a comprehensive public engagement and consultation plan (Appendix 10) and associated materials (Appendix 11 and 12) as follows:

- Public Engagement & Consultation Plan;
- Project website text and any online information - drydockprojects.com;
- Draft text of emails to stakeholders;
- Newspaper advertisement;
- Description of the public mail drop area;
- Public notification postcard;
- Project information guide;
- Public feedback form;
- Digital presentations - as all presentations will be undertaken virtually due to COVID-19, display boards will not be used as part of the public information meetings;
- Site rendering showing locations of planned infrastructure; and
- Sightline visuals.

At the conclusion of the engagement activities, an engagement summary report will be prepared for submission to VFPA. The summary report will also be available on the Seaspan website for public review.

6.4 Construction Communications Plan

Seaspan recognizes the importance of ensuring those living and working in and around VDC are aware of any construction and installation-related activities prior to getting underway.

While it is anticipated that impact on the adjacent community during installation of the floating docks will be minimal and limited to minor retrofits of the pre-assembled drydocks and the installation of the support pilings, in accordance with the VFPA requirements, Seaspan will ensure sufficient notice is provided prior to any construction activity commencing.

The draft construction communications plan can be found in Appendix 13. A pre-construction notification package will be prepared to provide to all stakeholders that will include the following information:

- Notice of the intended construction duration;
- Project overview and construction scope;
- Site plan;
- Construction timelines and hours of operation;

- Potential environmental effects and mitigations;
- Other information as required by the VFPA; and
- Seaspan and VFPA contact information.

Key messages and construction-related information will be largely determined by the final approved project and any conditions that may be applied by the VFPA. Upon project approval, key messages and project construction communications materials will be provided to the VFPA for prior approval. As per the CEMP, further notification will be provided if there is an extension of working hours. The CEMP also outlines reporting requirements associated with Environmental Monitoring.

7.0 REFERENCES

- [DFO] Fisheries and Oceans Canada. 2019c. Fish and fish habitat protection policy statement. Fisheries and Oceans Canada. Ottawa. [cited April 9, 2021] Available at: <https://www.dfo-mpo.gc.ca/pnw-ppe/policy-politique-eng.pdf>
- Haggarty DR. 2001. An evaluation of fish habitat in Burrard Inlet, BC, MSc thesis. Vancouver: The University of British Columbia.
- Seaspan ULC. 2017. Environmental Best Management Practices (BMPs). Latest revision: February 20, 2017.
- [VFPA] Vancouver Fraser Port Authority. 2019a. ShoreZone Portal. [cited April 9, 2021] Accessed at: <https://www.arcgis.com/home/item.html?id=5d877635a9a44257a56d395a43e0199f>
- VFPA. 2019b. Project & Environmental Review – External Guidelines for Public Engagement. Vancouver Fraser Port Authority. September 2019.
- VFPA. 2018. Project & Environmental Review Guidelines – Construction Environmental Management Plan (CEMP). Vancouver Fraser Port Authority. April 2018.
- Webb RH. 1996. Burrard Drydock Co. Ltd.: The Rise and Demise of Vancouver's Biggest Shipyard. *The Northern Mariner*, 1(3), p. 1-10.