SEASPAN VANCOUVER DRYDOCK WATER LOT PROJECT

Supplementary Public Engagement Summary Report
Appendix A: Proposed Project Fact Sheets
February 22, 2023

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APPENDIX A: PROPOSED PROJECT FACT SHEETS

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Proposed Project Fact Sheets

SUMMARY OF 2021 ENGAGEMENT

SPRING 2022

Seaspan has applied to the Vancouver Fraser Port Authority (port authority) for permit approval for its proposed water lot project at Vancouver Drydock. The port authority has deemed the project a Category C project under the port authority's **Project and Environmental Review (PER)**, and as part of this categorization provides specific requirements within its **public engagement guidelines** to ensure appropriate public notification and sufficient opportunities for public engagement and feedback.

In advance of undertaking public engagement activities in 2021, Seaspan submitted a public engagement plan to the port authority for approval. The plan approved in June 2021. Seaspan then undertook several activities to notify and solicit feedback from the community about the proposed project at Vancouver Drydock.

2021 Public Engagement

The initial public engagement period was 25 business days, from June 25 to July 30, 2021. On July 30, 2021, the engagement period was extended by a further eight business days, to August 12, 2021, to align with the Impact Assessment Agency of Canada's parallel public comment period:

PER application submitted	April 14, 2021
PER application deemed complete	June 21, 2021
Start of public engagement	June 25, 2021
Public engagement period	June 25 to July 30, 2021
Extension to public engagement period	July 31 to August 12, 2021
End of public engagement	August 12, 2021

2021 Community Notification Activities

Seaspan notified the community about the proposed project starting on June 25, 2021. A variety of channels were used for notification, including a project website, print and digital advertisements in the North Shore News, Facebook posts and advertisements, a direct mail postcard and notices to key stakeholders.

2021 Community Engagement Activities

Several materials were developed to allow the community to understand the scope and details of the proposed project. This included a project website with detailed project information, technical reports submitted to the port authority as part of the permit application, a project information guide and virtual site tour.

Seaspan hosted two virtual community information meetings on July 13 and July 15, 2021 to provide project information and address community questions. Seaspan presented information and responded to general project, as well as specific technical questions. Port authority representatives attended the sessions and were available to respond to specific questions about the permit application review process or other port activities.

55 individuals attended the July 13 meeting and 72 attended on July 15. Video recordings of both meetings, along with chat transcripts and questions not addressed during the meetings are available the **project website**.

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Seaspan also hosted a virtual meeting on July 28, 2021 with 20 representatives from neighbouring strata councils. Both Seaspan and port authority representatives attended.

2021 Public Participation

Seaspan gathered feedback from several sources, including from the online and printed feedback form, via email and voicemail. Seaspan also received feedback provided to the port authority and forwarded to Seaspan, as well as feedback provided by the City of North Vancouver, provincial and federal elected officials.

In total, 438 comments were received during the public engagement period. Of the 438 comments, 285 were identified as unique individuals or organizations.

Within the feedback form, community members were given the option to identify their community as either the City of North Vancouver, the District of North Vancouver or Other Municipality. Several community members also self-identified their place of residence in their comments.

Of those who submitted comments, the majority (67%) were located within the City of North Vancouver, and of those 64% self-identified as residing within the immediate vicinity of Vancouver Drydock.

2021 Engagement Summary Report

Following the public engagement activities in July and August 2021, Seaspan prepared an Engagement Summary Report that details the notification and engagement activities undertaken. The report was published on the project website on November 25, 2021, and is available on the **Learn More** page of the project website.

2022 Supplemental Public Engagement

Seaspan is now undertaking a number of supplemental public engagement activities to seek further input from the community on the proposed project mitigations that have been developed as a result of the feedback received.

This additional feedback will inform the final project mitigations that will be submitted to the port authority for consideration as part of the permit review process. Like the 2021 activities, a second Engagement Summary Report will be prepared and posted on the project website. Additionally, a Consideration Report will also be prepared detailing the community feedback received and how Seaspan intends to address feedback within the proposed water lot project.

AIR QUALITY

SPRING 2022

The Province of British Columbia, through the **BC Environmental Management Act**, has delegated the regulation of air emissions in the Lower Mainland to **Metro Vancouver** who are responsible for policies, bylaws and permits. Air emission bylaws and permits are supported by a comprehensive network of fixed and mobile air quality monitoring stations throughout the airshed.

Under Metro Vancouver's Air Quality Management Bylaw No. 1082, a **permitting system** is used to manage air emissions from large industrial and commercial emitters.

Vancouver Drydock Air Permit

In 2017, Vancouver Drydock applied to Metro Vancouver for an air emissions permit for the existing operations. Since that time, Vancouver Drydock has been and continues to actively work with Metro Vancouver to scope the parameters of the air permit and establish baseline metrics. Once approved by Metro Vancouver, Vancouver Drydock will be the first dedicated ship repair facility included in Metro Vancouver's permit registry.

The permit will define the type and quantities of air contaminants that can be released while minimizing the impact on public health and the environment and help Metro Vancouver reach its air quality objectives. The permit will regulate volatile organic compounds (VOC), metals and particulate emissions from on-site emission sources. Emission sources include the two existing floating drydocks, a surface preparation shed and a paint shed.

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Should the proposed water lot project be approved, the air permit will be amended to also include the new drydocks and work pontoon.

The types of activities and emissions from the proposed additional drydocks will be identical to the activities applied for in the 2017 air permit application. It is anticipated that the annual emission rates in the pending Metro Vancouver permit will be sufficient to accommodate the new proposed drydocks.

Air Quality Initiatives

Since applying for an air permit, Vancouver Drydock has completed a number of air quality improvement initiatives, including:

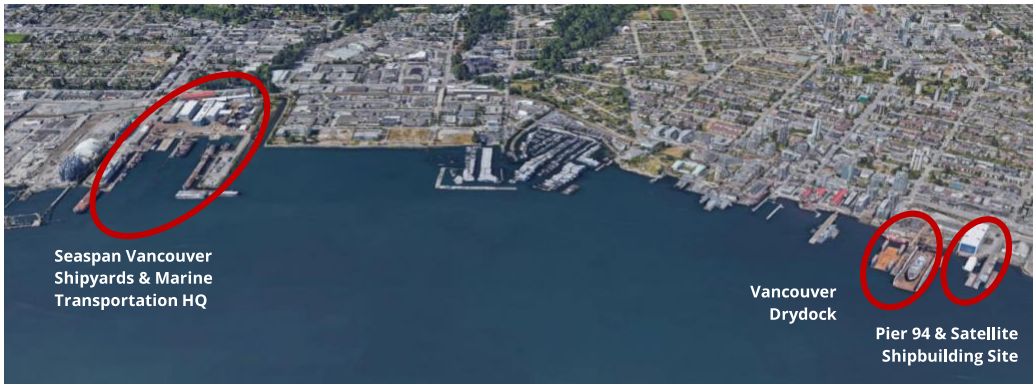
- Transitioned from grit sandblasting to ultra-high pressure (UHP) water surface preparation to reduce the potential for dust emissions.
- Adopted low carbon electrification of on-site equipment to reduce greenhouse gases.
- Using low volatile organic compound (VOC) paints, where practical.
- Using high efficiency paint spray nozzles.

Monitoring and Reporting

Particulate emissions monitoring is anticipated to be part of the Metro Vancouver air quality permit. An annual report will summarize results from the previous calendar year compared against the permit criteria and will be made available to the public through Metro Vancouver's website and on the Vancouver Drydock website.

Seaspan Master Waterfront Planning in North Vancouver

Seaspan operates three sites along the North Vancouver waterfront: its Pemberton Avenue campus, which is the headquarters for Seaspan Shipyards and Seaspan Marine Transportation; Vancouver Drydock at the base of St Georges Avenue; and Pier 94, which is directly east of Vancouver Drydock.



The nature of the shipbuilding, ship repair and marine transportation industries involves long-term planning and significant capital investment. In 2020, Seaspan engaged engineering consulting company Stantec to develop a master waterfront plan for its North Vancouver sites. The waterfront plan examined how Seaspan could meet growing demand for its services and expertise and how it could optimize its existing water lot use and on-land areas to support operations for both Seaspan Shipyards and Seaspan Marine Transportation – now and for decades to come. This plan was the catalyst for several projects that are now underway, including the proposed water lot project.

The waterfront plan determined that Seaspan's repair and drydocking services should be consolidated at Vancouver Drydock. Some repair and drydocking had been performed at Vancouver Shipyards, however consolidating this at Vancouver Drydock would enable Vancouver Shipyards to make all available space at the Pemberton Avenue site dedicated to construction and outfitting of the large, non-combat vessels for the Royal Canadian Navy and Canadian Coast Guard under the National Shipbuilding Strategy.

Today, Vancouver Drydock is Seaspan's primary vessel repair and drydock site in North Vancouver. The adjacent Pier 94 water lot is used for moorage, vessel maintenance and minor repairs, which do not require heavy mobile equipment or drydock services. These activities are consistent with the port authority's 'Industrial' land-use plan designation for these locations.

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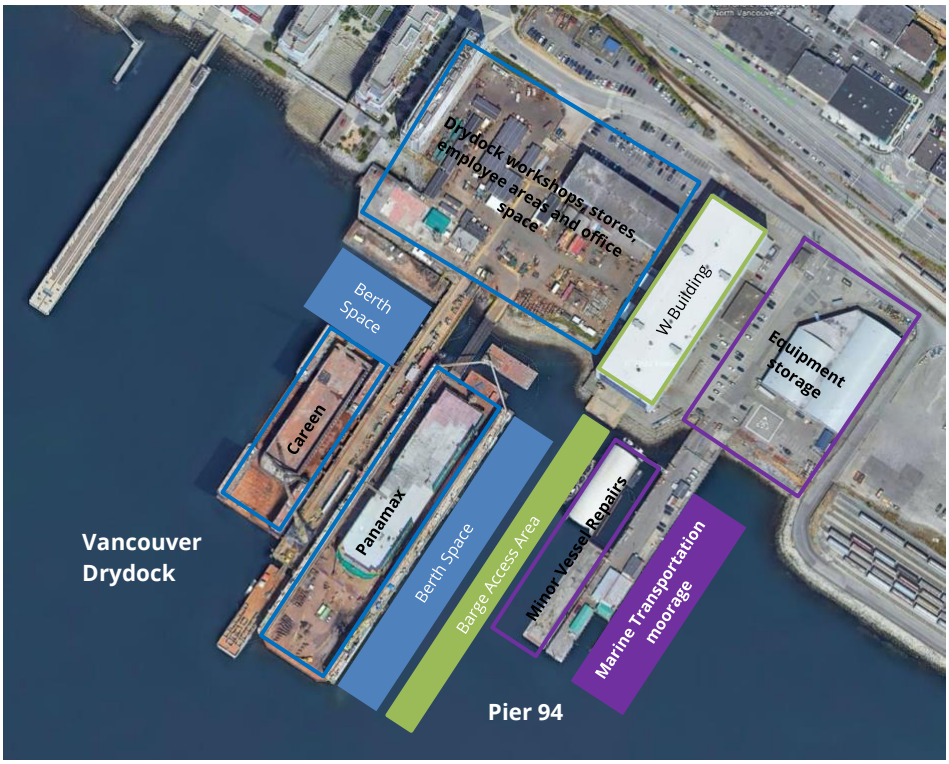


Existing uses of the Vancouver Drydock and Pier 94 sites

With the consolidation of repair and drydocking services at Vancouver Drydock, and recognizing the sustained high demand for these services, in spring 2021 Seaspan initiated a permit application to add two smaller drydocks and a work pontoon, and to extend its water lot by 40 metres to the west. This proposed change in the water lot exercises Seaspan's option in its 2018 lease agreement with the port authority to extend the Vancouver Drydock water lot to the west, subject to permit approval.

In addition to the proposed project at Vancouver Drydock, the master waterfront plan outlined several other projects, now underway at Seaspan's Pemberton site, to support the launching and outfitting of vessels constructed at Vancouver Shipyards. Details of the approved projects are available on the port authority's **Status of Permit Applications** page.

Two of these projects include the **Ship Load-Out Gravel Bed**, which involves building a 7,500 square metre gravel bed needed to safely launch the Joint Support Ships and the **Outfitting Pier Extension**, which entails removal of the existing timber pier from 1966 and replacing it with a concrete deck secured by steel piles.

The various projects at Vancouver Shipyards have reduced the amount of available water space around Seaspan's Pemberton Avenue site that has traditionally been used for Seaspan's Marine Transportation's tug fleet and moorage of its marine equipment.

Consequently, the waterfront plan identified the solution to move several barges from the Pemberton Avenue site to the Pier 94 site where they will continue to support the operating needs of the marine transportation business.

In September 2021, the port authority approved the **Pier 94 Mooring Piles project** (a category B project). This involves removing three existing steel-piled dolphins including their timber fenders and installing seven new one-metre diameter cantilevered steel mooring piles on the east side of Pier 94. Construction is scheduled to begin in summer 2022. Once complete, the area will continue to be used for moorage, vessel maintenance and minor repairs, which do not require heavy mobile equipment or drydock services. These activities are consistent with the port authority's 'Industrial' **land use plan** designation for this location.

Criteria for Drydock Siting Locations

In its assessment of potential siting locations for additional floating drydocks, Seaspan considered that several operational criteria must be met in order to carry out vessel repair and maintenance services. These criteria include:

1. A sheltered location, free from significant wave height and strong currents.

   Floating drydocks must be secured against a stable pier and must be sheltered from significant wave height and strong currents to protect the drydocks and the vessels within them. In the case of the Vancouver Drydock location, the existing drydocks benefit from the protection of the adjacent public pier and Lonsdale Quay.

2. An overall yard configuration that accommodates a 1:1 ratio of berth space to drydock length.

   To provide vessel repair and maintenance services, an operation must have equal drydock and berth space capacity to provide the necessary dry and water-based services. Drydock operations include both drydock and in-water activities. Drydock activities include painting and refinishing exteriors, replacing hull sections or propellers. In-water activities in the berth space include testing, trialing and commissioning of systems and equipment modifications or upgrades.

   Vancouver Drydock currently uses the berth space in the northwest of its water lot, as well as east side of the Panamax drydock. For example, the recent retrofit of the Canadian Coast Guard vessel *Sir Wilfred Laurier* included three months of activity in the Careen drydock, followed by six weeks in the berth space north of the Careen to trial and test the newly-installed vessel infrastructure.

3. Close to the on-site workshop and stores to provide access to replacement parts and materials, and proximity to employee spaces, such as lunchrooms.

   When a vessel is in drydock for repair or maintenance, there is a steady stream of employee and equipment activity between the on-land shipyard and the drydocks. Examples include components of the ship that need refurbishment or replacement need to move from the drydock to the shipyard, and from the shipyard workshop to the drydock for installation or equipment used for repair and maintenance must move from the shipyard to the drydocks.

   The components and equipment travelling between the shipyard and the drydocks are often large, weigh upwards of 20 tons, and need to be either carried by vehicle or lifted by cranes. On average, workers at Vancouver Drydock make six to eight roundtrips a day between the on-land shipyard and the drydocks, with each roundtrip ranging from approximately 200m to 700m. These trips include moving components and equipment as in the above examples, along with travel to and from employee spaces used for such activities as health and safety training and the lunchroom areas during designated break times.

Having an efficient layout is important to drydock operations to ensure that the team can carry out repair and maintenance projects at the required safety and quality standards in a timely way. The current on-land layout at Vancouver Drydock is designed for efficient operations and minimal travel between the shipyard and the drydocks. As an analogy, when completing a home renovation, the availability and proximity of construction supplies, tools and equipment is a necessity for timely and efficient renovations.

4. Direct access to the drydocks via the service pier for frequently-used mobile equipment – specifically cranes, forklifts, and mobile lifts – that weigh upwards of 20 tons.

   Service piers must have the size and capacity to carry the loads of large mobile equipment, components which are either removed from or installed into the vessels, and supplies used for vessel repair activities. The equipment and machinery to serve the smaller drydocks would be of a similar weight and scale as those used in operations today at Vancouver Drydock. For example, a mobile lift weighs 14 tons itself, a forklift weights up to 18 tons and carries loads of up to 15 tons.

5. Water depth of between 12 metres and 15 metres.

   12 meters is the minimum depth required to operate a drydock, given that it needs to move up and down within the water column for arriving and departing vessels.

6. Unencumbered barge access to the adjacent W Building Site – the satellite shipbuilding facility.

   Barges require access to the W Building, at minimum, every two weeks. Within the basin, the distance between the Panamax and Pier 94 is approximately 95m. Shipbuilding components leave the W building by barge approximately every two weeks. The barges servicing the W building are approximately 20 metres wide. To safely maneuver the barges, there must be sufficient clearance for the tugs, barges and vessels occupying the berth space.

7. Does not impede safe navigation of vessels within the Vancouver Drydock basins and in Burrard Inlet.

   Vessels and tugs must be able to be safely berthed within the existing and proposed drydocks and safely navigate within the basins to the west and east of the existing drydocks. Drydocking is a complex task that requires a high degree of accuracy to ensure that the vessel being drydocked is placed precisely in the drydock so that it remains stable, upright, and free from damage when it is raised out of the water. Adequate space around the drydock is needed, as drydocking a vessel requires two to four tugboats to precisely maneuver the vessel into position.

   Any future proposed drydocks must have sufficient distance from the Burrard Dry Dock public pier and the main Burrard Inlet navigation channels. The future proposed drydocks also must stay within the southern boundaries of the water lot, which restricts how far south the drydocks can be positioned. Additionally, anything that is too far south would not be permitted by the port authority.

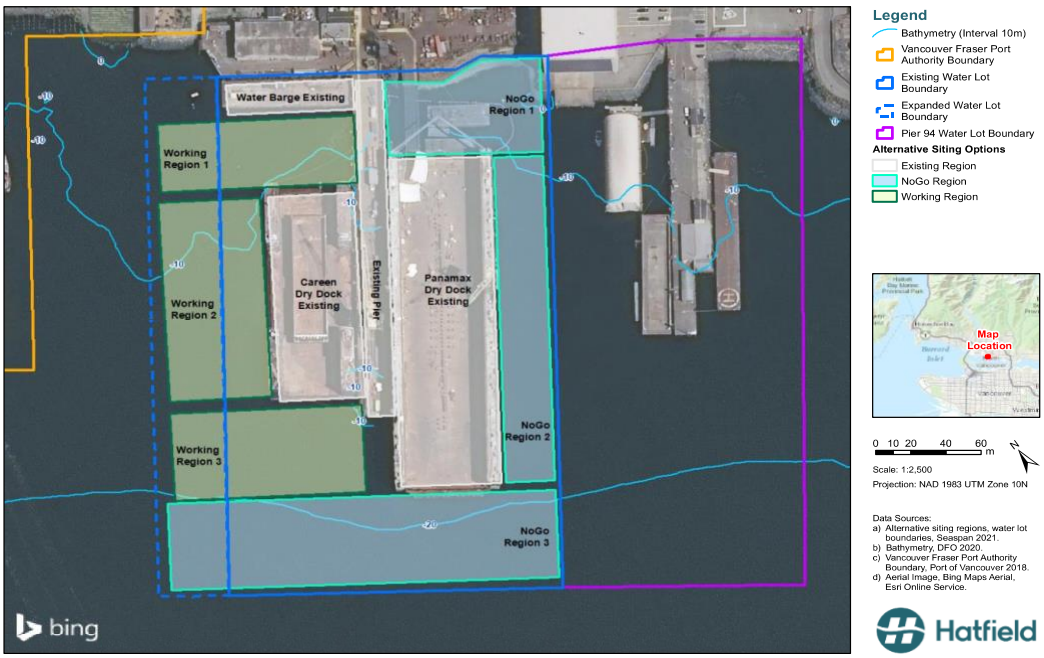
8. Community Proximity

   Given that the area to the west of Vancouver Drydock's site, previously used for industrial activity, has been developed for adjacent residents and businesses as the Shipyards District, Seaspan added an eighth criteria, community proximity, in its assessment of potential drydock locations, with the intent to reduce impacts of operations on the adjacent community.

Potential Siting Locations

Through the lens of the eight criteria noted above, Seaspan conducted an analysis to determine potential areas within Vancouver Drydock's water lot and, subsequently, the feasibility of the adjacent water lot directly east of Vancouver Drydock's current operations (Pier 94), which is leased by Seaspan ULC.

The western areas of Vancouver Drydock's water lot were a primary focus because the company's lease terms with the port authority allow for an expansion of the water lot to the west. The southern areas were also considered because they were not in active use by Vancouver Drydock other than for vessel movements and were a farther distance away from adjacent residences. The eastern portion of the water lot was also considered, although already in active use by Vancouver Drydock.



Vancouver Drydock potential siting locations

Seaspan identified six potential site locations for the additional drydocks within its existing water lot, expanding to the west, east and south. For each of these locations, Seaspan applied a rating of *requirement met* (green), *requirement partially met* or *inefficiency introduced* (yellow), or *requirement not met* (red) against the criteria. Any potential site where one or more of the criteria could not be met (red) was eliminated.

Based on this analysis, three of the six sites were identified as potential siting options (Working Regions) and three were eliminated (No-Go Regions). Results of the analysis are discussed below.

Analysis of Effective Siting Locations

The working regions 1 and 2 are operationally viable, while working region 3 is not viable:

Operational Requirements	Working #1	Working #2	Working #3	No-Go #1	No-Go #2	No-Go #3
Sheltered location	🟡	🟢	🟡	🟡	🟡	🔴
1:1 berth space to drydock length ratio	🟡	🟢	🟡	🟡	🔴	🟡
Workshop stores and employee spaces proximity	🟢	🟢	🟢	🟢	🟡	🟡
Mobile equipment direct access with 20T pier capacity	🟢	🟢	🟢	🟢	🟡	🟡
12m to 15m water depth	🟡	🟢	🟢	🟡	🟢	🟢
W Site barge access	🟢	🟢	🟢	🟡	🟡	🟡
Safe navigation	🟢	🟢	🔴	🔴	🟡	🔴
Community proximity	🔴	🟡	🟢	🟡	🟡	🟢

Key	Requirement is met	Requirement partially met	Requirement not met

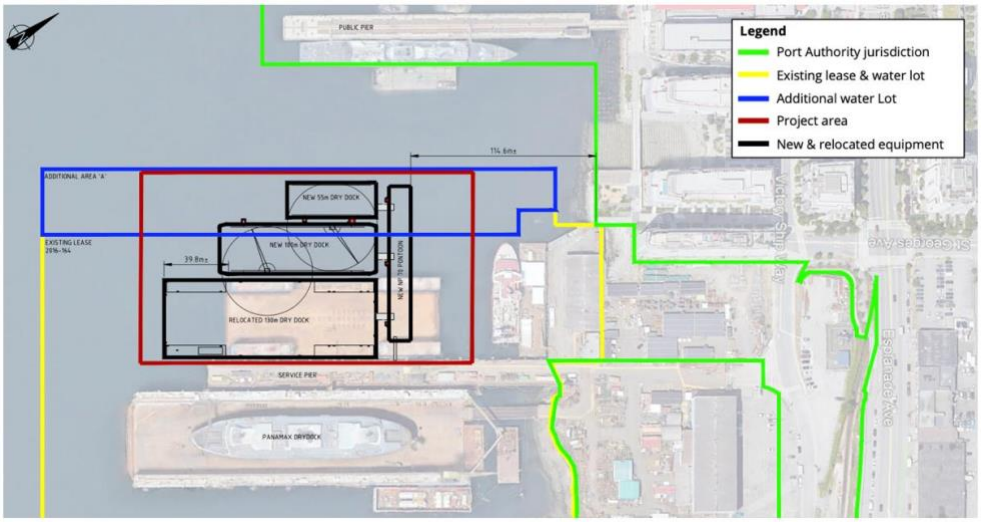
Criteria Rationale

- Working Region 1 can only accommodate one drydock and has an operational and environmental downside; dredging of the area would be required and is closest to the adjacent community.
- Working Region 2 can accommodate both drydocks if a work pontoon is included, and is similar proximity to Region 1
- Working Region 3 can only accommodate one drydock, but is not viable, as access to the Careen is blocked, which would restrict the safe navigation into and out of the Careen. There is also too much exposure to the main Burrard Inlet navigation channel.
- NoGo Region 1 is not operationally viable because it eliminates shore access to the Panamax and requires significant dredging to address the shallow seabed elevation, does not provide sufficient berth space and can only accommodate one drydock.
- NoGo Region 2 is not operationally viable because the existing berth space (east side of Panamax) is eliminated, movement to and from the drydocks would require two crane lifts and the drydock is not accessible when the Panamax is loading and unloading vessels, and can only accommodate one drydock (a second drydock would block access to the W-building).

- NoGo Region 3 is not viable because it has unsafe exposure in deep water, it blocks the entrance to the Panamax, and would require excessive marine structure to facilitate mooring of the drydock.

Proposed Site Location

From its analysis, Seaspan determined that the combination of Working Regions #2 and #3 – that is, shifting the Careen away from the shore by approximately 40 metres and siting the new drydocks next to it – presented the best balance of operational requirements and reduced adjacent community impacts. This is the siting that Vancouver Drydock presented to the port authority in 2021 for consideration, along with a number of technical studies in support of its application.



Vancouver Drydock Proposed Water Lot Project Siting

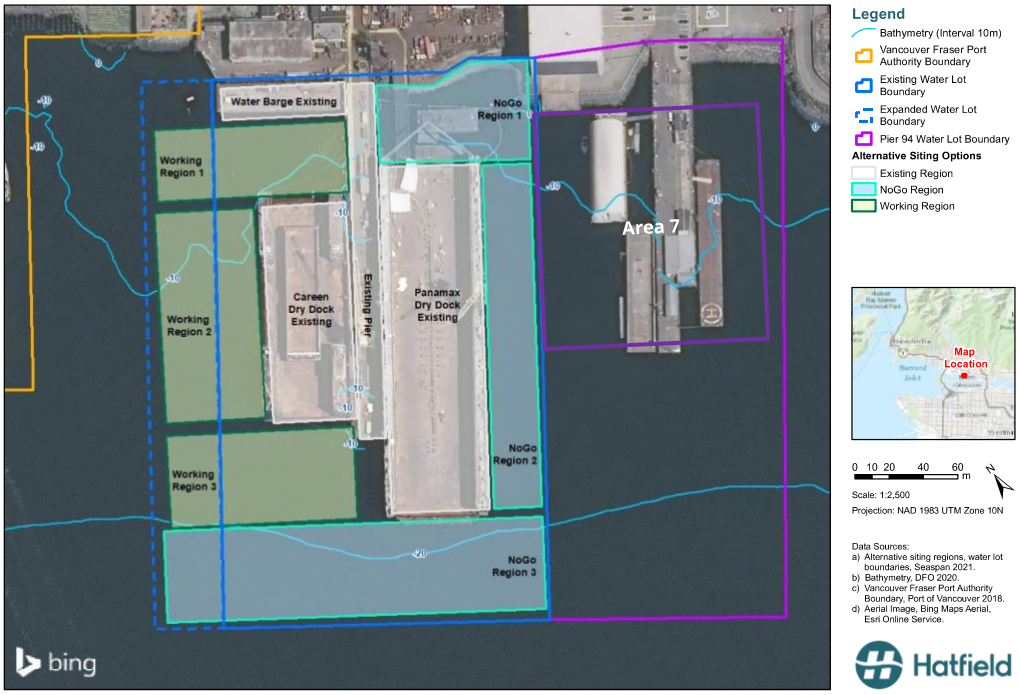
Alternate Siting Location – Area 7 (Pier 94)

In its siting assessment submitted in 2021, Seaspan did not consider any locations beyond the Vancouver Drydock water lot that were not specifically noted in its lease agreement with the port authority.

The water lot to the east of Vancouver Drydock's operations is commonly known as Pier 94. Vancouver Drydock did not present this as an option for the proposed new drydocks in 2021 for two reasons:

First, this water lot is leased to Seaspan ULC for its Marine Transportation business. While Seaspan ULC is the parent company of Vancouver Drydock and the Marine Transportation businesses, they are separate legal entities. Similarly, if business owner leases a commercial property and is planning an addition, they would not typically consider making the addition on an adjacent property leased by their neighbour.

Second, the Pier 94 water lot is already in use for moorage, vessel maintenance and minor vessel repairs (activities not requiring heavy mobile equipment or drydock services) and will continue to be used for these activities. As noted above, Seaspan's master waterfront plan to make the best use of existing water lot areas in North Vancouver identified the Pier 94 water lot area to accommodate moorage of marine assets, displaced at Vancouver Shipyards, to support the operating needs of the Marine Transportation business. Seaspan received a permit from the port authority in September 2021 to carry out the necessary site upgrades to accommodate these marine assets.



Water lot boundaries for Vancouver Drydock and Pier 94 areas, noting the additional area analyzed (Area 7)

Analysis of Area 7 (Pier 94)

While the Pier 94 water lot is leased to and in use by another legal entity, with the feedback from the community in summer 2021, Vancouver Drydock completed a detailed review to assess the feasibility of using this adjacent water lot.

The analysis applied the same criteria used for the Vancouver Drydock water lot and again applied a rating of *requirement met* (green), *requirement partially met* or *inefficiency introduced* (yellow), or *requirement not met* (red) against the criteria.

This further analysis affirmed that, even if the Pier 94 water lot was available to Vancouver Drydock, this location does not adequately support operational requirements.

Operational Requirements	Area #7
Sheltered location	🟡
1:1 berth space to drydock length ratio	🔴
Workshop stores and employee spaces proximity	🟡
Mobile equipment direct access with 20T pier capacity	🔴
12m to 15m water depth	🟢
W Site barge access	🟡
Safe navigation	🟢
Community proximity	🟢

Criteria Rationale

- The use of both new proposed drydocks in Area 7 would require demolition of the existing Pier 94 and a complete reconstruction to enable the operational weight bearing requirements to be met. Pier 94 is old, in poor condition and does not have the load bearing capacity to support manlifts, forklifts and mobile cranes – all of which are essential for a ship repair operation. The amount of capital investment required for complete reconstruction is not economically feasible for this project.
- There is currently no access for pedestrians or vehicles to travel on land on the south side between the Vancouver Drydock site and the Pier 94 site. To enable workers and equipment to travel efficiently between these two sites, a bridge would need to be constructed. The amount of capital investment required for this construction is not economically feasible for this project.

- To travel on land on the north side between the Vancouver Drydock and Pier 94 site, workers and equipment would need to travel 900m to 1.2km and would be required to exit and enter two secure areas and four security checkpoints (as they enter and exit each site) for each round trip. While technically feasible, this is logistically and financially unsustainable.

  Between these two secure sites, workers and equipment would be on an open port authority roadway between the Vancouver Drydock and Pier 94 sites. While challenging to move large equipment in this way, it also compromises the security requirements that are part of some of the vessel repair activities that happen at Vancouver Drydock today.

  In addition, the road may need to be regularly blocked to other traffic in order to move large equipment between sites. This could be problematic for road access to Richardson International or for emergency services requiring access along the road.

  Heavy equipment is used in vessel repair operations, and it is unknown if the existing road has enough reinforcement to withstand regular heavy loads transported between the sites. The road may need to be upgraded to allow for the safe movement to and from the machine shop on the Pier 94 site next door.

- A new crane with rails may be required to operate the drydocks in this location. Drydock operations occasionally require a crane to travel while carrying a heavy load, an activity that cannot be accomplished with a mobile crane.

- A permanent drydock at Pier 94 would further restrict the open space in the W building basin, reducing Vancouver Drydock's existing and necessary berth space, as noted in the criteria descriptions above.

VANCOUVER FRASER PORT AUTHORTY LAND USE PLAN

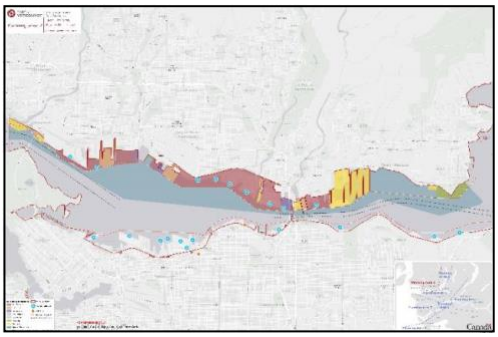
SPRING 2022

(SOURCE: https://www.portvancouver.com/land/land-use-planning/)

The port authority is responsible for Canada's largest port, and needs to carefully balance multiple priorities and interests across its jurisdiction.

Similar to a municipality's official community plan, the port authority's **Land Use Plan** describes the long-term land use policy directions and framework to guide existing and future development of the lands and waters it manages for the next 15 to 20 years. Read the document **here**

Land Use Planning Area 2: Burrard Inlet North Shore



Lands and waters within the port authority's jurisdiction are organized into seven planning areas based on geography and port-related activities. The proposed project is located in Planning Area 2: Burrard Inlet North Shore.

Planning Area 2 area extends from the southeast area of Ambleside Park in West Vancouver to Cates Park/Whey-ah-Wichen in the District of North Vancouver. It borders the District of West Vancouver, the City of North Vancouver, the District of North Vancouver, and the reserve lands of the Squamish and Tsleil-Waututh Nations.

This area is a critical export gateway to the Asia-Pacific region and supports export-based industries, including agriculture, forestry, mining and manufacturing in British Columbia and across Canada.

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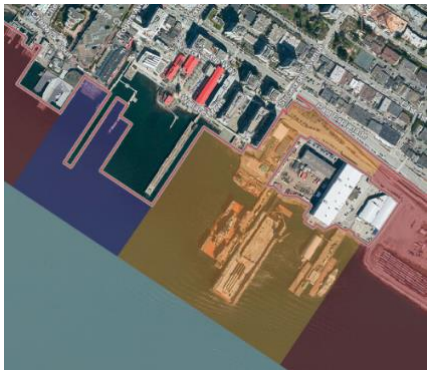
Land Use Plan Designations

The port authority's land use plan has eight designations. These include designations that relate to both land and marine uses. Each designation has a list of primary and ancillary uses.

1. Port terminal
2. Industrial
3. Commercial
4. Log storage and barge moorage
5. Recreation
6. Conservation
7. Port water
8. Special study area

Land Use Designations Specific to this Proposed Project



The land use designation for the area leased by Vancouver Drydock and the location of the proposed expansion is 'Industrial'. This is shown in orange on the graphic.

The land use designation to the east of Seaspan's lease areas is 'Port terminal'. This is shown in red.

The designation to the west is 'Commercial' and is shown in purple.

The primary and secondary uses for these three areas are detailed below. To find more information on all port authority land use plan designations, please review **page 51 of the plan**.

Port terminal

Port terminal areas are primarily designated for deep-sea marine and river terminals that handle a variety of cargo, including automobiles, breakbulk, dry bulk and liquid bulk cargo, and containers, as well as cruise passengers. This includes primary trade-related uses that support shipping, transportation of goods and passengers, and handling of goods, among other uses. Ancillary uses may include offices, storage areas, caretaker facilities, and other uses required to support the primary use.

Industrial

Industrial areas are primarily designated for light to heavy industrial activities in support of port operations and marine support services, including goods shipping, transportation, handling, and, in some cases, manufacturing. Primary uses may include intermodal yards, warehouses, container storage facilities, transloading facilities, ship repair, and barge moorage activities. Ancillary uses may include offices, storage areas, caretaker facilities, and other uses required to support the primary use.

Commercial

Commercial areas are primarily designated for commercial activities related to port or marine support services, tourism-related businesses, transportation of passengers, and the handling and storage of goods. Primary uses may include marinas, float plane terminals, warehouses, and tourism-related businesses. Ancillary uses may include offices, storage areas, caretaker facilities, and other uses required to support the primary use.

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LIGHTING

SPRING 2022

The lighting plan for the new proposed drydocks and work pontoon has been designed to address three important criteria: to be **dark-sky friendly**, to minimize glare in the marine environment and towards the shoreline and to meet all necessary requirements for safe operations.

Dark Sky Friendly Certified Lighting

To be considered dark-sky friendly, lighting designs need to meet the International Dark-Sky Association recommendations to minimize light pollution. Specifically, lighting should:

- Only be used when needed (photocell and dimmer controlled).
- Only illuminate the areas needed (dark sky friendly).
- Be no brighter than necessary (illuminated to appropriate code requirements for safety and operation).
- Minimize blue light emissions (by using 3000degK (warm) colour temperature rather than 4000degK (cool) colour temperature).
- Be fully shielded.

Drydock Lighting

The two proposed new drydocks will have lighting to support work being carried out on vessels in the drydocks, with lights positioned to face inward and down to only illuminate the interior of the drydocks. Once the proposed drydocks are onsite at Vancouver Drydock, the lighting systems will be assessed and if need be, retrofitted to minimize light spill and be dark-sky friendly.

Work Pontoon Lighting

On the work pontoon, lighting has been designed to eliminate light outside of the required circulation and work areas. Seven 7.5-metre tall light poles will be installed along the north edge of the pontoon. Each pole will have two fixed-position lights, one area light on the south side and one floodlight on the north side.

To address light spread, the south-facing area lights will point directly down to illuminate the pontoon and the access ramps to the drydocks. These lights will be controlled by photocells for on/off control and will be fitted with a motion sensor to dim when no motion is detected. Because the lights are installed horizontally, light fall-off is reduced, which means there will be no light pollution to the sky, nor glare to passing vessels or to people on shore.

The north floodlights will be tilted 30-degrees up from horizontal, with manual on/off controls and motion sensors. These lights will be used when there is a vessel moored to the north side of the new work pontoon, to support vessel berthing and installation of access walkways to vessels. When a vessel is moored, it will act as a shield to further block lights from the shoreline.

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House Side Shields

House side shields are covers built into or attached to lighting to further reduce light spread. As the example below shows, a house side shield has been used to reduce light spread towards the home.

House side shields will be used on the north, shore-side of the work pontoon light fixtures. With shields added, the lighting spread will be reduced to zero at 11m/35ft from the work pontoon (as opposed to 28m/92ft without a shield).

Example of how a house side shield works

Existing Operations Retrofit

While existing operations are outside the of the scope of this proposed project application, Seaspan has initiated design work to retrofit existing light pole and building mounted lights across the entire Vancouver Drydock site with dark-sky friendly lighting, and to incorporate house side shields, where appropriate.

MARINE HABITAT

SPRING 2022

As a shipbuilding, ship repair and marine transportation company, marine habitat protection is a priority for everyone at Seaspan. Marine wildlife and habitat protection is strictly controlled by Fisheries and Oceans Canada (DFO) and Seaspan follows all regulatory requirements.

Proposed Project Habitat Assessment

In advance of applying for port authority permit approval for the proposed water lot project, existing studies from Burrard Inlet were reviewed and a dive-based habitat survey was conducted to assess the potential impacts of the project on the marine environment in the water lot area.

The **habitat assessment** concluded that the seabed in this area does not support marine vegetation (e.g., seaweed or eelgrass) because the sediment is composed of silt (which cannot support seaweeds) and the water is too deep to support eelgrass.

Specifically, the studies noted that fish habitat-forming algae, such as kelp, cannot grow on the seabed in this area because the sediment is too fine. Kelps need hard structures like cobble and rocks to grow on. The proposed structures will be installed in deeper waters, which are also not suitable for kelp or marine vegetation like eelgrass that might do well with fine sediments. Marine vegetation needs sunlight to photosynthesize; the seabed in this area is too deep for sufficient sunlight penetration through the water.

Organisms that were observed during the habitat assessment included sea anemones, sea stars, sea slugs, small fish, and crabs. These organisms will not be affected by shading from the new structures because they do not rely on sunlight for food.

The environmental consultant also noted that should the proposed project be approved, the addition of six piles would provide a surface for marine invertebrates (e.g., mussels, anemones) in a location where there is currently no hard surface to attach to, resulting in more marine habitat for these organisms.

This pre-work formed the basis of a Project Review document, which was submitted to DFO – a requirement for marine-based activities, such as pile driving. DFO agreed with the environmental consultant (Hatfield Consultants) who prepared the Project Review document, that, with mitigations in place for pile driving, negative effects of construction or operations on marine habitat are unlikely with the implementation of proposed mitigation measures.

Habitat Enhancement

Along with community and First Nation partners and advisors, Seaspan has helped implement several habitat restoration projects in the Mackay Creek estuary over the last 10 years. Seaspan is currently building marine fish habitat east of its Vancouver Shipyards site, near the mouth of Mackay Creek. Seaspan also supports habitat restoration efforts in Mosquito Creek and is an ongoing supporter of the Pacific Salmon Foundation and local hatcheries such as at Mossom Creek. Seaspan also supports efforts to improve water and sediment quality through projects like the removal of abandoned creosote piles, in partnership with the Tsleil-Waututh Nation.

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Protection During Construction

As noted in the Project Construction fact sheet, and as recommended by DFO in their Letter of Advice, a professional third-party Environmental Monitor will be on site throughout the construction period to oversee all environmental aspects of the project, including measuring underwater noise and observing wildlife use of the area to ensure wildlife are protected.

If marine mammals get too close to the construction works and a condition arises which potentially threatens their safety, work will be halted until the safety of the marine mammals can be demonstrated.

Vancouver Drydock Water Usage and Treatment

As with all of Seaspan's operations, water usage and disposal are carefully controlled. Water does not drain into the ocean, rather, when vessels are in the drydocks, the water used to wash vessels and stormwater are collected into on-site holding tanks within the on-site wastewater treatment facility. From the holding tanks, water is treated to remove potential contaminants through a two-step process where particulates are first filtered out using sand then metals are filtered using activated charcoal. The water is then discharged to the sanitary sewer, as permitted by Metro Vancouver.

The proposed new drydocks would be connected to this existing wastewater treatment system.

Safe Vessel Operations

All vessels operating in the harbour are responsible for understanding and operating within **Transport Canada regulations** and local requirements. Prior to a vessel arriving at Vancouver Drydock, vessel owners or their representative(s) are advised of safety policies and procedures, environment and waste management regulations, and docking requirements.

Marine Spill Response

Seaspan takes every precaution to avoid spills into the marine environment and has well-established preventative maintenance programs, fuel and oil handling procedures, and robust spill response plans, equipment, and training at all our facilities and vessels. For more information, please see the Spill Prevention & Emergency Response and Project Construction Fact Sheets.

NOISE

SPRING 2022

At Vancouver Drydock, we service and repair vessels that range in size from a SeaBus and fishing boats, to Coast Guard vessels and large freighters. Specifically, we clean and paint hulls and exteriors, retrofit interiors, repair and replace worn or damaged parts and replace sections of steel which involves cutting out and replacing areas of the hull or superstructure.

Noise is generated at Vancouver Drydock as vessels and tugs arrive and depart, when pressure washing hulls, during repair work, gantry crane movements and other general site activities which include safety alarms and alerts.

Ultra-High Pressure Washing

The most notable source of noise is Ultra-High Pressure (UHP) washing, which uses compressors to provide water under very high pressure to remove debris and paint. Vancouver Drydock adopted UHP technology in 2020 to improve air quality by eliminating the potential for dust generated by the grit blasting technique used previously. Noise is generated at the nozzles and where the water jets hit the steel hull or superstructure.

Port Authority Noise Requirements and Monitoring

The port authority recognizes that while port operations are industrial by nature and occur on a 24/7 basis, the port authority and its tenants, including Vancouver Drydock, have a responsibility to work to minimize noise impacts on surrounding communities.

As part of these efforts, the port authority has a **Noise Monitoring Program** including 11 monitoring stations throughout the Lower Mainland to identify and track noise issues raised by communities and to work toward mitigation, where possible. Real-time noise levels are publicly available on the port authority's website for each of the monitoring stations. The monitoring station that is in closest proximity to Vancouver Drydock is located at St. Georges Avenue and Victory Ship Way.

Each monitoring station has an alert threshold, which is the background noise plus 10 decibels (dBA). Within the port authority's most recent **2020 annual noise monitoring report** for the St. Georges location it is noted that "there were minimal alerts generated at this site, with most alerts generated during the nighttime." Night periods within the report are defined as 10:00pm to 7:00am.

Operating Hours

Similar to other port authority tenants, Vancouver Drydock operations can occur year-around, 24 hours a day. The majority of the time, Vancouver Drydock operates two shifts from 7:00am to 10:30pm. Overnight activities are usually limited to such things as vessel arrivals and departures, which for safety, must be timed to align with the tides and currents, as well as urgent repair projects.

We recognize that our industrial operations are adjacent to residences and whenever possible schedule activities with the highest potential noise impact during the daytime from 7:00am to 7:00pm.

Noise Concerns

The port authority notifies Vancouver Drydock of all community noise complaints, which are investigated to determine the root cause. When contact information is provided, concerns are addressed directly with individuals.

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In 2021, Vancouver Drydock received two noise complaints. One was determined to be pressure washing activity at the facility and the other was road repairs on Esplanade from a City of North Vancouver contractor.

Permit Application Noise Assessment

As part of our permit application, Vancouver Drydock engaged an independent engineering firm specializing in acoustical consulting to undertake an **Environmental Noise Assessment.** The assessment followed the port authority's ***Project & Environmental Review (PER) Guidelines - Environmental Noise Assessment*** and compared the predicted post-project noise impacts against the PER Assessment Guideline indicators.

The engineering firm used a 3D model to assess noise levels at the nearby Trophy, Cascade East and Cascade West developments. The model predicted that the LRden (rated day-evening-night equivalent sound level) would increase one decibel (dBA) at the Trophy (65 dBA to 66 dBA) development and three dBA at both the Cascade East (62 dBA to 65 dBA) and Cascade West (60 dBA to 63 dBA) development. The maximum predicted LRden does not exceed 75 dBA, which is acceptable under Health Canada guidelines at any of the residences.

The 3D model also predicted an increase in percent highly annoyed (%HA), which is a measure of anticipated change in community annoyance, of 1.5% at the Trophy development, 3.4% at the Cascade East development and 3.8% at the Cascade West development. The predicted increase in %HA does not exceed the Health Canada guideline of 6.5%.

The assessment predicted an increase in the low frequency sound level (LLF) from 71 dBA to 75 dBA, which suggests a slight likelihood of increased noise induced rattles.

How We Plan to Reduce Noise as a part of the Proposed Water Lot Project

Should Seaspan receive a project permit, a post-project noise assessment will be completed to verify the model predictions and identify additional noise-reduction mitigations. The report will be publicly available on the project website.

Seaspan will trial the use of noise-reducing barriers around the ultra-high pressure (UHP) pumps, measuring noise before and after installation of the barriers to assess their effectiveness. The results of the trial will be included in the post-project noise assessment and posted on the project website.

Seaspan will also investigate the use of noise-reducing curtains on the drydocks. As part of this assessment, baseline measurements will be recorded at Vancouver Drydock and, in the community, to help determine their effectiveness. The results of the investigation and testing will be included in the post-project noise assessment, and posted on the website.

Construction Noise

During construction, the noisiest activity will be pile driving, which is anticipated to take six weeks – three to six days for each of the six pile installations.

Efforts will be made to minimize the impact of noise by muffling engines, timing operations within daylight hours, adopting quieter installation techniques for pile driving, installing bubble curtains and using soft start procedures, which involve the gradual increase in hammer energy at the start of pile driving.

The construction approach is detailed in the permit application in a document called the **Construction Environmental Management Plan**.

Should the project receive a permit, the new drydocks and work pontoon will be transported on water to Vancouver Drydock's site fully assembled, with some minor retrofitting required once on site. Once at Vancouver Drydock, six piles would need to be installed in the water to secure the drydocks and work pontoon in place.

To protect fish and wildlife species and habitat in Burrard Inlet, in-water work and construction activities will occur during Fisheries and Oceans Canada (DFO) 'least risk' window of August 16 to February 28, which is the time of year when work may be carried out with the lowest risk to fish and wildlife species and habitat.

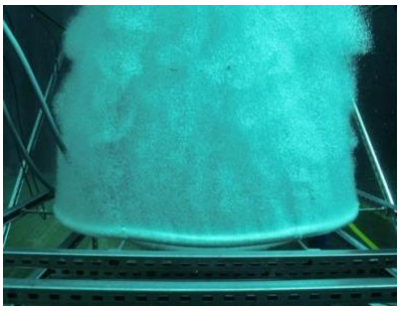
Construction Equipment

Access to the area and most of the project work will be marine-based on barges and/or other vessels resulting in no land-based activities or traffic. The staging area will also be entirely marine-based.

Two marine rigs, a derrick or crane barge and a scow barge to hold materials, will be on site during the pile installation. This equipment will be mostly stationary for the duration of the construction. Small skiffs will be used to move workers around the water, as needed.

Crane Barge

Construction-Related Noise



Bubble Curtain Example

Of all the activities required during construction to install the drydocks and other peripheral components, pile driving is the one that generates the most noise. Pile driving requires significant set up time and other break periods during installation that do not generate disruptive noise.

Efforts will be made to minimize the impact of noise such as muffling engines, timing operations within daylight hours, and adopting quieter installation techniques for pile driving such as using vibratory hammers, installing bubble curtains and using 'soft start' procedures, which involve the gradual increase in hammer energy at the start of pile driving.

Pile Installation

Pile installation is anticipated to take six weeks – three to six days for each of the six piles. Piles will be driven into the substrate using vibratory hammers and, if necessary, impact hammers on barge-mounted cranes.

Drilling out material inside the pile is necessary for concrete infill and may be required to assist when driving the piles to depth. DFO has strict requirements that no spillover is permitted into the marine environment.

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As a result, water inside the piles will be monitored and collected, and treated at the onsite water treatment facility to protect the surrounding marine environment.

Environmental Management During Construction

Prior to construction getting underway, Seaspan's **Spill Contingency Plan** will be reviewed and updated to include any additional measures to address the potential increased spill risk associated with marine construction. This plan aligns with the requirements outlined within the **BC Environmental Management Act.**

As part of its Spill Prevention and Response Plan, Vancouver Drydock has two spill booms strategically located for rapid deployment. Spill kits are also readily available throughout the site, including on the service pier and on both of the existing drydocks. Vancouver Drydock personnel undergo regular spill response training in accordance with the plan and would be available to assist in the event of an accidental spill during construction.

Marine Habitat Protection

The impact to marine wildlife and habitat is strictly controlled by DFO and safe practices will be implemented in accordance with all regulatory requirements.

A professional third-party Environmental Monitor will be on site throughout the construction period to oversee all environmental aspects of the project, including measuring underwater noise and observing wildlife use of the area to ensure wildlife are protected. If marine mammals get too close to the construction works and a condition arises which potentially threatens their safety, work will be halted until the safety of the marine mammals can be demonstrated.

Soft start procedures also assist in keeping marine mammals away from the activity before the full volume of underwater noise is reached. This method reduces noise exposure and therefore potential risk of injury by activating an avoidance response in aquatic mammals and giving them time to clear the area. Soft start procedures and other environmental management activities are further detailed in the **Construction Environmental Management Plan**.

SPILL PREVENTION & EMERGENCY RESPONSE

SPRING 2022

Protecting the environment around our operations, including preventing spills is the priority for all of Seaspan's operations and employees, including those who work at Vancouver Drydock. As part of this commitment and responsibility, Seaspan has rigorous plans and procedures in place to respond effectively in the event of a site emergency or environmental incident.

ISO Certified Environmental Management System

Seaspan operates under an Environmental Management System (EMS) certified to ISO 14001:2015, which is certified annually by Lloyd's Register. A requirement of the EMS is a commitment to pollution prevention, including verification of the effectiveness of controls to protect the environment, which encompasses engineering controls, operations, procedures and training.

Spill Prevention

Vancouver Drydock's **Spill Contingency Plan** details steps for risk assessment, spill prevention and response for potential on-land or on-water spills, and meets all requirements within the **BC Environmental Management Act.**

At Vancouver Drydock, two spill booms are strategically located for rapid deployment with spill kits located throughout the site, including on the service pier and both floating drydocks. Vancouver Drydock personnel also undergo regular training to be able to respond to spills in accordance with the plan.

Safe Marine Operations

All vessels operating in the harbour are responsible for understanding and operating within **Transport Canada regulations** and local requirements. Prior to a vessel arriving at Vancouver Drydock, owner representative(s) are advised of safety policies and procedures, environment and waste management regulations and docking requirements.

Green Marine Certification

Seaspan's three shipyard sites, including Vancouver Drydock, are certified under **Green Marine,** a rigorous and transparent voluntary environmental certification program for the North American marine industry. Green Marine measures companies' performance above and beyond regulatory compliance, with performance assessed and verified every two years by certified independent third-parties. Key performance categories assessed include spill prevention, stormwater protection, air emissions and waste management.

Water Management

Water used during operations at Vancouver Drydock does not drain into the ocean. When vessels are in the drydocks, vessel wash water and stormwater are collected into holding tanks that are part of the onsite wastewater treatment system. From the holding tanks, water is treated to remove potential contaminants through a two-step process where particulates are first filtered out using sand then metals are filtered using activated charcoal. The water is then discharged to the sanitary sewer, as permitted by Metro Vancouver.

The proposed new drydocks would be connected to the existing wastewater treatment system. The water would be treated according to existing practices under Seaspan's EMS.

Fire and Emergency Response Plan

Seaspan has a robust **Fire and Emergency Response Plan** that was developed to align with the **BC Emergency Response Management System**, which ensures a coordinated, organized response to any emergency in the province.

Fire prevention at Vancouver Drydock is the responsibility of all employees, management, contractors and visitors. This includes securing permits from Seaspan's safety department prior to starting any activity that could potentially cause a fire (such as welding, plasma cutting, or grinding), observing appropriate fire watch and cool down periods, and maintaining all electrical equipment in good repair.

All workers and visitors to Vancouver Drydock are given a health and safety, environment and emergency program orientation before starting work, with training updated regularly. Additionally, fire and evacuation drills are conducted a minimum of once per year. Fire and emergency drills are followed by in-depth debriefs to review the drill and suggestions to continuously improve the fire and emergency plan.

Recognizing the unique challenges faced by first responders for shipboard and drydock incidents, Seaspan has been working with all three North Shore fire departments for several years to enhance training to improve land-based marine firefighting and emergency response. As part of these efforts, in 2022, Seaspan will be funding specialized marine firefighting training for Seaspan, City and District representatives.