



PORT of
vancouver

PROJECT AND ENVIRONMENTAL REVIEW REPORT
PER NO. 17-278
MAPLEWOOD MARINE RESTORATION

Prepared for: Director, Environmental Programs

February 8, 2019

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 VANCOUVER FRASER PORT AUTHORITY PROJECT AND ENVIRONMENTAL REVIEW REPORT	
PER No.:	17-278
Tenant:	Untenanted Vancouver Fraser Port Authority Lands
Project:	Maplewood Marine Restoration Project
Project Location	Maplewood Basin, North Vancouver BC
VFPA SID No.:	DNV081, DNV083
Land Use Designation:	Conservation
Applicant:	Vancouver Fraser Port Authority, Habitat Enhancement Program
Category of Review:	C
Recommendation:	That PER No. 17-278 for Maplewood Marine Restoration Project be approved

1 INTRODUCTION

The Vancouver Fraser Port Authority (VFPA), a federal port authority, manages lands under the purview of the *Canada Marine Act*, which imparts responsibilities for environmental protection. VFPA accordingly conducts project and environmental reviews of works and activities undertaken on these lands to ensure that the works and activities will not likely cause significant adverse environmental effects. This project and environmental review report documents VFPA's project and environmental review (PER) of PER No. 17-278: Maplewood Marine Restoration Project (the Project) proposed by Vancouver Fraser Port Authority, Habitat Enhancement Program (the Applicant).

This project and environmental review was carried out to address VFPA's responsibilities under the *Canada Marine Act*, and to meet the requirements of the *Canadian Environmental Assessment Act*, 2012 (CEAA 2012), as applicable. The proposed Project is not a CEAA 2012 "designated project" and an environmental assessment as described in CEAA 2012 is not required. However, VFPA authorization is required for the proposed Project to proceed and in such circumstances, where applicable, Section 67 of CEAA 2012 requires federal authorities to assure themselves that projects will not likely cause significant adverse environmental effects. The project and environmental review process is designed to provide that assurance. In addition, VFPA considers other interests, impacts and mitigations through the project and environmental review.

The project and environmental review considered the application along with supporting studies, assessments and consultations carried out or commissioned by the Applicant, as well as other information provided by the Applicant. In addition, this project and environmental review considered other information available to VFPA and other consultations carried out by VFPA. A full list of information sources germane to the review is provided in Appendix B.

This project and environmental review report is NOT a project authorization. This project and environmental review report summarizes the review outcome, and provides the basis for approval or denial. Should the Project be approved, the report is accompanied by a project permit (the Permit) and the conclusions described in this report require compliance with the conditions in the Permit.

2 PROJECT DESCRIPTION

The Applicant is proposing to develop the Maplewood Marine Restoration Project for use as a fisheries habitat offset for the construction of the Centerm Expansion Project. The proposed Project is located in Burrard Inlet, south of the Maplewood Flats Conservation Area in the District of North Vancouver. The habitat area will include intertidal habitat, subtidal eelgrass habitat, and a rock reef habitat. The site location and layout and proposed habitat enhancement types are shown in Appendix A, Figure 3-1 and Figure 8-1.

The proposed Project would convert sections of a deep basin, historically dredged in the 1940's, into more productive fish habitat by infilling to create shallow intertidal and subtidal habitats in the Northeast Basin. Dredging of the Southwest Channel and creating new rock reef habitat is proposed to improve tidal flushing in the basin and enhance water quality, nutrient transportation and reduce siltation of marine vegetation. The habitat enhancement is anticipated to facilitate greater suspension and distribution of eggs and larvae of pelagic spawning fish and invertebrates. The proposed Maplewood Marine Restoration Project would result in the conversion of approximately seven hectares of low-value, deep marine habitat, into more productive habitat for fish, birds and other wildlife.

2.1 Proposed Works

The proposed works at the Southwest Channel and Northeast Basin include:

Southwest Channel and rock reef habitat

- Dredge approximately 87,000 m³ of material from the Southwest Channel. The channel will be dredged to improve intertidal flushing and to create an access point for construction barges.
- Place approximately 14,000 m³ of rock material into Southwest Channel along the base of the channel and along the side slopes of the channel to function as subtidal rock reef habitat and to protect against scour from tidal currents.

Northeast Basin intertidal, subtidal eelgrass, and rock reef habitats

- Infill the Northeast Basin with approximately 87,000 m³ of dredge material from the Southwest Channel and approximately 95,000 m³ of imported clean fill material to raise the elevation of the existing substrate and create habitat areas.
- Install geotextile fabric or rock filter material on the infill slope to prevent the loss of fines through the rock dyke.
- Place approximately 1,800 m³ of appropriately-sized rock material to construct a rock dyke to contain the fill material.
- Place approximately 6,000 m³ of appropriately-sized rock material to construct rocky reef habitat at the toe of the rock dyke. It is expected that a number of rock reef structures will be placed in the Northeast Basin, up to 10 m apart to create internal channels and to provide edge habitat. Rock sizes would range from 300 mm to 900 mm.

- Install a rip-rap apron in the mouth of the existing barge channel covering approximately 300 m². The apron is expected to protect intertidal habitat areas from scour at the outlet of the barge channel.
- Following construction and habitat stabilization, common eelgrass (*Zostera marina*) from suitable donor beds will be planted in the Northeast Basin.

The use of shell hash is being considered as a seeding technique to encourage bivalve colonization. If used, this material would be applied to the constructed habitat area.

Project works are anticipated to commence in summer or early fall 2019 with a construction period of approximately eight months. To accommodate tidal restrictions and Project schedule, works are proposed to occur 24 hours a day, seven days a week. The majority of the construction work is scheduled to occur during the fisheries least-risk work window for Burrard Inlet (August 16 to February 28). However, due to the potential settlement time required for material placement in the Northeast Basin, this work may extend beyond the end of the least risk work window (i.e., post-February 28). Any work outside the window would occur with appropriate mitigation in place. Planting of donor eelgrass stock is expected to occur during the summer of 2020, or 2021 pending construction completion.

2.2 Proposed Construction Methods

Construction will be conducted in-water, and no upland works are proposed for this Project. Marine works include dredging, infilling, and placing rock material to create habitat areas. Construction is anticipated to be completed by barge using clam-shell or cutter-suction dredge, scows, or other suitable marine equipment. Rock material is anticipated to be placed by clam-shell derrick with computer aided control and visualization. Rocks will be brought to site on flat deck or bottom dump scows.

For infill placement in the Northeast Basin, the initial infill would be placed in one metre thick layers, each comprised of two 0.5 m thick lifts. A nominal two-month waiting period is proposed after each infill layer prior to the placement of the next layer to allow for the dissipation of excess pore pressure in the soft marine sediments. The actual waiting periods may be different as they will be adjusted based on observational methods such as monitoring pore pressures in the marine sediments using vibrating wire piezometers, installed in the marine sediments prior to fill placement. The leads for the vibrating wire piezometers will be placed directly on the seabed and extend to a common area on the shoreline. All piezometer leads will be connected to a common data acquisition system.

3 VANCOUVER FRASER PORT AUTHORITY INTERNAL REVIEWS

The following VFPA departments have reviewed the application and have the following project considerations.

3.1 Planning

Planning has reviewed the application and has the following land use comments.

The proposal meets Planning's requirements, based on the primary considerations of the land use designation and current land use policies.

3.1.1 Land Use Designation

The Project conforms to the designation of "Conservation" in Vancouver Fraser Port Authority's Land Use Plan.

3.2 Engineering

The proposed Project intends to construct habitat including dredging, infilling and rip-rap placement in a portion of Burrard Inlet in North Vancouver. Engineering has reviewed the application and requires the Applicant to ensure the following:

- Provide record drawings in accordance with VFPA's Record Drawing Standards in both AutoCAD and Adobe (PDF) format to VFPA, including a Project site plan that clearly identifies the location of works.

This is reflected in condition No. 45 in the Permit.

The proposal meets the Engineering department requirements, subject to adherence to the listed project and environmental conditions in the Permit.

3.3 Marine Operations

The proposed Project intends to use and stage marine equipment to conduct habitat installation work in Burrard Inlet. To accommodate tides, some night time works are anticipated. Marine Operations has reviewed the application and requires the Applicant to undertake the following:

- Submit a marine construction and staging plan, to VFPA's satisfaction, at least 30 business days prior to commencing construction.

This is reflected in condition No. 21 in the Permit.

The proposal meets Marine Operations' requirements, subject to adherence to the listed project and environmental conditions in the Permit.

4 STAKEHOLDER CONSULTATION

The proposed Project was assessed to have potential impacts to stakeholders and the local community and consultation activities were determined to be required. The following sections describe the stakeholder and public consultation activities undertaken by the Applicant and VFPA as part of the project and environmental review.

4.1 Municipal Consultation

The Project was assessed to have potential impacts to municipal interests. A referral letter was sent to the District of North Vancouver (DNV) on September 20, 2018, providing notification of the proposed Project.

The DNV responded with comments on the Project. The following table summarizes the comments received and how they were considered as part of the project and environmental review.

Issue	Mitigations and Permit Conditions	Rationale
Advised that the Applicant may need to obtain municipal approval(s) for any land-based or upland aspect of the project. License may be required for work on DNV land.	None required.	No upland work proposed as part of the Project. Land tenure agreement reached for portion of Project within DNV jurisdiction.
DNV requested confirmation that the Applicant would be responsible for any work involved in removing or reconfiguring Project work in the barge channel.	None required	The Project is not anticipated to negatively affect the barge channel. The Applicant will not be responsible for removing or reconfiguring Project works, the Project will not preclude future barge channel restoration.
DNV requested a one-week advance notice when work is scheduled outside regular work hours. This will help prepare in advance to assist with calls or complaints that may be generated.	Condition No. 26 of the permit requires that the Applicant provide DNV five business days notice prior to construction and physical activities being conducted outside of the hours of 7:00 am and 8:00 pm.	The Applicant has proposed a 24 hour per day work schedule in order to complete marine works when tidal patterns are most appropriate.
DNV emphasized the importance of monitoring following completion of construction to ensure long term success of the Project.	None required.	Monitoring of the site during the post-construction phase is required and will be subject to the relevant terms and conditions associated with the <i>Fisheries Act</i> Authorization issued by Fisheries and Oceans Canada (DFO) for the Centerm Expansion Project and VFPA's agreement for habitat banking with DFO.

4.2 Federal, Provincial, Regional Agency Consultation

The Project was assessed to be of potential interest to other regulatory agencies. The Applicant has been in consultation with the following agencies:

- Environment and Climate Change Canada (ECCC) – On August 15, 2018, the Applicant requested that ECCC exempt the Project from a Disposal at Sea permit as the Project proposes “beneficial use” of the material. On February 5, 2019, ECCC made the determination that the placement activity for the Maplewood Marine Restoration Project

would not require a Disposal at Sea permit, subject to the conditions listed in the ECCC Letter of Advice.

- Department of Fisheries and Oceans Canada (DFO) – On November 14, 2018, DFO issued the *Fisheries Act* Authorization for the Centerm Expansion Project. This Authorization includes specific requirements related to the Maplewood Habitat Restoration Project, as it is designed to offset the impacts to fish habitat resulting from the Centerm Expansion Project.

No further consultation with federal, provincial or regional agencies was considered necessary in for the project and environmental review.

4.3 Adjacent Tenant Consultation

The Project was assessed to have potential impacts to adjacent VFPA tenant operations. A referral letter was sent to the following VFPA tenants on September 20, 2018, notifying them of the proposed Project:

- Pacific Environmental Science Centre
- Wild Bird Trust of British Columbia
- ERCO Worldwide

VFPA did not receive any comments from Pacific Environmental Science Centre or ERCO Worldwide.

Wild Bird Trust of British Columbia (WBT) responded with comments on the Project. Comments and questions provided by WBT were technical and project specific, these were provided to the Applicant to develop and distribute a response. WBT is generally in support of the Project and the Applicant will continue to engage WBT throughout the project development.

4.4 North Shore Waterfront Liaison Committee - Community Liaison Group Consultation

The Applicant presented the Project to the North Shore Waterfront Liaison Committee on two occasions. The first presentation was during the preliminary planning phase on November 23, 2017. The second presentation was made during the Application review phase just prior to the start of the public consultation process on September 20, 2018. VFPA did not receive any feedback from the North Shore Waterfront Liaison Committee other than questions received and answered during the presentations.

VFPA has reviewed the record of consultation and related documents and is of the view that the Project has adequately addressed the concerns raised during stakeholder consultation.

5 PUBLIC CONSULTATION

The proposed Project was assessed by VFPA to have potential impacts to community interests in the surrounding area during construction and upon completion. These include noise and general disturbance throughout construction and potential changes to the wildlife sanctuary's shoreline biodiversity.

The Applicant was required to conduct public consultation activities with a 15-business day (19 day) public comment period and host a public information session. The objective of public consultation during a project and environmental review, is to solicit feedback from the public on

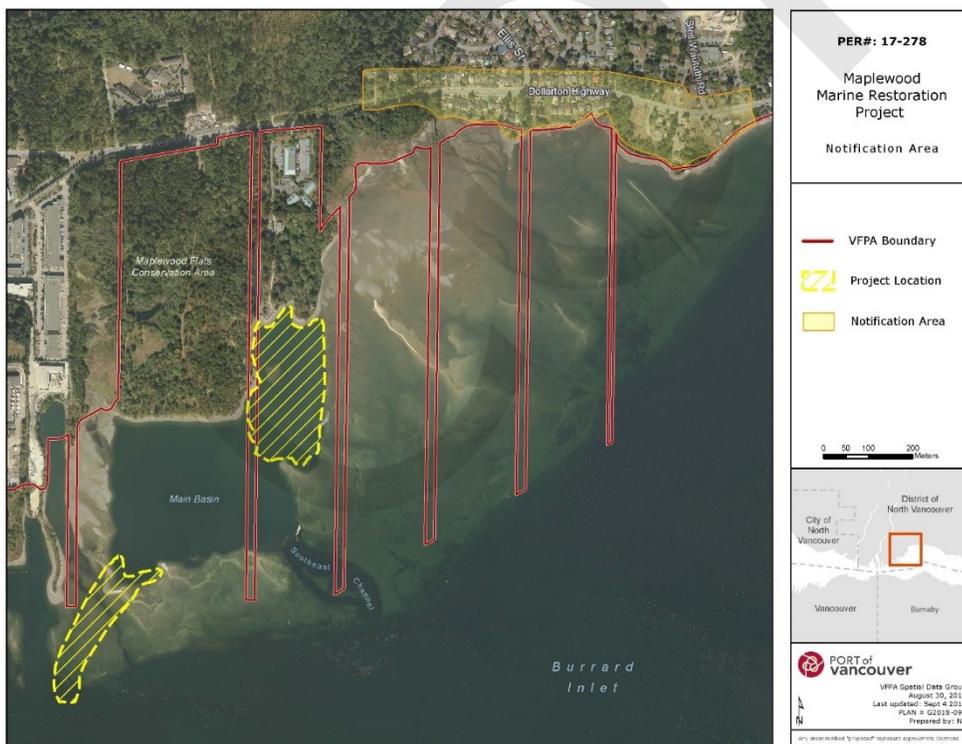
the proposed Project, the completed technical studies, and proposed mitigations during construction and operation.

The Applicant carried out the public consultation activities on the proposed Project between September 24 and October 12, 2018. This included a public information session held on Tuesday, October 2, 2018. VFPA reviewed the record of public consultation, including all comments received and the Applicant’s responses. This information was considered when determining mitigation requirements and in making a decision on the proposed Project.

The proposed Project was assessed by VFPA to have potential impacts to community interests during construction including noise and visual disturbances. The request to conduct work 24 hours a day, to take advantage of high tides and to shorten the overall construction time, may also have impacts on nearby residents and users of the Maplewood Flats Conservation Area.

As a result, the Applicant is required to send a construction notice to adjacent residents and businesses in the District of North Vancouver as shown in the map below, as well as post copies in key locations within the Maplewood Flats Conservation Area (i.e., the bulletin board adjacent to Corrigan Nature House, the foot of the pedestrian bridge and along the walking trails). For consistency, the notification area is the same as the area provided to the Applicant for the purpose of promoting the public information session in the fall of 2018. The construction notice shall be distributed by the Applicant at least 10 business days prior to the start of the works. The construction notice will be posted on Applicant’s website. This is condition No. 20 in the Permit.

Map of notification area



5.1 Summary of Public Consultation

A description of the Project and proposed works, and all supporting materials were posted to VFPA's PER Project website page in August, 2018. Details of the Applicant's public information session were also posted on VFPA's PER Project website and links were provided to the Applicant's Habitat Enhancement Program website for more information. The Habitat Enhancement Program website page also provided details on the Maplewood Marine Restoration Project and all supporting materials.

Public consultation and engagement activities were conducted by the Applicant from September 24- October 12, 2018 and included the following:

- Hosting a public information session on Tuesday, October 2, 2018 in the District of North Vancouver;
- Developing a discussion guide with key information about the Project;
- Hand-delivering and mailing notification letters to residents and business in the surrounding area;
- Placing two advertisements in the North Shore News regarding the public information session;
- Displaying posters about the information session and the public comment period on notice boards in the community;
- Sending out an e-blast communication to interested members of the public via the Habitat Enhancement Program's database.
- Creating a feedback form to collect community input;
- Developing an online feedback form and Project information posted on PortTalk;
- Providing an email address and telephone number for inquiries and submissions;
- Posting all Project-related materials on the Applicant's website; and
- Conducting presentations to the Northshore Waterfront Liaison Committee on November 23, 2017 and September 20, 2018.

The Applicant hand-delivered notification postcards to all residents and businesses in the area as shown in the map below on September 19, 2018, with information about the proposed Project and the upcoming public information session. The notification area included all residents and businesses up to 1,100 m to the east of the Project site. This area was selected because residents had previously received an earlier notification letter detailing exploratory works associated with the Project. The area of notification included approximately 60 residences, see map of notification area in Section 5 above.

During the public consultation period, the public was able to provide feedback via telephone, mail, and online. A dedicated webpage for the proposed Project was created by the Applicant to inform the public and to accept online feedback. This was hosted in two locations, the VFPA Habitat Enhancement Program website page and the VFPA consultation page, PortTalk.

The public information session was held at Corrigan Nature House, Maplewood Flats Conservation Area, 2645 Dollarton Highway, North Vancouver, on October 2, 2018 between 5:00 p.m. and 8:00 p.m. The public information session provided information about the project scope, design, environmental and other technical assessments, construction activities and construction management. Hard copies of the feedback form were also available. The Applicant's project and technical consultants were available to answer questions from the public. Staff from VFPA also attended.

Participation during the public consultation period included the following:

- 42 people attended the public information session;
- Five people completed the feedback form;
- One comment from the public was received via email; and
- No emails, letters or phone calls regarding the Project were received by VFPA.

Public comments mainly related to environmental, ecological and monitoring questions, construction activities and timeline, and the ecological/cultural feature.

The Applicant provided a detailed summary of the public consultation process and all comments received in a *Consultation Summary Report* dated November, 2018. The Applicant also provided a *Consideration Report* dated November 2018, which included the Applicant's formal responses to public comments organized by theme. VFPA has reviewed these documents and found them both to be acceptable. These reports were posted on VFPA's PER Project website and the Applicant's Habitat Enhancement Program website as of December 2018.

Below is a table summarizing issues raised by the public, and how they were considered by VFPA as part of the project and environmental review.

COPY

Issue	Considerations	Mitigations and Permit Conditions
Construction		
<p>Impacts and Timeline:</p> <p>Concern over potential noise and light impacts due to construction and the potential timelines for the work.</p>	<p>Residential areas are situated over 500 m from the proposed Project site and impacts will likely be limited. However, the following mitigations will be in place:</p> <ul style="list-style-type: none"> • A Construction Notification letter will be sent prior to construction starting. • Light mitigation measures will be implemented during construction. Crews will be instructed to direct lights down and away from land and residences. <p>Should the Project be permitted, work is expected to begin in the fall of 2019, for a period of approximately eight months. Work will take place 24 hours a day, seven days a week due to the need to work during high tides.</p>	<p>Permit conditions No. 18 and 20 require the permit holder to submit a draft construction notification and distribute an approved construction notification 10 business days prior to the start of construction.</p> <p>Permit condition No. 19 requires the permit holder to submit a draft construction communications plan detailing how the community will be informed and updated prior to and during construction.</p> <p>Permit condition No. 26 relates to construction work hours. No work will be permitted on statutory holidays. Any changes would require VFPA approval and additional community notification.</p> <p>Permit condition No. 16 requires the permit holder to complete the Project in accordance with the Construction Environmental Management Plan (CEMP).</p> <p>The CEMP details noise mitigation methods as well as the preliminary schedule for construction.</p> <p>Subsequent updates to the CEMP must be approved by VFPA.</p>
Historical Site Use		
<p>Interest in past site use and potential debris.</p>	<p>Maplewood Flats has been used by Aboriginal groups since time immemorial.</p> <p>The site was dredged between the 1940's and 1960's and was used for log storage and gravel extraction operations.</p> <p>Partial infilling occurred between 1969 and 1979 resulting in a new upland area which was used for a range of industrial operations before becoming a conservation area in the 1990s.</p> <p>The deep marine basin contains wood waste and debris from the log storage operations. This is not considered to be an issue in relation to the Project.</p>	<p>None required.</p>
Ecological or Cultural Feature		

Issue	Considerations	Mitigations and Permit Conditions
<p>Bird-blind:</p> <p>Suggestion that the feature could be an interpretive bird-blind or shelter in which to observe birds.</p>	<p>A decision regarding the proposed ecological or cultural feature will be made in due time, after further consultation with Aboriginal groups and stakeholders.</p>	<p>None required.</p>
<p>Feasibility Study:</p> <p>Suggestion to conduct a feasibility study into the restoration of the southern shoreline, located west of the barge channel.</p>	<p>This is outside the scope of the Project.</p>	<p>None required.</p>
<p>Habitat & Cultural Use Management Plan:</p> <p>Suggestion to participate in the Wild Bird Trust of BC's Habitat & Cultural Use Management Plan.</p>	<p>This is outside the scope of the Project.</p>	<p>None required.</p>
<p>Tsleil-Waututh Nation:</p> <p>Suggestion that any ecological or cultural feature should be meaningful to, or determined by the Tsleil-Waututh Nation.</p>	<p>The Tsleil-Waututh Nation have been involved throughout the proposed Project from its inception. The site was originally identified by the Nation as being an area of restoration priority.</p> <p>A decision regarding the proposed ecological or cultural feature will be made in due time, after further consultation with Aboriginal groups and stakeholders.</p>	<p>None required.</p>
<p>Environment/Ecology</p>		
<p>Design suggestion:</p> <p>Create an island within the Project area for nesting birds.</p>	<p>This is outside the scope of the Project. The main focus of the Project is to enhance fish habitat.</p> <p>Project enhancements are expected to improve habitat productivity and the biodiversity of the immediate area which will be beneficial for numerous birds including shorebirds, waterfowl, and raptors.</p>	<p>None required.</p>

Issue	Considerations	Mitigations and Permit Conditions
<p>Erosion:</p> <p>Interest in ensuring the proposed Project will not increase shoreline erosion east of the Project site.</p>	<p>Coastal engineering analysis and numerical modelling was undertaken by the Applicant to assess the potential effects of the Project on tidal flushing, sediment dispersal, and stability/erosion potential in the area.</p> <p>All results indicate that tidal flushing will be improved and no major changes are expected to the overall hydrodynamics, sediment transportation, or erosion at or around the Project site.</p>	<p>Permit condition No. 36 requires the permit holder to repair and/or remediate any damage or erosion resulting from disturbance to the intertidal foreshore during the Project.</p>
<p>Freshwater Flow:</p> <p>Concern regarding whether the Project will affect the flow of freshwater.</p>	<p>Freshwater input (both current and potential future increases) were considered by the Applicant in the Project design phase.</p> <p>McCartney Creek is the main source of fresh water in the Project area. Intertidal flat habitats are considered tolerant to variables in salinities due to freshwater input.</p> <p>Eelgrass grows well in brackish water and can tolerate a range of salinities as can kelp species typically found in rock reefs.</p> <p>The Project will not affect the flow of freshwater and freshwater will equally not affect the successful installation of the proposed habitat.</p>	<p>None required.</p>
<p>Future Development:</p> <p>Concern regarding the proposed future development by Darwin Construction north of Dollarton Highway and whether it would impact water flow to the proposed new habitat area.</p>	<p>The proposed Project would be completed prior to potential development happening north of Dollarton Highway or future restoration changes made to the barge channel to the west of the Project site.</p> <p>The Applicant, through its Habitat Enhancement Program, team will continue to work with the District of North Vancouver and others to understand future plans and how these may affect the proposed Project in the future.</p>	<p>None required.</p>

Issue	Considerations	Mitigations and Permit Conditions
<p>Habitat:</p> <p>Interest in the environmental benefit of intertidal flat, eelgrass and rock reef habitats and why these were chosen for each location.</p>	<p>The habitat types were chosen because they are currently represented in the vicinity and there is a regional precedent for their successful implementation in areas with comparable conditions.</p> <p>The habitat types will also provide a variety of surface areas for refuge, colonization, food, breeding areas and protective nurseries for fish, shellfish and other animals. Collectively, it is anticipated that the three habitats will result in an overall gain in habitat values and fisheries productivity.</p>	<p>None required.</p>
<p>Vegetation Colonization:</p> <p>Concern that it may take some time for vegetation to colonize after transplantation.</p>	<p>It may take time for vegetation to colonize, but post-construction, the site will be monitored to ensure the biophysical objectives are being met.</p> <p>Monitoring will focus on the physical stability of the habitat, the establishment of eelgrass, types of fish and macroinvertebrates observed.</p>	<p>None required.</p> <p>VFPA undertakes annual monitoring of all its Habitat Enhancement Program projects. This is guided by biologists and coastal engineers to ensure the enhanced habitat continues to function well.</p> <p>Under the <i>Fisheries Act</i> Authorization, habitat will be monitored in years 1, 2, 3, 4 and 5 following the completion of the construction. Contingency measures will be implemented if habit is not deemed successful based on DFO criteria.</p>
<p>Recreational Use</p>		
<p>Watercraft:</p> <p>Long term plans for the water lot.</p>	<p>The Project site is under the jurisdiction of the port authority. Impacts to vessel traffic during construction will be minimized.</p> <p>During construction, marine markers and/or signage may be installed, as required.</p>	<p>None required.</p>
<p>Support for the Project</p>		
<p>General comments supporting the Project and the port authority's work with Aboriginal groups.</p>	<p>The Tsleil-Waututh Nation have been involved with the proposed Project from its inception and the site was identified by the Nation as being an area of restoration priority.</p> <p>In addition to public and stakeholder consultation, a separate but parallel consultation process with Aboriginal groups has been undertaken by the port authority and will continue throughout the construction of the Project.</p>	<p>None required.</p>

VFPA has reviewed the record of public consultation, and provided that the mitigation measures and conditions outlined in the table above are included in the Permit, is of the view that the Project has adequately addressed the concerns raised by the public.

6 ABORIGINAL CONSULTATION

VFPA reviewed the Application and determined that Aboriginal consultation was required given that the Project has the potential to adversely affect asserted or established Aboriginal rights.

The Applicant (VFPA Habitat Enhancement Program) led the Aboriginal consultation activities for the proposed Project. VFPA Project and Environmental Review reviewed and considered the Applicant's record of consultation to ensure that the duty to consult has been met.

The information below summarizes the Applicant's consultation.

The following Aboriginal groups were consulted:

- Tseil-Waututh Nation
- Squamish Nation
- Musqueam Indian Band
- Sto:lo Nation
- Hul'qumi'num Treaty Group
 - Cowichan Tribes
 - Lake Cowichan First Nation
 - Penelakut Tribe
 - Halalt First Nation
 - Stz'uminus First Nation
 - Lyackson First Nation

The objectives of the Applicant's Aboriginal consultation process were to:

- Engage identified Aboriginal groups during Project development to determine potential impacts of the Project on their asserted or established Aboriginal rights;
- Provide opportunities for identified Aboriginal groups' involvement in Project development activities such as field studies, where applicable;
- Provide updates and share information about Project development activities as they became available;
- Work with identified Aboriginal groups to determine appropriate mitigation of Project impacts where appropriate;
- Explore opportunities for identified Aboriginal groups to share in the economic and social benefits of the Project, through avenues such as employment and training and;
- Provide information to the Project team with respect to issues raised by identified Aboriginal groups and in the development of responses to enquiries.

In summary, these objectives have been and will continue to be achieved by:

- Providing potentially affected Aboriginal groups with timely and relevant Project-related information;

- Providing Aboriginal groups with reasonable opportunities to present and communicate their views and concerns in relation to the Project throughout the Project development phase and Project and Environmental Review process;
- Considering the issues and concerns of Aboriginal groups, including those related to potential impacts on Aboriginal interests, in the development and implementation of the Project and by addressing, resolving, or otherwise accommodating such issues or concerns;
- Maintaining effective working relationships among VFPA Habitat Enhancement Program and the potentially affected Aboriginal groups; and
- Working with and each Aboriginal group in a respectful manner, reflecting their preferred approach to working with the VFPA Habitat Enhancement Program.

From August 2017 until December 2018, the Applicant conducted the following consultation activities with Aboriginal groups:

- Conducting face-to-face meetings with Aboriginal groups' leadership and staff;
- Held focused workshops on topics of interest/priority to Aboriginal groups;
- Attended and presented Project information at Council and/or community meetings (as scheduled or requested);
- Provided project-related information (hand-delivered at face-to-face meetings or via mail, courier, or e-mail);
- Requested input in relation to issues and concerns;
- Engaged Aboriginal groups in key aspects of the Project planning and design process;
- Involved key Aboriginal groups in environmental fieldwork;
- Involved Aboriginal groups in the development of appropriate mitigation measures; and;
- Ongoing follow-up and issue resolution.

The following table summarizes the main issues raised by Aboriginal groups during the consultation process to date, and how they were considered as part of the project and environmental review.

Issue	Considerations	Mitigations and Permit Conditions
<p>Impacts of the Project on archaeological resources.</p>	<p>The Applicant will be required to follow the recommendations made in the Archaeological Overview Assessment (AOA), submitted with the Permit application.</p> <p>The Applicant will also follow the Chance Find Procedure as outlined in the CEMP.</p> <p>An archaeological site is located on the intertidal flats near the southeast corner of the Northeast Basin. This archaeological site is associated with a work avoidance zone approximately 50m in diameter. The work avoidance zone restricts the southeastern extent of the rock reef habitat in the Northeast Basin. The work avoidance zone is described in the CEMP.</p>	<p>The following permit conditions address these concerns:</p> <p>Conditions No. 28, 16.</p> <p><i>If the Permit Holder encounters, expects to encounter, or should expect to encounter an actual or potential archaeological resource, the Permit Holder shall:</i></p> <ul style="list-style-type: none"> <i>a) Immediately stop any activities that may disturb the archaeological resource or the site in which it is contained (Site);</i> <i>b) Not move or otherwise disturb the archaeological resource or other remains present at the Site;</i> <i>c) Stake or flag the Site to prevent additional disturbances; and,</i> <i>d) Immediately notify VFPA by email and phone.</i> <p><i>The Permit Holder shall carry out the Project in accordance with the construction environmental management plan provided by the Permit Holder, and any subsequent amendments approved by VFPA.</i></p>

Issue	Considerations	Mitigations and Permit Conditions
<p>Request to be involved in identification of eelgrass donor sites.</p>	<p>The Applicant hosted an eelgrass donor site workshop in May 2018. A technical report was prepared (<i>MMRP Burrard Inlet Eelgrass Assessment Report – August 2018</i>), and shared with workshop participants. A follow-up workshop is planned for 2019.</p> <p>The Applicant will be required to provide a draft eelgrass donor site and planting plan to Aboriginal groups for comment, and to provide the plan to VFPA Project and Environmental Review for review and approval prior to works.</p>	<p>The following permit conditions address these concerns:</p> <p>Conditions No. 24, 25</p> <p><i>Prior to commencing eelgrass donor site removal or eelgrass planting at the project site the Permit Holder shall submit an eelgrass planting plan to VFPA for review and acceptance. The plan shall include an assessment of the donor site.</i></p> <p><i>Prior to submitting the eelgrass planting plan to VFPA, the Permit Holder shall share a draft plan with Aboriginal groups, seek comments and incorporate feedback where appropriate.</i></p>
<p>Habitat design considerations including oil-spill protection, shellfish and kelp seeding.</p>	<p>The Applicant has committed to continue to work with Aboriginal groups in development of potential plans to include shell hash and kelp seeding. Continued planning and discussions will take place in early 2019.</p> <p>The Applicant consulted with Western Canada Marine Response Corporation (WCMRC) to understand any future plans for oil spill response protection (led by WCMRC) in the Maplewood area. The Applicant undertook geotechnical work to obtain further information regarding the feasibility of pile installation for oil protection measures (e.g., boom deployment). Continued discussions are planned for 2019.</p>	<p>None.</p>

Issue	Considerations	Mitigations and Permit Conditions
<p>Habitat effectiveness monitoring and contingency measures.</p>	<p>Under the DFO <i>Fisheries Act</i> Authorization, the Applicant is required to conduct habitat effectiveness monitoring in years 1, 2, 3, 4 and 5 following the completion of Project construction.</p> <p>Contingency measures will be developed if habitat success criteria, as outlined in the DFO Authorization, are not met by year 5. If contingency measures are required, the Applicant will provide draft contingency plans to Aboriginal groups for review and comment.</p>	<p>The following permit conditions address these concerns:</p> <p>Conditions No. 42, 43, 46</p> <p><i>The Permit Holder, or their contractor, shall engage a qualified environmental professional to monitor the Project in order to ensure that the works are carried out in compliance with this Permit. Monitoring events shall take place as required by the environmental monitor, the Construction Environmental Management Plan, or VFPA, provided that monitoring will be no less than weekly will be full time when works are underway that have the potential to adversely affect fish or fish habitat.</i></p> <p><i>The Permit Holder shall provide weekly environmental monitoring reports to VFPA or more frequently if VFPA requires. In addition, a summary report for the whole monitoring period shall be forwarded to VFPA within 30 days of the conclusion of the monitoring period.</i></p> <p><i>The Permit Holder shall provide a copy of post-construction reporting and effectiveness monitoring reports submitted to DFO. VFPA shall be notified of the development of any contingency plans that fall within VFPA jurisdiction.</i></p>

Issue	Considerations	Mitigations and Permit Conditions
<p>Aboriginal group involvement in Project construction and monitoring activities.</p>	<p>The Applicant has committed to continue to discuss opportunities for involvement in Project construction. Continued discussions will take place in 2019.</p>	<p>The following permit conditions address these concerns:</p> <p>Condition No. 29</p> <p><i>The Permit Holder and their contractor(s) shall make available employment, training and contract opportunities relating to Project construction to qualified members and/or businesses of interested Aboriginal groups.</i></p>

The Applicant has made a meaningful effort to consult with all potentially affected Aboriginal groups. Based on the record of consultation, VFPA is of the view that the duty to consult has been met.

7 ENVIRONMENTAL REVIEW

To fulfill its responsibilities under the *Canada Marine Act* and CEAA 2012, VFPA must make a determination on the potential environmental effects of a proposed project on VFPA managed lands and waters prior to authorizing those works to proceed. To make that determination, VFPA considers the residual adverse effects of the Project, that is, the effects after mitigation measures have been taken into account.

This section of the project and environmental review report summarizes the environmental review conducted for the Project, and provides the environmental review decision. The environmental review also considered the information provided in the previous sections of this report.

7.1 Scope of Environmental Review

The environmental review includes consideration of the potential environmental effects of the proposed Project, taking into account mitigation measures to avoid or reduce those effects. This review considered the Project components and physical activities described in Section 2.

The temporal scope of the review includes Project construction. The environmental review considered potential adverse environmental and social effects of the Project on 14 environmental components (e.g., species with special status, aquatic species and their habitat, recreational interests, etc.) and from accidents and malfunctions. These environmental components are aspects of the biophysical and socio-economic environment considered to have ecological, economic, social, cultural, archaeological, or historical importance.

The environmental components assessed by the VFPA are presented in Section 7.2 and include the environmental effects listed in section 5(1) and 5(2) of CEAA 2012.

Section 7.2 summarizes the results of the environmental review.

7.2 Environmental Effects Summary

Four existing high value habitat areas were identified during biophysical assessments of the Main Basin, Northeast Basin, and Southeast Channel. The high value habitat areas include: two eelgrass beds, a sugar kelp bed and a bull kelp bed. These high-value areas will be appropriately marked (e.g., with buoys), georeferenced, and avoided during in-water works.

The habitat types proposed to be constructed and the associated ecological benefits are outlined below:

- **Intertidal flat habitat** to support colonization by bivalve shellfish and other infaunal and epifaunal macroinvertebrate co
- mmercial, recreational or Aboriginal (CRA) fishery species.
- **Shallow subtidal eelgrass habitat** to provide nursery habitat for CRA fishery species (e.g., Dungeness crab and Pacific salmon).
- **Rocky reef habitat** to support broad-bladed kelp and encrusting or colonial invertebrates, and to provide habitat and food for a variety of CRA fishery species (e.g., lingcod).

The following table summarizes the potential environmental effects from the Project on the identified environmental components.

Environmental Component	Potential Adverse Effects?		Overview of Potential Adverse Effects, Mitigation Measures, and Residual Adverse Effects	Significant Residual Adverse Effects?	
	Yes	No		Yes	No
<p>Air quality</p> <p>Assessed as required under subsection 5(1) and 5(2) of CEAA 2012</p>	■	<input type="checkbox"/>	<p>There is potential for adverse effects on air quality during construction activities from equipment operation. Mitigation measures to reduce the potential for adverse effects will be implemented as detailed in the CEMP. This includes an idling reduction, and the turning off of emission sources when not in use.</p> <p>With mitigation in place, residual adverse effects on air quality are expected to be not significant.</p>	<input type="checkbox"/>	■
<p>Lighting</p> <p>Assessed as required under subsection 5(1) and 5(2) of CEAA 2012</p>	■	<input type="checkbox"/>	<p>No new lighting will be installed as part of the Project.</p> <p>There is potential for adverse effects from lighting during night-time construction works. Mitigation measures will be implemented to reduce those effects, including the use of directional lighting focused on the works area, and limiting night time works when applicable.</p> <p>With mitigation in place, residual adverse effects from Project-related lighting are expected to be not significant.</p>	<input type="checkbox"/>	■

Environmental Component	Potential Adverse Effects?		Overview of Potential Adverse Effects, Mitigation Measures, and Residual Adverse Effects	Significant Residual Adverse Effects?	
	Yes	No		Yes	No
<p>Noise</p> <p>Assessed as required under subsection 5(1) and 5(2) of CEAA 2012</p>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<p>There is potential for adverse noise effects during construction activities.</p> <p>Mitigation measures to reduce the potential for adverse effects will be implemented as detailed in the CEMP. Construction work will be largely conducted during regular hours, however some works are anticipated during night-time hours to accommodate tides. Construction noise is anticipated to have minimal adverse effects due to the location of the project site (greater than 500 m away from residents), works being limited to marine activities (e.g., dredging and rip-rap placement), and the mitigation measures implemented.</p> <p>With mitigation in place, residual adverse effects on noise are expected to be not significant.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>Soils</p> <p>Assessed as required under subsection 5(1) of CEAA 2012</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<p>The Project is located entirely within subtidal and intertidal marine environment. Soils are not anticipated to be affected by the Project.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Environmental Component	Potential Adverse Effects?		Overview of Potential Adverse Effects, Mitigation Measures, and Residual Adverse Effects	Significant Residual Adverse Effects?	
	Yes	No		Yes	No
<p>Sediments</p> <p>Assessed as required under subsection 5(1) of CEAA 2012</p>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<p>There is potential for spills or suspension of sediments during fill placement to affect sediment quality.</p> <p>The dredged material to be used as fill will meet the necessary sediment quality criteria for use in local projects. The Applicant has obtained a determination from ECCC that the placement activity will not require a Disposal at Sea Permit, provided that the material is used to develop fish habitat and meets applicable sediment quality guidelines.</p> <p>Mitigation measures outlined in the CEMP will be implemented during construction to mitigate off-site transport of sediment including the use of a silt curtain, where feasible, and monitoring turbidity. A spill prevention, containment and clean-up plan will be implemented prior to works.</p> <p>With mitigation in place, residual adverse effects on sediment quality are expected to be not significant.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>Groundwater</p> <p>Assessed as required under subsection 5(1) of CEAA 2012</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<p>The Project is located entirely within subtidal and intertidal marine environment. Groundwater is not anticipated to be affected by the Project.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Environmental Component	Potential Adverse Effects?		Overview of Potential Adverse Effects, Mitigation Measures, and Residual Adverse Effects	Significant Residual Adverse Effects?	
	Yes	No		Yes	No
<p>Surface water and water bodies</p> <p>Assessed as required under subsection 5(1) of CEAA 2012</p>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<p>There is potential for adverse effects on surface water and water bodies during construction activities, including dredging and fill placement. Potential adverse effects are anticipated to be limited to water quality effects including total suspended solids (TSS) concentrations.</p> <p>The sediment transport modeling indicates that the TSS concentration plumes and sediment deposition will be limited and restricted to the dredging and infilling areas. This is due to the high settling velocity of sand, the relatively slow currents, and shallow bathymetry at the site, which combine such that any released sand is expected to settle out quickly.</p> <p>The modeling suggests that impacts to the surrounding area due to dredging and fill placement will be minimal. To mitigate the potential sedimentation effects from increased TSS, silt curtains will be used, where feasible. Turbidity monitoring will be conducted during in-water works. No dredging will occur in the fisheries sensitive period for Burrard Inlet. Mitigation measures outlined in the CEMP will be implemented during construction to mitigate off-site transport of sediment.</p> <p>With mitigation in place, residual adverse effects on surface water and water bodies are expected to be not significant.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Environmental Component	Potential Adverse Effects?		Overview of Potential Adverse Effects, Mitigation Measures, and Residual Adverse Effects	Significant Residual Adverse Effects?	
	Yes	No		Yes	No
<p>Species/habitat with special status</p> <p>Assessed as required under subsection 5(1) of CEAA 2012</p> <p>Assessed under section 79 of the <i>Species at Risk Act</i>, as applicable</p>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<p>There is potential for adverse effects on species with special status during construction activities.</p> <p>Federally-listed fish species with ranges that potentially overlap with the Project site include: Yelloweye rockfish, Green Sturgeon, and Bluntnose sixgill shark. Federally listed marine mammals with ranges that potentially overlap with the Project site include: Stellar sea lion, Killer Whale (Southern Resident and Transient), Harbour Porpoise, and Grey Whale. None of these species were identified at the site during the biophysical assessments and are unlikely to be present based on known habitat preferences.</p> <p>A number of federally-listed marine birds were identified using the Maplewood mudflat area or the Main Basin including Marbled murrelet, Great blue heron, common nighthawk, and Western grebe.</p> <p>No federally-listed invertebrate species were observed during surveys in the Maplewood Basin or the surrounding intertidal banks.</p> <p>Mitigation measures to reduce the potential for adverse effects will be implemented as detailed in the CEMP. These include: construction works will largely be conducted within the fisheries least-risk window (August 16 to February 28); pre-construction dive surveys and aquatic life salvages will be conducted prior to dredging and infill activities; and marine mammal safety zones will be established around the Project site, including a 1,000 m safety zone for cetaceans (whales, dolphins, and porpoises) and a 150 m safety zone for pinnipeds (seals and sea lions). If a marine mammal enters its respective safety zone during in-water construction activities, a work stoppage will be implemented.</p> <p>With mitigation in place, residual adverse effects on species/habitat with special status are expected to be not significant.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Environmental Component	Potential Adverse Effects?		Overview of Potential Adverse Effects, Mitigation Measures, and Residual Adverse Effects	Significant Residual Adverse Effects?	
	Yes	No		Yes	No
<p>Terrestrial resources (e.g., vegetation, wildlife, etc.)</p> <p>Assessed as required under subsection 5(1) of CEAA 2012</p>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<p>Wildlife species observed near the Project area include Black bear, River Otter, Mink, Coyote, and Black-tailed deer. Although wildlife may potentially be displaced during construction works (e.g., from construction noise), activities will be short-term in duration and wildlife are expected to return to the area after Project completion.</p> <p>The Project is located entirely within subtidal and intertidal marine environment. Terrestrial vegetation is not anticipated to be affected by the Project. No works will be conducted from land and mitigation measures will be in place to reduce noise to wildlife.</p> <p>With mitigation in place, residual adverse effects on terrestrial resources are expected to be not significant.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>Wetlands</p> <p>Assessed as required under subsection 5(1) of CEAA 2012</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<p>The Project is located entirely within subtidal and intertidal marine environment. Wetland habitat is not anticipated to be affected by the Project.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Environmental Component	Potential Adverse Effects?		Overview of Potential Adverse Effects, Mitigation Measures, and Residual Adverse Effects	Significant Residual Adverse Effects?	
	Yes	No		Yes	No
<p>Aquatic resources (e.g., aquatic plants, fish and fish habitat, waterbirds, marine mammals, etc.)</p> <p>Assessed as required under subsection 5(1) of CEAA 2012</p>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<p>There is potential for adverse effects on aquatic resources during construction activities.</p> <p>The Maplewood Flats receive freshwater inputs from McCarney and Blueridge Streams that sustain spawning coho salmon and cutthroat trout as well as chum salmon. Juvenile chum salmon have also historically used the Barge Channel at the northeast end of the Northeast Basin.</p> <p>An aquatic life salvage of invertebrate species (e.g., Dungeness crab, sea cucumber and urchins) will be conducted in the Project work area prior to the placement of rock and fill materials. Salvaged organisms will be relocated to similar habitat outside of the works area. Fin fish will not be targeted by the salvage as they are likely to move out of the work area as construction activities begin.</p> <p>Other mitigations, as outlined in the CEMP, will be in place to reduce impacts to aquatic resources. These include: establishing marine mammal safety zones, implementing slow start-up procedures for in-water works, and marking and protecting high value habitat (e.g., eelgrass beds).</p> <p>As per the <i>Fisheries Act</i> Authorization, habitat will be monitored in years 1, 2, 3, 4 and 5 following the completion of the construction of the offsetting measures. Contingency measures will be implemented if habit is not deemed successful based on DFO criteria.</p> <p>With mitigation in place, residual adverse effects on aquatic resources are expected to be not significant.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>Health and socio-economic conditions</p> <p>Assessed as required under subsection 5(1) and 5(2) of CEAA 2012</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<p>Based on the very low magnitude of residual effects on air and noise, the Project is not expected to cause adverse effects on health or socio-economic conditions of people, including Aboriginal people.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Environmental Component	Potential Adverse Effects?		Overview of Potential Adverse Effects, Mitigation Measures, and Residual Adverse Effects	Significant Residual Adverse Effects?	
	Yes	No		Yes	No
<p>Archaeological, physical, and cultural heritage resources</p> <p>Assessed as required under subsection 5(1) and 5(2) of CEEA 2012</p>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<p>There is potential for adverse effects on Archaeological, physical, and cultural heritage resources during construction activities.</p> <p>An archaeological site is located on the intertidal flats near the southeast corner of the Northeast Basin. This archaeological site is associated with a work avoidance zone approximately 50m in diameter. The work avoidance zone restricts the southeastern extent of the rock reef habitat in the Northeast Basin. The work avoidance zone is described in the CEMP.</p> <p>The works will follow the recommendations made in the Archaeological Overview Assessment (AOA), and a Chance Find Procedure will be implemented as described in the CEMP.</p> <p>With mitigation measures in place, the proposed works are not anticipated to affect archaeological, physical, or cultural heritage resources.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>Current use of lands and resources for traditional purposes by Aboriginal peoples</p> <p>Assessed as required under subsection 5(1) of CEEA 2012</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<p>The proposed works are not anticipated to affect current use of lands and resources for traditional purposes by Aboriginal peoples.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>Accidents and malfunctions</p> <p>Assessed as required by the <i>Canada Marine Act</i></p>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<p>There is potential for adverse effects on surface water from accidental equipment leaks or spills.</p> <p>Mitigation measures will be in place to reduce potential for adverse, project-related effects due to accidents, by implementing the measures outlined in the CEMP.</p> <p>With mitigation measures in place, the effect of an accident or malfunction on the environment, if it were to occur, is predicted to be not significant.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Residual adverse effects (i.e., effects that remain with mitigation in place) were identified for the following environmental components:

- Air quality;
- Lighting;
- Noise;
- Sediments;
- Surface water;
- Species/habitat with special status;
- Terrestrial resources;
- Aquatic resources;
- Archaeological, physical, and cultural heritage resources; and
- Accidents and malfunctions.

Overall, the residual adverse effects of the Project on all of the environmental components are characterized as:

- Low in magnitude due to impacts on surface water and aquatic resources anticipated to be not significant with mitigations in place, the temporary nature of the construction activities, and proposed overall improvement to habitat quality at the site;
- Local in geographic extent, because effects will be limited to the Project site and immediate vicinity;
- Short-term in duration because the Project will be in construction for approximately eight months;
- Continuous (daily to weekly) in frequency during Project construction, however once construction is complete overall improvement to aquatic habitat is anticipated; and
- Reversible/temporary because residual adverse effects of the Project would cease once the Project construction is complete.

In conclusion, based on the characterization above, the mitigation measures proposed by the Applicant, and the permit conditions, the residual adverse environmental effects from the Project are predicted to be not significant.

7.3 Environmental Review Decision

In completing the environmental review, VFPA has reviewed and taken into account relevant information available on the proposed project, proposed mitigations provided by the Applicant, and additional technically and economically feasible mitigation measures. In accordance with section 67 of CEAA 2012, VFPA concludes that with the implementation of proposed mitigation measures and Permit conditions, the Project is not likely to cause significant adverse environmental effects.

Original Copy Signed

CHRIS BARLOW
MANAGER, ENVIRONMENTAL PROGRAMS

February 6, 2019
DATE OF DECISION

8 CONCLUSION

In completing the project and environmental review, VFPA concludes that with the implementation of proposed mitigation measures and conditions described in the Permit, the Project has appropriately addressed all identified concerns.

It is the recommendation of staff that this application be approved subject to conformance with the project and environmental conditions listed in project permit **PER No. 17-278**.

COPY

**APPENDIX A
Location Plans**



Legend

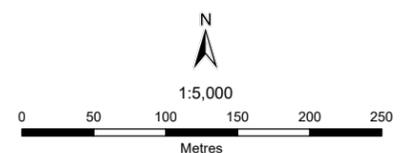
- - - Maplewood Marine Restoration Project Boundary
- - - Maplewood Basin
- - - Barge Channel
- Existing Salt Water Intake Line

Notes

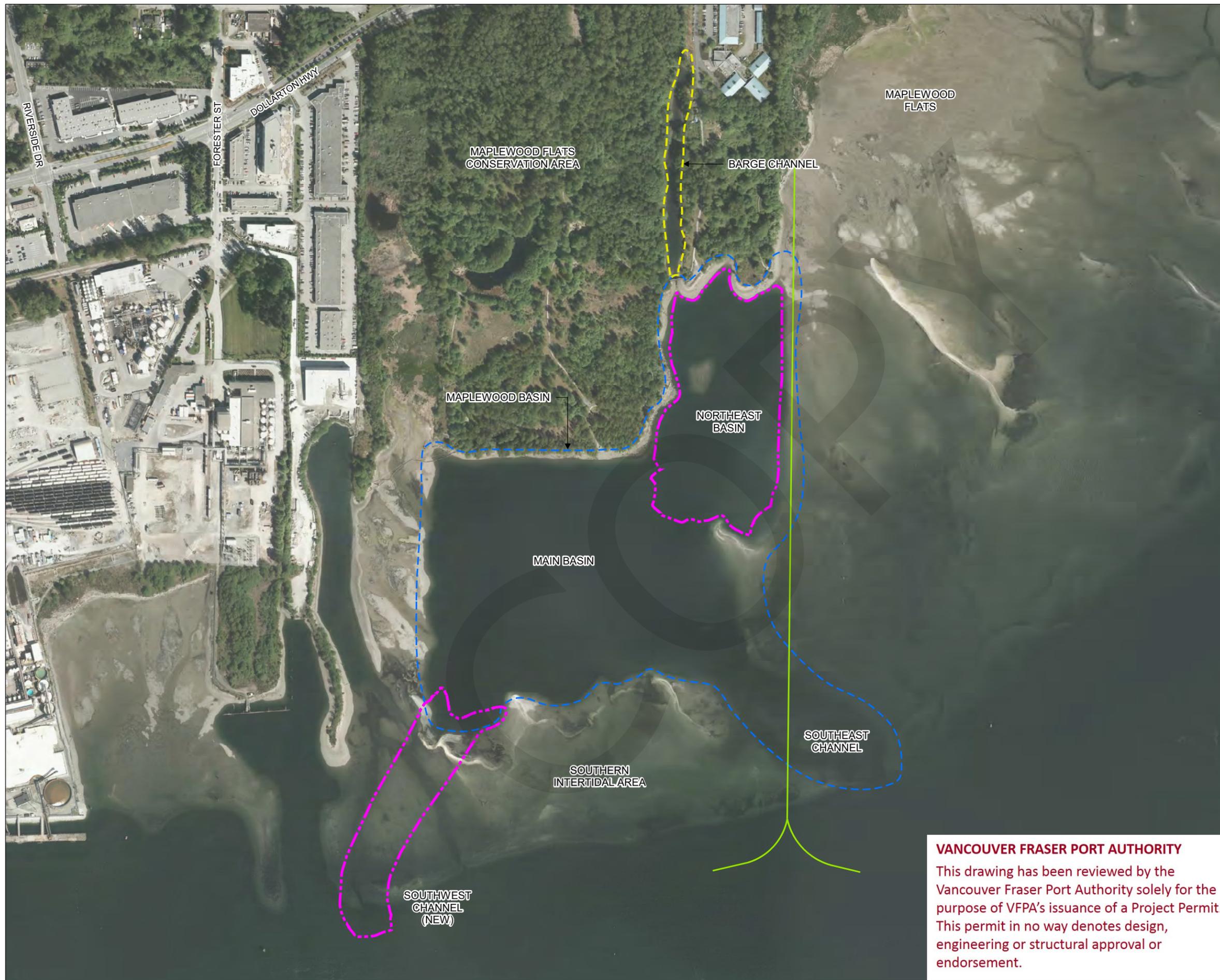
1. All mapped features are approximate and should be used for discussion purposes only.
2. This map is not intended to be a "stand-alone" document, but a visual aid of the information contained within the referenced Report. It is intended to be used in conjunction with the scope of services and limitations described therein.

Sources

- Project Boundary, Basins, and Channel: AECOM, 2018
- Aerial Image: North Vancouver, 2013
- Inset Basemap: ESRI World Topographic Map



NAD 1983 UTM Zone 10N
Page Size: 11" x 17"



VANCOUVER FRASER PORT AUTHORITY

This drawing has been reviewed by the Vancouver Fraser Port Authority solely for the purpose of VFPA's issuance of a Project Permit. This permit in no way denotes design, engineering or structural approval or endorsement.



Legend

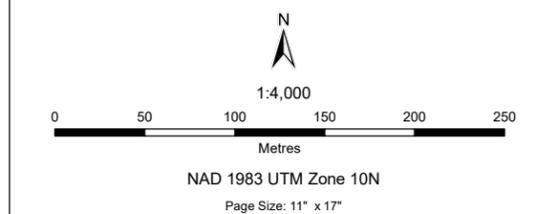
- Maplewood Marine Restoration Project Boundary
- Maplewood Basin
- Barge Channel
- Northeast Basin**
 - Intertidal Flat (19,000 m²)
 - Eelgrass (16,000 m²)
 - Rock Reef (11,000 m²)
- Southwest Channel**
 - Rock Reef (24,000 m²)

Notes

1. All mapped features are approximate and should be used for discussion purposes only.
2. This map is not intended to be a "stand-alone" document, but a visual aid of the information contained within the referenced Report. It is intended to be used in conjunction with the scope of services and limitations described therein.

Sources

- Project Boundary, Basins, Channel, and Proposed Enhancement Features: AECOM, 2018
- Aerial Image: North Vancouver, 2013



VANCOUVER FRASER PORT AUTHORITY
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APPENDIX B
List of Information Sources

VFPA has relied on the following sources of information in the project and environmental review of the Maplewood Marine Restoration Project:

- Application form and materials submitted by Applicant on behalf of the tenant on August 1, 2018.
- All Project correspondence from August 1, 2018 to January 31, 2019.
- All plans labelled Figure 3-1 and Figure 8-1;
- All Reports titled:
 - "Project Description Maplewood Marine Restoration Project", July 2018, Habitat Enhancement Program;
 - "Maplewood Marine Restoration Project Habitat Design - 60% Design Report", July, 2018, AECOM;
 - "Maplewood Marine Restoration Project - Key Milestones (Attachment 2)", July 31, 2018, Habitat Enhancement Program;
 - "Existing Ecological Conditions: Maplewood Marine Restoration Project", July 2018, Hemmera Envirochem Inc.;
 - "Maplewood Marine Restoration Project Sediment Characterization", July 31, 2018, Hemmera Envirochem Inc.;
 - "Maplewood Marine Restoration Project Archaeological Overview Assessment", July 26, 2018, Inlailawatash Limited Partnership;
 - "Appendix I – Noise Assessment Screening Worksheet, August 1, 2018, Habitat Enhancement Program;"
 - "Maplewood Marine Restoration Project Construction and Environmental Management Plan", July 2018, Hemmera Envirochem Inc.;
 - "Maplewood Marine Restoration Project Public Consultation and Stakeholder Engagement Plan", July 2018, Habitat Enhancement Program;
 - "Aboriginal Consultation Summary".
- All Memos titled:
 - "Limited Phase II Environmental Site Assessment – Maplewood Marine Restoration Project, Burrard Inlet, North Vancouver, BC", July 26, 2018. Hemmera Envirochem Inc.;
 - "PER MMRP Additional Information Request 2 (AIR-2): Coastal Engineering Memorandum", August 30, 2018, AECOM
 - "Additional Information Regarding Works Outside of Regular Work Hours and Noise Screening Worksheet, August 23, 2018, Habitat Enhancement Program.