



PORT of
vancouver

PROJECT AND ENVIRONMENTAL REVIEW REPORT

**PER NO. 2015-136
PORT MOODY CHANNEL DREDGING**

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December 28, 2016

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		VANCOUVER FRASER PORT AUTHORITY PROJECT AND ENVIRONMENTAL REVIEW REPORT
PER No.:	2015-136	
Tenant:	Pacific Coast Terminals Co. Ltd.	
Project:	Port Moody Channel Dredging	
Project Location:	Port Moody Navigation Channel	
VFPA SID No.:	PTM110	
Land Use Designation:	Port Water	
Applicant(s):	Envirochem Services Inc. on behalf of Pacific Coast Terminals Co. Ltd.	
Applicant Address:	206-267 West Esplanade, North Vancouver BC V7M 1A5	
Category of Review:	C	
Recommendation:	That PER No. 2015-136 for dredging of the Port Moody Navigation Channel 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 of PER 2015-136 Port Moody Channel Dredging (the Project) proposed by Envirochem Services Inc. on behalf of Pacific Coast Terminals Co. Ltd. (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. This review provides 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. It is a prerequisite to the issuance of a project permit (the Permit) and the conclusions described in this report require compliance with the conditions in the Permit.

2 PROJECT DESCRIPTION

Pacific Coast Terminals C. Ltd. (PCT) handles the bulk export of bulk and liquid bulk commodities, including sulphur, ethylene glycol, canola oil, and as of 2017, potash. PCT proposes to dredge a portion of the Port Moody navigation channel and turning basin near the terminal. The project is intended to increase the depth of the channel from -10.5 metres (34.5 feet) to -13.5 metres (44.3 feet) at low water. The dredging is proposed to extend west to a point just beyond the Reed Point Marina, and to address the shallowest points of the existing seabed travelled by deep sea vessels. The project is comparable to the 1995 PCT turning basin dredging project, which was an initiative of the Vancouver Fraser Port Authority at that time. That project included dredging of the turning basin only, and was smaller in both volume and area than the current proposal.

The total volume of dredging proposed is an estimated 550,000 m³. Dredged material is proposed to be disposed at sea, in an area of Port Moody Arm immediately east of the terminal. The project also includes the creation of an underwater berm, which will contain the loosely consolidated dredged sediments within the disposal area.

Proposed Works

- Installation of an underwater containment berm using a clamshell derrick on a barge;
- Dredging the shipping channel;
- Dredging the turning basin;
- Dredging the berth face;
- Disposal of approximately 550,000 m³ of dredgeate in the basin within the containment berm.

For maximum efficiency, dredging is anticipated to be completed using a trailing hopper suction dredge for the channel, a cutter suction dredge for the turning basin, and a clamshell derrick on a barge for the berth face area, as described in the application package and in subsequent communications. Depending on equipment availability however, the works may be completed with any combination of these, or other similar and comparable equipment that is available. The work is proposed to be undertaken by local dredging contractor Fraser River Pile & Dredge (GP) Inc. (FRPD), and, as described below, is subject to authorization by VFPA of the Imperial Oil and Gas pipeline removal and authorizations by other agencies, such as Environment and Climate Change Canada.

2.1 Rationale

Increased depth in the marine channel will enhance the operational efficiency of the terminal, by allowing fully loaded vessels to depart the terminal with less tidal assist. Following completion of the project, a loaded vessel could depart the terminal immediately after loading has finished, rather than the current practice of awaiting the next high tide after loading, for the tidal assist that allows the vessel to clear the shallowest portion of the channel near Reed Point Marina. The proposed deepening has positive effects for the terminal's berth utilization and overall potential throughput capacity, for vessel efficiency as it relates to the need for pilots to complete a departure, and positive implications for other vessel and crossing rail traffic at the Second Narrows. It will also reduce the use of the anchorages east of the Second Narrows.

The project would not directly affect the capacity of the terminal, or the size and frequency of vessels calling. PCT is anticipating an overall increase in vessel traffic at the terminal once the site commences handling potash in 2017. Due to the cyclical nature of export commodity markets, the terminal has in past years experienced higher vessel traffic levels than what are currently handled. Volumes shipped are variable and subject to market fundamentals and several other factors.

Fundamentally, the proposed dredging would reduce restrictions on loaded vessel departures, making the terminal more competitive with other deep-sea facilities in the region.

2.2 Channel Width

The Project will deepen an existing deep sea channel, which is a single-direction channel that services only PCT. The navigation channel approaching PCT is too narrow to permit deep sea vessels moving in opposite directions to pass each other, and this is not proposed to change. The terminal is the only site that benefits directly from the Project, as other users of the waterway do not require or benefit from the current full depth or the increased depth proposed. This is further described in Section 3.3.

2.3 Imperial Oil pipe crossings

The proposed PCT Project has direct effects on one other component of existing infrastructure: two parallel pipe crossings of Port Moody Arm located west of the terminal. Imperial Oil (IOL) owns two existing oil pipeline crossings referred to as the NPS6 and NPS12, which connect the loco distribution terminal and the former refinery on the north side of Port Moody Arm.

The pipes are 6 and 12 inches in diameter respectively, are intact but dormant and are no longer needed by IOL, and cross the path of the dredge cut. Portions of these two pipes spanning the entire width of the channel, including the safety buffer areas on either side of the channel, are proposed to be removed, approximately 150m in length. IOL has confirmed that there is no benefit or intent to reinstall the pipes at a greater depth below the dredge path.

The pipelines date from 1955. They have not been used since the late 1990's, and are not armored or otherwise protected from impacts. They are located immediately east of the Reed Point Marina (south end) and cross under the Loco Boat Club lease area (north end). They are located at a depth of between 1 and 2 m below the surface of the seabed, putting them in direct conflict with the proposed dredging project. The pipes have both been cleaned and inspected/surveyed several times since their use ceased, are filled with nitrogen, and are considered to be clean.

The pipelines are required to be removed by IOL according to the terms of the lease areas in which they are located. VFPA has confirmed that only the sections that are within the channel boundaries (including the safety zone) are required to be removed, as further described in Section 3.3 below. IOL has changed the proposed removal approach and methodology twice since the original application was made in December 2014, and has not yet finalized an approach acceptable to the company from a safety and economic perspective. The most likely approach to removal will include cutting the pipe and raising it in sections to a barge, for disposal off-site. The complete execution of the PCT project depends on the approval of the IOL PER application, and the conflicting pipes being removed. The removals are subject to a separate application, which continues to be reviewed under number 15-002. VFPA awaits re-submission of a proposed removal approach. A decision on the IOL application is anticipated to follow this permit.

IOL anticipates capping, filling with grout, and abandoning in place the remainder portions of pipe outside the channel, at the north and south ends. The grout would render them unusable in future. VFPA has not yet determined if the portions of pipe that are abandoned in place would be subject to the requirement to maintain an active lease, or under what terms portions might be abandoned.

2.4 Disposal at Sea

PCT requires a Disposal at Sea (DAS) permit from Environment and Climate Change Canada (ECCC) in order to commence the dredging operation as proposed. This permit is under review by ECCC, and a condition of this permit.

In preparation for the two permit applications, both PCT and IOL conducted extensive sediment sampling along the proposed dredge path and around the pipelines. The Applicants are also able to draw on other sampling done in previous years in preparation for the PER applications. PCT conducted sampling in accordance with ECCC direction, and with the goal of supporting the DAS application. IOL was also required to conduct sampling in accordance with the terms of the leases for the pipelines.

The sampling conducted by PCT confirmed that the dredgeate meets current DAS criteria, at all but one location. Sampling by IOL confirmed the existence of limited pockets of sediments that do not meet numeric DAS criteria. These are located at the south end of the lease area near the shoreline next to Reed Point Marina. The sediments of concern that failed a biological test are characterized as being high in hydrogen sulphide. They are also confirmed to not be related to the IOL pipelines, and to be weathering in place. Details of the sampling, testing, and the potential impacts of this are further discussed in Section 7.

While these sediments of concern are not directly impacted by the proposed dredging of the channel or turning basin, some of these sediments may be at risk of slumping into the channel at a future date. In doing so the turbidity associated with slumping could mean that they enter water column at that time, or later are at risk of being dredged to maintain the depth of the channel.

In response to these concerns raised as a result of the review process, PCT have proposed to conduct limited dredging (2,500 m³) of the sediment of concern near the pipelines using a clamshell derrick, and place this material behind the berm, to be followed by the dredge material from the remainder of the project. This approach is under review by ECCC, and is subject to their authorization. Should this approach not be authorized by ECCC, the alternative is to dispose this limited volume upland, at increased cost (see Section 7 for additional information).

2.5 Proposed Schedule

The works are anticipated to require several months to complete. The approximate duration is described below.

- Underwater berm construction – 8 weeks
- Removing sediments of concern – 2 weeks
- Dredging the marine channel – 16 weeks, if done 24/7
- Dredging the turning basin – 10 weeks
- Dredging the PCT berth face – 4 weeks

The works are all restricted to being conducted outside of the fisheries-sensitive period, meaning outside of the period between August 16th and February 28th, annually. They may be completed in one season, or broken up into phases and completed over several seasons.

The works are proposed to be largely conducted within standard VFPA construction hours of 7 am to 8 pm, Monday to Saturday and excluding statutory holidays. Noise modeling has been completed for dredging the channel portion of the project, assuming the FRPD 309 trailing hopper suction dredge. The 24/7 work is not expected to be audible to the residents in Port Moody. This is further discussed in Section 5 below.

The investment value of this project is between \$8 and \$11 million.

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 supports the recommendation to approve the Project subject to adherence to the listed project and environmental conditions in the Permit.

3.1.1 Land Use Designation

The proposed dredging and shipping activities conform to the designation of Port Water in Vancouver Fraser Port Authority's Land Use Plan.

Dredging of the berth face area is within PCT's lease boundary, an area which has a Port Terminal designation. The activity facilitates future use as a terminal, and thus conform to the Port Terminal designation.

3.2 Engineering

The proposed Project intends to dredge an underwater channel, deepening portions of the sea bed. The project also proposes to construct an underwater berm, which must be relied upon to retain dredgeate that is understood to be of very fine consistency.

Engineering supports the recommendation to approve the Project subject to adherence to the listed project and environmental conditions in the Permit.

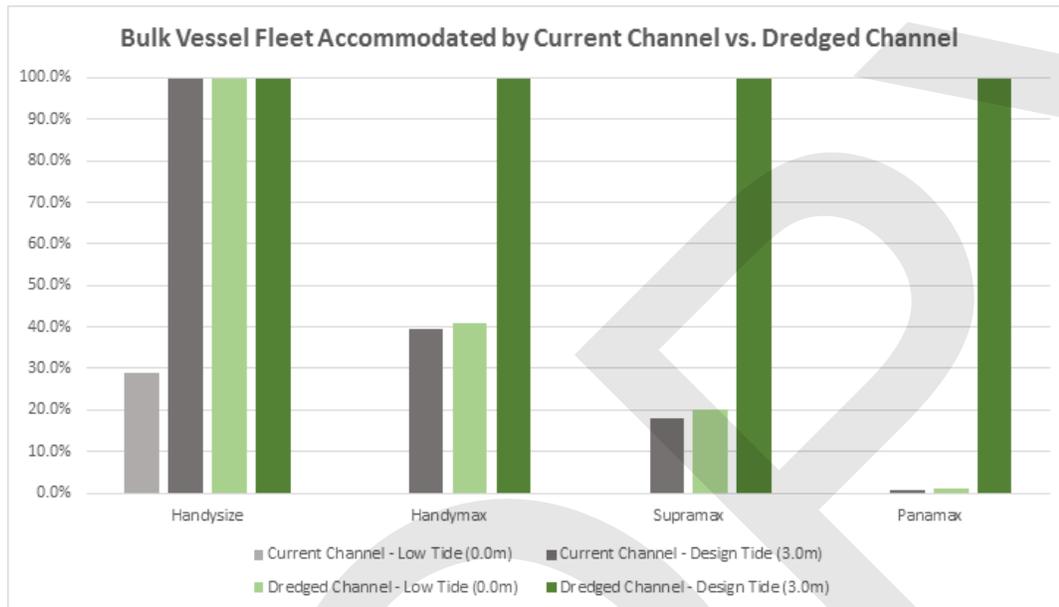
3.3 Marine Operations

The physical dredging activities are anticipated to improve navigation in the vicinity of both the terminal, and the Port Moody inlet generally. Deep-sea vessels calling at PCT are the only vessels accessing the inlet that are confined to the deep-sea channel.

The proposed deep-sea navigation channel dredging will improve terminal optimization by increasing the terminal's ability to handle a larger portion of the worldwide bulk fleet with less tidal assist. The marine navigation implications of this include more flexibility in vessel choice for shippers, decreased reliance on the anchorages located east of the Second Narrows, and decreased use of pilot hours to safely move a vessel from the terminal to the inner harbour of Burrard Inlet.

Currently, loaded vessels departing PCT must utilize tidal aid to transit the navigation channel, due to a high spot in the channel near the terminal. Vessels must also coordinate their departure to transit Second Narrows Movement Restriction Area (MRA-2) in compliance with vessel specific transit restrictions. Often times this is not possible without first utilizing an anchorage east of the Second Narrows MRA-2. This two-phased departure limits the ability to have vessels depart loaded, and be replaced with empty vessels in an efficient manner.

Marine Operations assessed the future capability of the dredged channel to accommodate bulk vessels of the world fleet, in comparison with the current channel. Although the terminal will still generally rely on tidal aid, to have loaded deep-sea vessels depart the terminal, the range of vessels that will be capable of transiting the channel under typical conditions will be greatly improved. Marine Operations assessed the capability of the deep-sea channel at low tide (0.0 meters) and a design tide of 3.0 meters, which represents the consistent daily tidal height in the Port Moody inlet. This is illustrated in the graphic below.



3.3.1 Construction / Dredging Phase

Marine Operations confirmed that there is sufficient depth of water for domestic and recreational traffic to safely transit to and from Port Moody inlet while dredging activities are underway within the channel, turning basin and proposed fill site. Deep-sea vessels, and other vessels requiring unimpeded access to the Port Moody inlet, will be able to coordinate arrivals and departures directly with the dredge contractor.

The FRPD vessels proposed to be engaged in dredging, including the trailing hopper suction dredge, cutter suction dredge and clamshell dredge are all Transport Canada certified vessels. The dredges, and all supporting vessels are required to conform to the *Canada Shipping Act, 2001 - Collision Regulations* at all times, including when actively dredging.

Dredging activities are anticipated to occur over several months, with each phase of activity having potential impacts to navigation. For example, use of the trailing hopper and cutter suction dredges require the use of floating pipeline sections to deliver dredged material to a diffuser located in the disposal area. These structures impose a certain risk to navigation both while in use and while stored at or near the job site. As such, the Applicant, and any contractors, are expected to be familiar with vessel movements, fisheries and other activities within Port Moody Arm with particular attention given to the deep-sea channel and turning basin.

At all times during the term of the project permit, construction and dredge related activities are required to be conducted in a manner that does not impede navigation and vessel movements within the area. To achieve this, the Applicant, and all contractors, are required to communicate

and coordinate all construction and dredging activities with PCT, VFPA, BC Coast Pilots, CCG-MCTS and other users of the Port Moody area.

Marine Operations will require the Applicant to hold a project launch construction staging meeting prior to any in-water activities occurring, and invite relevant stakeholders such as regular commercial users of the Port Moody inlet. Based on feedback received at the construction staging meeting, Marine Operations may require the Applicant to hold additional meetings periodically to provide marine works updates to relevant stakeholders. This is condition No. 21 in the permit.

These meeting(s) are an additional requirement for this project, above and beyond the requirement of the Applicant to submit a Marine Construction and Staging Plan (condition No. 24) and the standard requirement to issue Notices to Shipping via the Canadian Coast Guard (condition No. 20).

Given known and regular year-round commercial and recreational activities in Port Moody inlet and how they may be impacted by the construction phases of this project, Marine Operations also requires PCT or their contractors to maintain safe and unimpeded access for neighbouring tenants to their waterlot lease areas at all times (condition No. 38).

In order to maximize visibility of construction equipment, including vessels, the Applicant is required to ensure that the pontoon-supported floating pipeline structures are lit with a flashing yellow light during periods of darkness and reduced visibility in accordance with the Canadian Coast Guard's *The Canadian Aids to Navigation System* (condition No. 39).

3.3.2 Hydrographic Survey Requirements

In order to accurately record inlet depth, the Applicant is required to provide VFPA with pre and post bathymetric surveys of all underwater areas where either berm construction / fill placement, or dredging works are proposed to occur. Additionally, the Applicant will be required to provide VFPA Marine Operations with regular dredge monitoring surveys at intervals determined by VFPA.

As dredging progresses, the Applicant may wish to request that the navigable/control depth of the navigation channel, turning basin or berth pocket be revised. To have the advertised navigable or control depth for any of these areas be considered for revision, the post dredged survey data must be validated by a competent navigation authority. As such, the Applicant shall either contract a surveyor capable of meeting the Canadian Hydrographic Survey Standards, or request that VFPA arrange for a competent authority to conduct the survey. This requirement is detailed in condition No. 46 of the permit conditions.

To have the advertised navigable or control depth for either the navigation channel, turning basin or berth pocket revised, the post dredge survey data must be validated by a competent navigation authority. This is detailed in condition No. 46.

Marine Operations supports the recommendation to approve the Project 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. Note that this project was reviewed and referred for

comment concurrently with the IOL project, as the projects were deemed sufficiently related in purpose and timing. The scope of the PCT project is larger, and the majority of concerns raised were related to it.

4.1 Municipal Consultation

The proposed Project was assessed by Planning to have potential impacts to municipal interests. A referral letter was sent to the City of Port Moody on July 29, 2015, notifying them of the proposed Project. On November 20, 2015, Port Moody responded with comments on the proposed Project. Subsequent communication in 2016 also confirmed that the City had several concerns with the project, and VFPA responded by letter on March 8, 2016.

Below is a table summarizing the comments received from the City, and how they were considered as part of the project and environmental review.

Issue	Mitigations and Permit Conditions	Rationale
Impact of deposition of dredgeate in Port Moody Arm, and preference for disposal at Point Grey site.	None required.	The Applicant has completed testing to demonstrate that Disposal at Sea criteria are met for the proposed disposal area, with one exception as described in Section 7. Further, final approval from ECCC is required for disposal in Port Moody Arm.
Whether the disposal is considered environmental restoration.	None required.	The application does not state or rely on the project being considered environmental restoration. This concept formed part of the pre-application material prepared by the Applicant, but was not pursued in the submitted application.
Whether the potential socio-economic impacts of the works have been determined, and what measures would be employed to mitigate this.	None required.	Negative socio-economic impacts are not anticipated.
Whether future dredging would be required to maintain the channel.	None required.	No additional dredging is anticipated or known at this time. Should this be proposed in future, it would be assessed against current regulations at that time.
Whether there are any cumulative effects of the project, on their own or in combination with other projects.	None required.	Cumulative effects from the IOL pipeline removal project, described in Section 2.3, was considered during the review. No cumulative effects are anticipated.

Issue	Mitigations and Permit Conditions	Rationale
Whether the proposed monitoring program (1 year) is adequate.	Annual monitoring for 5 years is required. Condition 43, 44, and 45 address the monitoring and reporting structure.	One year was deemed to be insufficient based on VFPA technical review.

Following submission of the above responses to the City, the Applicant and VFPA subsequently met with City of Port Moody staff to discuss outstanding concerns and to address technical questions that had been raised about the project and the related IOL project. City staff asked several questions in support of an update to City Council, which occurred in November 2016. This resulted in a Council motion to oppose the Disposal at Sea application that is with ECCC.

Given the proximity of this project to residential areas, the unusual nature of the work and the type and relative visibility of project equipment while undertaking the dredging, the Applicant were required to submit an analysis of the anticipated noise profile that would be experienced by nearby above-water receptors. This analysis, conducted by BKL Acoustics, predicts interior noise levels at night with windows closed of approximately 30 dBA at the nearest residential receptor and thus, overnight work would not impact residents. While the City did not express concern with potential noise from the project in their comments, VFPA requires that the adjacent residential areas be captured in the construction notification distribution outlined in condition No. 19 in order to provide a feedback mechanism. In addition, condition No. 35 requires that in the event that it becomes apparent to the VFPA that additional measures are necessary with regard to managing noise, VFPA may require that the Applicant prepare and submit a noise management plan, including monitoring, to the satisfaction of VFPA. The Applicant shall be responsive to noise-related issues identified by the VFPA and by the public and other third parties.

4.2 Federal and Provincial Agency Consultation

PCT submitted an application to Fisheries and Oceans Canada (DFO) in November 2012 to determine whether the proposed Project is likely to result in serious harm to fish. DFO responded in February 2014, confirming that no formal *Fisheries Act* authorization is required in order to proceed with the Project.

The proposed Project was assessed by Planning and Environmental Programs to be of potential interest to Federal agencies. Contact was made with the following agencies, to discuss the possibility of coordinating the review of certain aspects of the project:

- Environment and Climate Change Canada; and
- Transport Canada.

VFPA worked with these two agencies to coordinate aboriginal consultation, and hosted these agencies on several meetings with the Applicant where the PCT and IOL permit applications, as well as the Disposal at Sea applications were discussed. In addition, these two agencies worked with VFPA and the Applicant to respond to questions from various stakeholders about the projects throughout the review.

VFPA understands that PCT has submitted an application to ECCC for Disposal at Sea, and that ECCC continues to review the application. A decision on the authorization has not yet been made. A copy of this permit is to be submitted to VFPA (see condition 7).

4.3 Adjacent Tenant Consultation

The proposed Project was assessed by Planning to have potential impacts to adjacent VFPA tenant operations. A referral letter was sent to the following VFPA tenants on July 29, 2015 notifying them of the proposed Project:

- Reed Point Marina; and
- Flavelle Sawmill Company Limited.

Flavelle Cedar (the sawmill, located immediately east of PCT) and the Marine Mammal Research Unit (subtenant of Reed Point Marina) responded with comments on the proposed Project. Below is a table summarizing the comments received and how they were considered as part of the Project and Environmental Review.

Issue	Mitigations and Permit Conditions	Rationale
A timeline for the activities, including start and completion dates, and daily schedule.	Condition No. 19 of the permit requires the Applicant to notify surrounding residents and stakeholders in accordance with an approved construction communications plan.	This is best practice for a project that may generate interest in the community, or have offsite impacts that warrant advanced notice.
Source noise levels for equipment required for dredging.	Condition No. 36 requires the submission of noise monitoring data and test methodology.	
More information about the potential disturbance of sediment, and how it may affect sea lions that are the subject of research.	None required. Condition No. 32 sets out performance criteria related to turbidity and monitoring of turbidity that might be generated during the works.	This is best practice for dredging projects.
Localized effects on turbidity near Reed Point Marina.	Condition No. 32 sets out performance criteria related to turbidity and monitoring of turbidity that might be generated during the works.	This is best practice for dredging projects.
Maintaining unimpeded access for log booms and chip barges to an adjacent leasehold.	Condition No. 38 of the permit requires that safe and unimpeded access is provided for neighbouring tenants to their waterlot lease areas at all times. Condition No. 39 also requires vessels and other dredging equipment to be lit in periods of reduced visibility.	Given the potential of the dredging equipment to impact local navigation while in use or while being stored, additional mitigative steps are warranted.

Following receipt of comments by VFPA, PCT representatives met with the operators of the Marine Mammal Research unit, and committed to maintaining communication with them during the course of project works.

4.4 Marine Users Consultation

The proposed Project was assessed by Marine Operations to have potential impacts to marine users. A referral letter was sent to the Marine Users on July 31, 2015 notifying them of the proposed Project.

The circulation for this referral included the following agencies:

- BC Coast Pilots;
- Council of Marine Carriers;
- BC Chamber of Shipping;
- Pacific Pilotage Authority; and
- Shipping Federation of Canada.

Marine Operations did not received any feedback on or concerns about the project.

5 PUBLIC CONSULTATION

The proposed project was assessed by VFPA to have no potential impacts to community interests upon completion, given the previous dredging that has taken place in Port Moody Arm, and the project rationale to enhance terminal and vessel efficiency. Public consultation was not required to be conducted by the Applicant during the permit review. The PCT and IOL projects were posted to the VFPA website for review once the applications were deemed complete in 2015.

The project was assessed by VFPA to have some potential impacts to community interests during construction. These include potential impacts such as noise and light from the dredging vessels, or impeded navigation from the floating pipeline sections. The public or other stakeholders may also raise questions about the work, given the likely visibility of dredging equipment on the water, and the length of time over which works could be ongoing.

As a result, the Applicant is required to send a construction notice to adjacent residents and businesses along several streets in Port Moody, as described in condition No. 19 and the Construction Communications Plan. The notification area is within approximately four blocks and 1500 m from the project site. The construction notice is required to be distributed by the Applicant at least 10 business days prior to the start of the works. The construction notice will also be required to be posted on VFPA's and the Applicant's websites. This is as described in condition No. 18 in the project permit.

PCT also included a request for extended work hours, beyond the hours when construction is normally authorized (7 am to 8 pm, Monday to Saturday, excluding statutory holidays), for one component of the works. Use of the FRPD 309, the vessel most likely to be employed for dredging of the marine channel, is most effective when operated continuously. With 24/7 operation, the proposed main navigation channel deepening can likely be achieved in fewer than 16 weeks. Construction and any physical activities related to the Project may be conducted Monday to Saturday between the hours of 7:00am and 8:00pm. In addition, specific works for the purpose of dredging the main navigation channel may be conducted 24 hours a day, 7 days a week for up to 16 weeks, provided monitoring is undertaken, consistent with condition No. 35. No construction

works shall occur during statutory holidays. These hours shall not be modified without prior approval from VFPA.

5.1 Environmental Interest Group Input

VFPA also received input from interested members of the public, which are here categorized as environmental interest groups. Input was received in November 2015 from the Burke Mountain Naturalists, the Port Moody Ecological Society, the Burrard Inlet Marine Enhancement Society, and the Reed Point Marine Education Centre, each expressing concerns about the project.

The table below summarizes the comments received, and how they were considered as part of the Project and Environmental Review. Further information on this subject generally is captured in Section 7 of this report.

Issue	Mitigations and Permit Conditions	Rationale
Sediment characterization and density	None required.	The Applicant's sediment sampling and analysis meets the needs of VFPA's technical assessment, as further described in Section 7.2 below.
Potential impacts to marine birds and mammals	Permit condition No. 27 requires works to be monitored by an appropriately qualified environmental professional, and condition No. 28 requires submission of monitoring reports from that professional on a weekly basis.	Effects on marine bird activities and numbers is not anticipated based on VFPA's technical assessment, as further described in Section 7.2 below. On-site monitoring will be conducted during the works. Should there be any unanticipated effects on marine birds and mammals, additional mitigation measures will be implemented.
Nutrients and phytoplankton; suspended solids and sedimentation	Permit condition No. 32 sets out requirements on turbidity and sediment in the water column.	Effects on aquatic species and water quality are described in Section 7.2 below.
Environmental benefit and construction of an island	None required.	The project does not rely on an assumption that there is environmental benefit to the dredged material, and an island is not proposed.

The four environmental interest groups were responded to by letter on April 18, 2016. No further comments or correspondence was received from these groups or from other members of the public.

6 ABORIGINAL CONSULTATION

VFPA Aboriginal Affairs reviewed the proposed works and determined that the project may have the potential to adversely impact Aboriginal or Treaty rights. As such, Aboriginal consultation was undertaken by VFPA.

The following Aboriginal groups were consulted:

- Tsleil-Waututh Nation;
- Squamish Nation;
- Musqueam Indian Band;
- Sto:lo Nation and Sto:lo Tribal Council (via the People of the River Referrals Office - PRRO);
- Cowichan Tribes;
- Halalt First Nation;
- Stz'uminus First Nation;
- Penelakut First Nation;
- Lyackson First Nation; and,
- Lake Cowichan First Nation.

The following consultation activities were conducted:

Pre-Application Phase:

Between 2011 and 2013, prior to submitting a project permit application to VFPA, PCT shared information regarding the proposed dredging project with Tsleil-Waututh, Squamish, Musqueam and Sto:lo Nations.

PRRO (Sto:lo) deferred their review early on. Information sharing and meetings continued with Musqueam, Squamish and Tsleil-Waututh Nations.

Application Review Phase:

On June 22, 2015, once the application, and the IOL application had been deemed complete, VFPA sent a referral package to each of the Aboriginal groups listed above. The referral package included:

- a consultation letter,
- the IOL project permit application,
- the PCT project permit application,
- an overview map, and
- Envirochem Services Memorandum.

VFPA explained its intention to coordinate Aboriginal consultation with two other federal agencies – Transport Canada (TC) and Environment and Climate Change Canada (ECCC). Of the two projects, both are required to obtain an authorization from TC under the Navigation Protection Act and PCT is required to obtain an authorization from EC for Disposal at Sea. Comments were requested from Aboriginal groups by July 24, 2015.

Project Updates:

During the Application Review Phase, several project updates were shared with Aboriginal groups due to changes in the Applicants' proposed project plans.

Update 1 – Possible proposed project design changes:

On December 8, 2015, VFPA informed Aboriginal groups that the Applicants were reviewing the scope of their proposed projects, and that the review may result in significant changes to the design of the pipeline removal and dredging works. VFPA committed to providing Aboriginal groups with a further update the following year.

Update 2 – IOL change to pipeline removal methodology:

On March 15, 2016, VFPA wrote to Aboriginal groups and described IOL’s proposed changes to their pipeline removal methodology. No changes regarding the PCT Dredge works were proposed at this time. VFPA requested comments from Aboriginal groups regarding the new IOL pipeline removal methodology by April 28, 2016.

Update 3 – PCT Sediment Handling Plan:

In April, 2016, based on the project and environmental review to that date, VFPA and ECCC concluded that PCT’s proposed dredge works may have the potential to disrupt a pocket of PAH-affected sediments that would then require specific handling or management. VFPA and ECCC requested PCT draft a sediment handling plan to describe how they would manage the PAH-affected sediments.

The proposed plan was completed by PCT, and shared with Aboriginal groups on May 20, 2016. VFPA requested comments from Aboriginal groups on the proposed sediment handling plan by July 5, 2016.

Update 4 – IOL change to pipeline removal methodology

In August 2016, IOL informed VFPA they would be once again be changing their proposed pipeline removal methodology. While VFPA was informed that IOL would submit their revised project plans in November 2016, as of December 2016 a revised application from the Applicant was still forthcoming.

Below is a table summarizing comments received from Aboriginal groups and how they were considered as part of the Project and Environmental Review.

Issue	Mitigation and Permit Conditions	Action
Impacts to fish and fish habitat.	VFPA does not anticipate significant adverse impacts to fish and fish habitat in consideration of the following: <ul style="list-style-type: none"> • DFO (Brian Naito’s letter, dated Feb 26, 2014) recommended four mitigation measures to minimize impacts to fish and fish habitat; accordingly, VFPA has imposed equivalent mitigations in the form permit condition Nos 34, 37 and 32 (32 addresses mitigations 3 & 4 in DFO’s letter). 	None - Addressed through the following permit conditions that address aquatic effects impacts: Condition No. 27 requiring an environmental monitor be in place for berm construction, dredging and dredged material placement works. Condition No. 28 requiring submission of monitoring reports. Condition No. 31 requires that activities be carried out in a manner that avoids adverse impact to fish and fish habitat and with deference to the Fisheries Act.

Issue	Mitigation and Permit Conditions	Action
	<ul style="list-style-type: none"> • PCT conducted studies to confirm that egg bearing female crabs would not be in the project area at the time of the dredge and so impacts to the crab population would be minimal. • VFPA will require post-placement sea bed monitoring for five years, looking at both sediment chemistry and biological communities. • The dredge plan has been created to minimize potential impacts to fisheries. • The diffuser will allow slow placement of sediment to minimize discharge velocity, reduce turbidity, and impact to the seabed. Silt screens will be deployed to a depth of 6 meters near the diffuser to contain sediments in the water column. • In addition, the dredge pump rate can be adjusted when required to reduce discharge velocity and minimize potential turbidity. • An environmental professional will monitor the deposition with a view to adaptive management and effects mitigation. 	<p>Condition No. 32 requiring management of sediment, sediment-laden waters and other deleterious substances entering the water, and management of turbidity levels.</p> <p>Condition No. 34 requiring no in-water works during the fish sensitive window – March 1 to August 15.</p> <p>Condition No. 37 prohibiting project vessels to ground or otherwise disturb the foreshore or seabed.</p> <p>Conditions No. 43, 44 & 45 imposing post-construction monitoring of the berm, dredging and placement area, including sediment and biological monitoring for 5 years.</p>
<p>Impacts to the ability to fish and practice cultural activities.</p>	<p>VFPA is not aware of any DFO AFS license to fish in the vicinity of the project area, however VFPA is aware that the DFO AFS licenses to fish</p>	<p>None - Addressed by the following permit conditions:</p> <p>Condition No. 20 requires that Notices to Shipping be provided to the marine</p>

Issue	Mitigation and Permit Conditions	Action
	<p>do not abrogate or derogate from Aboriginal rights.</p> <p>VFPA understands that the works would be carried out in a manner that will not adversely affect other users of the Port Moody Arm waterway, including recreational boaters and industrial users.</p> <p>As such, VFPA does not anticipate adverse impacts to Aboriginal groups and their rights to fish and utilize the Port Moody Arm waterway.</p>	<p>community advising of potential hazards.</p> <p>Condition No. 24 prescribing a 16 week window for dredge activities, so that impacts to cultural activities are limited.</p> <p>Condition No. 34 prohibiting in-water works during the fish sensitive window – March 1 to August 15.</p> <p>Condition No. 39 requirements regarding navigational aids and markers to support safe transit of all vessels in the vicinity of the Project.</p>
<p>Impacts to archaeological resources</p>	<p>There are no known archaeological sites within or near the proposed work area.</p> <p>All works are proposed to take place in deep water and impacts to archaeological resources are not expected.</p> <p>As a matter of due diligence, VFPA will require that the Applicants develop an Archaeological Chance Find Protocol as a condition of the Project Permits.</p>	<p>Addressed by permit condition No. 22 - The submission of an Archeological Chance Find Procedure to be used in conjunction with the project for VFPA approval.</p>
<p>Impacts to species at risk</p>	<p>As per VFPA's environmental review of the proposed project, VFPA is of the view that it is unlikely that the dredging project would impact any of the listed species, and VFPA does not believe that additional work is required in this regard.</p>	<p>No action required.</p>
<p>Noise impacts</p>	<p>VFPA does not anticipate significant noise impacts resulting from the dredging works.</p> <p>VFPA is awaiting submission of a revised application and/or confirmation of methodology</p>	<p>Addressed through the following permit conditions:</p> <p>Condition No. 35 requiring appropriate steps to minimize adverse noise impacts on people and wildlife, and potential submission of a noise</p>

Issue	Mitigation and Permit Conditions	Action
	<p>from IOL. Pipeline removal methodology's impact on noise will be assessed at that time.</p>	<p>management plan should these steps prove ineffective.</p> <p>Condition No. 36 requiring the submission of noise monitoring data and test methodology.</p>
<p>Concern that the entire pipeline wasn't being removed as part of IOL's proposed project.</p>	<p>Partly as a result of feedback from the community and Aboriginal groups, in early 2016, IOL revised their methodology to a pipeline pull.</p> <p>VFPA is awaiting submission of a revised application confirming proposed methodology from IOL. Aboriginal groups will be consulted as part of the permit review process.</p>	<p>The decision letter to Aboriginal groups will include notification that VFPA is awaiting IOL's revised methodology for the pipeline pull and confirming that VFPA will be consulting Aboriginal groups accordingly, once this information is received.</p>
<p>Interests in economic and employment opportunities / benefits</p>	<p>PCT committed to notifying interested Aboriginal groups once commercial arrangements are finalized, and will encourage them to directly contact the selected dredge contractor (FRPD) for economic development opportunities.</p> <p>Interested Aboriginal groups will be invited to participate in the monitoring program for meaningful employment which includes capacity building.</p> <p>Positions for nearshore and possibly operations monitoring will be coordinated with and offered to interested Aboriginal groups.</p>	<p>Addressed by permit condition No. 14 requires that the Applicant and their contractor(s) make available employment, training and contract opportunities relating to the construction and ongoing monitoring of the project area to qualified members and/or businesses of interested Aboriginal groups.</p>
<p>Project scope concerns.</p>	<p>VFPA confirmed that the proposed projects are being assessed as per Section 67 of CEAA, 2012.</p> <p>Part of the determination of the significance of environmental effects under</p>	<p>No action required.</p>

Issue	Mitigation and Permit Conditions	Action
	<p>CEAA, 2012 includes the consideration of potential effects to Aboriginal groups as per Section 5(1)(c).</p> <p>VFPA explained that when Aboriginal consultation reveals potential impacts to Aboriginal rights, this information becomes part of the PER process and certain conditions may be imposed to mitigate such impacts.</p>	
<p>Inadequate timeframe for consultation.</p>	<p>VFPA explained that it, along with ECCC and TC, are committed to meaningful consultation with Aboriginal groups to fully understand and avoid, minimize or mitigate any potential impacts from the proposed projects.</p> <p>VFPA conducted consultation on the proposed projects from June 22, 2015 to December 21, 2016.</p>	<p>No action required.</p>
<p>Lack of information on impact to Aboriginal rights and interest.</p>	<p>VFPA requested that Aboriginal groups submit to VFPA any information regarding the exercise of their Aboriginal rights in the area of the proposed projects, so that they may be considered as part of the PER process.</p>	<p>No action required.</p>
<p>Overreliance on 1999 study.</p>	<p>VFPA is of the view that the 1999 publication is relevant, as both the physical properties and the dredging rate for the earlier turning basin dredging project are similar to those for the currently proposed channel dredging project.</p>	<p>No action required.</p>
<p>Concern about berm failure.</p>	<p>In regards to berm failure, VFPA stated that no one at VFPA can recall any failure event of the berm ever occurring, and that VFPA's</p>	<p>Addressed by permit condition No. 43, requiring annual inspections of the berm for five years post-construction.</p>

Issue	Mitigation and Permit Conditions	Action
	<p>dredging expert has looked at the bathymetry and sees no evidence of historical failure.</p> <p>VFPA is of the view the engineering of the berm is sound.</p>	
<p>Concern regarding sloughing.</p>	<p>VFPA is satisfied that the proposed dredging approach is sound.</p> <p>Due to concerns regarding the sloughing of PAH-affected sediments at the southern end of IOL's pipeline right of way, PCT was required to develop a sediment management plan to mitigate potential impacts to the Port Moody Arm from PAH-affected sediments sloughing after dredging has been conducted.</p> <p>VFPA has reviewed PCT's proposed sediment handling plan, and is of the view it will adequately mitigate potential impacts to Port Moody Arm.</p>	<p>Addressed through permit condition No. 32, requiring management of sediment, sediment-laden waters and other deleterious substances entering the water, and management of turbidity levels.</p>
<p>Concern regarding the absence of DFO's analysis and confirmation of the purported habitat benefits of the proposed dredging project.</p>	<p>As the sediment proposed for dredging meets the criteria for Disposal at Sea as determined by Environment and Climate Change Canada, the project does not rely on its ability to enhance habitat.</p>	<p>No action required.</p>
<p>Potential impacts on crabs associated with hydrogen sulphide (H₂S) presence in sediment.</p>	<p>Impacts to crabs are not anticipated for the following reasons:</p> <ul style="list-style-type: none"> The Applicant did not identify any documented incidents of crab stress caused by elevated (acute) H₂S releases from the seabed due to dredging in the Arm. 	<p>Addressed through the following conditions that address potential impacts to crabs:</p> <p>Condition No. 27 requiring an environmental monitor be in place for berm construction, dredging and dredged material placement works) & Condition No. 28, requiring submission of monitoring reports.</p> <p>Condition No. 31, reminding the Applicant that activities will be carried</p>

Issue	Mitigation and Permit Conditions	Action
	<ul style="list-style-type: none"> • H₂S will rapidly (flash) oxidize upon exposure to the water column. A review of limited information available indicates that Dungeness crab can be sensitive to H₂S exposure. However due to the expected rapid oxidation of H₂S during the dredging process, residual H₂S upon placement of sediments is expected to be low. • Further, in response to Fisheries and Oceans Canada's concerns regarding impacts of dredging upon female Dungeness crabs, in particular ovigerous female crabs, PCT conducted a capture survey of crabs within Port Moody Arm. Ovigerous crabs were not captured. It is highly unlikely that ovigerous crabs will be encountered by the dredging and placement of sediments as proposed. 	<p>out in a manner that avoids adverse impact to fish and fish habitat and with deference to the Fisheries Act.</p> <p>Condition No. 32, requiring management of sediment, sediment-laden waters and other deleterious substances entering the water, and management of turbidity levels.</p> <p>Condition No. 34, prohibiting in-water works during the fish sensitive window – March 1 to August 15.</p> <p>Condition No. 37, prohibiting project vessels to ground or otherwise disturb the foreshore or seabed).</p> <p>Condition Nos 43, 44 & 45, imposing monitoring - post-construction - of the berm, dredging and placement area, including sediment and biological monitoring for up to 5 years.</p>
<p>Request for Applicant's analyses on human health risks, environmental costs, hazards, economics and exclusion of future uses.</p>	<p>PCT's analysis was provided.</p> <p>As per VFPA's PER of the proposed project, significant adverse impacts to human health, the environment, the economy and future uses are not expected as a result of the project.</p> <p>A human health risk assessment was not required by VFPA for the Project, as there is limited potential for human exposure to the dredged materials or other potentially problematic products of the dredging</p>	<p>No Action Required.</p>

Issue	Mitigation and Permit Conditions	Action
	activity, which meet Environment and Climate Change Canada’s Disposal at Sea criteria.	
Concern that the proposed berm construction and disposal “benefits” have not been adequately assessed in association with impacts of the dredging works.	VFPA clarified that the proposed project was not being considered as providing beneficial use, as per VFPA’s project and environmental review.	No Action Required.
Cumulative effects of this project and other adjacent projects on the Inlet.	<p>VFPA has reviewed the proposed dredging project concurrently with the Imperial Oil pipeline removal project.</p> <p>No other projects were identified by VFPA to contribute to cumulative effects.</p>	No Action Required.
Impacts resulting from the potential disturbance of buried PAH-affected sediments.	<p>Based on VFPA’s project and environmental review, significant adverse environmental effects from the PAH-affected sediments are not expected, as the PAH concentration is below the probable effects level for biological test organisms.</p> <p>Also, the sediment proposed for dredging meets the criteria for Disposal at Sea as determined by Environment and Climate Change Canada.</p>	<p>Addressed through the following conditions:</p> <p>Condition No. 27, requiring an environmental monitor be in place for berm construction, dredging and dredged material placement works & Condition No. 28, requiring submission of monitoring reports.</p> <p>Condition No. 32, requiring management of sediment, sediment-laden waters and other deleterious substances entering the water, and management of turbidity levels.</p> <p>Condition Nos 43, 44 & 45, imposing monitoring - post-construction - of the berm, dredging and placement area, including sediment and biological monitoring for up to 5 years.</p>

VFPA 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 for any permit issued for PCT’s proposed dredge. However, a consultation gap exists regarding IOL’s future activities for the pipeline pull. Accordingly, the decision letter to Aboriginal groups will include

notification that VFPA is awaiting IOL's revised methodology for the pipeline pull and will be consulting Aboriginal groups accordingly, once this information is received.

In December 2016, VFPA was made aware of a concept to use a significant volume of dredged material as fill for a potential habitat enhancement initiative in Maplewood Flats, as proposed by Tsleil-Waututh Nation. Significant further discussion and analysis is required to confirm this initiative's feasibility. While this proposed initiative – should it proceed – would not affect VFPA's assessment of having fulfilled the legal duty to consult on the proposal, it could be mutually beneficial for PCT, ECCC, VFPA, and Tsleil-Waututh. VFPA has asked PCT to further explore the possibility of diverting dredgeate for this purpose in 2017.

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. In addition, should a project be approved, VFPA includes additional environmental conditions in the project permit to further reduce the identified potential impacts. This section of the project and environmental review report summarizes the environmental review conducted for the project, and provides the environmental review decision in Section 7.4. The environmental review also considered the information provided in the previous sections of this report.

7.1 Scope of Environmental Review

7.1.1 Scope of the Project

As described in section 2.0, the scope of the project reviewed here consists of the following elements:

- Installation of an underwater containment berm using a clamshell derrick on a barge;
- Dredging the shipping channel (including precision dredging of sediments of concern at the IOL pipeline crossing);
- Dredging the turning basin; Dredging the berth face;
- Disposal of approximately 550,000 m³ of dredgeate in the basin within the containment berm, and to permitted upland disposal sites (if sediments of concern near the pipeline crossing are not accepted by Environment and Climate Change Canada for Disposal at Sea behind the retention berm).

Ship traffic using the deepened channel is not included within the scope of the project because the project will affect neither the type of vessels calling nor the frequency of their calls.

7.1.2 Spatial scope of the Review

The spatial scope of the review is the physical footprint of the proposed works (plus 5 metres to either side of the navigation channel) for direct effects, the bounds of Burrard Inlet for indirect effects resulting from the dispersal of suspended sediments, and the local air shed for air quality effects.

7.1.3 Temporal scope of the Review

The temporal scope of the review consists of the duration of the physical works plus a five-year period following completion of the physical works to permit monitoring of various components (e.g., sediment chemistry and biology and berm stability), plus any additional time that may be required to address any issues that may arise out of the monitoring.

7.1.4 Environmental factors considered

The scope of the environmental review included:

- Relevant background information as provided by the Applicant and as otherwise available to the VFPA;
- The potential for residual adverse environmental effects having regard for mitigation measures that will be incorporated into the Project;
- Technically and economically feasible measures to mitigate any adverse environmental effects.; and
- The significance of any residual adverse environmental effects.

The following biophysical components were considered in the environmental review:

- Fish and fish habitat, including species with special status;
- Marine mammals;
- Marine water quality; and
- Air quality.

The following socio-economic components were included in the environmental review:

- Social effects including lighting and noise;
- Archaeological resources;
- Navigable waters and navigation; and
- Aboriginal considerations.

7.2 Environmental Effects Summary

The following table summarizes the potential environmental effects the project could have on the identified environmental components.

Environmental Component	Potential Adverse Effects?		Significant Residual Adverse Effects?		Mitigation Measures / Comments
	Yes	No	Yes	No	
Species/habitat with special status	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	None identified within the project area.
Vegetation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	None.
Wildlife / wildlife habitat	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Marine birds use habitats within the project area but are not likely to be adversely affected by the Project.
Aquatic species / fish habitat	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<p>There is potential for project-related activities to disturb aquatic species and fish habitat. The effects of dredging and dredge spoil placement on aquatic habitat are likely temporary and self-mitigating. Monitoring is required for five years after completion of the work, as reflected in conditions No. 44 and 45.</p> <p>During the works, mitigation measures will be implemented to reduce potential adverse, project-related environmental effects. Direct effects from sediment suspension will be mitigated with silt curtains and a diffuser on the cutter suction discharge, and work scheduling to avoid fisheries sensitive periods. Mitigation measures are reflected in conditions No. 27, 28, 30, 31, 32, 34 and 37 in the Permit.</p>
Other marine resources	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	None identified
Soils	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Not applicable
Sediments	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<p>There have been over 80 surface and sub-surface sediment samples analyzed under the Disposal at Sea requirements for chemistry and biological testing.</p> <p>A relatively small volume of marginally PAH-contaminated sediments of concern from the vicinity of the IOL oil pipelines will be placed at depth behind the berm and covered with uncontaminated dredged sediments, or they will be taken to a permitted upland site if not approved for Disposal at Sea.</p> <p>During the dredging, mitigation measures will be implemented to reduce potential adverse environmental effects from the resuspension of contaminated sediments.</p>

Environmental Component	Potential Adverse Effects?		Significant Residual Adverse Effects?		Mitigation Measures / Comments
	Yes	No	Yes	No	
Ground water	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Not applicable
Surface water and water bodies	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Not applicable, except with respect to Port Moody Arm. Water quality issues (turbidity) will be mitigated as for "aquatic species", above.
Wetlands	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Not applicable
Air quality	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Emissions for equipment are not avoidable, but the effects on the local air shed are not expected to be significant.
Lighting	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Lighting on equipment conducting the dredging will be directed in a manner that mitigates adverse impacts in adjacent residential areas.
Noise	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Noise levels will be monitored and active management measures will be implemented if and as necessary.
Archaeological/ heritage resources	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	None known within the project footprint.
Aboriginal Group interests	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Concerns raised by aboriginal groups were taken into consideration. Permanent residual adverse effects are not expected.
Recreational interests	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Equipment deployment will accommodate the need for continual access to and from the Rocky Point Park boat launch site, the Reed Point Marina, and private moorings and wharves along the north shore of the Inlet.
Accidents and malfunctions	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	The work plan includes response provisions for accidents and malfunctions, including fuel and lubricant spills.

7.3 Other Environmental Considerations

The environmental review considered potential effects of the environment on the Project during construction, including the potential effects of tidal currents and severe weather. Effects on terminal operation were not considered as the Project will not result in changes to operation. All potential effects were assessed as insignificant or avoidable with mitigation. Permanent residual effects are not expected.

7.4 Environmental Review Decision

In completing the environmental review, VFPA has reviewed and taken into account relevant information available on the proposed project, has considered the information and proposed mitigations provided by the Applicant and other information as listed elsewhere in this document, and 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

ANDREA MACLEOD
MANAGER, ENVIRONMENTAL PROGRAMS

December 28, 2016
DATE OF DECISION

8 RECOMMENDATION

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. 15-136**.

APPENDIX A Location Plan



APPENDIX B

List of Information Sources

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

- Application form and materials submitted by the Applicant on behalf of the tenant on March 5, 2015
- All Project correspondence from March 5, 2015 to August 25, 2016
- Plans and drawings labelled PER No.15-136 A to C
- "Port Moody Arm Proposed Channel Dredge – Project Environmental Review Document", March 6, 2015, Envirochem Services Inc. and Envirowest Consultants Inc.
- Diagram showing methodology and revised equipment layout "Untitled" dated July 10, 2015, by Envirochem Services Inc.
- "Port Moody Arm Proposed Channel Dredge – Project Environmental Assessment – Emergency Planning Supplement" dated March 15, 2016, by Envirochem Services Inc.
- "PCT Dredge Program – Sediment Handling within Imperial Oil of Canada Lease Area, Port Moody Arm, BC (Version 2)" dated March 30, 2016 by Envirochem Services Inc.
- "PCT Dredge Program – Sediment Handling within Imperial Oil of Canada Lease Area, Port Moody Arm, BC" dated April 27, 2016 by Envirochem Services Inc.
- "Implementation of mitigation measures to avoid and mitigate serious harm to fish, file 12-HPAC-PA2-00645", letter from Fisheries and Oceans Canada (DFO) to Pacific Coast Terminals, dated February 26, 2014
- "Re: Noise Predictions for PCT Dredging Operations" dated August 9, 2016 by BKL Acoustics
- "Proposed Pacific Coast Terminals (PCT) Dredge Project Review Meeting (October 20, 2015) (between Applicants and the Marine Mammal Research Unit – Open Water Research Station) dated November 27, 2015, Envirochem Services Inc.
- "Turbidity Measurements Taken As Part of The Pacific Coast Terminals' Ship Turning Basin Dredging Project" dated April 21, 1995 by Delcan
- "PCT Dredging Program – Channel Cut for IOL Pipeline Decommissioning Submarine Stability" dated May 11, 2015 by Envirochem Services Inc.