



PORT of
vancouver

PROJECT AND ENVIRONMENTAL REVIEW REPORT

**PER NO. 15-180
G3 TERMINAL VANCOUVER**

Date: May 30, 2016

Prepared for: Project and Environmental Review Committee

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COPY



PER No.:	15-180
Tenant:	G3 Limited
Project:	G3 Terminal Vancouver
Project Location	95 Brooksbank Road, North Vancouver BC
VFPA SID No.:	CNV133
Land Use Designation:	Port Terminal
Applicant(s):	G3 Terminal Vancouver Limited Partnership
Applicant Address:	1055 West Georgia Street, Suite 1500, P.O. Box 11117, Vancouver, BC V6E 0B6
Category of Review:	D
Recommendation:	That PER No. 15-180 for development of a bulk grain terminal be approved, subject to the recommended permit conditions.

2 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 (PER) 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 the G3 Terminal Vancouver (the Project) proposed by G3 Terminal Vancouver Limited Partnership (the Applicant).

This PER 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", is not listed in the regulations designating physical activities, 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.

3 PROJECT DESCRIPTION

G3 Terminal Vancouver Limited Partnership (the Applicant) proposes to construct a new bulk grain terminal on VFPA land at the West Gate site located at the south foot of Brooksbank Avenue in North Vancouver.

The Applicant is a joint venture of Bunge Canada and SALIC Canada Limited, who have determined that growing Canadian grain export supply and global demand warrant a significant investment in additional west coast capacity for global grain exports. The terminal is proposed for the purposes of grain export only, with all product arriving by rail and departing by marine vessel. The maximum capacity of the new terminal is estimated at 8 Million Metric Tonnes (MMT) per year, with onsite storage of up to 200,000 tonnes in silos. Agricultural products handled are proposed to include wheat (all classes), canola, durum wheat, barley, and peas.

Existing breakbulk operations at the West Gate site by Western Stevedoring will be consolidated at their East Gate site while the West Gate site is completely converted for bulk grain operations. Consolidation of breakbulk operations within the existing East Gate terminal will result in an overall lower capacity for breakbulk cargoes on the north shore. This consolidation is also likely to result in the East Gate terminal operating at or near its maximum capacity more frequently than it has in the past.

G3 proposes to operate the terminal, and have Western Stevedoring provide stevedoring services for vessel loading.

3.1.1 Project Overview

On-site works include the following items:

- Demolition of existing structures and buildings within the project footprint;
- Removal, relocation and modification of underground utilities;
- Onshore ground improvements, including over excavation and placement of engineered fill, or piling in selected areas;
- Offshore improvements, including placement of underwater rock revetment adjacent to portions of the existing sheet pile wall;
- Construction of an extension to the existing underpass at Brooksbank Avenue, and an additional new underpass within the confines of the terminal;
- Construction of 48 grain silos that are 42 m (140 ft.) in height;
- Construction of a rail loop system, which can accommodate up to 3 trains of 150 cars each;
- Construction of material unloading station, conveyance, storage and cleaning systems and buildings;
- Construction of a new berth, including three ship loaders; and
- Construction of internal access roads, vehicle parking, utilities, and administration, maintenance, and other accessory buildings.

Off-site works include the following items:

- Partial demolition and renovation of the office addition to the northern warehouse on the Vancouver Pile Driving site as agreed to by Vancouver Pile Driving (on VFPA leased land);
- Replacement and upgrade to a water line running south from the intersection of Cotton Drive and Brooksbank Avenue (on City of North Vancouver road Right of Way, off-site and subject to a separate authorization);

- A line upgrade to the BC Hydro infrastructure running from the site east to the Walters Substation on Keith Road East, at Hwy 1 (on City of North Vancouver and District of North Vancouver road Right of Ways, off-site and subject to separate authorizations).

The demolition of existing infrastructure contemplated in this permit includes removal of all utilities on the site, and approximately 8 (eight) buildings inside the existing terminal. The building formerly occupied by Kal Tire at the north east corner of the site is within the Western Stevedoring existing lease area, but not currently within the West Gate site. This building is proposed to be demolished as part of this project, and has been vacated as of the writing of this report.

3.1.2 Project Operations

The basic functions and operation of the various components of the project are described here:

Rail car loop

Agricultural commodities arrive at the facility by train, and leave for export by marine vessel. The rail loop is capable of accommodating up to three unit trains of 150 cars each, with each train having a maximum length of 2,680 metres (8,793 feet). Using the same locomotives that delivered the trains, grain cars are circulated through the receiving system, and turned around on the facility using the "s track". This movement occurs without the unit train being broken into shorter segments under normal operating conditions. If required, the trains may be broken to replace a bad car with a good car from a supply held on site. Rail operations are described in more detail in section 4.3 of this report.

Receiving system

The receiving system transfers the commodities from rail cars using conveyors to the grain storage silos, via samplers and bulk scales. The conveying system is either air supported, or *Hi Roller* conventional conveyors, and equipped with air aspiration for dust control, including bag houses, fan ductwork, and a pit baffle system. All conveyors are fully enclosed and are proposed to include dust control filters at their spouts. The receiving system's sloped conveyors crisscross the site, and are supported by several towers, the larger of which contain the conveyor drive motors and take-up equipment.

Grain silos and cleaning

Up to 48 silos are proposed for the purposes of bulk storage, with additional storage spaces possible in the interstitial areas between the silos. These additional areas are not complete silos, but smaller spaces between silos which can be filled and emptied in the same manner, and are proposed to be used as such. Storage capacity of the facility is 200,000 tonnes. Travelling belt conveyors on top of the storage silos move grain to the appropriate compartment. If incoming grain requires cleaning, this is accomplished onsite in the cleaning building. Grain is moved from the storage silos to the cleaners by dedicated bucket elevators. The cleaning process generates a byproduct which is pelletized and transported to local markets via truck. Truck traffic volumes are described in more detail in section 4.3 of this report.

Ship loader and dock

Commodities are moved from the silos to the ships by dual ship loading conveyors similar to the other conveyors on site. The ship loading system consists of three loading booms which overhang the ship, and are capable of operating up to a combined maximum of 6500 tonnes per hour, using all three booms simultaneously. Dust emissions are kept to a minimum with dust filters located at

the spouts, and the use of weighted spouting dampers. A proposed access road from Brooksbank Avenue to the ship loader via the east side of the rail loop provides access to the dock outside of the rail loop, and also to the adjacent Vancouver Pile Driving site.

3.1.3 Project Construction

Certain concrete buildings for the project, including the silos and cleaning building, require construction using what is called a “slip pour”, where concrete is poured continually, and the forms slowly raised until the final design height is reached. This results in multi-day activity to construct parts of the terminal, and will result in 24/7 work hours. Authorization of construction activities outside of normal work hours will require separate review by VFPA.

Pile driving, both in-water and on land (to support some buildings or structures) is also required. Pile driving is anticipated to be completed during normal work hours of 7 AM to 8 PM including Saturdays but not including Sundays or holidays.

Construction is anticipated to require approximately 36 months (three years) to complete, using a design-build approach. As a result, some variation to project plans is anticipated as the Applicant works through the constructability of the terminal. Substantial variations to project plans may require amendment to the project permit, building permits, or both.

G3 has requested a permit validity period of four years (until 2020) to allow for unforeseen circumstances that could affect their project delivery period. An extended validity period is common for projects of this scale as it provides greater certainty that construction of the project is able to be completed within the permit validity period.

4 VANCOUVER FRASER PORT AUTHORITY INTERNAL REVIEWS

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

4.1 Planning

4.1.1 Land Use Plan

The West Gate site is located in Planning Area 2 as identified in the VFPA Land Use Plan. The context statement for this Planning Area acknowledges that:

“It is anticipated that there will be continued growth of port-related uses in all commodity sectors on the North Shore, particularly in dry bulk, liquid bulk and breakbulk activities. Further, intensification of port-related industrial uses on existing sites is likely, particularly as industrial lands in the region become more limited.”

The VFPA Land Use Plan designates the West Gate site as “Port Terminal” intended for:

“...deep-sea and marine terminals that handle a variety of commodities including autos, breakbulk, dry bulk, liquid bulk and containers as well as cruise passengers. This includes primary uses that support shipping, transportation of goods, and other uses...”

The proposed development is consistent with Land Use Plan context statement for Planning Area 2 and the land use designation of Port Terminal.

4.1.2 View Impacts

The proposed facility contains components that will be visible from off-site locations due to their height. The proposal considered the possibility of view impacts, and the design team re-oriented the silo structures from an east-west alignment to a north-south orientation prior to making the application, partly in order to minimize the impacts to views from the Moodyville neighbourhood to the north.

As part of the review process, the Applicant was required to submit a view and shade impact assessment to illustrate any potential impacts to the surrounding community. The assessment included photos and renderings from several locations. The assessment concluded that view impacts are not expected to be significant. VFPA concurs with the results of the assessment given the distance from potentially affected residential areas, the alignment of the taller structures, and the industrial nature of the area.

4.1.3 Building Permit Requirements

VFPA retained Jensen Hughes, a qualified third party consultant to review the Applicant's preliminary Fire Risk and Dust Explosion Assessments provided in support of the application. The results of that review indicate that the proposed design is aligned with good engineering practice for grain handling facilities. Once detailed design of the project is complete, these assessments will need to be reviewed again with that additional information.

Prior to commencement of construction, the proposed grain silos, maintenance, administration and related buildings and some accessory structures require review under the 2010 National Building Code and 2010 National Fire Code of Canada. A condition of the Permit requires the Applicant to obtain a VFPA Building Permit (for each building, or in phases) before proceeding with construction of those works. The Applicant must obtain occupancy approval from VFPA prior to occupying and operating the structures subject to a Building Permit. A Building Permit has also been identified as a requirement for the temporary buildings and structures to be occupied on site during construction.

Staff intend to retain Jensen Hughes to continue to review drawings and schedules and make a recommendation to VFPA on issuance of Building Permits, conduct related field reviews during construction, conduct a final inspection upon construction completion, and make a recommendation to VFPA on occupancy. The Applicant has held preliminary meetings with VFPA's code consultant to discuss code compliance expectations.

Specific conditions listed in the Project Permit that relate to Building and Code review are as follows:

- Condition No. 13 – The Applicant shall seek comments from the City of North Vancouver Fire Department on fire protection and life-safety issues during the course of Building Permit reviews;
- Condition No. 27 - For structures reviewable under the 2010 National Building Code, the Applicant shall obtain a VFPA building permit 40 days prior to commencement of construction;
- Condition No. 61 – The Applicant shall incorporate any required changes or adhere to any final recommendations resulting from the review of the Fire Risk and Dust Explosion Assessments.

VFPA Planning supports the recommendation to approve the Project subject to adherence to the listed project and environmental conditions in the permit.

4.2 Engineering

The proposed Project intends to remove all existing site service infrastructure including electrical, water, gas, storm water, and sanitary sewer lines, and replace with new as shown on the application drawings.

An off-site water upgrade is understood to be required by the City of North Vancouver along the west side of Brooksbank Avenue from Cotton Drive south to the north side of the CN Rail tracks. This is required given the age of the existing line, and the capacity required to provide fire protection flows to structures of the size and type proposed.

The geotechnical report prepared by the Applicant was used to confirm ideal building placement on the site, the strength and resistance of the existing sheet pile wall and fill overlying the site, and the required strength and resistance of the berth structure to a seismic event. It was noted that soil liquefaction during a significant seismic event could affect the southern portion of the terminal, and that the existing sheet pile wall, given its age and condition, cannot be assumed to have any remaining seismic resistance. The wall was not required to be upgraded as part of this project. Instead, its current condition was required not to be compromised. Rock revetment is proposed in front of parts of the wall, and is intended to upgrade the static loading capacity of the wall, rather than increase the seismic resistance of the existing structure.

The proposal includes construction of a new berth facility which supports three shiploaders, all of which are required by VFPA to comply with American Society of Civil Engineers (ASCE 61-14) standards for seismic resistance.

The terminal redevelopment was analyzed from the perspective of flood protection and sea level rise. VFPA required, and G3 has proposed to provide, enhanced flood protection for the Brooksbank road underpass by providing a berm near the north east corner of the site to 4.0 metres geodetic, as shown on the Site Plan and other drawings. The 4.0m elevation matches the VFPA predictions for the minimum protective height required in the year 2100, given a 1m sea level rise and a 1 in 500 year storm event. All building ground floor elevations are above this level, though some portions of the site would collect water during such an event. G3 has articulated a desire to protect important site infrastructure, while allowing portions of the site to remain at lower elevations subject to occasional flooding. For example, infield areas within the loop track are proposed to remain below the flood control level (FCL). These are areas which have no improvements that would be negatively impacted by occasional flooding.

VFPA Engineering has reviewed the application and requires the Applicant to submit signed and sealed BC certified engineer-stamped drawings for all proposed works prior to commencement of construction. This requirement is reflected in Permit condition No. 24.

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

4.3 Land Transportation

The proposed Project includes delivery of all grain to the site by rail, using unit trains of up to 150 cars in length. These deliveries would transit via the Second Narrows Rail Bridge, using up to three trains per day but averaging 1.9. The current typical Canadian grain unit train is 120 cars, but this length is expected to increase over time, and the terminal design accommodates this. They would be delivered to the loop track on site without the need for switching, shunting, or removal of the mainline engines. Once on site, the train is proposed to be operated by site crews around the loop track and through the receiving system at 3-5 km/h (2-3 mph). Unloading can be accomplished in

8 (eight) hours or less while the train is in continuous motion at this speed, using robotic gate openers.

The train's direction is reversed during the unloading process by circulation through the S track, and can then depart the site without additional switching. Should a defective "bad car" be noted to exist that is not suitable for departure from the terminal, it can be switched out and replaced with a good car from a small supply held on site. This irregular action is not desirable as it would require that the train be broken and that several shunts take place.

The Applicant was asked to engage an independent consultant to confirm that the proposed rail volume - an average of 1.9 trains per day over 325 days per year - would not detrimentally affect rail network fluidity along the North Shore. The consultant confirmed that the facility's proposed volumes, train sizes, and performance requirements were feasible, and this assessment is satisfactory to VFPA. A rail operating plan is required to confirm the specifics of rail car delivery on track abutting the terminal, as rail track design is finalized.

Bulk grain export occasionally requires that the commodity be "cleaned". This refers to the removal of impurities such as weed seeds and foreign material. The terminal includes a dedicated cleaning building, which would accomplish this as required by the customer. Waste material resulting from this process is proposed to be pelletized on site, and loaded to trucks for sale to the local market as animal feed or for other purposes. Traffic generated by this activity is estimated at less than 3 trucks per day.

The current site is operated by Western Stevedoring as a break bulk terminal, importing and exporting material that largely arrives or departs the site via truck. In addition, break bulk operations are much more labour intensive than the proposed bulk terminal. Current traffic levels are approximately 145 vehicles per hour at the peak hour (during the afternoon rush hour). Traffic resulting from the operation of the terminal, including approximately 50-60 full-time equivalent employees, the truck traffic from cleaning operations, and ancillary traffic is anticipated to be less than 20% of the traffic generated by the site as of 2015.

Traffic during the construction period is anticipated to be significant, and for a period of 18 months is proposed to arrive to the terminal via Mountain Highway and Dominion Street / Harbour Avenue, crossing Lynn Creek via an alternating one-lane connection on the existing rail bridge. In order to address concerns about the intensity and duration of this traffic, G3 have committed to delivering bulk materials (gravel, sand, rock) to the site by water, and establishing a batch plant for the purposes of providing on-site concrete mixing. These measures are anticipated to reduce truck traffic to/from the site by approximately 50,000 trips over the course of construction. The Applicant has also developed the site design in order to minimize the need for significant import or export of material in order to achieve finished grades. There is sufficient on-site area available to accommodate foreseeable construction parking.

VFPA Transportation Planning has reviewed the application and requires the Applicant to submit a construction traffic management plan, and a rail operating plan. These requirements are reflected in Permit conditions No. 29 and 30.

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

4.4 Marine Operations

The proposed Project triggered a Navigation Review by VFPA Marine Operations based on the proposal involving the following:

- Installation and removal of permanent works within navigable water;
- Activities that have the potential to impede navigation within navigable water;
- Installation of a facility designed for the purpose of interacting with a deep-sea vessel;
- A change to the size, characteristics and frequency of vessels calling on the terminal; and
- Installation and removal of aids to navigation.

The Applicant was required to submit plans, information and studies for VFPA review, including:

- Marine structures plans;
- Mooring arrangement information;
- An Aids to Navigation plan;
- Berthing Simulation Study (not yet received);
- Marine Construction and Staging Plan (not yet received); and
- Marine Traffic Study.

The two documents that were not received were agreed to be submitted at a later date as supplementary information, and are reflected in Permit conditions.

4.4.1 Installation and removal of permanent works within navigable water

A new single berth will replace the existing three berths that currently make up Lynnterm West Gate. The terminal as currently designed, has the capability to berth three deep-sea vessels simultaneously at Berth 1 (180m in length), Berth 2 (185m in length) and Berth 3 (200m in length). Berth 1 will remain unchanged post-construction, however berths 2 and 3 will effectively be converted into a single deep-sea berth. A portion of existing Berth 3 will be removed to gain access to the existing sheet pile bulkhead behind it for rock revetment construction. A new berth face will be constructed parallel to existing berths 2 and 3 and is comprised of three shiploader platforms (east, centre and west), two breasting dolphins (east and west) and four mooring dolphins (east, east inner, west inner and west).

Although the new berth extends into Burrard Inlet within the area defined as the Second Narrows Movement Restriction Area (MRA), the expansion does not impede safe access to neighboring tenants, sites, or to vessels transiting the MRA. The extension of the berth impacts neither inner harbour anchorages nor vessels transiting through the inner harbour.

4.4.2 Activities that have the potential to impede navigation within navigable waters

It is anticipated that there will be potential impacts to marine operations and navigation during the marine construction phase of this project given the proximity of the proposed berth to passing vessel traffic in the harbour. These concerns can be mitigated through the appraisal, planning, execution and monitoring of a Marine Construction and Staging Plan. The expected format of this plan is described below. The applicant is aware of the need to update the plan during the course of construction, and circulate the document to marine users and neighboring tenants.

A condition in the Project Permit requires that the Applicant:

- 1) Draft a marine construction and staging plan;
- 2) Hold a marine construction and staging plan stakeholder meeting including:
 - a. Presentation of draft plan
 - b. Gather feedback or concerns

- c. Establish communication needs and requirements going forward.
- 3) Incorporate feedback in the final plan, and commit to established communication requirements (e.g. Notice to Shipping, regular update meetings etc.) to the satisfaction of VFPA.

The plan should include, but not be limited to, the following information:

- Staging and construction areas;
- Dates and hours of operation;
- Description of activities taking place;
- Participating equipment and vessels (dimensions must be included);
- Method of preferred communication; and
- Special requests and/or additional information.

4.4.3 Facility designed for interacting with a deep-sea vessel

Marine Operations reviewed the estimated type and number of vessel calls expected at the G3 terminal. It was determined that the largest, although most infrequent expected vessel type calling at the terminal would be the New Panamax. As such, Marine Operations confirmed that the terminals’ marine structures are being designed to accommodate this size of vessel. The length, beam and air draft the New Panamax, and all other vessels proposed to call on the facility, are less than current channel design limits of Vancouver harbour and therefore are able to transit safely to and from the terminal site.

Marine Operations has reviewed and approved mooring arrangements for the following size vessels:

	Length Overall	Beam	Deadweight Tonnage	Displacement
New Panamax	293m	42.7m	125,000	165,000
Panamax	274m	32.3m	80,000	100,000
Handymax	168m	30.5m	35,000	40,000

Smaller vessels (such as Handysize) were not reviewed. Vessels calling on the terminal which exceed the specifications listed above would require prior approval from the VFPA Port Operations Centre.

The control depth for the existing berths are: berth 1 - 10.6m; berth 2 - 11.3m; berth 3 - 11.3m. The controlling depth for the new berth will be dependent on post-construction hydrographic survey, and is estimated to be in the 14-15m range. Marine Operations has provided the applicant with the option of either completing their own survey, or to reimburse the port for a hydrographic survey. This must be completed upon completion of construction in order to update the Burrard Inlet and Roberts Bank berth soundings book, which is referred to the Pacific Pilotage Authority for berth controlling depths within VFPA jurisdiction.

The Applicant has been required to undertake a berthing simulation study for the vessels anticipated to call at the terminal. This was required given the distance south from the existing berth face of the proposed new berth structure, the proposal to handle larger vessels than are currently handled at West Gate, the proximity to Lynn Creek (which may introduce particular eddy conditions) and the location of the site within the MRA. The intent of this assessment is to determine whether vessels can be safely berthed during various environmental conditions, and to identify what level of tug assistance is required to be available during movements. The assessment has been conducted in cooperation with the Pacific Pilotage Authority, and is in draft form. Its submission in final form is a Permit condition.

4.4.4 Change to the size, characteristics and frequency of vessels

The Lynnterm West Gate terminal has experienced relatively consistent deep-sea traffic calls since 2002. From 2002-2008, the terminal averaged 135 vessel calls per year, with a peak of 164 calls in 2006. Since 2009 however, annual vessel calls to West Gate have declined. The Applicant included in their submission package that during a 12 month period from January 2013 – January 2014, there were 56 vessel calls to the terminal.

Port of Vancouver – Foreign Vessel Calls – Lynnterm East and West*

Year	Lynnterm East Gate	Lynnterm West Gate	Total Calls
1995	267		267
1996	278		278
1997	269		269
1998	227		227
1999	220		220
2000	236		236
2001	222	1	223
2002	175	123	298
2003	180	127	307
2004	173	121	294
2005	194	156	350
2006	181	164	345
2007	167	146	313
2008	123	113	236
2009	113	82	195
2010	128	88	216
2011	133	81	214
2012	-	-	243
2013	-	-	234
2014	-	-	257
2015	-	-	209

*Table includes only VFPA-sourced data

The Applicant included as part of their application package an estimation of the frequency of annual vessel traffic proposed to call at the G3 facility. The most frequent vessel calling at the terminal will be Handymax class (72 calls) followed by the Handysize class (60 calls). G3 anticipates that the larger Panamax and New Panamax classes will be much less frequent callers (13 calls combined).

The trend in marine shipping is towards larger vessels, so Marine Operations anticipates that over time Panamax and New Panamax will call more frequently than in initial years. This trend will likely translate into less frequent vessel calls, as larger vessels are capable of carrying much more cargo. VFPA also expects that a number of vessels already in Vancouver to call at other grain facilities, (24 annual calls) will also call at the G3 terminal to “top-off” their cargo, an activity which is common practice in the grain industry.

The total number of anticipated annual vessel calls for the G3 terminal is 168. A portion of the anticipated vessels calls (24) are from vessels that will call on the terminal to “top-off” their cargo. The vessel traffic that will call on the port annually which is specific to the G3 terminal is therefore

an estimated 144 vessels. This frequency of vessel traffic attributable to G3 is similar to volumes previously generated by Lynnterm West Gate during the terminal's peak volume years in the mid 2000's. As such Marine Operations has no concerns with proposed vessel traffic levels.

4.4.5 The installation and removal of aids to navigation

Currently there are two chartered private aids to navigation installed and operated on the West Gate site. One is a fixed red light, located on the eastern corner of berth 3, which is to be decommissioned to facilitate the removal of a portion of the concrete deck. The other, a fixed green light located on the western corner between berths 1 and 2, is to remain unchanged.

To properly aid mariners to determine the position of the new marine structures, VFPA requires that the applicant install four new fixed navigation lights on the new berth structure. Starting from the east, these aids would include:

- 1) Fixed red light, located on the corner of the east mooring dolphin, at an elevation of 8.31m above chart datum. Nominal range of the light to be between 1-3 nautical miles.
- 2) Fixed yellow light, located on the corner of the east ship loader platform, at an elevation of 8.31m above chart datum. Nominal range of the light to be between 1-3 nautical miles.
- 3) Fixed yellow light, located on the corner of the west ship loader platform, at an elevation of 8.31m above chart datum. Nominal range of the light to be between 1-3 nautical miles.
- 4) Fixed green light, located on the corner of the west mooring dolphin, at an elevation of 8.31m above chart datum. Nominal range of the light to be between 1-3 nautical miles.

The above recommendations were submitted to VFPA by the Canada Coast Guard *Aids to Navigation*, care of Transport Canada *Navigation Protection Program*. The Applicant has committed to implementing them.

VFPA Marine Operations supports the recommendation to approve the Project subject to adherence to the listed project and environmental conditions. The issues discussed above are reflected in Permit conditions No. 22, 31, 59, and 68.

5 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.

5.1 Stakeholder Consultation

5.1.1 Municipal Referrals

The proposed Project was assessed by VFPA Planning to have potential impacts to municipal interests. G3 engaged municipal representatives during the pre-application comment period in September, 2015. Following receipt of a complete application, a referral letter was sent to the following municipalities by VFPA Planning on December 7, 2015 notifying them of the proposed Project and soliciting any feedback:

- City of North Vancouver
- District of North Vancouver

Both municipalities responded with comments on the project, during both the pre-application comment period in September 2015, and during the course of the application review stage, in January and February 2016.

Below is a table summarizing the comments received and how they were considered as part of the PER process. VFPA also received additional comments that were not directly related to the project but rather related to other port activity. Staff have responded to such comments directly.

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Municipal Comments	VFPA Considerations
<ul style="list-style-type: none"> Resolve life safety issues to the satisfaction of the City Fire Department, Building Division, and North Shore Emergency Management staff. 	<ul style="list-style-type: none"> Condition No. 13 of the permit requires the Applicant to seek comments from the City of North Vancouver Fire Department on fire protection and life-safety issues during the course of Building Permit reviews.
<ul style="list-style-type: none"> Use a flood construction level (FCL) of 4.5m to be consistent with City standards. 	<ul style="list-style-type: none"> VFPA requires the Applicant to construct to FCL 4.0m, as this is consistent with provincial standards and appropriate given the grading of the site. This is FCL shown on project plans.
<ul style="list-style-type: none"> Ensure that operational noise and dust mitigation plans make every effort to minimize these issues for the surrounding community. 	<ul style="list-style-type: none"> VFPA has required mitigation as committed to by the Applicant and as further described in Sections 5 and 6 below. VFPA anticipates that air emissions (dust) from the terminal will be below Metro Vancouver regional standards. <p>This is addressed in Permit conditions No. 64, 65, 66, 67, and 72.</p>
<ul style="list-style-type: none"> Complete a rail network plan to address potential impact of the increase in rail traffic on the network. 	<ul style="list-style-type: none"> VFPA has required the Applicant to submit an analysis of rail network capacity, which has been reviewed and found acceptable. Rail capacity is considered sufficient to handle the volumes proposed to be handled by the terminal. Additional details of proposed rail operations is also required. <p>This is addressed in Permit condition No. 30.</p>
<ul style="list-style-type: none"> Identify utility infrastructure requirement that have an impact on City utilities. 	<ul style="list-style-type: none"> VFPA understands that a potable water line upgrade along Brooksbank is required, and this work will be undertaken by G3 in order to satisfy the requirements under the National Building Code.

Municipal Comments	VFPA Considerations
<ul style="list-style-type: none"> Complete a Comprehensive Storm Water Management Plan. 	<ul style="list-style-type: none"> Conditions of the permit require the Applicant to address this concern through adherence to a Storm Water Pollution Prevention Plan, and by following best practices and applicable law with respect to storm water control. Storm Water Interceptors are proposed. Additional review of specific storm water practices is required to be conducted once the design of civil components of the project have been sufficiently evolved. <p>This is addressed in Permit conditions No. 21 and 49.</p>
<ul style="list-style-type: none"> Ensure climate adaptation is included in site design and facility operations. 	<ul style="list-style-type: none"> VFPA has requested the Applicant consider this concern in their facility design and operations. G3 has proposed to provide flood protection for the Brooksbank Underpass by providing a berm near the north-east corner of the site to 4.0 metres geodetic, as further described above in Section 4.2.
<ul style="list-style-type: none"> Provide regular communications and contact information for the public during the construction phase. 	<ul style="list-style-type: none"> VFPA has required that the Applicant adhere to a stakeholder engagement plan. <p>This is addressed in Permit condition No. 28.</p>
<ul style="list-style-type: none"> Source local labour and suppliers during the construction phase. 	<ul style="list-style-type: none"> VFPA has passed this concern on to the Applicant, and G3 has committed to this principle where possible.
<ul style="list-style-type: none"> Replace and upgrade any vegetation removed for construction. 	<ul style="list-style-type: none"> The Applicant has committed to plant the east side of the flood construction berm with native species to offset the removal of invasive species that are project-impacted.
<ul style="list-style-type: none"> Identify any potential impacts to Lynn Creek estuary and measures to offset those impacts. 	<ul style="list-style-type: none"> The Applicant has indicated that there are no known impacts to Lynn Creek, and VFPA agrees with this assessment. The Applicant has committed to offsite environmental improvement initiatives as part of a community amenity contribution.

Municipal Comments	VFPA Considerations
<ul style="list-style-type: none"> Consider potential community amenities that can be provided to the benefit of City residents. 	<ul style="list-style-type: none"> The Applicant sought suggestions from the public and other parties on this subject during the course of their consultation. While not a project requirement, VFPA has requested that G3 consider this feedback in their proposal. The Applicant proposes a total contribution of \$250,000 be made to a community amenity such as local environmental initiatives, including but not limited to the enhancement of Lynn Creek. The Applicant has committed \$100,000 - \$150,000 of this amount within one year after issuance of a project permit, and the remaining balance over the following five years. The Applicant continues to seek feedback from the City of North Vancouver as to which initiatives might benefit from this contribution.
<ul style="list-style-type: none"> Consider the impacts of construction traffic, and the potential for an on-site batch plant during this period 	<ul style="list-style-type: none"> The Applicant has committed to significant reduction in construction vehicle traffic (up to 50,000 trips) through barging materials to site, and provision of an on-site batch plant.
<ul style="list-style-type: none"> Consider site lighting and the minimization of lighting effects on off-site areas 	<ul style="list-style-type: none"> VFPA has reviewed the proposal against the Lighting Guidelines, adopted in 2015 and posted to our website. All lighting and mitigations shown on project plans and in the application package are required to be adhered to. The Applicant has committed to reviewing lighting in detail as site design progresses. VFPA requires the submission of additional lighting information as it becomes available. <p>This is addressed in Permit condition No. 16.</p>

The Applicant provided project overviews and updates to both City and District Mayors and Councils in 2015 and 2016 at the direction of VFPA and in the spirit of clear communications with these stakeholders. G3 and members of their consulting team also met with City staff on several occasions to review project details and review utility and emergency service provisions. It was also

confirmed to VFPA that G3 provided a tour of a similarly designed, modern grain terminal for North Vancouver City and Fire Department staff in Longview, Washington in 2015.

The Applicant has been advised of the need to continue to seek input from the City of North Vancouver staff in identifying and addressing impacts to City utilities and services, and has agreed to this in principle. Additional coordination with the City during the VFPA Building Permit review process has also been identified as required of G3, and will be undertaken by the code consultant.

VFPA Planning has reviewed the record of municipal consultation and is of the view that the concerns raised have been adequately addressed by the Applicant.

5.1.2 Regional Agency Referrals

The proposed Project was assessed by VFPA Planning and Environmental Programs to be of potential interest to regional agencies. A referral letter was sent to the following regional agencies on December 11, 2015, notifying them of the proposed Project:

- Metro Vancouver
- Vancouver Coastal Health Authority

VFPA did not receive any regional agency comments.

5.1.3 Federal and Provincial Agency Referrals

The proposed Project was assessed by VFPA Planning and Environmental Programs to be of potential interest to federal and provincial agencies. A referral letter was sent to the following Provincial agencies on December 11, 2015, notifying them of the proposed Project:

- BC Ministry of Transportation and Infrastructure

VFPA did not receive any provincial agency comments.

VFPA notified a federal agency as part of the Marine User stakeholder referral, detailed in section 5.15 below.

5.1.4 Adjacent Tenant and Industry Stakeholder Referrals

The proposed Project was assessed by VFPA Planning to have potential impacts to adjacent VFPA tenant operations. A referral letter was sent to the following VFPA tenants on December 7, 2015 notifying them of the proposed Project and soliciting any feedback:

- Cargill Limited
- Neptune Terminals
- JS MacMillan Fisheries
- Lynnwood Industrial Estates
- Richardson International
- Univar Canada Ltd
- Western Stevedoring Company Limited
- Vancouver Pile Driving
- Canadian National Railway

Neptune Terminals, Cargill Limited, Canpotex Limited, Richardson International, and Univar Canada Ltd. 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. Note that Canpotex is not a tenant, but rather a joint owner of Neptune Terminals, a VFPA tenant.

<i>VFPA Tenant Comments</i>	<i>VFPA Considerations</i>
<ul style="list-style-type: none"> Concerns with rail capacity on the north shore 	<ul style="list-style-type: none"> VFPA is satisfied that the operation of the G3 terminal is possible without negative effects to other north shore businesses that rely on rail deliveries for their operations.
<ul style="list-style-type: none"> Concerns with rail capacity on the 2nd Narrows Rail Bridge 	<ul style="list-style-type: none"> The port has obligated G3 to demonstrate through independent analysis that the rail bridge has sufficient capacity to service all existing north shore industries that rely on ratable or unit train rail service for their operations. This analysis has been reviewed by VFPA staff and found to be acceptable. <p>This concern is further addressed in Permit condition No. 30.</p>
<ul style="list-style-type: none"> Concerns should the project affect Neptune operations in the bight between the two terminals 	<ul style="list-style-type: none"> VFPA confirms that neither construction nor operation of the terminal will negatively affect the bight area. During construction, the bight will be used to stage and unload materials from barges, but this should not affect Neptune operations. Regular operation of the G3 terminal will not utilize the bight, but G3 will have the option of using Berth 1 in the bight should the need arise.

VFPA Planning has reviewed the record of industry stakeholder consultation and is of the view that the concerns raised have been adequately addressed by the Applicant.

5.1.5 Marine Users Referrals

The proposed Project was assessed by Marine Operations to have potential impacts to marine users and shipping industry stakeholders. Various communications between VFPA and marine stakeholders took place prior to and during the course of the review (in September 2015, December 2015, and March 2106). Marine stakeholders consulted included the three shown below:

- British Columbia Coast Pilots
- Pacific Pilotage Authority
- Transport Canada, Navigation Protection Program

The Applicant was also advised to consult directly with the Pacific Pilotage Authority and with Transport Canada to assess the needs of these agencies. A preliminary meeting was held in September 2015, to discuss the project prior to submitting the application to VFPA. Several subsequent meetings were also held to evaluate the review needs of the agencies and to scope a required Berthing Simulation Study.

Marine stakeholders provided 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.

Marine Stakeholder Comments	VFPA Considerations
<ul style="list-style-type: none"> The Pacific Pilotage Authority provided the applicant with the procedure titled <i>Pilotage Requirements for New Terminals</i>, and worked directly with the Applicant in the fulfilment of the requirements set out in the document. 	<ul style="list-style-type: none"> VFPA participated in the scoping of a Berthing Simulation Study, the completion of which is a condition of the Permit. The results of the study must be to the satisfaction of VFPA. <p>This is addressed in Permit condition No. 22.</p>
<ul style="list-style-type: none"> Transport Canada responded by participating in the review of the project, in particular those aspects related to navigation. 	<ul style="list-style-type: none"> VFPA anticipates providing the results of this review, including the permit, to Transport Canada for the purposes of assisting their review of the project.

VFPA Marine Operations has reviewed the record of industry stakeholder consultation and is of the view that the concerns raised have been adequately addressed by the Applicant.

5.1.6 Community Liaison Group Referrals

The proposed Project was assessed by Project Communications to be of potential interest to the members of the North Shore Waterfront Liaison Committee (NSWLC). G3 was instructed to contact the committee during the preliminary comment period, and was able to present an overview of the project to the regularly scheduled meeting on September 10, 2015. The NSWLC responded with comments on the proposed Project, and G3 replied noting that they were pleased to address concerns as the proposal evolved.

G3 was encouraged to provide an update to the committee as part of the consultation period during the application review phase, and did so on January 14, 2016. The committee provided additional comments as a result of the January update.

Below is a table summarizing the comments received from the NSWLC (comments resulting from both appearances before the Committee) and how they were considered as part of the Project and Environmental Review.

Community Liaison Committee Comments	VFPA Considerations
<ul style="list-style-type: none"> Provide a presentation to the Mayor and Council of both the City and District of North Vancouver. 	<ul style="list-style-type: none"> G3 provided a presentation to the DNV Council on September 14, 2015, and to the City Council on January 11, 2016.

Community Liaison Committee Comments	VFPA Considerations
<ul style="list-style-type: none"> Continue to widely publicize the preliminary review phase of the project to the general public. 	<ul style="list-style-type: none"> G3 satisfied VFPA's requirements with respect to notifying the community, including a requirement to post advertisements in a community newspaper, conduct several mail drops to nearby property owners, as well as maintain a web page and contact phone number.
<ul style="list-style-type: none"> Provide a variety of community feedback opportunities to allow for the public to provide input. 	<ul style="list-style-type: none"> G3 was required to follow the consultation practices for a Category D review as set out in VFPA's Public Consultation Guidelines, adopted in 2015 and posted to the VFPA website.
<ul style="list-style-type: none"> That all possible options to reduce the impacts to road and rail traffic be fully considered. 	<ul style="list-style-type: none"> This was undertaken as part of the PER process. For example, G3 was asked to review the traffic implications of using an onsite batch plant during construction, and to investigate the implementation of traffic mitigations during operations. The implementation of both measures have been committed to by G3. <p>Construction traffic is addressed in Permit condition No. 29.</p>
<ul style="list-style-type: none"> Consider ways to mitigate the effects of increased rail traffic through the Second Narrows rail bridge. 	<ul style="list-style-type: none"> The project is not considered to have negative impacts to the Second Narrows Rail Bridge, an item that was confirmed by an independent third party for VFPA. Additional details of proposed rail operations is also required. <p>This is addressed in Permit condition No. 30.</p>

The NSWLC also heard a delegation from several residents opposed to the project at its regularly scheduled meeting on March 10, 2016. The concerns expressed to the committee were consistent with those received by G3 during the course of public consultation and included the scope of the public consultation process, potential impacts to traffic, the proximity of the project to residential areas, and unspecified health and safety concerns. These concerns and the VFPA consideration of them are further addressed in the section 5.2 below.

5.2 Public Consultation

5.2.1 Objectives

As a Category D project, public consultation was required for the proposed project, with a preliminary review phase comment period and an application review consultation period. The objective for the preliminary comment period was to provide the public with an overview of the

project, outline the technical studies to be undertaken, as well as provide the scope of the studies for public feedback. During the application review consultation period, the objective was for the applicant to provide the public with more details of the project, and provide results of the completed technical studies as well as proposed mitigations.

5.2.2 Scope of Consultation

G3 was required to provide the public with information about the project by regularly updating their website, providing opportunities for online outreach, organizing in-person meetings, providing notification of meetings and comment periods to residents and businesses within a minimum four block radius of the project, develop a discussion guide and feedback form, display boards, and at the close of each consultation period, prepare a summary report and consideration report.

5.2.3 Overview of Consultation Activities - Pre-Application Comment Period

VFPA required that G3 undertake a 20 business day public comment period prior to making the application for a project permit. G3 elected to conduct an online outreach during this time, and solicit feedback electronically. Public notice of, and invitations to participate in, this phase was provided through the following means:

- **Advertising** – Display ads were placed in the North Shore News on September 9th and 11th inviting members of the public to participate in online consultation.
- **Postcard Mailer** – A postcard mail drop was delivered on September 5th, 6th and 8th to approximately 2,500 North Vancouver residents and businesses neighbouring the proposed project, notifying them of the opportunity to participate in online engagement.
- **Letters** to key stakeholders, including local municipal governments, were sent by email on September 4th. This contained information about the project overview, information about the online consultation, website, and contact information (phone number and email address).

The consultation activities included the following:

- Conducting a four week online opportunity during the preliminary comment period from September 9, 2015 to October 7, 2015 on G3's website: g3terminalvancouver.ca/;
- Presenting material during to the Northshore Waterfront Liaison Committee on September 10, 2015 and the Low Level Road Liaison Committee on September 30, 2015.

The results of this engagement were as follows:

- 18 people signed up for future updates;
- 11 provided input via the online portal; and
- 1 person provided feedback via email

G3 posted the Engagement Summary Report and Consideration Report on the G3 website on November 5, 2015. These documents summarized the concerns raised, and G3's response to those concerns.

Concerns raised during this comment period focused on:

- Increases in road traffic;
- Increases in noise levels from rail and operations;
- Changes to air quality;

- Impacts to viewscales;
- Impacts to birds; and
- Requests to broaden mail drop area.

VFPA also posted a [webpage](#) providing general information about the project, the dates for the comment period and the project's status in the review process on September 9, 2015.

Mail drop area for the preliminary review phase comment period (includes two separate areas):



5.2.4 Overview of Consultation Activities - Application Review Phase

Public notice to participate in the 20 business day application review phase was provided through the following:

- **Advertising** – Display ads were placed in the North Shore News on December 14th and 16th and January 6th, inviting members of the public to attend the Open House and participate in consultation on the proposal.
- **Postcard Mailer** – A postcard was delivered on December 14th – 17th and again January 4th – 7th to approximately 2,800 North Vancouver residents and businesses neighbouring the proposed project, notifying them of the opportunity to participate in consultation and attend the Open House. As per VFPA Guidelines and based on feedback received during the pre-application comment period, the mail drop area was broadened for this and subsequent deliveries to include approximately the area east of Sutherland Ave, south of Drayton St, and west of the Upper Levels Highway and Mountain Highway. Please see maps below for the updated mail drop area.
- **Letters** to project stakeholders and neighbouring tenants with whom G3 had previously communicated during the preliminary comment period were sent by email on December 11th, 2015.
- **Emails** to 23 people who signed up during or following the preliminary comment period notifying them of the Open House and approaching application review phase consultation period.

Mail drop area for the application review phase consultation period:



The consultation activities included the following:

- Conducting a four-week consultation period during the application review phase between January 4, 2016 and February 1, 2016;
- Hosting an open house on January 9, 2016 from 1 pm to 5 pm in North Vancouver; 86 members of the public attended;
- Updating the G3 website with relevant information and continuing to enable online consultation and solicit feedback between January 4, 2016 and February 1, 2016 at g3terminalvancouver.ca;
- Presenting material to the Northshore Waterfront Liaison Committee;
- Posting the Consultation Summary Report on March 18, 2016 and Consideration Report in April 22, 2016 to the G3 website; and
- G3 advised the public and local addresses via email update and mail drop (to the same area as Postcard mailer mail drop area) that the Consideration Report was posted in April and May 2016.

The results of this engagement were as follows:

- 58 people signed up, 46 provided input via G3's online portal;
- 32 completed an online survey;
- 5 completed feedback forms;
- 17 people provided feedback via email; and
- 2 people provided feedback via telephone.

The application and appendices were posted on the VFPA website on December 5, 2015. The Consultation Summary Report and the Consideration Report from the preliminary comment period were also posted on the VFPA websites on December 5.

In all the notification materials and meetings, information provided included the following:

- An overview of the proposed project;
- The date of the consultation period;
- Details of Open House;
- Where project information materials could be found;
- The VFPA website address for permitting information;
- How feedback could be provided; and
- Applicant contact information.

All consultation-specific materials were available on the G3 website during the application review public consultation phase. These included a discussion guide, survey, and feedback form that could be submitted to the project team directly from the website or emailed/mailed.

At the Open House, copies of the Project Permit application, Preliminary Review Phase Consultation Summary Report and Consideration Report, Discussion Guide, feedback forms, twenty-four display boards and three videos were on display. G3 had seven team members and fourteen technical experts available to discuss the proposed project. BC Hydro staff were also present at the Open House with information about off-site hydro upgrades that were being contemplated. VFPA staff attended the event to observe and answer questions about the VFPA review process and port development generally.

The Applicant provided a detailed summary of all comments received in a Public Consultation Summary Report dated March 18, 2016. The Applicant also provided a Consideration Report dated April 22, 2016 describing how they responded to public comments received. Both of these

documents were posted to both Applicant and VFPA websites in March and April 2016. Project update communications, including an additional mail drop and stakeholder emails, were sent in late April 2016 to notify interested parties of the posted documentation.

5.2.5 Overview of Comments Received

VFPA and G3 received a copy of an online petition on February 9, 2016 with 550 signatories, an updated copy of the petition on March 8, with 639 signatories and an additional updated copy on April 26, with 685 signatories. Of the 685 signatories, 505 (73%) self-identified as being North Vancouver residents, 122 (18%) as Lower Mainland residents, and 66 (9%) were from elsewhere in British Columbia, Canada, outside of Canada, or unstated locations.

The petition included comments from those who wished to supply additional written feedback - of the 685 signatories, approximately 220 people provided comments. The majority of comments were from residents of North Vancouver and Vancouver. Concerns cited in the petition were consistent with those provide through consultation activities to G3 and with those directed to VFPA, and focussed on:

- Construction noise and dust;
- Traffic congestion;
- The cumulative impacts from several large developments in the area;
- Port development generally;
- Air quality;
- Potential impact to property values;
- Proximity of the terminal to residential uses;
- View and aesthetic impacts of the terminal; and
- Scope of public consultation conducted by G3 or the Port.

While the port authority received several hard copies of the petition, the petition continues as an online forum.

On April 27, 2016, several concerned members of the public met with VFPA staff to discuss their concerns about the G3 project. Their concerns were consistent with those heard throughout the review of the project, as noted above, and as summarized in the table below.

VFPA also directly received direct comments via email, letter and phone calls from approximately 25 people. As with comments and feedback sent directly to G3, the majority of comments focused on concerns about:

- Noise from the terminal, roads, or rail;
- General port and industrial development;
- Potential impacts to views;
- Local or regional air quality;
- Fire safety and emergency preparedness; and
- Impacts to the environment, including nesting birds and Lynn Creek.

Other comments related to questions about current and future terminal employment, the relocation of businesses, and a request for an independent ombudsman for resident complaints. Some comments indicated support for the project, in particular on the subjects of jobs, tax generation, and regional or trade benefits.

Below is a table summarizing the public comments received by the Applicant and VFPA and how they were considered as part of the project and environmental review. Any permit conditions resulting from the concern are noted by number in the right column.

Public Comments	VFPA Considerations
<p>Marine Traffic Concerns about the effects of more marine traffic</p>	<p>As part of the review process, the Applicant provided information related to the anticipated marine traffic and size of vessels. The marine traffic is proposed to increase from 56 vessels per year in 2013, to approximately 168 at maximum capacity. As described in Section 4.4.4, this increased number of vessels is comparable to the number of vessels that called at the terminal in 2006, but which has decreased over time as the break bulk trade has decreased due to market demand, or been diverted to other competing terminals.</p> <p>The vessel size proposed by the project is the same size as other vessels calling at existing terminals at the port. Wave action from deep sea vessels in the inner harbour is not normally perceptible, and as such wave action generated by vessels calling the terminal should not be significant enough to be a safety concern.</p> <p>Given the ship loading capacity proposed is significantly higher than what is achievable at older grain terminals, the throughput of the facility may reduce vessel loading time and wait time at anchor, compared to existing grain terminals in the inlet.</p>
<p>Land Traffic Concerns about impacts to traffic, especially during construction</p>	<p>As part of the review process, the Applicant was required to submit a land traffic study to assess impacts to the road network during operations. The conclusion of the assessment indicates that road traffic is anticipated to decrease significantly. VFPA considers the traffic impacts during operations to be a net reduction of vehicles travelling to and from the terminal.</p> <p>Permit condition No. 14 requires that G3 employ strategies to facilitate non-auto travel both on and off site. As outlined in the Consideration Report, these measures include on-site showers and lockers, a guaranteed ride home program for employees, and measures to encourage pedestrian travel on and off the site.</p> <p>Permit condition No. 29 requires that G3 develop and submit a construction traffic management plan to accommodate construction and public traffic. It will include measures to reduce impacts on local vehicle traffic. Such measures may include scheduling construction traffic (e.g., equipment deliveries) and the start of construction shifts outside of peak traffic hours, or other measures.</p> <p>The Applicant has committed to employing strategies to reduce vehicle traffic to the site during construction by barging materials to the site, and operation of an on-site concrete batch plant. The Applicant has indicated that cumulatively, these measures are anticipated to reduce construction-related traffic by over 50,000 truck trips.</p>

Public Comments	VFPA Considerations
<p>Views Concerns with view impacts</p>	<p>The proposal considered the possibility of view impacts, and the design team re-oriented the silo structures from an east-west alignment to a north-south orientation prior to making the application, partly in order to minimize the impacts to views from the Moodyville neighbourhood to the north.</p> <p>As part of the review process, the Applicant was required to submit a view and shade impact assessment to illustrate any potential impacts to the surrounding community. The assessment included photos and renderings from several locations. The assessment concluded that view impacts are not expected to be significant. VFPA concurs with the results of the assessment given the distance from potentially affected residential areas, the alignment of the taller structures, and the industrial nature of the area.</p>

Public Comments	VFPA Considerations
<p>Air Quality</p> <ul style="list-style-type: none"> Concerns regarding dust and air emissions 	<p>The facility is anticipated to increase emissions of particulate matter and dust from grain handling, facility operations, and loading grain into marine vessels. Emissions from marine vessels and increased rail traffic have the potential to increase emissions of diesel particulate matter and NOx (nitrogen oxides). There is the potential for adverse effects on air quality from the new facility, but with the mitigations and conditions in place, the effects are not anticipated to be significant.</p> <p>Key mitigation measures to minimize dust emissions are integrated into the project design. For example, the grain will be transported by a network of enclosed conveyors with aspiration systems to collect dust and reduce dust release from transfer points. The ship loading system will be equipped with a state-of-the-art telescoping spout, deadbox, and point of discharge aspiration system. The ship loading spout will extend into the vessel hold maintaining a close proximity to the grain pile to minimize the release of fugitive dust from the open vessel hold.</p> <p>No project-specific mitigation measures are proposed to reduce emissions from rail locomotives or marine vessels, however, VFPA anticipates that emissions from these sources will decrease over time with technology improvements due to international and Canadian regulations, and normal fleet turnover.</p> <p>G3 will be required to develop and implement an air emissions management plan that includes verifying that the project mitigation measures perform as designed, operating procedures remain effective, and that the facility can demonstrate continuous improvement.</p> <p>There is potential for dust to be generated during construction. Dust mitigation measures will be implemented as detailed in the Construction Environmental Management Plan.</p> <p>These mitigation measures are reflected in Permit conditions No. 61, 62, 64, and 65.</p>

Public Comments	VFPA Considerations
<p>Noise</p> <ul style="list-style-type: none"> Concerns about existing and increased noise associated with train horns and shunting, vacuum systems, fans, exhaust portals and alarms as well as noise during construction 	<p>Noise will be produced during construction of the terminal, including from excavation, forming, pile driving, and general activities to transform the terminal and construct the facility. Noise will also be generated during operations, including from grain transfer equipment, dust extractors, and rail operation (i.e., wheel squealing). There is the potential for adverse effects from noise resulting from the facility, but with the mitigations and conditions in place, the effects are not anticipated to be significant.</p> <p>Construction activities will primarily occur from Monday to Saturday between 7:00 AM and 8:00 PM. G3 will be required to notify residents in advance of any construction activities that would occur outside of those times, and as may be approved by VFPA.</p> <p>During construction G3 will monitor noise from pile driving and potentially noisy activities to verify that the construction mitigation measures are effective, and implement additional mitigations as appropriate.</p> <p>Key mitigation measures to reduce noise during operations are integrated into the project design. For example, the site layout and loop track avoids most rail shunting, exhaust silencers will be used on dust extractors, electrical equipment selection will include low noise emission criteria, and baffles and shielding will be used on the equipment that are a significant source of noise.</p> <p>G3 will verify, through post construction monitoring, that the project noise emissions are within predicted levels, that mitigations perform as designed, and will implement additional improvements as appropriate to ensure that facility operates acceptably.</p> <p>These mitigation measures are reflected in Permit conditions No. 28, 60, 66, 67, and 72.</p> <p>Overall residual effects on the acoustic environment will be low in magnitude – noise will increase by 1 to 2 decibels in residential areas close to the site – and will have a small adverse effect on the adjacent community. Noise will be highest during construction. The extent of residual effects will be local because with mitigation, the project will not be the dominant source of noise in the local area. The terminal will produce noise daily and effects will occur throughout the project operations. With mitigation in place, residual adverse effects on the acoustic environment are expected to be not significant.</p>

Public Comments	VFPA Considerations
<p>Fire Safety and Emergency Preparedness Concern about the potential for fire and explosion</p>	<p>Safety and Emergency preparedness was considered as part of the review.</p> <p>To reduce the risks of accidents and malfunctions during facility operations G3 will implement a Fire and Life Safety Plan and a Spill Prevention, containment, and clean-up plan.</p> <p>Mitigation measures described in the Construction Environmental Management Plan will be put in place to reduce effects from accidents and malfunctions during construction.</p> <p>VFPA will continue to work with G3 and the City of North Vancouver with respect to emergency service provision for the facility.</p> <p>VFPA has required the preparation of Fire Risk and Dust Explosion Hazard Assessments, the preliminary review of which indicate that with appropriate mitigations, the terminal can be operated safely.</p> <p>This is reflected in Permit conditions No. 7, 13, 27, 62 and 63.</p>
<p>Biophysical Habitat Assessment and Nesting Birds</p> <ul style="list-style-type: none"> • Concerns about pest management, increased birds and rodents attracted by grain • Concern about wildlife, habitat and marine impacts 	<p>There is potential for adverse effects on terrestrial resources from vegetation removal for the project. Approximately 0.1 ha of vegetation would be removed for the project. The existing vegetation is primarily non-native plants, including English Ivy – an invasive species. Shrubs and small trees are present, including birch and elm and may provide nesting habitat for migratory birds. In general, habitat value of the existing vegetation is low.</p> <p>Though 0.1 ha of vegetation will be removed approximately 0.05 ha will be replanted on the flood protection berm adjacent to Lynn Creek. G3 has also committed to providing a community amenity that could include benefits to the environment, potentially near the terminal site.</p> <p>Mitigation measures described in the Construction Environmental Management Plan will be implemented to reduce potential adverse effects. Invasive plants will be handled and disposed of in a manner to reduce their risk of spreading. To reduce the risk of adverse effects on nesting birds, vegetation clearing will avoid the nesting season (April 1 to July 31).</p> <p>Mitigation measures are reflected in Permit conditions No. 7, 8, 18, 19, 20, 21, 38 to 58, 61, and 62.</p> <p>G3 will be responsible for pest control on the site, as with at all other terminals leased from VFPA, including five other grain terminals in Burrard Inlet.</p>

Public Comments	VFPA Considerations
<p>Port Development</p> <ul style="list-style-type: none"> Concerns about existing port activities and port development generally 	<p>The proposed project is an allowable use under the “Port Terminal” designation in VFPA’s Land Use Plan. It is a use that is entirely within an existing terminal footprint and in a heavy industrial area. Under the Canada Marine Act, the purpose of VFPA, amongst other things, is to contribute to the growth, competitiveness, and prosperity of the Canadian economy, while providing for a high level of safety and environmental protection.</p> <p>A thorough assessment of potential impacts was conducted through the Project and Environmental Review Process and mitigations have been proposed by the Applicant and required as part of the project permit to limit impacts to the surrounding community. VFPA is also taking steps through project permit conditions that allow for continuous improvement in several areas of public concern.</p> <p>Numerous conditions address the mitigation of potential Project impacts.</p>
<p>Community Amenity</p> <ul style="list-style-type: none"> Inquiries about community amenities/benefits including potential for a green space or park between the terminal and the road, or a separate bike lane 	<p>VFPA does not require community amenity contributions as part of the review process.</p> <ul style="list-style-type: none"> G3 has committed to providing \$250,000 toward a community amenity, with \$100,000 - \$150,000 of this amount being provided within one year after issuance of a project permit, and the remaining balance over the following five years. <p>As part of the consultation process, the Applicant collected feedback from the community on areas viewed as highest priority for potential contributions. The greatest priority identified was environmental initiatives with over 40% support, with the remaining interest spread over a number of areas.</p>
<p>Community Engagement</p>	<p>G3 is required to submit a community and stakeholder engagement plan presenting their communication activities from the date of permit issuance to the completion of construction, to the satisfaction of VFPA. The Plan is to provide details of activities to be undertaken by G3 to communicate with the interested public and stakeholders about the project, proposed mitigations, status of permit conditions, and all major phases of construction, with at least one public information session to be held prior to commencement of construction.</p> <p>This concern is captured in Permit condition No. 28.</p>

VFPA Project Communications has reviewed the record of consultation, is of the view that the concerns raised have been adequately addressed by the Applicant, and supports the recommendation to approve the Project subject to adherence to the listed project and environmental conditions in the permit.

5.3 Aboriginal Consultation

A Pre-Consultation Report was completed by Aboriginal Affairs staff and it was determined that the duty to consult was triggered.

5.3.1 Objectives

The Objectives of the Aboriginal consultation process are:

- To fulfill the Crown's legal duty to consult with Aboriginal groups;
- To provide updates and share information about the proposed project as they become available, including all relevant documents;
- To work with Aboriginal groups to either avoid or determine appropriate mitigation of potential project impacts to Aboriginal and Treaty rights where required;
- To provide information to the project team and the Applicant with respect to issues raised by Aboriginal groups and in the development of responses to inquiries;
- To encourage the Applicant to explore business and employment opportunities with Aboriginal groups.

5.3.2 Scope of Consultation

The proposed project falls within the asserted traditional territory of the following Aboriginal groups:

- Tsleil-Waututh Nation
- Squamish Nation
- Musqueam Indian Band
- Sto:lo Nation, as represented by the People of the River Referrals Office (PRRO)
 - Sto:lo Tribal Council
 - Sto:lo Nation
- Hul'qumi'num Treaty Group
 - Cowichan Tribes
 - Halalt First Nation
 - Stz'uminus First Nation
 - Penelakut Tribe
 - Lyackson First Nation
 - Lake Cowichan First Nation

All Aboriginal groups listed above were consulted on the proposed project.

5.3.3 Overview of Consultation Activities

Upon receipt of an accepted Project Application, VFPA reviewed the proposed project to determine whether Aboriginal consultation was required. A Pre-Consultation Report was completed and it was determined that the proposed project may have the potential to adversely impact Aboriginal rights. VFPA led the Aboriginal consultation activities on the proposed project with participation by the Applicant.

Consultation activities included phone calls, letters and emails between Aboriginal groups, VFPA and the Applicant. VFPA and the Applicant also met with Aboriginal groups to discuss the proposed project, VFPA's PER process, and any potential adverse impacts the project may have on participating groups' Aboriginal rights.

All letters and inquiries from Aboriginal groups were considered and responded to.

All Aboriginal groups listed in Scope of Consultation above were consulted in the following manner:

Pre-Application Comment Period: As the proposed project is a Category D project, VFPA issued a preliminary outreach letter to Aboriginal groups in the Pre-Application phase of VFPA's PER process. Letters were sent on September 8, 2015. The letter outlined G3's intention to submit to VFPA an application in the upcoming months for their proposed grain export facility.

G3 sent an introductory letter to all groups on September 9, 2015, providing Aboriginal groups with more information about the proposed project. G3 offered to meet with Tsleil-Waututh Nation, Musqueam Indian Band and Squamish Nation to discuss the proposed project.

Application Review Phase: On December 14, VFPA sent all Aboriginal groups listed above a referral package for their review and comment. The package included a cover letter, the project permit application, an overview map, a site plan and the following studies:

- Appendix D: Excavation Drawings
- Appendix F: Marine Structures
- Appendix L: Storm Water Pollution Prevention Plan
- Appendix O: Spill Prevention and Emergency Response Plan
- Appendix U: Archaeological Overview Assessment
- Appendix V: Construction Environmental Management Plan
- Appendix W: Biophysical Reports

All other project permit application materials were made available to Aboriginal groups, as with all interested parties, on VFPA's website.

5.3.4 Participation Funding

VFPA offered and provided participation funding to Aboriginal groups on a case by case basis.

5.3.5 Overview of Issues Raised by Aboriginal Groups

The following table summarizes the issues raised by Aboriginal Groups and VFPA's considerations of those issues. These issues have been categorized, by VFPA, in the table below according to the Environmental Effects listed in Section 5 of CEAA, 2012.

Issue	VFPA Considerations	Actions or Permit Conditions
Health and socio-economic conditions		
<p>Impacts of marine shipping on Aboriginal aquaculture businesses located on Vancouver Island.</p>	<p>Waters and navigational routes near Vancouver Island are outside the waters managed by VFPA. Regardless, VFPA provided the interested First Nation with information available to VFPA regarding the vessel route and the charted traffic separation scheme in the area.</p> <p>As vessels will be travelling within the traffic separation scheme for the majority of their voyage, impacts to aquaculture adjacent to Vancouver Island are not expected.</p>	<p>None</p>
<p>How cumulative effects are considered in the project application</p>	<p>In VFPA's project and environmental review, the past and current effects of development on the environment provides the context for VFPA's assessment of project effects, and so consideration of cumulative effects is inherently integrated into environmental reviews and decisions.</p> <p>Cumulative effects of the project on health are considered through VFPA review of the package of studies submitted as part of the application package.</p> <p>VFPA also considers the potential project effects on vegetation, wildlife, and fish and fish habitat in the context of the existing environment, taking into account past effects and current pressures on species.</p>	<p>A summary of the results of the VFPA Environmental Review is presented in Section 6.2 of this report.</p> <p>The summary table includes mitigation measures and any conditions implemented to reduce potential adverse effects, including on air, noise, and aquatic and terrestrial resources.</p>

Issue	VFPA Considerations	Actions or Permit Conditions
Current use of lands and resources for traditional purposes		
<p>Impacts of wake from marine shipping on Aboriginal fishing for crabs and prawns.</p>	<p>All vessels calling G3 will follow the same route and traffic separation scheme approaching VFPA jurisdiction, and then the same navigation channel into First Narrows as all other vessel traffic into Burrard Inlet.</p> <p>The concern regarding wake and marine shipping is with respect to existing marine shipping and not limited to the proposed project. The concern is relevant to marine shipping regulations and VFPA operations.</p> <p>VFPA will continue to explore this concern with First Nations, outside of the PER process for this project.</p>	<p>VFPA and other relevant federal agencies to continue dialogue with Aboriginal groups regarding concerns with marine shipping.</p>
<p>Impacts to traditional food sources</p>	<p>The proposed project is not expected to adversely impact traditional food sources.</p>	<p>None</p>

Issue	VFPA Considerations	Actions or Permit Conditions
Physical and cultural heritage, and any structure, site or thing that is of historical, archaeological, paleontological or architectural significance		
Impacts of development on archaeological resources	The Applicant will be required to follow the recommendations made in the Archaeological Overview Assessment, submitted with the Permit Application.	<p>Permit condition No. 25 requires that the Applicant submit an Archeological Chance Find Procedure to the satisfaction of VFPA.</p> <p>Permit condition No. 26 requires that the Applicant submit the results of an archaeological review of detailed development plans, proposed construction methods, and existing information on subsurface conditions in the vicinity of proposed excavations anticipated to be required, including a proposed course of action, to the satisfaction of VFPA.</p> <p>Permit condition No. 36 requires that the Applicant ensure that an appropriately qualified archaeological monitor be on site at all times during ground disturbing activities that may intrude into native soils.</p>

Issue	VFPA Considerations	Actions or Permit Conditions
Additional concerns		
<p>Impacts of project on vegetation and wildlife</p>	<p>Adverse impacts to vegetation and wildlife are not expected.</p> <p>Vegetation removal is limited to the removal of invasive plants within the project area. Impacts to wildlife are not expected, as the proposed upland works will be conducted within the existing terminal footprint.</p> <p>The Applicant has committed to replacing the existing vegetation on site with native species by re-vegetating the Lynn Creek side of the proposed flood-protection berm.</p>	<p>Permit condition No. 56 requires that the Applicant not disturb the riparian vegetation adjacent to Lynn Creek.</p> <p>Permit condition No. 57 requires that the Applicant plant the flood protection berm, adjacent to the Lynn Creek riparian area, with appropriate native species as soon as practical and in a manner that maximizes the likely success of the plantings.</p>
<p>Reconciliation for past infringements in the port</p>	<p>Under the <i>Canada Marine Act</i>, VFPA has been delegated the authority to manage federal lands and therefore conducts Aboriginal consultation on behalf of Transport Canada when operations or developments have the potential to adversely impact asserted or established Aboriginal or Treaty rights.</p> <p>The avenues currently available to Aboriginal groups to address reconciliation with Canada are forward-looking in nature and are most appropriately discussed with Indigenous and Northern Affairs Canada.</p>	<p>None</p>

Issue	VFPA Considerations	Actions or Permit Conditions
<p>Request for further Improvement to habitat value in project area or the site</p>	<p>In consideration of the proposed Project, the existing site and its future use, opportunities on site for net environmental gain are limited.</p> <p>The project includes the removal of approximately 405 piles, 230 of which are creosote treated timber piles. The project will also add 130 new steel pipe piles, resulting in net fewer piles within the project area.</p> <p>Pending project approval, the Applicant has committed to environmental restoration programming in part led by an Aboriginal group, as well as other projects that benefit the broader North Shore community. In line with the feedback G3 has received from consulted stakeholders, contributions are largely anticipated to have an environmental focus.</p>	<p>Permit condition No. 54 requires that invasive plants, including English ivy and Japanese knotweed, be handled in a manner that will prevent their spread and shall be appropriately contained, collected and disposed of.</p> <p>Permit condition No. 57 requires that the Applicant plant the flood protection berm, adjacent to the Lynn Creek riparian area, with appropriate native species as soon as practical and in a manner that maximizes the likely success of the plantings.</p>

Aboriginal Affairs has reviewed the record of Aboriginal consultation and is of the view that the duty to consult has been met.

6 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 G3 Terminal Vancouver Project, and provides the environmental review decision in Section 6.3. The environmental review also considered the information provided in the previous sections of this report.

6.1 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. Additional project information pertinent to the environmental review includes the following:

- Environmental Noise Assessment – Addendum Memo that updated the noise assessment submitted as part of the Application due to project design changes;
- Environmental Air Assessment – Addendum Memo that updated the air assessment submitted as part of the Application due to project design changes; and
- A Request for Review submitted to Fisheries and Oceans Canada (DFO) determined that the Project can be completed without serious harm to fish or fish habitat using the proposed procedures and mitigation measures. DFO responded that the proposal will not result in serious harm to fish provided the mitigation measures included in the submitted material are implemented.

The temporal scope of the review includes site preparation, project construction, and operation of the terminal up to the permitted annual capacity of 8 MMT/year.

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. Section 6.2 below summarizes the results of the review.

Though VFPA does not have a legislative requirement to conduct a cumulative effects assessment in our PER process, the past and current effects of development on the environment provides the context for our review of project effects, and so consideration of cumulative effects is inherently integrated into our environmental reviews and decisions. For example, both air and noise studies include model predictions of project effects, these effects are not reviewed in isolation, rather they are considered in addition to the current condition. Similarly, potential project effects on vegetation, wildlife, fish, and marine mammals are considered in the context of the existing environment taking into account past effects and current pressures on species.

6.2 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?		Overview of Potential Adverse Effects, Mitigation Measures, and Residual Adverse Effects	Significant Residual Adverse Effects?	
	Yes	No		Yes	No
Air quality	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<p>There is potential for adverse effects on air quality from the new facility with the increased marine and rail activity, and change in commodity. The facility is anticipated to increase emissions of particulate matter and dust from grain handling, facility operations, and loading grain into marine vessels. Emissions from marine vessels and increased rail traffic have the potential to increase emissions of diesel particulate matter and NOx (nitrogen oxides).</p> <p>Key mitigation measures to minimize dust emissions are integrated into the project design. For example, the grain will be transported by a network of enclosed conveyors with aspiration systems to collect dust and reduce dust release from transfer points. The ship loading system will be equipped with a state-of-the-art telescoping spout, deadbox, and point of discharge aspiration system. The ship loading spout will extend into the vessel hold maintaining a close proximity to the grain pile to minimize the release of fugitive dust from the open vessel hold.</p> <p>No project-specific mitigation measures are proposed to reduce emissions from rail locomotives or marine vessels, however, we anticipate emissions from these sources to decrease over time with technology improvements due to international and Canadian regulations, and normal fleet turnover.</p> <p>G3 will develop and implement an Air Emissions Management Plan that includes verifying that the project mitigation measures perform as designed, operating procedures remain effective, and that the facility can demonstrate continuous improvement.</p> <p>There is potential for dust to be generated during construction. Dust mitigation measures will be implemented as detailed in the Construction Environmental Management Plan.</p> <p>These mitigation measures are reflected in Permit conditions No. 18, 61, 64, and 65.</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>Residual effects (the project effects that remain after mitigation) on air quality are predicted to be low in magnitude and have a relatively small adverse effect on local air quality. The extent of residual effects will be local with the highest concentrations of emissions within the terminal site. Effects on air quality will occur daily and will last throughout the project operations. The effects are reversible when the project is decommissioned.</p> <p>With mitigation in place, residual adverse effects on air quality are expected to be not significant.</p>		
Lighting	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<p>There is potential for adverse effects from exterior lights at the facility on local residents. Mitigation measures will be implemented to reduce potential adverse effects. Permanent facility lights will be directed at the facility and not toward neighbouring sites, LED lights – which reduce light spill – will be used, and outdoor lights will be shut off unless needed. To avoid effects on marine navigation, lights will not be directed toward the inlet.</p> <p>Construction activities will primarily occur from Monday to Saturday between 7:00 am and 8:00 pm. If temporary lighting is needed during construction, lights will be directed downward, toward the facility, with task lights placed as close to the operation as possible.</p> <p>Residual effects from lighting on local residents are predicted to be low in magnitude and the extent will be limited to areas adjacent to the terminal. Adverse effects will be greatest during the construction period (daily for up to 3 years) and minimal during operations. The effects are reversible when the project is decommissioned.</p> <p>This issue is addressed in Permit condition No. 16.</p> <p>With mitigation in place, residual adverse effects from lighting 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
Acoustic Environment	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<p>There is potential for adverse effects of increased noise on the acoustic environment from the Project. Noise will be produced during construction, including from excavation, pile driving, and building the facility. Most noise during operations will be from grain transfer equipment, dust extractors, and rail (i.e., wheel squealing).</p> <p>Construction activities will primarily occur from Monday to Saturday between 7:00 am and 8:00 pm. G3 will notify residents in advance of any construction activities that would occur outside of those times.</p> <p>During construction G3 will monitor noise from pile driving and potentially noisy activities to verify that the construction mitigation measures are effective, and implement additional mitigations as appropriate.</p> <p>Key mitigation measures to reduce noise during operations are integrated into the project design. For example, the site layout and loop track avoids most rail shunting, exhaust silencers will be used on dust extractors, electrical equipment selection will include low noise emission criteria, and baffles and shielding will be used on the equipment that are a significant source of noise.</p> <p>G3 will verify, through post construction monitoring, that the project noise emissions are within predicted levels, that mitigations perform as designed, and will implement additional improvements as appropriate to ensure that facility operates acceptably.</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>These mitigation measures are reflected in Permit conditions No. 34, 60, 66, 67, and 72.</p> <p>Overall residual effects on the acoustic environment will be low in magnitude – noise will increase by 1 to 2 decibels in residential areas close to the site – and will have a small adverse effect on the adjacent community. Noise will be highest during construction. The extent of residual effects will be local because with mitigation, the project will not be the dominant source of noise in the local area. The terminal will produce noise daily and effects will occur throughout the project operations. The effects are reversible when the project is decommissioned.</p> <p>With mitigation in place, residual adverse effects on the acoustic environment are expected to be not significant.</p>		

Environmental Component	Potential Adverse Effects?		Overview of Potential Adverse Effects, Mitigation Measures, and Residual Adverse Effects	Significant Residual Adverse Effects?	
	Yes	No		Yes	No
Soils	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<p>There is potential for adverse effects on soil quality from the excavation and reuse of soils on site.</p> <p>Approximately 125,550 m³ of soil will be excavated for the project. Soil will be excavated for the road and rail underpasses and the grain silos, stored on site for testing and conditioning (as required), and if the material is of a suitable quality, will be re-used on site.</p> <p>Mitigation measures described in the Construction Environmental Management Plan will be implemented to reduce potential adverse effects if contaminated soils are encountered during construction. Additionally, a detailed Soil and Groundwater Management Plan will be developed and implemented. This will include specific information on how soils will be excavated, stockpiled, tested, and reused. Remediation and Removal Action Plans will also be developed for areas where there is high probability of encountering contaminated soil.</p> <p>Soils that exceed Contaminated Sites Regulation Industrial Land standards may not be re-used, and must be disposed of at an approved offsite facility.</p> <p>A qualified environmental professional in contaminated sites management will oversee all activities related to contaminated soils.</p> <p>The mitigation measures are reflected in Permit conditions No. 18, 20, 38, 52, 53, and 58.</p> <p>With mitigation measures in place there is a low likelihood of residual adverse effects of the project on soil quality. If adverse effects do occur they would be low in magnitude, site-specific in extent, short-term in duration, occur infrequently, and be reversible with remediation.</p> <p>If residual adverse effects on soils occur from the project they are predicted to be not significant.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Sediments	<input type="checkbox"/>	<input checked="" type="checkbox"/>	The project is not expected to affect sediments.	<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
Groundwater	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<p>There is potential for adverse effects on groundwater quality during soil excavation.</p> <p>Approximately 125,550 m³ of soil will be excavated for the project. Some excavations will be below the groundwater table and will require dewatering. Mitigation measures described in the CEMP will be implemented to reduce potential adverse effects. The water will be stored and treated for pH and turbidity. If the treated water meets Canadian Council of Ministers of the Environment (CCME) and Contaminated Sites Regulation criteria, it will be released to the stormwater system.</p> <p>There is known groundwater contamination that may be encountered during excavation of the grain receiving pit. In this area, the concentrations of copper, cadmium, and zinc in the groundwater exceed CCME guidelines. Mitigation measures described in the Construction Environmental Management Plan will be implemented to reduce potential effects on adjacent areas. The area will be isolated prior to excavation and any excess water will be stored and tested. If the water exceeds applicable guidelines, it will be transported to an approved facility for disposal.</p> <p>A soil and groundwater management plan will be submitted to VFPA for review and approval prior to construction. This will include specific information on groundwater testing methods. A qualified environmental professional in contaminated sites management will oversee activities related to contaminated groundwater.</p> <p>The mitigation measures are reflected in Permit conditions No. 20, 21, 38, 52, and 53.</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>With mitigation measures in place there is a low likelihood of residual adverse effects of the project on groundwater. If adverse effects do occur they would be low in magnitude, site-specific in extent, short-term in duration, occur infrequently, and be reversible with remediation.</p> <p>If residual adverse effects on soils occur from the project they are predicted to be not significant.</p>		
Surface water and water bodies	■	<input type="checkbox"/>	<p>There is potential for adverse effects on the water quality in Burrard Inlet during construction and operations.</p> <p>Project construction activities (e.g., site preparation, soil excavation, and use of a concrete batch plant) can affect water quality if sediments or contaminants enter the aquatic environment. The sediment and erosion control mitigation measures described in the Construction Environmental Management Plan will be implemented to reduce potential adverse effects.</p> <p>Stormwater from rainfall can flow over impervious surfaces (e.g., paved roadways, parking lots, and building rooftops, etc.) and accumulate debris, soil and sediment, and pollutants that could affect the water quality of Burrard Inlet.</p> <p>A Stormwater Pollution Prevention Plan will be implemented to reduce potential adverse effects. Stormwater effluent will be treated by oil-water-grit interceptors prior to discharge. The oil-water-grit interceptors will remove sediment, suspended solids, hydrocarbons, and free oil, from stormwater runoff.</p> <p>The mitigation measures are reflected in Permit conditions No. 21, 38, 39, 40, 48, 40, 50, and 51.</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>With mitigation measures in place there is a low likelihood of residual adverse effects of the project on water quality. If adverse effects do occur they are most likely to occur during construction. The effects are predicted to be low in magnitude and would extend into Burrard Inlet. The effects would likely be short-term in duration, occur infrequently, and would be reversible after project decommissioning.</p> <p>If residual adverse effects on surface water and water bodies occur from the project they are predicted to be not significant.</p>		
Species/habitat with special status	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<p>The Project is not expected to affect species, or habitats, with special status.</p> <p>The vegetation that would be removed for the project is primarily comprised of non-native plants, including English Ivy – an invasive species. Shrubs and small trees are present, including birch and elm (see Terrestrial Resources below). The existing site vegetation does not provide habitat for terrestrial species at risk. Similarly, no aquatic species at risk are likely to occur in close proximity to 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
Terrestrial resources (vegetation, wildlife and wildlife habitat)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<p>There is potential for adverse effects on terrestrial resources from vegetation removal for the project. Approximately 0.1 ha of vegetation would be removed for the project. The existing vegetation is primarily non-native plants, including English Ivy – an invasive species. Shrubs and small trees are present, including birch and elm and may provide nesting habitat for migratory birds. In general, habitat value of the existing vegetation is low.</p> <p>Though 0.1 ha of vegetation will be removed approximately 0.05 ha will be replanted on the flood protection berm adjacent to Lynn Creek. G3 has also committed to providing a community amenity that could include benefits to the environment.</p> <p>Mitigation measures described in the Construction Environmental Management Plan will be implemented to reduce potential adverse effects. Invasive plants will be handled and disposed of in a manner to reduce their risk of spreading. To reduce the risk of adverse effects on nesting birds, vegetation clearing will avoid the nesting season (April 1 to July 31).</p> <p>The mitigation measures are reflected in Permit conditions No. 8, 18, 54, 56 and 57.</p> <p>Overall residual effects on terrestrial resources will be low in magnitude. There will be a net loss of 0.05 ha of vegetation on site. The extent of effects will be site-specific and low in frequency (vegetation removal will only occur once), however, the loss of terrestrial resources will be long-term in duration and would be reversible after project decommissioning.</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"/>
Wetlands	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<p>The project is not expected to affect wetlands. It is planned to be located on a previously developed site with no existing wetlands.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

<p>Aquatic resources (e.g., aquatic plants, fish and fish habitat, waterbirds, marine mammals, etc.)</p>	<p>■</p>	<p>□</p>	<p>There is potential for adverse effects on aquatic resources from the construction of the marine terminal.</p> <p>A new marine terminal will be constructed as part of the project. This will include removal of a portion of the existing wharf deck and supporting piles as well as installing new in-water piles to support three ship-loading conveyors and access trestle. An in-water rock buttress will also be installed along the face of the existing sheet pile wall to support the static loads created by the new rail line.</p> <p>Fish, invertebrates, marine plants, and marine mammals use the habitats near the Project site. Construction of the marine terminal will affect fish and fish habitat and pile-installation will increase underwater noise which can affect the behaviour of fish and marine mammals.</p> <p>Approximately 230 existing creosote timber piles and 175 concrete piles will be removed for the project, and approximately 15 steel pipe piles (24" diameter) and 115 steel pipe piles (36" diameter) will be installed.</p> <p>Creosote-treated timber piles will be extracted with a vibratory hammer and concrete piles will be removed or cut to the mudline. New piles will be installed using vibratory and diesel impact hammers and multiple piles may be installed simultaneously. Bubble curtains will be used during pile installation to reduce underwater noise. G3 will monitor underwater noise and marine mammal presence in the area during pile installation activities. G3 will halt work if marine mammals are within 600 m of the terminal.</p> <p>Removal of the creosote-treated timber piles will affect the organisms living on them, however, these organisms are predicted to recolonize the new piles within several years. During pile removal an oil boom and a containment boom will be used to prevent contamination of adjacent waters.</p> <p>New rock revetment will be installed along the face of the sheet pile wall. The material will be clean and free of fines and placed with a belly dump barge, clam shell crane, and/or excavator. Overall the project will reduce the number of piles at the terminal. The new rock revetment will</p>	<p>□</p>	<p>■</p>
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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>change existing fish habitat, but is predicted to improve habitat quality due to the increase in light penetration from removal of the wharf and because the rock revetment will add structural complexity to existing habitat.</p> <p>All in-water works will be conducted during the least risk fish window. Additional mitigation measures described in the Construction Environmental Management Plan will be implemented to reduce potential adverse effects from in-water construction.</p> <p>G3 submitted a Request for Review of the project to Fisheries and Oceans Canada (DFO) who responded that the proposal will not result in serious harm to fish provided the mitigation measures included in the submitted material are implemented.</p> <p>The mitigation measures are reflected in Permit conditions No. 18, 40, 41, 42, 43, 44, 45, 46, 50, 51, 53, and 54.</p> <p>Overall residual effects on aquatic resources are moderate in magnitude. Adverse effects to fish habitat will be low in magnitude, however potential effects on fish and marine mammal behaviour are moderate due to the level of underwater noise anticipated from pile driving during construction. The extent of effects on fish habitat will be site-specific and effects from underwater noise will be local in extent (i.e., < 3 km from the site). Underwater noise will be produced daily for several months of the year for up to 2 years. The underwater noise from in-water works will be long-term in duration and but reversible after terminal construction is complete.</p> <p>With mitigation in place, residual adverse effects on aquatic resources are expected to be not significant.</p>		

Environmental Component	Potential Adverse Effects?		Overview of Potential Adverse Effects, Mitigation Measures, and Residual Adverse Effects	Significant Residual Adverse Effects?	
	Yes	No		Yes	No
Archaeological/ heritage resources	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<p>There is potential for adverse effects on archaeological/ heritage resources from ground disturbance and deep excavation activities (that may encounter native soil) during construction.</p> <p>The Applicant has committed to submit additional archaeological review of detailed development plans in relation to deep excavations once available. A chance find protocol will be implemented and an archaeologist will monitor construction activities with potential to affect heritage resources.</p> <p>The mitigation measures are reflected in Permit conditions No. 25, 26 and 36.</p> <p>With mitigation measures in place no residual adverse effects are predicted for archaeological or heritage resources.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Aboriginal Group interests	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<p>Section 5.3.5 provides an overview of the concerns raised by Aboriginal Groups during VFPA consultation about the Project.</p> <p>These include potential effects on:</p> <ul style="list-style-type: none"> • Health and socio-economic conditions; • Physical and cultural heritage; • Current use of lands and resources for traditional purposes; and • Any structure, site or thing that is of historical, archaeological, paleontological or architectural significance. <p>With mitigation measures in place (as described and listed in Section 5.3.5) residual adverse effects on Aboriginal interests are expected to be not significant.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Recreational interests	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<p>There is no potential for adverse effects on recreational interests from the Project. The project is on a previously developed industrial site and is not likely to affect recreational activities in the area.</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
Accidents and malfunctions	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<p>The potential adverse environmental effects from accidents and malfunctions was considered as part of the review.</p> <p>To reduce the risks of accidents and malfunctions during facility operations G3 will implement an operations environmental management plan, and a spill prevention, containment, and clean-up plan.</p> <p>Mitigation measures described in the Construction Environmental Management Plan will be put in place to reduce effects from accidents and malfunctions during construction.</p> <p>VFPA will continue to work with G3 and the City of North Vancouver with respect to emergency service provision for the facility.</p> <p>VFPA has required the preparation of Fire Risk and Dust Explosion Hazard Assessments, the preliminary review of which indicate that with appropriate mitigations, the terminal can be operated safely.</p> <p>This is reflected in Permit conditions No. 7, 13, 18, and 62.</p> <p>With mitigation measures in place the likelihood of residual adverse effects on the environment are low and if they do occur are 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;
- Acoustic environment;
- Soils;
- Groundwater;
- Surface water and water bodies;
- Terrestrial resources; and
- Aquatic resources.

The residual adverse effects of the project on these environmental components are characterized as:

- Moderate in magnitude due to predicted increases (1 to 2 dB) in terrestrial noise for residents in adjacent communities, and from the predicted increase in under-water construction noise and potential effects on fish and marine mammals;
- Local in geographic extent because effects will extend to the adjacent community and into Burrard Inlet;
- Long-term in duration because effects on the acoustic environment, air quality, and aquatic resources will last throughout the life of the project;
- Daily in frequency because noise and air emissions will occur throughout the life of the project; and
- All of the residual adverse effects of the project would be reversible once the project is decommissioned.

Taking into consideration all of the above, and with the implementation of proposed mitigation measures and Permit conditions, the residual adverse effects from the Project are predicted to be not significant.

6.3 Follow-up Program

Follow-up programs will be completed by G3 to verify the predictions of adverse residual effects on air quality, the acoustic environment, and aquatic resources, and to confirm the effectiveness of mitigation measures. This includes:

- An Air Emissions Management Plan which includes ongoing monitoring;
- Noise monitoring during construction, commissioning, and operations; and
- Underwater noise and marine mammal monitoring during in-water pile installation.

6.4 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

ENVIRONMENTAL PROGRAMS

May 30, 2016

DATE OF DECISION

7 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 the 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. 15-180**.

APPENDIX A

Figures and Drawings

- Application Drawings **PER No. 15-180 A to U**

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 supporting materials submitted by Applicant on November 5, 2015;
- All Project correspondence from November 5, 2015 to May 12, 2016;
- All plans and drawings labelled PER No.15-180 A – U;
- *Independent Professional Review of Fire Risk and Dust Explosion Assessments – G3 Terminal Vancouver*, May 12, 2016, Jensen Hughes;
- Application Review Phase Consideration Report *Proposed G3 Terminal Vancouver – Response to Community Consultation* dated April 22, 2016;
- Key correspondence:
 - Email dated 2016-05-06, from G3 to VFPA, *G3 Marine Construction Plan* with the following attachment:
 - *Lynnterm Terminal Expansion Project – Request for Review - G3 Terminal LP* dated February 12, 2016, Envirowest Consultants Inc.
 - Email dated 2016-05-12, from G3 to VFPA, *Revised Memorandums Per Request* with the following attachments:
 - *Addendum Memo G3TV Revised Layout Summary Memo* May 12 2016
 - *Addendum Memo G3TV Design Update* May 12 2016
 - Email dated 2016-05-20-2016, from G3 to VFPA, *Lynnterm Terminal Expansion Project* with the following attachment:
 - 2016-05-16 Letter of Advice (Fisheries and Oceans Canada)