APPENDIX M

Construction Environmental Management Plan (R2)

FIBRECO

Fibreco Export Terminal Enhancement
Permit Application Document

APPENDIX M

Construction Environmental Management Plan - Executive Summary

Fibreco is committed to ensure the highest level of environmental protection. Fibreco strives to be vigilant and compliant in all aspects of environmental protection for the land sea and air during construction and after.

The Construction Environmental Management Plan lays out a road map to assist both contractors and Fibreco employees in preventing any harmful occurrences as well as responding to an incident, should one occur.

Highlights of the plan include, but are not limited to:

- Key Project Personnel and Responsibilities
- Establishing an Environmental Monitor (EM)
  - EM responsibilities
  - EM authority
- Project Mitigation Measures and Environmental Specifications
  - Site Access, Mobilization and Laydown areas
  - Air Quality, monitoring and abatement methods
  - Noise and vibration
  - Machinery and Equipment
  - Erosions and sediment control
  - Contaminated groundwater management
  - Vegetation and wildlife management
  - Concrete and grouting
  - Marine work and dredging
  - Archaeological resources
  - Sensitive habitat features and species
- Emergency Response
  - Communication and protocols
  - Emergency Plan
  - Spill Response Plan
- Waste Management

Attached: Construction Environmental Management Plan

Construction Environmental Management Plan
Terminal Enhancement Project
Fibreco Export Inc.
North Vancouver, BC

Prepared for:
Fibreco Export Inc.
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North Vancouver, BC V7P 3H9

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November 2016 (Revision 1)

HEMMERA

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1.0 INTRODUCTION

Hemmera Envirochem Inc. (Hemmera) was retained by Fibreco Export Inc. (Fibreco) to prepare a Construction Environmental Management Plan (CEMP) for project elements at their woodchip export terminal located at 1209 McKeen Avenue, North Vancouver under the Fibreco Terminal Enhancement Project (the "Project"). This document is applicable to the property described as: *Parcel Areas 'A', 'B', 'C', and 'D' of the lease areas over a portion of the bed and foreshore of Burrard Inlet fronting Pemberton Avenue and Lot "B", Block 28, District Lot 266, and of the bed and foreshore of Burrard Inlet, Plan 17505*.

Fibreco plans on enhancing their terminal to include facilities for grain export with the construction of new storage silos, and material handling structures including conveyors, lifts, a dumper pit retrofit and other infrastructure. The woodchip exporting infrastructure is scheduled to be removed. This CEMP will be used as a guide for Fibreco and its representatives, their construction contractor and its subcontractors, to understand their roles and responsibilities, plus the project mitigation measures to be implemented.

2.0 PROJECT INFORMATION

The following sections provide information on site location, a description of the project, schedule, and a general site description.

2.1 LOCATION

The project is located within the City of North Vancouver, British Columbia. The geographical coordinates at the project's approximate centre are 10U 492035 E 5461920 N and borders Burrard Inlet to the south, Seaspan to the East, and Lions Gate Marina Ltd. and other businesses to the West side of the property. The attached **Figure 1** shows the Project location.

2.2 PROJECT DESCRIPTION

Fibreco is a wood chip and pellet terminal located in the First Narrows of the Burrard Inlet. The Fibreco terminal is located at 1209 McKeen Avenue, North Vancouver, B.C. The terminal consists of an upland portion of fee simple land owned by Fibreco and leased land along the foreshore from VFPA. The attached **Figure 1** shows the lease and property boundaries.

Fibreco proposes to undertake a Terminal Enhancement Project to enhance its current operations and add new operations. A portion of the Terminal Enhancement Project falls within an existing VFPA lease area. The remaining portion of the Project falls within Fibreco owned lands and a development permit application is being submitted to DNV concurrently. .

Fibreco submitted a Preliminary Project Inquiry application in September and addendum in November 2015 for the Terminal Enhancement Project. This application addressed the Terminal Enhancement Project elements. The Terminal Enhancement main project components are:

- limited foreshore improvements;
  - existing shoreline riprap repair to 30 lineal metres on the southwestern portion of the site.
- modifications to the existing causeway conveyor;
  - conveyor #3 requires modifications to efficiently handle grains.
- upgrades to the shiploading system;
  - increase to 2,000 t/hr capacity for Panamax size vessels.
- upgrade rail yard and rail car dumper;
- installation of storage silos and associated conveyor systems;

- upgrades and repairs to the existing berthing dock, dredging; and
  - two new berthing dolphins and two new mooring dolphins.
  - replacement of 5 wood catwalk piles
  - maintenance dredging at the berth face at an anticipated material volume of 4,000 m^3
- specific removal and demolition activities.
  - the wood chip conveyors to and from the inside berth.
  - a segment of wood retaining wall along the southern foreshore of the site.
  - existing lunch room and replacement.
  - chip conveyor (Cv16) from rail unloading
  - relocation of longshore lunchroom, dumper operator cab and rail dumping MCC room.

2.3 SITE DESCRIPTION

The Site is operated by Fibreco as a wood fibre shipping terminal and storage facility. The Site includes two barge docks, a rail yard for loading and unloading, a railcar dumper, a conveyor system, silos for wood pellet storage, a large storage shed for wood pellets, several large wood chip stockpiles, and maintenance areas for on-site equipment. The majority of the upland portion of the Site is paved.

3.0 CONTACTS AND RESPONSIBILITIES

The following sections identify the responsibilities of key personnel involved in the demolition and construction of the Project.

3.1 KEY PROJECT PERSONNEL

The key personnel for the proposed works, including Fibreco, contractors, regulators, consultants and the local municipality are provided in **Table B**.

Table A Key Project Personnel

Name	Role	Company	Phone Number
Glenn Dempster	Project Manager	Fibreco Export Inc.	604-240-1057
-	Planning Department	PoV Planning	604.665.9047
environmentalprograms @ portofvancouver.com	Environmental Programs Department	PoV Environment	604.665.9082
Richard Boase	Environmental Protection Officer	District of North Vancouver	604.990.2365
-	Emergency and Accident Reporting (Provincial)	WorkSafeBC	604.276.6100
-	Emergency and Accident Reporting (Federal)	ESDC	604.658.3595
-	Hazardous Waste Programs	BC Ministry of Environment	250.356.5044
-	Emergency Reporting	BC Environmental Emergency Program	1.800.663.3456
TBD	General Manager	Contractor (TBD)	TBD
TBD	Supervisor	Contractor (TBD)	TBD
TBD	Safety	Contractor (TBD)	TBD
TBD	Hazmat Contractor / Consultant	Contractor (TBD)	TBD
TBD	Prime Consultant	Contractor (TBD)	TBD
TBD	Environmental Monitor	Contractor (TBD)	TBD

3.2 ENVIRONMENTAL MONITOR RESPONSIBILITIES

The primary responsibility of the Environmental Monitor (EM) is to confirm that the environmental protection objectives of the proponent and applicable approvals/permits are met by determining whether requirements of this CEMP are adhered to. The EM will monitor compliance with the CEMP. Typical responsibilities of the EM include those identified below, but specific items are expected to be refined and/or expanded as per the needs of the project:

- communicate the requirements of the CEMP to project members during pre-job and tailgate meetings.

- be onsite as per the schedule established between parties prior to project start and remain on-call during non-critical work periods to respond to emerging environmental issues.
- review the contractor's work procedures to ensure functionality and compliance with the CEMP and applicable regulations, standards and Best Management Practices (BMPs). This includes hazardous building material abatement procedures.
- has authority to modify and/or halt any construction activity at any time if deemed necessary for the protection of the environment.
- advise project members if project activities have caused or are likely to cause an environmental incident and make recommendations for corrective action.
- liaise directly with project members and provide technical advice for the purpose of resolving situations that may impact the environment as they arise.
- maintain complete records of activities related to the implementation of the CEMP. This will include any measurements taken (e.g., pH, turbidity, conductivity, dust fall), photographs and incident reports.
- monitor and collect samples at the required frequency for the treatment and discharge of any accumulated storm water and/or groundwater from the Project.
- conduct clearance air sampling for any high risk asbestos abatement procedures and also conduct clearance inspections for low and moderate risk asbestos abatement procedures.
- complete and submit environmental monitoring reports to the applicant and regulatory bodies (if required within permit/approval criteria) and will report any unanticipated adverse effects to the environment. Such reports will include the nature of the effect, its cause, mitigation and/or remediation implemented, and whether a work stoppage was ordered, as well as photographs, analyses, and measurements, if applicable.

3.3 FIBRECO RESPONSIBILITIES

During construction, typical responsibilities of Fibreco and the Contractor include:

- Access to the construction zone will be restricted to authorized, trained, and protected personnel, limited to the contractor and subcontractor employees, Fibreco and representatives of their consulting team, and other Federal and Provincial (e.g., WorkSafeBC) regulatory agencies having jurisdiction over the project.
- Fibreco will review the project CEMP with their staff, the Contractor and its subcontractors prior to commencing works.
- Fibreco to establish lines of communication with the Contractor for daily construction activities and emergency response situations.
- Fibreco will retain the services of an EM to perform Quality Assurance as it relates to environmental monitoring and reporting inclusive of field activities including sample collection, submission of samples to the laboratory, quality assurance/quality control (QA/QC) inspection, data interpretation and reporting.

3.4 CONTRACTOR RESPONSIBILITIES

During construction, typical responsibilities of the Contractor will include:

- Restricting access to the deconstruction zone for its authorized personnel and subcontractors.
- Developing project-specific Work Procedures that comply with requirements of appropriate regulatory authorities and recognized best-practices in deconstruction safety.
- Be responsible for worker health and safety and the selection of appropriate Personal Protective Equipment (PPE) dependent on results of a site risk assessment prior to commencing deconstruction activities.
- Will review the project CEMP with their staff and its subcontractors prior to commencing works.
- Contractors will comply with the project permits and all agency permit or licence issued for the project as well as all other applicable federal, provincial and municipal laws, statutes, by-laws, regulations, orders, and policies.
- Contractors must cooperate with the EM appointed for the work. They must comply with written or verbal instructions with respect to conducting activities in compliance with the mitigation measures outlined in the CEMP.
- Contractors will correct deficiencies and any non-compliance issues upon direction from the EM whether written or verbal. Corrections will be made as soon as reasonably possible, ideally within 24 hours of directions.

An Exposure Control Plan will be prepared by the Contractor's abatement subcontractor, if required. This plan covers risk assessment, engineering controls, personal protective equipment, and decontamination procedures related to abatement of hazardous building materials identified during Fibreco's pre-demolition survey (see **Section 2.2**).

4.0 RELEVANT ENVIRONMENTAL LEGISLATION

The work site is located on federal land under lease to Port Metro Vancouver. The applicable legislation, regulations, and bylaws are summarized in the table below.

Table B Relevant Environmental Legislation

Act, Regulation or Bylaw	Description	Applicability	Approval or Permit in place / forthcoming, or Requirements Met
Federal			
PoV Non-Road Diesel Emissions (NRDE) Fee[1]	The NRDE fee recovers costs associated with managing air quality and reducing diesel particulate matter emissions.	The NRDE Fee is applicable to all parties granted the right by PoV to occupy lands owned, managed, or administered, by PoV.	Responsible parties must not introduce non-road diesel engines that are "non-certified" (Tier 0) or certified as "Tier 1" without prior written approval from PoV.
Port Authorities Operations Regulations	No person shall, by act or omission, do anything or permit anything to be done in a port that has or is likely to adversely affect soil, air or water quality, without port authorization.	Applicable to the navigable waters of a port, works and activities in a port and the property managed, held or occupied by a port authority.	Port Authority to issue Project Permit allowing for construction of terminal enhancements on approval of Project Review Application.
Disposal at Sea Regulation	Regulation of sediments eligible for Disposal at Sea	Applicable to clean material present beneath layer of contaminated sediment and administered by Environment and Climate Change Canada,	Proponent to apply for a DAS permit after removal of upper zone of contaminated sediment has been confirmed by third party.
Provincial			
Contaminated Sites and Hazardous Waste Regulations of the EMA	Provides criteria for waste classification and disposal of waste materials.	Applicable to any contaminated sediments dredged for upland disposal, any excavated soils for off-site disposal, and hazardous waste being removed as part of the demolition.	EM to confirm Fibreco has BCG number in place for any hazardous wastes to be generated from the demolition project, if applicable.
WorkSafe BC Occupational Health & Safety Regulation	Provides guidance on the assessment of hazardous building materials and exposure limits during abatement.	Applicable to potential exposure of contaminants to workers and or safety concerns.	Requirements to be meet by demolition and hazardous materials abatement contractors.
Municipal			
Noise Regulation Bylaw 7188	Establishes acceptable time periods for construction-related noise.	Although on federal land, the work site is within a kilometre of residential and commercial neighbourhoods.	Contractor is aware of accepted work periods for weekdays, weekends and holidays.
Street and Traffic Bylaw 7125	Covers approved truck routes and transportation of dangerous goods.	Trucking routes to be used for waste disposal and import backfill.	Contractor must use trucking routes approved by the District of North Vancouver.

1 Vancouver Fraser Port Authority, Fee Document, Effective Jan 1, 2015. Section 3J Non-Road Diesel Emissions Fee

5.0 PROJECT MITIGATION MEASURES AND ENVIRONMENTAL SPECIFICATIONS

General environmental standards, guidelines and Best Management Practices (BMPs) are to be used in performing the demolition project, as outlined in the sections below.

5.1 GENERAL PRACTICES

A list of general practices related to the proposed construction that are typically administrative in nature, include the following:

- Complete daily safety and environmental tailgate meetings to identify and communicate changes to risks related to hazards; discuss project status and daily working procedures;
- Daily inspections of equipment – to be documented and kept on site;
- Regular equipment maintenance – to be documented and kept on site;
- Daily inspection of surface water control systems (berms, sediment socks, storm drains, etc.) – to be documented;
- Daily inspection of spill control kits;
- Communicate any necessary changes to any place where the work may involve exposure to contaminants and which is restricted to essential personnel who are trained and appropriately protected;
- Communicate any necessary changes to any place where services are located and unprotected people can work with minimal exposure risk;
- Communicate any necessary changes to the contaminant reduction zone established if required. The contaminant reduction zone will be defined as a place where a serviced hygiene facility and facilities for washing mobile equipment will be kept;
- Confirm all contractors and site managers review this CEMP and the applicable guidelines prior to each project phase or new activity;
- Confirm contractors properly install any protection measures and understand BMPs used on the project;
- Stockpile, or have readily available, supplies of erosion and sediment control materials as appropriate on-site such as (but not limited to) rock, gravel, grass seed, silt fencing, staking, polyethylene sheeting, etc.;
- Site managers and contractors will be prepared to change existing measures and BMPs should they fail or additional measures be required. The EM will be notified of any changes to ensure they are adequate and installed and maintained properly; and,
- Supervisors will review work procedures with their crew and enforce their compliance at all times. Up-to-date copies will be kept on the job site to ensure they are available to workers and visitors at all times.

5.2 SITE ACCESS, MOBILIZATION AND LAYDOWN AREAS

Prior to construction, the Contractor will provide a plan to Fibreco for any planned laydown and stockpiling locations. Hauling access and trucking routes (McKeen Avenue, Pemberton Avenue, and 1st Street West) have already been established for delivery of equipment and materials, waste disposal and material recycling. The new Phillips Avenue overpass (located immediately west of the site entrance), will also be used by vehicles and equipment. All equipment will be delivered via the McKeen Avenue point of entry. Equipment mobilization and demobilization times will be scheduled to minimize conflict with port traffic, Seaspan and comply with the District of North Vancouver noise by-law. Additional considerations may include:

- The site will be swept to reduce dust;
- If necessary, coordination with the railway companies using the train tracks crossing Pemberton Avenue may occur to avoid any lengthy delays;
- The entrance to the site will be managed to retain sediment and dust leaving the site;
- Mobilization will be planned to minimize the number of trips to and from the site; and,
- A laydown area for storage of equipment and materials will be established. It will be located on a flat, stable area at least 30 m from any waterbody.

5.3 AIR QUALITY

Air emissions from vehicle/equipment exhaust and dust and vapours associated with construction-related activities will be minimized and managed to avoid adverse health, safety, nuisance and other environmental effects on and off-site. Requirements for air quality monitoring, reducing concrete dust emissions, and general measures concerning air quality at the Project site are discussed below.

5.3.1 Quality Assurance Monitoring during Abatement Procedures

In compliance with the regulatory requirements, contaminants that may become airborne during hazardous material abatement will be contained based on the risk level for the abatement procedure. An approved consultant will provide site inspections, clearance air sampling and reporting for the asbestos abatement to be carried out by an approved contractor. The project site inspections will include:

1) **Asbestos Pre-Contamination Inspections** - Critical third party inspections that determine if all preparation work is complete, in compliance with regulatory board requirements, before the actual asbestos abatement can begin. Inspections ensure enforcement of safe work procedures, and review of relevant project documentation, including worker training and respirator fit testing.
2) **Asbestos Abatement Inspections** - Once the actual asbestos abatement is in progress, the consultant will conduct inspections inside the work areas. The perimeter of the work areas and adjacent areas of the buildings and structures will also be inspected and air monitored.

3) **Asbestos Visual Clearance Inspections** - Perhaps the most critical of all inspections. The visual clearance inspections are a comprehensive and meticulous inspection of the work areas at the conclusion of removal activities. They confirm that asbestos abatement is complete and that asbestos materials have been properly cleaned up and disposed of properly.

For other hazardous materials, visual inspections will be conducted on an ongoing basis to confirm that they have been properly removed and either recycled, salvaged, or disposed. Project air sampling will include the following:

- Ambient asbestos air samples adjacent to the work areas, to verify that airborne asbestos fibres have not migrated outside the work areas;
- Occupational asbestos air samples inside the work areas to establish and assess work procedures, and ensure that work procedures do not create unnecessarily high asbestos fibre concentrations;
- Clean room asbestos air samples in the worker decontamination facility to verify that airborne asbestos fibres have not migrated outside the workers' decontamination facility if applicable;
- Air clearance asbestos air samples at the conclusion of visual clearance inspection of the work areas, as applicable;
- Occupational lead air samples inside the work areas to establish and assess work procedures, such that they do not create unnecessarily high airborne lead concentrations; and,
- Air sample results are documented and submitted to the contractor for posting at site daily.

5.3.2 Concrete Dust

With regard to dust generated from concrete, the deconstruction procedures to be employed are expected to produce low to moderate levels of airborne particulates (dust). However, when dust is created, water misting or fine spray to suppress dusts in a controlled manner will be utilized such that it will not cause excess runoff that cannot be controlled and contained.

Where activities may create dust that could affect others not directly involved in the deconstruction work, hoarding will be installed as required to isolate the problem area and maintain worker and operations safety. Prior to any deconstruction activities after the hazardous materials abatement, a thorough site risk assessment will be conducted. The risk assessment will consider the following:

- Types of contaminants present;
- Working conditions;
- Tasks to be carried out;
- Routes of exposure (the way substances get into the body); and,
- Level of exposure (hours of work in those conditions).

5.3.3 General Practices to reduce Air Emissions

Additional measures to limit air emissions include:

- Material loads entering or exiting the site will be covered as appropriate;
- No burning of oils, rubber, tires and any other material will take place at the site;
- Stationary emission sources (e.g. portable diesel generators, compressors, etc.) will be used only as necessary and turned off when not in use;
- Equipment and vehicles will be turned off when not in active use;
- All equipment, vehicles, and stationary emission sources will be well-maintained and used at optimal loads to minimize emissions; and,
- Vehicles or equipment producing excessive exhaust will be repaired or replaced prior to being used on the project.

5.4 NOISE AND VIBRATION

Fibreco is committed to working with railways, trucking, marine suppliers, and communities to be good neighbors. Fibreco aims to be consistent with the District of North Vancouver noise by-law. Under the by-law, construction will be carried out between 7:00 am and 8:00 pm on any weekday that is not a holiday and between 9:00 am and 5:00 pm on any Saturday that is not a holiday. Construction is not allowed on Sundays.

The by-law indicates the continuous sound level resulting from construction activities will not exceed a rating of 65 dB on an approved sound meter when measured at the property line of the parcel of land where the construction is taking place.

As such, noise generation and vibrations resulting from equipment and associated activities during construction is best addressed through appropriate noise management practices. The following BMPs are recommended to minimize noise impacts:

- Construction activities will be limited to the work periods outlined above. Should construction activities be required outside these hours, the contractor must contact Fibreco to determine if exceptions are permitted;
- All equipment will be properly maintained to limit noise emissions and fitted with functioning exhaust and muffler systems. Machinery covers and equipment panels will be well fitted and remain in place to muffle noise. Bolts and fasteners will be tight to avoid rattling;
- Engines will be turned off when not in use or reduced to limited idle (or as appropriate to reduce air emissions);
- The District of North Vancouver will be notified of the nature and anticipated duration of any particularly noisy operations that may be forthcoming such as frequent truck traffic, concrete crushing, and when it will be necessary to work outside daytime and early evening hours; and,
- Noise monitoring will be considered during particularly noisy activities to ensure the predicted impacts are not exceeded.

5.5 MACHINERY AND EQUIPMENT

The Contractor will provide Fibreco with a list of all equipment and machinery to be used on site during construction identifying equipment type, fuel type, year of manufacture, and engine power rating. The contractor will implement mitigation measures to avoid or minimize impacts resulting from operation and storage of equipment during construction as follows:

- Equipment and machinery will be in good operating condition and maintained free of leaks, excess oil and grease, invasive species, and noxious weeds. Equipment will be operated at optimum rated loads and be turned off when not in use to minimize exhaust and noise emissions. Equipment producing excessive exhaust or noise will be repaired or replaced.
- Refueling of equipment will occur on land at least 30 m from any waterbody, where possible. Where 30 m is not possible, a location as far as possible from the waterbody will be chosen. Topographic features and slope will be considered.
- The refueling area will have a spill containment kit immediately accessible and personnel will be knowledgeable in the use of the kit (see Section 7.0 for the CEMP Fuel Management Plan).
- The refueling area will be protected so refueling equipment is not susceptible to vehicle/equipment strikes.
- A spill containment kit will be readily accessible both on site and on each piece of equipment in the event of a release of a deleterious substance to the environment.
- All members of the construction team will be trained in the use of spill containment equipment/items. Any spill of a substance that is toxic, polluting, or deleterious to aquatic life of reportable quantities will be immediately reported to the Emergency Management BC Program 24-hour phone line at 1-800-663-3456 (see Section 7.1 below for the Spill Response Plan).

A large transformer is located in the southeast corner of the Site, on the upland portion of the VFPA lease area. The transformer failed late spring/early summer 2014 and was replaced with a newer used transformer. Fibreco has stated that the transformers do not contain PCBs. If the transformer is to be removed and replaced during construction then the ground in the immediate area should be investigated for any contamination. Standard contaminated soil management protocols will be followed.

5.6 EROSION AND SEDIMENT CONTROL

Presently, surface water on the VFPA leased area drains towards Burrard Inlet either as surface flow or through an independent catch basin (nhc 2016). Surface water on the Fibreco owned parcel flows either directly east to an open channel that drains into Burrard Inlet (central eastern region) or to catch basins on the northern portion and conveyed to the DNV storm mains (nhc 2016). Most of the site is paved other than the foreshore. Surface run-off within this area will be controlled through the installation of berms and other control structures. Site water from surface run-off and associated drainage systems will be re-routed to storm sewers if the water is clean or will be captured in a water collection system if turbid. Filters will be maintained in catch basins with sediment screens also installed at key locations to prevent off-site migration. The straw bale barrier placed along the bank of the open channel will also be maintained during the Project as well as the containment booms in Burrard Inlet.

Project activities will be conducted on paved surfaces. Consideration to soil management will be given for any placement of backfill. The following mitigation measures will be used to manage soil, minimize surface runoff, and reduce potential sedimentation to storm water:

- Construction team members will be prepared to quickly erect measures to minimize sediment entering receiving waters (Burrard Inlet) if necessary. The overall goal is to isolate the work area and prevent any potential sedimentation from entering a waterbody or encroaching onto adjacent properties or roadways;
- Cover any stockpiles of material that have a high potential for erosion in anticipation of heavy rain, unless the material is placed directly within a contained area of the Project site; and,
- Periods of heavy precipitation are possible during the proposed construction schedule. As much as possible, earthworks will be scheduled to be conducted and completed during dry weather. When significant wet weather is encountered, additional measures may be required to minimize erosion potential.

5.7 WATER CONTROL AND TREATMENT

Water control and treatment is not required given the proposed Project described above in **Section 2.2**.

5.8 CONTAMINATED SOIL AND GROUNDWATER MANAGEMENT

The majority of demolition work associated with the Project will be completed above grade. It is not anticipated that contaminated soils will be encountered during the Project on the VFPA lease area. Soils will be excavated on the Fibreco owned parcel for construction of the silo concrete foundations. Soils in area to be excavated for Project activities will either be pre-characterized through in-situ testing prior to construction or ex-situ tested through stockpiling sampling of excavated soils. It is anticipated at this time that the soils to be excavated from the Project footprint will meet the BC Contaminated Sites Regulation industrial land use standards, but potentially not CSR soil relocation standards to non-agricultural lands for metals and PAHs. No soils will be removed from the Site without authorization of the EM and Fibreco and prior acceptance at the disposal facility. The EM will be responsible for tracking and recording the amount and disposal location of soils removed from site.

If during excavation activities any suspect soils are encountered, they will be temporarily stockpiled on tarpaulin and covered pending laboratory results. If laboratory results confirm the soil is contaminated, it will be disposed of at a disposal facility, approved to accept the classified waste. It is not anticipated that contaminated groundwater will be encountered or treated during Project activities. Contaminated sediment removed during dredging activities for upland disposal will be managed in accordance with provincial regulations.

5.9 VEGETATION AND WILDLIFE MANAGEMENT

If trees and the conveyor systems are to be removed during the breeding bird window, March 15 to August 15, a pre-construction nest clearing survey conducted by a Qualified Environmental Professional (QEP) should be undertaken to confirm no birds are nesting in the area. If active nests of species protected by the *Migratory Birds Convention Act* are encountered during the nest survey, no-disturbance buffers will be flagged by the QEP. No activity will be permitted within this buffer while the nest is active and occupied. The nest will be monitored by the QEP until birds have fledged and the nest is confirmed to be inactive.

The presence of a noxious plant species (Japanese knotweed) in the Project site will require mitigation. The following measures should be undertaken to ensure that the plant is not spread to un-infested areas:

- Do not mow knotweed. Use mechanical control, such as hand pruners and shovels to remove plants;
- Remove stems and roots by hand;
- Do not compost. Dispose of all plant parts and soil containing roots in waste containers to be taken to a municipal waste facility;
- Clean machinery and equipment thoroughly after use;
- Do not drive vehicles or machinery through areas where knotweed is present.

5.10 CONCRETE WORKS AND GROUTING

The anticipated concrete works for this Project relate to the concrete foundations for the storage silos and new lunch room. All concrete work shall be completed in a manner such that water quality standards are maintained and the potential for concrete to impact the receiving environment is minimized. Run-off from uncured concrete, concrete wash water or other concrete process water can be harmful to the environment and releases to the environment must be prevented or immediately contained. Run-off from uncured concrete or discharge of concrete wash water to drains, ditches or watercourses is not permitted. Uncured concrete must be covered during rain to avoid run-off. Concrete shall be carefully poured and the work area isolated to minimize potential for spills to get into catch basins.

5.11 MARINE WORKS

5.11.1 Recommended Strategies to Mitigate Impacts to Fish and Fish Habitat

The following mitigation measures should be followed to minimize the potential impacts to fish and fish habitat that may result from construction activities related to pile installation:

- Plan to minimize or avoid in-water work where practical.
- Use as much of the current site, reducing potential footprint expansion to reduce disturbance below the high water mark.

- All construction, operation or maintenance activities below the HWM should be timed to occur within reduced risk work windows, in order to avoid or limit adverse effects to CRA fishery species and forage fish during sensitive life history phases (e.g., reproduction, migration). Burrard Inlet is located within DFO Fisheries Management Area 28. Nearshore marine activities in this area may be conducted during these times:
    - Summer Window: N/A.
    - Winter Window: August 16 - February 28.
- To address the potential for harm associated with works outside the least-risk work windows, in-water activities should be monitored by a qualified environmental monitor.
- DFO will be notified a minimum of 10 days prior to commencement of the works.
- All debris and deleterious substances generated by demolition and construction associated with the project shall be appropriately contained in the immediate work area, collected, and appropriately disposed of in accordance with all applicable legislation, guidelines, and best management practices.
- Appropriate sediment control measures, including use of silt curtains if necessary, should be in place during pile driving construction.
- Plan activities near water such that materials such as paint, primers, blasting abrasives, rust solvents, degreasers, grout, poured concrete or other chemicals do not enter the watercourse.
- Ensure that building material used in a watercourse has been handled and treated in a manner to prevent the release or leaching of substances into the water that may be deleterious to fish.
- Remove all construction materials from site upon project completion.
- Nearshore subtidal work (pile driving by barge) will take place during high tides to prevent propeller scour of sensitive habitats.
- If barge spuds are required to ground in sensitive habitat, an assessment of the spud grounding area will be conducted prior to deployment via Scuba, drop cam or other similar sensing method to locate area areas of least sensitivity.
- Barges will not be allowed to ground during pile driving or other support work.
- Offloading of equipment will take place at designated barge landing sites.

These mitigation measures will eliminate residual effects to fish and fish habitat.

5.11.2 Pile replacement and installation

The anticipated installation of 2 mooring dolphins and 2 berthing dolphins will require pile driving of precast concrete piles. The proposed pile installation should follow the recommendations in the “Best Management Practices for Pile Driving and Related Operations – BC Marine and Pile Driving Contractors Association – March 2003 (MPDCA 2003)”. The following mitigation measures will be used to manage underwater noise and impacts to marine fish and marine mammals:

- Less than 24 inch diameter

- The physical design of 24 inch concrete pile dictates that: 1) the energy required must be controlled in order to prevent the pile from breaking and 2) the concrete construction of the pile will absorb the energy. These two factors are expected to result in low level shock wave emission (less than 30 kPa.) and minimal or no effects to fish and their habitat should result.
- Environmental monitoring of sound pressure levels is generally not required.

- Greater than 24 inch diameter
  - Visual and hydrophone monitoring of the impact on fish by the sound waves emitted will be required.
  - If during pile installation the sound pressure exceeds 30 kPa or in the unlikely event that a fish kill or disturbance to marine life is observed, works will stop immediately and appropriate mitigation measures including deployment of a bubble curtain over the full length of the wetted pile will be implemented. If fish kills or disturbance to marine life is observed despite implementation of appropriate mitigation measures, the works will stop immediately and the methods will be reviewed and corrected (MPDCA 2003).

5.11.3 Dredging

The Fibreco Terminal Enhancement project will require maintenance dredging at the berth face to accommodate Panamax size vessels. The original design depth for the Fibreco terminal berth was – 13.0 metres chart datum. The proposed maintenance dredging target depth is - 13.5 meters chart datum, which is based on achieving the original design depth of - 13 meters chart datum with an allowance for infill during dredging operations. The anticipated dredge material volume from the proposed maintenance dredging is 4,000 cubic metres. It is anticipated that the barge/machinery will be moored to the existing dock infrastructure during dredging operations and not be anchored to the ocean floor.

The proposed dredging plan is provided in a separate technical memorandum prepared by Hemmera dated August 10, 2016 and the sediment investigation report prepared by Hemmera dated July 25, 2016. Both of these documents are submitted as part of the PER application. The conclusions of these document based on the sediment investigation results are:

- The top 0.3 m of sediments on the existing seabed within the proposed dredge prism have concentrations of metals (arsenic, cadmium, copper, and zinc), total polycyclic aromatic hydrocarbons (PAHs) and/or tri-butyl tine exceeding Disposal at Sea (DAS) criteria.
- An estimated 1,250 m^3 of contaminated sediments and wood fibre will be dredged in the first phase (Phase 1) and disposed of upland at an approved landfill facility due to concentrations of chloride and sodium exceeding provincial Contaminated Sites Regulation (CSR) industrial soil standards.
- Phase 1 of dredging would occur in the Fisheries and Oceans Canada (DFO) Fisheries window between August 15 and February 28.

- Subsequent to Phase 1 dredging and following confirmatory sediment sampling, a DAS Permit Application will be submitted to Environment and Climate Change Canada (EC) to allow for the remaining native dredged material, approximately 2,800 m^3, to be disposed at the Point Grey DAS site.
- Dredging of clean material (Phase 2) to be completed during the following annual DFO Fisheries window depending on timing of obtaining the DAS Permit.
- Dredging will be completed using a cable clamshell dredger in conjunction with a barge or a barge-mounted modified excavator.

The nearest DAS site to the Project is Point Grey, located approximately 10 km west of the mouth of Burrard Inlet.

General dredging BMPs are:

- Have a preconstruction meeting to go over environmental requirements;
- Time work in water to respect timing windows to protect fish, including their eggs, juveniles, spawning adults and/or the organisms upon which they feed;
- Minimize duration of in-water work;
- Conduct instream work during periods at low/ebb tide to further reduce the risk to fish and their habitat or to allow work in water to be isolated from flows;
- Schedule work to avoid wet, windy, and rainy periods that may increase erosion and sedimentation;
- Develop a response plan that is to be implemented immediately in the event of a sediment release or spill of a deleterious substance and keep an emergency spill kit on site;
- Wash, refuel, and service machinery and store fuel and other materials for the machinery in such a way as to prevent any deleterious substances from entering the water;
- Confirm that machinery arrives on site in a clean condition and is maintained free of fluid leaks, invasive species and noxious weeds;
- Follow provincial water quality criteria as much of the time as possible:
    - when background is less than or equal to 50 nephelometric turbidity units (NTU) or 100 milligrams per litre (mg/L) non-filterable residue (NFR), introduced turbidity should not exceed 5 NTU or 10 mg/L NFR above the background values.
    - when background is greater than 50 NTU or 100 mg/L, NFR, introduced turbidity should not exceed the background values by more than 10% of the background value.
- Notify appropriate authorities prior to construction. Typically this is performed at least 5 working days prior to construction;
- Avoid double-handling dredge material;
- Clearly delineate dredge boundaries for work crews and inspectors (GPS device, physical structures, signage, buoys, etc.); and,

- Use a fully enclosed 5m high silt curtain, where appropriate, to help reduce the spread of sediment-laden waters and reduce the deposition of sand and silt to adjacent areas. Silt curtains are only practical in areas with currents less than 1-2 knots and where equipment does not have to open and close the curtain to gain access to the dredge area. Based on local currents, it may be necessary to anchor the silt curtain to the seabed to maintain its effectiveness.

5.12 ARCHAEOLOGICAL RESOURCES

There are no known archaeological resources known within the Project site as documented in Hemmera's technical memorandum dated June 23, 2016 entitled Archeological Potential – Preliminary Assessment and provided with the PER application.

5.13 SENSITIVE HABITAT FEATURES AND SPECIES

No sensitive habitat features or species at risk are present within the Project site as documented in the biophysical survey reports provided with the PER application.

6.0 EMERGENCY RESPONSE

Effective environmental management during construction-related activities relies on a comprehensive emergency response plan, which, when initiated, allows for the rapid response of emergency services and/or the containment and cleanup of environmental emergencies. The following sections provide a general outline for an effective response plan on the overall Project.

6.1 EMERGENCY COMMUNICATION

The following table lists the agencies and associated phone numbers of those who may need to be contacted in case of emergency during the duration of the Project. An up-to-date list shall be maintained at the Site during the course of the Project.

Table C Emergency Contacts

Agency	Phone Number
Emergency Services	911
Fibreco Emergency Line	604-998-4111
PoV Operations Centre	604.665.9086
Local Non-emergency Police	604.985.1311
Local Non-emergency Fire	604.980.5021
Lions Gate Hospital	604.988.3131
Emergency Management BC (EMBC)	1.800.663.3456
BC Emergency Spill Reporting Line	1.800.663.3456
Canadian Coast Guard	604.666.6011
WorkSafeBC	604.276.6100

6.2 ENVIRONMENTAL EMERGENCY PLAN

Potential Environmental Emergencies that may occur during construction activities on the Project may include, but are not limited to:

- Reportable fuel spills;
- Sediment laden water leaving the site or entering a waterbody;
- Fire and/or Explosion;
- Significant release of hazardous substances during abatement work;
- Debris fallout or failure of structures being demolished; and,
- Accidental release of sediment from barge during basin dredging.

Fibreco has prepared as Spill Prevention and Emergency Response Plan for this Project and provided as Appendix V to the permit application document. The Spill Prevention and Emergency Response Plan provides information on: Incident Response Procedure; Responsibilities in Case of an incident; Incident Notification and Reporting and Best Management Practices. The EM will be notified of all environmental emergencies. The EM will assess and record all incidents and determine appropriate action. All significant emergencies will be reported as outline in Fibreco's Spill Prevention and Emergency Response Plan.

7.0 FUEL MANAGEMENT PLAN

The fuel management plan shall use BMPs to ensure adequate protection of the receiving environment from construction-related fuels and products on site. Best practices may include:

- Equipment will not be fuelled within 30 m of a waterbody. Refueling will occur on the paved access road between PAC 2 and PAC 3 to minimize potential off-site runoff;
- Fueling stations will be delineated with protection to avoid accidental vehicle/machinery strikes.
- All fuels, oils, lubricants and other petrochemical products will not be stored at least 30 m away from any waterbody;
- Refueling equipment will be clean and in good working order. Fuel tanks will be situated within appropriate secondary containment (an impermeable containment facility capable of holding 110% of the storage tank contents);
- Before fueling begins the drivers will put rubber gloves on and have a personal spill kit at hand in case of spillage;
- Avoid over filling the tanks and as required slow down and stop fueling before the tank is full.
- When finished fueling, allow the nozzle to drain and turn the nozzle up to avoid spilling trace amounts until nozzle is back at truck storage location; and,
- Any fuel spilled will be cleaned up immediately.

All spills will be reported to the EM, Port Authority, Regulatory Authorities, and other responsible parties as required.

7.1 SPILL RESPONSE PLAN

All fuel spills will be immediately reported to the EM who will determine the appropriate course of action to contain and clean up the spill. All spills of materials of reportable quantities must be reported to the authorities and the Owner as reiterated below. The Contractor's Site Manager will be required to make all resources available to contain and clean up a spill, unless safety would be compromised by stopping other activities already underway.

Small, manageable spills will be contained and cleaned up immediately (see below). Contaminated soils and vegetation will be removed for appropriate disposal. Larger spills may require a coordinated response. Large spills are likely to present a serious health, safety, and environmental hazard. The following procedures will be followed in the event a spill is detected by Contract work force personnel:

- Determine the extent and seriousness of the spill before taking any direct action;
- Do not touch any spilled material unless you are certain it is safe to do so. Wear appropriate protective masks, respirators, gloves, and other appropriate safety equipment;

- Do not leave the area of a spill unattended. Post warning signs or call co-workers to assist you to keep the area safe and secure until the appropriate spill response can be organized. When a spill is discovered, the first person on site will make sure the area is safe for entry and the spill does not pose an immediate threat to health or safety of responders. If the area cannot easily be made safe, block access and call for assistance;
- If you can do so safely, stop the source of the spill (plug leak, replace cap, place the container upright, shut off valve, turn off pump, etc.). By law you must attempt to contain or control a spill (and limit the adverse effects) unless it is unsafe for you to do so;
- Carefully check for hazards (flammable material, noxious fumes, cause of spill, slippery footing, broken glass, etc.). Spilled materials may seep into the sub-surface so they are not readily visible. Vapours may be present even though you cannot detect them. Beware of enclosed spaces. Do not endanger yourself or your co-workers. If in doubt, clear the area and call for assistance;
- If a flammable material is spilled, turn off all nearby engines, electrical equipment, or other sources of ignition. Warn others not to smoke, start engines, or use equipment that may cause a spark. If serious hazards are present, leave the area and call for assistance. Do not take any action that may cause the spilled substance or fumes to ignite. It may be best to allow fumes to dissipate and the danger of ignition to reduce before responding;
- If possible, stop spilled materials from entering watercourses, drains, or sensitive areas. For example, use absorbent or other material as necessary, close valves to drains, cover or plug drains, or dig a trench to direct the spilled fuel to a safe area where it can be cleaned up. Clean up spilled material with absorbents. Do not flush the area with water. Do not attempt to ignite spilled fuel or other flammable substances;
- Dispose of used material/absorbent in a secure container as hazardous waste; and,
- Make sure the cleaned area is not slippery. If the area is slippery, put down no-slip material or mark the area with a “slippery when wet” sign or block access until further clean-up is complete.

Since impacts from small spot spills can generally be minimized if appropriate actions are implemented promptly, all spills of fuel or noxious materials must be reported immediately to the EM and Contractor’s Site Manager. Spot spills (including leaking equipment, leaking hoses at refuelling area, etc.) will be handled according to the following procedures:

- Suspend construction activity in the immediate vicinity of the spot spill until permission to resume the activity has been granted by the Construction Manager;
- The Contractor’s Site Manager, in consultation with the EM, will determine appropriate methods to remove or restore contaminated soils or other natural materials;
- Soils and vegetation heavily contaminated with petroleum products will be incinerated or disposed of at an approved facility;
- Spot spills will be flagged or otherwise marked to enable post-construction monitoring;
- Lightly contaminated areas where restoration is feasible will be fertilized and then cultivated to a depth below the depth of contamination. This process will be repeated as required; and
- Record detailed information to satisfy the B.C. Reg. 263/90 O.C. 1223/90, Environmental Management Act - Spill Reporting Regulation.

All spills of reportable levels (quantities) will be reported to the appropriate regulatory authorities as set out in the Spill Reporting Regulation. Specifically, all reportable spills must be reported by the person who was in charge of the material before it was spilled, or by anyone observing a spill, if it appears that the spill has not been reported. The report must be made to the EMBC, the North Vancouver RCMP, DFO, and PoV in the event there is a spill into Burrard Inlet. The report should include the following information:

- The name and telephone number of the person reporting the spill;
- The name and telephone number of the person involved with or adjacent to the spill;
- The time and place at which the spill occurred, together with a description of the area surrounding the spill;
- The type and quantity of material spilled;
- The cause and effect of the spill;
- Details of any response action underway, including a list of agencies on the scene or advised of the spill; and,
- Details of further action required.

The Spill Reporting Regulation requires reporting of spills of any materials that could cause pollution. Under the Regulation, a spill is any unauthorized release to the environment of a material where the amount is equal to or greater than that shown in Column 2 (Specified Amounts) of the Schedule. EMBC reportable levels are specified in the table below:

Hazardous Material	EMBC Reportable Level
Antifreeze	5 kilograms (5 litres)
Diesel fuel	100 litres
Gasoline	100 litres
Greases	100 litres
Hydraulic Oil	100 litres
Lubricating Oils	100 litres
Methyl Hydrate	5 kilograms
Paints & Paint Thinners	100 litres
Solvents	100 litres
Pesticides	1 kilogram
Explosives	Any

8.0 WASTE MANAGEMENT

General best practices for waste management at the site include:

- Contractors are expected to adhere to all applicable legislation with respect to the handling, transportation, and/or disposal of all materials related to this project (waste or otherwise). These regulations may include (but not be limited to) the BC Hazardous Waste Regulations, Spill Reporting Regulations, Workers Compensation Board Regulations, and Transportation of Dangerous Goods Regulations;
- Hazardous building materials encountered at the Project site may include asbestos (roofing systems, flooring materials, wall and ceiling systems, mechanical systems, window and door sealants), lead-based paints, PCB ballasts, mercury, stored chemicals, and biohazardous waste;
- Hazardous wastes generated could include waste petroleum products from machinery and equipment (filters, engine oils, lubricants), spent batteries, solvents and cleaning agents, etc. Contractors will provide labelled separate container(s) for potentially hazardous waste such as oily rags and hydrocarbon absorbent pads;
- All hydrocarbon products and other hazardous wastes potentially present during project activities will be identified and the associated Workplace Hazardous Materials Information System (WHMIS) and Materials Safety Data Sheets (MSDS) will be kept on site and made available to all construction team members; and,
- All recyclable or compostable materials will be collected separately from general waste as per Metro Vancouver Regional District requirements.

Structural steel and other materials will only be recycled where possible after abatement of any hazardous substances has been confirmed. The proposed disposal and recycling facilities to be used during the deconstruction Project include (to be confirmed with contractor upon award):

- Concrete – Richvan Holdings, Richmond;
- Creosote Timbers – EcoWaste Landfill, Richmond;
- Wood debris – Urban Wood Waste Recyclers, Vancouver;
- Metals – ABC Recycling, Burnaby;
- General Demolition Waste – Vancouver Landfill, Delta; and,
- Hazardous Materials – Licensed Facility Depending on Type.

9.0 REFERENCES

Construction Environmental Management Plan (CEMP) Guidelines, Project & Environmental Review, Port of Vancouver, July 2015.

Guidelines - Demolition, Project & Environmental Review, Port of Vancouver, May 2016.

Guidelines - Developing your Stormwater Pollution Prevention Plan, Project & Environmental Review, Port of Vancouver, July 2015.

Developing your Stormwater Pollution Prevention Plan - A Guide for Industrial Operators, United States Environmental Protection Agency, June 2015.

British Columbia Ministry of Environment. 2005. *Environmental Management Act*, Hazardous Waste Regulation, B.C. Reg. 63/88, including amendments up to April 1, 2009.

British Columbia Ministry of Environment. 2005. *Environmental Management Act*, Spill Reporting Regulation, B.C. Reg. 263/90, including amendments up to B.C. Reg. 376/2008, December 9, 2008.

District of North Vancouver, *Noise Regulation Bylaw No. 7188*, amended to include Bylaw No. 7215, 7279, 7256 and 7334, effective October 28, 2002.

District of North Vancouver, *Street and Traffic Bylaw No. 7125*, including Bylaw No. 8133, effective July 6, 2015.

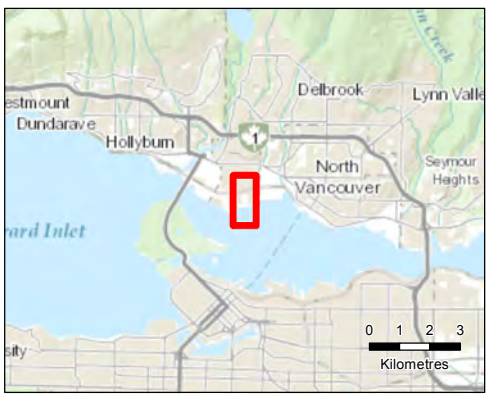
Fibreco, August 2016. Spill Prevention and Emergency Response Plan, Terminal Enhancement Project.

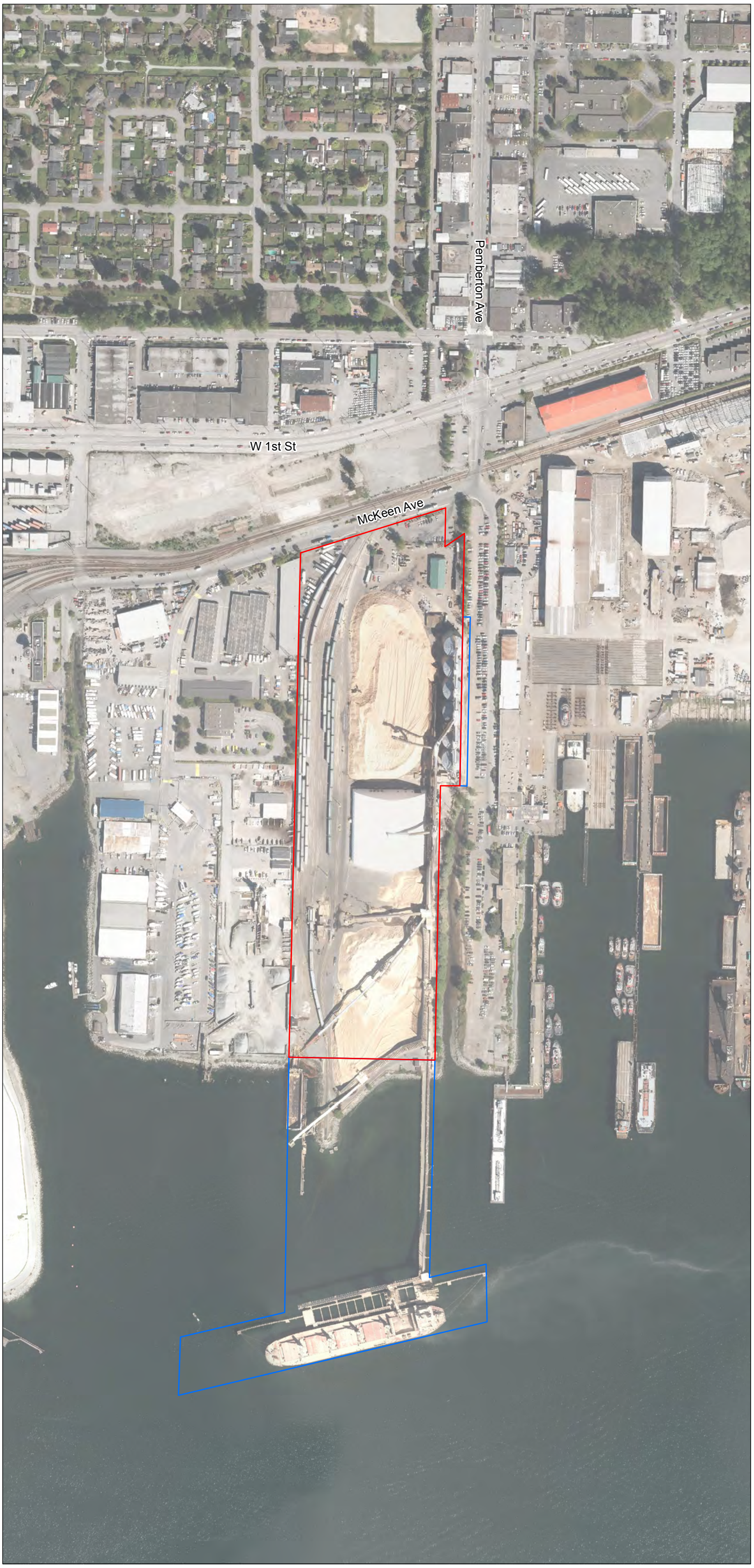
nhc, August 2016. Stormwater Management Plan for 1209 McKeen Avenue.

FIGURE

Terminal Enhancement Project - Construction Environmental Management Plan
1209 McKeen Avenue, North Vancouver, BC

Site Location and Aerial View





Legend

- Fibreco owned land
- VFPA lease area

Notes

1. This map is not intended to be a “stand-alone” document, but a visual aid of the information contained within the referenced Report. It is intended to be used in conjunction with the scope of services and limitations described therein.

Sources

- Aerial Image: District of North Vancouver, 2013
- Inset Basemap: ESRI World Topographic Map

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