PORT METRO VANCOUVER

OPERATIONS ENVIRONMENTAL ASSESSMENT CERTIFICATE COMPLIANCE REPORT
DELTAPORT THIRD BERTH

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January 2011
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<th>Acronym</th>
<th>Description</th>
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<tr>
<td>AMS</td>
<td>Adaptive Management Strategy</td>
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<tr>
<td>BCRC</td>
<td>BC Rail Company</td>
</tr>
<tr>
<td>COD</td>
<td>Corporation of Delta</td>
</tr>
<tr>
<td>CEAA</td>
<td>Canadian Environment Assessment Act</td>
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<td>Canadian Wildlife Services</td>
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<td>Deltaport Constructor's Limited</td>
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<td>Deltaport Community Liaison Committee</td>
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<td>Department of Fisheries and Oceans</td>
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<td>DP3</td>
<td>Deltaport Third Berth Project</td>
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<td>EAC</td>
<td>Environmental Assessment Certificate</td>
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<td>Environmental Work Plan</td>
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<td>Foreshore Technologies Inc.</td>
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<td>MMMP</td>
<td>Marine Mammal Monitoring program</td>
</tr>
<tr>
<td>MOE</td>
<td>Ministry of Environment</td>
</tr>
<tr>
<td>MOT</td>
<td>Ministry of Transportation</td>
</tr>
<tr>
<td>RBRC</td>
<td>Roberts Bank rail corridor</td>
</tr>
<tr>
<td>RTGs</td>
<td>rubber tire gantries</td>
</tr>
<tr>
<td>SAC</td>
<td>Scientific Advisory Committee</td>
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<td>TFN</td>
<td>Tsawwassen First Nation</td>
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<td>TOCA</td>
<td>Table of Owner’s Commitments and Assurances</td>
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<tr>
<td>TSI</td>
<td>Terminal Systems Inc.</td>
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<tr>
<td>VFPA</td>
<td>Vancouver Fraser Port Authority</td>
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1.0 INTRODUCTION

This document has been prepared to provide the British Columbia Environmental Assessment Office (EAO) with the status of the compliance with the Conditions of the Environmental Assessment Certificate (EAC #T06-01) issued to Vancouver Fraser Port Authority (VFPA) September 28, 2006 for the Deltaport Third Berth Project (DP3). As per condition 5 of the EAC, VFPA is required to submit a report documenting the status of compliance with the EAC one year after the start of operations. In February 2008, VFPA provided the EAO with a report on the status of key DP3 components which covered the start of construction up until December 31, 2007 (“VFPA Deltaport Third Berth 2007 Status Report”, Feb 2008), and in November 2009, VFPA provided the EAO with a report on the status of compliance covering the period from January 2008 and November 2009 (“Port Metro Vancouver, Pre-Operations EAC Compliance Report, Deltaport Third Berth”, Nov 2009). Both reports are available on the EAO website at http://a100.gov.bc.ca/appsdata/epic/html/deploy/epic_project_home_212.html. This operations report covers the period from December 2009 to December 2010. All status updates are provided in the updated Table of Owner’s Commitments and Assurances (TOCA) (see Appendix A) however, key components of the TOCA are highlighted in this report and include the following:

- Construction Environmental Management Plans;
- Operation Environmental Management Plan;
- Marine Mammal Monitoring;
- Adaptive Management Strategy;
- Consultation;
- Traffic, Lighting and Noise; and
- Fisheries Act Authorization.

1.1 PROJECT DESCRIPTION SUMMARY

DP3 is a VFPA and Terminal Systems Inc. (TSI) initiative to expand existing container operations at the Deltaport container terminal at Roberts Bank, in Delta, BC. The main on-site project components include:

- a wharf to accommodate the third berth;
- creation of land for a container storage yard;
- tug moorage and safety boat launch;
- ship access channel; and
- terminal services and infrastructure.

The main off-site project components include:
• additional rail track; and
• road improvements.

DP3 has increased capacity at Deltaport by at least 600,000 TEUs (twenty-foot equivalent units) by adding a third berth and 20 hectares of container storage facilities to the pre-existing two-berth container terminal. The third berth at Deltaport is operated by TSI, a private company that also operates the two pre-existing berths at Deltaport container terminal. DP3 is part of VFPA’s overall strategy to expand container capacity to accommodate consumer and business-driven demand for increased Canadian trade through the west coast of Canada (VFPA website, 2009).

The DP3 project was the subject of environmental assessments under the B.C. Environmental Assessment Act (BCEAA) and Canadian Environmental Assessment Act (CEAA). Both assessment processes were harmonised under the federal / provincial agreement, and the federal review was a Comprehensive Study. The project was approved under both these legislation in 2006.

1.2 CONSTRUCTION SUMMARY


The Uplands portion of the Third Berth construction, including terminal utility installation and pavement surfacing, was overseen by TSI, Deltaport Terminal Operator. Installation of terminal utilities commenced September 2008 and was completed in August 2009. Asphalt surfacing of the terminal area began in May 2009 and was completed in November 2009.

A summary of key construction milestones was included in the November 2009 Compliance Report referenced above.

1.3 OPERATIONS

The Deltaport Third Berth opened for business in January 2010. Operational activities at the terminal include loading and unloading of container ships, container storage and container transfers to and from rail and road transport. While these activities are the same as the activities conducted at Deltaport prior to the construction of the third berth, the addition of the third berth has increased the capacity and increased the container storage facilities at the terminal (within the capacity levels specified in the Environmental Assessment documents).

Although the third berth has already been operational for one year, TSI continue to optimize activities at the facility. In addition, although TSI has fulfilled its commitments related to the construction and operation of the third berth, TSI continues to work with VFPA and the community to address on-going
community concerns, particularly related to lighting and noise. Specifically, TSI completed the re-aiming of light fixtures to reduce offsite light migration, and continues to work with container lines to mitigate vessel noise.

2.0 PROGRESS IN MEETING CONDITIONS OF EAC #T06-01

As part of its environmental assessment report on the Deltaport Third Berth Project, the EAO issued the Owner’s Table of Commitments and Assurances (TOCA; Appendix E of the report), a series of commitments to responsible environmental management and other measures. Since 2007, the VFPA has voluntarily provided updates on the status of the TOCA to the EAO, Deltaport Community Liaison Committee (DCLC) and the public via VFPA’s website, as they became available. During the construction phase of the project, these updates were provided on a quarterly basis, with semi-annual updates provided for the first year of operations. This status report distribution has been an effective communication tool to provide interested parties with Project information and aid in transparency of the Project. The current status update of the TOCA January 31, 2011 is included in this report as Appendix A and key areas of the TOCA are highlighted in the following sections.

2.1 CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLANS

Detailed information regarding the construction environmental management plans for the DP3 project was provided in the November 2009 Pre-Operations EAC Compliance Report, and a synopsis is also provided in the TOCA provided as Appendix A of this report. In addition to the plans previously discussed, a construction environmental management plan was also produced and implemented for the East Causeway Habitat Compensation works. This document is titled Roberts Bank East Causeway Habitat Compensation Project, Construction Environmental Management Plans, and is dated August 2009. A copy of this plan is provided as Appendix B of this report. More detail regarding the East Causeway Habitat Compensation project is provided in Section 3.1 of this report.

2.2 OPERATION ENVIRONMENTAL MANAGEMENT PLAN

Prior to the start of third berth operations, TSI, the Terminal Operator, updated their Operation Environment Management Plan (EMP), including the Emergency Response Plan, to include the new berth at Deltaport. A copy of the draft EMP was provided with the November 2009 Pre-Operations Compliance Report. The EMP is designed to capture, organize and manage activities at the terminal so that a consistent approach for controlling environmental risks can be implemented. Through the EMP, environmental management has been integrated into routine planning processes and daily terminal operations. The EMP is a living document, and will be reviewed on an annual basis. The next review of the EMP will be conducted in January 2011. Any revisions or changes to process and procedures will be documented and forwarded to VFPA for information purposes.
2.3 **MARINE MAMMAL MONITORING**

An overview of the DP3 Marine Mammal Monitoring program was provided in the November 2009 Pre-
Operations EAC Compliance Report.

In 2008, partway through Project construction and after the implementation of the DP3 Marine Mammal
Monitoring program, Roberts Bank and the Deltaport area were designated as southern resident killer
whale critical habitat under the *Species at Risk Act* (SARA). As a result, clean up dredging works at
Deltaport in 2009 and 2010 were conducted following advice provided by DFO and the SARA Recovery
Team for Killer Whales. Mitigation measures were implemented during dredging activities to avoid
disturbance to killer whales, including having a DFO approved marine mammal observer maintain
constant observations for marine mammals within 1,000 m of the work area. No killer whales were
observed during dredging works in 2009 or 2010.

2.4 **ADAPTIVE MANAGEMENT STRATEGY**

Section 5 of the TOCA (Appendix A) outlines the requirement for an Adaptive Management Strategy
(AMS) to be developed and implemented for the inter-causeway marine and wildlife habitats at the site.
The AMS is a science-based approach to monitoring and managing the Roberts Bank ecosystem. The
approach will allow for the early detection of changes in the inter-causeway ecosystem so that potential
significant negative ecosystem trends that are attributable to the DP3 Project can be prevented or
mitigated. The AMS was developed in conjunction with and approved by Environment Canada.

The key areas of study for the AMS are:

1. Geomorphology/Oceanography
2. Surface Water Quality
3. Sediment Quality
4. Eelgrass
5. Other biota (benthic communities, fish, birds)

A Scientific Advisory Committee (SAC) was established in 2007 as a component of the AMS to provide
scientific and technical advice and recommendations regarding the implementation of the AMS. Three
scientists have been appointed to the SAC – one appointed by VFPA, one appointed by EC and a third
that was jointly appointed by VFPA and EC. Information regarding each of the scientists is available on
the Port website.

To date, the detailed AMS workplan, quarterly monitoring reports for 2007, 2008, 2009, and the first three
quarterly monitoring reports for 2010, and the 2007, 2008 and 2009 Annual Reports have been submitted

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to the SAC for review. The 2009 Annual Report was completed in September 2010, and all of the annual reports are available on the Port website\(^2\). The Annual Reports provide interpretation and discussion of the data that were collected over the course of the year and a discussion of potential trends observed over the course of the AMS monitoring program. The reports also include recommendations for modification of the AMS work program to better investigate identified trends or to reduce the scope of work when no impacts are evident.

The SAC met most recently on December 8, 2010 to discuss the draft first, second and third quarterly reports of 2010, and the upcoming 2010 annual report. The next meeting of the SAC is scheduled for late Winter 2010 to review the fourth quarterly report of 2010.

Based on the results of the first three plus years of monitoring for the DP3 AMS program, to date, it does not appear that the DP3 construction activities have contributed to significant negative ecosystem trends in the inter-causeway area. Additional information can be found in the annual reports or in the 2009 AMS Annual Report summary document, both available on the Port website\(^3\).

2.5 **CONSULTATION**

Consultation activities undertaken by the VFPA during the Deltaport Third Berth project have been guided by the document titled *Deltaport Third Berth Project: Community Liaison Plan - Construction and First Year Operation Phase*, which was a document prepared by VFPA to provide an overview of DP3 community consultation activities. This guiding document was provided as an attachment to the February 2007 *Deltaport Third Berth Pre-Construction Report*.

The VFPA has now completed a synopsis report on Deltaport Third Berth consultation activities, and that report is titled, *2007-2010 Community Liaison Activities and Input, Deltaport Third Berth*, and is dated January 2011. A copy of this document has been provided as Appendix C of this report.

2.6 **TRAFFIC**

VFPA remains committed to continuing to work with relevant authorities and parties, including TSI, the COD, and the Ministry of Transportation (MOT) to manage truck traffic issues. Updates on all traffic related commitments are included in the TOCA (Appendix A).

TSI has developed a Traffic Management Plan for the operation of the Deltaport facility. VFPA monitors performance of TSI’s TMP on a daily basis to ensure that TSI takes appropriate actions as necessary to address traffic problems. In addition, VFPA and TSI have established and co-chair the Delta Container Truck Traffic Working Group (DCTT), which meets monthly to address identified traffic issues. The Terms of Reference was prepared by the DCTT, whose membership includes TSI, VFPA, Corporation of Delta, ICBC, (DCLC – until December 2010), BC Ministry of Transportation & Infrastructure, Delta Police, RCMP

\(^2\) http://www.portmetrovancouver.com/projects/ongoing_projects/deltaport_third_berth_project/environment.aspx  
& Tsawwassen First Nation. Topics covered by the DCTT include general recommendations, terminal gate congestion, habitat compensation, community issues, and truck operating practices and standards. The DCTT has recently identified the need to promote vehicle driver safety & education, and the need for more intersection cameras to monitor traffic and to detect red-light violations. The DCTT last met in December 2010 and has agreed to continue its work into 2011.

2.7 **LIGHTING AND NOISE**

Throughout marine and uplands construction VFPA advised the public of Project activities anticipated to increase light and/or the noise environment through Project updates via email and posted to the Project website⁴. A Project information and feedback line has been available to the public throughout the course of the project, and issues and responses have been tracked in the DP3 Public Issues Tracking document, which is publicly available.

VFPA remain committed to working with TSI and the community to address on-going lighting and noise concerns at Roberts Bank, as well as throughout the VFPA’s jurisdiction.

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3.0 HABITAT COMPENSATION

The DFO issued the Fisheries Act Section 35(2) Authorization – Authorization No.: 02-HPAC-PA-000-000144 (the Authorization) on December 19, 2006. Habitat compensation projects completed for the site and reported on in the November 2009 Pre-Operations EAC Compliance Report include the Log Removal and Salt Marsh Restoration project, the Subtidal Reef project, the Caisson Refugia project, and the off-site Rose-Kirkland Island habitat compensation works. In addition, as reported in the November 2009 report, DFO advised the VFPA on October 20, 2009 that it was not approving the Sandbar Stabilization project, and instead VFPA is providing funding for a third party to develop habitat in the Fraser River Estuary. Progress on the East Causeway Habitat Compensation project is discussed below.

3.1.1 East Causeway Habitat Compensation Project

The East Causeway Habitat Compensation Project transformed the eastern part of the Deltaport causeway and part of the adjacent foreshore into diverse fish and wildlife habitat. Baseline work was conducted in 2007, 2008 and 2009 and construction commenced in September 2009. Construction works were substantially complete by the end of September 2010.

Construction works included excavating existing materials, installing slope protection and sheet pile walls, placing fill and growing medium, constructing two pedestrian ramps, planting salt marsh and upland areas, and paving. Works were conducted in the dry during suitable low tides in order to minimize the environmental impact of construction in the foreshore area. This required night work between October 2009 and April 2010. Environmental monitoring was performed regularly throughout the construction period to ensure that works were conducted in accordance with the requirements of the DFO authorization and the Fisheries Act.

Habitat features created as part of the East Causeway Habitat Compensation project include open and protected salt marsh, gravel and sand beaches, mud flat, boulder clusters, a cobble seam, and vegetated upland areas. Compensatory habitats were designed to provide protected areas for juvenile fish rearing, stable rock surfaces for colonization of macroalgae and invertebrates, upland areas for herbaceous and shrub vegetation, sand and gravel beaches for forage fish spawning, and crab nursery areas. Monitoring of the compensation habitat will be conducted annually until at least 2017.

Non-intrusive, upland activities such as fence and gate installation, placement of cultural objects, and the potential addition of informational signage in the two pedestrian access areas were not completed as part of the construction works. Completion of these remaining activities is subject to consultation with Tsawwassen First Nation (TFN).

With the exception of the two TFN pedestrian ramp areas, there will be no access to the intercauseway flats. VFPA has advised the public regarding the permanent closure of the east causeway and will work with the local community to identify opportunities to learn about and possibly visit the area.
4.0 CLOSING

This document has been prepared to provide the EAO with a final compliance report for the Deltaport Third Berth project, as required under the Environmental Assessment Certificate. Construction of the Project has been implemented in an environmentally responsible manner, and although this report fulfills VFPA’s final reporting requirement, VFPA remains committed to continued work on outstanding commitments.

We trust that this report meets your requirements. Please feel free to contact the undersigned by phone or email regarding any questions or further information that you may require.

Regards,

Vancouver Fraser Port Authority

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APPENDIX A
Owner’s Table of Commitments and Assurances – Status Update as of January 31, 2011
As an overriding objective of responsible environmental management, the Owner shall ensure that an Environmental Management System (EMS) shall be implemented for the Project. The Owner will ensure that the design, construction, operation, and maintenance of the Project is carried out in an environmentally responsible manner, and will employ Best Management Practices (BMPs) and comply with federal, provincial and municipal statutes, regulations, and bylaws where applicable. The Owner will instruct and advise the selected container terminal operator to abide by all relevant commitments in this Table as set forth in the EAC.

The Owner will ensure that required statutory Permits, Approvals and Authorizations are in place prior to proceeding with construction.

The Owner will develop or have developed and implement or have implemented a detailed Construction Environmental Management Plan (EMP) for the Project as outlined in section 3 below and prior to the start of construction. The Construction EMP will provide contractors and on-site workers with procedures and requirements for carrying out construction activities and complying with conditions of the EAC.

The Owner will prepare or have prepared an Operations EMP, as outlined in section 3 below and prior to the start of operations. The Owner will prepare an Operations EMP, as outlined in section 3 below and prior to the start of operations. The terminal operator has updated their Operations EMP to include the 3rd berth. Additional information on this EMP is available in section 2 of this document.

All required statutory Permits, Approvals and Authorizations were in place prior to proceeding with construction.

The Owner will ensure that the general content and intention of the Construction and Operation EMPS comply with the listing in section 21.2.1 of the EAC Application.

The Owner will ensure that the Construction EMP shall include the following sub-plans which are further specified in section 21.2.1 of the EAC Application (Section 21.2.1 (a) of the EAC):

- Surface Water Management and Sediment Control Plan
- Noise Management Plan
- Waste Management Plan
- Air Quality Impact Mitigation Plan
- Traffic Management Plan
- Construction Dredging Timing Plan
- Habitat Management Plan
- Wildlife and Vegetation Impact Mitigation Plan
- Marine Environment Management Plan
- Marine Water Quality Plan
- Habitat Management Plan
- Traffic Management Plan

Pre-construction, Construction, Operation, Maintenance

VPA, Contractors

VPA, Contractors

GVRD, FHA, MOE, COD

Pre-construction

GVRD, FHA, MOE, COD

Complete

The details of the Construction Environmental Management Plans (EMP) were contained in Schedule B of the documents filed with Fisheries Act S.35(2) Authorization, Authorization for Works or Undertakings Affecting Fish Habitat, Deltaport Third Berth Project", dated December 19, 2007, prepared by Hemmermans on behalf of the Port. Construction EMPs were also developed and implemented by contractors for the marine works (Deltaport Constructors limited) the uplift civil works (Trow on behalf of BA Blacktop and MATCON Civil Contractors), and the BCRC Trackwork Extension at Gulf (Trow on behalf of Mainland Civils Works). Additional information related to the EMPs is available in Section 2 of the table.

The Owner will prepare or have prepared an Operations EMP, as outlined in section 3 below and dealing with environmental management aspects of the long-term operations and maintenance of the Project. The Owner will ensure compliance with applicable BMPs, as well as with the EAC and with federal, provincial and municipal requirements of the Project.

The Owner will prepare or have prepared an Operations EMP, as outlined in section 3 below and dealing with environmental management aspects of the long-term operations and maintenance of the Project. The Owner will ensure compliance with applicable BMPs, as well as with the EAC and with federal, provincial and municipal requirements of the Project.

The Owner will prepare or have prepared an Operations EMP, as outlined in section 3 below and dealing with environmental management aspects of the long-term operations and maintenance of the Project. The Owner will ensure compliance with applicable BMPs, as well as with the EAC and with federal, provincial and municipal requirements of the Project.

The Owner will prepare or have prepared an Operations EMP, as outlined in section 3 below and dealing with environmental management aspects of the long-term operations and maintenance of the Project. The Owner will ensure compliance with applicable BMPs, as well as with the EAC and with federal, provincial and municipal requirements of the Project.

See also section 28 of this Table.
The VPA, Contractors

Under the direction of the Owner, all contractors will develop a MOE, COD, FHA VPA, Contractors Completed and GVRD, EC, DFO, MOE, WA, Prepared by the Vancouver Fraser Port Authority. Page 2 of 17

Ref | Objective – Commitments and Assurances | Timing | Delivered By | Approving Lead Agencies | Advisory Agencies | Status | Comments |
--- | --- | --- | --- | --- | --- | --- | --- |
22 | The Surface Water Quality Management and Sediment Control Plan shall be prepared for upland activities, largely associated with construction of additional rail siding from 57B Street to 64th Street. The plan must describe the following: | Construction | VPA, Contractors | MOE, COD, VPA | Completed and accepted by DFO as part of Schedule B of the Fisheries Act Authorization (02-HPAC-PA1-000-000144, December 2005). In addition, contractors have developed separate SMPs for each upland construction phase including civil upland works and BC Rail Trackwork at Gulf. | | | |
23 | A Hazardous Waste Management and Spill Control Plan shall be prepared to describe how the contractor will manage any hazardous waste material generated during Project construction as well as spill control procedure. The plan will describe the following: | Construction | VPA, Contractors | EC, MOE, DFO | Completed and accepted by DFO as part of Schedule B of the Fisheries Act Authorization (02-HPAC-PA1-000-000144, December 2005). In addition, this is included within the construction SMP for each construction phase including marine works, civil upland works and BC Rail Trackwork at Gulf. | | | |
24 | The Waste Management Plan for construction activities will be prepared and include the following: | Construction | VPA, Contractors | MOE, COD, VPA | Completed and accepted by DFO as part of Schedule B of the Fisheries Act Authorization (02-HPAC-PA1-000-000144, December 2005). | | | |

| Ref | Objective – Commitments and Assurances | Timing | Delivered By | Approving Lead Agencies | Advisory Agencies | Status | Comments |
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22 | | | | | | | |
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<th>Advisory Agencies</th>
<th>Status</th>
<th>Comments</th>
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<td>2.7</td>
<td>A Noise Management Plan will be developed to ensure identified mitigation measures are implemented. This plan will include the following:</td>
<td>Construction</td>
<td>VPA, Contractors</td>
<td>DFO, TSI, TFN</td>
<td>DFO, TSI, VPA</td>
<td>Complete</td>
<td>The Noise Management Plan was prepared as a component within the construction BMP for each construction phase including marine works, civil upland works, and BC Rail Trackwork at Gulf. A noise-monitoring study was conducted in June and July 2007 to evaluate any changes in construction noise from those predicted in the EA. The assessment concluded that the noise environment did not appear to have changed significantly since noise-monitoring conducted prior to the start of Third Berth construction. The draft report was shared with the DFO, EC, MOE, COD, GVRD, and TFN Complete. Sensitivity of migration due to construction noise.</td>
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<td>2.8</td>
<td>A Wildlife and Vegetation Impact Mitigation Plan for off causeway rail and road works will be developed by the Owner to ensure identified mitigation measures are implemented. The plan will include the following:</td>
<td>Construction</td>
<td>VPA, BC Rail Company (BCRC), Contractors</td>
<td>BC, MOE, Cod.</td>
<td>DFO</td>
<td>Complete</td>
<td>A project information and feedback line is available to the public (904-665-9337). The number is advertised on the project website, project newsletter, project advisory notifications, and is also advertised on other collateral material that is produced for the project.</td>
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<td>2.9</td>
<td>A Marine Environmental Management Plan (MEMP) was submitted to VPA prior to initiation; works were completed by the end of January, 2010. The MEMP describes procedures for avoiding temporary and unnecessary impacts.</td>
<td>Construction</td>
<td>VPA, Contractors</td>
<td>DFO</td>
<td>DFO</td>
<td>Complete</td>
<td>A Marine Environmental Management Plan (MEMP) was submitted to VPA prior to initiation; works were completed by the end of January, 2010.</td>
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### Notes
- **Ref**: Reference number.
- **Objective - Commitments and Assurances**: Description of the commitment or assurance.
- **Timing**: Reference to the timing of the commitment.
- **Delivered By**: The entity responsible for delivering the commitment.
- **Approving Lead Agencies**: Agencies responsible for approving the commitment.
- **Advisory Agencies**: Agencies involved in the advisory role.
- **Status**: Current status of the commitment.
- **Comments**: Additional comments or information about the commitment.
The Owner will develop or have developed and implement or have implemented a detailed Operation EMP. The development of this plan is described in the EAC Application (Section 21, up to EMR onwards).

- A detailed description of the Environmental Management Plan, including the EMR for the Marine Water Quality Management Plan has been completed and a copy was included within Schedule B of the Fisheries Act Authorization (02-HRAC-PH-1-000-000144, December 2006). The Marine Water Quality Plan is also presented in the construction EMPs for each phase including marine works, civil uplandworks, and BC Rail Trackwork at Gulf.

| Ref | Project Specific Marine Water Quality Plan would be developed by the Owner based on the baseline water quality information to confirm the construction mitigation measures are functioning and no impacts are occurring in the marine environment. The Marine Water Quality Plan, shall form part of the Fisheries Act Authorization and support the Adaptive Management Strategy for the Project. The plan would:
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<tr>
<td>2.1</td>
<td>Outline procedures for collection and analysis of water quality samples to ensure that marine water quality complies with Project specific requirements identified by regulatory agencies; - Lost protocols for regular monitoring, maintenance and repair of sediment control systems to ensure that these systems function effectively under all site conditions; - Describe the responsibilities of the environmental monitoring; Identify procedures for immediate mobilization of UPAs authorized site personnel and/or responsible authorities, in the event of an environmental incident such as discharge of deleterious substances from the project site over; and - Establish procedures to address and resolve issues arising from non-compliance with applicable standards, criteria, guidelines and/or approvals to the satisfaction of the applicable regulatory agency.</td>
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</tbody>
</table>
| 2.2 | The Owner will develop an Air Quality Impact Mitigation Plan as addressed in Table 20.1 of the Application and further discussed in section 18 of this Table. The Plan will cover but not be limited to:
|---|---|
| 2.3 | The Owner will develop a Marine Water Quality Management Plan as described in sections 19-21.) - A Project specific Marine Water Quality Plan must be designed by the Owner based on the baseline water quality information to confirm the construction mitigation measures are functioning and no impacts are occurring in the marine environment. The Marine Water Quality Plan, shall form part of the Fisheries Act Authorization and support the Adaptive Management Strategy for the Project. The plan would:
|---|---|
| 2.4 | The Owner will develop an Air Quality Impact Mitigation Plan as addressed in Table 20.1 of the Application and further discussed in section 18 of this Table. The Plan will cover but not be limited to:
|---|---|
| 2.5 | The Owner will develop a Marine Water Quality Management Plan as described in sections 19-21.) - A Project specific Marine Water Quality Plan must be designed by the Owner based on the baseline water quality information to confirm the construction mitigation measures are functioning and no impacts are occurring in the marine environment. The Marine Water Quality Plan, shall form part of the Fisheries Act Authorization and support the Adaptive Management Strategy for the Project. The plan would:
|---|---|
| 2.6 | The Owner will develop a Marine Water Quality Management Plan as described in sections 19-21.) - A Project specific Marine Water Quality Plan must be designed by the Owner based on the baseline water quality information to confirm the construction mitigation measures are functioning and no impacts are occurring in the marine environment. The Marine Water Quality Plan, shall form part of the Fisheries Act Authorization and support the Adaptive Management Strategy for the Project. The plan would:

| Ref | Project Specific Marine Water Quality Plan would be developed by the Owner based on the baseline water quality information to confirm the construction mitigation measures are functioning and no impacts are occurring in the marine environment. The Marine Water Quality Plan, shall form part of the Fisheries Act Authorization and support the Adaptive Management Strategy for the Project. The plan would:
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| 2.7 | The Owner will develop a Marine Water Quality Management Plan as described in sections 19-21.) - A Project specific Marine Water Quality Plan must be designed by the Owner based on the baseline water quality information to confirm the construction mitigation measures are functioning and no impacts are occurring in the marine environment. The Marine Water Quality Plan, shall form part of the Fisheries Act Authorization and support the Adaptive Management Strategy for the Project. The plan would:

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<tr>
<td>The Owner will develop or have developed and implement or have implemented a detailed Operation EMP. The development of this plan is described in the EAC Application (Section 21, up to EMR onwards).</td>
<td>Construction</td>
<td>VFA, Contractors</td>
<td>SFO, B.C.</td>
<td>Complete and accepted by SFO as part of Fisheries Act Authorization (Marine works). Completed for splashed works.</td>
<td></td>
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<tr>
<td>The Owner will develop a Marine Water Quality Management Plan has been completed and a copy was included within Schedule B of the Fisheries Act Authorization (02-HRAC-PH-1-000-000144, December 2006). The Marine Water Quality Plan is also presented in the construction EMPs for each phase including marine works, civil upland works and BC Rail Trackwork at Gulf.</td>
<td>Construction</td>
<td>VFA</td>
<td>SFO, RFA, HC, TFN</td>
<td>Complete</td>
<td></td>
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<td>The Marine Works contractor’s implementation is contained within Section 6.0 of the OC, EMP and has been updated several times as construction has progressed. Air construction and waste materials have been brought to and removed from the site primarily by water, not road. The focus of the plan has been on-site traffic. The Port’s marine works construction contract specified that all general fill, preload, granular sub-base and aggregate base course materials should be imported by waterborne transport. This is estimated to have reduced project-related traffic on nearby roads by approximately 250,000 single dump truck loads, i.e. 350,000 return trips (350,000 one-way trips) on nearby roads. The Marine Works contractor was allowed to truck up to 50,000 m$^3$ of surplus preload to a South Fraser Port Authority (SFPA) site within Delta, since that created less traffic and emissions impact within Delta than fill located outside of Delta. Only 38,000 m$^3$ was actually taken to the SFPA site.Ashphalt and ready-mixed concrete have been imported by truck, because there was no viable alternative that could provide the necessary time-sensitive delivery of these materials, which is essential for ensuring their quality. The Port and TSI have also built a temporary berth to bring construction materials to site by barge for terminal construction and for the causeway habitat compensation project. This is expected to eliminate approximately 24,500 return truck trips through Delta.</td>
<td>Construction</td>
<td>VFA</td>
<td>GVRD, TransLink</td>
<td>Complete</td>
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<td>2.7</td>
<td>The Owner will develop or have developed and implement or have implemented a detailed Operation EMP. The development of this plan is described in the EAC Application (Section 21, up to EMR onwards).</td>
<td>Operation</td>
<td>VFA, Terminal Operator, CPO, DFO, BCRO, PACO, DFO, B.C.</td>
<td>Complete</td>
<td></td>
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| 2.8 | The Owner will develop an Air Quality Impact Mitigation Plan as addressed in Table 20.1 of the Application and further discussed in section 18 of this Table. The Plan will cover but not be limited to:
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| 2.9 | The Owner will develop a Marine Water Quality Management Plan as described in sections 19-21.) - A Project specific Marine Water Quality Plan must be designed by the Owner based on the baseline water quality information to confirm the construction mitigation measures are functioning and no impacts are occurring in the marine environment. The Marine Water Quality Plan, shall form part of the Fisheries Act Authorization and support the Adaptive Management Strategy for the Project. The plan would:

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The Owner will ensure that the Terminal Operator updates the existing Adaptive Management Plan to ensure that all details of Schedule B, dated April 2006, to the Agreement are amended as required. Further details of this requirement and commitment are included in section 17 onwards of this Table.

The Owner will ensure that the monitoring of the DFO, GVRD, and TC Construction EMPs were developed prior to the commencement of marine works and upland works, and the programs themselves were initiated with the start of construction activities and the effectiveness of the environmental control strategies and mitigation measures, with respect to the terms and conditions of the DFO, GVRD, and TC permits, Appendices and Authorizations that may apply.

The Owner has completed a number of other operational environmental planning and management activities and they are listed in the relevant bio-physical and socio-community sections of this Owner’s Table.

The Owner will ensure that the Terminal Operator updates the existing Adaptive Management Plan, available for the DP3 Project is updated to incorporate the latest Project design as it applies to ballast water and bilge water. For reference, see VFPA Harbour Operations Manual Revision, December 2007, http://www.portmetrovancouver.com/users/manualsandregulations.aspx

The Owner will ensure that the Port Monitoring Committee and Planning Team has been updated to include the wider environmental context and includes Deltaport as a three berth container terminal. The Owner will proactively implement such practice and procedures as may be required to sustain safe and environmentally sound standards of marine operations in this area.

The Owner has committed to a number of other operational environmental planning and management activities and they are listed in the relevant bio-physical and socio-community sections of this Owner’s Table.

The Owner will ensure that the Terminal Operator (TSI) has updated their Operation EMP. See Section 3 for additional comments.

The Owner will ensure that general environmental monitoring and reporting for the construction phase of the Project will be conducted, with respect to the terms and conditions of the EAC and other regulatory permits, Appendices and Authorizations as applicable.

The Owner will engage or have engaged an independent Environmental Monitor, or an environmental monitoring firm, for the construction phase of the Project. The Environmental Monitor will undertake environmental monitoring activities, and will implement each of the environmental monitoring plans developed for the Project and as detailed in the respective monitoring plans of the third party EMPs.

The Owner will ensure that the Port Monitoring Committee and Planning Team has been updated to include the wider environmental context and includes Deltaport as a three berth container terminal. The Owner will proactively implement such practice and procedures as may be required to sustain safe and environmentally sound standards of marine operations in this area.

The Owner will ensure that the Port Monitoring Committee and Planning Team has been updated to include the wider environmental context and includes Deltaport as a three berth container terminal. The Owner will proactively implement such practice and procedures as may be required to sustain safe and environmentally sound standards of marine operations in this area.

The Owner will ensure that all details of Schedule B, dated April 2006, to the Agreement are complied with and shall conduct all required meetings to ensure that all parties to the Agreement, as specified in the Agreement and its Schedule B, comply with the terms of the Agreement and its environmental requirements.

The Owner will ensure that the Terminal Operator updates the existing Adaptive Management Plan to ensure that all details of Schedule B, dated April 2006, to the Agreement are amended as required. Further details of this requirement and commitment are included in section 17 onwards of this Table.

The Owner will ensure that the Terminal Operator updates the existing Adaptive Management Plan to ensure that the Terminal Operator updates the existing Adaptive Management Plan to include the third berth, and this plan is included in this Agreement EMP. See Section 3 for additional comments.

The Owner has committed to a number of other operational environmental planning and management activities and they are listed in the relevant bio-physical and socio-community sections of this Owner’s Table.

The Scientific Advisory Committee (SAC) for the AMS was formed in 2007, with one member selected by each of the Port Operators, Terminal Operators, and Contractors. The terms of reference for this Committee are outlined in section 18.1 of this Table.

The Owner has committed to a number of other operational environmental planning and management activities and they are listed in the relevant bio-physical and socio-community sections of this Owner’s Table.

The AMS program was signed in December 2006, and the AMS program is underway. The most recent meeting of the Scientific Advisory Committee (SAC) Application is scheduled for late Winter 2011.

The Owner will ensure that general environmental monitoring and reporting for the construction phase of the Project will be conducted, with respect to the terms and conditions of the EAC and other regulatory permits, Appendices and Authorizations as applicable.

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The Owner has committed to a number of other operational environmental planning and management activities and they are listed in the relevant bio-physical and socio-community sections of this Owner’s Table.
### Owner's Table of Commitments and Assurances

**Status Update as of January 31, 2011**

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<tr>
<td>6.1</td>
<td>The Owner commits to participate in the Roberts Bank Environmental Stewardship Program.</td>
<td>Construction, Operation</td>
<td>VPA</td>
<td>EC, DFO, GNSD, COG, FN</td>
<td>Complete</td>
<td>The initiative is being led by BIA, with support from the Port, through the BIA-FREMP Management Committee. A Reach Overview for Roberts and Sturgeon Banks was initiated. A project steering committee was formed in late 2008 and comprises representatives from Environment Canada, Department of Fisheries and Oceans, Transport Canada, BC, Metro Vancouver, VPA, Ministry of Agriculture, Fisheries and Food, Corporation of Delta, City of Richmond, City of Vancouver, Tsawwassen First Nation, Port-First Nation and the Port. The steering committee found that on Dec 5, 2008. Subsequent meetings were held in 2009 (Jan 25, Feb 12, May 28, Jun 29, Aug 11, and Sep 17) and 2010 (Feb 4, Apr 27, June 18). A workshop to present the draft Report was held on Nov 25, 2010. The Roberts and Sturgeon Banks Reach Overview provides a river-based context and analyses of habitat, aquatic and wetland issues that identify important ecological and physical features. The Reach Overview uses an Ecological Features and Function Approach to management that includes wetland and upland features, while taking into account the biological, economic and social characteristics of the ecosystem. The final document is intended to serve as a planning and decision making tool for municipal planners, agency staff, First Nations, developers, landowners and members of the public to integrate biophysical and social activities. The document builds on existing FREMP area designation information, habitat inventory and classification data, and other reach overviews. The final document, Roberts Bank and Sturgeon Bank Reach Overview, was completed at the end of November 2010 and will be available on the BIA-FREMP website <a href="http://www.biafremp.org">http://www.biafremp.org</a> at no charge or by request through VPA.</td>
<td></td>
</tr>
<tr>
<td>6.2</td>
<td>The Owner will implement a complaint tracking and response mechanism, agreed to by EAO prior to commencement of construction.</td>
<td>Pre-construction, Construction, early Operation</td>
<td>VPA</td>
<td>EAO, COG, TTN</td>
<td>Ongoing</td>
<td>The draft Community Liaison Plan was reviewed by the EAO and approved via email on November 21, 2009. Tracking includes issues that arise via the project information and feedback line, through correspondence and meetings with team members, as well as issues raised at public events. In addition, comments received by or directed to the Deltaport Third Berth Project Community Liaison Committee (CLC), are included in overall issues tracking for the project. A copy of the DPS Issues Tracking document is available on the project website and in library resource files. The CLC is made up of eighteen members, including a representative from the Port, COG and TTN. The Terms of Reference has been adopted by the committee and is available on the Port website. The purpose of the committee is to work with the Port and port stakeholders to address issues pertaining to the construction and first-year operation of the project. The first meeting was held on March 22, 2007. Subsequent meetings were held on January 22, February 19, April 16, June 26, August 23, October 25, and November 19. Meetings in 2008 were held on January 22, February 19, April 16, June 26, August 23, October 25, and November 19. Meetings in 2009 were held on January 17, February 26, April 27, June 18, August 23, October 25, and November 19. Meetings in 2010 were held on January 22, March 30, June 27, September 23 and December 2. For First Nations issues, see Section 6.1 and 6.4.</td>
<td></td>
</tr>
<tr>
<td>6.3</td>
<td>The Owner will continue to engage in consultation with relevant First Nations identified in the Assessment Report throughout the Post-Review and Construction Phases, including discussions on economic development opportunities, employment and cultural display opportunities generated by the Project. More specifically, such consultation shall continue with those First Nations who have informed EAO or the Owner on the Project’s adverse impacts on their asserted aboriginal rights, appropriate accommodation to reflect on such impacts as identified and described in the EAO Assessment Report.</td>
<td>Pre-construction, Construction, early Operation</td>
<td>VPA</td>
<td>EAO</td>
<td>Ongoing</td>
<td>The draft Post-Review and Construction Report was completed at the end of November 2010 and will be available online on the Port’s website. The draft Post-Review and Construction Report was reviewed by the EAO and approved via email on November 21, 2009. Tracking includes issues that arise via the project information and feedback line, through correspondence and meetings with team members, as well as issues raised at public events. In addition, comments received by or directed to the Deltaport Third Berth Project Community Liaison Committee (CLC), are included in overall issues tracking for the project. A copy of the DPS Issues Tracking document is available on the project website and in library resource files. The CLC is made up of eighteen members, including a representative from the Port, COG and TTN. The Terms of Reference has been adopted by the committee and is available on the Port website. The purpose of the committee is to work with the Port and port stakeholders to address issues pertaining to the construction and first-year operation of the project. Subsequent meetings were held in 2009 (Jan 23, Feb 12, May 28, Jun 29, Aug 11, and Sep 17) and 2010 (Feb 4, Apr 27, June 18). The final document, Roberts Bank and Sturgeon Bank Reach Overview, was completed at the end of November 2010 and will be available on the BIA-FREMP website <a href="http://www.biafremp.org">http://www.biafremp.org</a> at no charge or by request through VPA.</td>
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<td>6.4</td>
<td>The Owner will continue to update and make available media information materials, as part of its public information commitment.</td>
<td>Pre-construction, Construction, early Operation</td>
<td>VPA</td>
<td>EAO</td>
<td>Ongoing</td>
<td>The DCLC is made up of nineteen members, including a representative from the Port, TSI, COD and TTN. The Terms of Reference has been adopted by the committee and is available on the Port website. The purpose of the committee is to work with the Port and port stakeholders to address issues pertaining to the construction and first-year operation of the project. The first meeting was held on March 22, 2007. Subsequent meetings were held on April 17, May 22, June 26, July 23, September 23 and December 2. For First Nations issues, see Section 6.1 and 6.4.</td>
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<td>6.5</td>
<td>The Owner will implement a consistent tracking and response mechanism, agreed to by EAO prior to start of construction, for the construction phase of the Project. The Owner will commit to the organization of a Community Liaison Committee (CLC), including a representative from COD, for addressing public concerns. The Owner will also continue to liaise with First Nations, independently or through the CLC, to address relevant concerns over Project impacts.</td>
<td>Pre-construction, Construction, early Operation</td>
<td>VPA</td>
<td>EAO</td>
<td>Ongoing</td>
<td>The draft Post-Review and Construction Report was completed at the end of November 2010 and will be available online on the Port’s website. The draft Post-Review and Construction Report was reviewed by the EAO and approved via email on November 21, 2009. Tracking includes issues that arise via the project information and feedback line, through correspondence and meetings with team members, as well as issues raised at public events. In addition, comments received by or directed to the Deltaport Third Berth Project Community Liaison Committee (CLC), are included in overall issues tracking for the project. A copy of the DPS Issues Tracking document is available on the project website and in library resource files. The CLC is made up of eighteen members, including a representative from the Port, COG and TTN. The Terms of Reference has been adopted by the committee and is available on the Port website. The purpose of the committee is to work with the Port and port stakeholders to address issues pertaining to the construction and first-year operation of the project. The first meeting was held on March 22, 2007. Subsequent meetings were held on January 17, February 26, April 27, June 18, August 23, October 25, and November 19. Meetings in 2008 were held on January 22, February 19, April 16, June 26, August 23, October 25, and November 19. Meetings in 2009 were held on January 22, March 30, June 27, September 23 and December 2. For First Nations issues, see Section 6.1 and 6.4.</td>
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**Consulting with the Public and First Nations**

- The Owner will invite the local community, other stakeholders and First Nations within an open and interactive consultation process during the design, construction and throughout the first year of operation. Consultation will be carried out according to BC government policies included in the Vancouver Fraser Port Authority's footprint strategy, dated September 14, 2004.
- The Owner will conduct public as well as First Nations open houses and information sessions, at agencies, FN, construction.
- The Owner will implement a complaint tracking and response mechanism, agreed to by EAO prior to commencement of construction.
- The Owner will involve the local community, other stakeholders and First Nations within an open and interactive consultation process during final design, construction, schedules, and upcoming milestones.
- The Owner will continue to update and make available media information materials, as part of its public information commitment.
- The Owner will implement a consistent tracking and response mechanism, agreed to by EAO prior to start of construction, for the construction phase of the Project. The Owner will commit to the organization of a Community Liaison Committee (CLC), including a representative from COD, for addressing public concerns. The Owner will also continue to liaise with First Nations, independently or through the CLC, to address relevant concerns over Project impacts.
This project has been completed as documented in the MOT report titled "GVRD, MOT, COD, ALC, TransLink: Construction Contract Completion Report", which noted, ‘information requests for this report can be made through the MOT.’

The Owner will work with the Corporation of Delta to conduct a preliminary design of the highway 99 Massay Tunnel congestion management system on Highway 17 as part of the project Highway improvements. This was completed in conjunction with Highway 17 mitigation measures. See Section 7.1.

The Owner will implement signal modifications at Ladner Trunk Road and Highway 17 (including upgrade to 34B Avenue to correct the existing sight line). This was completed in conjunction with Highway 17 mitigation measures. See Section 7.1.

The Owner will work with MOT to amend the construction work program of the Ladner interchange. This will be completed in conjunction with Highway 17 mitigation measures. See Section 7.1.

The Owner will ensure that Transport Canada will undertake a warrant review for an overpass at 28th Avenue at Highway 17 prior to the closure of 57B. Delta Council further confirmed support in principle for an overpass at 41B Street at Deltaport Way. MOT is responsible for the delivery of this work and VFPA is a direct participant in the projects, along with the other Roberts Bank Rail Corridor partners. VFPA is also providing funding for the 28th-Ave project. The 28th-Avenue project is anticipated to be completed in March 2011.

The Owner will work with MOT to develop improvement options for this location once the plan has been finalized. The Port has been working with the Provincial Gateway Corporation meets once each quarter, at a minimum. In addition, the Port has been working with the Provincial Gateway

The Port will work with the Corporation of Delta to conduct a preliminary design of improvements to the intersection of Arthur Street/Old Highway 1 in order to minimize traffic impacts on Delta. Since the implementation of the TMP in February 2007 (See 7.2 above). Preliminary design is underway on all of these projects and detailed design is proceeding in consultation with MOT, TransLink, Greater Vancouver TransLink, and the Port, and the final report was distributed to the participants of the study and other stakeholders including CN, CPR, BCRC, Southern Railway of BC, the Corporation of Delta, and others. The 80th Street overpass is proceeding with COD responsible for delivering the project along with RBRC. VFPA is a funding participant in the project and is directly involved on the project steering committee. Design work is in progress as undertaken.

The Owner will participate in the development of a container truck reservation system in order to minimize traffic impacts on Delta. Since the Port is aware of. This commitment was deleted from the project at the request of COD due to their concern that trucks would use the Ladner Trunk Road route to avoid the tunnel congestion. The deletion of this work was discussed and confirmed at a December 1, 2007 meeting with MOT, COD, RCPM, Delta Police and VFPA. An update on all Highway 17 corridor improvements, including the deletion of this particular commitment, was presented to the OLC on October 25, 2007.

The commitment was deleted from the project at the request of COD due to their concern that trucks would use the Ladner Trunk Road route to avoid the tunnel congestion. The deletion of this work was discussed and confirmed at a December 1, 2007 meeting with MOT, COD, RCPM, Delta Police and VFPA. An update on all Highway 17 corridor improvements, including the deletion of this particular commitment, was presented to the OLC on October 25, 2007.

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The commitment was deleted from the project at the request of COD due to their concern that trucks would use the Ladner Trunk Road route to avoid the tunnel congestion. The deletion of this work was discussed and confirmed at a December 1, 2007 meeting with MOT, COD, RCPM, Delta Police and VFPA. An update on all Highway 17 corridor improvements, including the deletion of this particular commitment, was presented to the OLC on October 25, 2007.
The Owner will commit to working with relevant authorities and parties to optimize the performance, efficiency and reliability of container traffic congestion on local roads.

### Coastal Geomorphology

<table>
<thead>
<tr>
<th>Objective</th>
<th>Commitments and Assurances</th>
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</tr>
</thead>
<tbody>
<tr>
<td>7.1</td>
<td>The Owner commits to working with relevant authorities and parties to optimize the performance, efficiency and reliability of container traffic congestion on local roads.</td>
<td>Construction, Operation</td>
<td>VPA, Contractors, Terminal Operator</td>
<td>EC</td>
<td>DOC</td>
<td>Complete</td>
<td>The work is ongoing and involves liaison with MOT, COD, the DCLC, and others. Meetings held to address truck traffic issues include June 8, 2007 meeting with COD, Delta Police, RODP, MOT, and TSI, on August 23, 2007 meeting with the DCLC traffic sub-committee, and on September 17, 2007 meeting with DCLC (TSI was also present). In addition, TSI has developed a Traffic Management Plan (TMP) for the Deltaport facility. The TMP was finalized in 2008 and revised in early 2010 after the opening of Berth 3. The Port monitors performance of TSSA TMP on a daily basis to ensure that the Plan takes appropriate actions as necessary to address traffic problems. PMV and TSI have committed to further work with the Dels community with the establishment of the Delta Container Truck Traffic Working Group. This Group is co-chaired by PMV &amp; TSI, and additional members include the Corporation; BC Ministry of Transportation (Highways &amp; CVSE), Delta Police Department, RODP, and ICBC. The working group works together to address traffic issues such as terminal gate congestion; issues related to the habitat compensation project along the East Cowesway, community issues, etc. The Work Group met on an approximately monthly basis during 2010 and have continued to commit to ongoing meeting operations through 2011.</td>
</tr>
<tr>
<td>8.1</td>
<td>The Owner will ensure that shoreline protection (along coasts) will remain a key priority.</td>
<td>Construction, Operation</td>
<td>VPA, Contractors, Terminal Operator</td>
<td>EC</td>
<td>DOC</td>
<td>Complete</td>
<td>The newly created structures have been designed to minimize reflection and propagation of waves. VPA will provide training with P-Eng signed as kit drawings upon completion of all construction works.</td>
</tr>
<tr>
<td>9.1</td>
<td>The Owner will ensure that the construction works and operations for the Project are conducted in compliance with legislated requirements and BMPs, with particular attention to construction practices that prevent the introduction of deleterious substances, pursuant to section 35(2) of the Federal Fisheries Act, into fish frequented waters.</td>
<td>Construction, Operation</td>
<td>VPA, Contractors, Terminal Operator</td>
<td>EC</td>
<td>DOC</td>
<td>Complete</td>
<td>The commitment is met through the Adaptive Management Strategy monitoring program. The monitoring programs have been designed to be consistent with each other to maximize the utility of the data gained. Monitoring for both programs is ongoing.</td>
</tr>
</tbody>
</table>

### Water Quality

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<tr>
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</thead>
<tbody>
<tr>
<td>10.2</td>
<td>The Owner will ensure that the construction works and operations for the Project are conducted in compliance with legislated requirements and BMPs, with particular attention to construction practices that prevent the introduction of deleterious substances, pursuant to section 35(2) of the Federal Fisheries Act, into fish frequented waters.</td>
<td>Construction, Operation</td>
<td>VPA, Contractors, Terminal Operator</td>
<td>EC</td>
<td>DOC</td>
<td>Complete</td>
<td>The construction works and operations for the Project were conducted in compliance with environmental protection requirements, the BMPs discussed above and relevant BMPs and shall commit to adequate quality monitoring as reflected in the AMS referenced in section 5, above.</td>
</tr>
<tr>
<td>10.3</td>
<td>The Owner will ensure that the construction works and operations for the Project are conducted in compliance with environmental protection requirements, the BMPs discussed above and relevant BMPs and shall commit to adequate quality monitoring as reflected in the AMS referenced in section 5, above.</td>
<td>Construction, Operation</td>
<td>VPA, Contractors, Terminal Operator</td>
<td>EC</td>
<td>MOE</td>
<td>Complete</td>
<td>The construction works were conducted in compliance with the conditions of the Habitat Compensation Plan - (HCP) #02-HPAC-P000-000144-0 for construction of a temporary barge berth facility located within the New Deltaport. The HCP was obtained on August 13, 2007, and was amended in March 2008 to include the extended work schedule. The work was concluded in December 2008. Additional permits were obtained for temporary barge berth facilities located within the New Deltaport. The HCP was obtained on August 13, 2007, and was amended in March 2008 to include the extended work schedule. The work was concluded in December 2008. Additional permits were obtained for temporary barge berth facilities located within the New Deltaport.</td>
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### General Quality

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<tbody>
<tr>
<td>11.1</td>
<td>The Owner will ensure that the construction works and operations for the Project are conducted in compliance with environmental protection requirements, the BMPs discussed above and relevant BMPs and shall commit to adequate quality monitoring as reflected in the AMS referenced in section 5, above.</td>
<td>Construction, Operation</td>
<td>VPA, Contractors, Terminal Operator</td>
<td>EC</td>
<td>MOE</td>
<td>Complete</td>
<td>The construction works were conducted in compliance with the conditions of the Habitat Compensation Plan - (HCP) #02-HPAC-P000-000144-0 for construction of a temporary barge berth facility located within the New Deltaport. The HCP was obtained on August 13, 2007, and was amended in March 2008 to include the extended work schedule. The work was concluded in December 2008. Additional permits were obtained for temporary barge berth facilities located within the New Deltaport. The HCP was obtained on August 13, 2007, and was amended in March 2008 to include the extended work schedule. The work was concluded in December 2008. Additional permits were obtained for temporary barge berth facilities located within the New Deltaport.</td>
</tr>
</tbody>
</table>
104. Stormwater from the site's terminal will be directed through an oil interceptor and catch COD, TFN.

105. The off-site compensation agreement, the Habitat Compensation Plan, the Owner will ensure an underwater noise inventory of all equipment proposed for the Project will be developed and a marine noise-monitoring program will be established to measure acoustic production of all marine construction equipment (dredge equipment, vibro-flotation equipment, other marine construction equipment). See Schedule C of the Habitat Compensation Plan.

106. The Owner commits to the following measures to protect the fish habitat:

- Crab salvages were conducted prior to and periodically during the dredging periods, with documentation of the salvages provided to DFO and sent to DFO by VFPA. No permits were required for the crab salvage work.

- Survey the intertidal mudflat area within the Project footprint immediately prior to construction.

- Monitor over time to determine whether crab nursery habitat re-establishes itself along the newly created forelands. The re-establishment is successful, two adjacent crab nursery areas were established to ensure full compensation.

- Survey the intertidal mudflat area within the Project footprint immediately prior to construction. Locate any adult Dungeness crabs found in a suitable adjacent habitat prior to completion of construction.

- Complete The FRPD Cutter Suction Dredge ship began dredging on March 28, 2007 in water greater than -10 m CD. Also, VPD Barge No 2 conducted clamshell dredging in waters greater than -5 m CD from October 15 to March 31. No works conducted would result in a significant disturbance to the seabed of outer Roberts Bank which is situated in water greater than -50 m CD deep at daily low water for the protection of adult sulphur-crested cormorants, peregrine falcons, and bald eagles.

110. The Off-site Compensation Plan (see Section 2) is being completed with inputs from construction activities that have resulted in variations from the baseline underwater acoustic assessment work has been completed for marine construction works related to the Port of Vancouver Terminal 4 Expansion Project and as amended in Schedule C of the Habitat Compensation Plan.

111. The Off-site compensation agreement, the Habitat Compensation Plan and Habitat Compensation Monitoring Plan was submitted to DFO as part of the application package for DFO Authorization (32-HHPC-A-010-000-044, December 2006). The Authorization places conditions on the Port, and these conditions are being complied with and are ongoing. Details will be provided in the following subsections as the work is conducted.

112. The Owner commits to the following measures to protect the fish habitat:

- From October 15 to March 31 there shall be no works conducted which would result in a significant disturbance to the seabed of outer Roberts Bank which is situated in water greater than -50 m CD deep at daily low water for the protection of adult sulphur-crested cormorants, peregrine falcons, and bald eagles.

- Complete The owner is committed to applying for a Marine Mammal Protection Plan (see Section 2.4) going forward in support of a Fisheries Act authorization for the construction of the Deltaport Third Berth Project. See Schedule 1 EMP - Marine Environment Management Plan for additional details on the final Habitat Compensation Plan and monitoring.

- Complete The owner is committed to the following measures to protect the fish habitat:· Crab salvages were conducted prior to and periodically during the dredging periods, with documentation of the salvages provided to DFO and sent to DFO by VFPA. No permits were required for the crab salvage work.

- Complete The owner is committed to entering an agreement with Ducks Unlimited Canada, DFO, EC, and other relevant agreements on or before the date of the project.

- Complete The owner is committed to entering an agreement with Ducks Unlimited Canada, DFO, EC, and other relevant agreements on or before the date of the project.

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<th>Advisory Agencies</th>
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<tbody>
<tr>
<td>12.1</td>
<td>The Owner will ensure that any densification equipment (i.e. vibro-flotation head) is shut down while densification equipment is being relocated.</td>
<td>Construction</td>
<td>VPA, BCRC</td>
<td>DFO, FN</td>
<td>Complete</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14.1</td>
<td>The Owner commits to prepare a report on Orca pods in the vicinity of the Project and to assess where, if any, mitigation measures should be implemented.</td>
<td>Operation</td>
<td>VPA</td>
<td>Complete</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14.2</td>
<td>The Owner will work with the MPA to develop an education and awareness program about marine mammals and have pilots of vessels transiting to Roberts Bank steer away from observed marine mammal pods when vessel safety is not compromised.</td>
<td>Operation</td>
<td>VPA</td>
<td>Complete</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| 14.3 | The Owner will report the results of the Marine Mammal Monitoring program as part of the Post Project Monitoring after the completion of the project. | Pre-construction, Construction | VPA, Contractors | MOE | On-going | The Port has completed the marine mammal awareness program, entitled "Marine Mammals of the Roberts Bank Area" Distribution of the pamphlet began in December 2008 and continues to be distributed as appropriate. The pamphlet has been distributed to marine pilots, marine contractors, various agencies, at open houses, and more. Additionally, the Port is working with its marine mammal monitoring program consultant on a series of guiding principles for marine pilots in the development of the marine mammal awareness program. 
| 14.4 | The Owner will ensure vegetation cleared during construction is kept to a minimum. This would include clearing of riparian vegetation, shallow waters and vegetation cleared for any temporary or permanent hardening or other activities. | Construction, Operation | VPA, Contractors | MOE | Complete | 
| 14.5 | The Owner will ensure that the land-based construction works for the off causeway rail corridor in and around environmentally-sensitive areas. | Construction, Operation | VPA, Contractors | MOE | Complete | 

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<table>
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<tr>
<td>141</td>
<td>The Owner will re-vegetate areas disturbed by construction activities with native grass species. This would enhance native species in the study area and minimize the potential for establishment of non-indigenous species.</td>
<td>Pre-construction, Construction</td>
<td>VPA, Contractors, BCRC</td>
<td>MOE, TC</td>
<td>COC, TFN</td>
<td>Complete</td>
<td>VPA provided Environmental Work Plans (Mainland and Trow EWPs) that addressed this commitment. Construction impacts to vegetated areas outside of the actual project footprint was very limited and revegetation was not an issue.</td>
</tr>
<tr>
<td>142</td>
<td>The Owner will minimize the movement of people and machinery through vegetated areas.</td>
<td>Pre-construction, Construction</td>
<td>VPA, Contractors, BCRC</td>
<td>MOE, TC</td>
<td>COC, TFN</td>
<td>Complete</td>
<td>VPA provided Environmental Work Plans (Mainland and Trow EWPs) that addressed this commitment.</td>
</tr>
<tr>
<td>143</td>
<td>The Owner will manage interactions between employees and wildlife and will store and/or dispose of food, garbage and petroleum products in an appropriate manner to prevent attraction of wildlife to construction sites.</td>
<td>Pre-construction, Construction</td>
<td>VPA, Contractors, BCRC</td>
<td>MOE, TC</td>
<td>COC, TFN</td>
<td>Complete</td>
<td>VPA provided Environmental Work Plans (Mainland and Trow EWPs) that addressed this commitment.</td>
</tr>
<tr>
<td>144</td>
<td>The Owner must ensure that properly constructed and operated boxes in areas towards Brunswick Point where they are less vulnerable to major motorways.</td>
<td>Pre-construction, Construction</td>
<td>VPA, Contractors, BCRC</td>
<td>MOE, TC</td>
<td>COC, TFN</td>
<td>Complete</td>
<td>VPA provided Environmental Work Plans (Mainland and Trow EWPs) that addressed this commitment.</td>
</tr>
<tr>
<td>145</td>
<td>The Owner will become involved in barn owl management planning, either through a Barn Owl Management Team, or its ad hoc equivalent.</td>
<td>Pre-construction, Construction</td>
<td>VPA, Contractors, BCRC</td>
<td>MOE, TC</td>
<td>COC, TFN</td>
<td>Complete</td>
<td>VPA provided Environmental Work Plans (Mainland and Trow EWPs) that addressed this commitment.</td>
</tr>
<tr>
<td>146</td>
<td>The Owner will support appropriate environmental stewardship programs to place barn owl nest boxes in areas towards Brunswick Point where they are less vulnerable to major motorways.</td>
<td>Pre-construction, Construction</td>
<td>VPA, Contractors, BCRC</td>
<td>MOE, TC</td>
<td>COC, TFN</td>
<td>Complete</td>
<td>VPA provided Environmental Work Plans (Mainland and Trow EWPs) that addressed this commitment.</td>
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<td>147</td>
<td>The Owner will become involved in barn owl management planning, either through a Barn Owl Management Team, or its ad hoc equivalent.</td>
<td>Pre-construction, Construction</td>
<td>VPA, Contractors, BCRC</td>
<td>MOE, TC</td>
<td>COC, TFN</td>
<td>Complete</td>
<td>VPA provided Environmental Work Plans (Mainland and Trow EWPs) that addressed this commitment.</td>
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<td>148</td>
<td>The Owner will support appropriate environmental stewardship programs to place barn owl nest boxes in areas towards Brunswick Point where they are less vulnerable to major motorways.</td>
<td>Pre-construction, Construction</td>
<td>VPA, Contractors, BCRC</td>
<td>MOE, TC</td>
<td>COC, TFN</td>
<td>Complete</td>
<td>VPA provided Environmental Work Plans (Mainland and Trow EWPs) that addressed this commitment.</td>
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<td>149</td>
<td>The Owner must ensure that properly constructed and operated boxes in areas towards Brunswick Point where they are less vulnerable to major motorways.</td>
<td>Pre-construction, Construction</td>
<td>VPA, Contractors, BCRC</td>
<td>MOE, TC</td>
<td>COC, TFN</td>
<td>Complete</td>
<td>VPA provided Environmental Work Plans (Mainland and Trow EWPs) that addressed this commitment.</td>
</tr>
<tr>
<td>150</td>
<td>The Owner must ensure that properly constructed and operated boxes in areas towards Brunswick Point where they are less vulnerable to major motorways.</td>
<td>Pre-construction, Construction</td>
<td>VPA, Contractors, BCRC</td>
<td>MOE, TC</td>
<td>COC, TFN</td>
<td>Complete</td>
<td>VPA provided Environmental Work Plans (Mainland and Trow EWPs) that addressed this commitment.</td>
</tr>
<tr>
<td>151</td>
<td>The Owner will ensure that all contractors and the Terminal Operator construct and operate the Project with due attention to adverse public health effects.</td>
<td>Pre-construction, Construction</td>
<td>VPA, Contractors, Terminal Operator</td>
<td>MOE, TC</td>
<td>COC, TFN</td>
<td>On-going</td>
<td>See comments below.</td>
</tr>
<tr>
<td>152</td>
<td>The Owner must ensure that all contractors and the Terminal Operator construct and operate the Project with due attention to adverse public health effects.</td>
<td>Pre-construction, Construction</td>
<td>VPA, Contractors, Terminal Operator</td>
<td>MOE, TC</td>
<td>COC, TFN</td>
<td>On-going</td>
<td>See comments below.</td>
</tr>
</tbody>
</table>

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**Owner's Table of Commitments and Assurances**

Status Update as of January 31, 2011

**Reference**

- **Ref**: Reference number for the commitment.
- **Objective - Commitments and Assurances**: Description of the commitment or assurance.
- **Timing**: The time frame for the commitment or assurance.
- **Delivered By**: The entity responsible for delivering the commitment or assurance.
- **Approving/Lead Agencies**: The agencies responsible for approving or leading the commitment or assurance.
- **Advisory Agencies**: The agencies providing advisory support.
- **Status**: The status of the commitment or assurance.
- **Comments**: Additional comments or notes regarding the commitment or assurance.

**FHA, HC**

- **FHA**: Federal Health Agency
- **HC**: Health Canada

**MOE**

- **MOE**: Ministry of Environment

**GVRD**

- **GVRD**: Greater Vancouver Regional District

**Vancouver Fraser Port Authority (VPA)**

- **VPA**: The authority responsible for the Vancouver Fraser Port

**BC Rail**

- **BC Rail**: British Columbia Railways

**Wildlife Act**

- **Wildlife Act**: British Columbia Wildlife Act

**Species At Risk Act**

- **Species At Risk Act**: Species at Risk Act

**Migratory Birds Convention Act**

- **Migratory Birds Convention Act**: Migratory Birds Convention Act

**Migratory Birds Regulations**

- **Migratory Birds Regulations**: Migratory Birds Regulations

**Canada Wide Standards**

- **Canada Wide Standards**: Canada Wide Standards

**VPA, Contractors**

- **VPA, Contractors**: Vancouver Fraser Port Authority and its contractors

**BOC**

- **BOC**: BC Rail

**CRC**

- **CRC**: Metro Vancouver

**Prepared by the Vancouver Fraser Port Authority**

- **Prepared by the Vancouver Fraser Port Authority**: Document prepared by the Vancouver Fraser Port Authority
The Program must cover the marine construction program (undertaken by the Owner) and the FHA, COD, VPA, Contractors, The Owner commits, and must ensure that the Terminal Operator also commits, to diligently

The Port and the Terminal Operator implemented the truck reservation system in 2002. Extended terminal gate operating hours, to reduce potential impacts on marine mammals and air emissions.

The Owner will ensure the Terminal Operator completes the testing of the hybrid powered rubber tire gantry cranes (RTGs) at Deltaport, as outlined below.

The Owner commits to undertaking a vessel speed assessment of marine vessels approaching the Port and the Terminal Operator implemented the truck reservation system, which may include the use of extended terminal gate operating hours, to reduce potential impacts on marine mammals and air emissions.

The Owner commits to considering a differential port tariff system where cleaner ships fees are reduced, calling on the Port of Vancouver are charged lower fees as a reward system to encourage a reduction in marine vessel air emissions.

The Owner commits to undertaking a vessel speed assessment of marine vessels approaching the Port, to determine the potential benefit of lowering vessel approach speeds with the intention to reduce potential impacts on marine mammals and air emissions.

The Owner will ensure that the Terminal Operator completes the identification of emissions from container vessels calling at Deltaport. The Owner plans to continue providing mechanisms for continuous improvement of marine emissions below the ECA regulations.

The Owner commits to undertaking a vessel speed assessment of marine vessels approaching the Port, to determine the potential benefit of lowering vessel approach speeds with the intention to reduce potential impacts on marine mammals and air emissions.

The Owner commits to undertake a vessel speed assessment of marine vessels approaching the Port, to determine the potential benefit of lowering vessel approach speeds with the intention to reduce potential impacts on marine mammals and air emissions.

The Owner will remain committed to the use of hybrid trucks for new construction projects and those older than 1.5% by 2009.

The Owner commits to undertaking a vessel speed assessment of marine vessels approaching the Port, to determine the potential benefit of lowering vessel approach speeds with the intention to reduce potential impacts on marine mammals and air emissions.

The Owner will ensure all the hybrid trucks employed at Deltaport are within applicable Quebec terminal equipment regulations. All trucks must undergo a pre-trip check, and the Hybrid Program is available on the VFPA website.

The Owner's Table of Commitments and Assurances

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<th>Status</th>
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<tr>
<td>18.1</td>
<td>The Program must cover the marine construction program (undertaken by the Owner) and the FHA, COD, VPA, Contractors, The Owner commits, and must ensure that the Terminal Operator also commits, to diligently</td>
<td>Construction</td>
<td>VPA, Contractors, Terminal Operator</td>
<td>GVRD, EC, COD, TFN, FPA</td>
<td>Complete</td>
<td>Construction (TP of the marine works (DCL in Section 3.1), updated civil works (TS in Section 3.1), and DRCU track work at Gulf (GRC in Section 2) all address these commitments.</td>
<td></td>
</tr>
</tbody>
</table>

The Owner confirms his commitment and must ensure that the Technical Operator also commits, to diligently complete the draft of the Bill to be submitted to the Environment Canada.

The Owner commits, on-going The truck licensing program (TLS) contains four components to address air emissions, and took effect on April 1, 2008.

On-going All trucks now require a reservation. The Port implemented an anti-idling program for all container trucks in September 2002. Extended terminal gate operating hours, to reduce potential impacts on marine mammals and air emissions.

On-going The Port implemented a differential truck rate program, which became fully operational on April 1, 2007 - the program provides incentives for cleaner engine emissions, marine vessels, including the use of lower sulphur fuels. Program details are available on the VFPA website.

On-going The Owner will remain committed to the use of hybrid trucks for new construction projects and those older than 1.5% by 2009.

On-going The next set of requirements for trucks older than 1999 will occur on April 1, 2011. Standards; (c) mandatory idle reduction limits; and (d) a mandatory education program. Effective April 1, 2009, trucks older than 1994 were phased out. The next set of requirements for trucks older than 1999 will occur on April 1, 2011.

Complete The Port implemented a differential truck rate program, which became fully operational on April 1, 2007 - the program provides incentives for cleaner engine emissions, marine vessels, including the use of lower sulphur fuels. Program details are available on the VFPA website.

Complete The feasibility study for shore based power within 8 months of receipt of Project EA was submitted to the Environmental Assessment Office in June 2007.

Complete The feasibility study for shore based power was completed in May 2007. Omni Engineering Inc. and Westmar Consultants Inc. were retained by TSI Terminal Systems Inc. to conduct the study, the findings of which are presented in a report titled "Deltaport Third Berth Container Terminal: Cost Incurring Feasibility Study", dated May 30, 2007. The study was submitted to the Environmental Assessment Officer in June 2007.

Complete The project was completed. The Terminal Operator's summary report titled "Deltaport Third Berth Container Terminal: Cost Incurring Feasibility Study", dated May 30, 2007. The study was submitted to the Environmental Assessment Officer in June 2007.

Complete The Owner will ensure the Terminal Operator completes the testing of the hybrid powered rubber tire gantry cranes (RTGs) at Deltaport, as outlined below.

Implemented The Owner's Table of Commitments and Assurances is available on the VFPA website.

Implemented The Owner's Table of Commitments and Assurances is available on the VFPA website.

Implemented The Owner's Table of Commitments and Assurances is available on the VFPA website.

Implemented The Owner's Table of Commitments and Assurances is available on the VFPA website.
The Owner must commit to work with the Railways serving the Project to reduce emissions due to rail operations of Roberts Bank.

The Owner will ensure that the Terminal Operator must conduct regular training of Operator.

The Owner will ensure that the Terminal Operator prepares an.

The Owner will ensure that instructions are provided to their contractors throughout the pre-construction and construction phases to minimize possible effects related to noise, dust and vibration. The Owner must comply with the intent of COD, FHA, HC, TFN, and Metro Vancouver's noise management plan, which the BC Locomotive and Rail Air Quality Work Group had identified in its report to the Ministry of Environment. The noise management plan includes a noise monitoring program, environmental checklist for noise, noise reduction measures, and operational impacts. The plan would be included in the Operational EMP for the Deltaport Third Berth Project.

A management procedure, such as a 24-hour helpline, will be put in place by the Owner to deal with noise complaints that may arise from construction activities. Each complaint would be investigated and appropriate noise reduction measures established to mitigate future occurrences.

The Owner will ensure that the Terminal Operator prepares an Operation Noise Management Plan that contains environmental management measures to assess and monitor noise from the operation of the Project. The Plan would be included in the Operational EMP for the Deltaport Third Berth Project. Noise reduction measures for terminal operations would include:
- Monitoring noise levels
- Implementing noise reduction measures
- Monitoring the effectiveness of the Plan

The Owner will ensure that the Terminal Operator conducts routine training of Operators on Proper Training and awareness of noise issues associated with the operation of the project.

The Owner will ensure that the design, construction, operation, and maintenance of the Project conforms to all applicable health and safety requirements.

The Owner will ensure that all contractors and the Terminal Operator construct and operate the Project with due attention to advance public health effects.

The Owner will ensure that instructions are provided to their contractors throughout the pre-construction and construction phases to minimize possible effects related to noise, dust and vibration. The Owner must comply with the intent of COD, FHA, HC, TFN, and Metro Vancouver's noise management plan, which the BC Locomotive and Rail Air Quality Work Group had identified in its report to the Ministry of Environment. The noise management plan includes a noise monitoring program, environmental checklist for noise, noise reduction measures, and operational impacts. The plan would be included in the Operational EMP for the Deltaport Third Berth Project.

A management procedure, such as a 24-hour helpline, will be put in place by the Owner to deal with noise complaints that may arise from construction activities. Each complaint would be investigated and appropriate noise reduction measures established to mitigate future occurrences.

The Owner will ensure that the Terminal Operator prepares an Operation Noise Management Plan that contains environmental management measures to assess and monitor noise from the operation of the Project. The Plan would be included in the Operational EMP for the Deltaport Third Berth Project. Noise reduction measures for terminal operations would include:
- Monitoring noise levels
- Implementing noise reduction measures
- Monitoring the effectiveness of the Plan

The Owner will ensure that the Terminal Operator conducts routine training of Operators on Proper Training and awareness of noise issues associated with the operation of the project.

The Owner will ensure that the design, construction, operation, and maintenance of the Project conforms to all applicable health and safety requirements.
### Owner's Table of Commitments and Assurances

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<tr>
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</thead>
<tbody>
<tr>
<td>24</td>
<td>The Owner will ensure that construction contractors are aware of their obligations to comply with all applicable standards and regulations regarding the handling and use of toxic and hazardous materials that they may be using during construction (e.g., uncured concrete).</td>
<td>Pre-construction, Construction, Operation, Maintenance</td>
<td>VPA, Deltaport, TSI, COD, TFN</td>
<td>N/A</td>
<td>CDO</td>
<td>Complete</td>
<td>The contractors have each developed a plan within their respective Construction Plans that address the toxic and hazardous materials contained in the materials to be used during construction. No issues with this commitment were identified during monitoring activities. Construction is now complete.</td>
</tr>
<tr>
<td>25</td>
<td>The Owner will develop a community liaison plan to minimize construction-related impacts. The plan will consider the following:</td>
<td>Pre-construction, Construction, Operation, Maintenance</td>
<td>VPA, Terminal Operator</td>
<td>None</td>
<td>COD, TFN</td>
<td>Complete</td>
<td>The Community Liaison Plan (CLP) was developed and issued in December 2006 for review. A copy of the CLP was sent to the Delta Community Liaison Committee (DCLC) on March 30, 2010 and in June 24, 2010 when Eric Watz, President of TSI, addressed the DCLC meeting.</td>
</tr>
</tbody>
</table>

#### On-going

<table>
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<tbody>
<tr>
<td>26</td>
<td>The Owner shall ensure that all contractors and the Terminal Operator complete and operate the LED lighting with minimal visual and lighting effects.</td>
<td>Operation</td>
<td>VPA, Terminal Operator</td>
<td>None</td>
<td>COD, TFN</td>
<td>Ongoing</td>
<td>See comments below.</td>
</tr>
<tr>
<td>27</td>
<td>The Owner shall commit to operating a CLC referenced in section 6.3 of this Table, whose terms and references shall include any visual and lighting impacts generated by the gantry crane systems. The Owner shall ensure that all contractors and the Terminal Operator operate the LED lighting with minimal visual and lighting effects.</td>
<td>Operation</td>
<td>VPA, Terminal Operator</td>
<td>None</td>
<td>COD, TFN</td>
<td>Ongoing</td>
<td>The DCLC is made up of eighteen members, including a representative from the Port, TSI, COD and TFN. The Terms of Reference has been addressed by the committee. The purpose of the committee is to work with both the Port and the Terminal Operator, as well as the contractors and the Port engineer, to address any issues and to prevent them from rotating when the arms are raised and lowered. The DCLC meeting was held in March 2007. Subsequent meetings in 2007 were held on April 15, May 21, June 16, June 26, July 22, August 18, September 15, October 20, November 26. Meeting in 2008 were held on January 17, February 25, March 18, April 15, May 21, June 16, August 26, October 22 and November 27. Meetings in 2009 were held on January 22, February 19, April 10, June 16, September 17 and November 19. Meetings in 2010 were held on January 21, March 30, May 27, June 24, September 23 and December 2. Information pertaining to the DCLC is on the VPA website at <a href="http://www.portmetrovancouver.com/engaging/project/Delport_Third_Berth_Project.aspx">http://www.portmetrovancouver.com/engaging/project/Delport_Third_Berth_Project.aspx</a> or <a href="http://www.deltabetterbtohs.org/">http://www.deltabetterbtohs.org/</a>. A project information and feedback line is available to the public. The project information and feedback line number is 844-955-0207. The number is advertised on the project website, site map, project advisory and notification bulletins. A copy of the Terms of Reference shall include any visual and lighting impacts generating public concerns. The Owner shall develop a 24-hour help line for visual/lighting concerns/events, enabling contractors and site operators to address these commitments through ongoing work with the DCLC and VPA. Recent updates on lighting at Deltaport were provided to the DCLC by TSI on March 30, 2010 and in June 24, 2010 when Eric Watz, President of TSI, addressed the DCLC meeting.</td>
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#### Complete

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<td>28</td>
<td>The Owner will ensure that the Terminal Operator undertakes the following measures:</td>
<td>Operation</td>
<td>VPA, Terminal Operator</td>
<td>None</td>
<td>COD, TFN</td>
<td>Complete</td>
<td>The Terminal Operator has completed the following design evaluations: carriage side lighting will use downlights or light pattern; partner lighting will be directed inwards towards the Terminal site (the type of light is yet to be determined); security lighting will only be used during non-working hours; and, minimal night-light construction is proposed. A lighting design report was presented to the Delta Community Liaison Committee on November 27th, 2008 for review and comment. It was subsequently reviewed by a consultant and that review was discussed by the DCLC at its January 22, 2009 meeting. The final lighting report has been submitted to the DCLC and VPA. The Terminal Operator continues to address these commitments through ongoing work with the DCLC and VPA. Recent updates on lighting at Deltaport were provided to the DCLC by TSI on March 30, 2010 and in June 24, 2010 when Eric Watz, President of TSI, addressed the DCLC meeting.</td>
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<td>29</td>
<td>The Owner will ensure that the Terminal Operator has examined options for mounting luminaires on the arms of ship-to-shore gantry cranes to prevent them from rotating when the arms are raised and lowered.</td>
<td>Operation</td>
<td>VPA, Terminal Operator</td>
<td>None</td>
<td>COD, TFN</td>
<td>Ongoing</td>
<td>The Terminal Operator has examined options for mounting luminaires on the arms of ship-to-shore gantry cranes to prevent them from rotating when the arms are raised and lowered. TSI has commissioned to install a downlight style, cut-off luminaires for illumination of wharf and container yard areas. TSI is limited in how much they can reduce the lighting in this area due to regulatory requirements. Lighting has been designed for an average of 50 lux as required by Human Resource Development Canada (HRDC). Some downlight style cut-off luminaires remain on the terminal, which will be re-wired and possibly adjusted as additional ship-to-shore gantry crane luminaires are cycled off. TSI and DCLC have agreed to work towards an acceptable solution. TSI is limited in how much they can reduce the lighting in the area due to regulatory requirements. TSI has committed to create a ‘security setting’ option, which will result in the majority of lights shutting off when the port is not in operation. Anecdotal indication of these lights has been implemented. Boom lights will not be on during raising and lowering of the boom, therefore eliminating light from this source during these operations.</td>
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#### Requires documentation, community liaison, issues and economics

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<td>30</td>
<td>The Owner will evaluate the use of information integrating systems for lighting on ship-to-shore gantry cranes to minimize light time during raising and lowering of the equipment. The Owner will examine options for mounting luminaires on the arms of ship-to-shore gantry cranes to prevent them from rotating when the arms are raised and lowered.</td>
<td>Operation, Maintenance</td>
<td>VPA, Terminal Operator</td>
<td>None</td>
<td>COD, TFN</td>
<td>Ongoing</td>
<td>The Owner has examined options for mounting luminaires on the arms of ship-to-shore gantry cranes to prevent them from rotating when the arms are raised and lowered. TSI is limited in how much they can reduce the lighting in this area due to regulatory requirements. Lighting has been designed for an average of 50 lux as required by Human Resource Development Canada (HRDC). Some downlight style cut-off luminaires remain on the terminal, which will be re-wired and possibly adjusted as additional ship-to-shore gantry crane luminaires are cycled off. TSI and DCLC have agreed to work towards an acceptable solution. TSI is limited in how much they can reduce the lighting in the area due to regulatory requirements. TSI has committed to create a ‘security setting’ option, which will result in the majority of lights shutting off when the port is not in operation. Anecdotal indication of these lights has been implemented. Boom lights will not be on during raising and lowering of the boom, therefore eliminating light from this source during these operations.</td>
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<td>31</td>
<td>The Owner will ensure that the Terminal Operator has examined options for mounting luminaires on the arms of ship-to-shore gantry cranes to prevent them from rotating when the arms are raised and lowered.</td>
<td>Operation, Maintenance</td>
<td>VPA, Terminal Operator</td>
<td>None</td>
<td>COD, TFN</td>
<td>Ongoing</td>
<td>The Owner has examined options for mounting luminaires on the arms of ship-to-shore gantry cranes to prevent them from rotating when the arms are raised and lowered. TSI is limited in how much they can reduce the lighting in this area due to regulatory requirements. Lighting has been designed for an average of 50 lux as required by Human Resource Development Canada (HRDC). Some downlight style cut-off luminaires remain on the terminal, which will be re-wired and possibly adjusted as additional ship-to-shore gantry crane luminaires are cycled off. TSI and DCLC have agreed to work towards an acceptable solution. TSI is limited in how much they can reduce the lighting in the area due to regulatory requirements. TSI has committed to create a ‘security setting’ option, which will result in the majority of lights shutting off when the port is not in operation. Anecdotal indication of these lights has been implemented. Boom lights will not be on during raising and lowering of the boom, therefore eliminating light from this source during these operations.</td>
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<tr>
<td>32</td>
<td>The Owner will ensure that:</td>
<td>Operation, Maintenance</td>
<td>VPA, Terminal Operator</td>
<td>None</td>
<td>COD, TFN</td>
<td>Ongoing</td>
<td>The Owner will ensure that consideration is given to enhancing socio-economic aspects of the Project. The Owner transfers the EAC to the Terminal Operator, the Owner will ensure the involvement to the Terminal Operator of all relevant commitments, including but not limited to those listed in this Table.</td>
</tr>
<tr>
<td>33</td>
<td>The Owner will develop a community liaison plan to enhance construction-related impacts. The Plan will ensure that adequate participation is provided and will be developed with meaningful consultation with COD and TFN. This community liaison plan shall provide opportunities for the residents of the community, COD and TFN to provide meaningful input throughout the final design, construction and first year of operation, and it will also result in a CLC, both as described in section 6 of this Table.</td>
<td>Operation, Maintenance</td>
<td>VPA, Terminal Operator</td>
<td>None</td>
<td>COD, TFN</td>
<td>Ongoing</td>
<td>The Owner will ensure that consideration is given to enhancing socio-economic aspects of the Project. The Owner transfers the EAC to the Terminal Operator, the Owner will ensure the involvement to the Terminal Operator of all relevant commitments, including but not limited to those listed in this Table.</td>
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<tr>
<td>34</td>
<td>The Owner will ensure that:</td>
<td>Operation, Maintenance</td>
<td>VPA, Terminal Operator</td>
<td>None</td>
<td>COD, TFN</td>
<td>Ongoing</td>
<td>The Owner will ensure that consideration is given to enhancing socio-economic aspects of the Project. The Owner transfers the EAC to the Terminal Operator, the Owner will ensure the involvement to the Terminal Operator of all relevant commitments, including but not limited to those listed in this Table.</td>
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Prepared by the Vancouver Fraser Port Authority.
The Owner will ensure that the Project implementation team designs, constructs and operates the Project with care and attention provided to transportation and traffic considerations, so as to minimize and mitigate negative traffic impacts. The Owner will receive Project related transportation and traffic issues in consultation with COD and TFN.

The Owner will monitor the impact of construction activities on community services such as fire, police and emergency response during construction and commits to discuss appropriate levels of emergency access to the Project with COD.

The Owner will ensure that the Project implementation team designs, constructs and operates the Project in accordance with applicable bylaws and codes.

The Owner will construct traffic improvements as described in Section 7.1.

The Owner shall continue to participate in discussions with the Gateway Program, COD and other agencies regarding regional solutions to potential road and traffic issues in Delta.

The Owner will participate in Transport Canada's assessment of the Roberts Bank rail corridor to identify and seek solutions to rail crossing issues in Delta, Surrey and Langley.

The Owner and the Terminal Operator will use reasonable efforts to transport construction materials to and from the Project by barge to minimize additional highway traffic.

The Owner and the Terminal Operator will use reasonable efforts to transport construction materials to and from the Project by barge to minimize additional highway traffic.

The Owner will ensure that the Project implementation team designs, constructs and operates the Project in accordance with applicable bylaws and codes.

The Owner will monitor the impact of construction activities on community services such as fire, police and emergency response during construction and commits to discuss appropriate levels of emergency access to the Project with COD.

The Owner and Terminal Operator will use reasonable efforts to purchase goods and services from firms that are owned and operated by women or are minority or indigenous owned. The Owner will ensure that the work is accomplished through the Enhanced Local Content Plan as described in Section 7.2.

The Owner will ensure that the Project implementation team designs, constructs and operates the Project with care and attention provided to transportation and traffic considerations, so as to minimize and mitigate negative traffic impacts. The Owner will receive Project related transportation and traffic issues in consultation with COD and TFN.

The Owner will resolve issues in consultation with COD as the Project design and infrastructure is finalized.

The Owner must ensure that all commitments designed to prevent or minimize accidents and malfunctions resulting from the Project are implemented.

The Owner will ensure that the Project implementation team designs, constructs and operates the Project with care and attention provided to transportation and traffic considerations, so as to minimize and mitigate negative traffic impacts. The Owner will receive Project related transportation and traffic issues in consultation with COD and TFN.

The Owner will monitor the impact of construction activities on community services such as fire, police and emergency response during construction and commits to discuss appropriate levels of emergency access to the Project with COD.

The Owner and Terminal Operator will use reasonable efforts to purchase goods and services from firms that are owned and operated by women or are minority or indigenous owned. The Owner will ensure that the work is accomplished through the Enhanced Local Content Plan as described in Section 7.2.

The Owner will ensure that the Project implementation team designs, constructs and operates the Project with care and attention provided to transportation and traffic considerations, so as to minimize and mitigate negative traffic impacts. The Owner will receive Project related transportation and traffic issues in consultation with COD and TFN.

The Owner must ensure that all commitments designed to prevent or minimize accidents and malfunctions resulting from the Project are implemented.

The Owner will ensure that the Project implementation team designs, constructs and operates the Project with care and attention provided to transportation and traffic considerations, so as to minimize and mitigate negative traffic impacts. The Owner will receive Project related transportation and traffic issues in consultation with COD and TFN.

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<tr>
<td>24</td>
<td>The Owner will ensure that the following fuelling and spill measures are committed to by all Contractors and the Terminal Operator:</td>
<td>Pre-construction, Construction, Operation</td>
<td>VFPA, Terminal Operator</td>
<td>none</td>
<td>GVRD, COD, TFN, TransLink</td>
<td>Completed</td>
<td>The commitments can be found in the respective Contractor’s construction EMPs (see Section 2). In addition, an independent Environmental Monitor has been employed by the VFPA and/or TFN during the construction phases of this Project. The environmental monitoring reports were submitted to DFO, EC, CWS and MOE, amongst others during the course of construction work.</td>
</tr>
<tr>
<td>27</td>
<td>The Owner and Terminal Operator will ensure that their contractors develop a health and safety plan for each component of contractor work prior to the start of construction. The health and safety plan would typically include:</td>
<td>Pre-construction, Construction, Operation</td>
<td>VFPA, Terminal Operator</td>
<td>none</td>
<td>GVRD, COD, TFN, TransLink</td>
<td>Complete</td>
<td>The Terminal Operator’s health and safety plan is in place to ensure that Contractors/Consultants working on site have a health and safety plan prior to working on site. Contractors/Consultants working on site must have a health and safety plan prior to working on site.</td>
</tr>
<tr>
<td>29</td>
<td>The Owner and the Terminal Operator will ensure the following design measures:</td>
<td>Pre-construction, Construction, Operation</td>
<td>VFPA, Terminal Operator</td>
<td>none</td>
<td>GVRD, COD, TFN, TransLink</td>
<td>Complying</td>
<td>The Owner and the Terminal Operator will ensure that the following design measures are provided:</td>
</tr>
</tbody>
</table>

**Table of Commitments and Assurances**

Status Update as of January 31, 2011

---

Prepared by the Vancouver Fraser Port Authority.
The Owner must ensure that if required by the EC Disposal at Sea Program staff, the Contractor may provide for a Disposal at Sea Permit on site during the sampling of any received material proposed for disposal at sea; the Owner must provide the results of chemical analysis to the Program; the Program will consult with the Regional Ocean Disposal Advisory Committee and if the results are acceptable, the Contractor may apply for a Disposal at Sea Permit under the direction of the Owner.

To ensure such contractual compliance, with all mitigation proposals, relevant to the Project, that are described in this Application, or reflected in all other Owner generated documents listed in Appendix A to this Assessment Report or otherwise defined in this Table.

### Notes:

1. The “Owner” is understood to mean the applicant for an environmental assessment certificate (Certificate) pursuant to CEAA (in vancouver Point Authority – VPA) and to whom the Certificate may be issued. Any tender of commitments and assurances in this Appendix B is by the Owner & is a selected third party, such as the current terminal operator (TSI Inc.), must comply with all conditions of the Certificate. A partial but transferable of the Certificate and its conditions to TSI, if contemplated – as the new “Owner” – requires a new issuance for the holder of the Certificate and necessitates an Assessment to the Certificate. The Owner has also confirmed that its Secretary of Federal Impact and Mitigation Measures in Section 20 of the EA Application - Table 2.1. The current commitments in Table 2.1 are superseded by this Appendix B. The Owner’s written assurance is given in accordance with the Certificate of Amalgamation issued under Part 5.1 of the EA Application Management Regulations pursuant to the Canada Marine Act and having an effective date of January 1, 2008. The Vancouver Fraser Port Authority, the Fraser River Port Authority, and the Port of Vancouver Authority.

2. Authorization of Approving Agencies: Agency = Canadian Environmental Assessment Agency; ACC = Agriculture and Agri-Food; CDNA = Canadian Wildlife Service; DFO = Fisheries and Oceans Canada; EAO = BC Environmental Assessment Office; EC = Environment Canada; Fish = Federal Health Authority; GVRD = Greater Vancouver Regional District; HOV = High Occupancy Vehicle; MBCA = Migratory Birds Convention Act; MBR = Migratory Birds Regulations; MARPOL = International Convention for the Prevention of Pollution from Ships; MBCA = Migratory Birds Convention Act; MBR - Migratory Birds Regulations; OCMA = Ocean Disposal Permit issued on January 2, 2007.

3. The Port confirms commitment to compliance.

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<tbody>
<tr>
<td>01.1</td>
<td>Marpol = International Convention for the Prevention of Pollution from Ships</td>
<td>To ensure such contractual compliance, with all mitigation proposals, relevant to the Project, that are described in this Application, or reflected in all other Owner generated documents listed in Appendix A to this Assessment Report or otherwise defined in this Table.</td>
<td>Construction, Operation, Maintenance</td>
<td>TPA, Terminal Operator</td>
<td>VPA, Fraser River Port Authority</td>
<td></td>
<td>Pre-construction</td>
<td>Owner</td>
</tr>
</tbody>
</table>

**Notes:**

1. By the "Owner" is understood to mean the applicant for an environmental assessment certificate (Certificate) pursuant to CEAA (in vancouver Point Authority – VPA) and to whom the Certificate may be issued. Any tender of commitments and assurances in this Appendix B is by the Owner & is a selected third party, such as the current terminal operator (TSI Inc.), must comply with all conditions of the Certificate. A partial but transferable of the Certificate and its conditions to TSI, if contemplated – as the new “Owner” – requires a new issuance for the holder of the Certificate and necessitates an Assessment to the Certificate. The Owner has also confirmed that its Secretary of Federal Impact and Mitigation Measures in Section 20 of the EA Application - Table 2.1. The current commitments in Table 2.1 are superseded by this Appendix B. The Owner’s written assurance is given in accordance with the Certificate of Amalgamation issued under Part 5.1 of the EA Application Management Regulations pursuant to the Canada Marine Act and having an effective date of January 1, 2008. The Vancouver Fraser Port Authority, the Fraser River Port Authority, and the Port of Vancouver Authority.

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3. The Port confirms commitment to compliance.
APPENDIX B
Roberts Bank East Causeway Habitat Compensation Project
Construction Environmental Management Plan
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Appendix 1: Relevant sections of the CCA Best Practices Guide to Solid Waste Reduction.

LIST OF ATTACHMENTS

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ATTACHMENT 2: FISHERIES ACT S. 35(2) AUTHORIZATION No 02-HPAC-PA1 - 000-000144-2 (2008)

ATTACHMENT 3: Roberts Bank East Causeway Habitat Compensation drawings

ATTACHMENT 4: SPILL REPORTING REGULATION

ATTACHMENT 5: A Field Guide to Fuel Handling, Transportation & Storage

ATTACHMENT 6: DLC Waste Management Toolkit
1.0 Introduction

Double M Excavating has been retained by the Vancouver Fraser Port Authority (VFPA) to build the Roberts Bank East Causeway Habitat Compensation Project (Attachment 1). Consistent with the VFPA’s environmental requirements and conditions for the project, the following construction environmental management plans (EMPs) have been prepared:

- Air Quality Mitigation Plan (AQMP)
- Marine Water Quality Plan (MWQP)
- Hazardous Waste Management and Spill Control Plan (HWMSCP)
- Solid Waste Management Plan (SWP)
- Noise Management Plan (NMP)

The content of these plans was developed on the basis of environmental performance criteria and management strategies outlined in the following documents:

- Appendix 1, Environmental Requirements and Conditions, Table 1. Marine Construction Environmental Management Plans, pages 2 to 10. This document was issued as part of the construction tender documents (General Conditions, May 2009).

- Appendix E, Owner’s Table of Commitments and Assurances. Status Update as of May 31, 2009. This document was downloaded from the Deltaport Third Berth website.


- FISHERIES ACT S35(2) AUTHORIZATION No 02-HPAC-PA1-000-000144, as provided in VFPA tender documents for the east causeway.
2.0 Project description

Construction will begin in September 2009 and may take up to 15 months to complete. The following tasks will be undertaken in support of the project:

- Sheet pile wall installation along the causeway within 3 m of the existing asphalt.
- Removal of existing slope protection, upland and foreshore substrates to a distance of up to 50 m from the existing causeway. This will include the removal of vegetation, shrubs, grasses, timber, logs and wood waste in compensation area.
- Barging excavation spoils offsite for ocean disposal and / or re-use by a local aggregate supply company.
- Installation of new slope protection, with a combination of imported materials and existing materials in suitable condition for re-use onsite.
- Construction of barrier islands reinforced with riprap and filter stone, which will be covered with growing medium.

1 Double M has retained Westshore Constructors Ltd to install the sheet pile wall.
o Creation of a salt marsh channel between the barrier island and the sheet piles. This channel will be underlain with filter stone and overlain with marsh soils.

o Creation of sand / mud beaches with boulder clusters.

o Creation / reinstatement of a continuous 4 m pull out adjacent to the causeway.

o Marsh and shoreline planting.

o Road restoration (e.g. re-paving) as required.

This list of construction activities was also used to identify suitable content for the EMPs.

3.0 Air quality mitigation plan

The Air Quality Mitigation Plan (AQMP) identifies potential air quality impacts that may arise during construction, and outlines mitigation measures to address these potential impacts. In the context of the Robert’s Bank east causeway project, dust and combustion emissions from diesel and / or gas powered vehicles and stationary equipment are of most concern. Asphalt re-instatement and paints would also result in localized volatile chemical emissions.

3.1 VFPA mitigation measures and commitments

The VFPA\(^2\) has developed the following general air quality protection requirements for the east causeway project:

o On-road low sulphur diesel fuel must be used in all equipment capable of using such fuel.

o Diesel particulate filters must be used on all construction equipment capable of supporting their use.

\(^2\) VFPA (pg 3, Appendix 1: Environmental Requirements and Conditions, Table 1.Marine Construction Environmental Management Plans, May 2009)
Covered vehicles are required when transporting bulk fine materials to the project area.

Paved areas need to be cleaned on a routine basis to prevent the accumulation and mobilization of dust. Speed limits should be also implemented to reduce dust mobilization.

Site specific worker education programs must be developed to address:
- Idling reduction (automatic anti-idling shut-off where feasible)
- Operation of equipment at optimum rated loads
- Routine equipment inspection and maintenance
- Reducing worker trips (e.g. carpooling)
- Daily inspections to identify dust and equipment exhaust issues.

In addition to establishing the mitigation measures show above, the VFPA has committed to the following strategies as described in Appendix E Owner’s Table of Commitments and Assurances (May 2009):

- The use (where feasible) of 1997 or later model shore based equipment and vehicles to reduce particulate matter (PM), hydrocarbon and nitrous oxides (NOₓ) emissions.

- Compliance with the Canada Wide Standards\(^3\) (CWS) for air quality, particularly 'Annex A' during construction and operation. Relevant CWS standards for the east causeway project emphasize managing PM\(_{2.5}\)\(^4\).

- The use of applicable sections of MetroVancouver’s Air Quality Management Plan (2005) and/or provincial and federal air quality objectives to guide air quality mitigation strategies.

---

\(^3\) The Canada Wide Standards are considered objectives under the Canadian Environmental Protection Act (CEPA).

\(^4\) PM\(_{2.5}\) - particles ≤2.5 microns in diameter and including dust, dirt, soot, smoke, and liquid droplets. Sources of fine particles include combustion activities (motor vehicles, power plants, wood burning). US EPA [http://www.epa.gov/pmdesignations/faq.htm#0](http://www.epa.gov/pmdesignations/faq.htm#0)
3.2 Site specific mitigation measures

Consistent with the above objectives Double M plans to use the following 1997 or later model excavating and trucking equipment onsite:

- HITACHI EX600H-5 2001
- JOHN DEERE 450LC 1999
- KOMATSU PC300LC-6 1997
- VOLVO EC290B LC 2004
- SAMSUNG SE240LC-3 1998
- CAT 320B 2000
- KOMATSU PC200LC-6 LONG REACH 1997
- JOHN DEERE 310 SJ rubber tire backhoe 2008
- PETERBILT truck with end dump 2008
- KENWORTH truck with end dump 1998
- KENWORTH tandem dump truck 2008

- Double M and its sub contractor(s) will assess the potential for dust generation and combustion emissions on an ongoing site or task specific basis during construction. Steps will be taken to minimize dust and combustion emissions as needed.

- Visual assessments of dust and exhaust emissions will be completed on an ongoing basis during work and / or while machinery is operating.

- Double M and its sub contractor(s) will use water trucks to control dust as needed and will ensure that sediment laden water generated through dust suppression does not enter the aquatic environment without prior holding and settling or filtration.

- As required, covered vehicles will be used to transport fine materials.

- To start a maximum speed limit of 50 km / hour will be established in working areas. This limit will be adjusted as necessary to control dust mobilization.
Worker education with respect to engine idling, equipment operation and other site specific measures to protect air quality (e.g. ongoing visual assessments of dust generation) will be provided at project start up and on an ongoing basis to ensure new staff understand site requirements.

- The sheet pile contractor plans to use a low volatile organic compound (VOC) primer on sheet piles. Consistent with the ports specifications Painting Exterior Metal Surfaces, Section 09 97 19, coatings will be applied offsite.

### 3.3 Air quality monitoring

Air quality monitoring is not anticipated at this time. However, should air quality monitoring become a requirement, sampling protocols will be consistent with methods from the following provincial document:


### 4.0 Marine water quality plan

The Marine Water Quality Plan (MWQP) provides guidance on maintaining water and sediment quality during sheet pile installation, excavation and spoil loading, fill placement, barrier island construction and restoration planting. This document outlines the regulatory framework associated with water quality, planned mitigation measures to protect water quality and recommended water quality monitoring protocols. The MWQP emphasizes routine works and risks to water quality, such as elevated turbidity and suspended solids resulting from foreshore disturbance, changes in pH associated with concrete works and localized effects on water and sediment quality from spills or leaks of hazardous materials.

---

Endura Low VOC MC-Zn Zinc Rich Primer.
4.1 Regulatory framework

A combination of provincial and federal acts, regulations and best practices guide the protection of water and sediment quality in the marine environment. Key acts, regulations and best practices are shown in Table 1.

Table 1. Regulatory framework, best practices and guideline documents for marine water quality.

<table>
<thead>
<tr>
<th>Federal and provincial acts</th>
<th>Relevant regulations and sections</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fisheries Act (Canada)</td>
<td>Section (34) Deposition of a Deleterious Substance</td>
</tr>
<tr>
<td></td>
<td>Section (35) Harmful Alteration, Disruption or Destruction of Fish Habitat</td>
</tr>
<tr>
<td>Environmental Management Act (BC)</td>
<td>Hazardous Waste Regulation- Part 8 storage and transportation; Spill Reporting Regulation (reportable spills)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Guideline documents</th>
<th>Relevant sections</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical Guidance on Contaminated Sites: Characterization and Confirmation Testing (MOE)</td>
<td></td>
</tr>
<tr>
<td>Guideline documents</td>
<td>Relevant sections</td>
</tr>
<tr>
<td>---------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>BC Approved and Working Water Quality Guidelines and CCME Environmental Quality Guidelines</td>
<td></td>
</tr>
</tbody>
</table>

4.2 VFPA turbidity, TSS and pH guidelines

In addition to federal and provincial guidelines, the VFPA has established discharge criteria for turbidity, total suspended solids (TSS) and pH in the east causeway construction areas (VFPA, 2006 and DCL, 2006): These criteria are summarized in Table 2.

---


Table 2. VFPA turbidity, TSS and pH criteria.

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Turbidity (NTU)</td>
<td>When background is ≤ 50 (NTU) the induced turbidity should not exceed 5 NTU above background. When background is &gt; 50 NTU, the induced turbidity should not exceed the background values by &gt;10% of the background value.</td>
</tr>
<tr>
<td>TSS (mg/L)</td>
<td>When background is ≤ 100 mg/L (ppm), the induced TSS should not exceed 10 mg/L above background. When background is &gt; 100 mg/l TSS, the induced TSS should not exceed 10% of the background value.</td>
</tr>
<tr>
<td>pH</td>
<td>6.5 to 9.0</td>
</tr>
</tbody>
</table>

The VFPA turbidity and TSS criteria are reflective of induced measures in the receiving environment and are not applied directly to site discharges, except during wet concrete works, when discharge waters must be <10 NTU and between 6.5 to 9.0 prior to discharge.

4.3 Mitigation measures to protect water quality

As indicated in Section 1 of this MWQP plan, construction activities with some potential to impact marine water quality in the east causeway area include:

- Sheet pile installation
- Foreshore sediment / upland soils excavation
- Infilling with granular material
- Barge grounding
- Hauling
- Temporary storage of spoils and planting medium
- Small spills
- Concrete works
Mitigation measures identified to offset the effects of these activities will include but not necessarily be limited to the following:

- Sheet pile installation and foreshore excavation will generally be undertaken in the dry. This will be the most effective way to limit sediment suspension in foreshore habitats. If work must be undertaken at higher tide levels in wetted areas, Double M will meet with the VFPA’s environmental monitor and their environmental consultant prior to in water work to determine appropriate mitigation measures. These may include, for example, the use of silt curtains to minimize sediment plume mobility.

- The port requires work in the fisheries sensitive period (March 1 to August 15) be completed in the dry, during suitable tides, or inside isolation areas from which fish have been excluded (VPA et al, 2006).

- Sheet pile coatings will be applied offsite, prior to installation. As such, only small quantities will be needed onsite to complete patchwork immediately after steel sheet pile bulkhead walls are installed, and after excavation works in front of the walls are completed. The port has specified that a biodegradable cleaner must be used during repairs (VFPA, April 2009).

- Double M plans to work in sections, completing all work between the existing mudflat and the causeway before moving on to the next section. This will mean, for example, that at the southern end of the causeway, excavation will start at the toe of riprap and crews will work backwards to the barrier island, and continue through the salt marsh channel up to the installed sheet pile. This strategy will help avoid the creation of long lines of exposed areas that would be subject to wave erosion and would locally increase turbidity during higher tides.

- Turbid excavation waters from upland working areas will not be discharged directly to the foreshore. Where feasible (depending on weather, tide levels, discharge volumes) water may be discharged to ground adjacent to the paved road for exfiltration. A series of gravel packed sumps, in combination with trash pumps may also be used to manage turbid discharge. Temporary settling ponds may also be required.
o Salvaged and imported aggregate for slope protection and surficial materials will be clean and free of organics and other fines (General Notes & Design Criteria, Drawing 34-291-151, page 2 of 2). Where required, these materials will also be carefully placed, as opposed to dropped from a height (VPA et al, 2006).

o Barges and other vessels will not be permitted to ground on the foreshore or seabed, although spud barges are acceptable for use (VPA et al, 2006). Vessels using the barge berth will take steps to avoid sediment disturbance associated with propeller wash.

o Inactive spoil and growing medium stockpiles are not anticipated. However, should inactive stockpiles develop and should they have some potential to create air or water quality issues, they will be covered with anchored temporary covers. Stockpiles located on permeable upland areas may also need to be surrounded by keyed in silt fence for additional protection. This would be determined on a case-by-case basis with the environmental monitor.

o Temporary access points will be constructed from angular rock (e.g. 3” minus) where onsite conditions will result in excessive mud formation and mud tracking onto paved surfaces.

o Spills and / or the discovery of suspect contaminated sediments will be managed by implementing the Hazardous Waste Management and Spill Control Plan (HWMSCP). Potential effects on water quality will be mitigated through spill containment and the appropriate disposal of used response materials and affected sediments. Suspect contaminated sediments will be segregated, protected from the elements, and characterized through analytical sampling to determine appropriate disposal strategies.
o Standard containment and wastewater controls for concrete works (concrete cope beam at sheet pile wall) will be implemented as follows:

- Concrete delivery trucks will not be permitted to wash out onsite, although most delivery trucks are equipped with wash out containment so this is not expected to be an issue.

- Concrete will be contained in forms, which will limit the exposed concrete surface area with the potential to impact water quality. As required, temporary plastic covers will be used to cover small areas of exposed concrete. Selected rapid curing agents like Eco-cure™ may also be used with prior approval from the environmental monitor and VFPA.

- CO₂ tanks, hoses and regulators will be maintained onsite and staff will be trained in their use to respond to concrete spills to water.

- Concrete wastewater generated onsite will not be permitted to enter aquatic environments unless it meets the following criteria: <10 NTU and pH between 6.5 and 9.0 (VFPA, 2006). Temporary containment and pH adjustment may be required to achieve these criteria.

### 4.4 Water quality monitoring program

The main parameters of concern for this project are turbidity, TSS and pH. These parameters will be monitored as needed in the receiving environment and a control or background site’ outside of the working area – and will involve taking in situ measurements of pH and turbidity. TSS samples will also be collected if necessary. Corrective measures will be implemented as required on the basis of in situ pH and turbidity results.

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As per the Fisheries Act Authorization: background or control sites – background is considered the concentration or measure for a given parameter (e.g. turbidity) at a site which is unaffected by construction or any discharge from the construction site.
5.0 Hazardous Waste Management and Spill Control Plan

The Hazardous Waste Management and Spill Control Plan (HWMSCP) provides guidance on managing hazardous materials. Hazardous materials have the potential to affect soil, water and sediment quality and hazardous wastes are prohibited from routine disposal. Examples of hazardous wastes that may be associated with the east causeway project include used oils, hydraulic fluids, sheet pile coatings, concrete wastewater and spent solvents. Contaminated soils and absorbent materials used to clean up spills would also be considered hazardous waste. As required by the VFPA8 this HWMSCP outlines the following:

- Provincial and federal regulatory framework dictating hazardous materials management
- Strategies and general guidelines for managing hazardous materials
- Spill preparedness and response requirements
- Emergency contact list
- General guidelines for fuel management and fueling.

5.1 Regulatory framework

A combination of provincial and federal acts, regulations and best practices guide the storage, transportation and disposal of hazardous materials. These are shown in Table 3.

---

Table 3. Regulatory framework guiding hazardous materials management in BC.

<table>
<thead>
<tr>
<th>Federal and provincial acts</th>
<th>Relevant regulations and sections</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Management Act (BC)</td>
<td>Contaminated Sites Regulation - Part 7 Liability</td>
</tr>
<tr>
<td></td>
<td>Hazardous Waste Regulation- Part 8 storage and transportation</td>
</tr>
<tr>
<td>Fire Services Act: British Columbia Fire Code Regulations</td>
<td>Fuel dispensing and storage requirements</td>
</tr>
<tr>
<td>Public Health Act (BC)</td>
<td>Part 4, Section 15: reporting of toxic spills</td>
</tr>
<tr>
<td>Transportation of Dangerous Goods Act (Canada)</td>
<td>Section (5) Safety Requirements, Standards and Marks</td>
</tr>
<tr>
<td></td>
<td>Section (7) Emergency Response Assistance Plan requirements</td>
</tr>
<tr>
<td></td>
<td>Section (8) Means of containment</td>
</tr>
<tr>
<td></td>
<td>Section (18) Duty to Respond (report)</td>
</tr>
<tr>
<td></td>
<td>Section (23) Disclosure of information</td>
</tr>
<tr>
<td>Transportation of Dangerous Goods Act (BC)</td>
<td>Parts (2,4) Requirements for appropriate product labelling</td>
</tr>
<tr>
<td></td>
<td>Duty to report discharge</td>
</tr>
<tr>
<td></td>
<td>Dangerous Goods Shipping Documentation (all marine pollutants and flash points of Class 3 flammable products must be identified in the documents)</td>
</tr>
<tr>
<td>Canadian Environmental Protection Act (CEPA) (Canada)</td>
<td>In the ocean disposal context:</td>
</tr>
<tr>
<td></td>
<td>Schedule 1 – List of toxic substances</td>
</tr>
<tr>
<td></td>
<td>Schedule 5 – Waste or other matter</td>
</tr>
<tr>
<td>Fisheries Act (Canada)</td>
<td>Section (32) Destruction of Fish</td>
</tr>
<tr>
<td></td>
<td>Section (34) Deposition of a Deleterious Substance</td>
</tr>
<tr>
<td></td>
<td>Section (35) Harmful Alteration, Disruption or Destruction of Fish Habitat</td>
</tr>
</tbody>
</table>
Table 3. Regulatory framework guiding hazardous materials management in BC, continued.

<table>
<thead>
<tr>
<th>Guidelines, BMPs and Technical Guidance</th>
<th>Relevant sections</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Field Guide to Fuel Handling, Transportation and Storage</td>
<td>Design, Operations, Transportation Documentation and Training Small containers - labeling, storage and dispensing Small TDG tanks Large TDG tanks Spill Response</td>
</tr>
<tr>
<td>Technical Guidance on Contaminated Sites: Characterization and Confirmation Testing (MOE)</td>
<td>In situ characterization and confirmation sampling, sampling guidance for suspect material, stockpile sampling procedures and data interpretation.</td>
</tr>
</tbody>
</table>

### 5.2 Hazardous materials management strategies

Effective hazardous materials management strategies include:

- Preparing inventories of chemicals that will be used, or have the potential to be used onsite. Inventories should include anticipated volumes and types of materials and Material Safety Data Sheets (MSDS).

- Providing appropriate storage and general guidelines for use of hazardous materials.

- Conducting an overview assessment of risks associated with spills of known hazardous materials used in working areas. This requires the contractor to evaluate the potential hazards of working with specific chemicals, in association with a particular task, in a particular area.
Developing and posting spill prevention plans. Such plans would include guidelines for daily use and overnight fuel storage, as well as designated waste storage areas for oils, solvents, concrete and other potentially hazardous products. These plans also include guidelines for managing suspect or known contaminated materials.

Developing and posting spill preparedness and response plans for chemicals in use onsite. These plans should include, at a minimum, information on appropriate spill response equipment, communications and response plans.

### 5.3 Inventory of chemicals

Potentially hazardous materials anticipated for use in the east causeway excavation program generally include small quantities of antifreeze, hydraulic oils, degreasers, sheet pile paint, concrete, gasoline and diesel fuel. Oil and grease products anticipated for use include the following:

- Chevron DELO SHP SAE 15W-40 (Diesel engine oil)
- Chevron AW46 (Hydraulic oil)
- Chevron Supreme High Mileage 10W-40 (Motor oil)
- Chevron RPM 2 (Grease)

Fuel will be stored onsite in a combination of small containers for daily use (e.g. jerry cans) and in truck box tidy tanks ($\leq 400$ L) equipped with automatic shut off. Given the tanks will be truck mounted, they will not be onsite full time, and will be protected from potential damage. Double M will formalize the list of chemicals anticipated for use once they and their sheet pile subcontractor have mobilized to the site. MSDS for each chemical will be compiled in one or more binders and will be kept in designated hazardous materials storage areas for quick reference. Note Double M is investigating alternatives to traditional petroleum hydrocarbon based products.

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9 Note Double M will investigate opportunities for using vegetable based fluids in their machinery prior to mobilizing onsite.
5.4 Storage and use of hazardous materials

Where feasible and applicable, Double M and its subcontractors will follow these general guidelines for storage and use of hazardous materials in construction areas (Gibb et al., 1999):

- Outdoor storage will be secured when unmanned, and storage of hazardous or potentially hazardous materials will ideally be arranged so that stored products are away from vegetated areas and there is $\geq 6$ m between stored products, uncontrolled grasses or weeds, and fuel dispensers.

- Storage areas and containers will be regularly inspected for leaks, poor condition, inadequate seals and other problems that may result in the spill or release of a hazardous substance.

- Personnel will read and follow the directions for all products, and have easy access to MSDS for all hazardous material onsite.

- Products will be stored in their original containers and their labels maintained in good condition; labels will be protected with transparent tape as necessary.

- As needed and where safe to do so, a correctly sized funnel will be used to transfer hazardous materials from one container to another.

- Personnel will avoid mixing chemicals unless specified by the manufacturer, and will use chemicals as specified on labels, in well-ventilated areas.

- Corrosives will be stored away from flammables.

- Re-useable or recycled degreasers will be used where possible or appropriate to machinery and equipment.
5.5 Overview assessment of risks

Risks to water, soil and sediment quality in the east causeway working area would primarily include spills to ground or water, as a result of leaking or failed hydraulic lines, improper storage of daily use fuels, lubricants and paints, and failed wet concrete containment.

Spills to ground could result in localized soil contamination, which would require spill response, excavation and segregation of contaminated soils, followed by offsite disposal of used spill response gear and soils consistent with the Environmental Management Act.

Spills to water could result in localized exceedences of provincial water quality guidelines and criteria under the Contaminated Sites Regulation (CSR). Spills to water could also result in localized effects on sediment. In both cases, spill response would be required. Excavation and segregation of contaminated sediments, as well as offsite disposal of spill response materials and sediments would be required.

5.6 Spill prevention

Spill prevention strategies for the east causeway project will include the following:

- Daily inspections of machinery for leaks, cracked hoses and other conditions that may result in spills. Contractors will also ensure external equipment surfaces are free of oil, diesel and other potential contaminants prior to use.

- Routine inspections of storage areas and containers for leaks, poor condition, improper seals and other problems that may result in the release of a hazardous substance.

- Storage of daily use fuels, lubricants and other chemicals ≥ 15 m away from the Highest High Water Level (HHML)\(^{10}\), over impermeable areas and / or in lined, leak proof containers. Temporary covers will be used as needed to prevent rainfall from pooling in daily use storage containers.

\(^{10}\) As per Section 21 of Fisheries Act Authorization 02-HPAC-PA1 -000-000144.
Daily use chemicals will be stored onsite in a locked container or will be taken offsite at the end of each workday.

Fuelling and equipment maintenance will be undertaken ≥ 15 m away from the foreshore wherever possible. In the event this becomes impractical or impossible to achieve, a fuelling and equipment maintenance area will be established in consultation with the environmental monitor and the VFPA.

Written procedures for the proper use and storage of chemicals will be provided as needed, depending on the potential risks associated with each chemical, anticipated frequency of use and any special handling requirements.

Based on the results of Hemmera’s May 2009 soil and sediment sampling conducted along the east causeway\footnote{Samples were collected from 20 different test pit areas along the causeway and analysed for PAH (not detected), cadmium (<0.16 ppm), lead (not detected <30 ppm) and mercury (<0.02 ppm). (VFPA, May 2009).} contaminated media are not expected in the project area. However, should localized areas of soil or sediment contamination be discovered these materials will be segregated and either trucked offsite immediately or temporarily stored onsite. Materials stored onsite will be located on impermeable surfaces and protected with temporary covers (e.g. poly, tarps etc.) to prevent losses and contaminant migration associated with wind and rainfall.

5.7 Spill preparedness

Written spill response procedures and communications protocols will be posted at conspicuous locations onsite. Personnel should know the locations of the spill kits in each working area and be trained in their use prior to construction. Spill kits will be appropriate to the types of hazardous materials and anticipated spills onsite (e.g. smaller hydrocarbon spills).

Machine operators will generally have onboard spill kits. However, one larger spill kit should also be available at each working area. At a minimum we recommend larger kits contain: (50) absorbent pads, (4) booms, (1) bag granular absorbent, (4) disposal bags, (1) stop leak plug, personal protective equipment, (1) roll duct tape, flagging, tarps, up to 80 empty sand bags, instructions and list of contents.
Spill kits will need to be restocked after use. BC rated fire extinguishers, pointed and/or broad shovels, nylon rope (100 m) and recovery / storage drums should also be available for use onsite (Ministry of Water, Land and Air Protection, 2002). Finally, the province recommends keeping between 250 mL and 1 Liter of commercial, dry or pre-mixed bentonite clay onsite to plugholes in leaking containers during spill response (MWLAP, 2002).

5.8 Spill response

Double M and its subcontractors will develop and post spill response plans prior to construction. These plans will include but not be limited to the following procedures:

- Confirm the safety of all personnel and secure the area (as needed)
- Eliminate ignition sources
- Identify spilled product, associated hazards and clean up requirements (refer to MSDS if uncertain).
- Contact site supervisor (Anne Tenbrink)
- Determine if the spill can be contained and cleaned up by onsite staff. Spills that cannot be managed by onsite personnel should be directed to the Port and other agencies identified in cooperation with the Port.
- Stop the flow of spilled materials if safe to do so.
- Contain spilled materials if safe to do so.
- Clean up and dispose of spilled product and used response materials consistent with the Environmental Management Act, Hazardous Waste Regulation.
• Notify the Environmental Protection Division of Environment Canada and the Provincial Emergency Program (PEP) in the event of a reportable spill, as defined by the Spill Reporting Regulation of the Environmental Management Act (see Attachment 3).

  - Spills of flammable Class 3 Liquids like gasoline or fuel oil that are ≥ 100 L are reportable.

  o Investigate causes of the spill and identify required changes to hazardous materials management strategies and spill response plans.

  o Complete spill reporting forms ensuring the following information is provided:

    • Name of the person(s) reporting the spill
    • Witnesses of the spill
    • Date, time and location of the spill
    • Source of spill
    • Type and estimated volume of product
    • Nature of the receiving environment (e.g. soil, water)
    • Spill response measures
    • Estimated volume recovered
    • Impact of the spill on terrestrial and / or aquatic resources
    • Required remediation, if any
    • Measures take to prevent similar spills in future
    • Agencies made aware of the spill (as needed).

A list of contacts and emergency numbers for managing and responding to spills is provided in Table 4.
### Table 4. Contact list for spill response.

<table>
<thead>
<tr>
<th>Contact person</th>
<th>Role / reason for contact</th>
<th>Phone Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anne Tenbrink</td>
<td>Superintendent, Double M Excavating</td>
<td>Cell 604 240 3584 Office 604 467 4792</td>
</tr>
<tr>
<td>Donna Salmi,</td>
<td>Engineering support, Double M Excavating</td>
<td>Cell 778 549 6007 Office 604 467 4792</td>
</tr>
<tr>
<td>Juergen Baumann</td>
<td>Manager, Environmental Programs Port Metro Vancouver</td>
<td>Office 604 665 9081 Cell 604 603 8110</td>
</tr>
<tr>
<td>Patrick Craig</td>
<td>Environmental Coordinator, Assessment and Monitoring, Environmental Programs</td>
<td>Office 604 665 9121 Cell 778-231-6953</td>
</tr>
<tr>
<td>Provincial Emergency Program (PEP)</td>
<td>Spills of hazardous materials under the Spill Reporting Regulation</td>
<td>1 800 663 3456</td>
</tr>
<tr>
<td>Environmental Protection Service - Environment Canada</td>
<td>Spills of hazardous materials under the Spill Reporting Regulation</td>
<td>604 666 6100</td>
</tr>
<tr>
<td>CANUTEC</td>
<td>Emergencies involving dangerous goods</td>
<td>613-996-6666 or *666 by cell phone.</td>
</tr>
<tr>
<td>Canadian Coast Guard (CCG)</td>
<td>Clean up assistance</td>
<td>1 800 889 8852</td>
</tr>
<tr>
<td>DFO RADIO ROOM CONTACT</td>
<td>-</td>
<td>604-666-3500</td>
</tr>
<tr>
<td>Corporation of Delta</td>
<td>Climate Action &amp; Environment, spill reporting</td>
<td>604 946 3253</td>
</tr>
</tbody>
</table>
5.9 General guidelines for fuel management and equipment fuelling

Double M and its subcontractors will follow these general guidelines for fuel management and the fuelling of trucks and other machinery where applicable (Ministry of Water, Land and Air Protection, 2002; Triton, 2005):

Fuel management

- Fuel containers must be labeled as per the Workplace Hazardous Materials Information System (WHMIS) and consistent with the Fire Code (FC Section 4.2.3.2.) - as necessary.

- Small containers (≤ 230L as per MWLAP 2002) that are used to store flammable or combustible liquids must meet design specifications of the Fire Code (FC Section 4.2.3.1.).

- Small TDG tanks (< 454L) must be designed, built, filled and sealed so that under normal handling and transport conditions, no discharge, emissions or escape of the dangerous goods that could endanger the public will occur.

- While above ground fuel tank storage is not expected, secondary containment will be required for truck-box fuel tanks that are > 230L and removed from the truck or other vehicle and operated in a fixed location for any length of time. (FC 4.3.7.1.) Important note: secondary containment must have a capacity of ≥110% of the holding tank.

  - In the unlikely event that onsite fuel tank storage is required, tanks and onsite storage will comply with the provincial Fire Code, the CCME Environmental Code of Practices for Aboveground Storage Tank Systems Containing Petroleum Products (August 1994) and A Field Guide to Fuel Handling, Transportation and Storage (MWLAP, 2002)

- Containers must be maintained in good condition – with no evidence of rust, damage or leaks. Containers must also be adequately sealed with proper fitting lids, caps, bungs or valves to prevent spills and leaks.
Hoses and nozzles used for dispensing fuel should be maintained in good repair.

Maintenance and operating procedures will be established and posted to prevent spills. (FC 4.1.6.3.)

**Fueling and servicing procedures**

- Construction personnel will monitor all fuel dispensing.
- Engines will be shut off and smoking will be prohibited during fuelling.
- Fuel transfers must be stopped prior to overflowing to leave room for expansion. Small TDG tanks must not be filled beyond a level corresponding to 90% capacity.
- Trucks, machines and other equipment must be fuelled ≥ 15 m away from the HHWL preferably over an impermeable surface (e.g. concrete).
- Equipment must be serviced ≥ 15 m away from aquatic or otherwise sensitive habitats. Drip pans and / or other protective devices should be used to prevent spills of petroleum products and other potentially hazardous liquids (e.g. antifreeze) during servicing.
- Contractors will contain fuel losses during fuelling or servicing of equipment and will inspect fuel-dispensing equipment for leaks.

### 6.0 Solid waste management plan

This Solid Waste Management Plan (SWMP) provides guidance on managing *non-hazardous waste* such as untreated wood, food waste, packing materials, broken concrete, damaged rebar and other non hazardous wastes common to construction. For information on managing potentially hazardous materials, like oily rags, used spill response gear or wood waste with an oily residue or appearance, see the Hazardous Waste Management and Spill Response Plan (HWMSP) in Section 5.0. This SWMP provides guidelines for developing site-specific solid waste management plans.
Relevant sections of the Canadian Construction Association’s (CCA’s) Best Practices Guide to Solid Waste Reduction (2001) are summarized in Appendix 1. Metro Vancouver’s Demolition, Land Clearing and Construction (DLC) Waste Toolkit is provided in Attachment 4. This toolkit provides information on wastes prohibited from routine landfill disposal and identifies facilities that will accept selected construction wastes for re-use and recycling.

### 6.1 Regulatory and best practices framework

Solid waste is managed through a combination of provincial law and regional district prohibitions. The CCA has also developed guidelines for the reduction, re-use and recycling of selected construction materials. The regulatory framework and applicable BMPs are shown in Table 5.

#### Table 5. Provincial legislation, regional prohibitions and industry BMPs for solid waste management.

<table>
<thead>
<tr>
<th>Acts, regional prohibitions and industry BMPs</th>
<th>Relevant sections</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metro Vancouver</td>
<td>Selected materials banned from disposal via landfill: e.g. corrugated cardboard, styrofoam packing materials, PVC pipe, batteries, gypsum, asphalt, concrete, tires.</td>
</tr>
<tr>
<td>CCA (2001) A best practices guide to solid waste reduction</td>
<td>Opportunities to reduce, reuse and recycle at different stages of construction or demolition, and for specific materials.</td>
</tr>
</tbody>
</table>

### 6.2 Solid waste management planning

For the East causeway project, solid waste management plans will emphasize effective waste containment and disposal measures to:

- Limit potential effects on scavenging wildlife.
- Ensure hazardous materials do not enter the landfill disposal stream.
- Encourage re-use and recycling where feasible.
SWMPs should include or be reflective of the following where appropriate:

- Inventory of expected waste types (e.g. wood, metals, cardboard) and rough anticipated volumes to identify onsite bin requirements.

- Suitable locations for disposal bins, which should be near active construction areas for convenient use. Secured and/or covered bins should be used to prevent wildlife access and the spread of garbage via wind as needed.

- Information (as needed) on sorting and storage requirements of specific wastes or materials that can be reused or recycled. Bins should be properly labeled and located in easily accessible areas to encourage reuse and recycling, and to ensure materials destined for landfill disposal are properly stored.

- Daily site cleaning and routine inspections of recyclables and waste disposal storage areas to make sure materials are correctly sorted and placed in the proper bins.

- Routine solid waste and recyclables pickup schedules.

- Employee and subcontractor training on site-specific waste management strategies. In particular, employees and subcontractors should be made aware of materials that are banned from landfill disposal, including hazardous wastes.

Site-specific waste management plans should be posted at each worksite for reference as needed.

### 6.3 Re-use of onsite materials

Where materials are in suitable condition for re-use Double M will salvage existing slope protection materials for use in the habitat compensation works. Double M is also investigating opportunities for offsite uses of spoil generated through excavation. This will ideally divert substantial volumes of spoil from disposal at sea. In addition, Double M will segregate clean wood (logs, stumps etc.) suitable for use in habitat compensation projects and move it to their Maple Ridge site for storage.
7.0 Noise management plan

The Noise Management Plan (NMP) outlines applicable noise bylaws, best practices and potential noise reduction measures to minimize the effects of construction noise. Noise modeling conducted for the original impact assessment for the Deltaport Third Berth project indicated no significant impacts\(^\text{12}\) on noise levels at local residential areas were expected. Additionally, noise levels were not expected to exceed external noise thresholds at any of the residential sites studied as part of the assessment (VPA, 2005). Although significant noise impacts are not anticipated, contractors are required to implement noise mitigation measures when needed. The VFPA has committed to Noise Management Planning for all phases of construction, including the east causeway habitat compensation project, and has established a 24-hour help line for the general public to express their concerns (VFPA, 2009).

7.1 Noise bylaws and criteria

Noise bylaws and criteria relevant to the east causeway project include:

- Corporation of Delta (COD) Noise Control Bylaw No. 1906, 197210, which outlines construction-timing restrictions.
- National Guidelines for Environmental Noise Control (NGENC) Health and Welfare Canada, Environmental Health Directorate, Health Protection Branch, March 1989, which outlines noise thresholds, such as Leq noise level of 45 dBA for interiors where spoken communication is important and an Leq of 40 dBA for bedrooms to prevent sleep disturbance (VPA, 2005).
- Workers Compensation Board BC Occupational Health and Safety Regulation, Part 7, Noise Exposure\(^\text{13}\) – workers must not be exposed to noise levels that exceed 85 dBA \(L_{eq}\) daily noise exposure level or 140 dBC peak sound level.

\(^{12}\) Described as <1 decibel increase above ambient conditions.

\(^{13}\) Part 7, Noise exposure also provides guidelines for noise measurement programs, Noise control and hearing conservation program, Hearing protection and warning signs.
Under the Noise Control Bylaw the Corporation restricts construction noise as follows:

- Monday to Friday prohibited before 7:00 am and after 7:00 pm.
- Saturday noise prohibited before 9:00 am and after 5:00 pm.
- Construction noise prohibited on Sundays.

Double M will make all reasonable efforts to complete the project consistent with the Corporation’s criteria. For example, construction is not anticipated on Sundays. Where feasible work will be scheduled between Monday and Friday, 7:00 am. to 7:00 pm and on Saturdays between 9:00 am and 5:00 pm. We note however the need to work during low tides will dictate Double M’s work schedule and will necessitate night-time work.

Noise mitigation measures will be implemented as necessary to limit potential effects of nighttime construction noise. The implementation of construction noise mitigation measures, in combination with worker hearing protection and other measures to protect worker health and safety are expected to address the NGENC and the requirements of the Occupational Health and Safety Regulation.

### 7.2 Mitigation measures

Examples of noise mitigation measures that may be implemented during the east causeway project include:

- Developing a construction noise awareness training program for all personnel addressing site specific and generic construction noise issues, potentially sensitive noise receptors, relevant noise bylaws and performance criteria.

- Preparing and submitting a list of equipment, prior to construction, to evaluate potential noise impacts. Examples of noise ratings for construction machinery are provided in Table 6.
• Selecting less noisy machinery, vehicles and equipment for use onsite wherever possible. Newer equipment, and/or equipment with noise suppression features like exhaust silencers on air tools should be evaluated for use onsite.

• Equipment should be kept in good order, emphasizing lubrication, replacement of worn parts and the condition of exhaust systems. Diesel and gas powered equipment should be routinely inspected and equipped with higher quality mufflers where possible.

• Locating noisy equipment (e.g. portable generators) away from sensitive noise receptors, such as construction personnel or nearby shoreline areas frequented by birds.

• Muffling back up beepers where safe and feasible to do so.

• Shutting off equipment that is not in use and operating equipment at the minimum speeds permitting effective operation, with hoods and shields closed (GVTA, 2004).

• Enforcing speed limits to reduce vehicle noise. This will also help reduce dust mobilization.
Table 6. Examples of noise ratings and equipment age (from Gilchrist et al. 2003).

<table>
<thead>
<tr>
<th>Equipment</th>
<th>New equipment</th>
<th>Old equipment (&gt;5 yrs old)</th>
</tr>
</thead>
<tbody>
<tr>
<td>compressor</td>
<td>73</td>
<td>76-80</td>
</tr>
<tr>
<td>backhoe</td>
<td>75-80</td>
<td>83-88</td>
</tr>
<tr>
<td>concrete mixer</td>
<td>75</td>
<td>85-87</td>
</tr>
<tr>
<td>concrete pump</td>
<td>75</td>
<td>82-85</td>
</tr>
<tr>
<td>concrete saw</td>
<td>90</td>
<td>n/a</td>
</tr>
<tr>
<td>concrete vibrator</td>
<td>75</td>
<td>76-80</td>
</tr>
<tr>
<td>crane</td>
<td>75</td>
<td>85-90</td>
</tr>
<tr>
<td>bulldozer</td>
<td>75</td>
<td>83-88</td>
</tr>
<tr>
<td>dump truck</td>
<td>84</td>
<td>85-88</td>
</tr>
<tr>
<td>excavator</td>
<td>83</td>
<td>85-87</td>
</tr>
<tr>
<td>grader</td>
<td>72-75</td>
<td>85-90</td>
</tr>
<tr>
<td>jackhammer</td>
<td>75-80</td>
<td>85-90</td>
</tr>
<tr>
<td>loader</td>
<td>80-85</td>
<td>92-95</td>
</tr>
<tr>
<td>paver</td>
<td>80-85</td>
<td>95-101</td>
</tr>
<tr>
<td>rock drill</td>
<td>80-85</td>
<td>95-98</td>
</tr>
<tr>
<td>roller</td>
<td>80</td>
<td>88-90</td>
</tr>
<tr>
<td>scraper</td>
<td>78-83</td>
<td>96-98</td>
</tr>
<tr>
<td>tractor</td>
<td>75</td>
<td>85-90</td>
</tr>
<tr>
<td>trencher</td>
<td>83-88</td>
<td>n/a</td>
</tr>
<tr>
<td>vibratory rollers</td>
<td>95</td>
<td>n/a</td>
</tr>
</tbody>
</table>

8.0 References


Fisheries and Oceans Canada (2006) FISHERIES ACT S. 35(2) AUTHORIZATION Authorization No 02-HPAC-PA1 -000-000144.

Fisheries and Oceans Canada (2008) FISHERIES ACT S. 35(2) AUTHORIZATION Authorization No 02-HPAC-PA1 -000-000144-2 provided by the VFPA


VFPA (May 2009) Roberts Bank East Causeway Habitat Compensation VANCOUVER, B. C. CANADA ADDENDUM NO. 4 (Hemmera soil and sediment sampling results)


VFPA (2009) ROBERTS BANK EAST CAUSEWAY Section 09 97 19
HABITAT COMPENSATION PAINTING EXTERIOR METAL SURFACES

VFPA (2006) PROJECT ENVIRONMENTAL MANAGEMENT PLAN DELTAPORT BERTH 3 MARINE WORKS DELTAPORT CONSTRUCTORS LTD. (DCL)


USEPA (accessed 2009). Fine Particle (PM$_{2.5}$) Designations.
http://www.epa.gov/pmdesignations/index.htm
Appendix 1: Relevant sections of the CCA Best practices guide to solid waste reduction.

Contractors are encouraged to consider the following guidelines when working on the east causeway project: (RTP, 1999c):

**Reduce:**
- Identify and implement construction methods that result in less waste.
- Identify practices with the potential to generate unacceptable volumes of waste.
- Purchase materials with less packaging and other materials that will contribute to onsite waste streams.
- Purchase materials with the dimensions required by the project, this would help prevent unused construction materials from entering the waste stream.

**Reuse:**
- Identify construction materials with potential for re-use.
- Separate materials that can be re-used onsite and store in protected areas.
- Identify local markets for re-usable materials.

**Recycle:**
- Identify construction waste that may be recycled and used either on or offsite.
- Segregate materials that can be recycled and store them in protected areas.
- Use recycled construction materials where feasible, practical and consistent with contract specifications.

---

14 From Section 12.0 Solid Waste Management Plan Richmond • Airport • Vancouver Rapid Transit Canada Line. Construction Environmental Management Plan (Triton, 2005).
Comply with local government initiatives and prohibitions with respect to preventing recyclables from entering the solid waste stream.

Identify local markets for recyclable materials.

**Strategies for metals**

Metals waste generally includes, but is not limited to, structural steel, steel studs and tacks, re-bar, electrical and mechanical systems, flashing and aluminum siding (CCA, 2001). Contractors are encouraged to identify metals recycling facilities that provide recycling bins, haulage and segregation of ferrous and nonferrous metals. Simple metals waste management strategies are shown in Table A1 (CCA, 2001).

**Table A1. Reduce, reuse and recycling strategies for metals.**

<table>
<thead>
<tr>
<th>Reduce</th>
<th>Order materials efficiently to limit waste</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Measure and cut accurately</td>
</tr>
<tr>
<td></td>
<td>Maintain an inventory of surplus materials to reduce over-supply at other sites</td>
</tr>
<tr>
<td>Reuse</td>
<td>Store cuttings in designated area for reuse</td>
</tr>
<tr>
<td></td>
<td>Remove surplus materials and use them at other sites, where feasible</td>
</tr>
<tr>
<td>Recycle</td>
<td>Investigate pick up and hauling options for metals</td>
</tr>
</tbody>
</table>

**Strategies for asphalt**

Sources of asphalt include stripped road surface from parking areas and road surfaces. Potential waste asphalt management strategies are shown in Table A2 (CCA, 2001).

**Table A2. Reduce, reuse and recycling strategies for asphalt**

<table>
<thead>
<tr>
<th>Reduce</th>
<th>Inspect deliveries and return damaged material to the supplier</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Minimize asphalt orders by carefully reviewing site plans and ordering only what is needed</td>
</tr>
<tr>
<td>Reuse</td>
<td>Limited opportunities for reuse</td>
</tr>
<tr>
<td>Recycle</td>
<td>Recovered and crushed pavement can be processed and used in road base, unpaved parking areas, new pavement, and asphalt shingles.</td>
</tr>
</tbody>
</table>
Strategies for concrete

Waste concrete can be crushed and recycled for use in aggregate road base and as aggregate fill. Potential management strategies for waste concrete are shown in Table A3 (CCA, 2001).

Table A3. Reduce, reuse and recycling strategies for waste concrete.

<table>
<thead>
<tr>
<th>Reduce</th>
<th>Reuse</th>
<th>Recycle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inspect deliveries and return damaged material to the supplier</td>
<td>Store unused concrete blocks in protected areas for later reuse</td>
<td>Separate re-bar from broken concrete for recycling</td>
</tr>
<tr>
<td>Pay careful attention to quantities when ordering to eliminate waste</td>
<td>Use excess concrete as barriers (e.g. parking stops)</td>
<td>Recycle waste concrete where possible - companies that take concrete include:</td>
</tr>
<tr>
<td>Consult with a forming contractor to develop a forming plan that limits waste wood</td>
<td></td>
<td>o B.A. Blacktop Ltd.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>o Columbia LaFarge</td>
</tr>
<tr>
<td></td>
<td></td>
<td>o Inner City Recycling</td>
</tr>
<tr>
<td></td>
<td></td>
<td>o Mainland Sand and Gravel</td>
</tr>
<tr>
<td></td>
<td></td>
<td>o Richvan Holdings Ltd.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>o RDM</td>
</tr>
<tr>
<td></td>
<td></td>
<td>o Urban Wood Waste Recyclers</td>
</tr>
</tbody>
</table>

Plastics and Vinyl

Plastics with adhesives can have limited recycling potential. Onsite plastics management programs can be complicated by having to segregate plastics by resin type (identified with the recycling number). Plastics management strategies should ideally focus on reducing plastics onsite.

Strategies for corrugated cardboard

Corrugated cardboard is used in packaging, storing and transporting. Cardboard covered in wax, grease, oil or paint is not considered recyclable and should be treated as waste (GVRD, 2004). Potential cardboard waste management strategies are shown in Table A4 (CCA, 2001).
### Table A4. Reduce, reuse and recycling strategies for corrugated cardboard.

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reduce</strong></td>
<td>Buy materials in bulk to minimize packaging wastes</td>
</tr>
<tr>
<td></td>
<td>Have suppliers deliver materials with a minimum of packaging and transporting cardboard</td>
</tr>
<tr>
<td></td>
<td>Try to use suppliers that will retrieve packaging cardboard and other materials</td>
</tr>
<tr>
<td><strong>Reuse</strong></td>
<td>Use cardboard on site, where feasible, to protect and store tools and other small construction materials</td>
</tr>
<tr>
<td><strong>Recycle</strong></td>
<td>Identify private cardboard recyclers who will provide bins / pick up</td>
</tr>
<tr>
<td></td>
<td><strong>Crown Packaging</strong> in Burnaby uses corrugated cardboard for gypsum wallboard liner, boxboard and middle corrugating medium</td>
</tr>
</tbody>
</table>

### Wood

Wood waste can include pallets and buried (uncontaminated wood). Wood waste can be used in wood composites like panel board, building materials, like shingles and roof felt, pulp, animal bedding, mulch, soil amendments and even landfill cover.

The following facilities accept wood waste in MetroVancouver:

- Matsqui Transfer Station
- Mini-load disposal
- Coquitlam construction Recycling Facility
- Wastech Services
- Cloverdale Fuel Ltd
- Langley Transfer Station
- Maple Ridge Transfer Station
- Basran Fuels
- North Shore Transfer Station
- Fraser Richmond Soil and Fibre
- Inner City recycling
- Urban Wood Waste Recyclers

Double M will also take clean waste wood, suitable for use in habitat compensation projects to their Maple Ridge site for storage.
ATTACHMENT 1: FISHERIES ACT S. 35(2) AUTHORIZATION
Authorization No 02-HPAC-PA1 -000-000144
FISHERIES ACT S. 35(2) AUTHORIZATION

AUTHORIZATION FOR WORKS OR UNDERTAKINGS AFFECTING FISH HABITAT

Authorization No./PATH#: 02-HPAC-PA1-000-000144

Authorization issued to:

Company Name: The Vancouver Port Authority ("VPA")
Contact: Darrell Desjardin, Director of Environmental Programs
Address: 100 The Pointe
999 Canada Place
Vancouver, B.C. V6C 3T4 Canada
Telephone: 604-665-9000
Fax: 1-866-284-4271

Location of Project:

The Deltaport Third Berth Project is located 35 km south of Vancouver, in Delta British Columbia at the existing Roberts Bank Port facility situated north of the BC Ferries Tsawwassen ferry terminal. The existing VPA facilities at Roberts Bank include Deltaport, a 65-hectare (160-acre) container terminal and Westshore Terminals, a 50-hectare (124-acre) bulk handling coal port facility. These terminals are connected to the mainland by a 4.1 km causeway, which supports road and rail infrastructure.

The GPS coordinates of the site are: 123:08:24degE, 49:01:12N

Valid Authorization Period:

The valid Authorization period for the Harmful Alteration, Disruption or Destruction of fish habitat associated with the construction of the Deltaport Third Berth Project is between January 2, 2007 and December 31, 2009; the valid authorization periods for the other conditions of this authorization are as set out below.

Description of Works or Undertakings:

Project Description:

The Deltaport Third Berth Project (the "Project") involves the construction a container terminal and third berth to the existing Deltaport container terminal;

- construction of a fill area of approximately 21.72 hectares of land for an expanded container storage yard;
- construction of a 430.2 m long caisson wharf extension caisson wharf to accommodate the third berth structure;
- dredging to deepen the channel along side of the Deltaport third berth;
- relocation of the tug moorage area located at Deltaport container terminal to the north side of the third berth;
- construction of habitat compensation works as described in condition 40.

Figure 2 in Schedule D provides a summary of the above referenced works. Detailed plans and specifications for the above referenced works have been provided to DFO and are included Schedule A.
Authorized Harmful Alteration, Disruption or Destruction of Fish Habitat:

The Harmful Alteration, Disruption or Destruction of fish habitat (HADD) hereby authorized is:

1. The placement of fill, including a partial rock dyke to contain fill material, new foreshore area and concrete caisson structures over an area approximately 21.86 hectares north east of the existing Roberts Bank Container Terminal (Areas 1-4 Figure 2 Schedule D). This construction will result in impacts to the existing intertidal and shallow subtidal marine habitats, including the permanent loss of approximately:
   a. 5 hectares of eelgrass;
   b. 300 m² of salt marsh;
   c. 10 hectares of intertidal sand/mudflat; and
   d. 6.9 hectares of subtidal mud.

2. Dredging of approximately 603,500 m³ of geotechnically incompetent sediment from under the caissons and terminal area (including the relocated tug basin) with an estimated disposal volume for ocean disposal of 300,000 m³ (Area 4 and 5 Figure 2 Schedule D). This construction will result in impacts to the existing shallow subtidal marine habitats.

3. The relocation of a tug berthing facility consisting of a 1.55m by 12.2 m walkway, a 1.55m by 15.24 m ramp and a 13.5 m by 83.0 m mooring barge, including installation of 11 steel piles on approximately 5.25 square metres of seabed and foreshore adjacent to the north west side of the third (Area 4 Figure 2 Schedule D). The relocated berthing facility will result in impacts to the existing shallow subtidal marine habitats.

4. Dredging of approximately 249,500 m³ to deepen the ship channel from about -12 to -14 m chart datum (CD) to -15.85 m CD deep for 350 m along the third berth face alignment in existing subtidal mud with an estimated disposal volume of 175,000 m³ (Area 6 Figure 2 Schedule D). This construction will result in impacts to the existing shallow subtidal marine habitats.

<table>
<thead>
<tr>
<th>Area</th>
<th>Dredge Volume</th>
<th>Disposal Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dredging under Caissons and Terminal Area (including tug basin)</td>
<td>603,500</td>
<td>300,000</td>
</tr>
<tr>
<td>Dredging of Ship Channel</td>
<td>249,500</td>
<td>175,000</td>
</tr>
<tr>
<td>TOTAL (estimated)</td>
<td>853,000</td>
<td>475,000</td>
</tr>
</tbody>
</table>

Actual Disposal Volume is based on amount of geotechnically competent dredged material that can be recovered for terminal fill. Monitoring will be done pursuant to the conditions of the Part VI CEPA Ocean Disposal Permit.

Figure 2 in Schedule D provides a summary of the above referenced construction footprint impacts (Areas 1-6).

No other harmful alteration disruption or destruction is authorized by this document.
Conditions of Authorization:

Responsibility for Plans and Works

1. The VPA confirms that all plans and specifications relating to this Authorization have been duly prepared and reviewed by appropriate professionals working on behalf of the VPA. The VPA acknowledges that it is solely responsible for all design, safety, and workmanship aspects of the works associated with this Authorization.

2. The VPA confirms that the location and design of the works are to be consistent with the information attached as schedules to this authorization and that any deviations from such designs, that may impact fish habitat, must be reviewed and approved by DFO and other agencies having jurisdiction in this matter. VPA is responsible to ensure compliance of all conditions in this Authorization.

3. The VPA recognizes that the designs and construction methods for two habitat compensation elements, the Sand Bar Stabilization and the Log Removal and Tidal Channel Restoration, are not complete at the time of issuance of this Authorization and, therefore, have not been approved by DFO. See conditions 40 thru 44.

4. The conditions of this Authorization notwithstanding, DFO may at any time and at their sole discretion direct the VPA, and/or their agents, and/or contractors, to suspend or alter any work or activity associated with this project to avoid or mitigate adverse impacts to fish or other aquatic resources. Further, DFO may at any time and at their sole discretion, direct VPA, and/or their agents, and/or contractors to carry out at VPA's own expense any works or activities deemed necessary by DFO to avoid or mitigate adverse impacts to fisheries resources.

Conditions that Relate to the Construction of the Project, and Compensation Works

Notifications:

5. For the purposes of this Authorization, the Chief of Environmental Assessment Major Projects (EAMP), Oceans, Habitat and Enhancement Branch, ("DFO"), or their designate, shall be the formal contact and representative of DFO. In the absence of an EAMP Chief, the DFO Regional Director General, Pacific Region, or their designate; or the Minister of Fisheries and Oceans, or their designate, shall be the DFO contact and representative.

6. Please ensure that our File Number (02-HPAC-PA1-000-000144) appears on all correspondence, documents and plans.

7. The following personnel must be contacted and advised of the schedule of all marine works a minimum of five (5) days in advance of the works commencing:

   a. Fisheries and Oceans Canada, Conservation and Protection Field Supervisor in Steveston (telephone 604-664-9250, Fax 604-664-9055)
   b. DFO Habitat Biologist, Brad Fanos (telephone 604-666-0845, Fax 604-666-6627)
8. VPA shall complete the construction of the Project and associated works in the manner described in the VPA’s Construction Environmental Management Plan attached as Schedule B.

Environmental Windows / Weather and Water Conditions

9. Work on the project involving the seabed, foreshore, and immediately adjacent upland shall not start prior to January 2, 2007, and shall be completed by December 31, 2009.

10. All work seaward of Higher High Water Level, i.e., 4.8 m chart datum ("HHWL") and shallower than -5m, shall be carried out in the dry, during periods of low water, or in isolation of tidal waters to the satisfaction of DFO. The VPA, and/or their agents, and/or contractors will follow the mitigation measures that are detailed in the Construction Environmental Management Plan attached as Schedule B.

11. Work on the Project involving the seabed, foreshore, and immediately adjacent uplands will adhere to the DFO fisheries sensitive periods to avoid impacts to fish and fish habitat:

   The DFO fisheries sensitive periods are:

   a. No dredging is permitted in waters less than -5 m CD deep from March 1 to August 15 for the protection of juvenile salmon unless the works area is adequately isolated from fish bearing waters to the satisfaction of DFO;
   b. From October 15 to March 31 there shall be no works conducted which would result in a significant disturbance to the seabed of outer Roberts Bank which is situated in water greater than -5 m CD deep at daily low water for the protection of adult ovigerous female Dungeness crabs; and
   c. Any works proposed within the above referenced work windows will require DFO review and approvals.

Environmental Management Plans and Attached Schedules

12. The VPA, and/or their agents, and/or contractors will adhere to all Schedules and appropriate Environmental Management Plans (EMP) attached as Schedules to this Authorization to mitigate potential negative impacts to fish, and fish habitat during the construction of the Project. The schedules and elements of the EMPs, which relate to the protection of fish and fish habitat are hereby incorporated and form part of this authorization and must be complied with by VPA.

Dredging and excavation

13. All dredging, excavation and filling at the site shall be carried out using best management practices, and the most suitable methods and equipment, to minimise adverse environmental effects (as described in the Construction EMP in Schedule B). Dredging operations at the site shall be isolated to the satisfaction of DFO, and shall be carried out such that the dispersal of dredged material is restricted to the immediate work area.
14. All materials dredged or excavated from the seabed, foreshore, or upland in association with the project shall be appropriately disposed of at an appropriate upland or ocean disposal site in accordance with all applicable legislation, guidelines, and best management practices.

**Sediment and Turbidity of Marine Waters**

15. Sediment or sediment-laden waters or other deleterious substances shall not be permitted to enter the aquatic environment during the work. All works and activities, including in-water works and works over or adjacent to the water will be carried out in compliance with the following water criteria:

- When background is less than or equal to 50 nephelometric turbidity units (NTU) induced turbidity should not exceed 5 NTU above the background value;
- When background is greater than 50 NTU, induced turbidity should not exceed the background values by more than 10% of the background value;
- When background is less than or equal to 100 milligrams per litre (mg/L) non-filterable residue (NFR) induced NFR should not exceed 10 mg/L above the background value; or
- When background is greater than 100 mg/L NFR, induced NFR should not exceed 10% of the background value.

For the purposes of this Authorization, background shall be defined as the level at an appropriate adjacent reference site that is affected neither by works at the site, nor sediment-laden or turbid waters resulting from works at the site.

**Marine Works / Diversions /Fish Salvages**

16. All freshwater instream construction activities must be conducted in isolation of flowing water. Generally this is accomplished by temporarily diverting, enclosing or pumping the water around the work site. Flow to downstream portions of the site must not be cut off at any time during the diversion. The point of discharge to the watercourse must be located immediately downstream of the work site and must discharge to an energy dissipater to mitigate erosion of the stream channel. An extra pump should be on-site in the event of a pump malfunction.

17. Prior to conducting instream works in freshwater or marine works below the HHWL (e.g. initiating containment dyke and filling works below 4.8M CD) a fish and Dungeness crab salvage must be conducted by a qualified environmental monitor. All appropriate fish collection permits must be obtained prior to the commencement of any marine works.

18. The proponent must retain a qualified environmental consultant, approved by DFO, to undertake a fish salvage prior to commencement of works. The environmental consultant must obtain all necessary permits required by fisheries regulations.

**Machine Use**

19. Machinery is to work from the bank of the HHWL mark and is not permitted to cross or work within the intertidal habitats that are not appropriately isolated from marine waters.
Access and work behind the containment berm will be permitted, subject to implementation of appropriate BMP's and isolation from marine waters to the satisfaction of DFO.

20. All equipment and machinery working within fifteen (15) meters of freshwater watercourses or the HHWL mark of the marine environment must be in good working condition (power washed) and free of leaks or excess oil and grease. No fuels, lubricants, construction wastes or other deleterious substances may enter any ditch, watercourse, ravine or storm sewer system.

21. No equipment refuelling or servicing or storage of fuel, paints etc. may be undertaken within fifteen (15) meters of any freshwater watercourse or the HHWL mark of the marine environment.

No Release of Deleterious Substances

22. The VPA shall ensure that cement, uncured concrete, concrete leachate, hydrocarbon products (e.g. fuel, oil, hydraulic fluid, lubricants), and any other deleterious substances (i.e. substances harmful to fish), shall be prevented from entering the marine environment at the project site at any time during the Third Berth Project. The VPA, and/or their agents, and/or contractors will follow the best management practices and mitigations outlined in Schedule B – Water Quality EMP.

Clean Materials

23. All materials used for works associated with this project fill activities shall be clean material, free of fines, organic material, and contaminants, and deleterious substances (i.e., substances harmful to fish).

Ground Densification and Pile Driving

24. Ground densification works and activities at the site ("densification") shall be conducted such that sediment, sediment laden water, turbid water, and deleterious substances generated by or associated with densification are prevented, to the satisfaction of DFO, from entering into the marine environment. To this end, all densification, including vibro-floating, shall be carried out on lands above Higher High Water, i.e., 4.8 m chart datum (HHWL), and in isolation from the marine environment to the satisfaction of DFO, or in waters greater than -5 m CD deep at daily low water.

25. The Fisheries Act prohibits the destruction of fish (i.e., killing of fish) by means other than fishing. Without the implementation of appropriate mitigation measures certain pile driving activities can kill fish; therefore, it is the VPA, and/or their agents, and/or contractors responsibility to ensure that appropriate mitigation measures are employed when and where necessary to ensure that the Project does not kill fish.

Spill Contingency and Clean-up Plan

26. The VPA, and/or their agents, and/or contractors will conduct spill and emergency clean-up following all appropriate best management practices, and the most suitable methods and equipment, to minimise adverse environmental effects (as described in the Spill...
Contingency and Clean-up Plan EMP in Schedule B. Dredging operations at the site shall be isolated to the satisfaction of DFO, and shall be carried out such that the dispersal of dredged material is restricted to the immediate work area or to designated ocean disposal site(s).

**Stormwater and Surface Runoff (during and post construction)**

27. A sediment, erosion and runoff control plan, prepared by a qualified trained professional, must be developed and implemented prior to site preparation and construction. These facilities must be maintained until occupancy permit stage or until no longer applicable to site conditions. Moreover, it is the responsibility of the VPA and/or their agents and/or contractors to ensure that these facilities are maintained and working adequately to control all discharges from the site.

28. The VPA confirms that a permanent stormwater system using an appropriate and proven effective combined oil/water separators, sedimentation tanks and storm outfall shut-off valves will be incorporated into the terminal stormwater treatment system to contain oil and gasoline runoff from the terminal operation area. It is the responsibility of the VPA and/or their agents, and/or contractors to provide adequate ongoing maintenance to ensure the effectiveness of such facilities and to avoid the deposition of deleterious substances into the receiving watercourse. A maintenance schedule must be developed, and the maintenance carried out for the life of the operation of the project by the terminal operator or responsible authority. Include reference to appropriate EMP.

**Environmental Monitoring During Project Construction**

29. All works associated with the Project that have, in the opinion of DFO, the potential for adverse impacts to fisheries resources including marine mammals, shall be monitored by an appropriately qualified individual(s), (the “environmental monitor”) deemed to be satisfactory by DFO. The acceptability of nominees for environmental monitor shall be confirmed with DFO prior to the nominee(s) working as an environmental monitor on the Project. Due to the Project construction activities and potential effects on the marine environment, there may be more than one “environmental monitor” on the Project to reflect the required expertise. The environmental monitoring activities will be coordinated by VPA.

30. The environmental monitor shall, in consultation with, and at the discretion of DFO, monitor and direct all works on the Project to ensure compliance with the *Fisheries Act*, and all other applicable legislation, guidelines, and best management practices; and compliance with the terms and conditions of this Authorization. The foregoing notwithstanding, the authority of the environmental monitor is subject always to the discretion of DFO. DFO does not delegate any authority under the *Fisheries Act* to the environmental monitor. The environmental monitor does not have the authority to change, modify, or revise, either the Project or the terms and conditions of the Authorization.
Monitor's Authorization

31. The environmental monitor shall be empowered, in writing, to direct or stop works and apply mitigation as necessary for the Project to ensure compliance with the *Fisheries Act*, and compliance with the terms and conditions of the Authorization.

Scheduling of Environmental Monitoring During Construction

32. The environmental monitor(s) accepted by DFO shall be at the project site at all times when there is, in the opinion of DFO, the potential for adverse impacts to fisheries resources resulting from work on the Project, and particularly during works, over, within or adjacent to the marine environment. The acceptability of alternate scheduling for environmental monitoring shall be determined in consultation with DFO.

Monitor's reporting

33. Whenever there is the potential for adverse impacts to fisheries resources resulting from work on the project, and particularly during works on the foreshore, intertidal or subtidal areas, or adjacent upland areas, DFO shall be provided with written weekly reports from the environmental monitor. The weekly reports will be provided for the duration of the Project construction and shall include, but shall not be limited to, the following:

a. A summary of the works carried out or undertaken that week.
b. Commentary on the works and the work area from an environmental perspective (e.g., whether or not fish are present along the shore at the site, the turbidity of the water, marine mammal activity).
c. Water quality measurement of marine waters at the site and in the vicinity of works such as shoreline preparation, dredging, ground densification and fill and rock placement. Measurements shall include reference and sample sites as approved by DFO.
d. A summary of marine mammal monitoring activities and results;
e. Identification of any environmental issues or impacts that arose or occurred and details of specific mitigation measures put in place to address environmental issues and impacts.

These weekly reports shall be provided to DFO the same week as the work they cover. Facsimile transmissions may be sent to DFO Environment Assessment Major Projects (EAMP) at [604] 666-7907 to the attention of the Chief or to an e-mail address as may be specified.

In addition, the monitor must notify DFO, immediately, of any event that has caused, or may cause, an unauthorized HADD or the release of a deleterious substance into the aquatic environment.

34. In addition to the weekly reports from the on site environmental monitor, following completion of in-water works and/or phases of works adjacent to the shore, DFO shall be provided with a summary report including the following:

a. A summary of works carried out or undertaken in association with the project.
b. Comments on the works from an environmental perspective.
c. Identification of any environmental issues and impacts that arose or occurred and details of specific mitigation measures put in place to address environmental issues and impacts.

d. Detailed engineering drawings, stamped and sealed by an appropriately qualified professional, showing the works associated with this project as they have been built (i.e., 'as-built' drawings).

This report shall be provided to DFO to the attention of the EAMP Chief within 60 days of the completion of any significant phase of works adjacent to the shore.

Marine Mammal Monitoring Program During Construction and Initial Operation

35. The VPA will comply with the "marine mammal monitoring program", attached as Schedule C, that sets out:
   a. Monitoring and survey activities to assess presence of killer whales within the Project area, measured zones of audibility;
   b. Acoustic threshold triggers and mitigation measures to reduce potential effects on killer whales through the reduction or elimination of underwater noise when whales are present within the measured zones of audibility of the Project area.
   c. Phase 2 modeling study and results will be completed and provided to DFO prior to the initiation of construction activities that generate underwater acoustic levels that have the potential to negatively affect killer whales. The results of Phase 2 will be used to develop appropriate marine mammal monitoring survey methods (may include visual and underwater acoustic hydrophone) to monitor killer whale presence in the zone of acoustic influence under all visibility conditions. Final survey methods will be prepared and submitted to DFO for review and approval prior to Jan 31, 2007.

36. Marine mammal monitoring methods and surveys (35. c above) will be conducted daily during all construction activities that generate underwater acoustic levels that have the potential to negatively affect killer whales:
   a. Intensive surveys will be conducted daily and fulltime as described in Phase 2; and
   b. Extensive surveys will be conducted daily and part time as described in Phase 7.

37. The VPA will provide DFO with:
   a. Weekly summary reporting on marine mammal monitoring results will be coordinated with and included as part of the weekly construction monitoring reports described in condition 33.
   b. Summary reporting to be completed with in 4 weeks of the competition of each Phase of the marine mammal monitoring program that summarize the results and effectiveness for each phase.
   c. Data and preliminary analysis results for all phases of the Marine Mammal Monitoring Program will be made available to DFO upon request.

38. The environmental monitor for the "marine mammal monitoring program" shall monitor and direct all works, including the cessation of works, on the Project to reduce potential effects...
on killer whales and to ensure compliance with the *Fisheries Act*, *SARA* and all other applicable legislation, guidelines, and best management practices; and compliance with the terms and conditions of the Authorization to reduce potential effects on marine mammals.

39. The marine mammal monitoring program will be conducted by a qualified biologist or other professional who is experienced in the area of conducting similar marine mammal monitoring work.

**Conditions that Relate to Onsite Compensatory Habitat**

40. The VPA agrees to build the compensatory works according to the Deltaport Third Berth Habitat Compensation Plan (HCP, as outlined in "Vancouver Port Authority Deltaport Third Berth Submission of Information for Fisheries Act Authorization Habitat Compensation Program" attached as Schedule D and following and the habitat compensation construction schedule attached in Schedule E.

The HCP consists of five onsite components:

a. East Causeway;
b. Log Removal and Tidal Channel Restoration;
c. Caisson Refugia;
d. Subtidal Reef; and
e. Sand Bar Stabilization (Dendritic Channel Modification).

41. All five habitat compensation elements are to be constructed as described in Schedule D and the detailed engineering drawings attached as Schedule F.

42. The VPA confirms that all appropriate agreements and permissions have been obtained to complete the habitat compensation works and that all appropriate permits and licences will be obtained from other regulatory agencies prior to initiating construction.

43. Final designs for the Log Removal and Tidal Channel Restoration (condition 40.b) habitat compensation works will be prepared and submitted to DFO for review and approval by May 31, 2007 or such other date as agreed to by DFO and prior to these compensatory works proceeding.

**Contingency Plan for Failure of Compensatory Works**

44. Final designs for the Sand Bar Stabilization (condition 40.e) habitat compensation works will be prepared and submitted to DFO for review and approval by January 31, 2007 or such other date as agreed to by DFO and prior to these compensatory works proceeding.

a. In the event the final design and construction plans for the Sand Bar Stabilization works are not approved by DFO, the VPA agrees to the contingency of develop an alternative habitat compensation plan involving the creation of a minimum of 5 ha of productive fish
habitat. This contingency plan must be developed and presented to DFO by the 31<sup>st</sup> of March 2007;

b. In the event the contingency plan (41.a) is not approved by DFO, the VPA agrees to fund a third Party, chosen by DFO, in the amount of $500,000.00 Can., within two weeks of written notification to this effect from DFO, for the development of appropriate fish habitat in the Fraser River estuary.

45. If ongoing monitoring identifies any elements of the habitat compensation works are not functioning as intended, the VPA is responsible for completing any appropriate remedial works to ensure the compensatory habitat is stable and is functioning as intended, pursuant to this Authorization.

46. If after the completion of the Habitat Compensation Effectiveness Monitoring Program (condition 45 thru 49) the habitat compensation works are not functioning as intended and further remedial work is not likely to rectify the situation. The VPA shall work with DFO to identify and then carry out alternative compensatory works to the satisfaction of DFO.

Conditions that Relate to Habitat Compensation Effectiveness Monitoring

47. The VPA shall carry out, to the satisfaction of DFO, a Habitat Monitoring Program to assess the form and function of the fish habitat compensation associated with the Project (Condition 40) and their success and productivity as fish habitat. The VPA will implement the "habitat monitoring program" attached as Schedule H.

a. The Monitoring Program includes pre-development and post development monitoring;

b. The VPA shall identify appropriate reference sites (the "reference sites"), which are satisfactory to DFO, for incorporation into the habitat monitoring program. Appropriate reference sites will be suitable areas of existing fish habitat which are adjacent to the project site and have demonstrated biophysical nature similar to that of project site habitat.

c. The habitat monitoring program varies with each habitat compensation feature and includes quantitative surveys and assessments (during years 1, 2, 3, 5, and 8 or as otherwise noted in the monitoring program) and annual qualitative surveys and assessments on years when the quantitative surveys are not conducted.

d. The habitat monitoring program will be conducted by a qualified biologist or other professional who is experienced in each area conducting work for similar habitat compensation features.

48. Data and preliminary analysis results for each of the compensatory habitat monitoring events will be made available to DFO upon request.

49. Annual comprehensive habitat compensation effectiveness monitoring reports with full data analyses will be provided to DFO within 3 months of the completion of each annual monitoring occasion or prior to December 31 of each calendar year, which ever comes first.
Determining Success of Compensatory Habitats

50. The success of the compensatory habitats shall be determined in accordance with the methods laid out in the habitat monitoring program (Schedule H). The compensatory habitat will be deemed to be functioning as intended if, in the opinion of DFO, the habitats are physically stable and the productivity, and growth of marine organisms associated with these habitats are similar in nature to, and exhibits the same or better growth characteristics, and the same or greater abundance as the marine organisms at the reference sites and if the productivity in terms of fish habitat is equal to or greater than that which existed prior to the Project.

51. Following the initial eight (8) year monitoring period, and any extensions thereof, DFO will assess the success of the habitat compensation works and determine whether or not they are functioning as intended, and choose the appropriate course of action as outlined below:

a. the habitat compensation works are functioning as intended, pursuant to this Authorization and will be self-sustaining without further remedial work. The Monitoring Program will be terminated;

b. the habitat compensation works are not functioning as intended. The VPA shall extend the Monitoring Program, including remedial work, for an additional two years to allow more time for the habitat to become adequately established; or

c. the habitat compensation works are not functioning as intended and further remedial work is not likely to rectify the situation. The VPA shall work with DFO to identify and then carry out alternative compensatory works.

Protection of Compensatory Habitats

52. All compensatory fish habitat associated with the Project shall be considered to be fish habitat pursuant to section 35 of the Fisheries Act. The VPA shall not carry on any work or undertaking that will adversely disturb or this habitat, and will take all reasonable steps to ensure that the habitats are not disturbed by others.

Remedial Works

53. The VPA shall ensure that the fish habitat associated with the Project including the compensation habitat (condition 38) as described in detail in Schedule D continue to function as productive fish habitat for the lifetime of the Project operation. If at any time during the lifetime of the Project operation the VPA becomes aware that the fish habitats are not functioning as intended, for example, by reason of erosion or damage by waterborne debris, the VPA shall carry out any works necessary to enable the habitats to function as intended, to the satisfaction of DFO.

Offsite Habitat Compensation Agreement

54. The VPA has agreed to complete the offsite habitat compensation plan that is described in the Deltaport Third Berth Habitat Compensation Plan (as outlined in “Vancouver Port Authority Deltaport Third Berth Submission of Information for Fisheries Act Authorization...

Conditions that Relate to Financial Security

55. The VPA shall provide DFO with a Letter of Credit in the sum of $1.4 million dollars to act as a performance bond for the obligations of the VPA with respect to the habitat compensation monitoring requirements described in the Authorization. DFO may draw on the Letter of Credit and apply the proceeds towards the requirements described in the Authorization as deemed appropriate by DFO at its sole discretion. The Letters of Credit shall be unconditional and irrevocable; and automatically extend without amendment from year to year. The bank shall give DFO ninety (90) days written notice should the bank elect not to extend a letter of credit for any additional period (the "Expiry Date"). Upon demand, the bank shall pay DFO the amount demanded without inquiring whether DFO has the right to such amount. Draws on the Letter of Credit by DFO shall be permitted at anytime on or before the Expiry Date. Partial draws shall be permitted.

56. After the Project has been completed, and the VPA has fulfilled the requirements and obligations of this Authorization to the satisfaction of DFO, DFO shall return to the VPA, within a reasonable period of time, any letter of credit then held by DFO. The determination of whether works have been successfully concluded, whether a component of the Project has been completed, and whether the VPA has fulfilled the requirements and obligations of this Authorization shall be at the sole discretion of DFO. In making their determination, DFO will consider the terms of this Authorization, and other information, including the results of any monitoring programs.

Independent Monitoring and Auditing of the Authorization

57. VPA will fund a third party mutually agreed to by the parties to this Authorization (the Auditor) to audit the monitoring reports against the conditions of the Authorization to ensure that its terms and conditions are met. The Auditor will document the results of each audit, and send these in the form of a report to DFO and the VPA within 3 weeks of the conclusion of each audit.

58. The details and terms of reference of the audit plan and reporting format will be prepared in consultation with the VPA, DFO and the Auditor, with a final plan completed prior to January 31, 2007. The completed Audit Plan will be attached as Schedule I.

59. The Audit Plan (Schedule I) will include:

a. Auditing will be conducted at the following frequency consistent with the Project Construction Schedule included in Schedule D:
   i. Years 1, 2 and 3 the Auditor will complete two audits per year;
   ii. Years 4, 5, 6, 7, and 8 the Auditor will complete one audit per year;

b. Auditing will include onsite field assessments to confirm the accuracy of the Monitoring results provided.
Authorization:
The holder of this Authorization is hereby authorized under the authority of Section 35(2) of the Fisheries Act, R.S.C., 1985, c.F.14, to carry out the work or undertaking described herein.

This Authorization is valid only with respect to fish habitat and for no other purposes. It does not purport to release the applicant from any obligation to obtain permission from or to comply with the requirements of any other regulatory agencies.

Failure to comply with any condition of this Authorization may result in charges under the Fisheries Act.

This Authorization form should be held on site and work crews should be made familiar with the conditions attached.

Date of issuance: December 19, 2006

Approved by:  

Title: Chief, Environmental Assessment Major Projects  
Oceans, Habitat and Enhancement Branch  
Fisheries and Oceans Canada

VPA acknowledges that Fisheries and Oceans Canada has consulted with it regarding the terms of this Authorization, and confirms that it has reviewed and understands the terms of this Authorization, and agrees to the terms contained therein.

Executed by an authorized signatory of the VPA on the 18th day of December, 2006, in the presence of:

Witness (signature)  

Name (print)  

Title

Per:  

Authorized signatory

Name (print)  

Title

President and CEO
List of Schedules:

A  Construction drawings

B  Construction Environmental Management Plan
   •  Marine Environmental Management Plan
   •  Marine Water Quality Management Plan
   •  Surface Water Quality and Sediment Control Management Plan
   •  Hazardous Waste Management and Spill Control Plan

C  Marine Mammal Monitoring Program: Construction and Operation Deltaport Third Berth Project

D  Vancouver Port Authority Deltaport Third Berth Submission of Information for Fisheries Act Authorization Habitat Compensation Program, dated December 1, 2006

E  Habitat Compensation Construction Schedule

F  Habitat Compensation Drawings

G  Off-site Habitat Compensation 5 Party Agreement

H  Habitat Monitoring Program

I  Independent Monitoring and Auditing of the Authorization
ATTACHMENT 2: FISHERIES ACT S. 35(2) AUTHORIZATION
Authorization No 02-HPAC-PA1 -000-000144-2
AUTHORIZATION FOR WORKS OR UNDERTAKINGS AFFECTING FISH HABITAT

Authorization issued to:
Company Name: The Vancouver Fraser Port Authority ("VFPA")
Contact: Darrell Desjardin
Title: Director, Environmental Programs
Address: 100 The Pointe
999 Canada Place
Vancouver, B.C. V6C 3T4
Telephone: 604-665-9000
Fax: 1-866-284-4271

Location of Project:
The VFPA is proposing to construct a temporary barge facility within the newly constructed tug basin at Deltaport's Third Berth. Deltaport is located 35 km south of Vancouver in Delta, British Columbia at the existing Roberts Bank port facility situated north of the BC Ferries Tsawwassen ferry terminal. The existing VFPA facilities at Roberts Bank include Deltaport, a container terminal, and Westshore Terminals, a bulk handling coal port facility. These terminals are connected to the mainland by a 4.1 km causeway, which supports road and rail infrastructure.
The GPS coordinates of the Deltaport Third Berth are: 123:08:24degE, 49:01:12N

Valid Authorization Period:
The valid authorization period for the harmful alteration, disruption and/or destruction of fish habitat associated with the work or undertaking is:
From: December 4, 2008
To: December 4, 2012
The valid authorization periods for the other conditions of this authorization are as set out below.

Description of Works or Undertakings:
The VFPA is proposing to construct a temporary barge facility at its new tug basin located north west of the Deltaport Third Berth, which is currently under construction. The barge facility is being proposed to reduce the truck traffic required to complete construction of the Third Berth and to facilitate the construction of fish habitat compensation on the east side of the causeway. The operation of the barge facility will be limited to an "as needed" basis for delivery and/or exportation of aggregate materials, as tide levels allow.
The construction of the temporary barge facility will involve the following:

- Construction of a fill area of approximately 1400 m²;
- Installation of a 15.24 m barge ramp, including piles to support the pivot ramp;
- Relocation of a small craft float, and installation of access ramp and landing float, to south of Seaspan Barge 912;
- The relocation of approximately 35 metres of the crest protection/rip rap slope to facilitate barge access to the facility;
- Placing imported dyke core rock;
- Installation of rip rap for slope protection;
- Installation of a tied-back retaining wall/abutment, including four foundation piles (barge berth);
- Installation of two mooring piles for the barge berth;
- Installation of piles for small craft float and landing float;
- Placement of granular sub-base on top surface of barge berth surface; and,
- Dredging and disposal off site of up to 1500 m$^3$ of native seabed material.

The proposed works, hereafter referred to as “the Project” are more specifically described in the following documents:


2. The letter report from Patrick Craig of the VFPA to Jennifer Simpson of the Department of Fisheries and Oceans Canada (DFO) regarding “Authorization No./PATH#: 02-HPAC-PA1-000-000144 Port Metro Vancouver Deltaport Third Berth Barge Berth Facility”, dated August 25, 2008, including its attachments.


4. The email and its attachments from Patrick Craig of the VFPA to Jennifer Simpson of the DFO, dated September 29, 2008 4:10PM, regarding, “DP3 barge berth – KC drawings”.

5. The email and its attachments from Patrick Craig of the VFPA to Jennifer Simpson of DFO dated October 7, 2008 at 5:22 pm regarding, “DP3 Barge Berth – revised Habitat Inventory and Figures”.

6. The email and its attachment from Patrick Craig of the VFPA to Jennifer Simpson of DFO, dated October 8, 2008 at 9:34 am regarding, “DP3 Barge Berth – revised Habitat Inventory and Figures”.

7. The email and its attachments from Patrick Craig of the VFPA to Jennifer Simpson of DFO, dated November 3, 2008 at 1:00 PM regarding, “RE: DFO draft Authorization #02-HPAC-PA2-000-000144-2 DP3 Barge Berth – comments/corrections”, including the addition to the drawing added by DFO.

8. The email and attachments from Patrick Craig of the VFPA to Jennifer Simpson of DFO, dated November 24, 2008 at 10:00 AM regarding, “draft Authorization #02-HPAC-PA1-000-000144-2 DP3 proposed Barge Berth”.

Canada
The harmful alteration, disruption and/or destruction of fish habitat hereby authorized, in association with the Project, is limited to the following:

- The harmful alteration and/or destruction of no more than 894 square metres of intertidal eel grass habitat from the placement of fill to construct the barge facility;

- The harmful alteration and/or destruction of no more than 311 square metres of intertidal mudflat from the placement of fill to construct the barge facility;

- The harmful alteration, disruption and/or destruction of no more than 727 square metres of rocky intertidal habitat from the placement of fill to construct the barge facility;

- The harmful alteration, disruption and/or destruction of no more than 535 square metres of rocky sub-tidal habitat from the placement of fill to construct the barge facility;

- The harmful alteration, disruption and/or destruction of a total of no more than 450 square metres of intertidal eel grass and/or mudflat, from erosion and/or the implementation of mitigation measures to prevent erosion, resulting from the construction of the barge facility and/or recent changes to the crest protection; and,

- The harmful alteration, disruption and/or destruction of a total of no more than 2000 square metres of intertidal and sub-tidal rocky habitat resulting from the removal of the barge facility; and,

- The harmful alteration, disruption and/or destruction of no more than 450 square metres of intertidal cobble and/or gravel habitat resulting from the removal of any mitigation measures implemented to arrest erosion resulting from the barge facility. The extent of harmful alteration authorized in this situation is limited to that equal to the area covered by the mitigation measures.

Conditions of Authorization:

1. The conditions of this Authorization notwithstanding, should the above works or undertaking, due to weather conditions, different soil or other natural conditions, or for any other reason, appear, in the opinion of the Department of Fisheries and Oceans ("DFO") likely to cause greater impacts than the parties previously contemplated, then DFO may direct the Proponent, and its agents, and contractors, to suspend or alter works and activities associated with the project, to avoid or mitigate adverse impacts to fisheries resources. DFO may also direct the Proponent and its agents, and contractors, to carry out at the Proponent's expense any works or activities deemed necessary by DFO to avoid or mitigate further adverse impacts to fisheries resources. In circumstances where DFO is of the view that greater impacts may occur than were contemplated by the parties DFO may also modify or rescind this authorization. If the authorization is to be changed the Proponent will be given an opportunity to discuss any proposed modifications or rescission.
Responsibility for Plans and Works

2. The VFPA confirms that all plans and specifications relating to this Authorization have been duly prepared and reviewed by appropriate professionals working on behalf of the VFPA. The VFPA acknowledges that it is solely responsible for all design, safety, and workmanship aspects of the works associated with this Authorization.

3. The construction of the Project must comply with the terms and conditions of this Authorization. Harmful alteration, disruption or destruction of fish habitat other than that specifically identified within this Authorization is not permitted.

4. The VFPA confirms that the location and design of the works are to be consistent with the information attached as schedules to this authorization and that any deviations from such designs, that may impact fish habitat, must be reviewed and approved by DFO and other agencies having jurisdiction in this matter. For any such design deviations VFPA shall submit a detailed written proposal to DFO well in advance of the date proposed for implementation of changes in order to allow DFO to conduct a proper review.

Conditions that Relate to the Construction of the Project and Compensation Works

Notifications:

5. For the purposes of this Authorization, the Chief of Environmental Assessment Major Projects (EAMP), Oceans, Habitat and Enhancement Branch, (“DFO”), or their designate, shall be the formal contact and representative of DFO. In the absence of an EAMP Chief, the DFO Regional Director General, Pacific Region, or their designate; or the Minister of Fisheries and Oceans, or their designate, shall be the DFO contact and representative.

6. Please ensure that our File Number (02-HPAC-PA1-000-000144-2) appears on all correspondence, documents and plans.

7. The following personnel must be contacted and advised of the schedule of all marine works a minimum of five (5) days in advance of the works commencing:
   a. Fisheries and Oceans Canada, Conservation and Protection Field Supervisor in Steveston (telephone 604-664-9250, Fax 604-664-9255)
   b. DFO Environmental Assessment Analyst, Jennifer Simpson (telephone 604-666-4609, Fax 604-666-0417 and email Jennifer.Simpson@dfo-mpo.gc.ca)

8. VFPA shall complete the construction of the Project and associated works in the manner described in the documents included in Schedule A, unless modifications are required to ensure compliance with this Authorization.

Environmental Windows and Isolation of Works

9. Every effort should be made to schedule construction works to avoid the fisheries sensitive period for juvenile salmonids (i.e., March 1st to August 15th, inclusive).

10. If works are conducted during the fisheries sensitive period for juvenile salmonids (i.e., March 1st to August 15th, inclusive) they shall be conducted in the dry, as tides permit, or in isolation of fish bearing waters.
Environmental Management Plans and Attached Schedules

11. The VFPA, and/or their agents, and/or contractors will adhere to all Schedules and appropriate Environmental Management Plans (EMP) attached as Schedules to the Authorization for DP3 (i.e., DFO Authorization 02-HPAC-PA1-000-000144) to mitigate potential negative impacts to fish, and fish habitat during the construction of the Project. The schedules and elements of the EMPs, which relate to the protection of fish and fish habitat are hereby incorporated and form part of this authorization and must be complied with by VFPA.

Machine Use

12. Land-based machinery is to work from above the HHW mark or from within the footprint of the proposed works.

13. To ensure machinery operators are fully aware of the limits of the area authorized for impact (i.e., the area of fish habitat authorized for harmful alteration, disruption and/or destruction), the area should be surveyed and clearly marked. All individuals involved in the construction of the project should be advised of the need to ensure impacts beyond the surveyed area are prevented.

14. All power equipment used on or adjacent to the foreshore should be inspected daily by a competent individual prior to entry into the work area to ensure there are no visible leaks of fuel, hydraulic fluids, lubricants, etc. Any necessary repairs must be made before the equipment enters the work area.

No Release of Deleterious Substances

15. The VFPA shall ensure that deleterious substances (i.e., substances harmful to fish), are prevented from entering the marine environment during the construction, operation and removal of the facility and during the restoration of the site.

Sediment and Turbidity of Marine Waters

16. Sediment or sediment-laden waters or other deleterious substances shall not be permitted to enter the aquatic environment during the work. All works and activities, including in-water works and works over or adjacent to the water will be carried out in compliance with the following water criteria:

- When background is less than or equal to 50 nephelometric turbidity units (NTU) induced turbidity should not exceed 5 NTU above the background value;
- When background is greater than 50 NTU, induced turbidity should not exceed the background values by more than 10% of the background value;
- When background is less than or equal to 100 milligrams per litre (mg/L) non-filterable residue (NFR) induced NFR should not exceed 10 mg/L above the background value; or
- When background is greater than 100 mg/L NFR, induced NFR should not exceed 10 % of the background value.

For the purposes of this Authorization, background shall be defined as the level at an appropriate adjacent reference site that is affected neither by works at the site, nor sediment-laden or turbid waters resulting from works at the site.

17. Silt curtains shall be used when necessary to ensure compliance with the terms of this Authorization and the Fisheries Act.

18. Should work on the Project result in NTU or NFR in excess of the criteria outside an area contained within a silt curtain, then those works and activities that might be contributing to the turbidity shall be halted until
measures are put in place to ensure compliance with the criteria to the satisfaction of DFO OHEB. Any such events shall be included in the Environmental Monitoring Report.

Concrete

19. All work associated with the Project involving the use of concrete, mortars, and other Portland cement or lime-containing construction materials shall be conducted so as to ensure that sediments, debris, concrete, and concrete fines are not deposited, either directly or indirectly, into the marine environment outside of the forms of cast in place structures.

20. Prior to pouring of concrete, all concrete forms shall be thoroughly inspected to ensure that form work is fully secured and sealed to prevent the release of concrete or concrete contaminated water into the marine environment. Where necessary, following placement of concrete it shall be covered with an appropriate material (e.g., plastic sheeting), as required, to seal the concrete from the marine environment until the concrete is significantly cured.

21. Any water contacting uncurled or partly cured concrete or Portland cement or lime-containing construction materials, such as the water that may be used for exposed aggregate wash-off, wet curing, equipment washing, etc., shall be prevented from entering, directly or indirectly, the marine environment unless this water has been tested (to an accuracy of within +/- 0.2 pH units) and found to have a pH of between 6.5 and 9.0 pH units and a turbidity of less than 25 NTU (to an accuracy of within +/- 2 NTU). Containment facilities shall be provided at the project site for the wash down water from concrete delivery trucks, concrete pumping equipment, and other tools and equipment, as required.

Fuel

22. Fuelling of equipment and storage of petroleum products (e.g., fuel, oil, lubricants) over or adjacent to the marine environment in association with the Project shall be appropriately contained and handled in compliance with all applicable guidelines, legislation, and best management practices.

Spill Contingency and Clean Up

23. An appropriate up-to-date spill prevention, containment and cleanup contingency plan for hydrocarbon products (e.g., fuel, oil, hydraulic fluid, lubricants), and all other deleterious substances that may be used in association with the Project, shall be put in place prior to work commencing. Appropriate containment and clean up materials shall be available at the Project site throughout the construction and operation of the facility and during the restoration of the site to its pre-barge facility condition.

24. All individuals working at the Project site shall be familiar with the spill response plan and the proper use and deployment of the spill response materials.

25. The VFPA, and/or their agents, and/or contractors will conduct spill and emergency clean-up following all appropriate best management practices, and the most suitable methods and equipment, to minimise adverse environmental effects (as described in the Spill Contingency and Clean-up Plan EMP in Schedule B of DFO authorization 02-HPAC-PA1-000-000144).

Clean Materials

26. All materials used in the construction of the project, including filter rock, rip rap, ground improvement material, and shore armouring or surfacing, shall be clean material, free of fines (except as allowed by terminal specifications), organic material, and deleterious substances (i.e., substances harmful to fish).
Pile Driving

27. The Fisheries Act prohibits the destruction of fish (i.e., killing of fish) by means other than fishing. Without the implementation of appropriate mitigation measures certain pile driving activities can kill fish; therefore, it is the VFPA, and/or their agents, and/or contractor's responsibility to ensure that appropriate mitigation measures are employed when and where necessary to ensure that the Project does not kill fish.

28. If methods of pile placement other than vibration are deemed necessary the VFPA will ensure a sound signature for the method of placement is developed and a potential zone of disturbance for killer whales is identified.

Wastes

29. Debris and waste materials generated during these works shall be appropriately contained, collected, and disposed of at appropriate upland locations in accordance with all applicable legislation, guidelines, and best management practices. In this regard, it should be noted that burning of a wide range of materials, including creosote treated wood is restricted or prohibited. Wherever possible, re-use or re-cycling of recovered materials is encouraged.

Dredging

30. VFPA is proposing this facility with full knowledge that it will only be accessible during certain tide levels.

31. Dredging at the site shall be limited to the 1500 m³ required to facilitate the construction of the facility.

32. Dredging to improve access for barges over a larger tidal range is not authorized.

Spillage

33. Loading and unloading of barges at this facility will be conducted in a manner that prevents spillage of material into the marine environment.

Preservatives and Other Coatings

34. All applicable legislation, guidelines, and best management practices shall be employed with respect to the application of wood preservatives and other coatings. Wherever practicable wood preservatives are to be applied at an appropriate upland location in the dry, sufficiently in advance of the installation of the treated timber to allow the preservative to completely absorb and prevent leaching into the marine environment. This condition applies to initial construction and to subsequent maintenance. The applicant may wish to refer to the Fisheries and Oceans Canada “Guidelines to Protect Fish and Fish Habitat From Treated Wood Used In Aquatic Environments in the Pacific Region” (Hutton, K.E. and S.C. Samis. 2000. Can. Tech. Rep. Fish. Aquat. Sci. 2314: vi + 34 p).

35. Alternatives to creosote treated wood should be utilized whenever possible.

36. Any barges or other vessels used during construction or removal of the facility shall not be permitted to ground on the foreshore or seabed or otherwise disturb the foreshore or seabed habitat or sediments (e.g., disturbance as a result of vessel propeller wash).

Operational Limitation on the Barge Facility

37. The operation of the facility will be restricted, as needed, to ensure marine equipment (i.e., barges, vessels, etc.) is prevented from grounding on the intertidal foreshore or seabed or otherwise disturbing the foreshore or seabed habitat or sediment (e.g., disturbance as a result of vessel propeller wash).
Removal of the Barge Facility

38. The barge facility is proposed as a temporary facility. The VFPA shall remove and restore the site to the conditions, which existed prior to the construction of the barge facility to ensure no net loss in the productive capacity of fish habitat results from the Project.

39. If possible, measures should be put in place during the construction of the facility to aid in its removal and the restoration of the site.

40. The methodology for removal and reconstruction of the site to its pre-bridge facility condition shall be submitted to DFO as an environmental management plan.

41. The VFPA anticipates the barge facility shall remain in place for 24 months. In order to accommodate any unanticipated delays, which may cause the facility to remain in place longer than anticipated this Authorization shall accommodate the facility for 36 months. However, the structure shall be removed and the site restored by no later than 36 months following the signing of this Authorization.

Environmental Monitoring During Project Construction, Facility Removal and Restoration of the Site

42. All works associated with the Project that have, in the opinion of DFO, the potential for adverse impacts to fisheries resources, shall be monitored by an appropriately qualified individual(s), (the “environmental monitor”) deemed to be satisfactory by DFO. The acceptability of nominees for environmental monitor shall be confirmed by DFO prior to the nominee(s) working as an environmental monitor on the Project.

43. The environmental monitor shall, in consultation with, and at the discretion of DFO, monitor and direct all works on the Project to ensure compliance with the Fisheries Act, the Species at Risk Act, and all other applicable legislation, guidelines, and best management practices; and compliance with the terms and conditions of this Authorization. The foregoing notwithstanding, the authority of the environmental monitor is subject always to the discretion of DFO. DFO does not delegate any authority under the Fisheries Act or the Species at Risk Act to the environmental monitor. The environmental monitor does not have the authority to change, modify, or revise, either the Project or the terms and conditions of the Authorization.

*A qualified monitor is defined as a biologist or other professional who has previous training and/or experience in the required activities and whom is acceptable to DFO EAMP. To determine acceptability, DFO EAMP may request a resume and/or interview, and/or require that specific training has been completed by the professional to ensure that the environmental monitor is qualified. DFO EAMP reserves the right to refuse an environmental monitor should they not possess qualifications suitable for the works being undertaken.

Monitor’s Authorization

44. The environmental monitor shall be empowered, in writing, to direct or stop works and apply mitigation as necessary for the Project to ensure compliance with the Fisheries Act, the Species at Risk Act, and compliance with the terms and conditions of the Authorization.

Scheduling of Environmental Monitoring During Construction

45. The environmental monitor(s) accepted by DFO shall be at the project site at all times when there is, in the opinion of DFO, the potential for adverse impacts to fisheries resources resulting from work on the Project, and particularly during works, over, within or adjacent to the marine environment.

46. At a minimum, the monitor shall be on site daily while work is occurring seaward of the current higher high water mark (i.e., during the construction and removal of the barge facility, and during the restoration of the site). The environmental monitor should be scheduled to be on site when new activities seaward of the existing higher high water mark are scheduled to begin (e.g., placement or removal of fill, etc.).
47. The acceptability of alternate scheduling for environmental monitoring shall be determined in consultation with DFO.

48. Monitoring for potential erosion of the intertidal mudflat around the barge facility and the recent modifications to the crest protection shall be reported weekly, during construction, operation and removal of the facility, and during restoration of the site and for two years following site restoration.

Monitor's reporting

49. Whenever there is the potential for adverse impacts to fisheries resources resulting from work on the project, and particularly during works on the foreshore, intertidal or sub-tidal areas, or adjacent upland areas, DFO shall be provided with written weekly reports from the environmental monitor. The weekly reports will be provided for the duration of the construction and removal of the facility and during the restoration of the site. The weekly reports shall include, but shall not be limited to, the following:

a. A concise summary of the works carried out or undertaken that week (i.e., point form is preferred).

b. Commentary on the works and the work area from an environmental perspective (e.g., whether or not fish are present along the shore at the site, the turbidity of the water, marine mammal activity).

c. Water quality measurement of marine waters at the site and in the vicinity of works such as fill and rock placement. Measurements shall include reference and sample sites as approved by DFO.

d. A summary of marine mammal monitoring activities and results;

e. A summary of any erosion or deposition which may be occurring in or around the barge facility or recently altered crest protection. (In addition to the general construction environmental monitoring, potential issues associated with erosion of the intertidal mudflat and/or eel grass in the area of the barge facility or recently altered crest protection shall be monitored and reported to DFO weekly during operation of the facility and for two years following restoration of the site.); and,

f. Identification of any environmental issues or impacts that arose or occurred and details of specific mitigation measures put in place to address environmental issues and impacts.

These weekly reports shall be provided to DFO the same week as the work they cover. Facsimile transmissions may be sent to DFO Environment Assessment Major Projects (EAMP) at [604] 666-7907 to the attention of the Chief or to an e-mail address as may be specified.

In addition, the monitor must notify DFO, immediately, of any event that has caused, or may cause, an unauthorized HADD or the release of a deleterious substance into the aquatic environment.

50. The monitoring reports for this Project may be combined/added to the monitoring reports submitted to DFO for the expansion of Deltaport Third Berth, as a requirement under DFO Authorization (02-HPAC-PA1-000-000144).

51. In addition to the weekly reports from the on site environmental monitor, following construction of the barge facility, the removal of the barge facility and restoration of the site, DFO shall be provided with summary reports, specific to this Project, which shall include the following:

a. A summary of works carried out or undertaken in association with the project.

b. Comments on the works from an environmental perspective.

c. Identification of any environmental issues and impacts that arose or occurred and details of specific mitigation measures put in place to address environmental issues and impacts.
d. Detailed engineering drawings, stamped and sealed by an appropriately qualified professional, showing the works associated with the Project as they have been built (i.e., 'as-built' drawings) and survey drawings showing the site after restoration.

These reports shall be provided to DFO to the attention of the EAMP Chief within 60 days of the completion of the aforementioned stages of the Project.

Marine Mammals

52. In accordance with the *Species at Risk Act*, no person shall kill, harm, or harass killer whales. As such, no work or activity associated with this Project is allowed to kill, harm or harass killer whales.

53. If construction activities may result in the harassment of marine mammals via noise effects (e.g., pile driving of large diameter steel piles via impact hammer) a report must be submitted to DFO for review and approval prior to initiation of the proposed works. The report must outline the proposed works, the likely acoustic zone of potential disturbance, the mitigation measures proposed to prevent any impact to killer whales and any monitoring recommended for the proposed construction activity of concern. Any such report shall be prepared by professionals with appropriate expertise in acoustic effects on marine mammals.

Erosion

54. The area around the proposed barge facility may experience some erosion, as a result of the construction of the barge facility or the recent changes to the crest protection structure. As such, the area of mudflat and/or eel grass located around the barge facility and the recently modified section of the crest protection shall be monitored during construction of the barge facility, while the barge facility is in place, during site restoration and for two years following restoration.

55. If localized erosion occurs, the erosion shall be assessed and mitigation measures proposed by professionals with appropriate experience in coastal engineering. Any mitigation measures to arrest erosion shall be designed to minimise impacts to fish habitat and they should be designed, if possible, so they can be easily removed when the site is restored.

56. For the purpose of comparison, pre-construction conditions shall be well documented (i.e., existing conditions shall be surveyed).

57. The results of the monitoring to assess erosion on the intertidal mud flat and eelgrass around the barge facility and the tug basin shall be reported in the weekly environmental monitoring reports.

58. Prior to implementing any erosion mitigation measures, plans should be submitted to DFO for review and approval, unless time is of the essence and the measure would comply with this Authorization.

Compensation Fish Habitat

59. The VFPA confirms that all appropriate agreements and permissions have been obtained to construct the fish habitat compensation works and that all appropriate permits and licences will be obtained from other regulatory agencies prior to initiating construction.

60. The VFPA shall ensure the following measures are constructed as fish habitat compensation:

a) The rock substrate of the compensatory reef overbuild, which totals 1800 square metres. It is located at an elevation of -4 to -4.5 m chart datum and extends up to 2.5 m outside of the original design boundary for the rip rap and is comprised of rock that has a diameter of 20 inch minus quarry run stone, with a nominal size of 8 inch;

b) The 225 square metres of additional intertidal fish habitat compensation being created by replacing the originally proposed lock block retaining wall with a sheet pile retaining wall at the...
east causeway habitat compensation site. The area will be located within the intertidal zone, at approximately +3.7m chart datum. The substrate for this new habitat will consist of gravel, cobble or sand;

c) For the time the barge facility remains in place, the habitat value provided by the slopes of the barge facility shall function as fish habitat compensation; and,

d) The removal of the barge facility and the restoration of the site to the condition which existed prior to the construction of the barge facility. The site shall be restored with the materials and in a manner that will allow the site to support the habitat features which existed prior to the construction of the barge facility (e.g., the site shall be restored and prepared with appropriate material and eelgrass shall be transplanted to the area).

61. Conditions 60. a), b), and c) are intended to offset the temporal loss of fish habitat productive capacity from the Project.

62. The removal of the barge facility and restoration of the site to its pre-barge facility condition, combined with the increase in productivity achieved in perpetuity from Condition 60 a) and b) are intended to ensure the Project achieves no net loss in the productive capacity of fish habitat over the long term.

Fish Habitat Compensation Monitoring

63. The VFPA shall carry out, to the satisfaction of DFO, a fish habitat compensation monitoring program to assess the form and function of the fish habitat compensation associated with the Project and its success and productivity as fish habitat. As such, the VFPA will implement the following “Fish Habitat Compensation Monitoring Program” (i.e., the Compensation Monitoring Program).

a. The Compensation Monitoring Program shall be divided into two phases:

1) The first phase being the monitoring of the reef over build and the habitat provided by converting the lock block retaining wall to a sheet pile wall. Monitoring for Phase 1 will occur during the 1, 3 and 5 year following the construction of these features.

2) The second phase being the monitoring of the restoration of the site to the conditions which existed prior to the construction of the barge facility. This monitoring shall be reported in the 1, 3 and 5 year following restoration of the site.

b. Both phases of the Compensation Monitoring Program shall include the following measures:

1) An annual assessment of the physical stability of the compensation fish habitat using suitable methods such as site inspection, photography and ground elevation surveys, as required.

2) An annual inventory and assessment of the presence, establishment, growth and development of flora and fauna making use of the fish habitat compensation. Methods of assessment may include ground cover measurements, growth parameters and comparison to similar adjacent habitat. The assessments shall include quantitative and qualitative surveys and assessments.

3) Identification of remedial works which could be implemented to enable the fish habitat compensation to function as intended (i.e., similar to a reference site, acceptable to DFO).

4) The VFPA shall identify appropriate reference sites (the “reference sites”), which are satisfactory to DFO. The reference sites shall be areas exhibiting similar habitat types to those being proposed as fish habitat compensation and are located in areas un-impacted by recent development.

5) A written annual report describing the findings of the compensation monitoring program, including as-built drawings (i.e., surveyed draws showing the works after construction), and any relevant documents and photographs. For the barge facility site, surveyed drawings showing the site prior to construction shall be submitted for the purpose of comparison to as built drawings of the restored site. The VFPA shall provide DFO, to the attention of the Chief of Environmental
Assessment and Major Projects, with an annual report by December 31st of each year habitat monitoring is required by the Compensation Monitoring Program.

6) The Compensation Monitoring Program will be conducted by a qualified biologist or other professional, and each year of monitoring shall strive to use the same method of assessment to ensure easy comparison between different years of the monitoring program.

64. The Compensation Monitoring Program can be combined with the annual comprehensive habitat compensation effectiveness monitoring reports, which are being submitted for the Deltaport Third Berth Expansion Project (i.e., DFO Authorization 02-HPAC-PA1-000-000144).

Contingency Plan for Failure of the Fish Habitat Compensation

65. If ongoing monitoring identifies any elements of the fish habitat compensation that are not functioning as intended, the VFPA is responsible for completing any appropriate remedial works to ensure the fish habitat compensation is stable and functioning as intended.

Determining Success of the Fish Habitat Compensation

66. The fish habitat compensation will be deemed to be functioning as intended if, in the opinion of DFO, the habitats are physically stable and the productivity and growth of marine organisms associated with these habitats are similar in nature to, and exhibit the same or better growth characteristics and the same or greater abundance as, the marine organisms at the reference sites.

67. Following the initial monitoring periods identified for each phase of the project above, and any extensions thereof, DFO will assess the success of the fish habitat compensation and determine whether or not they are functioning as intended, and choose the appropriate course of action as outlined below:

a) the fish habitat compensation is functioning as intended and will be self-sustaining without further remedial work. The Fish Habitat Compensation Monitoring Program will be terminated;

b) the fish habitat compensation is not functioning as intended. The VFPA shall extend the Fish Habitat Compensation Monitoring Program, including remedial work, for an additional two years to allow more time for the habitat to become adequately established; or

c) the fish habitat compensation is not functioning as intended and further remedial work is not likely to rectify the situation. The VFPA shall work with DFO to identify and then carry out alternative compensation works to ensure no net loss in the productive capacity of fish habitat is achieved for the Project.

Protection of the Compensation Fish Habitat

68. All fish habitat compensation associated with the Project shall be considered to be fish habitat pursuant to section 35 of the Fisheries Act. The VFPA shall not carry on any work or undertaking that will adversely disturb or impact this habitat, and will take all reasonable steps to ensure that the habitats are not disturbed by others. The only exception to this condition shall be those specifically stated in this Authorization (i.e., the habitat losses associated with the removal of the barge facility).

Remedial Works

69. If at any time the VFPA becomes aware that any portion of the fish habitat compensation is not functioning as intended, for example due to erosion, debris accumulation, etc., the VFPA shall, in consultation with DFO, carry out any works which are deemed necessary to enable the fish habitat compensation to function, as intended.
Conditions that Relate to Financial Security

70. The VFPA provided DFO with a Letter of Credit in the sum of $1.4 million dollars to act as a performance bond for the obligations of the VFPA with respect to the habitat compensation monitoring requirements described in DFO Authorization (02-HPAC-PA1-000-000144). By signing this authorization the VFPA hereby agrees that the aforementioned Letter of Credit may be drawn on by DFO and the proceeds applied towards ensuring this Project achieves no net loss in the productive capacity of fish habitat, should the VFPA fail to meet its obligations agreed to in this Authorization.

71. DFO retains sole discretion as to whether or not it shall draw from the Letter of Credit.

72. All other conditions pertaining to the Letter of Credit shall remain as described in DFO Authorization 02-HPAC-PA1-000-000144.

Independent Monitoring and Auditing of the Authorization

73. Compliance with the conditions of this authorization shall be audited as part of or in addition to the auditing which is occurring as a requirement under DFO authorization (02-HPAC-PA1-000-000144).
Authorization:

The holder of this Authorization is hereby authorized under the authority of Section 35(2) of the Fisheries Act, R.S.C., 1985, c.F.14, to carry out the work or undertaking described herein.

This Authorization is valid only with respect to fish habitat and for no other purposes. It does not purport to release the applicant from any obligation to obtain permission from or to comply with the requirements of any other regulatory agencies.

Failure to comply with any condition of this Authorization may result in charges under the Fisheries Act.

*This Authorization form should be held on site and work crews should be made familiar with its conditions.*

Date of issuance: _Dec, 8/05_

Approved by: 

[Signature]

Chief

Title:

Chief, Environmental Assessment Major Projects

Oceans, Habitat and Enhancement Branch

Fisheries and Oceans Canada

VFPA acknowledges that Fisheries and Oceans Canada has consulted with it regarding the terms of this Authorization, and confirms that it has reviewed and understands the terms of this Authorization, and agrees to the terms contained therein.

Executed by an authorized signatory of the VFPA on the _4_ th day of _Dec_., _2008_, in the presence of:

[Signature]

Witness (signature)

[Signature]

Name (print)

Manager, Env. Programs

Title

Per: 

[Signature]

Authorized signatory

Name (print)

Director, Environmental Programs

Title
ATTACHMENT 3: Roberts Bank East Causeway Habitat Compensation drawings
ROBERTS BANK
EAST CAUSEWAY HABITAT COMPENSATION
2009

DRAWING LIST

EAST CAUSEWAY GENERAL (100 SERIES)

1. SHEET 1
   1. GENERAL NOTES AND DESIGN OFFERED

EAST CAUSEWAY ENVIRONMENTAL HABITAT COMPENSATION (500 SERIES)

1. SHEET 1
   1. SITE PLAN AND SITE PLAN LEGEND
   2. SITE PLAN AND SITE PLAN LEGEND
   3. SITE PLAN AND SITE PLAN LEGEND
   4. SITE PLAN AND SITE PLAN LEGEND
   5. SITE PLAN AND SITE PLAN LEGEND
   6. SITE PLAN AND SITE PLAN LEGEND

REFERENCE DRAWINGS

DWG. NO. 541
DWG. NO. 542
DWG. NO. 543
DWG. NO. 544

SITE PLAN

PRELIMINARY
NOT FOR CONSTRUCTION

VFPA

ROBERTS BANK
EAST CAUSEWAY HABITAT COMPENSATION
COVER SHEET
NOTES:
1. REFER TO DRAWINGS 34-291-564 FOR PLANT SPECIES, SIZES, AND QUANTITIES.
2. FINAL PLACEMENT AND SPACING OF PLANT MATERIAL TO BE APPROVED BY CONSULTANT.
3. REFER TO ENGINEERING DRAWINGS FOR ALL NON-LANDSCAPE WORK.

LEGEND

- TREES
- WILLOW PLANTING
- SHRUBS
- SHRUB POCKETS
- PLUG/HYDROSEED
- HYDROSEED
- SALT MARSH

SCALE: 1:500
The compensation marsh is roughly 7,000 M², requiring approximately 12,000 linear meters of 200 M² x 10 M² cells. The salt marsh areas will be comprised of 70% donor material and 30% donor plant material will consist of the following native salt marsh species: Three-Square Bulrush (Triglochin maritima), Pickleweed (Salicornia virginica), Seashore Salt Grass (Distichlis spicata), and Seacoast Bulrush (Bolboschoenus (Scirpus) maritimus). Donor plant material may include species to 10% of total plants if available and growing in the appropriate elevation range.

NOTES:
1. REFER TO ENGINEERING DRAWINGS FOR ALL SPECIES, SIZES, AND QUANTITIES.
2. SALT MARSH HARVESTING AND TRANSPLANTING: Excavated plant material may be taken up to 10% of total plants if available and growing in the appropriate elevation range.
Preliminary

NOT FOR CONSTRUCTION
LANDSCAPE SECTIONS + DETAILS

EAST CAUSEWAY HABITAT COMPENSATION

SECTIONS

1. Willow plantings in filter stone

2. Typical shrub pocket

3. Typical perennial and grass plug layout

4. Waterfowl protection fence

5. Typical deciduous tree planting

6. Typical coniferous tree planting

7. Typical shrub planting

NOTE:
Final location, placement, and spacing to be confirmed by landscape architect on site.
Environmental Management Act

SPILL REPORTING REGULATION

[includes amendments up to B.C. Reg. 376/2008, December 9, 2008]

Contents
1 Interpretation
2 Report
3 Further action

Schedule

Interpretation

1 In this regulation:

"Act" means the Environmental Management Act;

"PEP" means the Provincial Emergency Program continued under the Emergency Program Act;

"spill" means a release or discharge into the environment, not authorized under the Act, of a substance in an amount equal to or greater than the amount listed in Column 2 of the Schedule opposite that substance in Column 1;

"substance" means a substance, product, material or other thing listed in Column 1 of the Schedule to this regulation.

[am. B.C. Regs. 321/2004, s. 28 (a) and (b); 220/2006, Sch. s. 3.]

Report

2 (1) For the purposes of section 79 (5) of the Act, a person who had possession, charge or control of a substance immediately before its spill shall immediately report the spill to PEP by telephoning 1-800-663-3456.

(2) Where it appears to a person observing a spill that a report under subsection (1) has not been made, he or she shall make the report referred to in this section.

(3) A report under this section shall include, to the extent practical,

(a) the reporting person's name and telephone number,

(b) the name and telephone number of the person who caused the
spill,
(c) the location and time of the spill,
(d) the type and quantity of the substance spilled,
(e) the cause and effect of the spill,
(f) details of action taken or proposed to comply with section 3,
(g) a description of the spill location and of the area surrounding the spill,
(h) the details of further action contemplated or required,
(i) the names of agencies on the scene, and
(j) the names of other persons or agencies advised concerning the spill.

[am. B.C. Reg. 220/2006, Sch. s. 4.]

Further action

3 Where a spill occurs, the person who immediately before the spill had possession, charge or control of the spilled substance shall take all reasonable and practical action, having due regard for the safety of the public and of himself or herself, to stop, contain and minimize the effects of the spill.

Schedule

[en. B.C. Reg.376/2008.]

Reportable Levels for Certain Substances

1 In this Schedule:

"Federal Regulations" means the Transportation of Dangerous Goods Regulations made under the Transportation of Dangerous Goods Act (Canada);


<table>
<thead>
<tr>
<th>Item</th>
<th>Column 1</th>
<th>Column 2</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Substance spilled</td>
<td>Specified amount</td>
</tr>
<tr>
<td>1</td>
<td>Class 1, Explosives as defined in section 2.9 of the Federal Regulations</td>
<td>Any quantity that could pose a danger to public safety or 50 kg</td>
</tr>
<tr>
<td>2</td>
<td>Class 2.1, Flammable Gases, other than natural gas, as defined in section 2.14 (a) of the Federal Regulations</td>
<td>10 kg</td>
</tr>
<tr>
<td>3</td>
<td>Class 2.2 Non-Flammable and Non-Toxic Gases as defined in section 2.14 (b) of the Federal Regulations</td>
<td>10 kg</td>
</tr>
<tr>
<td>Class</td>
<td>Description</td>
<td>Quantity</td>
</tr>
<tr>
<td>-------</td>
<td>-----------------------------------------------------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>4</td>
<td>Class 2.3, Toxic Gases as defined in section 2.14 (c) of the Federal Regulations</td>
<td>5 kg</td>
</tr>
<tr>
<td>5</td>
<td>Class 3, Flammable Liquids as defined in section 2.18 of the Federal Regulations</td>
<td>100 L</td>
</tr>
<tr>
<td>6</td>
<td>Class 4, Flammable Solids as defined in section 2.20 of the Federal Regulations</td>
<td>25 kg</td>
</tr>
<tr>
<td>7</td>
<td>Class 5.1, Oxidizing Substances as defined in section 2.24 (a) of the Federal Regulations</td>
<td>50 kg or 50 L</td>
</tr>
<tr>
<td>8</td>
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<td>1 kg or 1 L, or less if the waste poses a danger to public safety or the environment</td>
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<tr>
<td>11</td>
<td>Class 7, Radioactive Materials as defined in section 2.37 of the Federal Regulations</td>
<td>Any quantity that could pose a danger to public safety and an emission level greater than the emission level established in section 20 of the &quot;Packaging and Transport of Nuclear Substances Regulations&quot;</td>
</tr>
<tr>
<td>12</td>
<td>Class 8, Corrosives as defined in section 2.40 of the Federal Regulations</td>
<td>5 kg or 5 L</td>
</tr>
<tr>
<td>13</td>
<td>Class 9, Miscellaneous Products, Substances or Organisms as defined in section 2.43 of the Federal Regulations</td>
<td>25 kg or 25 L</td>
</tr>
<tr>
<td>14</td>
<td>waste containing dioxin as defined in section 1 of the Hazardous Waste Regulation</td>
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<tr>
<td>15</td>
<td>leachable toxic waste as defined in section 1 of the Hazardous Waste Regulation</td>
<td>25 kg or 25 L</td>
</tr>
<tr>
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<td>waste containing polycyclic aromatic hydrocarbons as defined in section 1 of the hazardous Waste Regulation</td>
<td>5 kg or 5 L</td>
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<tr>
<td>17</td>
<td>waste asbestos as defined in section 1 of the Hazardous Waste Regulation</td>
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<td>waste containing a pest control product as defined in section 1 of the Hazardous Waste Regulation</td>
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<td>PCB Wastes as defined in section 1 of the Hazardous Waste Regulation</td>
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</tbody>
</table>

http://www.bclaws.ca/Recon/document/freeside/-->%20e%20--/environmental%20manage...
<table>
<thead>
<tr>
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<tr>
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<td>waste containing tetrachloroethylene as defined in section 1 of the</td>
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<tr>
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<td>Hazardous Waste Regulation</td>
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<td></td>
<td></td>
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[Provisions of the *Environmental Management Act*, S.B.C. 2003, c. 53, relevant to the enactment of this regulation: sections 53, 79 (5) and 92]
PROVINCE OF BRITISH COLUMBIA
ORDER OF THE LIEUTENANT GOVERNOR IN COUNCIL

Order in Council No. 902, Approved and Ordered DEC - 8 2008

Executive Council Chambers, Victoria

On the recommendation of the undersigned, the Lieutenant Governor, by and with the advice and consent of the Executive Council, orders that the Schedule to the Spill Reporting Regulation, B.C. Reg. 263/90, is repealed and the attached Schedule is substituted.

Minister of Environment

Presiding Member of the Executive Council

Authority under which Order is made:
Act and section: Environmental Management Act, S.B.C. 2003, c. 53, s. 79 (5) and 92
Other (specify): OIC 1223/90

July 23, 2008
## Schedule

### Reportable Levels for Certain Substances

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ATTACHMENT 5: A Field Guide to Fuel Handling, Transportation & Storage (February 2002)
INTRODUCTION

This document provides guidance on acceptable industry practice for managing fuel handling, transportation and storage in rural and remote areas of British Columbia. It summarizes requirements of applicable statutes of Canada and British Columbia, industry codes of practice and recommendations relating to environmental protection, health and safety, and fire protection.

This document provides general guidance; however, it is not intended to address every type of fuel facility. It is the responsibility of each commercial or industrial operator to implement the statutory requirements for which they are responsible.

While this document refers to legislation in effect on the date of publication and proposed legislation, users should always reference the current piece of legislation for accuracy of legal requirements.

To assist the user:
(1) terms or phrases that are defined in the Section 11. Glossary are italicized in the text of this document; and,

(2) legislated requirements and recommendations are separately highlighted throughout the document as follows:
   ■ Denotes statutory requirements of legal documents, such as the BC Fire Code and the Transportation of Dangerous Goods Regulations, with text references.
   ◆ Denotes recommended practices.

Nothing in this document should be construed as waiving compliance with any applicable statutory or other legal requirement.

ACKNOWLEDGMENTS

The Ministry of Water, Land and Air Protection and the Ministry of Forests acknowledge: Vern Atkinson, Regional Fire Commissioner, Victoria; Ray Hollenberg, NorthWest Response Ltd., Smithers; Bernard A. Bintner, Environmental Management Branch; and Canadian Forest Products Limited (CANFOR) for their contribution toward the development of this document.
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This guide is meant to assist field operators in reducing the risk and environmental impact where flammable or combustible liquids (See Section 11. Glossary.) are handled, transported and stored. It provides statutory requirements and recommended practices for preventing fires and enhancing health, safety and environmental protection.

Section 1. SMALL CONTAINERS = 230L – Canisters, Jerry Cans, Pails, Drums

<table>
<thead>
<tr>
<th>Statutory Requirements &amp; Recommended Practices</th>
</tr>
</thead>
</table>

1.1 DESIGN
(See definition of small container in Section 11. Glossary.)
- Containers = 230L, used to store flammable or combustible liquids (e.g., gasoline & diesel fuel), must meet the appropriate design specification. (FC4.2.3.1.)
- Maintain containers in good condition – not damaged, rusting or leaking.
- Adequately seal containers with proper fitting lids, caps, bungs or valves to prevent spills and leaks.

1.2 OPERATIONS

Spill control
Note: Secondary containment is not required for individual small containers
- Spill control is required for small containers of flammable and combustible liquids that have the potential to spill. (FC 4.1.6.)
- The degree of spill control should be based on the level of risk. (See Section 7. – Risk Assessment.)

Safety Awareness
- All fuel containers must be labelled in accordance with the Workplace Hazardous Materials Information System (WHMIS), and according to the Fire Code. (FC 4.2.3.2.)
- Smoking is not permitted where dispensing is being carried out. (FC 4.1.5.4.)
- One 20-B:C rated fire extinguisher or two 10-B:C rated fire extinguishers are required where containers are stored within a building or structure. (FC 4.2.9.7. & FC 6.2.3.5.)
- Signs should be displayed where storage (e.g., fuel cache) or dispensing takes place.

Dispensing
- Maintenance and operating procedures shall be established to prevent spills. (FC 4.1.6.3.)
- Containers must not be filled beyond their safe filling level. (FC 4.5.2.7.)
Section 1. SMALL CONTAINERS = 230L

<table>
<thead>
<tr>
<th>Statutory Requirements &amp; Recommended Practices</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐ Mark containers at a safe maximum fill level corresponding to approximately 90% capacity.</td>
</tr>
<tr>
<td>☐ Use an electric fuel pump when dispensing from a drum. When an electric fuel pump is not available or not practical, use a manual pump. Always store and secure the fuel hose above the drum to prevent siphoning.</td>
</tr>
<tr>
<td>☐ Ensure that dispensing procedures are clearly outlined and posted where all operators can see them.</td>
</tr>
<tr>
<td>☐ Keep the drum upright; avoid dispensing from a horizontal drum.</td>
</tr>
<tr>
<td>☐ Ensure housekeeping is effective in maintaining a clean and tidy facility.</td>
</tr>
</tbody>
</table>

Emergency Response

- Spills of TDG Class 3 – flammable liquids ≥ 100L must be reported to the Provincial Emergency Program (PEP) telephone 1-800-663-3456). (WMA, Spill Reporting Regulation – see definition of TDG Class 3 flammable liquids in Section 11. Glossary.)
- Ensure that spills are recovered and that all contaminated soil is removed or treated. (FC 4.1.6.3.)
- Post initial spill response procedures with truck or fuel cache. (See Section 9. – Spill Response.)
- Maintain a spill response plan and a kit capable of containing and absorbing fuel spills. (See Section 9.3. – Spill Response Equipment.)

Remote Storage Locations

- Forestry landings must not be closer than 30 m to a stream to ensure that the landing provides sufficient buffer for sediment, ash and fuel spill infiltration. (FPC – Community Watershed Guidebook 4, Section 6.4.1)
- Assess and manage the risk potential at all remote fuel cache locations. (See Section 7. – Risk assessment.)
- Ensure all empty containers are removed from remote locations and returned for refilling or recycling.

1.3 TRANSPORTATION

Note: TDG documentation is not required when the total fuel capacity of all the containers on the vehicle is = 2000L. (TDG 2.31)

Load Security

- No person shall drive or operate on a highway a vehicle carrying a load unless the load is secured in a manner which ensures that:
  - the load will not escape from the vehicle
  - the load will not shift or sway in a manner that may affect the operation of the vehicle. (MVA Division 35.03)
Section 1. SMALL CONTAINERS = 230L

Statutory Requirements & Recommended Practices

- No person shall drive or operate a commercial vehicle on highway while the vehicle is carrying drums or barrels on end unless:
  - where metal drums or barrels are stacked on end, or on other metal drums or barrels, the stacks are separated by dunnage; and,
  - the vehicle has sides, sideboards or side stakes and the drums or barrels are blocked or tied down with hardware adequate to prevent the load from shifting on the vehicle. (MVA 35.08)

- Tie Downs must:
  - have a safe working load of not more than the weight of the load secured by the tie downs
  - be marked directly, or on a tag permanently attached, with:
    (a) the safe working load as warranted by the manufacturer or by a registered professional engineer, or
    (b) sufficient information so as to enable a peace officer to determine the manufacturer, grade and quality of the tied down. (MVA 35.08)
  - not to be used if worn:
    (a) beyond a wear limitation specified by the manufacturer, or
    (b) to the extent that they have become unsafe
  - when in use be protected as necessary against abrasion
  - when in use have any load binder handle that forms part of the tie down assembly locked in place and secured by rope, wire or chain or a locking mechanism that restricts any movement of the handle, and be designed, constructed and maintained so that the driver of a vehicle can tighten them, unless the tied down consists of steel, fibre or synthetic strapping, if the strapping is taut when in use.(MVA 35.12)

1.4 DOCUMENTATION & TRAINING

Inspection

- All sites that require cleanup of contaminated soil must follow the WMA, Contaminated Sites Regulation. (Section 8. Treating Hydrocarbon Contaminated Soils.)

- Inspect the storage and dispensing area and document the inspections to ensure the operations are in accordance with this guide.

- Develop an action plan to address potential liabilities and to upgrade facilities or practices that do not meet the industrial standards identified in this guide.

- Do not attempt a site cleanup unless you are familiar with the WMA, Contaminated Sites Regulation. (See Section 8. – Treating Hydrocarbon Contaminated Soils.)

- Document any site clean-up with photos, written notes and samples.

Training

Note: TDG training is not required when the total fuel capacity of all the containers on the vehicle is = 2000 L. (TDG 2.31)

- TDG training and spill response training is recommended for anyone transporting small containers.
Section 1. SMALL CONTAINERS = 230L

### Statutory Requirements & Recommended Practices

- Ensure all operators have been given some awareness training in fuel handling, storage and dispensing procedures for *small containers*.
- Review *risk assessment* and spill response procedures with employees.
Section 2. SMALL TDG TANKS ≤ 454L – Truck-Box Fuel Tanks

<table>
<thead>
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<td><strong>2.1 DESIGN</strong></td>
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<tr>
<td>(See definition of small TDG tank in Section 11. Glossary.)</td>
</tr>
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- All small tanks ≤ 454L must be designed, constructed, filled and closed so that, under normal conditions of handling and transport, there will be no discharge, emission or escape of the dangerous goods from the container that could constitute a danger to public safety. (TDG 7.21.)

- All small TDG tanks must meet the UN31 standard for flammable or combustible liquids on January 1, 2003.

**Tanks Used to Transport Diesel Fuel and other Combustible liquids**

(Note: For FC and TDG definitions of flammable liquids and combustible liquids, see Section 11. Glossary.)

- Small TDG tanks (< 454L) used for combustible liquids that are constructed to a non-specified standard but meet the intent of TDG Section 7.21 (See 2.1 Design above.) will be acceptable. (Note: This remains in the proposed amendment to the TDG Regulation.)

**Tanks Used to Transport Gasoline and other Flammable Liquids**

- Small TDG tanks (< 454L) used for flammable liquids that are constructed to a non-specified standard but meet the intent of TDG Section 7.21 (see Design above) may be used until January 1, 2003. Note:
  - A non-specified tank manufactured before 1996 (with visible data plate or date stamp) with a capacity = 454L, that meets the criteria in TDG Section 7.21, is a permitted substitute for gasoline fuel until January 1, 2003.
  - A TC57 portable tank is a permitted substitute for gasoline fuel.
  - A ULC/ORD 142.13 specified mobile refuelling tank manufactured before January 1, 2003, with a capacity = 454L may be used as a permitted substitute for gasoline until January 1, 2010. (TDG)

<table>
<thead>
<tr>
<th><strong>2.2 OPERATIONS</strong></th>
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**Spill Control & Secondary Containment**

Note: Secondary containment is not required for truck-box fuel tanks where the tank is mounted or built as an integral part of the vehicle.

- Secondary containment is required for any truck-box fuel tank that is > 230L and removed from the truck, trailer or mobile unit and operated in a fixed location for any length of time. (FC 4.3.7.1.)

- The degree of spill control should be based on the level of risk. (See Section 7. Risk assessment.)

**Safety Awareness**

- A truck-box fuel tank must be labelled with a flammable/combustible sticker or placard so that it is visible from outside the truck. (FC 4.2.3.2 & TDG Part 5.1.2 & TDG Part 5.7)

- Take appropriate measures against static charge build-up when transferring flammable liquids or combustible liquids in trucks with plastic box liners or rubber mats.
**Statutory Requirements & Recommended Practices**

- Tanks must not be filled beyond their safe filling level. (FC 4.5.2.7.)

- Any vehicle fitted with a portable fuel tank is required to have at least one 20-B:C rated portable fire extinguisher or two 10-B:C rated portable fire extinguishers are within 9m of the truck-box fuel tank. (FC 4.11.2.1.)

- Signs, indicating that the ignition must be turned off and smoking is not permitted while the vehicle is being refuelled must be visible to every driver approaching the dispenser.

- Do not fill beyond a safe-filling level corresponding to 90% capacity.

### Dispensing

- When dispensing flammable liquids, ensure that static electrical charges are controlled by establishing an electrical connection between the tank or container and truck box fill stem, or by providing other appropriate measures as applicable. (FC 4.1.8.2. FC Appendix A-4.1.8.2.(1)(b))

- Hose nozzle valves must conform to CAN/ULC-S620-M, “Hose Nozzle Valves for Flammable and Combustible Liquids” (FC 4.5.5.2.)

- An automatic shut-off nozzle must be used when using an integral hold-open device. (FC 4.5.5.2.)

- When a hose nozzle valve with a hold-open device is used, a break-away coupling conforming to CAN/ULC-S644-M, “Emergency Break-away Fittings for Flammable and Combustible Liquids” shall be provided. (FC 4.5.5.2.)

- Do not use any object or device to maintain the flow of fuel that is not an integral part of the hose nozzle valve assembly. (FC 4.5.8.6.)

- Use only manufacturer’s specified pressure relief security caps. (FC 4.2.3.1.)

- Use fuel dispensing pumps conforming to good engineering practice, and designed for flammable or combustible liquids (See Section 10 – Statutes, Industry Standards & Codes of Practice – Office of the Fire Commissioner, Interpretation Bulletin No. IB 016, Pumps for Transferring Flammable or Combustible Liquids.)

- Do not fuel or service equipment within a riparian management area of a stream or wetland, or within 30m of a lakeshore identified in an operational plan, unless (i) the equipment is hand held, or (ii) the fuelling or servicing is required for carrying out fire fighting activities, required to move broken down equipment, or authorized by the district manager. (FPC, Timber Harvesting Practices Regulation 24 (3); Range Practices Regulation 6 (3); Forest Road Regulation Part 3, 12 (1)(f) & (m))

- Operators should minimize the potential for overfilling a truck-box fuel tank by providing continuously supervised filling operations using suitably qualified personnel. (FC 4.3.1.8)

- Hoses and nozzles used for dispensing fuel should be maintained in good repair.

- Use nozzles that must be kept open by continuous application of manual pressure.
Section 2. SMALL TDG TANKS \( \leq 454L \)

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<tr>
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<tbody>
<tr>
<td>□ Secure nozzles in the back of pickup trucks with some means of drip containment.</td>
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<tr>
<td>□ Do not use hand pumps where power is available.</td>
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<tr>
<td>□ Ensure that all dispensing procedures are made available to operators.</td>
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</table>

**Emergency Response**
- Spills of TDG Class 3 – *flammable liquids* \( \geq 100L \) must be reported to the Provincial Emergency Program (PEP) telephone 1-800-663-3456. (WMA, *Spill Reporting Regulation* – see definition of TDG Class 3 *flammable liquids* in Section 11. Glossary.)
- Ensure that spills are recovered and that all contaminated soil is removed or treated. (FC 4.1.6.3.)
- All vehicles transporting fuel must have a spill response kit capable of containing and absorbing fuel spills. (FC 4.1.6.3.)
- Provide spill response procedures and a current spill response plan with the vehicle.
- Maintain a spill response kit, capable of containing and absorbing fuel spills, with the vehicle. (See Section 9.3. Spill Response Equipment.)

**2.3 TRANSPORTATION**

**Load Security**
- No person shall drive or operate on a highway a vehicle carrying a load unless the load is secured in a manner which ensures that:
  - the load will not escape from the vehicle
  - the load will not shift or sway in a manner that may affect the operation of the vehicle. (MVA Division 35.03)
- Tanks should be placed on plywood or equivalent material to prevent the tank from rubbing on the truck box platform.

**2.4 DOCUMENTATION & TRAINING**

**Inspection**
- All sites that require cleanup of contaminated soil must follow the WMA, *Contaminated Sites Regulation*. (Section 8. Treating Hydrocarbon Contaminated Soils.)
- Ensure that drips and leaks are routinely cleaned so that the truck box remains clean.

**Training**
- TDG training and Spill Response training is recommended for anyone transporting fuel using a *truck-box fuel tank*. 
Section 2. SMALL TDG TANKS ≤ 454L

**Statutory Requirements & Recommended Practices**
Section 3. LARGE TDG TANKS > 454L – Tank Vehicles

This section deals with tank vehicles used as temporary fuelling facilities that are intended to be mobile.

### Statutory Requirements & Recommended Practices

#### 3.1 DESIGN

**Tank Trucks**

- The tank truck must be certified to the current CSA B620-1987/TC306 standard. If the proposed CSA B620-98/TC406 standard is adopted into the TDG Regulations, upgrades will not be required as long as it continues to pass inspections. (TDG)

- The current inspection requirements for tank trucks include:
  - inspection by a facility that is registered by Transport Canada
  - visual inspections every two years and pressure testing is required every 5 years;
  - under the proposed CSA B620-98 standard visual inspections and a leak test will be required every (1) year and an internal inspection and pressure test will be required every five (5) years. (TDG)

- A tank truck that does not meet the current CSA B620-1987/TC306 standard may be certified under a “grandfather clause” or equivalence clause if it meets the intent of the CSA B620 standard. (TDG 7.33.1): This certification is valid only until January 1, 2005. After this date the tank must be disposed of or upgraded to meet the CSA B620-98/TC406 standard. Only a Certified Transport Canada Inspector can certify the tank under the “grandfather clause”. (TDG)

- Ensure that all trucks used to transport fuel tanks meet commercial vehicle inspection requirements.
  - Inspection may not be required in some remote locations where the trucks are not used on public roads; however, commitment to inspection is recommended to provide assurance that the trucks meet an industrial standard for safety and performance.

**Trailers & Semi-Trailers**

- On January 1, 2003 all large TDG tanks >454 L must meet UN31A or UN31B standard for flammable or combustible liquids.

- For specified manufactured fuel tanks:
  - a ULC/ORD standard 142.13 Mobile Refuelling Tank and a TC Standard 57 Portable tank are acceptable substitutes for transporting flammable liquids or combustible liquids;
  - a ULC/ORD standard 142.13 Mobile Refuelling Tank may be used until January 1, 2010 only if it was manufactured before January 1, 2003. (ULC)

- For non-specified manufactured fuel tanks, the following interim requirements must be met:
  - non-specified fuel tanks (of any size) may be used to transport combustible liquid (e.g., diesel fuels) until December 31, 2002 if it is “designed, constructed, filled and closed so that under normal conditions there will be no leakage that could endanger public safety”
  - a non-specified tank that is < 3000L, manufactured before July 1, 1996 and used for flammable liquid (e.g., gasoline) may be used if the tank is:
Section 3. LARGE TDG TANKS > 454L

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<td>Recommended Practices</td>
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<th>Symbols:</th>
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<th>Abbreviations:</th>
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<td></td>
<td>litre (L)</td>
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<td>kilogram (Kg)</td>
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</table>

### Statutory Requirements & Recommended Practices

(a) “designed, constructed, filled and closed so that under normal conditions there will be no leakage that could endanger public safety”, and

(b) leak-tested, inspected and date stamped every 30 months by a facility registered by Transport Canada.

Note: If the fuel tank is used for flammable liquids (gasoline) and was manufactured on July 1, 1996 or later, it must satisfy UN 31A or UN 31B (CGSB 43.146 standard). (TDG)

- Ensure that all tank trucks, trailers and semi-trailers used to transport fuel tanks meet commercial vehicle inspection requirements.
  
  Note: Inspection may not be required in some remote locations where the trucks are not used on public roads; however, commitment to inspection is recommended to provide assurance that the trucks meet an industrial standard for safety and performance.

### 3.2 OPERATIONS

#### Spill Control & Secondary Containment

Note: Spill control, including secondary containment, is not required for tank vehicles where the tank is mounted or built as an integral part of the vehicle including tank trucks, trailers and semi-trailers.

- A fuel storage tank > 230L requires spill control (or secondary containment) when it is removed from a mobile unit and installed in a fixed location. (FC 1.2.1.2.) (See Section 6. Secondary containment & Collision Protection.)

- Consider additional spill control for all fuel storage and dispensing units (including secondary containment systems) that operate in high-risk areas as determined by risk assessment. (See Section 7. Risk assessment.)

#### Safety Awareness

- Signs, indicating that the ignition must be turned off and smoking is not permitted while the vehicle is being refuelled must be visible to every driver approaching the dispenser. (FC 4.5.8.8.)

- Maintain at least one 20-B:C portable fire extinguisher with the tank vehicle (FC 4.11.2.1.)

- During loading and unloading bulk fuel from a tank vehicle, measures shall be taken against static electrical charges. (FC 4.11.3.2.)

- Ensure fuel storage is physically protected against collisions, including:
  - moving the tank vehicle (or mobile skid) to a safe location or place a barrier (i.e. a log or equivalent protection) between the traffic area and the tank. (FC 4.5.2.1. & FC 4.11.2.4.) (See Section 6. 5. – Collision Protection.)

- Tanks must not be filled beyond their safe filling level. (FC 4.5.2.7.)

- When providing collision protection for fuel storage areas, consider selecting:
  - a site that is easily visible
  - a site that is way from traffic.
Section 3. LARGE TDG TANKS > 454L

<table>
<thead>
<tr>
<th>Statutory Requirements &amp; Recommended Practices</th>
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<tbody>
<tr>
<td>Dispensing</td>
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<tr>
<td>■ A storage tank shall be prevented from being overfilled by providing one or both of the following:</td>
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<tr>
<td>• continuous supervision of the filling operations by personnel qualified to supervise such operations (FC4.3.1.8.)</td>
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<tr>
<td>• an overfill protection device that meets the intent of ULC/ORD-C58.15, “Overfill protection Devices for Flammable Liquid Storage Tanks”.</td>
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<tr>
<td>■ Refuelling equipment from a tank vehicle is permitted if the following conditions are met:</td>
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<tr>
<td>• only diesel fuel is dispensed into the fuel tanks (not gasoline)</td>
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<tr>
<td>• the fuelling is conducted in connection with commercial or industrial operations</td>
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<tr>
<td>• the fuelling is conducted outdoors on commercial or industrial establishments</td>
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<tr>
<td>• the fuelling is conducted using approved hose-reel and automatic closing nozzles</td>
</tr>
<tr>
<td>• appropriate training and equipment are supplied to deal with any incidental spillage. (FC 4.11.3.8.)</td>
</tr>
<tr>
<td>■ Do not fuel or service equipment within a riparian management area of a stream or wetland, or within 30m of a lakeshore identified in an operational plan, unless (i) the equipment is hand held, or (ii) the fuelling or servicing is required for carrying out fire fighting activities, required to move broken down equipment, or authorized by the district manager. (FPC, Timber Harvesting Practices Regulation 24 (3); Range Practices Regulation 6 (3); Forest Road Regulation Part 3, 12 (1)(f) &amp; (m))</td>
</tr>
<tr>
<td>■ Do not use any object or device to maintain the flow of fuel, that is not an integral part of the hose nozzle valve assembly. (FC 4.5.8.6.)</td>
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<tr>
<td>■ When a hose nozzle valve with a hold-open device is used, a break-away coupling conforming to CAN/ULC-S644-M, “Emergency Break-away Fittings for Flammable and Combustible Liquids” shall be provided. (FC 4.5.5.2.)</td>
</tr>
<tr>
<td>■ Fuel hose length must not exceed 4.5m, or 6m where a retracting system is used. (FC 4.5.5.1.(2)(3) &amp; FC 4.11.3.8)</td>
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<tr>
<td>❑ There should be no leaks from the valve or pipe system to the pump. Draw-off valves must be threaded at the discharge end or otherwise designed to provide a liquid-tight connection to the delivery hose.</td>
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<tr>
<td>❑ Post all fuel handling procedures.</td>
</tr>
<tr>
<td>❑ Operators should always stay with the nozzle while refuelling.</td>
</tr>
<tr>
<td>❑ Any delivery hose that has the potential to cause a spill, if it were pulled from the delivery pump or valve, should be fitted with a breakaway valve.</td>
</tr>
</tbody>
</table>
Statutory Requirements & Recommended Practices

- Gravity-feed systems are considered high-risk facilities and should be phased out as soon as possible. Additional control measures are strongly recommended to ensure:
  - the bottom-of-tank valve is protected
  - the dispensing hose will not be pulled from the bottom of the tank without a break-away valve
  - additional collision protection is installed to prevent the accidental contact with the tank
  - the tank cannot be overfilled
  - access to the top of the tank meets legal requirements
  - the volumes of fuel are recorded through a meter system.

- The use of automatic shut-off nozzles is recommended to discourage the use of devices to hold the nozzle valve assembly open while refuelling.

- Use fuel-dispensing pumps according to manufacturers’ specifications.

- Close and lock valves as required.

Emergency Response

- Spills of TDG Class 3 – flammable liquids > 100L must be reported to the Provincial Emergency Program (PEP) telephone 1-800-663-3456. (WMA, Spill Reporting Regulation – see definition of TDG Class 3 flammable liquids in Section 11. Glossary.)

- Ensure that spills are recovered and that contaminated soil is removed or treated. (FC 4.1.6.3.) (See Section 8. Treating Hydrocarbon Contaminated Soils.)

- All vehicles used to transport fuel must have a spill response plan and spill response kit, capable of containing and absorbing fuel spills. (FC 4.1.6.3.) (See Section 9. 4. & 9.5. Spill Response Equipment.)

- Post spill response procedures and maintain a spill response plan with the fuel system.

3.3 TRANSPORTATION

Load Security

- No person shall drive or operate on a highway a vehicle carrying a load unless the load is secured in a manner which ensures that:
  - the load will not escape from the vehicle
  - the load will not shift or sway in a manner that may affect the operation of the vehicle. (MVA Division 35.03)

- Appropriate placards must be visible on all four sides of any fuel truck or mobile refuelling trailer that is > 2000 L whether filled or empty. (TDG Part V)
Statutory Requirements & Recommended Practices

### 3.4 DOCUMENTATION & TRAINING

**TDG Documentation**

- TDG documentation (TDG 2.31 & TDG 4.8) is required when transporting more than 2000L of TDG Class 3 – flammable liquid. (See Section 11. – Glossary.) The shipping document must show:
  - document number and date
  - the name, address and signature of the shipper
  - the consignee’s name and address and the carrier’s name
  - fully trained-operator status
  - full description and total volume of dangerous good(s);
  - a 24 hour contact number
  - the type and number of placards, if required. (TDG Part V)

- When transporting an empty tank, the shipping document must use the words: “Residue – Last Contained”.
  - Tanks that are cleaned and purged do not require any documentation. (TDG 4.19)

**Inspection**

- All sites that require cleanup of contaminated soil must follow the WMA, *Contaminated Sites Regulation*. (Section 8. Treating Hydrocarbon Contaminated Soils.)

- Regular inspections must be conducted and documented to ensure that fuel trucks and mobile refuelling tanks meet all safety specifications. (TDG 7.33.1)

- Inspections should be documented and inspection reports kept on file.

**Training and Signage**

- Post clearly legible operating instructions at card or key activated dispensers. (FC 4.5.8.4 & FC 4.5.8.8.)

- Emergency instructions must be conspicuously posted. (FC 4.1.6.3.)

- Spill response training needs should be assessed and implemented annually.

- All drivers who transport bulk fuel should be trained through the Canadian Petroleum Producers Institute (CPPI) Drivers Certification Training and Transportation of Dangerous Goods certification course or equivalent.

- Only experienced drivers with a Transportation of Dangerous Goods (TDG) certificate and emergency response training (ERT) should transport bulk fuel.
Section 4. FIXED LOCATION ABOVEGROUND STORAGE TANKS (AST) > 230L

### Statutory Requirements & Recommended Practices

#### 4.1 DESIGN

- All storage tanks for combustible and flammable liquids must be built and maintained in accordance with Underwriters Laboratories of Canada (ULC) tank specifications, and bear a current ULC certification plate or label. (FC 4.3.1.2.)

- Where a storage tank > 230L is removed or abandoned, it is permitted to be reused for the storage of flammable liquids and combustible liquids only after having been refurbished and found to conform to one of the acceptable standards. (FC 4.3.1.2 & FC 4.10.4.2.)

- Materials, systems, equipment and procedures not specifically described in the Fire Code, or that vary from the specific requirements of the Fire Code, or for which no recognized test procedure has been established, are permitted to be used if it can be shown that these alternatives are equivalent on the basis of tests, evaluations or past performance. (FC 1.1.2.1.)

- All aboveground storage tanks must be installed on firm foundations designed to minimize uneven settling and corrosion, and to prevent the design stress of the tank from being exceeded. (FC 4.3.3.1.)

- Multiple tanks must have a minimum 1m separation between them. (FC 4.3.2.2.)

- Hose Nozzle valves must conform to CAN/ULC-S620-M, “Hose Nozzle Valves for Flammable and Combustible Liquids” (FC 4.5.5.2.).

- When a hose nozzle valve with a hold-open device is used, a breakaway coupling conforming to CAN/ULC-S644-M, “Emergency Break-away Fittings for Flammable and Combustible Liquids” shall be provided. (FC 4.5.5.2.)

- Valves at the storage tank must be constructed of steel according to the Fire Code. (FC 4.3.6.2.(1))

- To ensure a tank meets a specified engineering standard, check for a current certification plate or label.

- Annual risk assessments should be conducted on all gravity-feed systems currently in operation and control measures implemented to reduce and manage the risk(s).

- Gravity-feed systems are considered high-risk facilities and should be phased out as soon as possible. Additional control measures are strongly recommended to ensure:
  - the bottom-of-tank valve is protected
  - the dispensing hose will not be pulled from the bottom of the tank without a break-away valve
  - additional collision protection is installed to prevent the accidental contact with the tank,
  - the tank cannot be overfilled
  - access to the top of the tank meets legal safety requirements
  - the volumes of fuel are recorded through a meter system
  - a record of daily inspections and recorded volumes.
Temporary-Out-Of-Service

- **Aboveground storage tanks**, which will be out of service for a period not exceeding 180 days, must be isolated by closing and securely locking the necessary valves, or by capping the piping from the tank. (FC 4.10.2.2.)

- If the tank contains flammable or **combustible liquids**, the liquid level in the tank must be measured and the readings compared at intervals not greater than one month. (FC 4.10.2.2.)

- When an **aboveground storage tank** will be out of service for a period exceeding 180 days:
  - all liquid and vapour must be removed from the tank and its connected piping
  - the tank markings must clearly indicate that the tank is empty. (FC 4.10.2.2.)

- If the aboveground tank is on a cradle, so that the bottom of the tank is exposed, the bottom of the tank should be visually inspected and documented on a regular basis.

- Remote facilities, that are difficult or impossible to access on a monthly basis, should secured to prevent spills and contamination. This may include leak detection monitoring equipment with wireless communication alarms.

### 4.2 OPERATIONS

**Spill Control & Secondary Containment**

- **Spill control** may include one or more of the following:
  - double-walled tank
  - tank-in-a-box system
  - a graded or sloped site capable of diverting and containing a spill and preventing spills from entering natural waterways, storm drains and sanitary sewers
  - a paved or concrete pad sloped so that water and spilled fuel is directed to an oil/water separator
  - a non-combustible barrier of sufficient height to contain the spill. (FC 4.1.6 & FC 4.3.7.)

- **Secondary containment** areas must not be used for storage purposes. (FC 4.3.7.9.)

- Tanks within the containment area must be on the ground, mounted on a skid or securely positioned on a cradle. The cradle or tank support shall have a fire-resistance rating of not less than 2 hours (i.e. steel). (FC 4.3.3.1.)

- Precipitation must not be allowed to accumulate within the containment area. (FC 4.3.7.8.)

**Safety Awareness**

- Signs, indicating that the ignition must be turned off, smoking is not permitted while the vehicle is being refuelled, and any other fuelling procedure, must be visible to every driver approaching the dispenser. (FC 4.5.8.8)
### Statutory Requirements & Recommended Practices

- At least 2 portable 20-B:C rated fire extinguishers must be available within 9m of the work area. (FC 4.6.5.1 & FC 6.2.3.5.)

- Establish proper bonding, grounding and isolation components for protection against static charges during loading of tank vehicles when transferring flammable liquids or combustible liquids. (FC 4.6.4.5.)

- Ensure fuel storage tank is physically protected against collisions. (FC 4.5.2.1.(3))

- Tanks should be filled to an acceptable safe filling level corresponding to approximately 90% of capacity.

### Dispensing

- Fixed dispensers must be protected against collision damage by either:
  - a concrete island not less than 100mm high, or
  - guard rails. (FC 4.5.3.3.)

- Fuel dispensing hose length must not exceed 4.5m, or 6m where a retracting system is used. (FC 4.5.5.1.(2)(3))

- An automatic shut-off nozzle must be used when using an integral hold-open device. (FC 4.5.5.2.)

- Do not use any object or device to maintain the flow of fuel that is not an integral part of the hose nozzle valve assembly. (FC 4.5.8.6.)

- There must be no leaks from the valve or pipe system to the pump. Draw-off valves must be threaded at the discharge end or otherwise designed to provide a liquid-tight connection to the delivery hose. (FC 4.4.5.)

- During loading and unloading bulk fuel from a tank vehicle, precautionary measures must be taken to prevent static electrical charges. (FC 4.11.3.2.)

- Ensure that all operators stay with the fuel nozzle while refuelling.

- Any delivery hose that has the potential to cause a spill, if it were pulled from the delivery pump or valve, should be fitted with a breakaway valve.

- The fuel dispensing hose should be stored inside the containment berm where applicable.

- The use of automatic shut-off nozzles with an integrated hold-open device is recommended to discourage the use of devices or objects to hold the nozzle valve assembly open while refuelling.

- The fuel dispensing hose should be stored inside the containment berm where applicable.

- Keep hoses off the ground and valves closed and locked when not in use.

- Always stay with fuel dispensing system while refuelling.
### Statutory Requirements & Recommended Practices

- A hose retractor should be used to keep the hose off the ground when not in use.
- All pumps used to transfer fuel should conform to manufacturers' specification.
- Use automatic shut-off nozzles.
- Nozzles should be equipped with some means of drip containment.

### Pollution Prevention

- Storage tanks must not be overfilled, and precautions must be taken to prevent overflow or spillage by providing continuous supervision of the filling operations by personnel qualified to supervise such operations (FC 4.5.8.6.)
- To help minimize spills while filling the tank, an over-fill spill box should be located around the fill stem pipe.

### Emergency Response

- A spill response kit capable of containing and absorbing fuel spills must be made available and maintained (FC 4.2.6.3) (See Section 9.3 spill Response Equipment.)
- Ensure that spills are recovered and that contaminated soil is removed or treated. (FC 4.1.6.3.) (See Section 8. Treating Hydrocarbon Contaminated Soils.)
- Spills of TDG Class 3 – flammable liquids > 100L must be reported to the Provincial Emergency Program (PEP) telephone 1-800-663-3456). (WMA, Spill Reporting Regulation – see definition of TDG Class 3 flammable liquids in Section 11. Glossary.)
- Post spill response procedures and maintain an emergency response manual with the fuel facility.

### 4.3 DOCUMENTATION & TRAINING

#### Inspection & Documentation

- Visual inspections must be made daily and during each shift of the piping system, pumps and ancillary equipment for leaks spills and obvious abnormal conditions. Any leakage must be repaired immediately. (FC 4.4.11.5.)

- At fuel dispensing stations where the tank is resting on the ground (and visual inspection beneath the tank is not possible) the measurement (by tank dip) and computation of any gain or loss of liquid shall be taken each day that the station is in operation. (FC 4.3.16.1.)
Statutory Requirements & Recommended Practices

- All sites that require cleanup of contaminated soil must follow the WMA, *Contaminated Sites Regulation.* (Section 8. Treating Hydrocarbon Contaminated Soils.)
- Keep a record of all volumes before and after deliveries.

Training and Signage

- Ensure that the training of fuel dispensing attendants includes procedures for:
  - supervising the dispensing of flammable and *combustible liquids*
  - taking appropriate measures to prevent sources of ignition from creating a hazard at the dispensers
  - taking appropriate action in the event of a spill to reduce the risk of fire
  - shutting off the power to all dispensers in the event of a spill or fire. (FC 4.5.8.5., FC 4.5.8.6. & FC 4.4.11.2)
- Spill and fire-training requirements should be assessed and implemented annually.
- All drivers who transport bulk fuel should be trained through the Canadian Petroleum Producers Institute (CPPI) Drivers Certification Training and Transportation of Dangerous Goods certification or equivalent.
Section 5. MARINE FACILITIES

Section 5. MARINE FACILITIES – foreshore facilities, wharves, docks, floating structures, barges and boats

Statutory Requirements & Recommended Practices

### 5.1 DESIGN

- All aboveground storage tanks for combustible and flammable liquids must be built and maintained in accordance with Underwriters Laboratories of Canada (ULC) tank specifications, and bear a current ULC certification plate or label. (FC 4.3.1.2.)

- All aboveground storage tanks must be installed on firm foundations designed to prevent the allowable design stress of the tank from being exceeded, and to minimize corrosion and uneven settling. (FC 4.3.3.1.)

- Refurbished aboveground storage tanks for flammable and combustible liquids must meet the standards specific in the Fire Code before reuse. (FC 4.3.1.2 & FC 4.10.4.2.)

- All fuel facilities around marine facilities require additional control measures as outlined in
  - Marine Fuel dispensing Stations (FC 4.5.6.6)
  - Piers and Wharves. (FC 4.7).


- Tanks on floating structures should have additional controls including:
  - Additional floatation to ensure buoyancy and stability of the floating structure
  - Additional log-boom protection to ensure protection against large irregular swells and wave action
  - Emergency shut off devices on the tank assembly
  - Pressure relief valves on the tank
  - A baffle system within tank to keep the product within the tank more stable
  - Sheer valves inside the tank
  - Anti-siphon valves for the tank.

- Fuel dispensing from tanks should be carried out from the tops of the tanks.

- All gravity-feed systems should be phased-out as a precaution against spills.

- An annual risk assessment should be conducted on all gravity-feed systems and measures implemented to reduce the risks.

### Siting Requirements

- Storage tanks at marine fuel dispensing stations must not be located closer than 4.5m horizontally from the normal annual high-water mark. (FC 4.5.6.6.)

- Solid piping must be used between storage tanks located on shore. Suitable lengths of acceptable flexible hose may be used between piping on floating structure and solid piping located on shore. (FC 4.5.6.6.)
Section 5. MARINE FACILITIES

### 5.2 OPERATIONS

#### Spill Control & Secondary Containment

- All fuel storage tanks > 230L capacity require secondary containment. (FC 4.3.7.)
  (See Section 6. 1. Secondary Containment.)

- Spill control must include one or more of the following:
  - double-walled tank
  - tank-in-a-box system
  - a graded or sloped site capable of diverting and containing a spill and preventing spills from entering natural waterways, storm drains and sanitary sewers
  - a paved or concrete pad sloped so that water and spilled fuel is directed to an appropriately designed oil/water separator
  - a non-combustible barrier of sufficient height to contain the spill. (FC 4.1.6 & FC 4.3.7.)

- Secondary containment must be able to contain 110% of the primary tank plus 10% of all the additional containers. Secondary containment must not be used for storage purposes. (FC 4.3.7.3 & FC 4.3.7.9)

- Tanks within the containment area must be on the ground, mounted to a skid or securely positioned on a cradle. The cradle or tank support shall have a fire-resistance rating of not less than 2 hours (i.e. steel). (FC 4.3.3.1.)

- Visual inspections must be made daily and during each shift of the piping system, pumps and ancillary equipment for leaks, spills and obvious abnormal conditions. Any leakage must be repaired immediately. (FC 4.4.11.5.)

- Precipitation must not be allowed to accumulate within the containment area. (FC 4.3.7.8.)

- Safety measures for docks and floating structures should take into account wave action, tidal movement and wind storms, and may include:
  - additional containment (e.g., 150%) with an increased distance between the tank and the wall of the secondary containment (e.g., 1m)
  - floats engineered, designed and constructed to be stable when the fuel tank, and possibly the secondary containment, are at maximum capacity due to water accumulation.

- Ensure that the secondary containment is kept clean of fuel and oil contamination.
Statutory Requirements & Recommended Practices

Safety Awareness
- At least 2 portable 20-B:C rated fire extinguishers and one spill response kit must be provided on site. (FC 4.1.5.1.)
- Only trained personnel must be allowed to use the fuel dispensing system. (FC 4.4.11.2.)
- Signs, indicating that the ignition must be turned off and smoking is not permitted while the vehicle is being refuelled, must be visible to every driver approaching the dispenser. (FC 4.5.8.8.)
- Mark each storage tank at a level corresponding to 90% capacity, and do not fill beyond that level.
- Ensure that clearly marked sign outlining the fuelling procedures is visible to all operators.
- All personnel on floating structures should use coast guard-approved life jacket/vests.
- Non-skid surfaces should be used in areas of high traffic and on tidal fluctuating ramps.
- For docks and floating structures, additional safety measures should be considered to take into account wave action, tidal movement and wind storms. These measures may include:
  - stabilizers under the fuel dock
  - one-way flow valves on all solid lines connecting storage tank to dispensers
  - break-away devices between docks and dock/shore.

Dispensing
- Dispensers at marine fuel dispensing stations shall be at a location which will permit safe access by watercraft. (FC 4.5.2.4.)
- At marine fuel dispensing stations, a readily accessible valve shall be provided in each pipeline at or within 7.5m of the pier to shut off the supply from shore. (FC 4.5.4.3.)
- Tanks and pumps that are not integral with the dispenser shall be located on shore or on a pier of the solid-fill type. (FC 4.5.6.6.)
- Where shore locations would result in excessively long supply lines to the dispenser, storage tanks to a maximum capacity of 5,000L to a maximum capacity of 5000L are permitted on a pier provided applicable spacing, secondary containment and piping requirements are met. (FC 4.5.6.6 & FC 4.3.7.)
- The length of extended fuel dispensing hose at marine fuel dispensing stations is permitted to exceed the values which apply to other fuel dispensing stations (4.5m, or 6m). (FC 4.5.5.1.(4))
- All hoses must be fitted with a breakaway valve when using a nozzle with a hold-open device. (FC 4.5.5.2.)
- Keep all fuel delivery hoses off the surface of the dock walkway.
## Statutory Requirements & Recommended Practices

- Use anti-surge valves in all the fuel vent lines.
- Use *breakaway valves* between all jump-hoses for dock-to-dock and dock-to-shore connections.
- Any delivery hose that has the potential to cause a spill, if it were pulled from the delivery pump or valve, should be fitted with a *breakaway valve*.
- A clearly marked sign outlining fuelling procedures should be visible to all operators including:
  - one person should stay with the fuel nozzle at all times during refuelling
  - sorbent pads should be used to catch drips from the nozzle.
- Tanks should be marked at a level corresponding to 90% capacity, not filled beyond that level, and care should be taken so that:
  - fuel levels are checked prior to filling
  - valves are closed and the hose properly secured when refuelling is finished
  - appropriate fuel caps are secured after refuelling
  - portable fuel tanks are filled onshore.

- For docks and floating structures, safety measures should be taken, to account for wave action, tidal movement and windstorms, including one-way flow valves on solid lines from *storage tanks* to dispensers.

### Pollution Prevention

- All dock facilities must have spill response kits capable of containing and absorbing fuel spills on water. (FC 4.1.6.3.) (See Section 9.5 Spill Response Equipment.)

- Suitably qualified personnel must prevent a boom boat from being overfilled by providing continuous supervision of the filling operations. (FC 4.3.1.8.)

- Sorbent pads should be used around the fill stem pipe to catch any drips from the nozzle while refuelling.

- Standard industrial refuelling equipment and parts should be used to ensure that the design meets industrial standards.

### Emergency Response

- Spills of TDG Class 3 – *flammable liquids* ≥ 100L must be reported to the Provincial Emergency Program (PEP) telephone 1-800-663-3456). (WMA, *Spill Reporting Regulation* – see definition of TDG Class 3 *flammable liquids* in Section 11. Glossary.)

- Ensure that spills are recovered and that contamination is removed or treated. (FC 4.1.6.3.) (See Section 8. Treating Hydrocarbon Contaminated Soils.)
Section 5. MARINE FACILITIES

**Statutory Requirements & Recommended Practices**

- Maintain a spill response kit capable of containing and absorbing fuel spills. (FC 4.1.6.3.)
- Review fire safety plans annually. (FC 2.8.2.)

- Post spill response procedures in locations that are visible to all operators
- An emergency response plan should be implemented immediately following a spill.
- Use all available resources and technical expertise to ensure a quick and effective response.
- Maintain an adequate spill response kit capable of containing and absorbing fuel spills.
  (See Section 9.3. Spill Response Equipment.)
- An emergency shut-off system should be used to immediately close all valves between fuel storage units and dispensing units.

### 5.3 DOCUMENTATION & TRAINING

**Inspection & Documentation**

- Visual inspections must be made daily and during each shift of the piping system, pumps and ancillary equipment for leaks, spills and obvious abnormal conditions. Any leakage must be repaired as quickly as practicable. (FC 4.4.11.5.)
- A fuel-storage tank that is resting on the ground, such that visual inspection beneath the tank is not possible, must be measured daily (using tank dip measurements) and any gain or loss of liquid recorded. (FC 4.3.16.1.)
- Implement an *environmental management system* (EMS) to assess and assist in managing risks.
- The owner/operator should keep a record of all volumes before and after deliveries.
- Develop a checklist system to ensure all aspects of the facility are inspected and working as required.

**Training and Signage**

- Post clearly legible operating instructions. (FC 4.5.8.4. & FC 4.5.8.8.)
- Emergency instructions must be conspicuously posted. (FC 4.5.8.4.)
- Spill and fire training procedures should be assessed annually and changes implemented as necessary.
- A record of training scenarios and exercises should be kept on file.
Section 6. SECONDARY CONTAINMENT & COLLISION PROTECTION

<table>
<thead>
<tr>
<th>Statutory Requirements &amp; Recommended Practices</th>
</tr>
</thead>
</table>

### 6.1 Secondary Containment

- The Ministry of Water, Land and Air Protection may order preventive measures to reduce the risk of a spill entering the environment. (WMA Section 33)

- *Secondary containment* works should include *spill control* measures for preventing *petroleum products* from entering natural waterways, storm drains and sanitary sewers. These measures may include the following:
  - site selected for adequate slope or graded to divert and containing a spill
  - double-walled tanks or tank-in-a-box systems that operate in high-risk areas
    (See Section 7. – Risk assessment)
  - paved or concrete pad sloped so that water and spilled fuel will be directed to an appropriately designed oil/water separator
  - tank-farm *berm* that conforms to FC 4.1.6 or containment for a single tank of sufficient size to contain the volume of the tank plus 10%
  - for a multi-tank farm facility, a *berm* capable of containing 110% of the largest tank or 100% of the largest tank plus 10% of the aggregate volume of all the tanks within the *berm*, whichever is greater.

### 6.2 Design, Materials & Construction

- *Secondary containment* works should be designed and constructed by incorporating:
  - concrete, steel or soil with an impermeable geotextile material of 30 mil
  - soil permeability should be sufficient to contain a spill (i.e. clay of not more than $10^{-6}$ cm/s)
  - geotextile with sand above and below the geomembrane liner when used in combination with soil
  - a means of removing accumulated precipitation and any spills within the bermed area. (For example a sump and siphon system, an oil/water separator or a hydrocarbon detection electric sump pump
  - necessary means of testing for leaks after construction. (For example, fill the *berm* with water and monitor the level over a period of a few days.)
  - covered containment where practicable to minimize maintenance.

### 6.3 Maintenance

- Maintenance should include regular inspection of containment works to ensure:
  - the integrity of the containment system
  - containment systems are emptied of rainwater/snow accumulations
  - drainage valves and plugs in steel secondary containment units are closed or sealed
  - geomembranes are not exposed or damaged.

### 6.4 Discharge of Wastewater

Subject to compliance with the WMA, Petroleum Storage and Distribution Facilities Stormwater Regulation, the Special Waste Regulation, and a permit, approval or order, an operator may introduce hydrocarbon contaminated storm water effluent into the environment from a petroleum storage and distribution facility.
## Statutory Requirements & Recommended Practices

- A petroleum storage and distribution facility that:
  - has a cumulative storage capacity >100,000 L,
  - occupies a location for a period ≥180 consecutive days, or
  - is not part of a retail service station,
  must maintain the discharge of stormwater from its operations to the environment, so that the total extractable hydrocarbon in the discharged effluent is = 15mg/L.

- Maintain any sized operation so that the quality of a discharge to the environment does not exceed a total extractable hydrocarbon content of 15 mg/L.

- If the accumulated precipitation has an oily sheen, a bad odour or appears to be contaminated, it should be sampled and analyzed according to Schedule 2, WMA, *Petroleum Storage and Distribution Facilities Storm Water Regulation*.

- Use an oil/water separator, carbon filter, coalescing separator or other approved treatment/filter system as appropriate.

- Contaminated water from a secondary containment can be pumped into drums (or other containers) and disposed of through a suitably qualified disposal company.

### 6.5 Collision Protection

- Storage tanks that are exposed to risk of collision must be protected by posts or guardrails. 
  (FC 4.3.7.4. (2)(c))
  - the B. C. Fire Commissioner has ruled that aboveground storage tanks at permanent fuel facilities require barriers consisting of not less than 100mm diameter steel pipes filled with concrete, that are set into the ground to a depth of at least 1m and extend above ground for at least 750mm. These posts must be spaced not more than 1400mm apart and positioned at a distance of 1m from the exterior of the tank assembly’s outer shell. (HM 09 91-11-21).

- Regarding a tank-in-a-box storage system the B. C. Fire Commissioner has ruled that the aboveground tank assembly satisfies the intent of FC 4.1.6. and is acceptable without the need for a conventional dike. 
  (HM 09 91-11-21).
Section 7. RISK ASSESSMENT

The objective of risk assessment is to help operators understand the level of risk they are taking in managing their fuel facility for the purpose of taking appropriate risk-control measures.

This section provides a simple risk-ranking approach:

a) assign a risk-rank value (3 for high, 2 for medium and 1 for low) for each of the risk identification categories indicated in the column on the left in Table 7.1.

b) add these values to arrive at the total risk-ranking value for the fuel storage facility.

Table 7.1. Risk-Ranking for Land-Based Fuel Facilities

<table>
<thead>
<tr>
<th>Risk Identification Category</th>
<th>Risk Rank High</th>
<th>Risk Rank Medium</th>
<th>Risk Rank Low</th>
<th>Assigned Risk-Rank Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Numerical Value</strong></td>
<td>3</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td><strong>Environmental</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distance to nearest water course</td>
<td>&lt; 50m</td>
<td>50m-100m</td>
<td>&gt;100m</td>
<td></td>
</tr>
<tr>
<td>Characteristic of soil at the fuel facility</td>
<td>Porous or unknown</td>
<td>semi-porous</td>
<td>Non-porous clay/bedrock</td>
<td></td>
</tr>
<tr>
<td>Slope of terrain surrounding the fuel facility</td>
<td>&gt;6% slope</td>
<td>2%-6% slope</td>
<td>&lt;2% slope</td>
<td></td>
</tr>
<tr>
<td><strong>Operational</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Site designation or description</td>
<td>High traffic logging road (Main Line)</td>
<td>Low traffic logging road (Side Spur)</td>
<td>No through traffic logging road</td>
<td></td>
</tr>
<tr>
<td>Duration of fuel facility operations</td>
<td>&gt; 6 days</td>
<td>2-6 days</td>
<td>&lt; 2 days</td>
<td></td>
</tr>
<tr>
<td>Volume of fuel stored at the fuel facility</td>
<td>&gt; 4500L</td>
<td>500L-4500L</td>
<td>&lt;500L</td>
<td></td>
</tr>
<tr>
<td>Number of times the fuel facility is used per day</td>
<td>&gt; 12 times per day</td>
<td>6-12 times per day</td>
<td>&lt;6 times per day</td>
<td></td>
</tr>
<tr>
<td>Amount of traffic around the fuel facility</td>
<td>&gt; 15 people on site</td>
<td>5-15 people on site</td>
<td>&lt;5 people on site</td>
<td></td>
</tr>
<tr>
<td><strong>Prevention / Preparedness</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distance to additional spill response cache</td>
<td>&gt; 60 minutes</td>
<td>15-60 minutes</td>
<td>&lt;15 minutes</td>
<td></td>
</tr>
<tr>
<td>Additional spill control</td>
<td>Tank with no secondary containment</td>
<td>Tank with secondary containment</td>
<td>Tank with secondary containment &amp; additional spill control – graded site</td>
<td></td>
</tr>
<tr>
<td>Last spill response training session for everyone handling fuel</td>
<td>Operator not trained in &gt;2 years</td>
<td>Operator not trained in 1-2 years</td>
<td>Operator trained in the last year</td>
<td></td>
</tr>
</tbody>
</table>

Total Risk-Rank Value (total of the Assigned Risk-Rank Values) =
In Table 7.2, use the total Risk Rank Value determined from Table 7.1 to determine appropriate levels of effort to mitigate the risks at the fuel handling facility.

**Table 7.2. Recommendations on Risk Control Measures**

<table>
<thead>
<tr>
<th>Numerical Value</th>
<th>Risk Ranking</th>
<th>Recommendations on Risk Control Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;12</td>
<td>Low Risk</td>
<td>(a) No additional control measures are necessary.</td>
</tr>
<tr>
<td>12-23</td>
<td>Medium Risk</td>
<td>(a) Additional control measures should be considered to reduce risk. (b) Document inspections.</td>
</tr>
<tr>
<td>&gt;23</td>
<td>High Risk</td>
<td>(a) Additional controls are necessary to reduce risk. (b) Consider moving the fuel facility. (c) Document inspections.</td>
</tr>
</tbody>
</table>
Section 8. TREATING HYDROCARBON CONTAMINATED SOILS

8.1 Introduction

The objective of this section is to provide some information on processes for handling, treating and disposing of soil that has been contaminated with petroleum hydrocarbons (gasoline, diesel fuel, lubricating oil and waste oil).

The ongoing remediation of polluted or contaminated sites will help minimize the long-term environmental impacts of contamination from minor spills, leaks and drips from mobile equipment. These remediation activities are meant to complement ongoing maintenance programs for the handling, transportation and storage of fuel.

The reader is referred to the Contaminated Sites Regulation B. C. Reg. 375/96, and the WMA, Special Waste Regulation B. C. Reg. 63/88 for requirements related to the notification, investigation, remediation and if desired, certification of petroleum hydrocarbon contaminated sites and the movement, disposal or alternate use of petroleum hydrocarbon contaminated soil.

8.2 Polluted or Contaminated Soil Remediation

"Land farming" is a commonly used method of soil remediation for lightly hydrocarbon-contaminated soil that relies on natural breakdown of hydrocarbons by microbial action. This is done by spreading a shallow layer of contaminated soil onto a lined bermed area referred to as a biocell, or by piling the soil in long row known as a windrow.

Factors that determine the efficiency of microbial action include temperature, moisture, aeration and the availability of nutrients. In many cases, natural microbes present in soil are adequate to commence treatment; however, a commercially available microbial mixture may be worked into the soil along with dry nutrients (nitrogen and phosphorus) during periodic cultivation of the land farm.

Biocells and windrows should be located on impermeable soil (i.e. clay), as far away from watercourses or riparian zones as possible and secure from public access (i.e. within a fenced compound). Locate the biocell or windrow on high ground and above the seasonal high water table to facilitate proper drainage. It is important to check with a Ministry of Water, Land and Air Protection (MWLAP) Regional Office before finalizing the siting of proposed soil treatment facilities.

8.3 Contaminated Soil Collection

Contaminated soil or visually stained soil should be collected on a regular basis. Visual inspection of the ground surface should provide a rough estimate of the amount of soil that must be removed. Samples of the base and walls of the excavation pit will help ensure that all the contamination has been removed and provide a record of clean up.

In areas where the contaminated soil lies below existing structures (i.e. storage tanks, storage sheds, generator sheds, pumping stations, waste oil storage sheds) the following steps should be taken:

- Ensure that all hydrocarbon leak(s) is/are stopped at the source. This includes leaking pipes, oil drums, drip trays, etc.
- Contact the MWLAP Regional Office to assist in a site assessment.
- Remove as much of the contaminated soil as possible.
- If the structure cannot be removed, the location of the contamination should be noted.

At historically contaminated sites, the depth of oil or fuel seepage may be considerable. Under these conditions an environmental consultant should be retained to assess the contamination and develop an effective remediation and monitoring plan.
8.4 Preparing a Windrow

A windrow is usually formed 1m to 2m in height and is as wide as the soil naturally falls during its construction. The soil is turned over frequently to promote aeration of the soil and evaporation of the hydrocarbon. During wet seasons, the windrows should be covered with plastic tarps to minimize the potential for leachate formation and the contamination of storm water runoff.

8.5 Preparing a Biocell

A biocell should be constructed over a period of time to a maximum depth of no more than about 3-4 ft (1 meter) in depth as the natural breakdown of hydrocarbons occurs. To allow for effective aeration, successive layers of contaminated soil should be spread up to 1 – 2 feet deep over a buffer layer of clean soil on the bottom of the biocell.

Stockpiled soil should be banked or sloped close to the perimeter of the biocell, and covered as necessary to deflect surface water run-off.

The biocell should have a built-in ramp at one end and to allow front-end loader/back-hoe operations while at the same time preventing runoff carrying hydrocarbons and fertilizer. The base of the biocell should be sloped to one corner to collect leachate. A pump-and-treat system may be required to ensure that leachate does not escape to the environment.

Where a geotextile-type liner is used, a protective buffer layer of uncontaminated soil or plywood should be used over and under the liner on the biocell floor.

8.6 Adding Nutrients

Based on the level of contamination and the soil type, add a commercially available microbial mixture and nutrient blend to the soil using a spray system. Work the soil until the fertilizer is adequately mixed throughout the layer of soil.

To avoid anaerobic poisoning of microbes, leachate accumulation and the need for leachate treatment, avoid excess water accumulation in the biocell.

Aerating the soil is very important, especially during the initial stages, because the bacteria in the soil require oxygen to break down the petroleum contamination. Aeration can be achieved using a cultivator or by turning it with a front-end loader every two weeks.

8.7 Disposal of Remediated Soil in British Columbia

Sufficiently treated soil can be useful as cover material for landfills or as material for road construction.

Prior to removing the soil for disposal or alternate use, written approval must be obtained from the MWLAP Regional Office. Complete information on contaminated site remediation in B. C. is available at the ministry’s contaminated sites web page at: http://www.elp.gov.bc.ca/epd/epdpa/contam_sites/
Section 9. SPILL RESPONSE

This Section provides information on the spilled material, notification of appropriate authorities, initial assessment of the extent of the spill in the environment, initial spill response and a list of spill response equipment.

9.1. Initial Spill Identification, Notification and Assessment

The first responder must make an initial identification of the spilled material, and assess the incident prior to taking action to ensure that resources are used effectively. This assessment includes collecting information on safety and the extent of the spill in the receiving environment. The assessment is followed by an initial response procedure.

Table 9.1. Initial Spill Identification, Notification and Assessment Procedure

<table>
<thead>
<tr>
<th>PRIORITY</th>
<th>ACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identify Spilled material</td>
<td>□ Identify product spilled and flammability of the product <em>(What)</em> (See Section 11. Glossary for FC and TDG definitions of flammable liquid/combustible liquids.)</td>
</tr>
<tr>
<td>Safety</td>
<td>□ For spills of gasoline or other flammable liquids – clear and secure the site and notify the fire department and the Provincial Emergency Program (PEP) – see telephone number below. Further spill assessment and response for these products is usually too dangerous.</td>
</tr>
<tr>
<td>(a) Use the buddy system</td>
<td>□ Determine safety and protective equipment for working in or around the spill.</td>
</tr>
<tr>
<td>(b) Never work alone.</td>
<td>□ Provide first aid to injured persons</td>
</tr>
<tr>
<td>(c) Initiate action</td>
<td>□ Monitor vapour levels</td>
</tr>
<tr>
<td>Safety Action</td>
<td>□ Prioritize the safety action plan</td>
</tr>
<tr>
<td>Initial Spill Description</td>
<td>□ Describe the spill <em>(Where, When and How)</em></td>
</tr>
<tr>
<td></td>
<td>□ Identify the tank volume</td>
</tr>
<tr>
<td></td>
<td>□ Note the duration of spill from tank or line</td>
</tr>
<tr>
<td></td>
<td>□ Note any potential fire hazards</td>
</tr>
<tr>
<td></td>
<td>□ Note any other physical hazards</td>
</tr>
<tr>
<td></td>
<td>□ Determine if the spill can be stopped</td>
</tr>
<tr>
<td>Notify PEP</td>
<td>□ Determine if the spill can be contained at the source or downstream</td>
</tr>
<tr>
<td>1-800-663-3456</td>
<td>□ Immediately report spills ≥100 litres of TDG Class 3 – flammable/combustible liquids or waste oil to PEP. (WMA Spill Reporting Regulation)</td>
</tr>
<tr>
<td>Description of Spill in the Receiving Environment</td>
<td>• Complete a spill reports form, including <em>whom, what, where, when and how.</em></td>
</tr>
<tr>
<td>Determine equipment needed for initial containment, recovery, and clean-up.</td>
<td>On land</td>
</tr>
<tr>
<td></td>
<td>□ Mark the extent (perimeter) of the spill area.</td>
</tr>
<tr>
<td></td>
<td>□ Dig test pits to determine the depth of the spill in the ground.</td>
</tr>
<tr>
<td></td>
<td>In streams, creeks or ditches</td>
</tr>
<tr>
<td></td>
<td>□ Note the destination of spilled product downstream.</td>
</tr>
<tr>
<td></td>
<td>□ Identify eddies, pools or culverts to use in diverting the spill.</td>
</tr>
<tr>
<td></td>
<td>□ Note the depth and the velocity of the water.</td>
</tr>
<tr>
<td></td>
<td>□ Note soils, vegetation, fish spawning areas, bird habitat, and wildlife.</td>
</tr>
<tr>
<td></td>
<td>□ Identify any downstream areas and the rate of spread of the main slick.</td>
</tr>
<tr>
<td></td>
<td>In lakes, ponds &amp; lake foreshore</td>
</tr>
<tr>
<td></td>
<td>□ Visually inspect the foreshore to identify the extent of contamination.</td>
</tr>
<tr>
<td></td>
<td>□ Note where the product is pooling along shore.</td>
</tr>
<tr>
<td></td>
<td>□ Note any marsh areas that must be protected.</td>
</tr>
</tbody>
</table>
9.2. Initial Spill Response for Combustible Products

The first response action provided in Table 9.2. is to be used in conjunction with annual spill response training.

Table 9.2. Initial Spill Response for Combustible Products (See Section 11. Glossary for FC and TDG definitions of \textit{flammable liquids} and \textit{combustible liquids}.)

<table>
<thead>
<tr>
<th>PRIORITY</th>
<th>RESPONSE ACTION</th>
</tr>
</thead>
</table>
| Act Fast & Think Safety|  - Use Common Sense!  
  - Prior to taking any action, ensure that a complete assessment is made to ensure that resources are used effectively.  
  - Use appropriate safety procedures and personal protective equipment.  
  - An intense & quick response is essential to minimize the potential impact on the environment. |
| Containment & Recovery |  - Mark the perimeter of the spill.  
  - Dig recovery ditches around the perimeter (and pits within the spill area) to contain the spill.  
  - Monitor the ditches and pits to ensure the collection system are effective.  
  - Use sorbent pads to remove free product and excavate the contaminated soil.  
  - Sample the soil to determine the extent of contamination.  
  - Pump the product from the containment area or obtain approval from BC MWLAP to burn the product. |
| Disposal & Site Restoration |  - Confirm disposal options and approval with BC MWLAP.  
  - Take photos and notes to document the spill incident, response and clean-up.  
  - Ensure samples are taken and the results are properly documented and kept on file. |

Spill to Land

- Mark the perimeter of the spill.
- Dig recovery ditches around the perimeter (and pits within the spill area) to contain the spill.
- Monitor the ditches and pits to ensure the collection system are effective.
- Use sorbent pads to remove free product and excavate the contaminated soil.
- Sample the soil to determine the extent of contamination.
- Pump the product from the containment area or obtain approval from BC MWLAP to burn the product.

Spill to Water

To effectively contain the spill, use several containment methods in series:
- In a ditch or stream, contain the spill using tarp containment system, underflow system or containment booms.
- In open water (i.e. lake) divert the spilled product to the containment system using sorbent booms, synthetic booms.
- Use sweeps to corral the spilled product to one corner. Add a second containment boom if required.
- Use sorbent pads and/or pumps to collect the spill products from the containment area.
- Use sweeps and sorbent pads to recover the product. Use a wringer to extract the excess product then reuse the sorbent pads.
- Use a skimmer or suction pump (i.e. pump truck) if the volume is significant and the spill is contained.
- Develop a monitoring program to assess and remove free product over a given time frame.
9.3. Spill Response Equipment

The necessity for spill response equipment will depend on the environment, the time of year and the type of incident. The following table – “General Spill Response Equipment Cache” serves as a guide to equipment that should be maintained within a reasonable distance of any potential spill location. Separate lists are provided for pick-up trucks and tank vehicles to help implement response preparedness.

The need for additional response equipment, resources or expertise will depend on the initial assessment of a spill, including safety, initial spill control and the extent of the spill in the receiving environment. These resources should be listed in the emergency response plan.

Table 9.3 (a) General Spill Response Equipment Cache

<table>
<thead>
<tr>
<th>General Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Communication</strong></td>
</tr>
<tr>
<td>Up-to-date Emergency Spill Response Plan</td>
</tr>
<tr>
<td>Inventory of spill response equipment and locations</td>
</tr>
<tr>
<td>Spill assessment forms (i.e. Environmental, safety and spill assessments)</td>
</tr>
<tr>
<td>Two-way radios, cell phone or other appropriate radio transmitter/receiver</td>
</tr>
<tr>
<td><strong>Personal Protection and Safety</strong></td>
</tr>
<tr>
<td>PVC gloves, insulated rubber gloves, leather gloves</td>
</tr>
<tr>
<td>Rain gear (pants and jackets), steel toe rubber boots</td>
</tr>
<tr>
<td>Safety glasses, hard hat, hearing protection</td>
</tr>
<tr>
<td>20:BC rated fire extinguisher, first aid kits</td>
</tr>
<tr>
<td><strong>Hand Tools</strong></td>
</tr>
<tr>
<td>Tool kit, drum bung-wrench</td>
</tr>
<tr>
<td>Pointed and/or broad shovels</td>
</tr>
<tr>
<td>Flagging / barrier tape, traffic cones</td>
</tr>
<tr>
<td>Tie wire, duct tape, 100m of nylon rope (braided or twisted)</td>
</tr>
<tr>
<td><strong>Containment</strong></td>
</tr>
<tr>
<td>1L of commercially available bentonite clay or equivalent (in dry or pre-mixed form) used to plug holes in leaking containers</td>
</tr>
<tr>
<td>3 tarps (large and medium)</td>
</tr>
<tr>
<td>80-100 empty sand bags (to be filled when required)</td>
</tr>
<tr>
<td>River boom 100-600 ft (30-180 m)</td>
</tr>
<tr>
<td>Re-bar (12 stakes)</td>
</tr>
<tr>
<td>Rope 1/4&quot; diameter x 300 ft (200 m)</td>
</tr>
<tr>
<td>5 PVC pipes, 4&quot; x 12'</td>
</tr>
<tr>
<td><strong>Recovery and Storage</strong></td>
</tr>
<tr>
<td>3-6 bails of sorbent pads</td>
</tr>
<tr>
<td>2-4 bails of sorbent booms</td>
</tr>
<tr>
<td>1 roll of sorbent blanket</td>
</tr>
<tr>
<td>1,000 gallon (4,546 litre) port-a-tank</td>
</tr>
<tr>
<td>45 gallon drums - open tops with lids</td>
</tr>
<tr>
<td>Wringer for pads with open top drum</td>
</tr>
<tr>
<td>Plastic drum liners</td>
</tr>
</tbody>
</table>
Table 9.3 (b) Spill Response Equipment Located with Pick-Up Truck

<table>
<thead>
<tr>
<th>Personal Protective Equipment</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Rubber steel toe boots, hard hat</td>
<td></td>
</tr>
<tr>
<td>Rain gear, PVC gloves, eye/ splash protection</td>
<td></td>
</tr>
<tr>
<td><strong>Hand Tools</strong></td>
<td></td>
</tr>
<tr>
<td>Shovel</td>
<td></td>
</tr>
<tr>
<td>Flagging / barrier tape</td>
<td></td>
</tr>
<tr>
<td><strong>Containment</strong></td>
<td></td>
</tr>
<tr>
<td>250ml commercially available bentonite clay (in dry or pre-mixed form) used to plug holes in leaking containers.</td>
<td></td>
</tr>
<tr>
<td>1 tarp (4m x 5m) and rope</td>
<td></td>
</tr>
<tr>
<td>10-20 empty sand bags (to be filled when needed)</td>
<td></td>
</tr>
<tr>
<td>Plywood (1m x 2m)</td>
<td></td>
</tr>
<tr>
<td><strong>Recovery and Storage</strong></td>
<td></td>
</tr>
<tr>
<td>Plastic drum liners (heavy plastic bags)</td>
<td></td>
</tr>
<tr>
<td>25 absorbent pads (for petroleum)</td>
<td></td>
</tr>
<tr>
<td>1 absorbent boom (3m) and rope</td>
<td></td>
</tr>
</tbody>
</table>

Table 9.3 (c) Spill Response Equipment Located with Tank Vehicles

<table>
<thead>
<tr>
<th>Personal Protection and Safety</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Rubber steel toe boots, hard hat</td>
<td></td>
</tr>
<tr>
<td>Rain gear, PVC gloves, eye/ splash protection</td>
<td></td>
</tr>
<tr>
<td><strong>Hand Tools</strong></td>
<td></td>
</tr>
<tr>
<td>2 shovels</td>
<td></td>
</tr>
<tr>
<td>Tool kit</td>
<td></td>
</tr>
<tr>
<td>Reflective traffic warning triangles</td>
<td></td>
</tr>
<tr>
<td><strong>Containment</strong></td>
<td></td>
</tr>
<tr>
<td>1L of commercially available bentonite clay (in dry or pre-mixed form) used to plug holes in leaking containers.</td>
<td></td>
</tr>
<tr>
<td>2 tarps (medium and large)</td>
<td></td>
</tr>
<tr>
<td>Hatch-cone kit and hatch lock kit</td>
<td></td>
</tr>
<tr>
<td>3 plastic pails</td>
<td></td>
</tr>
<tr>
<td><strong>Mobile Operations</strong></td>
<td></td>
</tr>
<tr>
<td>Plastic drum liners (heavy plastic bags)</td>
<td></td>
</tr>
<tr>
<td>25 absorbent pads (for petroleum)</td>
<td></td>
</tr>
<tr>
<td>1 sorbent boom (3m) and rope</td>
<td></td>
</tr>
</tbody>
</table>
Section 10.  STATUTES, INDUSTRY STANDARDS & CODES OF PRACTICE

A fuel facility should be operated and maintained according to (and not limited to) the following statutes, industry standards and codes of practice:

- British Columbia Fire Code 1998, and Office of the Fire Commissioner – Interpretation Bulletins (See below: Interpretation Bulletin No. IB 016 Pumps for Transferring Flammable or Combustible Liquids.)
- Fire Services Act [RSBC 1996] Chapter 144
- Fisheries Act (See *note below)
- Forest Act
  - Community Watershed Guidebook – 4
  - Forest Road Regulation
  - Operational Planning Regulation & Forest Road Engineering Guidebook
  - Range Practices Regulation
  - Timber Harvesting Practices Regulation
- Motor Vehicle Act, B. C. Reg. 26/58 (MVA)
- Transportation of Dangerous Goods Act and Regulations (TDG)
- ULC/CSA standards
- Water Act [RSBC 1966] Chapter 483
- Water Protection Act [RSBC 1996] Chapter 484
- Waste Management Act (WMA) (See *note below)
  - Contaminated Sites Regulation B. C. Reg. 375/96
  - Special Waste Regulation B. C. Reg. 63/88
  - Spill Reporting Regulation B. C. Reg. 263/90.
- Workplace Hazardous Materials Information System (WHMIS)

Office of the Fire Commissioner – Interpretation Bulletin No. IB 016
Pumps for Transferring Flammable or Combustible Liquids

In response to some questions on the issue of pumps and the power source for pumps used to transfer flammable or combustible liquids from containers or portable tanks, clarification of the OFC position and interpretation of the BC Fire Code is offered.

Part 4 of the BC Fire Code deals with transferring of flammable or combustible liquids from containers or portable tanks, whether mounted on trucks or service vehicles or installed in remote areas outside of buildings.

Section 4.22 “Tank Vehicles” is silent about pumping equipment yet the scope of Section 4.22 covers any vehicle with a cargo tank having a capacity of more than 450 L, (100 gallons) mounted or built as an integral part of the vehicle.

Dispensers at fuel dispensing stations must conform to CSA B346-M “Power operated Dispensing Devices for Flammable Liquids”. Pumps used to transfer flammable or combustible liquids from containers and tanks are required to be designed in conformance with good engineering practice. Pumps tested and listed by recognised agencies such as Underwriters Laboratories Inc. and Factory Mutual Engineering Corporation are considered to be designed in conformance with good engineering practice.

The power sources for driving these recognised pumps are varied and range from hand operated, electric motors, internal combustion engines and transfer box drives from the vehicle gear box.
Section 10. STATUTES, INDUSTRY STANDARDS & CODES OF PRACTICE

Hand operated pumps pose little if any concerns and should be used only for transfer from drums. Electric driven units shall be listed for use with flammable or combustible liquids and are used frequently on tanks mounted on service vehicles.

Internal combustion engines used to drive pumps transferring flammable or combustible liquids have created some concerns in the last few years. However, NFPA 385 “Standard for Tank Vehicles for Flammable and Combustible Liquids” recognises this practice and lays out some requirements where internal combustion engines are used to drive pumps.

1. The engine air intake shall be equipped with an effective flame arrester, or an air cleaner having effective flame arrester characteristics, substantially installed and capable of preventing emission of flame from the intake slide of the engine in the event of a backfire.

2. The fuel system shall be so located or constructed as to minimize the fire hazard from spillage during filling and leakage from the tank or the fuel system.

3. The engine shall be so located in relation to the pump that spillage from the pump shall be prevented from coming in contact with the engine or any part of the ignition and exhaust system. Adequate shielding can be provided to attain the same purpose.

4. Where the engine is carried within an enclosed space, adequate provision shall be made for air circulation at all time to prevent accumulation of explosive vapours and avoid overheating of the engine.

5. The exhaust system shall be substantially constructed and installed and free from leaks. The exhaust line and muffler shall have adequate clearance from combustible materials, and shall discharge at a location that will not constitute a hazard. When engines are carried within an enclosed space, the exhaust gases shall discharge outside of such enclosed space.

6. The ignition wiring shall be substantially installed with firm connections. Spark plugs and other terminals shall be suitably insulated to prevent sparking in event of contact with conductive materials. The ignition switch shall be of the enclosed type.

*Under the Waste Management Act

- Failure to report the fuel spill – a violator may be liable to a penalty of up to $200,000 and/or up to six months imprisonment.
- Introduction of waste into the environment (air, land or water) – a violator may be liable to a penalty of up to $1,000,000 and/or up to six months imprisonment.
- Introduction of waste into the environment in such a quantity as to cause pollution – a violator may be liable to a penalty of up to $1,000,000 and/or up to six months imprisonment.

*Under the Fisheries Act

- A fuel spill or deposit of other deleterious substances into waters frequented by fish is a violation – a violator may be liable to a penalty under Summary Conviction of up to $300,000 and/or up to six months imprisonment. If convicted under Indictment, the violator is liable to a penalty of up to $1,000,000 and/or up to 36 months imprisonment.

The onus is on the company or responsible person to demonstrate to the Conservation Officer Service the means taken to prevent a fuel spill in their operations involving handling, storage, and transportation of fuels.
Section 11. GLOSSARY

aboveground storage tank (AST) means a storage tank (capacity greater than 230 litres (L)) which is at least 90% above surface grade.

berm means an impermeable system for containing leaks or spills. In tank farms containing a single tank, it must be of sufficient size to contain the volume of the tank plus 10%. For a multi-tank farm facility the berm must contain 110% of the largest tank or 100% of the largest tank plus 10% of the aggregate volume of all the tanks within the berm, whichever is greater. The berm can be constructed of steel, concrete, or soil in combination with a geotextile liner that is compatible with and impermeable to the stored liquid.

biocell means a bermed and lined area used for application of biological methods for treating hydrocarbon-contaminated soil.

breakaway valve means valves used on fuel hoses to prevent spills from hose and valve connectors. The typical breaking point is 300 lbs. (136 kg). These valves are usually located on either end of the fuel dispensing hose.

combustible liquids (See flammable liquids below – this glossary)

CGSB 43.146 refers to the Canadian General Standards Board (CGSB) standard for “Intermediate Bulk Containers (IBC) for the Transportation of Dangerous Goods” and the United Nations (UN) requirements for IBC’s. The requirements for certification include material type, construction and pressure relief requirements, design type, tests, and quality assurance.

CSA B620-87 means the Canadian Standards Association (CSA) Preliminary Standard B620-1987 Highway Tanks and Portable Tanks for the Transportation of Dangerous Goods. This standard outlines the requirements for certification including: material thickness, weld thickness, material alloy and properties, structural integrity, circumferential reinforcement, rollover protection, rear bumpers, emergency flow control and piping protection, vents and, closure for manholes.


dunnage means loose material used around a cargo to prevent damage.

drum means a barrel having a capacity of less than 230L (50 imperial gallons) but greater than 23 litres (5 imperial gallons).

environmental management system (EMS) means a system including “organizational structure, responsibility, practices, procedures, processes, and resources for developing, implementing achieving, reviewing, and maintaining the environmental policy” - (ISO 14001)

fire extinguisher includes: a 10-B:C rated portable fire extinguisher (weighing approximately 5lbs. depending on manufacturer); a 20-B:C rated portable fire extinguisher weighing approximately 10lbs. depending on manufacturer).
Section 11. GLOSSARY

**Fire Code (FC)**

**fixed location**
means any location that is used to store a fuel tank (or container), regardless of the length of time it is being stored.

**flammable liquids**
In the B. C. FC (and National *Fire Code* – NFC), liquids with a *flash point* below 37.8 °C are referred to as *flammable liquids*, whereas liquids with a *flash point* at or above 37.8 °C are referred to as *combustible liquids*. In contrast, TDG Regulations classifies *flammable liquids* as Class 3 Dangerous Goods, and defines them as liquids having a *flash point* below 61 °C.

<table>
<thead>
<tr>
<th>Comparison of FC and TDG classifications based on flash point (FC A-4.1.2.1.)</th>
<th>Flash point °C</th>
<th>NFC Classification</th>
<th>TDG Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>below –18</td>
<td>IA</td>
<td>3.1</td>
<td></td>
</tr>
<tr>
<td>at or above –18 &amp; below 22.8</td>
<td>IA</td>
<td>3.2</td>
<td></td>
</tr>
<tr>
<td>below 22.8 (equivalent to 23 in TDG)</td>
<td>IB</td>
<td>3.2</td>
<td></td>
</tr>
<tr>
<td>at or above 22.8 &amp; below 37.8</td>
<td>IC</td>
<td>3.3</td>
<td></td>
</tr>
<tr>
<td>at or above 37.8 &amp; below 60 (equivalent to 61 in TDG)</td>
<td>II</td>
<td>3.3</td>
<td></td>
</tr>
<tr>
<td>at or above 60 &amp; below 93.3</td>
<td>IIIA</td>
<td>Not Regulated</td>
<td></td>
</tr>
<tr>
<td>at or above 93.3</td>
<td>Not Regulated</td>
<td>Not Regulated</td>
<td></td>
</tr>
</tbody>
</table>

**flash point**
means the lowest temperature at which a liquid or solid (e.g., petroleum product) gives off vapour of sufficient concentration to form an ignitable mixture in air as determined by a closed cup test describe in Part I of Schedule IV of the TDG Regulations.

**FPC**

**fuel cache**
means a temporary storage (e.g. seasonal) of drums at a remote location.

**fuel dispensing (or service) station**
means any *fuel facility* (operating on marine or fresh waters) including service stations, self-service outlets or *tank farms* at isolated industrial projects at which *flammable liquids* or *combustible liquids* are dispensed from fixed equipment into the fuel tank of a vehicle, watercraft, or other equipment.

**fuel facility**
means any location (may include a remote *fuel cache*) at which *flammable liquids* or *combustible liquids* are dispensed from a *tank vehicle* or fixed *storage tank* into the fuel tank of a motor vehicle, equipment or watercraft.

**hatch-cone kit**
is a funnel-shaped bag used to off-load fuel from the hatch of a rolled over fuel truck. The wide end of the funnel is fitted with a wire clamp that can be secured under the lip of the dome. The small end of the funnel is fitted with a cam-lock fitting for a hose connection.

**hydrocarbon fuels**
means flammable or combustible *petroleum products* including but not limited to, gasoline, diesel, aviation gasoline, jet fuel A (kerosene), jet fuel B (naphtha).

**marine fuel dispensing (or service) station**
See *fuel dispensing station* above – this glossary.
overfill protection includes:
prevention of tanks from being overfilled by providing continuous supervision of the filling operation by personnel qualified to supervise such an operation; or, an overfill protection devise conforming to ULC/ORD-C58.15. “Overfill Protection Devices for Flammable Liquid Storage Tanks.” Examples include float valve shut off devices, audible or visible overfill alarm systems, automatic sensing and shut-off devices and vent restriction devices.

petroleum products includes pure hydrocarbon products or mixtures of hydrocarbons, which have been refined from crude oil, with or without additives, that is used as a fuel or lubricant. Such products include gasoline, diesel fuel, aviation fuel, kerosene, naphtha, lubricating oil, fuel oil, hydraulic oil and engine oil (including used oil) and exclude propane, paint, and solvents.

portable tank means a closed container that is designed to be movable while containing liquid, which is equipped with skids, mountings or accessories to facilitate handling of the tank by mechanical means, and is not permanently attached to a transport vehicle.

purged means a tank from which all vapours have been properly removed by forced air venting or by a non-combustible gas (CO₂ or Nitrogen).

riparian zones or areas mean those terrestrial areas where vegetation complexes and microclimate conditions are products of the combined presence and influence of perennial and/or intermittent water, associated high water tables, and soils that exhibit some wetness characteristics. The terms have traditionally been used in reference to zones within which plants grow rooted in the water table of these rivers, streams, lakes, ponds, reservoirs, springs, marshes, seeps, bogs and wet meadows. The riparian zone is influenced by and exerts an influence on the associated aquatic ecosystem.

risk assessment means the rating of relative risks which includes: environmental, operational and prevention/preparedness factors (See Section 7. Risk Assessment.) that is expected be made and documented whenever fuel is stored at a new location.

RSBC means Revised Statutes of British Columbia

secondary containment means structures used for spill control such as:
(a) a double walled container (or tank within a tank design);
(b) a steel or concrete container (tank within a box design) capable of containing 110% of the volume being stored (should be manufactured to a ULC specification);
(c) an earth or clay dike which is lined with an impermeable geomembrane material and is capable of containing 110% of the volume being stored; or,
(d) a site which is graded or sloped to divert a spill into a collection system where it will not impact public health, safety or the environment. The containment should be lined with a geomembrane to prevent contaminating the subsurface soil layer.

small container Small container means a container with a capacity of less than 230L, including canisters, jerry cans, pails and drums, that is covered by the Fire Code. Small TDG tank means a container with a capacity less than 454L, that is covered by the TDG Regulation. Small TDG tanks can be recognized by ULC or CSA label or logo.

specified tank means a tank that was designed and manufactured to recognized engineering standards, in contrast to a “non-specified tank” which does not meet recognized engineering standards.
spill control  means site selection and storm water management practices and techniques to prevent spills from entering natural waterways. It may include techniques and structures for diverting or containing spills and preventing them from entering storm drains and sanitary sewers, and may include grading the site, and using double walled tanks and tank-in-a-box systems.

storage tank  means a vessel for flammable or combustible liquids having a capacity greater than 230L, and designed to be installed in a fixed location. (FC 1.2.1)

tank farm  means any facility where bulk petroleum products/ hydrocarbon fuels are stored in storage tank(s).

tank vehicle  means any vehicle, other than railroad tank cars and boats, with a cargo tank having a capacity greater than 454L, mounted or built as an integral part of the vehicle and used for the transportation of flammable liquids or combustible liquids and including tank trucks, trailers and semi-trailers. (FC 1.2.1)

Transportation of Dangerous Goods (TDG)  means the Transportation of Dangerous Goods Act, 1992 and Regulations, a comprehensive Canadian statute to promote public safety in the transportation of dangerous goods.

truck-box fuel tank (includes slip tank or Tidy tank)  means a portable container used for transportation of fuels on a truck. The capacity may vary depending on the type of tank (see Section 2.1. Design.).

Underwriters Laboratory of Canada (ULC)  means the Underwriters Laboratory of Canada, a non-profit organization that maintains and operates laboratories, certification services and a quality system registration program for the examination, testing and classification of devices, construction, materials and systems to determine their relation to life, fire and property hazards.

ULC/ORD-C 142.13 – 1997  means to the Underwriters’ Laboratories of Canada /Other Recognized Document requirements for steel tanks that are to be used for the limited transportation of flammable and combustible liquids employed in the servicing of off-road equipment. This document outlines the fabrication, inspection and testing for leakage before shipment from the factory as complete assemblies. These requirements cover tanks having a maximum capacity of 5,000L or single wall tanks and tanks with secondary containment either as double-wall vacuum monitored or contained tanks. These supply tanks are intended for off road use in forest management and construction or other areas where permitted by the authority having jurisdiction. Tanks manufactured before 2003 are acceptable to Transport Canada and may be used until 2010.

UN 31A/UN 31B  means the United Nations specification for acceptable intermediate bulk containers (IBC) for the transportation of dangerous goods (as per the TDG Regulation), that outlines the acceptable requirements for transporting flammable liquids and combustible liquids on all public roads. This specification will be the only recognized specification after 2010.
## Section 12. CONTACTS

<table>
<thead>
<tr>
<th>Regional &amp; Sub-Regional Offices</th>
<th>MWLAP</th>
<th>Other Agencies</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Vancouver Island Region</strong></td>
<td>2080-A Labieux Road Nanaimo BC V9T 6J9 Tel: 250-751-3100 Fax: 250-751-3103</td>
<td>Office of the Fire Commissioner Victoria Tel: 250-356-9000 BC Forest Service Vancouver Forest Region, Nanaimo Tel: 250-751-7001</td>
</tr>
<tr>
<td><strong>Lower Mainland Region</strong></td>
<td>10470 152nd Street Surrey BC V3R 0R3 Tel: 604-582-5200 Fax: 604-582-5334</td>
<td>Canadian Coast Guard North Vancouver Tel: 604-631-3951</td>
</tr>
<tr>
<td><strong>Southern Interior Region</strong></td>
<td>1259 Dalhousie Road Kamloops BC V2C 5Z5 Tel: 250-371-6200 Fax: 250-828-4000</td>
<td>Office of the Fire Commissioner Kamloops Tel: 250-828-4001 BC Forest Service Kamloops Forest Region, Kamloops Tel: 250-828-4131</td>
</tr>
<tr>
<td><strong>Southern Interior Sub-Region</strong></td>
<td>201 - 3547 Skaha Lake Road Penticton, BC V2A 7K2 Tel: 250-490-8200 Fax: 250-492-1314</td>
<td></td>
</tr>
<tr>
<td><strong>Kootenay Region</strong></td>
<td>401 - 333 Victoria Street Nelson BC V1L 4K3 Tel: 250-354-6355 Fax: 250-354-6367</td>
<td>BC Forest Service Nelson Forest Region, Nelson Tel: 250-354-6200</td>
</tr>
<tr>
<td><strong>Kootenay Sub-Regional Office</strong></td>
<td>205 Industrial Road G Cranbrook, BC V1C 6H3 Tel: 250-489-8570 Fax: 250-498-8506</td>
<td>Office of the Fire Commissioner Cranbrook Tel: 250-426-1272</td>
</tr>
<tr>
<td><strong>Skeena/ North Coast Region</strong></td>
<td>3726 Alfred Street Bag 5000 Smithers BC V0J 2N0 Tel: 250-847-7260 Fax: 250-847-7591</td>
<td>BC Forest Service Prince Rupert Forest Region, Smithers Tel: 250-847-7500 Canadian Coast Guard Prince Rupert Tel: 250-624-5390</td>
</tr>
</tbody>
</table>
### Section 12. Contacts

<table>
<thead>
<tr>
<th>Regional &amp; Sub-Regional Offices</th>
<th>MWLAP</th>
<th>Other Agencies</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Omineca-Peace</strong></td>
<td>1011 - 4th Avenue Prince George BC V2L 3H9 Tel: 250-565-6155 Fax: 250-565-6629 Rm. 400, 10003 110 Ave Fort St. John, BC V1J 6M7 Tel: 250-787-3283 Fax: 250-996-5290</td>
<td>Office of the Fire Commissioner Prince George Tel: 250-561-5607 BC Forest Service Prince George Forest Region, Prince George Tel: 250-565-6100</td>
</tr>
<tr>
<td><strong>Cariboo Region</strong></td>
<td>400-640 Borland Williams Lake Tel: 250-398-4533 Fax: 250-398-4296</td>
<td>Cariboo Forest Region, Williams Lake Tel: 250-398-4345</td>
</tr>
<tr>
<td><strong>Environment Canada</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Office of the Fire Commissioner</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Underwriters’ Laboratories of Canada (ULC)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Canadian Standards Association (CSA)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Provincial Emergency Program (PEP)</strong></td>
<td><strong>1-800-663-3456</strong></td>
<td></td>
</tr>
</tbody>
</table>
ATTACHMENT 6: DLC Waste Management Toolkit
In this toolkit

Metro Vancouver provides utility services on behalf of the region’s 2.3 million residents. Those services include: managing the region’s more than three million tonnes of solid waste. A current priority in waste management is to reduce the amount of waste generated, then to recover materials and energy whenever possible.

For more information on waste reduction, waste planning, public facilities and regulations, visit our website at www.metrovancouver.org.
### Introduction

#### Who is this toolkit for?

This Demolition, Land Clearing and Construction (DLC) Waste Toolkit is a reference guide for contractors, design professionals and building owners, to help them maximize the amount of construction and demolition waste diverted from disposal through salvage, reuse and recycling.

This toolkit is developed by Metro Vancouver’s Sustainable Business Services as part of its BuildSmart program.

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**For further information contact**

**Sustainable Business Services:**

**Phone:** 604-451-6575

**Email:** buildsmart@metrovancouver.org

**Website:** www.metrovancouver.org/buildsmart

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### Metro Vancouver Waste

Waste from the construction, demolition and renovation sectors constitutes about one third of the region’s waste. Wood waste alone accounts for 22% of the waste disposed from residents and businesses. More than half of the construction and demolition related wastes are readily recyclable and do not need to go to disposal.

---

### Five Great Reasons to Set Up a Construction Waste Management Program

Besides making a measurable difference in the amount of material being sent to a landfill there are other reasons for setting up a construction waste management program:

#### 1. Compliance

The following materials are banned from landfills and other waste disposal facilities in Metro Vancouver:

- Corrugated cardboard
- Newsprint
- Office paper
- Blue box recyclables (including glass, metal and plastic Type 1, 2, 4 & 5 containers)
- Yard trimmings
- Gypsum drywall
- Electronic waste (personal computers, printers and TVs)
- Refundable beverage containers (all except milk cartons)
- Paint, solvents, flammable liquids, gasoline and pesticides
- Oil, oil filters and empty oil containers
- Lead-acid (car) batteries
- Medications/pharmaceuticals
- Tires

A surcharge of 50% will be applied to the tipping fee for waste loads delivered to Metro Vancouver transfer stations and disposal facilities found to contain 5% or more by volume of one or more of the banned materials.

---

### What is the zero waste challenge?

In 2007, Metro Vancouver established the Zero Waste Challenge as part of the region’s Solid Waste Management Plan to help increase the waste diversion rate from 52% to 70%.

The core goals of the Zero Waste challenge are:

- Minimize the generation of waste in the region
- Maximize reuse, recycling and energy recovery from solid waste
In addition to materials banned from disposal at Metro Vancouver and other local disposal facilities, a number of other materials have been restricted from disposal. A list of restricted materials at the City of Vancouver and Ecowaste (private) landfills and Metro Vancouver facilities is identified on pages 54 and 55.

Details available by contacting:
City of Vancouver landfill
Phone: 604-326-4600
www.vancouver.ca/engsvcs/solidwaste/landfill/index.htm

Ecowaste landfill
Phone: gatehouse 604-277-1410 or office 604-276-9511
www.ecowaste.com

Contractors must comply with the BC Hazardous Waste Regulation www.qp.gov.bc.ca/statreg/reg/E/EnvMgmt/EnvMgmt63_88/63_88_00.htm and Environmental Management Act www.qp.gov.bc.ca/statreg/stat/e/03053_00.htm and all other applicable laws and regulations.

Any hazardous or banned materials must be identified, properly removed, and disposed of by qualified persons prior to any salvage or demolition work.

Some examples of hazardous materials commonly found in building demolition projects include:

- Asbestos
- Underground storage tanks
- PCBs
- Abandoned chemicals such as solvents, paints, pesticides and gasoline
- Mercury switches

2. Reduced costs
Tipping fees for separated recyclables are considerably lower than mixed waste loads. Recycling cardboard and scrap metal should generate revenue. Over the course of a project these savings make good business sense for doing the right thing.

3. Marketing opportunity
Achieving high construction waste diversion rates provides a distinct marketing advantage for companies, as a growing number of customers are looking for contactors using environmentally responsible practices.

4. Certification
If your building project is seeking certification under a green building rating systems (see examples below), implementing an effective construction waste management plan is key.

- Up to 3 points for reusing existing structures on-site
- Up to 2 points for diverting between 50% and 75% of demolition, land clearing and/or construction waste from the landfill and redirecting recyclables back to the manufacturing process and reusable materials to appropriate sites
- Up to 2 points for using 5% - 10% salvaged or reused building materials

BuiltGreen™ residential green building rating system awards – www.builtgreencanada.ca/
- More than 27 points are available for waste reduction initiatives on single family residential construction sites; a minimum of 7 points are required as part of the BuiltGreen™ designation
- Up to 4 points for reusing an existing structure
- Up to 16 points for waste reduction initiatives on single family residential construction sites
- 1 point for every salvaged building product used on the project

BOMA Go Green – www.bomagogreen.com/
- One of the program requirements under Waste Reduction and Recycling is to have a written policy on how building management intends to reduce construction waste sent to landfills

Some municipalities are implementing mandatory green building practices and/or compulsory construction waste management on job sites.
5. Reduced impact on the environment

Through waste reduction and more efficient use of resources, you will be reducing the impact from your project on the environment by:

- Conserving natural resources
- Reducing consumption of energy and water and creating less air pollution, greenhouse gases and solid waste when extracting, transporting and manufacturing virgin materials.
Deconstruction and Salvage

Demolishing existing buildings by knocking them down and sending waste to landfill is no longer the most cost-effective and environmentally responsible option.

If your site has an existing structure that is slated for demolition, consider the following options:

**Selling or donating the structure for reuse at another location**
If a building is at the end of its useful life, because it is no longer needed at the site it sits on, it could still be structurally sound and used on another site.

**Deconstructing the building**
Deconstruction is “construction in reverse”; it is the process of removing a building by selective disassembly of structural and non-structural building components. This process can yield a significant amount of valuable, reusable building materials.

**Salvaging building materials for reuse in new construction**
If the building is not to be deconstructed, you can still salvage valuable non-structural building components prior to demolition. This can include appliances, doors, hardwood flooring, light fixtures, siding, etc.

The following is a list of materials that can be salvaged for reuse and/or recycled from buildings slated for demolition:

<table>
<thead>
<tr>
<th>Examples of Salvageable Building Materials</th>
<th>Examples of Recyclable Demolition Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensional lumber</td>
<td>Structural concrete</td>
</tr>
<tr>
<td>Heavy timbers</td>
<td>Cinder blocks</td>
</tr>
<tr>
<td>Steel beams &amp; studs</td>
<td>Asphalt pavement</td>
</tr>
<tr>
<td>Wainscoting</td>
<td>Dimensional lumber</td>
</tr>
<tr>
<td>Insulation</td>
<td>Metal piping</td>
</tr>
<tr>
<td>Siding</td>
<td>Gypsum wallboard</td>
</tr>
<tr>
<td>Heating ducts</td>
<td>Electrical cable</td>
</tr>
<tr>
<td>Electrical equipment</td>
<td>Aluminium siding</td>
</tr>
<tr>
<td>Brick &amp; block</td>
<td>Metal window frames</td>
</tr>
<tr>
<td>Light fixtures</td>
<td>Rebar</td>
</tr>
<tr>
<td>Plumbing fittings</td>
<td>Cement based stucco</td>
</tr>
<tr>
<td>Faucets</td>
<td>Metal deck railings</td>
</tr>
<tr>
<td>Interior doors &amp; frames</td>
<td></td>
</tr>
</tbody>
</table>

**Case Study – Township of Langley Civic Facility**
The Township of Langley expanded and converted an existing three storey office building over ground floor parking to provide new municipal offices for Township of Langley staff, council chambers, recreation centre, library, and community police office.

The project involved reusing most of the existing building, carefully deconstructing the renovated areas, reusing a number of the materials on site (including insulation), and diverting 80 per cent of materials from going to landfill (see graph below).

The project also involved strategic material selection, including use of 12% of materials with high levels of recycled content (by value), and use of 21% of materials that were manufactured locally.

**Solid waste diversion**
- 19% Waste
- 79% Recyclables
  - 39% Concrete
  - 19% Drywall
  - 17% Commingled Recyclables
  - 4% Metals
- 2% Salvaged Materials
Recommended steps for salvage, reuse and recycling

The following steps are recommended to successfully reuse, salvage and recycle building structures:

1. **Start planning for deconstruction early**
   Deconstruction is more labour-intensive than conventional demolition. Allowing salvage contractors the necessary time to deconstruct will result in more materials being salvaged and recycled. This reduces disposal costs and increases revenues from the sale of salvaged materials.

2. **Consult a contractor**
   Consult a demolition and salvage contractor experienced in salvaging structural and non-structural building materials. Ensure that the contractor is professionally qualified, bonded and/or insured. Consult the Directory section on page 25 for a listing of demolition and salvage contractors.

3. **Conduct an on-site audit to identify salvage and recycling opportunities**
   A team consisting of the owner, architect, general contractor and salvage and recycling specialist should survey the building for materials that can be salvaged and recycled. The amount and type of materials salvaged and recycled depends on:
   - The time available to the contractor to do the work
   - The type and size of building to be taken down
   - The condition of the building
   - The existing markets for the materials

4. **Create a Deconstruction Plan**
   Ask your deconstruction contractor to draw up a plan specifying the work to be done, including:
   - Assessment and abatement of hazardous and banned materials (see table below)
   - Type and number of materials to be salvaged for reuse
   - Quantities or volumes of materials to be separated for recycling
   - On-site procedures for separating recyclables from other waste materials
   - Site setup if materials are recycled on site
   - Quantities or volumes of waste to be disposed of
   - Name and address of used building materials yards, licensed recycling and disposal facilities accepting the materials generated by your project.

<table>
<thead>
<tr>
<th>Hazardous materials typically found in buildings</th>
<th>Possible Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asbestos</td>
<td>Siding, pipe insulation, pipe tape, ceiling tile, drywall joint compound, vinyl sheet flooring, vinyl tiles, lag pipe, insulation asbestos board and linoleum</td>
</tr>
<tr>
<td>Underground Storage Tanks</td>
<td>Fuel tanks for heating/cooling systems. Look for fill and vent pipes. Should a tank be found during excavation, then work must cease until the tank, its contents and contaminated soils are remediated or removed as required</td>
</tr>
<tr>
<td>PCBs</td>
<td>Fluorescent lighting ballasts, power transformers, generators and other power supply and management equipment</td>
</tr>
<tr>
<td>Abandoned Chemicals</td>
<td>Paint, solvents, oils, cleaning products, flammable and combustible substances like gasoline, pesticides, herbicides, and medications</td>
</tr>
<tr>
<td>Others</td>
<td>Other hazardous materials may include Freon from cooling equipment and mercury switches</td>
</tr>
</tbody>
</table>

Source: City of Vancouver

For a listing of companies that test for, remove and properly dispose of hazardous materials ask your demolition or salvage contractor or check your phone book under Asbestos Abatement & Removal, Oil Tank Removal, Environmental Consultants & Services
Proper removal and disposal of hazardous materials are crucial for the health and safety of your workers, the community and environment. Ensure a hazardous materials survey is completed by a qualified professional prior to the start of any renovation or deconstruction work. For more information go to www2.worksafebc.com/Portals/Construction/HazardousMaterials.asp.

5. **Monitor progress**

Monitor the salvaging and recycling activities on an ongoing basis to ensure materials are salvaged, recycled and disposed of as specified. Make sure you keep a record of disposal receipts and credits from the sale of materials.

6. **Evaluate your project to determine the outcome**

Ask your demolition and salvage contractor to provide you with the following information:

- List and quantity of materials salvaged, recycled and disposed of
- The name and location of the recycling and disposal facilities
- A copy of receipts from recycling and disposal facilities and from material sales
**Construction Waste Management**

**Construction of a New Building, Renovation or Expansion**

These are the steps to take to set up a construction waste management (waste diversion and recycling) program:

**STEP 1**

**Estimate your waste and recyclables**

Based on the type and size of your project, estimate the type and quantity of waste materials that will be generated on site, using either waste disposal records from similar previous projects or the *Demolition, New Construction and Renovation Projects Waste Generation Rates* table on page 53.

**STEP 2**

**Choose a recycling program that best fits your site**

Decide what type of collection is appropriate for your site, and identify your hauling options.

---

### Collection Options

**Source separation** is when recyclables such as clean wood, cardboard and scrap metal, are separated on-site and either put into separate bins, a dual (or multi) compartment bin, or stored in piles on the site. The bins are transported to recycling facilities by your contracted waste hauler or site workers.

**Commingled collection** is when recyclable materials such as clean wood, cardboard and scrap metal are collected in one bin and taken to a recycling facility for sorting.

---

### Comparison of Source Separation and Commingled Recycling

<table>
<thead>
<tr>
<th></th>
<th>Pros</th>
<th>Cons</th>
</tr>
</thead>
</table>
| **Source separation** | • Lower tipping fees at recycling facilities  
• Revenue generation for recyclables such as cardboard and scrap metal  
• Higher recycling rates and more accurate account of each material recycled | • Multiple bins on-site  
• More sorting required |
| **Commingled collection** | • Fewer bins required – good for sites with space constraints  
• Less sorting required | • Lower recycling rates  
• Higher tipping fees at recycling facilities |

---

### Options for Space-Constrained Sites

Small sites can target materials at certain phases of construction.

For example, place a dedicated wood bin on site during the framing stage to collect the majority of the wood; and for the remainder of project use a commingled bin that includes collection of wood.

**Request a “Front-end Bin” (instead of a “Roll-off Bin”) from your waste hauler.**

These can vary in size from 2 to 8 cubic yards. Front-end bins take up much less space than the more regularly used 40 yard waste containers.

Consider using a front-end bin to recycle office paper from the site office or cardboard.

Note: For offsite storage of construction bins permits are required in most municipalities (i.e. temporary storage on City streets and lanes).

Recycling can represent cost savings in excess of 50%. Make sure recyclable materials are separated properly; otherwise the recycling depot may reject the materials or charge you more.
Hauling Options

Contracting Hauling Services
Contracting a hauler to pick up recyclables generated on your site is the most convenient option. Most haulers can recommend the number and size of bins you will require, and might help you set up a job site recycling program.

Ask the following questions when looking for a hauler:
- What recyclable materials do you pick up?
- What are your requirements for separating recyclable materials?
- Do you provide commingled recyclable collection?
- How much contamination is acceptable for different waste streams?
- What type and size of bins do you offer?
- Does your company provide help on how to set up job site recycling and help educate the workers?
- Do you supply signs for recycling bins?
- Can you provide the itemized waybills and invoices which document the type and quantity of materials recycled, and where?

Self-Hauling
Using company workers and trucks to collect and haul recyclable materials works best on smaller sites. Self hauling can reduce your costs and allow you to take advantage of lower fees—or in some cases, no fees—at recycling depots.

Approximate Recycling Fees at Metro Vancouver Area Facilities

<table>
<thead>
<tr>
<th>Type of waste</th>
<th>Tipping Fee*</th>
<th>Revenue*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wood waste</td>
<td>$14 - $40</td>
<td></td>
</tr>
<tr>
<td>Cardboard</td>
<td></td>
<td>$70 - $90</td>
</tr>
<tr>
<td>Scrap metal (ferrous only)**</td>
<td></td>
<td>$60 - $120</td>
</tr>
<tr>
<td>Commingled recyclables</td>
<td>$40</td>
<td></td>
</tr>
<tr>
<td>Construction waste disposal</td>
<td>$48 - $69</td>
<td></td>
</tr>
</tbody>
</table>

*per metric tonne
**prices for non-ferrous metals vary by type of metal and amount

STEP 3
Create a Waste Management Plan
The waste management plan is a document that contains all the information needed by any worker on site to be able to achieve the project’s waste diversion goals and targets. For more information see Construction Waste Management Plan on page 51.

STEP 4
Organize your recycling program
Designate a person who will be responsible for implementing the program and monitoring the site; for larger projects, this could be a waste management team.

This designated person will be responsible for:

Setup of the program on-site
- Be sure to locate recycling bins close to where materials are generated.
- Place recycling bins and garbage bins next to each other to prevent garbage, especially food waste, from ending up in recycling bins.
**Note to contractors**

Food waste and disposable food containers should NOT go in construction waste recycling bins. Construction waste loads contaminated with food waste may have a surcharge applied to them when received at recycling depots. Ensure small garbage bins are placed throughout the site for collection of food waste.

**Use proper signage**
- Use large, removable, weatherproof signs for all bins, which clearly show what belongs in each bin
- Post lists of what can and cannot be recycled in visible locations around the site

**Educate all workers including subcontractors**
- Workers are vital to the success of any recycling program. Communicate the importance of a job site construction waste management program to the company and the success of the project
- Use weekly site meetings to introduce the program and inform workers which materials to recycle, how to separate them, and where bins are located

**Prevent contamination and monitor the program**
- Inspect bins on a regular basis to identify contamination problems
- Remove contaminants from bins
- Schedule bin pick-up with haulers
- Consider using bins with lids or added security (fencing/locks) to avoid contamination or scavenging

**Record keeping and reporting**
- Collect and file recycling and disposal waybills and invoices for tracking volumes and costs

**Where to take it?**
See the directories in the following section for a list of salvage contractors, structural moving companies, local recycling depots and waste haulers.

---

The following is a list of construction and demolition waste materials that can be recycled in Metro Vancouver.

<table>
<thead>
<tr>
<th>Construction Waste Material</th>
<th>Includes</th>
<th>Reuse or Recycling Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existing vegetation</td>
<td>Shrubs, small trees, plants and sod</td>
<td>Replant on another site or on the same site at the landscaping stage</td>
</tr>
<tr>
<td>Landclearing debris</td>
<td>Stumps, branches, green waste</td>
<td>Can be chipped on site and used for mulch, or hauled to a recycling facility</td>
</tr>
<tr>
<td>Concrete/Asphalt/Aggregates</td>
<td>Structural concrete, cinder blocks, asphalt pavement, bricks, washout from mixer trucks</td>
<td>Crush on site and use as fill material or recycle</td>
</tr>
<tr>
<td>Wood</td>
<td>Forming lumber</td>
<td>Reuse on next project, sell or recycle</td>
</tr>
<tr>
<td></td>
<td>Dimensional lumber off cuts, 2X4</td>
<td>Reuse on site or recycle</td>
</tr>
<tr>
<td></td>
<td>Painted wood, composite</td>
<td>Reuse on site or recycle</td>
</tr>
<tr>
<td></td>
<td>Pallets</td>
<td>Reuse or recycle if damaged (nails okay)</td>
</tr>
<tr>
<td>Gypsum</td>
<td>Gypsum wallboard off cuts</td>
<td>Recycle</td>
</tr>
<tr>
<td>Paper</td>
<td>Cardboard from packaging, office paper, newspaper</td>
<td>Recycle</td>
</tr>
<tr>
<td>Metals</td>
<td>Piping, aluminum siding, banding, wires, cable, rebar</td>
<td>Recycle</td>
</tr>
<tr>
<td>Beverage and food containers</td>
<td>Plastic, metal and glass bottles and containers</td>
<td>Recycle</td>
</tr>
<tr>
<td>Plastics</td>
<td>Empty pails and containers, plastic film, pipes</td>
<td>Recycle</td>
</tr>
</tbody>
</table>

Check our website for the most current information at: [www.metrovancouver.org/buildsmart](http://www.metrovancouver.org/buildsmart)
DIRECTORY
Directory of Deconstruction and Salvage Contractors and Used Building Materials Suppliers

Please call the listed companies for details on services and pricing.

<table>
<thead>
<tr>
<th>Company</th>
<th>Address</th>
<th>Deconstruction Services</th>
<th>Salvage Services</th>
<th>Used Building Materials Yard</th>
<th>Residential (R) or Commercial (C)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>3R Demolition</td>
<td>5735 Beresford Street Burnaby</td>
<td></td>
<td>★</td>
<td>★</td>
<td>Both</td>
<td>Online listing of available materials</td>
</tr>
<tr>
<td></td>
<td><a href="http://www.3rdemolition.com">www.3rdemolition.com</a></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>604-435-2555</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ace Demolition</td>
<td>20366 Wharf Street Maple Ridge</td>
<td></td>
<td>★</td>
<td>★</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td></td>
<td><a href="http://www.acedemolitionsolutions.ca">www.acedemolitionsolutions.ca</a></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>604-780-4702</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assertive Excavating and Demolition</td>
<td>264 - 19567 Fraser Hwy Surrey</td>
<td></td>
<td>★</td>
<td>★</td>
<td>Both</td>
<td></td>
</tr>
<tr>
<td></td>
<td><a href="http://www.assertiveexcavating.com">www.assertiveexcavating.com</a></td>
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<tr>
<td></td>
<td>604-888-6055</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B-Line Appliance Recycling</td>
<td>776 Kingsway Vancouver</td>
<td></td>
<td>★</td>
<td>★</td>
<td>Both</td>
<td>Rebuild, resell and recycle used appliances.</td>
</tr>
<tr>
<td></td>
<td>604-879-4050</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bent Nail New &amp; Used Building Supplies</td>
<td>31255 Wheel Avenue Abbotsford</td>
<td></td>
<td>★</td>
<td>★</td>
<td>Both</td>
<td></td>
</tr>
<tr>
<td></td>
<td><a href="http://www.bentnail.org">www.bentnail.org</a></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1-877-850-2691</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chilliwack New &amp; Used Building Materials Inc.</td>
<td>44720 Yale Road West Chilliwack</td>
<td></td>
<td>★</td>
<td>★</td>
<td>Both</td>
<td></td>
</tr>
<tr>
<td></td>
<td><a href="http://www.chilliwacknew.com">www.chilliwacknew.com</a></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>1-604-792-7322</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Deconstruction Services</td>
<td>Salvage Services</td>
<td>Used Building Materials Yard</td>
<td>Residential (R) or Commercial (C)</td>
<td>Comments</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>D. Litchfield Demolition &amp; Used Building Materials</td>
<td></td>
<td></td>
<td>Both</td>
<td>Provide onsite aggregate recycling services. Contact company for a list of available materials.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Demco Disposal Service Ltd.</td>
<td></td>
<td>C</td>
<td></td>
<td>Online listing of available materials</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Douglas Anthony Demolition Ltd.</td>
<td></td>
<td></td>
<td>Both</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fraser Trucking &amp; Tractor Ltd.</td>
<td></td>
<td></td>
<td>Both</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Habitat for Humanity Abbotsford ReStore</td>
<td></td>
<td></td>
<td>Both</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Habitat for Humanity Burnaby ReStore</td>
<td></td>
<td></td>
<td>Both</td>
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<tr>
<td>Vancouver Timber Services Ltd.</td>
<td></td>
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<td>Both</td>
<td>Specializes in reclaimed timber, wood flooring, and furniture.</td>
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<td>Western Reclaimed Timber Corp.</td>
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<td>Specializes in reclaimed timber, wood flooring, and furniture.</td>
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</table>
## Directory of Local Recycling Depots

These local public and private recycling depots are open to builders and demolition contractors. Depots will only accept separated recyclable materials unless indicated otherwise. Please always call ahead for drop-off details and hours of operation.

<table>
<thead>
<tr>
<th>Abbotsford</th>
<th>Concrete &amp; Asphalt</th>
<th>Cardboard</th>
<th>Drywall</th>
<th>Land Clearing Debris</th>
<th>Pallets</th>
<th>Scrap Metal</th>
<th>Wood</th>
<th>Mixed Construction Waste</th>
<th>Green Waste</th>
<th>Residential and/or Commercial Loads</th>
<th>Comments</th>
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<tr>
<td>Abbotsford Community Services Recycling 33670 Valley Road <a href="http://www.abbotsfordcommunityservices.com/Recycling.htm">www.abbotsfordcommunityservices.com/Recycling.htm</a> 604-850-3551</td>
<td>♦</td>
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<tr>
<td>Columbia Lafarge 28371 Huntingdon Road <a href="http://www.lafarge-na.com">www.lafarge-na.com</a> 604-856-7794</td>
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<td>Matsqui Transfer Station 33621 Valley Road <a href="http://www.metrovancouver.org/services/solidwaste/disposal/Pages/disposalfacilities.aspx">www.metrovancouver.org/services/solidwaste/disposal/Pages/disposalfacilities.aspx</a> 604-853-7560</td>
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<td>Regional Recycling 750 Riverside Road <a href="http://www.regionalrecycling.ca/abbotsford.html">www.regionalrecycling.ca/abbotsford.html</a> 604-852-9152</td>
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<td>Land Clearing Debris</td>
<td>Pallets</td>
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<td>Wood</td>
<td>Mixed Construction Waste</td>
<td>Green Waste</td>
<td>Residential and/or Commercial Loads</td>
<td>Comments</td>
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<td>ABC Recycling 8081 Meadow Avenue <a href="http://www.abcrecycling.com">www.abcrecycling.com</a> 604-522-9727</td>
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<td>Burnaby Recycling Depot 4800 Still Creek <a href="http://www.city.burnaby.bc.ca/cityhall/departments/engrn/engrn_sntrnr.html">www.city.burnaby.bc.ca/cityhall/departments/engrn/engrn_sntrnr.html</a> 604-294-7972</td>
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*Both truckloads are accepted depending on space available*
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<th>Scrap Metal</th>
<th>Wood</th>
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<th>Green Waste</th>
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Coquitlam Transfer Station
1200 United Boulevard
www.metrovancouver.org/services/solidwaste/disposal/Pages/disposalfacilities.aspx
604-526-6570

Coquitlam Construction Recycling Facility
1001 United Boulevard
www.metrovancouver.org/services/solidwaste/disposal/Pages/disposalfacilities.aspx
604-526-6570

Columbia Lafarge
2300 Rogers Avenue
www.lafarge-na.com
604-521-8811

Basran Fuels
9486 River Rd.
540 Ewens Avenue
604-522-1628

Cloverdale Fuel Ltd.
20408 - 102B Avenue
www.cloverdalefuel.com
604-534-4313

Langley Transfer Station
1070 - 272nd Street, Aldergrove
www.metrovancouver.org/services/solidwaste/disposal/Pages/disposalfacilities.aspx
604-856-3225

Slater Iron & Salvage Co. Ltd.
Hangar 18A 5225 - 216 Street
www.slateriron.com
604-533-8522

West Coast Metal Recycling
R & P Metals
19841 - 57A Avenue
www.westcoastmetalrecycling.com
604-534-3531
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<td>604-467-7878</td>
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<td>Ridge Meadows Recycling Society</td>
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<td><a href="http://www.rmrecycling.org">www.rmrecycling.org</a></td>
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<td>604-527-4060</td>
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<td><strong>North Vancouver</strong></td>
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<td>B.A. Blacktop Ltd.</td>
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<td>6 Riverside Drive</td>
<td><a href="http://www.bablacktop.com">www.bablacktop.com</a></td>
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<tr>
<td>604-929-7974</td>
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<td>North Shore Recycling Depot</td>
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<td>75 Riverside Drive</td>
<td><a href="http://www.nsrp.bc.ca">www.nsrp.bc.ca</a></td>
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<td>604-981-3124</td>
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Maximum vehicle size allowed is 1 tonne.
Small commercial volumes. Call ahead to verify.
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<thead>
<tr>
<th>North Shore Transfer Station (Wastech)</th>
<th>Concrete &amp; Asphalt</th>
<th>Cardboard</th>
<th>Drywall</th>
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<td>Fraser Richmond Soil &amp; Fibre Ltd.</td>
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<td><a href="http://www.fraserrichmond.ca">www.fraserrichmond.ca</a></td>
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<td>Allied Salvage &amp; Metals (1985) Ltd.</td>
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**Directory of Hauling Services**

The listed haulers pick up separated recyclable materials from construction and renovation sites in the Lower Mainland. Where indicated, haulers pick up mixed waste for offsite sorting.

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<th>Materials</th>
<th>Concrete &amp; Asphalt</th>
<th>Cardboard</th>
<th>Drywall</th>
<th>Land Clearing Debris</th>
<th>Scrap Metal</th>
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<td>604-522-9727</td>
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Note:◆ indicates available service, ▲ indicates non-ferrous metals only.
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<td><a href="http://www.freshstartrecycling.com">www.freshstartrecycling.com</a></td>
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<td><a href="http://www.mapleleafdisposal.com">www.mapleleafdisposal.com</a></td>
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<th>Wood &amp; Pallets</th>
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<th>Dual Bin</th>
<th>Commingled Recyclables Bin</th>
<th>Residential and/or Commercial</th>
<th>Comments</th>
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<tr>
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<td>✔</td>
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<td>✔</td>
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<td>Materials</td>
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<td>Cardboard</td>
<td>Drywall</td>
<td>Land Clearing Debris</td>
<td>Scrap Metal</td>
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<td>Prompt Waste Management</td>
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<tr>
<td>Langley</td>
<td><a href="http://www.promptwaste.com">www.promptwaste.com</a></td>
<td>1-877-853-0487</td>
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<td>Pacific Metals Ltd.</td>
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<tr>
<td>Vancouver</td>
<td><a href="http://www.pacifcmetal.ca">www.pacifcmetal.ca</a></td>
<td>604-327-1148</td>
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<td>Recycling Alternative</td>
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<td>Vancouver</td>
<td><a href="http://www.recyclingalternative.com">www.recyclingalternative.com</a></td>
<td>604-874-7283</td>
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<td>Richmond Steel Recycling Ltd.</td>
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<td>Richmond</td>
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<tr>
<td>Surrey</td>
<td><a href="http://www.rypacmetalrecycling.com">www.rypacmetalrecycling.com</a></td>
<td>604-580-7471</td>
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<td>Scott Road Trading Ltd.</td>
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<td><a href="http://www.scottroadtrading.com">www.scottroadtrading.com</a></td>
<td>604-580-0771</td>
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<td><a href="http://www.smithrite.com">www.smithrite.com</a></td>
<td>604-529-4030</td>
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<td>Super Save Waste Systems Inc.</td>
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<td><a href="http://www.supersave.ca">www.supersave.ca</a></td>
<td>604-533-4423</td>
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<td><a href="http://www.urbanimpact.com">www.urbanimpact.com</a></td>
<td>604-273-0089</td>
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<td>Materials</td>
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<td>Drywall</td>
<td>Land Clearing Debris</td>
<td>Scrap Metal</td>
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| Coquitlam  
www.wmcanada.com  
604-520-7800 | | | | | |
| Waste Services Inc.  
Abbotsford  
www.wasteservicesinc.com  
604-857-1990 | ✔ | ✔ | ✔ | ✔ | ✔ |
| Wescan Disposal  
Coquitlam  
www.wescandisposal.com  
604-526-9511 | ✔ | ✔ | ✔ | ✔ | ✔ |
| West Coast Metal Recycling  
Langley  
www.westcoastmetalrecycling.com  
604-534-3531 | | | | | non-ferrous metals only |
| Western Material Recovery  
Richmond  
604-325-3299 | | | | | |
| West Coast Metal Recycling  
Langley  
604-534-3531 | | | | | non-ferrous metals only |
| Western Gypsum Recycling  
Richmond  
604-325-3299 | | | | | |
| Wood & Pallets | Mixed Construction Waste | Dual Bin | Commingled Recyclables Bin | Residential and/or Commercial |
| Comments | ✔ | ✔ | | C |
| Waste Services Inc.  
Abbotsford  
www.wasteservicesinc.com  
604-857-1990 | ✔ | ✔ | | Both |
| Wescan Disposal  
Coquitlam  
www.wescandisposal.com  
604-526-9511 | ✔ | ✔ | | Both |
| West Coast Metal Recycling  
Langley  
www.westcoastmetalrecycling.com  
604-534-3531 | | | | Both |
| Western Material Recovery  
Richmond  
604-325-3299 | | | | C |
| West Coast Metal Recycling  
Langley  
604-534-3531 | | | | C |
| Western Gypsum Recycling  
Richmond  
604-325-3299 | | | | C |
Summary of Roles

The following is a summary of the roles that all parties must play to maximize the amount of construction and demolition waste that is diverted from disposal.

**General Contractor**
- Estimate waste generation, salvage and recycling opportunities
- Identify a recycling program that is best suited for the site
- Select a waste hauler with experience in job site recycling
- Setup the program on site
- Educate workers
- Monitor waste management program day-to-day
- Record keeping and reporting

**Developers, Property Owners and Managers**
- Make waste reduction a priority from the start of the project
- Set waste diversion goals for the project
- Support the waste management program, during the duration of the project

**Architects/Designers**
- At the design stage try to prevent waste by:
  1. Selecting standard sizes for all building materials to minimize waste on site (i.e. off cuts)
  2. Designing spaces that would be flexible to changing uses
  3. Designing for deconstruction
- Identify material reuse and waste reduction opportunities
- Select a contractor with established experience in job site recycling
- Include a construction waste management specification
- Write a waste management plan
- Monitor the job site recycling program
- Report on the program’s success

**Construction Waste Management Plan**

A construction waste management plan is a document that contains all the information needed by any worker on site to be able to achieve the project’s goals and targets. A sample construction waste management plan is available in Metro Vancouver’s LEED for Contractor’s Guide at http://www.metrovancouver.org/about/publications/Publications/greenconstructionLEEDforcontractors08.pdf.

The plan needs to contain information about:

1. **Project’s waste diversion goals and targets**
2. **Name(s) and contact information** of person(s) responsible for waste management on site.
3. An estimate of the **types and quantities of materials** generated.
4. List of **how and where** each material will be removed and salvaged or recycled.
5. **Costs and revenues** from salvaged and recycled materials.
6. **Methods and techniques** for collecting, separating and recycling materials.
7. **Methods of assessment**, abatement and safe disposal of hazardous materials.
8. **Plans for training, meetings and other communications** related to job site waste management, including:
   - Procedures for educating workers and subcontractors
   - Site setup and identification of collection areas
9. **Troubleshooting instructions and contact information** for:
   - Waste haulers
   - Used building materials yards
   - Licensed recycling and disposal facilities
10. **Reporting and record keeping** including:
    - Collect and record all cost and revenue data
    - Calculate waste diversion rate
    - Report on any new opportunities, not previously identified, to minimize waste on site through reuse, salvage or recycling
Construction and Deconstruction Projects Material Inventory Form

This form can be used to track and report construction and/or deconstruction waste management amounts.

To download a full-size PDF version of this inventory form that you can print out and use, visit www.metrovancouver.org/buildsmart.

Demolition, New Construction and Renovation Projects Waste Generation Rates

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<th>Activity</th>
<th>Waste Generation Rates</th>
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<tr>
<td>Wood</td>
<td>MISC</td>
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<tr>
<td>D</td>
<td>764 kg/m² (1,555 lbs/sq ft)</td>
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<tr>
<td>NC</td>
<td>12.3 kg/m² (2.5 lbs/sq ft)</td>
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<tr>
<td>R</td>
<td>39 kg/m² (8.5 lbs/sq ft) **</td>
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<table>
<thead>
<tr>
<th>Composition (by weight)</th>
<th>Total Area (SQ.FT. OR SQ.M.)</th>
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<tr>
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<tr>
<td>DRYWALL</td>
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</tr>
<tr>
<td>METALS</td>
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</tr>
<tr>
<td>CONCRETE/ ASPHALT</td>
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<tr>
<td>CORRUGATED CARDBOARD</td>
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</tr>
<tr>
<td>MISC</td>
<td></td>
</tr>
<tr>
<td>WOOD</td>
<td></td>
</tr>
<tr>
<td>DRYWALL</td>
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<tr>
<td>METALS</td>
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<tr>
<td>CONCRETE/ ASPHALT</td>
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<td>CORRUGATED CARDBOARD</td>
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<th>Type of Building</th>
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<td>D: Demolition</td>
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<tr>
<td>NC: New Construction</td>
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<tr>
<td>R: Renovation</td>
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</table>

* This is an average calculated from a wide range of renovation projects such as kitchen, bathroom, deck and roof
** This rate was calculated from a range of commercial retrofits and tenant improvement projects

Source: Squamish-Lillooet Regional District Construction and Demolition Waste Management Study, October 2003
Characterization of Building-Related Construction and Demolition Debris in the United States, June 1998

### Table: Composition (by weight)

<table>
<thead>
<tr>
<th>Material</th>
<th>Single Family (including concrete)</th>
<th>Multi-Family (including concrete)</th>
<th>Single Family (111 lbs/sq ft)</th>
<th>Multi-Family (17 lbs/sq ft)</th>
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<tbody>
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<td>D</td>
<td>NC</td>
<td>R</td>
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<tr>
<td>DRYWALL</td>
<td>44%</td>
<td>65%</td>
<td>16%</td>
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<tr>
<td>METALS</td>
<td>2%</td>
<td>21%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CONCRETE/ ASPHALT</td>
<td>6%</td>
<td>1%</td>
<td>6%</td>
<td></td>
</tr>
<tr>
<td>CORRUGATED CARDBOARD</td>
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<td>2%</td>
<td>6%</td>
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<tr>
<td>MISC</td>
<td>3%</td>
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### Table: Project Summary

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<thead>
<tr>
<th>Material</th>
<th>Estimated Generation</th>
<th>Salvaged</th>
<th>Recycled</th>
<th>Disposed</th>
<th>Facility</th>
<th>Remarks/Comments</th>
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</thead>
<tbody>
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<td>DRYWALL</td>
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<td>3%</td>
<td>29%</td>
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<td>METALS</td>
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<td>CONCRETE/ ASPHALT</td>
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<td>21%</td>
<td>2%</td>
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<tr>
<td>CORRUGATED CARDBOARD</td>
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<td>1%</td>
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<tr>
<td>MISC</td>
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<td>68%</td>
<td>12%</td>
<td>24%</td>
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<tr>
<td>WOOD</td>
<td>65%</td>
<td>21%</td>
<td>1%</td>
<td>65%</td>
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</tr>
</tbody>
</table>

**EXPLANATORY NOTES:**

Column 1 Material: enter materials targeted for salvage, recycling, and/or disposal
Column 2 Estimated Generation: enter the estimated volumes, quantities, or number of salvageable, recyclable, and waste materials generated (e.g., cu. yd., tonnes, board ft.)
Column 3, 4 & 5 Salvaged, Recycled and Disposed: enter the volumes, quantities, or number of materials handled (e.g., cu. yd., tonnes, board ft.)
Column 6 Facility: enter the end-destination of salvaged, recycled, and disposed materials
Column 7 Remarks/Comments: enter any additional comments or details as required.
Prohibited/Restricted Wastes at Local Landfills and Transfer Stations

List of Prohibited Wastes at the Ecowaste Landfill*
www.ecowaste.com

- Hazardous wastes as defined by the Hazardous Waste Regulation of the BC Environmental Management Act
- Semisolid sludge or liquid wastes
- Automobiles, white goods, household appliances, metallic car parts, large metallic objects, tires (other than small utility tires which can not be recycled)
- Food wastes or other putrescible refuse or dead animals
- Bulk quantities of waste paper, newspaper and corrugated cardboard
- Gypsum board in excess of 1% of any individual load (5% in the case of fire damaged materials)
- Excavation material and/or soil, unless pre-approved. Soils of residential or industrial quality based on the applicable numerical soil standards in the Contaminated Sites Regulation are acceptable. Certain soils with contamination levels above the industrial level (“Waste Soil”) may be accepted on a case by case basis
- Asbestos or materials containing asbestos
- Concrete with heavy rebar

Restricted Materials at Metro Vancouver disposal sites
www.metrovancouver.org/services/solidwaste/disposal/Pages/bannedmaterials.aspx

- Appliances (washers, dryers, refrigerators and more)
- Asbestos
- Compact fluorescent bulbs
- Fluorescent tubes
- Milk containers (includes soy & rice milk)
- Rechargeable batteries
- Sod
- Odourous and dusty loads
- Propane tanks

*partial list only; call for more information

List of Prohibited Wastes at the Vancouver Landfill
www.vancouver.ca/engsvcs/solidwaste/landfill/index.htm

- Hazardous wastes (i.e. pathogenic and radioactive materials)
- Hazardous wastes as defined by the Hazardous Waste Regulation of the BC Environmental Management Act
- Biomedical waste, including sharps
- Paint
- Liquid wastes and sludges
- Explosive substances
- Chemicals or other materials which may create hazardous working conditions
- Inflammable materials
- Materials hot enough to start combustion
- Automobile bodies
- Boat hulls longer than 30 ft, and/or containing any metals or oils (fibreglass and wood parts are accepted for disposal only)
- Dead animals and animal parts including bones, feathers, skin, hair, nails and teeth (excluding processed meat)
- All forms of excrement
- Barrels, drums and other large liquid containers, whether full or empty
- Lumber, timber, logs, etc., longer than 3.6m (12ft)
- Solid objects larger in cross section than 3500 cm2 (3.8ft2) if longer than 2.5m (8ft)
- Fabricated objects wider or thicker than 1.2m (4ft) and longer than 2.5m (8ft)
- Soil with contaminant levels exceeding Urban Park standards defined by the Contaminated Sites Regulation of the Environmental Management Act
- Coated or uncoated wire or cable in excess of 1% by weight of any load
- Commercial loads of dry cell batteries
- Materials accepted for recycling at the landfill
- Asbestos and materials containing asbestos that are not double-bagged
- Desktop computers, computer monitors, notebook computers, desktop printers and fax machines, and televisions

Note: A 50% surcharge may be assessed on garbage loads containing banned materials in excess of 5% or more by volume (see list on page 5).
Thank you to the following people who provided input and reviewed the toolkit.

Corinne Fulton
3R Demolition

Jennifer Lukianchuk
City of New Westminster

Jennifer Sheel
City of Vancouver

Neil McCriddy
City of Vancouver

Dale MacDonald
Dominion Construction

Shane Van Vliet
Double V Construction Ltd.

Amy Spencer-Chubey
Greater Vancouver Home Builders Association

Peter Simpson
Greater Vancouver Home Builders Association

Daniel Roberts
Kane Consulting

Joanne McCran
Light House Sustainable Building Centre
Metro Vancouver’s source for sustainable building information

For more information, or to browse the online sustainable products and services directory, please visit www.metrovancouver.org/buildsmart

Contact a Business Advisor at 604-451-6575 or email buildsmart@metrovancouver.org.

For information on the Zero Waste Challenge or for guidance on how to move your business towards sustainability, please visit www.metrovancouver.org

Printed in Canada using vegetable-based inks on recycled paper using 100% post-consumer waste.
APPENDIX C
2007-2010 Community Liaison Activities and Input Report
2007-2010 Community Liaison Activities and Input

Deltaport Third Berth Project
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   1.2 Federal and Provincial Regulatory Review Process  
   1.3 EAO Table of Commitments and Assurances  
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2.0 Community Liaison Activities  
   2.1 Community Liaison Committee  
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   2.4 Project/Construction Updates and Advisories  
   2.5 Library Resource Files  
   2.6 Issue Tracking and Response Tables  

3.0 Issue Summary  

4.0 Conclusion
1.0 Introduction

1.1 Overview

The development of the Deltaport Third Berth Project (DP3) was a Port Metro Vancouver (PMV) and TSI Terminal Systems Inc. (TSI) initiative to expand existing container operations at the Deltaport container terminal at Roberts Bank, in Delta, B.C. DP3 is part of PMV’s overall strategy to expand container capacity at the Port to accommodate consumer and business-driven demand for increased Canadian trade through the west coast of Canada.

The development of DP3 increased capacity at Deltaport by approximately 600,000 TEUs (twenty-foot equivalent units) by adding a third berth and 20 hectares of container storage facilities to the existing two-berth container terminal. This third berth at Deltaport is operated by TSI, a private company that operates the existing Deltaport container terminal.

DP3 officially opened in January 2010. Construction for the Deltaport Third Berth Project began in January 2007, with the commencement of dredging and marine works. The terminal construction was completed in late 2009. The environmental habitat compensation work is scheduled for completion in early 2011.

Community consultation during the construction and first-year operation of DP3 occurred as per the Deltaport Third Berth Project: Community Liaison Plan - Construction and First Year Operation Phase, a document prepared by PMV to provide an overview of DP3 community consultation activities. Please see section 1.4 for more information regarding the Community Liaison Plan.

1.2 Federal and Provincial Regulatory Review Process

DP3 required provincial approval under the British Columbia Environmental Assessment Act and federal approvals following a review under the Canadian Environmental Assessment Act. The provincial and federal review processes identified potential environmental, economic, social, heritage and/or health impacts and defined how these would be avoided or mitigated.

The Project was comprehensively reviewed by federal and provincial government
agencies through a single harmonized environmental assessment process facilitated by the B.C. Environmental Assessment Office (EAO) and was open to the full participation of stakeholders and the general public.

On September 29, 2006, Port Metro Vancouver received a provincial environmental assessment certificate from the EAO for the Deltaport Third Berth Project. The federal Minister of the Environment and the Minister responsible for the Canadian Environmental Assessment Agency (CEAA) announced on November 3, 2006 that the proposed Deltaport Third Berth Expansion Project was unlikely to cause significant adverse environmental effects. On December 19, 2006, PMV received authorization under the Fisheries Act to allow construction on the Project to commence.

The Project Compliance Report for DP3 was submitted on November 13, 2009 to the EAO. On December 1, 2009, the EAO confirmed DP3 was in compliance with the Environmental Assessment Certificate and could proceed to commence operation.

1.3 EAO Table of Commitments and Assurances

As part of its environmental assessment report on the Deltaport Third Berth Project, the B.C. Environmental Assessment Office (EAO) issued the Owner’s Table of Commitments and Assurances, a series of commitments to responsible environmental management and other measures.

During the three years of DP3’s construction phase, as well as its first year of its operation, PMV reported to the EAO and the working group (composed of various provincial and federal regulatory agencies, First Nations groups, municipalities and other stakeholders) on the status of these commitments.

Updated versions of the Owner’s Table of Commitments and Assurances are also uploaded to the Project website, as they became available. Updates to the Owner’s Table of Commitments and Assurances will be provided on a semi-annual basis as the majority of commitments are complete. The next update to the Table will occur in February 2011.
1.4 Community Liaison Plan

On December 12, 2006, PMV issued the Deltaport Third Berth Project: Community Liaison Plan - Construction and First Year Operation Phase (the Plan) to provide the public with an overview of the community liaison activities planned for the construction and first year of operations of DP3. The Plan integrated the consultation and communications commitments made in the Owner’s Table of Commitments and Assurances.

Activities within the Plan focused on communications and consultation with Delta stakeholders, including the Corporation of Delta, residents, special interest groups, First Nations and other stakeholders. The Plan’s goals were:

• To provide an open and interactive consultation process that considers local, regional and provincial interests;
• To foster community support for the Project;
• To strengthen ongoing relations with local community interests; and
• To integrate the commitments and assurances identified in the Environmental Assessment Report APPENDIX E.

The Plan was designed to allow for ample opportunity to review Project information and provide meaningful input.

Input obtained through community liaison activities was considered advisory in nature, and was incorporated into Project design and construction and operation whenever it was reasonable to do so. Input regarding PMV activities other than those involved in DP3 was addressed using appropriate PMV resources.

The Plan was amended once, on April 23, 2009.

2.0 Community Liaison Activities

During the development and first-year operation of DP3, PMV was committed to working with the community of Delta to identify issues and minimize impacts related to the Project.
From 2007-2010, PMV undertook the following consultation and communications activities as described in the Deltaport Third Berth Project – Community Liaison Plan:

- Twenty-seven (27) meetings of the Deltaport Third Berth Project Community Liaison Committee;
- Fourteen (14) public information sessions to provide Project updates;
- One (1) open house to provide an opportunity for public see the project first-hand;
- Eight (8) newsletters (two per year) delivered to all residential and business addresses in Delta, e-mailed to the Project database and posted on DP3 webpage;
- Forty-one (41) Project advisories/updates via email circulation to over 580 individuals on the project database and postings on the DP3 webpages;
- Regularly updated project resource binders at community libraries;
- Development and maintenance of a regularly updated public comment and issues tracking table;
- Maintaining contact and feedback mechanisms (Project information line, e-mail address, facsimile line and mailing addresses).

The following sections provide details of these key activities.

2.1 Community Liaison Committee

Overview
The Deltaport Third Berth Project Community Liaison Committee (DCLC) consisted of up to 18 individuals representing residents, community associations and businesses in Delta, as well as port stakeholder groups.

The purpose of the committee was to work with PMV during the construction and first-year operation of the third berth at Deltaport to identify community concerns, develop potential solutions to address those concerns and assist in communicating information among the community, PMV and other port stakeholders.

Terms of Reference
PMV developed the DCLC Terms of Reference on December 8, 2006 and the DCLC revised them on April 4, 2007, April 20, 2007 and April 24, 2008.
Meetings
A total of twenty-seven DCLC meetings occurred since the Committee’s inception.
Meeting dates were as follows.

<table>
<thead>
<tr>
<th>DCLC Meeting</th>
<th>Date</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>March 22, 2007</td>
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<td>April 19, 2007</td>
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<td>3</td>
<td>May 1, 2007</td>
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<td>4</td>
<td>June 26, 2007</td>
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<td>5</td>
<td>July 3, 2007</td>
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<td>6</td>
<td>September 6, 2007</td>
</tr>
<tr>
<td>7</td>
<td>October 25, 2007</td>
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<tr>
<td>8</td>
<td>November 29, 2007</td>
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<tr>
<td>9</td>
<td>January 17, 2008</td>
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<tr>
<td>10</td>
<td>February 28, 2008</td>
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<tr>
<td>11</td>
<td>April 24, 2008</td>
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<tr>
<td>12</td>
<td>June 26, 2008</td>
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<tr>
<td>13</td>
<td>August 28, 2008</td>
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<tr>
<td>14</td>
<td>October 23, 2008</td>
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<tr>
<td>15</td>
<td>November 27, 2008</td>
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<tr>
<td>16</td>
<td>January 22, 2009</td>
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<tr>
<td>17</td>
<td>February 19, 2009</td>
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<tr>
<td>18</td>
<td>April 16, 2009</td>
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<tr>
<td>19</td>
<td>June 18, 2009</td>
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<tr>
<td>20</td>
<td>September 17, 2009</td>
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<tr>
<td>21</td>
<td>November 26, 2009</td>
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<tr>
<td>22</td>
<td>January 21, 2010</td>
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<td>23</td>
<td>March 30, 2010</td>
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<tr>
<td>24</td>
<td>May 27, 2010</td>
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<td>25</td>
<td>June 24, 2010</td>
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<tr>
<td>26</td>
<td>September 23, 2010</td>
</tr>
<tr>
<td>27</td>
<td>December 2, 2010</td>
</tr>
</tbody>
</table>
Presentations

Presentations were provided to DCLC during their scheduled meetings, as follows:

<table>
<thead>
<tr>
<th>Presentation</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Truck Licensing System</td>
<td>October 25, 2007</td>
</tr>
<tr>
<td>Highway 17 Improvements</td>
<td>October 25, 2007</td>
</tr>
<tr>
<td>DP3 Scientific Advisory Committee</td>
<td>January 27, 2008</td>
</tr>
<tr>
<td>Roberts Bank Rail Corridor Update</td>
<td>April 24, 2008</td>
</tr>
<tr>
<td>BCRC Port Sub Presentation</td>
<td>June 26, 2008</td>
</tr>
<tr>
<td>Land Operations at Port Metro Vancouver</td>
<td>August 28, 2008</td>
</tr>
<tr>
<td>Construction Environmental Monitoring</td>
<td>October 23, 2008</td>
</tr>
<tr>
<td>Overview of DP3 Monitoring</td>
<td>October 23, 2008</td>
</tr>
<tr>
<td>Marine Mammal Monitoring Program</td>
<td>October 23, 2008</td>
</tr>
<tr>
<td>DP3 Terminal Lighting</td>
<td>November 27, 2008</td>
</tr>
<tr>
<td>March 14, 2009 PMV Information Session</td>
<td>April 16, 2009</td>
</tr>
<tr>
<td>Trucking Safety – Deltaport Way</td>
<td>June 18, 2009</td>
</tr>
<tr>
<td>DCLC Truck Traffic Subcommittee</td>
<td>September 17, 2009</td>
</tr>
<tr>
<td>2008 AMS Annual Report</td>
<td>November 26, 2009</td>
</tr>
<tr>
<td>Traffic Management Plan</td>
<td>November 26, 2009</td>
</tr>
<tr>
<td>Smart Corridors – Roberts Bank Pilot Project</td>
<td>January 21, 2010</td>
</tr>
</tbody>
</table>

Fact Sheets

At the request of DCLC, PMV prepared four fact sheets in response to frequently asked questions.

<table>
<thead>
<tr>
<th>Topic</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Quality</td>
<td>October 2007 (updated November 26, 2007)</td>
</tr>
<tr>
<td>Wildlife</td>
<td>November 2007 (updated December 4, 2007)</td>
</tr>
<tr>
<td>Highway 17</td>
<td>November 6, 2007</td>
</tr>
<tr>
<td>Lighting</td>
<td>September 1, 2008</td>
</tr>
</tbody>
</table>
Subcommittees

DCLC established four subcommittees to address issues involving each of the following four areas:

- Traffic impacts from DP3
- Noise impacts from DP3
- Lighting impacts from DP3
- DP3 communications

The subcommittees met when a greater understanding of these particular issues was needed. The subcommittee objectives were to review these issues and to work to develop recommendations to be passed onto DCLC.

2.2 Information Sessions

Overview

The purpose of the information sessions were to provide the community with an opportunity to find out about the status of DP3; to give community members an opportunity to speak to Project staff and members of DCLC; and to receive input and provide feedback on the project. PMV hosted fourteen information sessions as follows:

- May 29, 2007, Delta (Delta Town and Country Inn, 20 attendees)
- May 31, 2007, Tsawwassen (Coast Tsawwassen Inn, 29 attendees)
- Nov. 24, 2007, Delta (Delta Town and Country Inn, 65 attendees)
- May 29, 2008, Tsawwassen (Coast Tsawwassen Inn, 43 attendees)
- December 2, 2008 Tsawwassen (Tsawwassen Golf and Country Club, 49 attendees)
- March 14, 2009 in Tsawwassen (Tsawwassen Centre Mall, spoke with 54 individuals)
- May 30, 2009 in Tsawwassen (Tsawwassen Centre Mall, spoke with 50 individuals)
- June 27, 2009 in Tsawwassen (Tsawwassen Centre Mall, spoke with 38 individuals)
- July 12, 2009 in Ladner (Ladner Village Markey, spoke with 236 individuals)
- November 27, 2009 in Tsawwassen (Tsawwassen Centre Mall, spoke with 30 individuals)
• November 29, 2009 in Ladner (Ladner Save-on-Foods, spoke with 115 individuals)
• June 5, 2010 in Tsawwassen (Tsawwassen Centre Mall, spoke with 42 individuals)
• June 12, 2010 in Tsawwassen (Tsawwassen Centre Mall, spoke with 39 individuals)
• June 13, 2010 in Ladner (Market Village, spoke with 303 individuals)

Additionally, PMV and TSI hosted an open house at the Deltaport Container Terminal on June 26, 2010, which was attended by approximately 3,000 individuals.

Project resource staff and members of the Deltaport Third Berth Project Community Liaison Committee (DCLC) were available to speak to the public at these information sessions. Project resource staff and DCLC members handed out newsletters and backgrounders to passers-by, asked them verbal questions, and recorded their input. Information boards also were developed for display. Additionally, passers-by were asked to fill out a questionnaire regarding DP3.

Brief summaries of the information sessions and open house were developed following these events. Issues raised in information session comment forms or during discussion with project resource staff and DCLC members were documented and responded to in Issue Tracking and Response Tables. (Refer to Section 2.6)

Advertisements
Advertisements in local newspapers provided notification of the information sessions and open house. The ad placement schedule was as follows:

May 29/31, 2007 public information sessions:

<table>
<thead>
<tr>
<th>Date</th>
<th>Newspaper</th>
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</thead>
<tbody>
<tr>
<td>May 18, 2007</td>
<td>South Delta Leader</td>
</tr>
<tr>
<td>May 19, 2007</td>
<td>Delta Optimist</td>
</tr>
<tr>
<td>May 25, 2007</td>
<td>South Delta Leader</td>
</tr>
<tr>
<td>May 25, 2007</td>
<td>Surrey/North Delta Leader</td>
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<tr>
<td>May 26, 2007</td>
<td>Delta Optimist</td>
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</tbody>
</table>
### November 24, 2007 public information session:

<table>
<thead>
<tr>
<th>Date</th>
<th>Newspaper</th>
</tr>
</thead>
<tbody>
<tr>
<td>November 16, 2007</td>
<td>South Delta Leader</td>
</tr>
<tr>
<td>November 17, 2007</td>
<td>Delta Optimist</td>
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<tr>
<td>November 21, 2007</td>
<td>Delta Optimist</td>
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<tr>
<td>November 21, 2007</td>
<td>Surrey/North Delta Leader</td>
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<td>November 23, 2007</td>
<td>South Delta Leader</td>
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<td>November 23, 2007</td>
<td>Surrey/North Delta Leader</td>
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<tr>
<td>November 24, 2007</td>
<td>Delta Optimist</td>
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</table>

### May 29, 2008 public information session:

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<thead>
<tr>
<th>Date</th>
<th>Newspaper</th>
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<tr>
<td>May 16, 2008</td>
<td>South Delta Leader</td>
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<td>May 17, 2008</td>
<td>Delta Optimist</td>
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<td>May 21, 2008</td>
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<td>May 25, 2008</td>
<td>Surrey/North Delta Leader</td>
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<tr>
<td>May 28, 2008</td>
<td>Delta Optimist</td>
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</table>
### December 2, 2008 public information session:

<table>
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<tr>
<th>Date</th>
<th>Newspaper</th>
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<tbody>
<tr>
<td>November 19, 2008</td>
<td>Delta Optimist</td>
</tr>
<tr>
<td>November 21, 2008</td>
<td>South Delta Leader</td>
</tr>
<tr>
<td>November 22, 2008</td>
<td>Delta Optimist</td>
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<td>November 23, 2008</td>
<td>Surrey/North Delta Leader</td>
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<td>November 26, 2008</td>
<td>Delta Optimist</td>
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<td>November 28, 2008</td>
<td>South Delta Leader</td>
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<td>November 29, 2008</td>
<td>Delta Optimist</td>
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<tr>
<td>November 30, 2008</td>
<td>Surrey/North Delta Leader</td>
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### March 14, 2009 public information session:

<table>
<thead>
<tr>
<th>Date</th>
<th>Newspaper</th>
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<tbody>
<tr>
<td>March 14, 2009</td>
<td>South Delta Leader</td>
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</table>

### May 30, 2009 public information session:

<table>
<thead>
<tr>
<th>Date</th>
<th>Newspaper</th>
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</thead>
<tbody>
<tr>
<td>May 27, 2009</td>
<td>Delta Optimist</td>
</tr>
<tr>
<td>May 29, 2009</td>
<td>South Delta Leader</td>
</tr>
<tr>
<td>May 30, 2009</td>
<td>Delta Optimist</td>
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</tbody>
</table>
### June 27, 2009 public information session:

<table>
<thead>
<tr>
<th>Date</th>
<th>Newspaper</th>
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</thead>
<tbody>
<tr>
<td>June 24, 2009</td>
<td>Delta Optimist</td>
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<tr>
<td>June 26, 2009</td>
<td>South Delta Leader</td>
</tr>
<tr>
<td>June 27, 2009</td>
<td>Delta Optimist</td>
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</table>

### July 12, 2009 public information session:

<table>
<thead>
<tr>
<th>Date</th>
<th>Newspaper</th>
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</thead>
<tbody>
<tr>
<td>July 8, 2009</td>
<td>Delta Optimist</td>
</tr>
<tr>
<td>July 10, 2009</td>
<td>South Delta Leader</td>
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<tr>
<td>July 11, 2009</td>
<td>Delta Optimist</td>
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### November 27, 2009 public information session:

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<th>Date</th>
<th>Newspaper</th>
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<tbody>
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<td>November 18, 2009</td>
<td>Surrey/North Delta Leader</td>
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<td>November 20, 2009</td>
<td>South Delta Leader</td>
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<tr>
<td>November 25, 2009</td>
<td>Surrey/North Delta Leader</td>
</tr>
<tr>
<td>November 27, 2009</td>
<td>South Delta Leader</td>
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<tr>
<td>November 28, 2009</td>
<td>The Delta Optimist</td>
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### November 29, 2009 public information session:

<table>
<thead>
<tr>
<th>Date</th>
<th>Newspaper</th>
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<tbody>
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<td>November 18, 2009</td>
<td>Surrey/North Delta Leader</td>
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<tr>
<td>November 20, 2009</td>
<td>South Delta Leader</td>
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<tr>
<td>November 25, 2009</td>
<td>Surrey/North Delta Leader</td>
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<tr>
<td>November 27, 2009</td>
<td>South Delta Leader</td>
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<tr>
<td>November 28, 2009</td>
<td>The Delta Optimist</td>
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</table>
June 5, 12, and 13, 2010 public information sessions and June 26, 2010 open house:

<table>
<thead>
<tr>
<th>Date</th>
<th>Newspaper</th>
</tr>
</thead>
<tbody>
<tr>
<td>May 28, 2010</td>
<td>South Delta Leader</td>
</tr>
<tr>
<td>June 4, 2010</td>
<td>South Delta Leader</td>
</tr>
<tr>
<td>June 4, 2010</td>
<td>Surrey/North Delta Leader</td>
</tr>
<tr>
<td>June 5, 2010</td>
<td>South Delta Leader</td>
</tr>
<tr>
<td>June 9, 2010</td>
<td>Delta Optimist</td>
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<tr>
<td>June 11, 2010</td>
<td>Surrey/North Delta Leader</td>
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<tr>
<td>June 11, 2010</td>
<td>South Delta Leader</td>
</tr>
<tr>
<td>June 12, 2010</td>
<td>Delta Optimist</td>
</tr>
<tr>
<td>June 30, 2010</td>
<td>Delta Optimist</td>
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</tbody>
</table>
2.3 Newsletters

A Deltaport Project Update newsletter was developed to provide updates to the public regarding DP3 activities. The newsletters were delivered to all residential and business addresses via Canada Post mail-drop, circulated to the Project database via e-mail and posted on the PMV website.

<table>
<thead>
<tr>
<th>Deltaport Third Berth Project Update</th>
<th>February 2007</th>
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<tbody>
<tr>
<td></td>
<td>November 2007</td>
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<td></td>
<td>May 2008</td>
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<td>November 2008</td>
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<td>May/June 2009</td>
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<td>November 2009</td>
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<tr>
<td></td>
<td>June 2010</td>
</tr>
<tr>
<td></td>
<td>December 2010</td>
</tr>
</tbody>
</table>

2.4 Project/Construction Updates and Advisories

Forty-one Project/construction updates and advisories were issued by PMV from 2007 to 2010, which provided timely Project information. These advisories/updates were distributed to over 580 individuals on the Project database via e-mail and posted on the PMV website.
2.5 Library Resource Files

Key project information was made available in hard copy in resource files at the following local libraries.

- Ladner Pioneer Library
- George Mackie Library
- South Delta Library
- Cloverdale Library
- Strawberry Hill Library
- City of Langley Library

2.6 Issue Tracking and Response Tables

Issue tracking and response documents were developed by PMV, as laid out in the Owner’s Table of Commitments and Assurances. The tracking documents include the issues raised from 2007-2010 by the public in correspondence to PMV and the DCLC and at the Project open house and public information sessions. PMV provided responses to the identified issues on an ongoing basis.

The tracking documents were updated by PMV prior to each DCLC meeting with new issues and PMV responses were added as they were received. The documents were circulated to DCLC members and posted on the Project website.

3.0 Issue Summary

Issues appearing in the Issue Tracking and Response Tables include concerns relating to the environment, noise, lighting, air quality, trucking, rail, the Adaptive Management Strategy (AMS), consultation and communications, socio-economics, and other general project and out-of-scope issues.

Environmental issues included:
- Construction, dredging and power line impacts on wildlife and wildlife habitat, including effects on killer whales, dungeness crabs, barn owls, and other marine and bird life
- Environmental management
- Impacts from the construction of concrete caissons
- Impacts from accidents and spills
- Levels of habitat compensation, especially for the East Causeway Compensation Project
- Damage to silt curtains and mooring buoys
- Removal of preload material

**Noise issues included:**
- Dredging noise
- General construction noise, especially at night

**Lighting issues included:**
- Compliance with lighting standards
- Lighting studies undertaken
- Impacts from lighting operations and construction
- Lighting improvements
- Light emanating from the East Causeway Compensation Project
- Strobe light use and impacts

**Air quality issues included:**
- Emissions from tankers, truck traffic, and construction machinery
- The status and placement of the air quality monitoring station

**Trucking issues included:**
- General truck traffic impacts
- Safety of truck operations
- Increases in truck traffic
- Adequacy of traffic mitigation measures
- Highway 10 and 17 traffic mitigation measures
- Truck driver behaviour
Rail issues included:
• Road/rail interfaces
• Frequency and length of trains
• Rail’s effect on commuter traffic
• Mitigating rail’s commuter traffic impacts, (e.g., through overpasses or reliance on trucks)

Issues involving the Adaptive Management Strategy (AMS) included:
• Study area of the AMS
• Independent review of the AMS
• AMS mitigation measures implemented
• Work of the Scientific Advisory Committee (SAC)

Consultation and Communications issues included:
• Support for DCLC
• Longer lead times for construction notification and provision of documents
• Access to Project information
• Transportation to DP3 open house
• Support for involvement of First Nations in Project processes

Socio-economic issues included:
• Impacts to agriculture and farmland
• Mitigating impacts on the lifestyles of residents
• Water access

General project issues and questions included:
• Rationale for the Deltaport Third Berth expansion.
• Impact on existing operations at Roberts Bank
• Emergency preparedness
4.0 Conclusion

Consultation and communications activities for the Deltaport Third Berth Project have been completed as per the Deltaport Third Berth Project: Community Liaison Plan - Construction and First Year Operation Phase.

PMV has fulfilled its community liaison obligations as per the EAO Table of Commitments and Assurances.