



PORT METRO
vancouver

Fraser Surrey Docks
Direct Transfer Coal Facility

Environmental Review Decision Statement
EAP 2012-072

August 12, 2014

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1. Introduction

The Vancouver Fraser Port Authority (VFPA), a federal authority doing business as Port Metro Vancouver (PMV), manages federal Crown lands under the purview of the *Canada Marine Act*, which imparts stewardship responsibilities. PMV accordingly conducts environmental reviews of works and activities undertaken on these lands to ensure that the works and activities do not result in significant adverse environmental effects. This Environmental Review Decision Statement documents the components of PMV's environmental review of the Direct Transfer Coal Facility Project (the Project) proposed by Fraser Surrey Docks LP (FSD or the Proponent). It is a companion document to the Project Review Report.

This environmental review was carried out to address PMV's stewardship responsibilities, and to meet the requirements of the *Canadian Environmental Assessment Act 2012* (CEAA 2012). The proposed Project is not a CEAA 2012 "designated project" and an environmental assessment as described in CEAA 2012 is not required. However, PMV authorization is required for the Project to proceed and in such circumstances Section 67 of CEAA 2012 requires federal authorities to assure themselves that projects will not result in significant adverse environmental effects. This review provides that assurance.

The environmental review considered the Project Permit Application, along with supporting studies, assessments and consultations carried out or commissioned by FSD, as well as other information provided by FSD. In addition, this environmental review considered other information available to PMV and other consultations carried out by PMV. A full list of information sources germane to the review is provided in the following pages of this statement.

This Environmental Review Decision Statement is NOT a project authorization. It is a prerequisite to the issuance of a PMV Project Permit, and the conclusions described in this Decision Statement require compliance with the conditions attached to that Permit.

2. Project Summary

2.1 Project Description

Fraser Surrey Docks (FSD) is a multipurpose marine terminal located on the Fraser River in Surrey, British Columbia, handling containers, bulk agricultural, and breakbulk commodities. FSD has submitted a Permit Application to Port Metro Vancouver (PMV) for the development of a Direct Transfer Coal Facility to handle the export of up to four million metric tonnes (MMT) of coal per year.¹ Direct Transfer means that transshipment of the product is proposed to be direct from land to water, without being stockpiled at the terminal.

¹ The Proponent has indicated an interest in increasing throughput up to eight million MT later, perhaps after four or five years. This Project Permit review considers only the four MMT maximum. PMV has stated that any increase beyond that amount would require a new, full environmental review and Project Permit.

Thermal coal, graded as sub-bituminous, is proposed to be delivered by rail from Wyoming or Montana in the United States (Powder River Basin) to the FSD terminal and loaded directly onto 8,000 dead weight tonne (DWT) barges at Berths 2 and 3. Once loaded, tugs are proposed to tow barges down the Fraser River and then north to an existing facility operated by Lafarge Canada Inc. (Lafarge) on Texada Island in the Georgia Strait. At Texada Island, the commodity will then be loaded into deep-sea vessels for export to international markets. Barges will be towed from the FSD terminal by the marine carrier (Lafarge), only when wind speeds do not exceed 40 km/h. Tows may be in tandem in the Georgia Strait leg of the trip. During peak capacity of movement of four MMT per year, the frequency of tandem tows in the Georgia Strait leg would be one tow per day.

Rail traffic is proposed to be up to 320 coal trains annually via the Burlington Northern Santa Fe (BNSF) Railway. This translates into up to one rail delivery per day by BNSF, which would consist of a unit train between 124 and 135 cars in length. The train would be broken into parts for circulation around the loop track and through the dumper using an electric indexer. Each train will require two barges for transport to the facility on Texada Island.

Specifically the proposed operations at the terminal are to occur as follows: the commodity will arrive by train and the cars will be unloaded using a bottom-dump mechanism into an open ended covered shed/receiving pit. The commodity will then be conveyed to the barges on fixed electric belts via a surge bin and transferred by a slewing barge loader (a pivoting conveyor) with an adjustable spout for direct loading into the barges. During loading, a binding agent or dust suppressant will be applied to the commodity as it is conveyed from the dumper to the berth face and barges. The conveyor systems are proposed to be covered but not enclosed. Barges and rail cars will not be covered but will be sprayed by a dust suppressant. Coal is not proposed to be stockpiled at the terminal.

The proposed operating hours of the Direct Transfer Coal Facility will be during normal working hours between 8:00 am to 4:30 pm, however there may be operations occurring between 4:30 pm to 1:00 am and 1:00 am to 8:00 am. FSD has committed to posting on their website 48 hrs in advance of any working periods that will be conducted outside of normal dayshift hours. FSD currently operates over 24 hours, 7 days a week.

The proposed infrastructure developments at the terminal to support the Direct Transfer Coal Facility consist of the following:

- Installation of new rail track and realignment of existing track within the FSD lease area, across an adjacent PMV roadway, and within the Port Authority Rail Yard (PARY) to the east of the terminal;
- Construction of a new coal receiving/unloading facility including a receiving pit for unloading bottom-dump rail cars, conveyor systems and associated structures and enclosures;
- Construction of a new barge loading system at FSD Berths 2 and 3, including conveyors, a snorkel loading system, 12 new fender piles (steel pipe piles), and a land-based barge winching system;

- Construction of a new covered conveyor system between the new unloading and loading facilities;
- Installation of dust suppression systems along the unloading, loading and conveyor systems;
- Site drainage management systems to capture and treat site runoff for reuse on site or prior to offsite discharge (sanitary sewer discharge is proposed) as well as construction-related excavation dewatering;
- Construction necessary to mitigate certain potential adverse environmental effects associated with the Project, including installation of monitoring equipment, riparian restoration and planting, and development of new riparian fish and wildlife habitat to mitigate the effects of streamside construction associated with the Project;
- Relocation of existing non-commercial vehicle access gate at Elevator Road vehicle entrance;
- Realignment of existing Bekaert Canada access from Elevator Road to Robson Road;
- Removal of the Data Audit Industries truck scale and fencing the remaining area;
- Relocation of portions of Elevator Road to the south west;
- A fire suppression system;
- Lighting on all structures; and
- Installation of any necessary utility connections.

2.2 Project Scope

The scope of the Project consists of the components described above. It does not include the mining and/or processing of the coal at the mine site, the transportation of the coal by rail to the terminal, the transportation of the coal by vessel outside of PMV's navigational jurisdiction, or the end use of the coal. The geographical scope is limited to FSD's physical site and the Fraser River from the FSD terminal to the downstream limits of PMV jurisdiction. The temporal scope comprises Project construction from the initiation of physical works and Project operation for an indefinite period of time. Decommissioning is not within the scope, as it would entail a full new review and permitting by PMV.

3. Environmental Review Documentation and Information

The following documents and information were reviewed and considered in the environmental review of the proposed Project:

- A September 12, 2012 general description of the Project prepared by FSD, in slide and bullet form including maps displaying the approximate barge delivery route and tandem towing methods
- A September, 2012 *Coal Transfer Facility Fire Safety Plan* prepared for FSD by RKMS Group

- A September 26, 2012 *Risk Assessment Study for Coal Barge Operation* prepared for FSD by Det Norske Veritas
- A November 25, 2012 letter from Karla Graf of Triton Environmental Consultants Ltd. to Jurgen Franke of FSD with the subject line "Supplemental information to EMP for a proposed coal direct to barge facility at Fraser Surrey Docks in Surrey BC"
- A November 28, 2012 e-mail from Brian Naito of Fisheries and Oceans Canada to Juergen Baumann of PMV with the subject line "RE: Fraser Surrey Docks coal project impacts on Shadow Brook", together with later personal communications between these two individuals
- FSD's *Environmental Policy Statement*, January 1, 2013
- A Port Metro Vancouver Project Review Application prepared by Jurgen Franke, Director, Engineering and Maintenance of FSD Terminals Limited Partnership, dated June 13, 2012 and updated by attached memo with the subject line "*Direct to Barge Project – Detailed Project Scope* and dated May 13, 2013"
- A January 21, 2013 letter report by Tom Watson and Karla Graf of Triton Environmental Consultants Ltd. to Jurgen Franke of FSD with the subject line "*Overview discussion of the potential toxicity of unburned coal*"
- An April 18, 2013 letter from Karla Graf of Triton Environmental Consultants Ltd. to Jurgen Franke of FSD with the subject line "Proposed water and sediment quality monitoring programs for the operating temporary coal offloading facility at Fraser Surrey Docks, Surrey BC"
- A June 5, 2013 letter from Karla Graf of Triton Environmental Consultants Ltd. to Jurgen Franke of FSD with the subject line "Evaluation of Bekaert Access Road Option 2 at Fraser Surrey Docks (FSD)"
- An August, 2013 *Fraser Surrey Docks Direct Transfer Coal Facility Project Proposal Phase 2 - Consideration Memo* describing how FSD proposes to address project-related concerns raised by the public
- An August 27, 2013 letter from Jeff Scott of FSD to Jim Crandles of PMV with the subject line "Analysis of Options for Covering Barges"
- A November 18, 2013 *Environmental Impact Assessment for the Direct Transfer Coal Facility*, (the EIA), prepared by SNC-Lavalin Inc. Environment and Water (SNC-Lavalin), including:
 - A summary of the potential project effects, mitigation measures and residual effects (Table 14.1 of the EIA)

And the following appendices and attachments:

- Appendix i: The project review application to PMV referenced above
- Appendix ii: Information concerning coal dust binding and suppression agents
- Appendix iii: Information describing FSD's proposed anti-idling and dust control measures

- Appendix iv: FSD's proposed procedures for small and large-scale coal spills
- Appendix v: Lafarge's barge operating procedures
- Appendix vi: Environmental Management Plans (EMPs), including a preliminary EMP for construction and operations prepared by Triton Environmental Consultants Ltd. (Triton) in June, 2013 and an EMP for the Port Authority Rail Yard upgrade and maintenance project prepared by Triton in April, 2013
- Appendix vii: A community engagement summary
- Appendix viii: A draft air quality assessment and a draft air quality management plan both prepared by Levelton Consultants Ltd. (Levelton) on November 15, 2013 (superseded by the final air quality assessment specified later in this list)
- Appendix ix: A discussion of health effects associated with exposure to particulate matter, prepared by SNC Lavalin
- Appendix x: A list of wildlife known to occur in the Metro Vancouver area
- Appendix xi: A list of plants with special status that may occur in the Project vicinity
- Appendix xii: A list of wildlife with special status that may occur in the Project vicinity
- Appendix xiii: Letters:
 - A June 17, 1998 letter from Robert A. Strang of South Fraser Health Region to Verne Kucy of the Corporation of Delta (no subject line but responding to Delta's concerns regarding potential air quality related health impacts)
 - A July 16, 2013 letter from Leonard Ritter, Fellow of the Academy of Toxicological Studies to Jeff Scott of FSD with the subject line "*Expert Opinion Regarding Health Impact From Fugitive Coal Dust From Coal Trains*"
 - A July 16, 2013 letter from Tom A. Watson of Soleil Environmental Consultants Ltd. to Jeff Scott of FSD with the subject line "*Opinion Regarding the Potential Health Impacts from Fugitive Coal Dust from Train and Barge Transport*"
 - A July 16, 2013 memorandum from Chris Koscher of Levelton to Jeff Scott of FSD with the subject line "*Professional opinion on fugitive coal dust from coal handling facilities and transportation of coal by rail on ambient air quality and health*"
- Appendix xiv: The public version of William VanHook's September 28, 2012 statement to U.S. Surface Transportation Board regarding the reasonableness of the BNSF Railway Company's coal dust mitigation measures
- Attachment – Engineering drawings (drawings listed in the EIA that have been superseded or are no longer applicable are not listed here – see the April 17, 2014 redesign package):
 - FSD-DTB-181013-03 DTB Coal Facility Rail Works EB3785-SK-19B Rev D, 2013-09-13

- FSD-DTB-181013-08 DTB Coal Facility Rail Car Storage 0 – 2 Million Tonnes EB3785-SK-20 Rev B, 2013-05-16
- FSD-DTB-181013-09 DTB Coal Facility Rail Car Storage 2 – 4 Million Tonnes EB3785-SK-21 Rev A, 2013-05-16
- FSD-DTB-181013-33 Boom (Fender) Log Design 002, 2013-05-22
- An April 17, 2014 letter from Jeff Scott of FSD to Jim Crandles of PMV with the subject line *Fraser Surrey Docks Direct Transfer Coal Facility Design Changes*
- An April 17, 2014 FSD DTB Project Drawing Package (redesign package) submitted by Jurgen Franke of FSD, including the following drawings:
 - FSD-DTB-170414-01 (13024-SK-000 Rev P1, 14/03/04, Coal Transload Facility Redesign Process Flow Diagram)
 - FSD-DTB-170414-02 (13024-SK-001 Rev P2, 14/04/04, Coal Transload Facility Redesign General Arrangement Plan)
 - FSD-DTB-170414-03 (13024-SK-002 Rev P1, 14/03/04, Coal Transload Facility Redesign General Arrangement Elevations)
 - FSD-DTB-170414-04 (13024-SK-003 Rev P1, 14/03/04, Coal Transload Facility Redesign General Arrangement Railcar Dumper)
 - FSD-DTB-170414-05 (13024-SK-004 Rev P1, 14/03/04, Coal Transload Facility Redesign Barge Warping System Details)
 - FSD-DTB-170414-06 (13024-SK-005 Rev P1, 14/03/04, Coal Transload Facility Redesign Sections and Details)
 - FSD-DTB-170414-07 (13024-SK-006 Rev P2, 14/04/04, Coal Transload Facility Redesign Drainage Plan)
 - FSD-DTB-170414-08 (13024-SK-007 Rev P2, 14/04/04, Coal Transload Facility Redesign Utilities Plan)
 - FSD-DTB-170414-09 (EB3785-SK-09 Rev I, 14/02/28, DTB Coal Facility – Redesign)
 - FSD-DTB-170414-10 (EB3785-SK-08 Rev I, 14/02/28, DTB Coal Facility – Redesign)
 - FSD-DTB-170414-11 (EB3785-SK-16 Rev I, 14/02/28, DTB Coal Facility – Redesign Main Gate Relocation)
 - FSD-DTB-170414-12 (EB3785-SK-17 Rev I, 14/02/28, DTB Coal Facility – Redesign Elevator Road Alignment)

- FSD-DTB-170414-13 (EB3785-SK-18 Rev I, 14/02/28, DTB Coal Facility – Redesign Bekaert Access Relocation)
- FSD-DTB-170414-14 (EB3785-SK-19A Rev H, 14/02/28, DTB Coal Facility – Redesign Rail Works)
- A May 20, 2014 letter from George Duggan of BNSF Railway to Tim Blair of PMV affirming BNSF Railway's commitment to build a coal re-spray center along their rail line
- A June 1, 2014 *Direct Transfer Coal Facility Excavation and Dewatering Management Plan*, prepared and submitted by FSD
- A June 20, 2014 *Fraser Surrey Docks Direct Coal Transfer Facility: Air Quality Assessment*, prepared by Levelton for FSD
- A July 8, 2014 *Archaeological Overview Assessment of Direct to Barge Coal Project, Receiving Pit and Steel Tunnel*, prepared by Archer CRM Partnership for FSD
- A July 18, 2014 *Human Health Risk Assessment, Fraser Surrey Docks Direct Transfer Coal Facility*, prepared by SNC-Lavalin for FSD, including the following appendices:
 - Appendix I: Tables of risk estimate data
 - Appendix II: Tables of exposure modelling data
 - Appendix III: Worked example calculations
 - Appendix IV: A summary discussion of current human health in the region, focusing on PM_{2.5}
 - Appendix V: A discussion of the rationale for the selection of toxicity reference values
 - Appendix VI: Details on the statistical analyses used to calculate exposure concentrations from background soil and source coal
 - Appendix VII: Summary tables of analytical results
 - Appendix VIII: Results of sensitivity analyses
- An August 2014 *Direct Transfer Coal Facility Water Management Plan* prepared by Omni Engineering Inc.
- An August 2014 *Direct Transfer Coal Facility Construction and Communications Plan*, prepared and submitted by FSD
- An August 7, 2014 *Third Party Review Fraser Surrey Docks – Direct Transfer Coal Proposal*, prepared by Golder Associates for PMV, including the following appendices:
 - Appendix A: Golder Associates initial Review Report on Fraser Surrey Docks Proposed Direct Transfer Coal Facility (January 9, 2014)

- Appendix B: Golder Associates comments on the SNC-Lavalin Human Health Risk Assessment Work Plan (February 7 and March 7, 2014)
- Appendix C: Golder Associates Review Comments on the Draft Problem Formulation for the Human Health Risk Assessment (May 9, 2014)
- Appendix D: Additional Clarification to the Human Health Risk and Air Quality Assessment Reports in Response to Golder Requests
- Appendix E: Summary of minor discrepancies in HHRA

4. Federal Environmental Review Requirements

PMV is a designated Canada Port Authority under the *Canada Marine Act* and is a federal authority under the *Canadian Environmental Assessment Act 2012* (CEAA 2012). PMV has responsibility for managing and administering federal property including over 16,000 hectares of water, nearly 1,000 hectares of land, and assets along more than 600 kilometres of shoreline.

As a federal authority, under Section 67 of CEAA 2012, PMV must assure itself that projects it authorizes that are not CEAA 2012 designated projects do not result in significant adverse environmental effects, in a process herein referred to as federal environmental review. The proposed Project is not a CEAA 2012 designated project, but because the Project could affect federal land under PMV's management and PMV must authorize the Project before it can proceed, PMV must conduct an environmental review of the Project.

PMV's environmental review considered factors including:

- Environmental effects of the proposed Project, including the environmental effects of malfunctions or accidents that may occur in connection with the proposed Project;
- The significance of the environmental effects referred to above;
- Comments from authorities with relevant mandates and expertise;
- Comments from First Nations;
- Comments from the public; and
- Technically and economically feasible measures that would mitigate any significant adverse environmental effects of the proposed Project.

Environmental effects or changes that the proposed Project may cause on the environment also include consideration of the effects on health and socio-economic conditions and First Nations concerns.

During the course of the review, in September 2013 PMV requested that FSD prepare an Environmental Impact Assessment (EIA), including the effects of the Project on health. The EIA evaluates the potential environmental effects of the proposed Project. PMV reviewed and considered the EIA as reflected in this environmental review. Following initial review of the EIA and of comments from the public during the public comment period, PMV required

FSD to undertake further studies on the effects of the Project on human health. FSD accordingly undertook a human health risk assessment (HHRA). PMV has reviewed and considered the HHRA in this environmental review.

5. Federal, Provincial and Regional Agency Consultation

For this Project, PMV is the sole decision maker and no other authority (federal, provincial or municipal) was required to conduct an environmental review. However, PMV provided Project information, including the EIA, to appropriate representatives of Transport Canada, Fisheries and Oceans Canada, Environment Canada, Health Canada, the Ministry of Forests, Lands and Natural Resource Operations (FLNRO), Metro Vancouver, Vancouver Coastal Health Authority and Fraser Health Authority for review and comment.

Transport Canada was provided an initial draft of the EIA but did not comment.

Fisheries and Oceans Canada was consulted early in the Project application and review process, and a number of times as the design evolved. It was known that watercourses (including some that are or could be fish-bearing) could be affected by construction works and Project footprint, and appropriate mitigation measures needed to be accommodated in the Project design. It was determined that DFO did not need to authorize the works, but DFO did provide advice that was incorporated into the design of the mitigatory Shadow Brook riparian plantings. DFO did not express concern that potential coal spills could have adverse effects on fisheries resources.

Environment Canada was provided an initial draft of the EIA but did not comment.

Health Canada was provided an initial draft of the EIA for the Project but responded that because this is not a designated project under CEAA 2012 it would decline to comment.

FLNRO did reply but limited its comments to mentioning the need for a provincial *Water Act* approval. This is not a federal requirement and is not germane to the PMV environmental review, but FSD has nevertheless indicated that this provincial requirement will be addressed in its final permitting process.

Metro Vancouver identified some concerns with an initial air quality modelling report provided by FSD and with potential human health issues associated with the transportation aspects of the Project. These were considered in completing the air quality assessment and the air quality management plan referenced in the EIA and the human health risk assessment commissioned by FSD, and in the completion of this review.

The Fraser Health Authority and the Vancouver Coastal Health Authority provided extensive comments regarding the human health effects that may be associated with the Project (notably the effects of coal dust but also including the potential for increased exposure to diesel exhaust particulate matter, coal dust binding agents, air quality monitoring, access for emergency response vehicles and other issues). The health authorities also raised a number of other concerns, such as with the nature and level of public engagement

undertaken by FSD. All of these concerns were taken into consideration in the PMV environmental review and where appropriate were addressed by FSD through an air quality assessment and a human health risk assessment.

6. Public Consultation and Communication

Public consultation was carried out and the results were considered in the environmental review. This consultation and its consideration in the Project decision are detailed in the companion document, the Project Review Report.

7. First Nations Consultation

First Nations consultation was carried out and the results were considered in the environmental review. This consultation and its consideration in the Project decision are detailed in the companion document, the Project Review Report.

8. Scope of the Environmental Review

The scope of the environmental review included:

- Relevant background information as provided by the Proponent and as otherwise available to PMV;
- The potential for residual adverse environmental effects, including cumulative environmental effects, having regard for mitigation measures that will be incorporated into the Project; and
- The significance of any residual adverse environmental effects.

The following biophysical components were considered in the environmental review:

- Fish and fish habitat, including species with special status;
- Vegetation, including species with special status;
- Wildlife and wildlife habitat, including species with special status;
- Surface water quality;
- Soil and groundwater quality; and
- Air quality, including fugitive dust emissions.

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

- Economic effects;
- Social effects including traffic, lighting, noise and employment;
- Heritage and archaeological resources;
- Risk to human health;
- Navigable waters and navigation; and

- First Nations considerations.

The following factors were considered in completing the environmental review:

- The purpose of the Project;
- Environmental effects of accidents and malfunctions;
- Effects of the environment on the Project; and
- Technically and economically feasible measures to mitigate any adverse environmental effects.

9. Spatial and Temporal Boundaries

Potential environmental effects specific to the proposed Project were reviewed based on two main Project phases:

- The construction phase (approximately six months of active construction followed by two months of commissioning, commencing shortly after the Project is authorized by PMV); and
- The subsequent operation phase.

Decommissioning was not addressed in the environmental review as the operations phase of the proposed Project is indicated to be indefinite. Any future proposal to decommission the Project will be subjected to environmental review by PMV at the appropriate time, as required under existing PMV policy for any significant physical work carried out on the lands it administers.

Spatial and temporal boundaries for the effects review were specific to the proposed Project component under review. Temporal boundaries typically included time prior to commencement of construction to determine reference or baseline conditions.

10. Environmental Effects

The following is a summary of the key conclusions of the environmental review for each of the biophysical and socio-economic components considered. Specific mitigation requirements identified for each component are described in the Proponent's "Environmental Impact Assessment for the Direct Transfer Coal Facility". Compliance with the conditions of approval included in the PMV Project Permit is required for the conclusions described in this Decision Statement to be valid. Adherence to these conditions is a mandatory requirement of PMV's authorization of the Project.

10.1 Biophysical Components

10.1.1 Fish and Fish Habitat, including species with special status

The Project area is frequented by fish, including species with special status and species of importance to commercial, recreational and aboriginal fisheries. It also contains habitat important to them. Project construction and operation are not expected to cause significant residual adverse effects on these, taking into consideration the implementation of the

mitigation measures described in the Proponent's documents (including the Shadow Brook riparian plantings) and compliance with the mandatory conditions attached to the Project Permit (and in particular the 'Fish and Wildlife Habitat' conditions of the Permit). Potential effects generators considered included spills (coal, coal handling area storm water and hazardous materials associated with the Project), the effects of fugitive emissions of coal dust and their potentially associated binding agent residues, pile driving activity, the alienation of habitat through new road and rail footprints, and others. All potential adverse effects were assessed as insignificant, avoidable (if procedures described in the application documents are adhered to) or reversible with mitigation. It is expected that there will not be any permanent residual adverse effects (e.g., habitat loss to new rail footprint will be offset by new habitat to be created on Shadow Brook in the Project area).

10.1.2 Vegetation, including species with special status

Plant species with special status have been known to occur in the Project area and may be present despite having not been found in surveys the Proponent commissioned for the Project application. However, Project construction and operation are not expected to cause significant residual adverse effects on vegetation, taking into consideration the implementation of the mitigation measures described in the Proponent's documents and compliance with the mandatory conditions attached to the Project Permit (and in particular the 'Vegetation and Wildlife Habitat' conditions of the Permit). Potential effects generators considered (on species with special status and on other vegetation) included land clearing and alienation associated with new road and rail footprints. All potential adverse effects were assessed as insignificant or avoidable with mitigation (e.g., avoiding disturbance to areas where pertinent species have been known to occur). Permanent residual adverse effects are not expected.

10.1.3 Wildlife and Wildlife Habitat, including species with special status

The Project area is extensively industrialized and has limited habitat for wildlife. Wildlife species with special status have not been recorded in the Project area, have limited potential to be present because of the industrialization, and were not found in surveys FSD commissioned for the Project application. Nevertheless species with special status have been recorded in the broader regional area and could occur near or even in the Project area. However, Project construction and operation are not expected to cause significant residual adverse effects on these, taking into consideration the implementation of the mitigation measures described in the Proponent's documents and compliance with the mandatory conditions attached to the Project Permit (and in particular the 'Vegetation and Wildlife Habitat' and 'Fish and Wildlife Habitat' conditions of the Permit). Potential effects generators considered included new road and rail construction (habitat loss and fragmentation), spills (habitat degradation), watercourse realignment, noise and vibration (sensory disturbance) and rail car movements (collisions). All potential adverse effects were assessed as insignificant or avoidable with mitigation. Permanent residual adverse effects are not expected.

10.1.4 Surface Water Quality

The Project area contains the lower Fraser River as well as a number of watercourses tributary to it. Some of the latter are merely drainage channels for storm water flow, while others are fish-bearing or are tributary to fish-bearing streams and have functions important for fish such as food production. Water quality is important for all of these, considering their fish-bearing status or contributions to fish-bearing watercourses. Project construction and operation are not expected to cause significant residual adverse effects on any of these, taking into consideration the implementation of the mitigation measures described in the Proponent's documents and compliance with the mandatory conditions attached to the Project Permit (and in particular the 'Spill Prevention and Contingency', 'Sediment and Erosion Control' and 'Operational Water Quality' conditions of the Permit). Potential effects generators considered included spills (coal, coal handling area storm water and hazardous materials associated with the Project), site preparation (turbidity and sedimentation, excavation dewatering) and fugitive dust emissions associated with operation (turbidity and sedimentation as well as contamination through binding agent residues). All potential adverse effects were assessed as insignificant or avoidable with mitigation. Permanent residual adverse effects are not expected.

10.1.5 Soil and Groundwater Quality

The Project area is extensively industrialized, with extensive hard surfaces. Semi-permeable and permeable surface areas do exist, and there will be temporary exposures of soils during construction. Soils and groundwater are thus vulnerable to contamination, and while groundwater is not used directly in the Project area, surface watercourses are vulnerable to contamination through contaminated groundwater. However, Project construction and operation are not expected to cause significant residual adverse effects on soils or groundwater, taking into consideration the implementation of the mitigation measures described in the Proponent's documents and compliance with the mandatory conditions attached to the Project Permit (and in particular the 'Operational Water Quality' and 'Soil and Groundwater Quality' conditions of the Permit). Potential effects generators considered included spills of hazardous materials during construction and operation. All potential adverse effects were assessed as insignificant or avoidable with mitigation. Permanent residual adverse effects are not expected.

10.1.6 Air Quality, including fugitive dust emissions

The Project area, the terminal, and the barge route to the mouth of the Fraser River, is located within the well-populated Metro Vancouver area. Project construction and operation are not expected to cause significant residual adverse effects on local or regional air quality within the Metro Vancouver area, taking into consideration the implementation of the mitigation measures described in the Proponent's documents and compliance with the mandatory conditions attached to the Project Permit (and in particular the 'Air Quality' conditions of the Permit). Potential effects generators considered included rail locomotives on the terminal, tugs (criteria air contaminants and diesel particulate matter), uncovered rail cars and barges, and coal dumping and conveying at the FSD site (fugitive coal dust emissions). The air quality assessment considered other sources of fugitive emissions, specifically agricultural product handling, at the FSD terminal that is not directly associated

with the handling of coal. Potential effects from the improvements identified in the air quality assessment for the agricultural handling process will be assessed through a separate project review by PMV. All potential adverse effects were assessed as insignificant or avoidable with mitigation. Permanent residual adverse effects are not expected, but air quality will nevertheless be confirmed with the development of a management plan before the initiation of operations and ongoing monitoring and evaluation.

Greenhouse gas (GHG) generation from rail, barge and terminal operations (i.e., without considering end use of the coal being shipped) is not expected to increase significantly above current levels and is expected to decline on an intensity basis in the future with the ongoing implementation of regulatory measures and PMV policies intended to address such emissions.

The end use of the coal is a GHG generator. The governments of British Columbia and Canada have implemented provincial and national resource extraction policies, which include coal mining and trade. The purpose of the *Canada Marine Act* includes the creation of marine infrastructure (including Canada Port Authorities) that supports the achievement of national, regional and local social and economic objectives and promotes and safeguards Canada's competitiveness and trade objectives, including the trade of coal. PMV does not make international trade policy decisions defining what can or cannot be exported. As a Canada Port Authority, PMV assesses whether the goods and commodities can be moved safely with no significant impact to the environment and surrounding community.

10.2 Socio-Economic Components

10.2.1 Economic Effects

Employment and economic opportunities are considered to be positive during both Project construction and operation. The Project is likely to have a net positive residual effect on local, provincial, and federal economies.

10.2.2 Social Effects

The environmental review considered social effects including the industrial activities associated with the Project and road and rail impacts on local communities and community services, including schools, parks and recreation, and police and fire fighting services. All potential effects were assessed as insignificant or avoidable with mitigation. Permanent residual effects are not expected.

The potential for the generation of nuisance noise and lighting conditions associated with the Project were considered in this review. Potential effects generators considered included noise associated with coal dumping, conveying and loading and work site lighting. Project construction and operation are not expected to generate significant nuisance levels of noise and lighting, taking into consideration the implementation of the mitigation measures described in the Proponent's documents and compliance with the mandatory conditions attached to the Project Permit (and in particular the 'Noise' and 'Lighting' conditions of the Permit).

10.2.3 Heritage and Archaeological Resources

The environmental review included consideration of six known archaeological sites within two kilometres of the FSD terminal. All potential effects were assessed as insignificant or avoidable with mitigation. Permanent residual effects on archaeological resources are not expected. There are no reported heritage resources at risk from this Project.

10.2.4 Risk to Human Health

During the PMV review of the FSD EIA as well as of comments received from other reviewers (the Health Authorities, Metro Vancouver and the public) it became clear that further studies were required on the effects of the Project on human health. Accordingly, a Human Health Risk Assessment (HHRA) was undertaken. FSD engaged a qualified consultant (SNC Lavalin) to conduct the HHRA for the Project, and PMV engaged a different qualified consultant (Golder Associates) to conduct an independent third party review of the HHRA (i.e., PMV did not seek to influence or direct Golder's review towards any particular outcome). An HHRA assesses health risks to individuals, in contrast to a Health Impact Assessment (HIA), which assesses population-level health risks. PMV deemed that an HHRA more specifically targeted the health concerns expressed by the public during consultation on this Project.

The scope of the HHRA consists of the development and operation of the Project within PMV jurisdiction, and included the delivery of coal by rail from the Canada/U.S.A. border to the FSD terminal. It drew on the results of an Air Quality Assessment (AQA) conducted by Levelton (see the information sources section of this Decision Statement). The AQA concluded that the maximum concentrations of Criteria Air Contaminants (including particulate matter) would remain below the most stringent of the municipal, provincial, national and international air quality objectives and guidelines, except that NO₂ levels could exceed objectives over the waters of the Fraser River adjacent to the FSD ship berth faces. The HHRA also considered other factors including coal contaminants (organic chemicals, metals and metalloids) and potential toxicants associated with dust control chemicals. The HHRA concluded that the Project would not result in unacceptable health risks to individuals due to exposure to Project emissions, even with consideration of the NO₂ exceedances at the berth faces.

Golder's review of the HHRA found that the risk assessment followed recognized HHRA frameworks (in particular Health Canada), provided an appropriate selection of receptors, a conservative and comprehensive selection of Contaminants of Potential Concern (COPCs), and an appropriate selection of exposure pathways. Golder agreed that the HHRA's conclusions were generally reasonable and appropriate, but noted that some of the risk estimates are near the thresholds where a potential for risk appear to be indicated. Golder indicated that the convergence with thresholds is likely the result of a series of conservative assumptions (not unusual in an HHRA), but recommended that any uncertainty be resolved through air quality monitoring. In the event that monitoring identifies conditions that are worse than expected, Golder recommends that the HHRA be updated with the new data. These recommendations are addressed through conditions in the Project Permit.

10.2.5 Navigable Waters and Navigation

The environmental review included consideration of the impacts of the tug and barge traffic associated with the Project on existing vessel traffic, as well as the risks associated with the Project traffic. Details of the navigational issues, potential concerns associated with these and their mitigation are provided in the companion Project Review report. All potential adverse effects were assessed as insignificant or avoidable with mitigation, and the risks were judged to be acceptable with mitigation. Permanent residual adverse effects are not expected.

10.2.6 First Nations Considerations

First Nations issues were taken into consideration in this environmental review and the Project Review report. Details of the potential concerns associated with these and their mitigation are provided in the companion document, the Project Review report. There were no environmental issues that were specific only to First Nations, and permanent residual adverse environmental effects are not expected.

10.3 Accidents and Malfunctions

PMV's environmental review considered the potential environmental and health effects associated with accidents or malfunctions as a result of the Project during construction and operations. The range of considered accidents and malfunctions included spills and leaks, road, rail and marine movement incidents, emergency response incidents and fugitive dust emissions (see Section 9.0 of FSD's EIA). All potential effects were assessed as insignificant or avoidable with mitigation. Permanent residual effects are not expected.

10.4 Effects of the Environment on the Project

The environmental review considered potential effects of the environment on the Project during construction and operations, including the potential effects of seismic events, tidal conditions and severe weather (see Section 10.0 of FSD's EIA). All potential effects were assessed as insignificant or avoidable with mitigation. Permanent residual effects are not expected.

10.5 Cumulative Environmental Effects

FSD's cumulative environmental effects assessment is described specifically in Section 12.0 of its EIA and more generally in the Levelton 2014 Air Quality Assessment and the HHRA.

Cumulative environmental effects are those effects that might occur when the effects of the reviewed Project act cumulatively or in combination with the effects of other past, present or future known projects, including those that will or are likely to occur in a reasonable temporal and spatial scale.

Cumulative environmental effects occur when:

- impacts on the natural and social environments take place so frequently or densely that the combined individual effects cannot be assimilated into the environment; or when

- the impacts of one activity combined with those of another in a synergistic manner create a cumulative effect that is at least equal in intensity, or often greater than the total of the individual effects.

The potential effects that were assessed to be likely to act cumulatively with the effects of other projects were limited to air quality effects. Cumulative effects were identified but considering the AQA and HHRA specifically, the air quality effects were assessed to be not significant or avoidable with mitigation.

11. Environmental Review Decision

In completing this federal environmental review, PMV has reviewed and taken into account relevant information available on the proposed Project, has considered the information and proposed mitigations provided by FSD and other information as listed in Section 3.0 of this document, and concludes that with the implementation of proposed mitigation measures and conditions (as described in the Conditions in the Project Permit), the Project is not likely to cause significant adverse environmental effects.

Port Metro Vancouver
August 12, 2014