

#	Category	Mitigation Strategy Description	Where applicable
	Construction on the Facility		
(a)	Dust	Prior to the start of construction, a "baseline level" particulate matter, dust fall and nitrogen dioxide monitoring program will be implemented to quantify the pre-project levels. This will provide a comparative reference for future monitoring. Two monitoring stations with Met One E- Samplers and dust fall canisters would be installed at least six months prior to construction and take continual samples over that period. A meteorological monitoring station would measure wind speed, wind direction, rainfall, temperature and relative humidity. Nitrogen dioxide would be tested using a hand held monitor on a monthly basis. Current particulate matter concentrations can be analyzed by wind speed and direction to infer potential existing sources.	All construction activities and post facility activity
(b)	Noise	Construction activity will take place between 7:00 AM and 10:00 PM in accordance with City of Surrey noise bylaws and in order to minimize noise during the night. There will be no work Sundays.	All construction activities
(c)	Noise	Pile driving, which is expected to be the largest source of noise, is expected to last no longer than two weeks. This activity will adhere to the City of Surrey Bylaws with respect to timing. These bylaws require that work is conducted between 7:00 AM and 10:00 PM, Monday to Saturday. Most work is expected to occur between 9:00 AM and 6:00 PM, Monday to Friday.	A total of 12 piles are to be installed.
(d)	Noise	A vibratory pile driving process will be used, rather than a hammer process, to reduce noise.	A total of 12 piles are to be installed.
(e)	Dust	Air quality will be monitored throughout the construction period and during operations via two Met One E-Sampler air quality monitoring stations sampling particulate matter. If particulate matter monitoring data exceeds air quality objectives or baseline levels, then the origin or source of the emissions will be investigated and documented. The cause and potential reasons will be determined and corrective action will be taken to ensure ambient air quality is below air quality objectives or baseline levels.	Air quality will be monitored where dust emissions from construction activities will be most prevalent.

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(f)	Dust	<p>Contractors will be required to employ the following mitigation practices during construction:</p> <ul style="list-style-type: none"> - Grading of the construction site in phases, to coincide with actual construction in each specific area - Commencing linear construction at the location that is upwind from the prevailing wind direction - Using wind fencing in construction areas that are frequently subjected to high winds (will be evaluated once construction commences) - As necessary during the construction process, use water spray to control dust on access roads, lay-down areas, work areas and disposal areas - Minimizing drop heights when transferring material (such as when loading soil onto haul trucks) - Large portions of the construction site where possible will be fenced in to eliminate non-essential traffic and dust propagation. 	During entire construction phase
(g)	Surface run off	<p>No significant impacts are expected. Catch basin protection will be installed prior to construction in the Shed 1 working areas. Excavation discharge will be directed to in-ground pits specifically created to manage turbid excavation waters.</p>	In ground construction work near shed 1; installation of the receiving pit and tunnel, water settlement pond and support columns for the conveyors
(h)	Lighting	<p>Existing overhead Terminal lighting for the facility is expected to be adequate for the construction of the proposed facility. However, if any additional lighting is required for any excessively dark days or confined work, lighting will be directed away from residential areas.</p>	All construction activities
(i)	Traffic	<p>All construction traffic will access/egress the terminal at pre-arranged times to avoid concerns with regular traffic patterns to and from the terminal. Construction impacting regular and public traffic routes will be performed during off peak times with full flagging. Notifications will be posted one week in advance and sent to all surrounding properties detailing times and impacts of proposed construction work on regular and public traffic routes.</p>	All construction activities within the terminal. Rail construction activities, particularly the rail crossing on Robson Road and Elevator Road. Bekaert access reconstruction.

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(j)	Riparian Planting	<p>Plantings will be undertaken in the Shadow Brook area to mitigate the loss of riparian vegetation</p> <p>The current design does not impact the Shadow Brook area. The current design of the rail loop/Bekaert's relocated access and proposed rail works within the rail holding yard potentially impacts green and possibly yellow coded ditches. Due to these impacts, it was proposed to mitigate by way of enhancing 1,206 m² in the Shadow Brook and area with approximately 1,206 native plant species.</p> <p>The species planted will be appropriate native species.</p> <p>Riparian planting will be undertaken in the fall to maximize survival.</p>	Shadow Brook Channel, green coded ditch east of Elevator Road and Rail Yard work.
(k)	Communications	<p>Questions, concerns or enquiries during construction can be directed to Public Affairs: 604-581-2233 (24x7) 604-582-2244 (M-F) Community@fsd.bc.ca</p>	All construction activities
1. Operations - Rail Transit			
(a)	Dust	<p>To be compliant with the BNSF loading requirements, all customers will be required to contractually commit to :</p> <ul style="list-style-type: none"> - Applying a veneer suppressant at mines pre departure (binds the surface particles together to provide a membrane that is resistant to dust lift off) - Profiling coal loads in accordance with the BNSF loading template - Removing excess coal on wagon sills by using a car sill brush 	<ul style="list-style-type: none"> - Coal trains in transit between the origin mines and FSD - Coal trains in the PARY, pre unloading - Coal trains on the FSD terminal, pre unloading

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	(b) Dust	The sides and bottom of the empty cars will be automatically sprayed to remove any remaining coal after leaving dumper pit shed enclosure at a defined wash car station. The spray device is configured in an arch shape up either side and across the bottom with nozzles at specific intervals to ensure full coverage. The spray device is automatically triggered from a sensor in the track that recognizes movement of the railcar. All water collected from car washing will be automatically pumped to the water treatment/settling pond for proper handling, recycling and/or disposal.	For all empty rail cars upon departure from the unloading shed.
	(c) Noise	Cars will be shunted through the bottom dump receiving pit via an electric positioner (an indexer), which is quieter than a locomotive. A positioner is quieter as it eliminates the frequent stopping and starting that occurs with a locomotive. Use of the positioner eliminates the recurring compaction and retraction of rail car couplings and associated noise.	All rail cars to be unloaded
	(d) Noise	The on dock rail has been designed to have turning angles no greater than 12.5 degrees in order to reduce noise. If unexpected squealing noise does occur at certain points, FSD will install track lubricators in order to help mitigate.	All curves on the proposed rail unloading loop.
	(e) Spills	All spills will be cleaned immediately in accordance with FSD's Spill Response Plan. The method of addressing spills will be dependent on the size and location of the spill. The different scenarios and respective actions and authorities are outlined in FSD Spill Response Plans. All Operational and Maintenance Supervisors will be trained to safely and effectively deal with a spill. All spills will be handled in the priority of human safety, environment, and equipment and infrastructure.	Coal spills
	(f) Archeological Considerations	FSD commissioned a 3 rd party expert to conduct an AOA of the anticipated areas of excavation. The results of the final report indicated there were no areas of concern and recommend only that key construction personnel be made aware "Chance Finds" and maintain a "Chance Finds" procedure on site at all times during the course of construction. Please refer to the AOA report 10590_AOA_DTB Coal Facility_FSD.	All areas of excavations disturbing native soils.
	(g) Operation Time	FSD is a 24x7 operation. Although railcars are expected to be received between 4am and 8am and picked up between 5pm and 9pm it could take place at any time of the day. FSD will post alternate receiving or delivery periods on their website 48 hours in advance prior to operations.	

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			Rail receiving and delivery
2.	Operations - Coal receiving pit and conveyors		
(a)	Dust	The receiving pit will be within a covered structure, except for the opening at either end for the train to enter/exit.	Bottom dump receiving pit
(b)	Dust	Atomized water mist/fog system will be projected directly at both sides of the bottom dump rail car while unloading into the pit. There are two spray bars, one on each side, equipped with several nozzles at appropriate distances to ensure complete coverage. The system is automatically triggered by the railcar movement and will apply a steady mist to all areas receiving coal during the entire unloading process.	Receiving pit
(c)	Dust	All external conveyors will be covered on the top and sides with steel sheeting to prevent coal or dust from exiting. All external transfer points from one conveyor to the other will be fully enclosed on all four sides, top and bottom. In addition, all external transfer points will be equipped with water/misting spray with a chemical suppressant that is automatically applied on a continual basis while system is in operation. A spray bar is located above the conveyor at the transfer point and has several nozzles at appropriate distances to ensure complete coverage. Transfer points are also equipped with wash down equipment used for cleaning out the system.	Three conveyor segments: <ul style="list-style-type: none"> - Hooper feeder conveyor - Outfeed conveyor from the Feeder conveyor - Marine Vessel Loader Two transfer points: <ul style="list-style-type: none"> - Feeder conveyor to Outfeed conveyor - Outfeed conveyor to Marine Vessel loader
(d)	Dust	Coal on conveyors will be mechanically profiled to not exceed belt edge height to limit exposure to air flow. Profiling is accomplished through the flow (design) of the transfer point at the designated height to shape the coal as it passes by.	All conveyors (see list in 3(c))
(e)	Dust	Water spray with a chemical suppressant will automatically be applied at transfer points between conveyors on a continual basis while system is in operation. The spray bar is located above the conveyor and has several nozzles at appropriate distances to ensure complete coverage.	Two transfer points between conveyors (see list in 3(c))
(f)	Dust	Dust suppression technology will be incorporated into the design of the transfer points. Use of dust limiting shapes such as curved chutes, baffles, belt skirting and shrouds to reduce the amount of turbulence and wind which increases exposure to air and can create dust.	All conveyors (see list in 3(c))
(g)	Grey Water Management	The receiving hopper will be mounted in a sealed concrete pit. All collected water will be pumped to the water treatment/settling pond for proper handling, recycling and/or disposal.	Receiving hopper and pit

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	(h) Leachate	All collected water, exposed water and wash down water will be pumped to the water treatment/settling pond for proper handling, recycling and/or disposal.	Full facility area and applicable watershed
	(i) Lighting	Existing overhead Terminal lighting for the facility is expected to be adequate for the proposed facility. If lighting is required on the facility it will be directed away from residential areas.	The receiving shed housing the hopper and pit, conveyor tunnel, along the length of conveyors and catwalks, around the transfer points, around the single control room (marine), and along the Marine Vessel loader
3.	Loading coal on barges		
	(a) Dust	Coal drop heights will be limited through the use of a variable height (luffing) vessel loader to reduce the ability for the product to catch wind and create dust. Max height in this condition can be more controlled would have an average drop height of 1m. The vessel loader will be covered to contain the product and reduce emissions.	Marine Vessel loading conveyor
	(b) Dust	A snorkel off the end of vessel loader will be used to reduce turbulence of the product and drop height which eliminates the ability for the product to separate or catch wind and create dust. The snorkel will be enclosed to contain the product and reduce emissions. At the end of the snorkel there will be a halo (round) water spray to mitigate against fugitive dust while loading the barge.	Marine Vessel loading conveyor
	(c) Dust	The adjustable vessel loader will be used to shape the coal pile on the barge such that it is slightly rounded and not peaked to reduce the ability of the coal to catch wind and create dust. The vessel loader will be manually controlled and the operator will move the unit side to side, forward and back to flatten out the coal.	Barges during loading operation
	(d) Dust	In response to dust generation, and when weather conditions are expected to lead to dust generation (days with no precipitation, sunny conditions, winds greater than 19 km/hr), water will be applied to wet the coal as it is loaded onto the barge and when the barge is sitting at the berth awaiting departure. Application will be via a manually operated spray halo installed on the tip of the vessel loader snorkel and a series of manually operated rain birds along the berth face.	Barges during loading operation, as weather conditions dictate

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(e)		Dust suppressants in the form of binding agents will be added to the coal prior to loading onto the barge. The agents will significantly reduce fugitive dust and the potential for spontaneous combustion. The same or similar agents are currently being used by the producers and prior to loading the rail car. Please reference Section 2.4.6.2 of the Environmental Impact Assessment.	
(f)	Dust	An anemometer and particulate matter air quality monitor will be located nearby the vessel loader. Meteorological data will be monitored continuously and will be available in real time to the terminal operator and on the terminal's website to the general public. The monitoring will include wind speed and direction, particulate matter, temperature, relative humidity and precipitation. Operations will shut down in periods of winds in excess of 40 km/h on a sustained basis of more than 5 minutes.	Marine Vessel loading conveyor
(g)	Leachate	While the barges are at FSD, the coal surface on loaded barges will be wetted as required (i.e. rain birds operated from the berth for five minutes every 30 minutes). The coal on the barges is expected to absorb all of the water that will be sprayed on it during normal operations.	Barges during loading operation, as weather conditions dictate.
(h)	Lighting	Existing overhead Terminal lighting for the facility is expected to be adequate for the proposed facility and we do not expect to require any new lighting. If lighting is required on the vessel loader it will be directed away from residential areas.	The Marine Vessel loading conveyor and the control room
4.	<i>Coal barge transit down Fraser River to Texada Island</i>		
(a)	Dust	Barge sidewalls will be used to partially protect coal from airflow	All coal barges used between FSD and Texada Island
(b)	Dust	The adjustable vessel loader will be used to shape the coal pile on the barge such that it is slightly rounded and not peaked to reduce the ability of the coal to catch wind and create dust. The vessel loader will be manually controlled and the operator will move the unit side to side, forward and back to flatten out the coal.	All coal barges used between FSD and Texada Island
(c)	Dust	Coal barge will be sprayed with water prior to departure from FSD if the surface of the coal is not sufficiently wet to help control dusting during transit.	All coal barges used between FSD and Texada Island
(d)	Dust	Coal barges will not operate in periods of high wind in excess of 40km (22 knots per hour) on a sustained basis of more than 5 minutes.	All coal barges used between FSD and Texada Island

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(e)	Marine safety	Barge movements will only be conducted when wind conditions are appropriate	All coal barges used between FSD and Texada Island
(f)	Marine safety	Compartmentalized barges will be used, such that a leak in one compartment will not compromise the entire barge	All coal barges used between FSD and Texada Island
(g)	Marine safety	No coal storage in hull of barges, such that a puncture of the hull would not lead directly to a coal spill	All coal barges used between FSD and Texada Island
(h)	Fishing Communications	The project barge/vessel schedule will be available to the public online	All coal barges used between FSD and Texada Island
(i)	Fishing	Where practical, barge/vessel movements will be scheduled around fishing windows	To be applied where practical and where the barge operators feel there is a potential conflict with fishing groups
(j)	Fishing	Pre-emptively notify fishing groups if a conflict is expected	To be applied where practical and where the barge operators feel there is a potential conflict with fishing groups
5. Emergency Response			
(a)	Fire Prevention	Conveyor belts will be equipped with fire taps with valves at regular intervals	All conveyor segments
(b)	Fire Prevention	A hose tap will be located at the belt drive area directly upwind of the belt drive	Conveyor system
(c)	Fire Prevention	The conveyor system will use fire retardant hydraulic fluids and fire resistant belting	Conveyor system
(d)	Fire Prevention	An automated dry active fire suppression system will be installed in the receiving building, concrete pit and conveyor tunnel.	Receiving building, pit and conveyor tunnel

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	(e) Marine Emergency Response	<p>FSD has worked with its barging operator to develop a marine emergency response protocol. The protocol prioritizes response in the following manner:</p> <ol style="list-style-type: none"> 1. Human safety: ensure the wellbeing of the surrounding public, emergency responders and staff. 2. Containment: ensure vessel is secure to mitigate further damage or spillage and if relevant, employ containment tactics to surround and recover lost cargo. 3. Assessment: review shoreline impacts using adapted Shoreline Clean-Up Assessment Tactics, in close consultation with Environment Canada, and review marine impacts in consultation with the Department of Fisheries and Oceans (DFO); 4. Cleanup: following consultation with regulators and other stakeholders, undertake dredge or other clean up operations. This activity would likely be done in collaboration with specialized clean up agencies. 5. Resumption of business for users of the Fraser River: once it is deemed safe to do so, open route in Fraser River so users can resume business in a timely manner. 	All Project barging operations
6.	General		
	(a) Communications	<p>Questions, concerns or enquiries during operations can be directed to Public Affairs: 604-581-2233 (24x7) 604-582-2244 (M-F) Community @fsd.bc.ca</p>	During operations rail, facility or barging

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(b)	Marine Habitat and Waterways	<p>The Facility and the Project barges will be operated by very experienced Operators. The marine carrier and Terminal operator have been operating on the Fraser River for over 40 and 50 years respectively. FSD and the barge operator have worked together to develop a set of risk mitigation processes in order to minimize the potential for a barge accident and resulting coal spill. However, trace elements and PAH in unburned coals proposed for handling at FSD would not be considered harmful to aquatic life because these constituents are generally not bioavailable under typical environmental conditions. Given that standard operating procedures focus very highly on incident prevention and a spill into the aquatic environment is considered unlikely, residual effects on fish or fish habitat are not expected from the operation of the proposed Project. Please refer to section 5.5 of the EIA (Fish and Fish Habitat) which looks at potential effects and proposed mitigation measures.</p> <p>Wastewater from coal handling will be recycled through the water management system during operation. In addition, storm water quality for the Project will be monitored prior to discharge. With the implementation of management plans for water treatment, water quality monitoring, Run-off and emergency spill prevention as well as the mitigation measures identified above, no significant residual effects on water quality, including the Fraser River are expected. For a summary of the Water Management mitigation strategies, please refer to page 189-190 of the EIA.</p> <p>The EIA can be found at http://www.fsd.bc.ca/index.php/company/community-outreach/</p>	DTB Facility overall Operations

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(c)	Wildlife and Vegetation	<p>Mitigation measures to protect wildlife and vegetation, particularly near Shadow Brook and other watercourses include:</p> <ul style="list-style-type: none"> • Schedule vegetation clearing activities, if required, outside of the breeding bird season (March 1 to August 1) to avoid contravention of the BC Wildlife Act and Migratory Birds Convention Act; • Nest surveys if the breeding bird season cannot be avoided; • Pre-clearing and construction listed plant surveys, with an emphasis on stream bank lupine which may be present in the existing track alignment; • Installing temporary fencing (e.g. snow fence) around the riparian zone of Shadow Brook to prevent personnel and machine access into the area; and • Noxious weed control. <p>With the assistance of an experienced Environmental consultant, FSD has established a comprehensive Environmental Management Plan. The plan ensures the full protection of wildlife, vegetation, water way and marine habitat protection during the construction and operational phase. Please refer to the EMP for further detail. Please refer to section 5.6 of the EIA where mitigation measures to protect wildlife and vegetation are outlined. Additionally, summarized mitigation measures for Vegetation and Wildlife can be found on page 187 of the EIA.</p> <p>The EIA and EMP can be found at http://www.fsd.bc.ca/index.php/company/community-outreach/</p>	DTB Facility overall Operations (and Construction)
(d)	Operation Time	<p>FSD is a 24x7 operation. Although coal receiving is anticipated to be during dayshift hours (8am to 4:30pm) it could take place on the afternoon (4:30pm to 1:00am) and graveyard (1:00am to 8:00am) shifts. FSD will post afternoon and graveyard working periods on their website 48 hours in advance prior to operations.</p>	During operations of coal receiving or vessel loading