**G3 Terminal Vancouver**
**Metro Vancouver Air Permit Application Overview**

## Background

G3 Terminal Vancouver (G3), a state-of-the-art export grain terminal under construction at the Port of Vancouver in North Vancouver, is designed to optimize grain receiving, storage, and shipping throughput operations on Canada's west coast, and act as an essential conduit for Canadian farmers and marketers to ensure global competitiveness in moving agricultural commodities to world markets. Primary materials handled at the G3 facility include wheat, soybeans, canola, peas, corn (occasionally) and some specialty by-products. G3 Terminal Vancouver anticipates beginning commissioning work in late 2019 and commencing operations in 2020.

## Air Permit Application

G3 filed an Air Permit Application with Metro Vancouver in January 2018 to obtain an air discharge permit prior to terminal commissioning and operations. G3 also participated in the Port of Vancouver's Project and Environmental Review Process which included an Environmental Air Assessment. G3 received a project permit from the Port of Vancouver in May 2016.

## Differences in Metro Vancouver and Port of Vancouver application process

G3 undertook a review of project air discharges and impacts as part of its Port of Vancouver permitting process, completed in 2016. While there are many similarities in the Metro Vancouver and the Port of Vancouver application process, there are some key differences. Most notable is that Metro Vancouver reviews the annual emissions from G3's facility when operating at "maximum possible" capacity (excluding emissions from transportation sources such as marine vessels, rail, trucks) – these emissions then form the permitted limit, which G3 will not be allowed to exceed at any time. On the other hand, Port of Vancouver reviews the "expected" annual emissions from within the facility boundary, which includes the facility and transportation sources (marine vessels at berth, rail and trucks on-site).

"Maximum possible" is a level that is highly unlikely to be reached as it involves continuous, long term operation at peak rates that are practically only possible for short periods. "Expected emissions" are a more accurate estimate of actual emissions from the facility when operating at its realistic annual

maximum capacity, while the Metro Vancouver permit allows the facility to operate at its expected peak times.

Because of these different approaches, G3's emissions in the Metro Vancouver Air Permit Application differ from those reported in the Port of Vancouver assessment. Annual dust emissions (PM, PM10, PM2.5) are higher in the Metro Vancouver application, since they reflect upper limits. Annual emissions of combustion gases (NOx, SO2) are lower in the Metro Vancouver application, since emissions from transportation sources (marine vessels, rail, trucks) are not included.

**Requested Emission limits in Metro Vancouver permit application (tonnes/year)**

**Total Particulate Matter** (PM) 46.1 tonnes,

which includes **PM10** (fine and coarse): 14.6 tonnes, and

**PM2.5** (fine): 4.5 tonnes

**Nitrogen Oxides** (NOx): 0.77 and **Sulphur Dioxide** (SO2): 0.022 – from a relatively small, natural gas fired, steam generator.

**Dust and Air Emissions**

When transportation sources are considered in the analysis, emissions of many combustion pollutants at G3 Terminal Vancouver are anticipated to be reduced by up to approximately 45% compared to previous site usage, primarily due to lower emissions of NOx from ships at berth and limited non-road equipment. Dust emissions will increase due to grain handling activities, and will be managed using the best available technology, including state-of-the-art telescoping ship loader spouts and capture systems with fabric filter controls.

**Community Impacts**

Both the Metro Vancouver and the Port of Vancouver process required a study with dispersion modelling to predict the peak pollutant concentrations in the community that will result from facility emissions. The studies differed mainly due to the use of "maximum possible" or "expected" operations, and slight refinements in facility design. Both studies reported total concentration, which is the sum of G3's impacts and background concentrations from all other sources in the region (e.g. transportation, other industrial, residential heating, long-range transport). In both studies, total impacts (pollutant concentrations from all sources) in the community (i.e. anywhere off-property) were shown to be below (i.e. better than) Metro Vancouver's ambient air quality objectives.

**Emission Mitigation Measures**

G3 will use the best available technologies to control air emissions and dust produced by the facility in various stages of process, including:

• Railcar unloading: Point-of-generation capture at the receiving hoppers and receiving belt conveyors

• Baghouses and bin vents: All conveyors, elevators, and transfer points are closed at the points of dust generation and equipped with dust collectors with filters.

• Ship loadout system: Moveable, covered belt conveyors extend over the ships for loading, each with a spout that extends down from the end of the conveyor into holds of the ship. The configuration near the bottom of the spout creates an artificial “plug” to minimize the air in the grain column. This “dead box” also slows down the flow of grain and minimizes dust created; the relatively small amount of dust created in the spout is controlled by the filters connected to it.

• Pelleted screening loadout system: Pelleted screenings will be loaded onto trucks using a Dust Suppression Hopper (DSH) loading spout equipped with a dust collector. Spouts are suspended and kept at fixed operating level minimizing the grain free fall distance.

• Locomotive emission sources: The continuous movement rail loop and receiving system will allow grain to be received using the line-haul locomotives directly, optimizing the railcar unloading process by synchronizing car movements with the robotic rail car gate openers/closers. The system will minimize the train accelerations and limits the use of higher throttle notches, generating fewer exhaust emissions than a more traditional shunting method with relatively frequent stop-start accelerations.

**A Closer Look at Dust Control at G3 Terminal Vancouver**

G3’s facility will receive grain exclusively by rail. A state-of-the art rail loop and unloading system allow full trains to enter the property, unload, and leave without breaking up or stopping the train for long periods of time. Railcar unloading will occur within a building, with openings at each end for continuous rail access. Particulate matter (dust) generated at receiving will be captured with down-draft air flow into the receiving hopper and routed to an air pollution control device (baghouse) that removes particulates from the air.

From the rail receiving system, grain will be transported by a network of enclosed/covered conveyors to the bulk scale tower. The conveyors would be equipped with multiple dust collectors. Dust generated from grain transfers in the bulk scale tower will be controlled by staging bin vent filters and standalone dust collectors.

The grain will travel on conveyors to the storage facility. The conveyors are equipped with multiple dust collectors. All storage bins receive grain from an overhead conveyor system for distribution. Storage bins receive grain from one of two (2) overhead shuttle conveyors or individual spouts and equipped with spot filters or bin vent filters.

Most of the grain will be transferred directly from storage to ships. Dust generated during grain transfer for ship loading is controlled with baghouses and conveyor spot filters. A high capacity ship loading system includes three booms with extendable loading spouts. Each spout is equipped with a state-of-the-art dust suppression spout to minimize dust emissions while loading grain. The relatively small amount of dust that is generated at the discharge of the spout is contained by a skirt, and controlled by the dust collectors mounted directly on the spout.