

# Ridley Island Propane Export Facility

January 20, 2016

## Project Description

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**Acronyms and Abbreviations**

BC	British Columbia
BCEAA	BC Environmental Assessment Act
CCME	Canadian Council of the Ministers of the Environment
CDC	Conservation Data Centre
CEAA	Canadian Environmental Assessment Act
CEA Agency	Canadian Environmental Assessment Agency
CEPA	Canadian Environmental Protection Act
CGS	Coast Guard Stations
CMA	Census Metropolitan Area
CMT	Culturally Modified Tree
CN	Canadian National Railway
CRA	Commercial, Recreational, Aboriginal
CSA	Canada Shipping Act
CWH	Coastal Western Hemlock
DFO	Fisheries and Oceans Canada
EA	Environmental Assessment
EAO	Environmental Assessment Office
ECA	Emission Control Area
EED	Environmental Evaluation Document
FA	Fisheries Act
LNG	Liquefied Natural Gas
MBA	Mutual Benefits Agreement
PRPA	Prince Rupert Port Authority
RA	Responsible Authorities
RTI	Ridley Terminals Incorporated
SARA	Species at Risk Act
SQCRD	Skeena-Queen Charlotte Regional District
TC	Transport Canada
TDG	Transportation of Dangerous Goods
VC	Valued Components
VLGC	Very Large Gas Carriers

**Units**

BGS	Below Ground Surface
DWT	Dead Weight Tonnes
MMSCFD	Million Standard Cubic Feet Per Day
PJ	Petajoule
TPH	Tonnes Per Hour
TPY	Tonnes Per Year

## Executive Summary

AltaGas Ltd. (AltaGas) is proposing to construct a new propane export facility (the Project) on a site sub-leased from Ridley Terminals Inc. (RTI) located at 2110 Ridley Road, Prince Rupert, British Columbia (BC). The Project will be designed for propane and include the capability to handle butane in the future. The Project will be called the “Ridley Island Propane Export Facility”.

The Project will receive liquid propane from BC and Alberta via the Canadian National Railway (CN) existing rail line, which will be transferred to intermediate pressurized storage bullets on the Project site. The propane will then be cooled so that it can be stored and shipped at atmospheric pressure. The cooled propane will be transferred to Very Large Gas Carriers (VLGC) using the existing RTI coal jetty for transport to Asia and other markets. The Project will be designed to maximize throughput at the facility. Onsite total storage capacity will be, in aggregate, less than 100,000m<sup>3</sup>. The Project will also include up to 20 rail unloading racks, new loading arms on the existing jetty, gas driven compressors, connection to the BC Hydro grid, minimal processing equipment to meet cooling requirements and product specifications, and associated piping, which will allow for anticipated throughput of approximately 1.2 million tonnes per annum. This translates to offloading approximately 50-60 rail cars per day, and loading approximately 20-30 VLGCs a year.

Based on preliminary engineering, AltaGas has determined that part of RTI's lease land and existing facilities are suitable for the development of the Project. Project-related rail car and carrier traffic volumes will replace a small portion of the coal traffic volumes currently permitted at the RTI facility but are unused due to the declining demand for coal from RTI.

The environmental aspects of the Project will be reviewed by federal authorities, including at a minimum the Prince Rupert Port Authority (PRPA) and RTI, under Section 67 of CEAA 2012. The Project is neither a Designated Project under CEAA 2012 nor a Reviewable Project under BCEAA. Consultation will be required with Transport Canada to confirm compliance with the Navigable Waters Act for any improvements to the jetty.

Subject to the timing of First Nations and stakeholder consultation as well as regulatory approvals, AltaGas anticipates an in-service date as early as 2018.

AltaGas understands the importance of communicating the work and processes involved in developing the Project to First Nations and stakeholders. This document has been prepared to provide a general description of the construction, operation, and decommissioning phases of the Project. AltaGas is committed to ensuring First Nations, stakeholders, including regulatory authorities, and other affected parties know who we are, why a propane export facility is needed, what it will do, how it will be operated, and the measures that will be taken to ensure that the facility is safe and is managed in a manner that respects both the environment and the community.

## 1. Project Overview and Location

The proposed propane export facility (the Project) is located on British Columbia's (BC) North Coast, 9 kilometers south of the City of Prince Rupert. The Project is on Ridley Island on federal port land administered by the Prince Rupert Port Authority (PRPA) that is leased to Ridley Terminals Inc. (RTI) (Figure 1). The RTI site is accessible by road (Highway 16), rail (Canadian National Railway (CN)) and by marine cargo carriers using shipping lanes accessing the Port of Prince Rupert.

Land to the north and east of Ridley Island is forested mountain of Kaien Island between the port and the city of Prince Rupert. Porpoise Harbour is connected to Chatham Sound between Ridley and Lelu Islands, and to Wainright and Morse Basins to the east.

Ridley Island falls under the Port of Prince Rupert 2020 Land Use Management Plan (2010) that designates zoning for industrial and port terminal development, including the provision for dry and liquid bulk terminals. PRPA land is leased to RTI and supports a fully operational coal terminal built in 1983. The entire RTI lease occupies an area of about 400 acres (including water lot lease areas). The Project is to be located on the southwest corner of the RTI lease area on a small 24 acre (9.7 ha) parcel of land as shown in Figure 2. A close up aerial view of the Project area is provided in Figure 3.

The existing RTI terminal consists of a rail loop and rotary railcar dumper, coal stockyard and reclaim system, berth with dual quadrant ship loading system, partially completed liquid sulphur storage and transfer system, wood pellet railcar unloading, storage and export system, and stormwater treatment system. The Project will be independent from the existing facilities at RTI. However, the Project will utilize common facilities (e.g. the jetty and rail yard) as necessary for construction and operation. The propane storage facility will be located on land sub-leased from RTI, whereas the shared infrastructure, including rail offloading structures and the jetty will be on RTI land.

The Project's sub-leased site is currently occupied by a partially completed sulphur export facility (Figure 3). Sulphur Corp of Canada started construction of the sulphur facility in 1999; however the facility was never fully commissioned and was never used for storage, import or export of sulphur or any other product. The infrastructure that was built for the sulphur facility includes two above ground 15,000 tonne molten sulphur storage (API 650) tanks, piping and pipe racks, loading racks and pump house, as well as settling ponds used to address water runoff from the coal export facility located adjacent to the site. In order to construct the Project, the sulphur facility will be dismantled and removed.

The Project will receive pressurized liquid propane via rail, which will be transferred to intermediate pressurized storage bullets. The propane will then be chilled, and transferred to refrigerated storage at atmospheric pressure. The cooled propane will be transferred to Very Large Gas Carriers (VLGC), using the existing RTI coal jetty, for transport to Asia and other markets. The Project will include up to 20 rail unloading racks located on the Project site, loading arms on the existing berth, gas generation, cooling equipment, and associated piping (all located on the Project site) which will allow for anticipated throughput of approximately 1.2 million tonnes per annum. There may be some equipment to ensure ethane content meets the product specifications of the buyer. Final equipment types and sizes will be determined during the next phase of engineering as optimization of the Project design continues. Based on the preliminary design, the Project expects to offload approximately 50-



60 rail cars per day, and to deliver by marine transport approximately 20-30 cargos of propane a year to market.

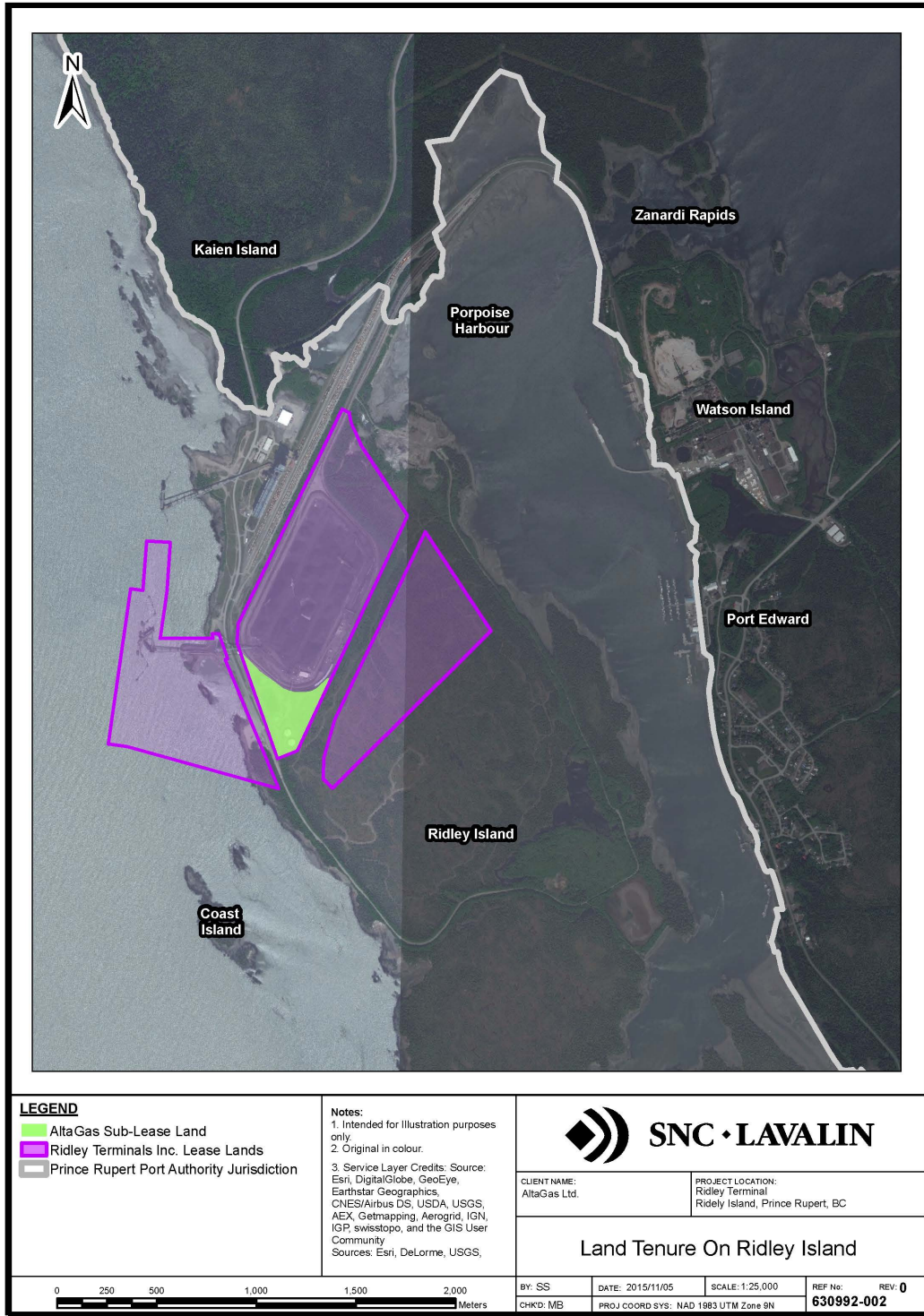
The primary components associated with the propane export facility include (see Figure 4):

- Modification to rail and switching on PRPA land leased to RTI designated for rail use.
- Rail tank car unloading facilities and associated equipment on the Project site.
- Product storage including pressurized bullets and large full containment atmospheric storage tanks on the Project site.
- Refrigeration and boil off gas recovery systems on the Project site.
- Ship loading facilities on RTI's existing coal export marine jetty.
- On-site utilities including power generation, connection to the grid, and distribution on the Project site.
- Safety systems including ground flare, fire and gas detection, spill response and fire suppression on AltaGas and shared facilities, including the rail yard, offloading arms, storage, piping, and jetty.
- Project control systems, ancillary support services and required buildings.

**Figure 1 - Project Location**



Figure 2 - Land Tenure on Ridley Island



MXD Path: \\S120206\projects\LOB\BIAW-BC\Current Projects\AltaGas - L161630992 - Ridley Terminal LPD\4.0 Execution\4.5 GIS and Drawings\GIS\MapSet\MXD\630992\_002\_Project\_Land\_Tenure.mxd

Project Path:

Figure 3 - Aerial View of the Project site.

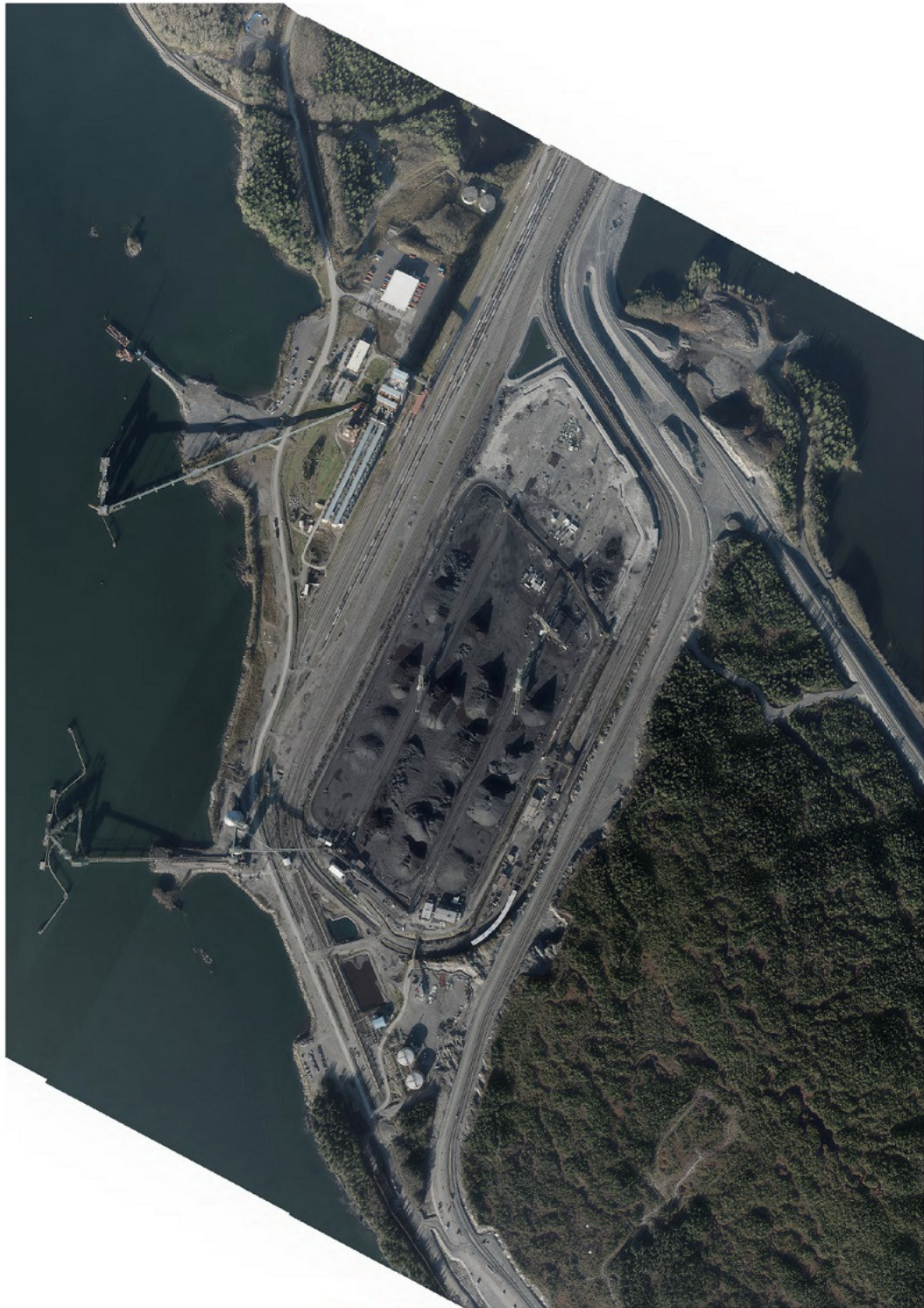
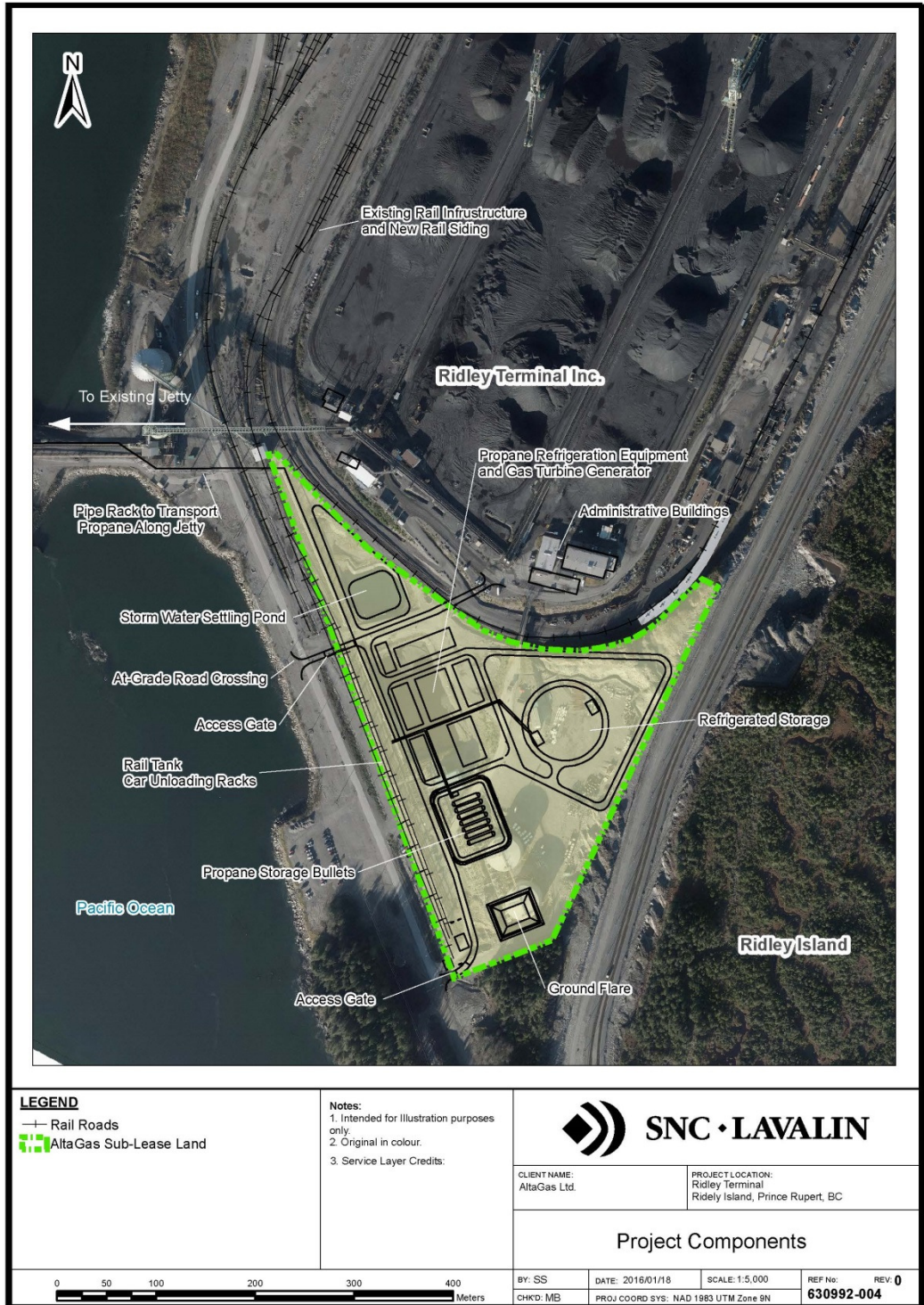


Figure 4 - Project Components



## 1.1 Project Justification

Like natural gas, propane is a gas at room temperature and normal atmospheric pressure. The process to turn propane into a liquid for shipment is similar to converting natural gas into LNG, but is simpler and requires much less equipment and energy. Shippers convert propane into a liquid because it is much easier to transport liquids than gases. There are numerous propane export and import facilities around the world that have been operating safely and reliably for decades.

Propane has been produced and consumed in North America for decades, and has well-established, developed markets and infrastructure to support it. The United States has traditionally hosted both import and export facilities for propane, and became a net exporter of propane for the first time in 2012. Current export facilities are located at Ferndale, Washington (owned by an AltaGas affiliate); Mont Belvieu, Texas; and Marcus Hook, Pennsylvania. Most of Canada's propane exports currently go to the United States by pipeline, truck or rail. Propane facilities in BC consist mainly of rail and truck receipt terminals that serve as distribution centers to feed retail markets.

The largest source of propane in North America is the production of natural gas. Changes in natural gas drilling technology coupled with higher prices for propane have resulted in a large increase in propane supplies in western Canada. New drilling techniques have opened the development of natural gas trapped in what were previously inaccessible shale formations. Higher returns on investment from natural gas with a high propane content led producers to focus their natural gas drilling on those formations that are also rich in propane and butane. Targeted drilling in BC and Alberta is expected to substantially increase the supply of propane, and result in a surplus for the region. AltaGas believes a propane export facility is required in Canada to alleviate the increased supply of propane. This need will be heightened if LNG export facilities are developed in BC.

As detailed in 'Strategic Outcomes and Program Alignment Architecture: 2013-2014' Natural Resources Canada (2014) has several objectives related to energy development. These objectives include: facilitating investment and capitalizing on the potential to stimulate jobs and growth through responsible resource development, while also maintaining strong environmental protection; to improve the alignment of federal and provincial regulatory processes and to ensure effective and meaningful consultation with First Nations people; to manage energy resources and infrastructure to contribute to the broader economy; and the development of new energy supply. The propane export facility proposed by AltaGas provides an excellent opportunity to fulfill all of these goals. Creating new markets for Canadian propane will also help energy producers, and will play an important role in supporting their efforts to develop LNG export projects. Supporting propane exports from BC is also consistent with the mandate of BC's Ministry of Natural Gas Development as detailed in the 2013-2016 Revised Service Plan.

Major developed economies in eastern Asia, Japan, South Korea and China lack the resources to be self-sufficient in energy, and rely on imports from other countries to meet their energy demands. Roughly 80% of current demand for propane in Japan, South Korea and China originates in the Middle East. A burgeoning supply surplus in North America has increased the interest of Asian buyers in sourcing propane from North America. Asian buyers are attracted to the lower prices of North American propane as well as supply diversity and the lower political risk that accompanies North American propane. Significantly reduced shipping times is an additional benefit of propane supply from western Canada. The Project will provide significant economic benefits to Prince Rupert

and the surrounding area by generating approximately 250 person years of construction activity, and approximately 40 full-time positions once the facility is in operation. Local businesses will have the opportunity to provide services in a broad range of areas related to construction and operation of the Project. The large capital investment and annual operating expenses associated with the Project will diversify economic activity at Ridley Island, and will help support the long term economic stability of the region for future generations.

## 1.2 Proponent Information

AltaGas is a publicly traded North American energy infrastructure company with a focus in Canada and the United States. AltaGas owns and operates assets in natural gas, renewable energy and utilities and is listed on the Toronto Stock Exchange (ALA).

AltaGas has significant experience developing and operating infrastructure assets in North America in the natural gas, natural gas liquids (propane and butane) and power sectors. Currently AltaGas owns or has interest in six large natural gas processing facilities in BC and Alberta that produce propane and butane. Two of these facilities have rail loading facilities.

In British Columbia, AltaGas has over \$1.6 billion in assets in the Province and recently constructed three run-of-river hydroelectric facilities. All three run-of-river facilities started as greenfield development projects in northern BC. AltaGas was the originator of the hydroelectric development, moving the projects through initial development, permitting, construction, and commissioning. Additionally, AltaGas recently completed the development and permitting and has begun the construction on a new 200 MMSCFD natural gas processing facility (the Townsend Facility) in northeast BC. AltaGas also developed the Bear Mountain Wind Power Project in northeast BC.

AltaGas has direct experience with handling, storing, and exporting propane and butane through its responsibility for operating of the Ferndale Propane Export Facility (owned by an AltaGas affiliate) in Washington State. The Ferndale facility has been operating safely for over 35 years without a major incident. It has the capability to handle exports and imports of up to 3,226 tonnes a day and has facilities to handle and supply propane to the regional market for U.S. domestic consumption. The terminal has rail, truck and pipeline capability and is connected to the two local oil refineries offering gas balancing services. A photograph of the Ferndale facility is provided in Figure 5.

With its track record and experience in project development, construction and operation in BC, AltaGas has a firm understanding of the regulatory regime and safety requirements under which extraction and gas transportation facilities are developed and operated. This understanding is enhanced through AltaGas' operating the Ferndale Facility.

AltaGas will leverage the experience it has gained from developing, constructing and operating projects throughout BC, to execute the Project in a commercially viable and environmentally sound manner, while considering the needs of PRPA, RTI, First Nations and stakeholders. AltaGas is a proven leader in developing working relationships with First Nations as evidenced by the positive working relationship created with the Tahltan Nation for the development and operation of the Northwest Hydroelectric Facilities.

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**Figure 5 - Aerial view looking west of Ferndale Propane Export Facility, Washington**





## 2. Project Information

### 2.1 Proposed Development

The scope of the Project includes all physical works and activities associated with the construction, operation, and decommissioning of the Project. All project related physical works and activities are located on RTI lease lands or within the federal lands administered by PRPA.

Propane supply for the Project will come from natural gas processing facilities in BC and Alberta. International buyers rely on well-defined product specifications to ensure that imported propane is consistent and compatible with equipment they use to process or consume the product. AltaGas will be relying on long-term contracts so that the operations team will be able to ensure a steady and reliable supply of propane to the Project that will meet customer specifications. The Project will be designed for propane only but will include the capability to handle butane in the future using the same equipment.

The facility is being designed to run at an annual average of 3,226 tonnes/day. To enhance reliability, the facility will add redundancy by incorporating two trains, each with a capacity to handle a maximum 3,226 tonnes/day. The ability to occasionally process over the average 3,226 tonnes/day is being designed in to the facility in order to accommodate situations where trains are backed up due to unpredictable events that could close the railway temporarily. The environmental assessment being undertaken will adopt a conservative approach by considering the maximum potential throughput of the facility.

Key Project Parameters are presented in Table 1 below:

**Table 1 - Key Project Parameters**

<b>Inlet Product</b>	<b>HD 5- Propane (&gt;90% C3)</b>
<b>Export Product</b>	J-Spec Propane (>95% C3)
<b>Energy Storage Capacity</b>	2.66 PJ
<b>Expected Average Daily Capacity</b>	3,226 tonnes/day
<b>Annual Capacity</b>	1,177,420 tonnes/year
<b>Railcars per day</b>	~ 50-60 railcars/day
<b>Storage Track Space for shunting</b>	200 railcars
<b>Unloading Spots (two sides)</b>	Up to 20 unloading racks, with a capacity to unload up to 40 railcars
<b>Refrigerated Storage Tank Capacity</b>	98,000 m3 (Fully contained, pre-stressed concrete type)
<b>Power Supply</b>	Approximately 15 MW. The facility will use gas driven compressors to supply a portion of the process refrigeration load. The remainder of the facility will be run off power from the BC Hydro grid. The facility will have sufficient on-site diesel emergency power generation for critical services.
<b>Utility Requirements</b>	1000 kg/hr or 522.3 USG/hr (estimate)
<b>Ship Handling Capabilities</b>	230 m (Overall Length), 38.4m (Beam), 64,220 DWT (Deadweight Tonnes), 13.6 m (Summer Draft)

Ship turnaround time	40 hours
Number of carriers/year	Approximately 20-30 at full capacity
Operations	24/7/365 for rail handling, processing and ship loading

## 2.2 Project Context

The Project is being built on a brownfield site, designated and used for port related activities within RTI leased lands and PRPA jurisdiction. The Project fits within the objectives and land use plans described in the PRPA 2020 Land Use Management Plan, which was reviewed by the public and First Nations in a consultation process. All new construction for the Project will take place on previously cleared sites and/or will build upon existing infrastructure. In addition, a great deal of environmental information is publically available through the work done on recent environmental assessment processes in the immediate area, PRPA sustainability planning and implementation efforts, and known and proven strategies for mitigation of any expected environmental effects in the vicinity of Prince Rupert and for propane export projects. Consequently, AltaGas believes that environmental effects can be avoided or minimized through proven and effective mitigation measures.

## 2.3 Project Components and Activities

All land and docking facilities required by the Project will be located on PRPA land or RTI lease land. AltaGas will design the unloading, refrigeration, storage, and associated facilities to fit within the area subleased from RTI (see section 2.4 and Figure 2). Other facilities, several of which will have shared use with RTI, are described in section 2.3.1.

### 2.3.1 Project Components

The Project will include the following components (Figure 2):

#### ***Project Facilities on PRPA Land***

- Build out of track A6 (shared use with RTI).
- Construction of tracks A7 and A8 (shared use with RTI).

#### ***Project Facilities on RTI Lease Land***

- Regraded existing rail sidings (shared use with RTI).
- Connection to RTI's existing 69 kV substation connecting with the BC Hydro grid
- Connection to the existing natural gas line terminating on the RTI lease lands.
- New buildings, including: administration, central control room, lab, operations, washrooms and sanitary waste disposal and maintenance buildings (shared use with RTI).

***Project Facilities on the AltaGas Sub-Lease Site***

- Rail tank car unloading equipment.
- Propane storage bullets.
- Propane refrigeration equipment.
- Boil off gas recovery system.
- Gas driven compressors.
- Connection to the BC Hydro grid.
- De-ethanizer.
- Equipment cooling system (water or air).
- Refrigerated storage.
- Fire monitors.
- Deluge system (integrated infrastructure).
- Ground flare.
- Storm water settling pond (shared use with RTI).
- New vehicle access bridge (shared use with RTI).
- Vehicle parking.
- New access gate
- Upgrading of the existing stormwater outfall pipe (shared use with RTI).

***Project Facilities on the Existing RTI Jetty***

- Pipe rack along the existing trestle to support the liquid loading and vapour return lines.
- Two liquid loading lines (size TBD) running the length of the trestle.
- Two vapour return line (size TBD) running the length of the trestle.
- Loading arms on the trestle to offload propane to the VLGCs.

**2.3.2 Project Activities**

The Project includes the following activities:

***During construction:***

- Site preparation, including limited blasting and grading of the AltaGas sub-lease site. The site is already cleared, so there will be little to no clearing, grubbing, or stripping of overburden.
- Removal of the existing sulphur storage facility. The facility was never commissioned so no hazardous substances are anticipated to be encountered.

- Relocation and reconstruction of the existing RTI settling ponds on the AltaGas sub-lease site.
- Installation of utilities, including electrical power, natural gas, water, sewers, fire protection, stormwater settling pond, and upgrading RTI's existing stormwater outfall pipe on the RTI lease lands and the AltaGas sub-lease site. RTI will share the upgraded outfall pipe with AltaGas to avoid the addition of a second effluent point.
- Construction of tracks A7 and A8 and build out of track A6 on PRPA land.
- Re-grading of existing rail sidings on RTI lease land.
- Connection to the BC Hydro grid at the existing RTI tie-in on RTI lease land.
- Installation of piping and loading arms on the existing RTI jetty.
- Installation of the refrigerated propane storage tank on the AltaGas sub-lease site.
- Installation of the propane refrigeration equipment on the AltaGas sub-lease site.
- Installation of a new vehicle access bridge to the RTI coal stockyard area from the AltaGas sub-lease site, and removal of the existing bridge.
- A new at-grade turn-off to the bridge from the main road and access gate will be established approximately 340m north of the existing turn-off.
- Approximately 250 person years of construction activity.

***During operations (see additional information in Section 2.4: Receiving, Storing and Offloading Propane):***

- Continuous operation capabilities (24 hours, 365 days a year).
- Full-time employment for approximately 40 people.
- Receiving and unloading propane from CN trains accessing the site on existing rail tracks.
- Refrigerating propane.
- Storing propane.
- Loading propane carriers for export (see additional information in Section 2.5: Marine Jetty: design, operations, and safety systems).

***During decommissioning:***

- Removal of land-based above-ground infrastructure on the AltaGas sub-lease site.
- Decommissioning of infrastructure on the jetty will be the responsibility of RTI.

## **2.4 Receiving, Storing and Offloading Propane**

### **2.4.1 Transportation of Propane to Facility by Rail**

There are no pipelines in the Prince Rupert area that can be used to transport propane. As a result, all supply will be brought by rail to the RTI site from processing facilities further east in BC and

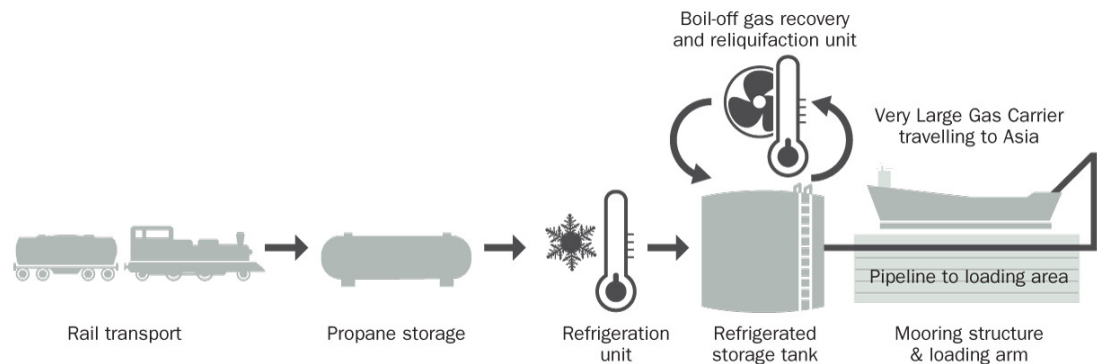
Alberta. Gas processing facilities located in northeast BC and Alberta, owned by AltaGas and other producers, are, or can be, connected to rail. Transport of propane to the Project site will be handled by manifest or unit trains owned and operated by CN. CN currently transports approximately 200 rail cars of propane per year through the Port of Prince Rupert, where they are loaded onto barges destined for Alaska.

Propane is regulated for transport under the Transportation of Dangerous Goods (TDG) Act and Regulations. AltaGas will make arrangements as required to develop a rail tank car fleet that will be moved by CN between gas processing facilities and the RTI site. Rail tank cars that carry propane are specifically designed and built for that purpose and are required to meet well-established engineering codes and the requirements of Transport Canada and the US Department of Transport. The tank cars are intended to ship propane at ambient temperatures, and as such they are pressurized to keep the propane in liquid form.

#### 2.4.2 Propane Facility Operation

Propane facility operations consist of: receiving pressurized propane by rail; offloading it to temporary pressurized storage; cooling it; storing it in an unpressurized, refrigerated tank until it is offloaded using the existing RTI jetty with new propane loading arms to a VLGC sized carrier for export. A simplified schematic outlining the operation of the facility is shown in Figure 6 below.

Figure 6 - Propane Facility Operation



Detailed process flow and instrumentation diagrams will be completed as part of the detailed design of the facility.

#### Unloading

Pressurized liquid propane is unloaded from rail tank cars to intermediate storage tanks (commonly referred to as bullets) on the AltaGas sub-lease site, which will hold the pressurized propane in advance of it being refrigerated and brought to atmospheric pressure. Transfer from the rail tank cars will be done using specially designed loading arms, which will be mounted on a common platform connected to the centrally located loading rack. The rail unloading location is illustrated in Figure 4.

Unloading of rail cars will occur in several batches daily, 24 hours per day. A separate set of tracks will be installed on each side of the common platform. Each track will be capable of holding up to 20 rail cars. Each batch will unload up to 40 rail cars. It is anticipated that shuttling of the cars into and out of position will be accomplished by existing shunting engines that are owned and operated by RTI.

### ***Refrigeration and Storage***

The next step takes place in the refrigeration facility on the AltaGas sub-lease site and consists of removing any water from the propane to prevent the water from freezing and plugging up the heat exchanger. Once the water is removed, the propane is chilled to approximately -42°C. At this point, the propane will be at atmospheric (low) pressure, and transferred to refrigerated storage tanks, where it is held until a carrier is ready for loading.

### ***Boil-off Gas and Ground Flare***

Although the storage tank is insulated some minor amounts ethane and propane (referred to as 'light ends') will boil off. These light ends are used in the power section of facility with excess recompressed and used for cooling. The facility will have an enclosed ground level flare which will be used to safely vent and combust flammable gases that arise from process upsets, or from periodic process venting associated with normal operations when pipes need to be opened for maintenance purposes. The flare will not emit a visible flame, nor will it emit radiant energy that will impact adjacent properties.

### ***Carrier Loading***

VLGCs specially designed to handle chilled propane will be brought to the RTI facility to receive product for export. VLGCs that call at the facility will be owned and operated by third party companies that are specialists in the safe transport of propane. New piping will be built on the existing RTI jetty to deliver propane from the facility to the carriers. Electric motor driven pumps will transfer the chilled propane along the pipes from the unpressurized storage tank to the carrier. It is anticipated that carrier loading operations will occur approximately once every 15 to 20 days, which at full capacity results in approximately 20-30 carriers per year depending on customer demand. Loading will take approximately 40 hours, and will be completed in accordance with RTI's terminal rules and regulations (see section 2.5).

### ***Power Supply***

AltaGas estimates that approximately 15 MW will be required for on-site power of the facility. The facility will use gas driven compressors to supply a portion of the process refrigeration load. The gas driven compressors will be supplied by a mixture of pipeline quality natural gas and light hydrocarbons (methane, ethane and propane) that are evaporated from the incoming propane stream during the refrigeration process and would otherwise need to be combusted in a flare. The remainder of the facility will be run off grid power from RTI's existing 69KV substation connecting with the BC Hydro grid. The facility will have sufficient on-site diesel emergency power generation for critical services.

The use of the gas driven compressors is necessary, as the saturated gases (light ends) from the propane in the rail cars (minor amounts of ethane and methane) must be removed in order to meet export specifications of the purchaser. The use of the removed ethane and methane in gas driven compression is an efficient use of what would otherwise be a waste stream.

In order to maximize site safety, critical process equipment and emergency systems will be backed-up by power from the grid and a back-up emergency diesel generator. The diesel generator will only start up in emergency scenarios where the back-up power from the grid connection was insufficient.

### 2.4.3 Shipping of Propane to Market by Carrier

Shipping and shipping related activities will be handled by third party owners and operators. Shipping of propane is expected to displace coal shipping resulting in no net increase in ship traffic at the RTI terminal.

The global propane industry is served by a large fleet of propane specific carriers. The current fleet of 144 carriers worldwide has an average draft of 11.6 meters, a maximum draft of 13.6 meters, and 100 of the carriers have draft of 12 meters or less. These carriers are similar in size to those already calling at RTI's coal terminal. Propane carriers typically have a beam of 36 meters, and length of 230 metres and carry approximately 40,000 tonnes. Carrier scheduling is generally planned well ahead of actual loading. AltaGas and RTI will confirm physical acceptability of the carrier after reviewing the documents associated with the carrier. In addition to the physical aspect, AltaGas will also review the record of maintenance, accident reports, on board inspection reports, and any certificates by major oil and gas companies based on a 'SIRE report'<sup>1</sup>. Selecting reliable buyers who provide sound carriers in a timely manner is an important requirement of the Project.

Detailed maintenance and operation procedures (including those for emergency situations) will be developed for the carrier loading operations for the Project. At present, AltaGas can confirm that a Nitrogen leak test will be performed at the connection point of manifold prior to loading propane onto a carrier. Should a leak or other deficiency be found during the loading of propane onto the carrier, operators would immediately stop the loading operation and disconnect the manifold. Operators would then ask the carrier to leave the berth immediately and fix the deficiency at a safe area within PRPA jurisdiction. After fixing the deficiency, the carrier would be allowed to berth again.

### 2.4.4 Daily Operations

Normal operations will consist of manifest or unit trains arriving and then departing on CN every day. Initial total deliveries will likely be 15–20 railcars per day, with anticipated growth to approximately 50–60 railcars per day within 12–18 months of the start of operations.

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<sup>1</sup> The Ship Inspection Report Programme (SIRE) is a carrier risk assessment tool – a large database of up-to-date information about carriers and barges. It is an industry-wide system established 21 years ago and is used by the Oil Companies International Marine Forum (OCIMF) member companies and registered recipients.

The Project will be designed to accommodate the maximum daily number of rail tank cars that could potentially be delivered by CN. Direct labour is required only for connecting the rail tank cars to the high pressure storage, and connecting the low pressure storage to the carrier. All other operations will be managed from a control room operated by AltaGas personnel and located on the AltaGas sub-leased land.

## 2.5 Marine Jetty: Project Facilities Design, Operations, and Safety Systems

RTI will be responsible for all aspects of the Project associated with maintaining and operating the existing marine jetty. AltaGas will be responsible for retrofitting specific components of the jetty to accommodate propane. No works below the high-water mark are planned.

RTI has advised AltaGas that they are currently updating their “Terminal Rules and Regulations” document as well as producing a “Port Information Booklet” specific to the handling of propane at the marine jetty. These documents detail the mandatory procedures and regulations, as well as general information for the carrier to follow prior to arrival and while moored at the jetty. Details will be specific to the following:

- Carrier acceptance (vetting).
- Pilotage.
- Tug assistance.
- Carrier berthing.
- Carrier mooring.
- Limiting environmental operating conditions.
- Cargo transfer.
- Product safety specifications.
- Communications.
- Fire protection.
- Carrier and terminal security.
- Carrier access.
- Carrier repair and provisioning.
- Spill prevention<sup>2</sup>.
- Emergency response.

The following provides a brief description of the marine related safety systems and operational measures that will be adopted for the Project.

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<sup>2</sup> There are no bunkering facilities located at Prince Rupert. No bunkering will take place as part of the Project.



### 2.5.1 Carrier Vetting

As part of RTI's operational procedures, all carriers will be vetted and required to meet RTI's safety and environmental standards and the terminal's rules and regulations prior to arrival at the terminal. Carrier vetting procedures are currently being developed from regional and global best practices and will be provided to PRPA six months prior to the in-service date.

The carrier vetting procedures will specify that all carriers calling at the terminal will be modern, double-hulled carriers equipped with firefighting systems, inert gas systems (part of the firefighting system), and electronic navigation systems including radar, collision avoidance systems, global positioning systems, electronic chart display and information system, and automatic identification system. Carriers will also need to have been constructed and regularly inspected in accordance with recognized classification society rules.

### 2.5.2 Pilotage Requirements

Pilotage and escort requirements will be in accordance with the PRPA's "Harbour Practices and Procedures" and the Canada Shipping Act, the federal Pilotage Act, and the Pacific Pilotage Requirements.

### 2.5.3 Escort Requirements

RTI will comply with tug escort requirements that are defined in the PRPA's "Harbour Practices and Procedures" guidance and as determined in consultation with the Pacific Pilotage Authority, Transport Canada, and the Canadian Coast Guard.

### 2.5.4 Carrier Berthing Operations

Harbour tugs will be required to meet the carrier at the direction of the Pilot and Master to assist the carrier in safely berthing and mooring at the marine terminal.

A docking aid system will be installed at the existing jetty to assist the pilots and terminal operators in carrier berthing. The system will monitor and display the carrier's approach speed, distance and angle with respect to the berthing dolphins. The system improves the safety of the berthing operation and reduces the risk of abnormal berthing events by allowing the Pilot to manage the carrier's speed and approach vector in order to verify that the approach procedure is within the specified terminal limits.

Inbound carriers arriving in a ballasted condition will normally berth with their port sides to the loading platform allowing for the bow of the carrier to be head on into the prevailing current and wind direction.

As the existing jetty is designed to allow for berthing of carriers much larger than those that will be calling at the Project (up to 250,000 DWT<sup>3</sup>), no modifications or upgrades to the existing fender system are anticipated.

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<sup>3</sup> DWT: Deadweight Tonnes

### 2.5.5 Carrier Mooring Operations

The existing mooring points are expected to be sufficient for safe mooring of the carriers calling at the facility for the Project. The number and placement of the mooring lines will be determined for each size of carrier during the detailed engineering phase of the Project.

### 2.5.6 Maximum Operating Conditions

Operational safety limits will be established to cover visibility, wind and sea conditions. The preliminary limiting environmental operating criteria are as follows:

- Berthing maximum wind speed: 20 m/s (40 knots)
- Loading/unloading shutdown maximum wind speed: 25 m/s (50 knots)
- Loading/unloading arm disconnect maximum wind speed: 30 m/s (60 knots)
- Carrier to vacate berth: 32.4 m/s (63 knots)
- Maximum current: 2.5 knots
- Minimum visibility: 1.0 km

The above are estimated limiting criteria and are considered preliminary at the time of writing. The limiting operating criteria are subject to change pending detailed operational and mooring analyses to be conducted during the detailed design of the Project.

Meteorological and oceanographic sensors will be installed to monitor: wind speed and direction; current speed and direction; visibility; tidal changes; and wave height and direction. Real-time data from the sensors will be transmitted to the control room for display and logging.

### 2.5.7 Cargo Transfer

The Project will include the pipelines, valves, fire protection, carrier access, and control systems required to safely transfer the cargo and crew between the shore, the jetty, and the carrier. All loading equipment on the jetty will be controlled by a central control room located on RTI lease land on Ridley Island. Topside equipment and systems can be categorized into cargo transfer systems, safety and security systems, emergency response systems, carrier services, and control systems.

The cargo transfer system includes marine loading arms, manifolds, pipelines, booster pumps and valves. All cargo pipelines and hoses connecting the carrier to the marine terminal will conform to industry standards. The actual connection between the carrier and the marine terminal for the purpose of transferring propane will be made with the use of marine loading arms. The loading arms feed into an adjacent manifold, which controls the flow of product being transferred through the system. In turn, the manifold is connected to pipelines running along the jetty's access trestle to the onshore tank facilities. There will be up to four new pipelines built for the Project from the storage tank to the manifold: two liquid loading lines (size to be determined) and two vapour return lines (size to be determined).

For safety purposes a safety zone will be established around the facility in consultation with RTI, PRPA and Transport Canada.

**2.5.8 Dredging**

Dredging will not be required for the Project.

**2.5.9 Emergency Response Requirements**

AltaGas will work with RTI to establish and manage all land-based emergency response plans. The plans will be established after detailed engineering is complete, and prior to construction and/or operation.

RTI will be managing all marine emergency response requirements and intends to comply with all Emergency Response Plan (ERP) requirements that have already been established for the facility. The ERP will be modified as necessary to address propane specific response plans.

## 3. Environmental and Socio-Economic Background

### 3.1 Introduction

The Project is proposed on a site characterized by a history of industrial development and use. Environmental and socio-economic information has been gathered over the course of the last several decades, resulting in a substantial amount of available data for the site and adjacent areas. Development began at Ridley Island when an access road was constructed in 1982 connecting the island with Highway 16 north of Port Edward, BC. RTI was constructed after the completion of this access road and has been operating on Ridley Island since 1984. The Project site will be leased from RTI and is located on existing industrial zoned land at the southwest end of the terminal. This proposed sublease area encompasses the southern portion of the RTI property. It is an existing brownfield site and, although never commissioned, currently contains facilities developed for the purpose of unloading, storing, and transporting liquid sulphur to the RTI dock for export. The following sections describe the environmental setting and socio-economic background of the Project and the adjacent areas.

### 3.2 Environmental Setting

The environmental setting of the Project is based primarily on information sources from recent environmental documents for the area, including a Limited Phase 1 Environmental Site Assessment (ESA) completed by SNC-Lavalin Inc. on July 20, 2015.

#### 3.2.1 Climate

The Project site experiences precipitation patterns consistent with a maritime climate and is located in a temperate rainforest region. As shown in Table 1 below, this coastal climate is characterized by high annual rainfall, with annual precipitation averaging approximately 3055mm, with the wettest months occurring from fall (October) to spring (April). During the winter months, at sea level the precipitation can fall occasionally in the form of snow. Average temperatures experienced in this climate fall within a narrow range from approximately 3 to 13°C range, with highest temperatures experienced in the summer months, (average daily temperatures of 12-13°C) and lowest temperatures in January (average daily temperatures of 3.4°C).

Table 2 - Climate Data of the Project

PRECIPITATION	Annual	Rainfall:		2,910 mm											
		Snowfall:		1,446 mm											
		Total Precipitation:		3,055 mm											
PRECIPITATION	Monthly (mm) (2011)	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.		
		307.8	252.2	263.8	234	167.7	144.6	116.2	153.3	252.2	428.4	370	365.3		
AVERAGE DAILY TEMPERATURES (deg. C)		Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.		
		3.4	5.2	5.2	7.4	9	11	12.6	13	11.9	8.9	6.9	5.6		

Note: Climate data are from the Environment Canada on-line database, Canadian Climate Normals 1971 to 2000, for the "PRINCE RUPERT R PARK" weather station (located at 54°18'00.000"N, 130°20'00.000"W and 90.8 m elevation), approximately 9.6 kilometres north-northwest of the Ridley Island Terminal, read March 7, 2011.

### 3.2.2 Terrain

The Project site is on low-lying, rolling terrain with a maximum elevation of approximately 35 m at a point south of the RTI facilities (Dillon 2004). The underlying surficial materials overlay bedrock to a maximum depth of 21 m below ground surface (bgs).

The jetty is situated on the western shoreline of Ridley Island, which is generally characterized as a steep, rocky intertidal zone composed primarily of bedrock, boulder and cobble (WorleyParsons 2012).

#### 3.2.2.1 Soil Quality

The Project site is currently developed for industrial use and little to no natural soil cover remains; the stratigraphy beneath the RTI property and lease area consists of sand and gravel fill and/or blast rock from surface to depths ranging from 0.2 m to 7.5 m bgs across the site. Where natural soil exists outside the Project site, it consists of a humic layer overlying bedrock (Keystone 2007).

#### 3.2.2.2 Terrain Stability

The site and immediately adjacent terrain is low relief with a shallow and stable soil cover.

#### 3.2.2.3 Seabed Sediments Quality

Baseline studies conducted by Stantec (2014) for a nearby project on Ridley Island indicate that seabed sediments are typically sand with some silt in the intertidal zone; silt, gravel, and clay in the subtidal zone; and silty clay at depth. Metals in the intertidal, subtidal, and core sample sediments were all within Canadian Council of the Ministers of the Environment (CCME) interim sediment quality guidelines (ISQG) for all metals except Arsenic (As) and Copper (Cu), which were just above the criteria. Sediment hydrocarbons exceeded CCME ISQG levels. All polychlorinated biphenyls (PCBs) were below detection limits, while dioxins and furans were detected at low levels. Existing marine sediment contamination can be attributed to the long history of industrial practice in the surrounding area, in particular, the now closed Skeena Cellulose Plant and a number of other sources such as diesel generators, municipal solid waste, and other incineration stack emissions. The Project is not expected to disturb these marine sediments.

### 3.2.3 Water

#### 3.2.3.1 Surface Water Quality

There are no natural water courses on the Project site. Surface runoff is gathered in drainage ditches and two existing settlement ponds on the RTI sub-lease site.

Drainage ditches on the RTI lease property collect surface water from the roads (active areas) and drain directly to Settlement Pond #1. Settlement Pond #1 drains to the foreshore on Chatham Sound via a manually controlled weir system. No flocculants are used in Settlement Pond #1 and water from the pond is also used for dust suppression on site roads.

#### 3.2.3.2 Groundwater Quality

The depth to the water table within the surficial material (fill/blast rock layer) ranges from 0.5 to 2.0 m bgs and generally flows toward the drainage ditches. Groundwater within the underlying bedrock has been encountered at depths ranging from 1.0 m to 16.6 m bgs.

Pre-existing petroleum hydrocarbons have been reported in groundwater in RTI lease lands. Previous ESA studies established groundwater monitoring wells, however, several have been disturbed during subsequent construction around the RTI property. None of the groundwater wells are on the Project site. Groundwater quality on the Project site will be determined prior to construction.

#### 3.2.3.3 Marine Water Quality

PRPA has conducted marine water quality monitoring in PRPA waters since 2013. Coastal waters are monitored for oceanographic properties, heavy metals, polycyclic aromatic hydrocarbons, and bacteriological properties. Four of the 26 monitoring stations lie immediately adjacent to Ridley Island and they have been sampled seasonally at multiple depths for three years. The marine water quality at these stations is considered excellent with only two provincial and federal water quality guideline exceedances for dissolved copper (Cu) and dissolved oxygen at depth in 2014.

### 3.2.4 Marine Resources

This section provides a general background to the marine bio-physical setting for the Project. While the Project site is inland from the marine environment the marine setting is described to provide background for activities involving carrier movements and activities on the jetty where the propane is loaded onto carriers.

#### 3.2.4.1 Marine Habitat (Biophysical Conditions Including Light)

The western shoreline of Ridley Island is a steep, rocky intertidal zone composed primarily of bedrock, boulder and cobble (WorleyParsons 2012). The intertidal zone supports a diverse community of marine biota from exposure to high wave action. Dominant algal species include rockweed (*Fucus gardneri*), sea lettuce (*Ulva* spp.), Turkish washcloth (*Mastocarpus papillatus*), sea sac (*Halosaccion glandiforme*), and various understory kelps (e.g., *Laminaria* spp., *Alaria* spp.). Common invertebrate species include barnacles (*Balanus* spp.), snails (*Tegula* spp., *Littorina* spp.), limpets (*Tectura* spp., *Lottia* spp.), and chitons (*Tonicella* spp.) (Stantec 2011).

The eastern shoreline of Ridley Island in Porpoise Harbour is dominated by boulders, cobble, and gravel in the high to mid-tidal zones, whereas the low intertidal zone is predominantly marine clays and mudflat. Porpoise Harbour has less diversity of marine biota relative to the west side of Ridley Island. Rockweed (*Fucus gardneri*) and sea lettuce (*Ulva* spp.) are the dominant algal species. Common invertebrate species include barnacles (*Balanus* spp.), snails (*Littorina* spp.), and limpets (*Tectura* spp.).

#### **3.2.4.2 Marine Mammals**

The Pacific North Coast Integrated Management Area (PNCIMA) is one of five large federal ocean management areas in Canada and covers an area of approximately 102,000 square kilometers (Department of Fisheries and Oceans (DFO) 2016a). The Project study areas fall within PNCIMA, and the DFO mapping data indicates that the Prince Rupert area of the PNCIMA includes important foraging, resting, and migrating areas for humpback whales, northern resident killer whales, and Steller sea lion (DFO 2016b).

Several local environmental assessment studies have also indicated that several species of marine mammals occur regularly in the Prince Rupert area, including: humpback whales (*Megaptera novaeangliae*), northern resident killer whales (*Orcinus orca*), harbour porpoises (*Phocoena phocoena*), Dall's porpoises (*Phocoenoides dalli*), Pacific white-sided dolphins (*Lagenorhynchus obliquidens*), Steller sea lions (*Eumetopias jubatus*), and harbour seals (*Phoca vitulina richardsi*). It has been observed that many of these marine mammal species increase in numbers during spring and summer months in the Prince Rupert area in relation to seasonal increases in prey (Stantec 2014).

Several of the marine mammals in the Prince Rupert area are federally listed under Schedule 1 of the Species at Risk Act (SARA) and are considered species of conservation concern. Killer whales (northern resident and transient populations) are listed as Threatened, and are also provincially red listed species. Humpback whales are federal species of special concern, and Provincially blue-listed. Steller sea lions, grey whales (*Eschrichtius robustus*), harbour porpoise, and sea otters (*Enhydra lutris*) are also listed as special concern under SARA, and are provincially blue listed species. Sea otters are also protected under the BC Wildlife Act. Stantec (2014a) indicates that the Prince Rupert area is likely beyond the northern range of sea otters. Dall's porpoise, Pacific white-sided dolphin, and harbour seal are also common in the area (Stantec 2014a) but these species are not currently considered at risk.

#### **3.2.4.3 Species at Risk (except fish)**

Eleven species classified under Schedule 1 of the federal Species at Risk Act (SARA) as Endangered, Threatened or of Special Concern were identified as having ranges that include Ridley Island and surrounding waters (WorleyParsons 2012). Six of the species, grey whale (*Eschrichtius robustus*), harbour porpoise (*Phocoena phocoena*), humpback whale (*Megaptera novaeangliae*), killer whale (*Orcinus orca*) resident and transient populations, steller sea lion (*Eumetopias jubatus*), and northern abalone (*Haliotis kamtschatkana*), are marine inhabitants. Among these species, the

northern resident killer whale is listed as Threatened under SARA and the harbour porpoise is listed as Special Concern.

#### **3.2.4.4 Seabird/Waterfowl**

Species most likely to be observed near Ridley Island include marbled murrelet (BC Blue List; SARA Threatened), rhinoceros auklet, common murre (BC Red List), surf scoter (BC Blue List), common merganser, pelagic cormorant pelagicus subspecies (BC Red List), mallard, green-winged teal, mew gull, glaucous-winged gull, black turnstone, and dunlin.

#### ***Marine Resource Use***

Marine resource use in the vicinity of the Project site includes:

- Industrial and commercial marine activities associated with PRPA and Port Edward Harbour Authority.
- Recreational activities.
- Commercial, Recreational, and Aboriginal (CRA) Fisheries.

The following facilities are all currently part of the Port of Prince Rupert within the jurisdiction of the PRPA: Fairview Container Terminal, Ridley Terminals (coal, petroleum coke, dry bulks, and liquid bulks), Pinnacle Pellets (wood pellets), Prince Rupert Grain, Northland Cruise Terminal, the BC Ferries Terminal, the Alaska Marine Highway Terminal, and the Atlin Terminal (small cruise ships) (PRPA 2013a). These facilities create marine traffic into and out of Prince Rupert and Ridley Terminals.

In addition to PRPA, Port Edward Harbour Authority serves small craft harbours in each of the small vessel marinas in Prince Rupert and Port Edward (Fairview Harbour, Porpoise Harbour, Rushbrook Harbour, and Cow Bay Harbour). There are several other types of marine facilities within Prince Rupert and Port Edward including marinas, yacht clubs, public wharves, and coastal ecotourism and fishing lodges.

Recreational activities in the area include recreational boating (powered and self-propelled) and tourism activities associated with the nearby Kitson Island Marine Provincial Park located approximately 5 km south of the Project site.

Four Coast Guard Stations (CGS) (with up to 90 staff) are located in the North Coast. One of these stations is located in Prince Rupert at the Seal Cove Seaplane Base. The Prince Rupert Canadian Coast Guard (CCG) Station offers services to assist maritime safety (DFO 2007).

#### ***CRA Fisheries***

Commercial, recreational, and Aboriginal (CRA) fisheries are highlighted here due to their significance to provincial and federal regulators in an environmental assessment context, to address the Fisheries Act administered by the Department of Fisheries and Oceans (DFO). Fisheries interests have typically played a substantive role in the evaluation of projects in and around Prince Rupert.



Fishing is an important cultural, commercial, and recreational activity for the people of the Prince Rupert and Port Edward area. Pacific salmon (sockeye, Chinook, coho, pink and chum), have long been the most important contributor to local fisheries and are found throughout Chatham Sound. Other fisheries species include halibut (*Hippoglossus stenolepis*), Pacific herring (*Clupea pallasii*), rockfish (*Sebastes* spp.), lingcod (*Ophiodon elongates*), Pacific cod (*Gadus macrocephalus*), eulachon (*Thaleichthys pacificus*), Dungeness crab (*Cancer magister*) and shrimp (*Pandalus* spp.). Other invertebrates are commonly harvested in Chatham Sound by Aboriginal groups including cockles (*Clinocardium* spp.), butter clams (*Saxidomus* spp.), mussels (*Mytilus* spp) and littleneck clam (*Protothaca staminea*).

#### **3.2.4.5 Species at Risk (fish)**

Green sturgeon (*Acipenser medirostris*) is a species of Special Concern protected under SARA Schedule 1. This species occurs in coastal marine waters, estuaries and the lower reaches of large rivers and is known to occur in the marine environment near the project (BC Conservation Data Centre [CDC] 2015). No other fish with known geographic distribution within the Skeena-Queen Charlotte Regional District (SQCRD) are designated under SARA.

### **3.2.5 Terrestrial Resources**

The following sections describe the terrestrial resources adjacent to the Project site. The Project site has no vegetation cover due to recent ground disturbance and development and therefore has limited wildlife values at present.

#### **3.2.5.1 Vegetation Communities and Ecosystems**

Ridley Island is within the Coastal Western Hemlock (CWH) Biogeoclimatic zone, which predominates low lying to middle elevations on the BC coast. The shorelines have limited vegetation cover (primarily alder [*Alnus* sp.]) and riparian habitat due to the ring road corridor. Coastal areas around the island include a beach along the southwest shore, and several tidal sloughs, notably along the northern side. The Project site itself is completely cleared of vegetation.

On undeveloped areas of Ridley Island, to the north and south of the Project site, there is a mosaic of mature coastal forest, wetland ecosystems (muskeg, bogs and marshes with open water, treed swamps) and transitional zones between forest and wetland. A reconnaissance investigation completed by WorleyParsons (2012) estimated that 20% of the island is forested, 60% is muskeg-bog with areas of stunted trees and transitional shrubs, and 20% is marsh and ponds. Mature coastal forest stands occupy parts of the northeastern corner of the island.

Vegetation in the bog ecosystems is dominated by stunted shore pine and yellow cedar (*Chamaecyparis nootkatenis*), with several shrubs common to bogs, including Labrador-tea (*Ledum groenlandicum*), salal (*Gaultheria shallon*), bog cranberry (*Oxycoccus oxycoccus*), western bog-laurel (*Kalmia microphylla* ssp. *occidentalis*) and sweet gale (*Myrica gale*). The bryophyte layer is widespread with red and green sphagnum moss (likely *Sphagnum magellanicum*) and club-moss (likely stiff club-moss *Lycopodium annotinum*).

Marsh habitats contain thick stands of sedge (likely Sitka sedge, *Carex sitchensis*). Rushes (likely small-flowered bulrush, *Scirpus microcarpus*) and dagger-leaved rush, (*Juncus ensifolius*) and other characteristic wetland species are commonly found on the pond perimeters.

### 3.2.5.2 Wildlife

#### **Mammals**

During field investigations, WorleyParsons (2012) found evidence of use by black-tailed deer (*Odocoileus hemionus*), gray wolf (*Canis lupus*), and bear (*Ursus* sp.) on a 7.5 acre parcel at the Project site which has since been cleared. The presence of these species directly adjacent to industrial operations indicates some degree of habituation by these individuals.

Other wildlife species noted on Ridley Island include: red squirrel (*Tamiasciurus hudsonicus*), beaver (*Castor canadensis*), short-tailed weasel (*Mustela erminea*), marten (*Martes americana*), porcupine (*Erethizon dorsatum*), and snowshoe hare (*Lepus americanus*). A grizzly bear (*Ursus arctos horribilis*) has been observed near the access road to Ridley Island. Several species of coastal bats are also known to inhabit the Prince Rupert region, but have not yet been field verified.

#### **Birds**

The Project site is disturbed and has little or no value for birds. The ecosystems on the lands adjacent to and south or east of the Project site provide suitable habitat for several species of migratory and resident birds. Similarly, several coastal birds have been documented around Ridley Island.

There are no known nests for diurnal raptors<sup>4</sup> near the Project site. Northern goshawk (*A.r. gentilis*) has had historic presence, but the habitat requirements of this species are lacking and therefore this species is unlikely to occur near or at the site.

Breeding sites for owl species<sup>5</sup> in the vicinity of the Project are unknown, but unlikely given existing conditions.

There are abundant nest opportunities for common<sup>6</sup> and other songbirds south and east of the site. Nest locations on the site are assumed to be limited due to the lack of adequate nesting habitat.

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<sup>4</sup>Diurnal raptors documented in the vicinity of the Project site include: bald eagle (*Haliaeetus leucocephalus*) Cooper's hawk (*Accipiter cooperii*), sharp-shinned hawk (*A. striatus*), red-tailed hawk (*Buteo jamaicensis*), rough-legged hawk (*B. lagopus*), osprey (*Pandion haliaetus*) and peregrine falcon (*F. peregrines pealei*).

<sup>5</sup> Owl species that may occur on Ridley Island include: great-horned owl (*Bubo virginianus*), northern saw-whet owl (*Aegolius acadicus*), western screech-owl (*Otus kennicottii kennicottii*), northern pygmy-owl (*Glaucidium gnoma*), and barred owl (*Strix varia*).

<sup>6</sup> Common songbird species in the area include: orange-crowned warbler (*Vermivora celata*), hermit thrush (*Catharus guttatus*), American robin (*Turdus migratorius*), winter wren, (*Troglodytes hiemalis*), song sparrow (*Melospiza melodia*), dark-eyed junco (*Junco hyemalis*), pine siskin (*Carduelis pinus*), and gray jay (*Perisoreus canadensis*).

Coastal birds noted in the vicinity of the Project site include several species of seabirds, waterfowl, waders and gulls, such as common loon (*Gavia immer*), red-necked grebe (*Podiceps grisegena*), common merganser (*Mergus merganser*), double-crested cormorant (*Phalacrocorax auritus*), great blue heron (*Ardea herodias*), marbled murrelet (*Brachyramphus marmoratus*), Barrow's goldeneye (*Bucephala islandica*), surf scoter (*Melanitta perspicillata*), bufflehead (*Bucephala albeola*), mallard duck (*Anas platyrhynchos*), Canada goose (*Branta Canadensis*), and glaucous-winged gull (*Larus glaucescens*).

### ***Amphibians and Reptiles***

Higher elevation ponds and marshes on Ridley Island provide suitable breeding habitat for amphibians, including western toad (*Anaxyrus boreas*) which is well-documented in wetland areas of Ridley Island (WorleyParsons 2012). Four other amphibian species may occur near the Project site including: rough skinned newt (*Taricha granulosa*), red-legged frog (*Rana aurora*), long-toed salamander (*Ambystoma macrodactylum*), and northwestern salamander (*A. gracile*) (WorleyParsons 2012; CDC 2015). Ridley Island is within the geographic distribution of coastal tailed frog (*Ascaphus truei*); however, there is a lack of suitable breeding habitat for this species, so the likelihood of tailed frog presence is low.

Common garter snake (*Thamnophis sirtalis*) and the western garter snake (*T. elegans*) are two reptile species that may occur near the site<sup>7</sup> (WorleyParsons 2012).

The likelihood of amphibian and reptile presence within the Project site is low given the lack of suitable habitat.

#### **3.2.5.3 Species at Risk (wildlife and rare plants)**

### ***Wildlife at Risk***

The marginal habitat values at the Project site preclude the presence of the majority of the species listed in Table 3 for the SQCRD. The one exception was western toad, which was documented at the site prior to recent clearing and is locally abundant in adjacent lands where populations exist; and great blue heron, which is tolerant of human presence and often will roost or hunt in drainage ditches or shorelines.

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<sup>7</sup> <http://www.carcnet.ca/english/herps.php>

Table 3 - Wildlife <sup>8</sup>Species at Risk which occur in the SQCRD<sup>8</sup>

Scientific Name	English Name	SARA	COSEWIC	BC List
<i>Anaxyrus boreas</i>	Western Toad	1-SC (Jan 2005)	SC (Nov 2012)	Blue
<i>Myotis lucifugus</i>	Little Brown Myotis	1-E (Dec 2014)	E (Nov 2013)	Yellow
<i>Accipiter gentilis laingi</i>	Northern Goshawk, <i>laingi</i> subspecies	1-T (Jun 2003)	T (Apr 2013)	Red
<i>Brachyramphus marmoratus</i>	Marbled Murrelet	1-T (Jun 2003)	T (May 2012)	Blue
<i>Mustela erminea haidarum</i>	Ermine, <i>haidarum</i> subspecies	1-T (Jun 2003)	T (May 2015)	Red
<i>Contopus cooperi</i>	Olive-sided Flycatcher	1-T (Feb 2010)	T (Nov 2007)	Blue
<i>Aegolius acadicus brooksi</i>	Northern Saw-whet Owl, <i>brooksi</i> subspecies	1-T (Dec 2007)	T (Apr 2006)	Blue
<i>Euphagus carolinus</i>	Rusty Blackbird	1-SC (Mar 2009)	SC (Apr 2006)	Blue
<i>Ascaphus truei</i>	Coastal Tailed Frog	1-SC (Jun 2003)	SC (Nov 2011)	Blue
<i>Falco peregrinus pealei</i>	Peregrine Falcon, <i>pealei</i> subspecies	1-SC (Jun 2003)	SC (Apr 2007)	Blue
<i>Rana aurora</i>	Northern Red-legged Frog	1-SC (Jan 2005)	SC (May 2015)	Blue
<i>Megascops kennicottii kennicottii</i>	Western Screech-Owl, <i>kennicottii</i> subspecies	1-SC (Jan 2005)	T (May 2012)	Blue
<i>Patagioenas fasciata</i>	Band-tailed Pigeon	1-SC (Feb 2011)	SC (Nov 2008)	Blue
<i>Ardea herodias fannini</i>	Great Blue Heron, <i>fannini</i> subspecies	1-SC (Feb 2010)	SC (Mar 2008)	Blue
<i>Synthliboramphus antiquus</i>	Ancient Murrelet	1-SC (Aug 2006)	SC (Nov 2014)	Blue
<i>Myotis keenii</i>	Keen's Myotis	3 (Mar 2005)	DD (Nov 2003)	Blue
<i>Megascops kennicottii</i>	Western Screech-Owl	1	T (May 2012)	No Status

### Rare Plants

There are no federally-listed rare plant species at risk located on RTI lands or in the nearby vicinity of the Project site.

#### 3.2.5.4 Traditional Ecological Knowledge and Resource Use

Traditional knowledge and use of resources, such as Culturally Modified Trees (CMT) have been recorded on Ridley Island. However, the Project site has been extensively disturbed and no traditional resources are anticipated on the Project site (see section 3.3.6).

<sup>8</sup> The CDC (2015) SARA-listed wildlife species known to occur within the SQCRD

### 3.2.6 Air Quality

The current operations at RTI run 24 hours a day, seven days a week. Air emissions at the current terminal are generated by the operation of marine carriers calling at the terminal, non-road engines, heavy- and light-duty vehicles, movement of inbound and outgoing cargo (including metallurgical and thermal coal, petroleum coke), coal operation infrastructure and existing CN rail infrastructure. A number of vessels and equipment are in regular use at the RTI.

The Prince Rupert airshed benefits from consistent wind flow (being situated on the coast), generally without persistent stagnant conditions that can affect inland airsheds in BC. In addition, import of air contaminants is not an issue, given the community's remote location.

PRPA, its terminals and service providers (rail, marine, truck) constitute the most important economic drivers for the region. The airshed is not currently considered 'challenged' due to relatively few industrial emission sources. Because of this, ambient monitoring generally ceased in the early 2000s with the closing of the Skeena Cellulose Plant (which was the key industry and emission source at that time). While this plant was in operation, the province maintained several ambient air quality stations that monitored for sulphur dioxide (SO<sub>2</sub>), hydrogen sulphide (H<sub>2</sub>S) and particulate matter (PM). More recently, PRPA, with some assistance from the province, has re-instituted ambient monitoring in the community. This monitoring is to confirm that the air quality is currently 'good' and to track ambient levels of the criteria air contaminants as part of their ongoing environmental sustainability initiative. Recent monitoring has indicated very localized PM (dust) measurements. PRPA completed an airshed study of all the port-related activities in 2012, which confirmed that the port activities do not cause adverse air quality impacts (air quality concentrations that approach the ambient objectives held by the provincial and federal governments); however, the province recently commissioned an airshed study incorporating the tremendous growth that could be experienced within the airshed, largely due to proposed liquefied natural gas (LNG) facilities. This provincial study aims to predict any air quality pressures that could emerge if the potential growth is realized, including any related effects (e.g., acidic deposition, eutrophication of soils). This work has not yet been released.

Given the Emission Control Area (ECA) established for the west coast of North America, shipping emissions of key contaminants (SO<sub>2</sub>, PM, nitrogen dioxide [NO<sub>2</sub>]) have significantly decreased and these improvements are expected to alleviate air quality concerns that could otherwise develop with a doubling or tripling of shipping rates in the region if proposed developments including LNG proceed.

### 3.2.7 Noise and Vibration

The nearest noise receptors to the Project site are located across Porpoise Harbour in Port Edward, approximately 2 km east of the Project. Noise and vibration experienced at these receptors are currently affected by existing operations of marine vessels, non-road engines, heavy- and light-duty vehicles, and movement of inbound and outgoing cargo (including metallurgical and thermal coal, petroleum coke), coal operation infrastructure and existing CN rail infrastructure. The current operations at RTI run 24 hours a day, seven days a week.

### 3.2.8 Light

Sources of light emissions at RTI are the high and low mast lighting that is necessary to safely operate at night. This light source currently has limited or no visibility from Port Edward.

## 3.3 Project Social and Economic Background

The following section provides a general description of the social and economic setting of the area surrounding the Project site.

### 3.3.1 Local Community

The Project is situated within the SQCRD on the north coast of British Columbia. The main urban centre is the City of Prince Rupert, and there are a number other small villages and towns located along the coastline, on adjacent islands and on the islands of Haida Gwaii. Over the last 10 years, the SQCRD has experienced a decrease in population in the order of 21%, and at the same time its economy has been facing substantial restructuring with decreasing reliance on more traditional sectors such as fishing and forestry. While on a community-level basis there tends to be relatively high levels of labour market participation, the SQCRD currently suffers from unemployment at a rate in the order of double that of the province. The District Municipality of Port Edward is the closest community to the Project site, located approximately 2.5 km east and across Porpoise Bay. The population is estimated at 544 residents. The town has an elementary school and community centre offering recreational services. Public, emergency and medical services are based out of Prince Rupert located 15 km north of Port Edward.

### 3.3.2 Emergency and Health Services

There are existing emergency and health services, based primarily in Prince Rupert. These services include those of the Canadian Coast Guard's Marine Traffic Services, Pacific Pilotage Authority, BC Coast Pilots, SMIT Marine and PRPA, provincial ambulance, fire and policing, as well as resources available from tenants of PRPA.

### 3.3.3 Economy

The main economic activities within the communities of Port Edward and Prince Rupert are in industry, fishing, forestry and recreation.

The CRA fisheries active in the area around Project site depend upon several species mentioned in Section 3.2.4.4, in addition to Dungeness crab (*Cancer magister*). Chatham Sound located west of Ridley Island is a known location for sport fishing. More information on CRA fisheries is addressed in Marine Resource Use (Section 3.2.4).

Tourism is playing an increasing role in the regional economy, capitalizing on the area's high level of natural beauty and the abundance of eco-adventure opportunities.

PRPA and the tenants on port lands are also an important part of the economy of the Prince Rupert and Port Edward area. Currently there are several proposals for new port facilities, with particular attention given to LNG facilities.

### 3.3.4 Work Force and Employment

Since the late 1990s, the SQCRD, including the City of Prince Rupert and the District of Port Edward and surrounding areas, have experienced industrial closures in the resource sector and a general decline in shipments of coal out of its port facilities. A relatively high unemployment rate was recorded for the Prince Rupert Census Metropolitan Area (CMA), which includes Port Edward, compared to the province as a whole.

The economic situation in northwest BC has shown considerable improvement over the past four years as new major industrial projects have been proposed, or are under construction, including: hydro transmission lines, pipelines, LNG facilities, mines, and container ports. While some projects are underway, others await environmental approvals and final decisions by their investors. These initiatives are expected to be major drivers of new development and employment activity in the region.

At present, it is anticipated that a significant portion of the workforce expected for the construction of the facility will be residents of the Prince Rupert and surrounding communities. Other workers are expected to be accommodated in area hotels, apartments and other temporary lodgings.

### 3.3.5 Land Use

The Project site is located on land used for industrial and transportation activities. The land is designated by PRPA for port use in the “2020 Land Use Management Plan” for the lands under their jurisdiction (available: <http://www.rupertport.com/documents/prpa-land-use-management-plan/pdf>). All of the land on which the Project will be located is disturbed and currently used for industrial and port related activities. Rail transportation will be on lands already used for rail transport, both on PRPA and RTI lease lands, and on CN lands. Activities on marine areas will be on pre-existing structures and shipping will use waters already designated for vessel movements.

### 3.3.6 Current Use of Land for Traditional Purposes

Use of the land or resources on the Project site by Aboriginal persons for traditional purposes has not been identified, because the site has been substantially developed for industrial use. However, Aboriginal persons may currently use resources for traditional purposes in the marine areas that would be traversed by marine carriers using existing terminal facilities.

### 3.3.7 Archaeology

An archaeological survey was completed by Millennia Research Ltd. in a small area southwest of the current RTI facilities in 2006. The survey identified a site containing seven CMT archaeological features (Brunsden 2010). There is no current evidence of CMTs at the Project site.

## 4. Environmental Permitting and Authorizations

The following provides a preliminary list of environmental permits/authorizations anticipated to be required for the Project:

- Section 67 Determination (under the Canadian Environmental Assessment Act, 2012).
- Navigation Protection Act approval.
- Fisheries Act authorization, if necessary.
- Explosives Act Permit, if necessary.

The Canadian Environmental Protection Act 1999 (CEPA) applies to activities undertaken by Crown Corporations on federal lands. In order to satisfy the requirements of the Act, the Project will adopt an appropriate set of environmental management plans, including Spill Management Plans, that satisfy the Act and support the safe and environmentally sound operation of the facility.

### 4.1 Federal Authorizations

#### 4.1.1 Canadian Environmental Assessment Act

The Canadian Environmental Assessment Act, 2012 (CEAA 2012) defines responsibilities and procedures for environmental assessment (EA) of projects involving the federal government, and establishes a process for determining environmental effects of projects. The CEAA 2012 “Regulations Designating Physical Activities” specifies triggers for Environmental Assessments that are overseen by the Canadian Environmental Assessment Agency (CEA Agency), the National Energy Board, and the Canadian Nuclear Safety Commission.

The following potential triggers were considered, as described in the Regulations Designating Physical Activities. No triggers were identified.

- Under Section 13(f) of the Regulations, designated projects that may be overseen by CEAA 2012 include “The construction, operation, decommissioning and abandonment, or an expansion that would result in an increase in production capacity of more than 35%, of a liquefied petroleum gas storage facility with a capacity of more than 100 000 m<sup>3</sup>”. The storage capacity of the proposed liquefied petroleum gas storage facility will not exceed 100,000 m<sup>3</sup> and will therefore not trigger an EA under CEAA 2012.
- Section 28(c) of the Regulations, applicable to “the proposed construction decommissioning, or abandonment of a marine terminal designed to handle vessels larger than 25,000 Dead Weight Tonnes (DWT) unless the terminal is located on lands that are routinely and have historically been used as a marine terminal or that are designed for such use in a land-use plan that has been the subject of public consultation”, does not apply as the Project will be using RTI’s existing marine terminal.
- Section 29(a) of the Regulations, applicable to “the proposed construction of a railway line more than 32 km in length on a new right of way” does not apply as the length of rail being built for the Project is less than 32 km.
- Section 4(a) of the Regulations, applicable to “the proposed construction, decommissioning, or abandonment of a fossil fuel-fired electrical generating station with a production capacity of



200 MW or more” does not apply as the generating capacity of the Project will be approximately 15 MW.

- Section 14(a) of the Regulations, applicable to “the proposed construction of an oil and gas pipeline more than 75 km in length on a new right-of-way” does not apply as no pipeline will be built on a new right-of-way and the length of piping required for the Project is under 75 km.

However, as the Project will be built on federal lands, Section 67 of the Canadian Environmental Assessment Act, 2012 will apply, whereby:

“An authority must not carry out a project on federal lands, or exercise any power or perform any duty or function conferred on it under any Act of Parliament other than this Act that could permit a project to be carried out, in whole or in part, on federal lands, unless (a) the authority determines that the carrying out of the project is not likely to cause significant adverse environmental effects; or b) the authority determines that the carrying out of the project is likely to cause significant adverse environmental effects and the Governor in Council decides that those effects are justified in the circumstances under subsection 69(3)”. 2012, c. 19, s. 52 "67", c. 31, s. 431(E).

Under Section 67 of CEAA 2012, PRPA and RTI – as Federal Authorities – have a responsibility to determine if the Project is likely to cause significant adverse environmental effects before undertaking the Project. PRPA and RTI’s Section 67 approval process is described further in Section 5 of this report.

#### **4.1.2 Navigation Protection Act**

As administered by Transport Canada, in accordance with the Navigation Protection Act (NPA) “it is prohibited to construct, place, alter, repair, rebuild, remove or decommission a work in, on, over, under any navigable water that is listed in the schedule”. Since the Project involves the alteration of the exiting RTI terminal facility which is situated in the federal jurisdiction of the Pacific Ocean, NPA approvals are expected to be required despite no work being planned below the high water mark.

#### **4.1.3 Fisheries Act Authorization (if necessary)**

As administered by Fisheries and Oceans Canada (DFO), Fisheries Act (FA) authorization under paragraph 35 (2)(b) of the Act will be required if any of the proposed works, undertakings or activities of the Project are likely to result in impacts to fish or fish habitat that are part of or support commercial, recreational or Aboriginal fisheries.

There are no proposed works under the high water mark as part of the Project, and as such no Fisheries Act authorization is anticipated at this time.

#### **4.1.4 Explosives Act (if necessary)**

Site preparation activities will utilize explosives to level the grade of the RTI sub-lease site. It is anticipated that blasting will be carried out by a licensed contractor and that explosives will not be manufactured or stored on site. In the event that explosives will need to be manufactured or stored on site, Explosives Act permits will be obtained in advance of their use.

## 4.2 Provincial Authorizations

### 4.2.1 British Columbia Environment Assessment Act

Provincial legislation does not apply on federal lands, and as such no Provincial environmental assessment is required for the Project. For informational purposes, the Project also does not exceed criteria set by the provincial Reviewable Projects Regulation that would trigger review under the British Columbia Environmental Assessment Act (BCEAA).

The following criteria were considered:

- The Project is a new energy storage facility with the capability to store 2.66 PJ, which is less than the criteria of >3PJ of stored energy.
- The Project's generator (approximately 15 MW) will be less than the criteria for a new facility with a rated nameplate capacity of >50 MW of electricity.
- The Project is not a transmission pipeline facility and as such does not meet those criteria for inclusion.
- New rail tracks for the Project will be less than the threshold of >20 continuous km of developed track.

## 5. CEAA Section 67 Approval and Overview of Environmental Effects

### 5.1 CEAA Section 67 Approval Process

As described in Section 4, the Project does not trigger the requirements for an Environmental Assessment (EA) under the CEAA 2012 Regulations Designating Physical Activities. However as per Section 67 of CEAA 2012, as federal authorities, both PRPA and RTI have a responsibility to determine whether the Project is likely to cause significant adverse environmental effects before granting authorization for the Project to proceed.

An EA will be undertaken for review by federal authorities in order to determine the likelihood and severity of potential impacts from the Project on components of the environment that are of value to First Nations, the public, and/or agencies. A preliminary list of these 'Valued Components' (VCs) is included below and will be updated to reflect comments received from First Nations, the public, and agencies.

The purpose of the EA will be to undertake a systematic evaluation of potential projects effects on VCs. The early identification of potential impacts from the Project reduces the likelihood of long-term adverse effects, as it allows for the identification and implementation of mitigation measures to avoid or minimize significant adverse effects through engineering design, and changes to construction methodologies and management.

An Environmental Evaluation Document (EED) will be submitted to federal authorities for their review and as a basis on which they make their Section 67 approval decision. The EED will:

- Describe the Project.
- Describe the identified VCs.
- Predict environmental effects of interactions between the Project and VCs.
- Identify mitigation measures recommended to avoid or minimize adverse environmental effects.
- Evaluate the potential for significant adverse environmental effects.
- Document the analysis.

### 5.2 Valued Components and Potential Project Interactions

AltaGas has identified a preliminary list of VCs that are anticipated to be important to First Nations, the community, and regulators (Table 4). The list will be modified based on input from First Nation and public engagement, and input from regulators. This list will form the basis of the environmental effects assessment whereby the VCs will be initially screened for potential interactions with the Project. Where an interaction is anticipated, the effect will be evaluated and mitigation identified to avoid or minimize the effect.

Table 4 - Valued Components

VALUED COMPONENT	SUB-COMPONENT
TERRAIN	Soil Quality
	Terrain Stability
	Seabed Sediment Quality
WATER	Groundwater Quality
	Surface Water Quality
	Marine Water Quality
MARINE RESOURCES	Marine habitats (including foreshore and shallow subtidal)
	Marine mammals
	Marine Species at Risk (except fish)
	Marine Resource Use
FISH	CRA fish
	non-CRA fish
	Species at Risk - fish only
TERRESTRIAL RESOURCES	Vegetation Communities and Sensitive Ecosystems (including wetlands)
	Wildlife including migratory and non migratory birds
	Species at Risk - wildlife and rare plants
	Traditional Ecological Knowledge and Resource Use
HUMAN HEALTH	Air Quality
	Noise and Vibration
	Light (Visual)

### 5.2.1 Anticipated Environmental Studies

Environmental studies will be undertaken for the Project where there is an anticipated interaction between a VC and the Project, in the construction, operation, and/or decommissioning phases of the Project. A literature review will be undertaken to determine where sufficient information exists for the EA, and field studies will be undertaken where necessary.

The following studies have been identified at this time:

- Literature review for potential effects to all VCs: physical, biological, and socioeconomic.
- Phase 1 Contaminated Site Assessment.

- Phase 2 Contaminated Site Assessment.
- Noise assessment at sensitive receptor sites.
- Air quality modelling.
- Facility HAZID and risk assessment.
- Marine HAZID and risk assessment.
- Navigability studies.

### 5.3 Summary of Potential Project Effects

The following sections provide a preliminary outline of the potential effects of the Project on the environment within PRPA jurisdiction, presented for each key component. This preliminary outline is based on a review of the studies shown in the reference section of this document as well as other environmental assessments that have been previously conducted in the vicinity of Ridley Island. The preliminary list of effects of the Project will be updated as the Project Description is reviewed with the public, key stakeholders and First Nations:

#### 5.3.1 Project Facilities and the Existing Marine Jetty

The principle potential effects related to Project facilities and the existing marine jetty include:

- Disturbance of contaminated sediment and soils at the Project site, during removal of existing structures and preparation of the ground for project facilities. The principal concern is to avoid or minimize release of contaminants to the groundwater and/or marine environment. It is anticipated that site disturbance would follow established procedures for identifying contamination, removing contaminated material and procedures to prevent contamination moving off the site.
- Air emissions from Project activities (during construction and operation) and effects on human health. The principal sources of emissions are from carriers during berthing and transit through waters under the jurisdiction of the PRPA, trains operations on PRPA land, and vehicles operating on PRPA and RTI lands, and from Project facilities such as the ground flare. The facility will have an enclosed ground level flare which will be used to safely vent and combust flammable gases that arise from process upsets, or from periodic process venting associated with normal operations. The flare will not emit a visible flame, nor will it emit radiant energy that will impact adjacent properties. The assessment of air emissions from shipping will focus on nitrogen oxide, sulphur dioxide, and particulate matter. The assessment of air emissions from trains and vehicles will focus on nitrogen oxide, sulphur emissions and particulate matter. The assessment of air emissions from flaring will focus on carbon monoxide and sulphur dioxide emissions.
- Noise from Project activities (during construction and operation) and effects on human health. The principal sources of noise from the Project are from carriers during berthing, from trains and vehicles operating on PRPA and RTI lands, and from the operation of the gas generator.

- Visual effects from the Project storage facilities on human health. Most of the Project facilities are not expected to be readily visible to communities near Ridley Island as they will be concealed by terrain and vegetation. The facilities would be visible to marine traffic though not as prominent as other facilities on Ridley Island.
- Lighting effects on marine fish and habitat at the marine jetty. The Project may require additional lighting on the jetty where the propane will be loaded onto carriers. This lighting is required for safety reasons for night-time operations. The actual change in lighting that may affect nearby marine conditions and marine birds will be considered in context with the existing lighting requirements on the marine structures.

As the Project is located on an industrial brownfield it is expected that these effects can likely be managed with proven mitigation measures.

### 5.3.2 Marine Transport

The primary environmental effects of concern are (a) carrier and marine mammal collisions, (b) fuel spills into the marine environment, (c) interactions with fishing vessels and (d) air emissions from carriers. Overall the change to shipping activity in Prince Rupert Harbour is expected to be minor, as the Project's shipping traffic will displace permitted coal traffic volumes at the RTI terminal. The carrier traffic associated with the Project will be subject to the requirements of Transport Canada and PRPA.

### 5.3.3 Rail Transport

The additional rail car traffic will in part replace coal car transport currently using the rail line. The concerns associated with the transport of propane are associated with (a) accidents along the tracks and spills with associated human health and safety concerns, (b) air emissions associated with train movements, and (c) noise from the rail traffic associated with the Project. The probability of accidents described above is considered low. In all cases proven mitigation will be applied to avoid or reduce any potential effects.

## 5.4 Environmental Mitigation

Mitigation measures will be identified in the EED based on AltaGas' experience at its existing propane export facility in Ferndale, Washington, best management practices, and industry standards and regulations. A preliminary overview of some of the anticipated mitigation measures is provided below.

### 5.4.1 Air Emissions Containment

The low pressure refrigerated propane storage tanks will be connected to a boil-off gas handling system to recover boil-off vapours and send the condensed liquid propane stream back to storage. A closed venting system will be installed to receive any gas released as a result of a controls related shutdown, and the system will feed to a combustor ground flare in case of emergencies. The flare at a similar facility operated by AltaGas has not been used during almost four decades of safe and reliable operation.

### 5.4.2 Fire Protection System

Dry chemical fire extinguishers will be provided in all areas where a hydrocarbon release could occur. A looped firewater system will be provided to service the unloading rack, the pressurized storage area, the process area, and the refrigerated storage tanks. In the event of a significant fire, deluge systems will be provided to protect the unloading rack, pressurized storage tanks, and for all process equipment. Hydrants will be placed strategically with remotely operated fire monitors to cool the refrigerated storage tank, pipe racks, and other equipment not protected by deluge systems.

The need for additional fire water storage needs to be defined based on maximum water demand for fighting a major fire, the defined duration of the event, and the availability of fire water currently available on site. An evaluation to confirm the feasibility of on-site fresh water storage or pumping of sea water will be completed.

### 5.4.3 Secondary Containment

Secondary containment systems will be provided for the propane facility:

- Full containment, pre-stressed concrete tanks have the advantage of secondary containment around the tank, negating the need for a containment berm since the berm is built around the tank itself.
- Bottom drip pans will be installed to capture accidental spills and leaks from equipment. Drainage from these pans will be directed through American Petroleum Institute (API) separator tanks to ensure proper discharge of stormwater runoff from the trays.

### 5.4.4 Safety Monitoring, Alarm and Emergency Shutdown Systems

The propane facility will have an instrumentation and control system that will monitor, alarm, and shut down all or part of the facilities in the event of an emergency. A description of the elements of the monitoring and shutdown systems for the terminal components is provided below:

- Combustible gas detectors will be provided in all areas where hydrocarbon releases are possible. Horns and beacons will be provided to warn personnel of any potential hazard. Automated valves will be provided to isolate sections of the plant upon detecting gas. Consideration shall be given to safely venting any isolated equipment or systems if combustible levels are detected.
- Fire detection will be provided at the unloading rack, the pressurized storage area, and the refrigerated storage area. Audible alarms and strobe lights will be provided to warn personnel of any potential hazard.
- The design of the detection systems will allow for early warning of dangerous conditions and allow time for terminal personnel to take action.
- The loading/unloading lines between the jetty and storage tank will be equipped with a leak detection system and emergency shutdown valves that allow for the rapid isolation in the unlikely event of a pipe failure.

- The low pressure refrigerated storage tank will be equipped with primary and secondary monitoring systems to prevent tank overflow by a series of level transmitters that trigger alarms when specific tank fill levels are exceeded. Activation of the alarm will initiate operator action and depending on the tank level may also initiate closing of the tank line manifold valve, preventing further filling of the tank.



## 6. Project Engagement and Consultation Plan

### 6.1 Community Engagement Planning

AltaGas has substantial experience and success engaging with communities in which it builds and operates projects. AltaGas has adopted the following five guiding principles in its approach to public engagement:

- Accountability – act in accordance with the commitments it makes to stakeholders and demonstrate that results and outcomes are consistent with promises it makes;
- Inclusiveness – strive to reach, involve, and hear from those who are affected, whether directly and indirectly;
- Transparency – provide clear, timely and complete information, and endeavor to ensure decision processes, procedures, and constraints are understood and followed;
- Commitment – allocate appropriate resources for effective consultation; and
- Responsiveness – be responsive, accessible and endeavor to understand stakeholder concerns.

AltaGas is developing a comprehensive plan to engage with local residents and stakeholders, the details of which will be shared publically upon completion.

### 6.2 Aboriginal Engagement Plan

AltaGas will engage with Aboriginal groups as directed by the federal authorities in order to inform them of the Project, to better understand their concerns and expectations, and to identify opportunities for economic benefit and training. AltaGas will also use the opportunity to better understand the current use of land and resources for traditional purposes in areas affected by the Project with the goal of avoiding or minimizing potential impacts wherever possible.

To support engagement with Aboriginal groups, AltaGas expects to review existing information from Aboriginal engagement on other projects in the area to gain an understanding of current uses for traditional purposes; to gauge the interest, commitment and/or involvement of each group in the engagement process, and ensure that AltaGas satisfies the requirements for PRPA's and RTI's environmental review.

## 7. Project Schedule

Project approval is anticipated in mid-2016. Engineering and design are planned to be completed and executed in mid-2016 which will be followed by construction through to 2018 (approximately 18 months). Therefore, subject to obtaining the necessary regulatory approvals and required consultation, the proposed propane export facility could be commissioned and start operations as early as 2018.

Key Milestones for the Section 67 approval process are as follows:

- Public comment period on the Project Description Winter 2016
- Federal Authorities approval of the Project Description Winter 2016
- Federal Authorities approval of the scope of the EED Spring 2016
- Public comment period on the EED Spring 2016
- Federal Authorities Approval of the EED Summer 2016

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