KWISPAA LNG

Co-managed by

Steelhead LNG

huu ay aht
ANCIENT SPIRIT, MODERN MIND

PROJECT DESCRIPTION

October 2018

REVISION HISTORY				
Rev. No.	**Issued Date**	**Originator**	**Distribution**	**Description**
1	October 16, 2018	Kwispaa LNG (CF) Limited Partnership	BC Environmental Assessment Office Canadian Environmental Assessment Agency	Issued as Final
Document No.		KWI-CR0000-HEM-G10-00001-00		

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Acronyms and Abbreviations

Acronym or Abbreviation	Description
ACRD	Alberni-Clayoquot Regional District
ASLNG™	At-Shore Liquefied Natural Gas
BC	British Columbia
BC EAO	BC Environmental Assessment Office
BCEAA	BC *Environmental Assessment Act*
CEAA 2012	*Canadian Environmental Assessment Act, 2012*
CEA Agency	Canadian Environmental Assessment Agency
EA	environmental assessment
FEED	Front End Engineering Design
First Nation Reserve	"Reserve" as defined under the Federal *Indian Act*, R.S.C., 1985, c. I-5
GHG	greenhouse gas
HHRA	Human Health Risk Assessment
HSDA	Health Service Delivery Area
ICSS	integrated control and safety system
LHA	Local Health Area
LNG	liquefied natural gas
Q1	first quarter
Q4	fourth quarter
SARA	*Species at Risk Act*
TERMPOL	Technical Review Process of Marine Terminal Systems and Transshipment Sites

Defined Terms

Term	Description
Application	Application for an Environmental Assessment Certificate
Bivalve Harvest Area	Maa-nulth Intertidal Bivalve Harvest Area
Developer	Kwispaa LNG (CF) Limited Partnership
Huu-ay-aht	Huu-ay-aht First Nations
Kwispaa LNG Area	the area where all Project components (aside from a potential electric transmission line) are anticipated to be located; also known as the Sarita Cultural Protection Line
Kwispaa LNG Team	Huu-ay-aht First Nations and the Developer
Project	proposed Kwispaa LNG Project
Steelhead LNG	Steelhead LNG Limited Partnership

Symbols and Units of Measure

Symbol / Unit of Measure	Description
%	percent
"	inches
°	degrees
°C	degrees Celsius
cm	centimetre
cm/sec	centimetres per second
CO	carbon monoxide
CO_2	carbon dioxide
CWH	Coastal Western Hemlock
CWHvh1	Coastal Western Hemlock southern very wet hyper-maritime variant
dBA	A-weighted decibel
ha	hectares
H_2S	hydrogen sulphide
km	kilometre
km^2	square kilometre
km/h	kilometres per hour
L/s	litres per second
m	metre
m/s	metres/second
masl	metres above sea level
mm	millimetre
mtpa	million tonnes per annum
MW	megawatt
NO_2	nitrogen dioxide
SO_2	sulphur dioxide
tCO_2e/tLNG	tonnes of CO_2 equivalent per tonne of liquefied natural gas
µm	micrometre

List of Contributors to Project Description

Contributor	Credentials	Section(s)	Relevant Experience
Tiffany Murray	B.A., MIS	1 – Introduction 6 – Engagement and Consultation	More than eight years of experience in community consultation and engagement with a focus on Aboriginal engagement
Nathan Gloag	B.Eng, GradDipLS	2 – Project Information	More than 17 years of experience in the development and execution of major capital projects throughout the energy, renewable power and infrastructure sectors
Alex Brigden	B.Eng. MBA, C.Eng.(UK)	2 – Project Information	More than 25 years of experience in the oil and gas and shipping industries, including a specialization in project management and contracting
Ruth Hardy	M.Sc., P.Ag.	3.2 – Land Ownership, Tenure, and Legal Descriptions 3.4 – Land Use Plans and Zoning 5.3.2.2. – Non-Traditional Land and Water Use	Senior environmental assessment practitioner with over 15 years of experience in community and land use planning, land suitability analysis, and soil and terrain survey and analysis
Nina Barton	B.Sc., MRM	3.3 – Treaty Lands and Indigenous Agreements 3.5 – Local Context 5.3 – Social, Economic, Health and Heritage Setting	Senior researcher with over 15 years of diverse interdisciplinary experience, including environmental and socio-economic assessment, environmental planning, and Indigenous land use for major resource projects
John Alan Jack	B.A. (Global Studies)	5.1 – Cultural Resources Setting	An elected leader for Huu-ay-aht First Nations since 2009; experience in modern and traditional governance practices for Huu-ay-aht First Nations, including use of natural resources and land-use
Mark Milner	M.Eng., P.Eng.	5.2.1 – Atmospheric Environment	Senior atmospheric environment specialist with 20 years of experience in air quality, noise, greenhouse gas, odour, and light assessments within the mining, transportation, oil and gas, industrial, and forestry sectors

Contributor	Credentials	Section(s)	Relevant Experience
Mike Demarchi	B.Sc., M.Sc., R.P.Bio.	5.2.2 – Marine Environment 5.2.4 – Terrestrial Environment 5.2.5 - Birds	Senior wildlife ecologist with over 25 years of experience in the marine and terrestrial environments of western Canada, including natural resources inventories, impact assessments, and work with Indigenous communities
Bob Bocking	B.Sc., MRM, R.P.Bio	5.2.3 – Freshwater Environment	Senior fisheries biologist with over 30 years of experience in the marine and freshwater environments of B.C. including salmon stock assessments, watershed assessments, impact assessments, and work with Indigenous communities
Marc d'Entremont	B.Sc., M.Sc., Ph.D., R.P.Bio.	5.2.5 - Birds	Senior wildlife biologist with over 20 years of experience in the marine and terrestrial environments of Canada, including natural resources research and management, environmental sciences, impact assessment, and work with Indigenous communities

1. Introduction

1 Introduction

Kwispaa LNG (CF) Limited Partnership (the "Developer"), a subsidiary of Steelhead LNG Limited Partnership ("Steelhead LNG"), is proposing to develop, construct, and operate a liquefied natural gas ("LNG") export facility at Nuumaqimyiis Bay (also known as Sarita Bay) in the Alberni Inlet on Vancouver Island, British Columbia ("BC"). The proposed Kwispaa LNG Project (the "Project") is being developed through a unique co-management relationship between Huu-ay-aht First Nations ("Huu-ay-aht") and the Developer (together the "Kwispaa LNG Team"). The Project is located approximately 11.5 kilometres ("km") from Anacla, 10 km northeast of Bamfield and 42 km southwest of Port Alberni on Vancouver Island, BC (**Figure 1-1**). The Project will produce and export approximately 24 million tonnes per annum ("mtpa") of LNG at full build-out and will have an initial lifespan of approximately 25 years for each phase.

The Kwispaa LNG Team anticipates the Project will be subject to a review under both the *Canadian Environmental Assessment Act, 2012*, SC 2012, c. 19 ("CEAA 2012") and the British Columbia *Environmental Assessment Act*, SBC 2002, c. 43 ("BCEAA") (see **Section 1.7** for details). Accordingly, the purpose of this Project Description is to:

- provide an overview of Project information to enable the Canadian Environmental Assessment Agency ("CEA Agency") and the BC Environmental Assessment Office ("BC EAO") to determine whether an environmental assessment ("EA") is required under their respective enabling legislation;
- if an EA under CEAA 2012 is required, provide information to assist the CEA Agency and Federal Minister of the Environment and Climate Change in determining whether the Project is to be reviewed through a substituted process led by the BC EAO; and
- provide other parties (e.g., Federal and Provincial government agencies, Indigenous groups, local and regional governments, the public) with information so that they can determine whether they have an interest that would be affected by the Project.

This Project Description has been prepared in accordance with the *Prescribed Information for the Description of a Designated Project Regulations* pursuant to CEAA 2012 (Government of Canada 2012a), the *Guide to Preparing a Description of a Designated Project under CEAA 2012* (CEA Agency 2015), and *Preparing a Project Description for an Environmental Assessment in British Columbia* (BC EAO 2018).

1.1 Kwispaa LNG Story

The most important of the 35 rivers and creeks in Huu-ay-aht's ḥahuułi (pronounced ha-houlthee) (traditional territory), the Sarita River, known as the "heart of the people", was given this name by Spanish explorers when they arrived in Huu-ay-aht's ḥahuułi. The proper Nuu-chah-nulth place name for the land adjacent to Nuumaqimyiis Bay (also known as Sarita Bay) is Kwispaa (pronounced kwis-pah-ah), a name that carries knowledge passed from generation to generation and is part of Huu-ay-aht's story map, which helped guide citizens from place to place. Kwispaa means "on the other side", as the area known as Kwispaa is on the other side of the bay from Nuumaqimyiis (pronounced new-muck-a-mis), Huu-ay-aht's traditional winter village located at the mouth of the Sarita River.

In November 2017, the Developer and Huu-ay-aht announced a change in the Project's name from Sarita LNG to Kwispaa LNG, following recommendations from Huu-ay-aht's LNG Advisory Committee and Ha'ẇiih (hereditary chiefs) Council. Naming the Project after the appropriate Indigenous place name demonstrates the Developer and Huu-ay-aht's commitment to reconciliation and co-management values.

1.1.1 Huu-ay-aht First Nations

Huu-ay-aht is a self-governing, modern treaty Nation with lands that are located in the Barkley Sound region on the west coast of Vancouver Island at the entrance to Alberni Inlet. Of the approximately 805 Huu-ay-aht citizens, 15 percent ("%") reside around the village of Anacla, the Nation's principal community near Bamfield. The remaining 85% live in Port Alberni, Greater Vancouver, across Vancouver Island, and beyond. The lands and waters making up Huu-ay-aht's ḥahuułi have been occupied by the Nation since time immemorial.

A signatory to the *Maa-nulth First Nations Final Agreement* (MFNFA 2009) (the "Maa-nulth Final Agreement"), the first modern-day treaty to be concluded on Vancouver Island, Huu-ay-aht has full ownership and jurisdiction over more than 8,200 hectares ("ha") of land within the Nation's ḥahuułi, allowing the Nation to govern the lands under a "made in Huu-ay-aht" Constitution. Guided by that Constitution and Huu-ay-aht's Sacred Principles, Huu-ay-aht's elected Council and Ha'ẇiih are working together to foster a safe, healthy, and sustainable community where their culture, language, spirituality, and economy flourish for all.

Huu-ay-aht's motto is "Ancient Spirit, Modern Mind." Ancient Spirit is the foundation of Huu-ay-aht's success in overcoming the impact of tsunamis, historic wars, and colonization of the past 150 years; Modern Mind is focused on using Huu-ay-aht's powers of self-government, treaty, and economic development to achieve the Nation's vision, bridging tradition and modernity.

Huu-ay-aht is guided by three Sacred Principles:

- **ʔiisaak**, or "Greater Respect", a public expression of not only personal but collective respect for the community and its people, traditional knowledge, the natural world, the metaphysical world, and other peoples and communities.
- **ʔuuʔałuk**, or "Taking Care Of…" in this context, this is about taking care of present and future generations as well as taking care of the resources provided by the land and the natural world.
- **Hišuk ma c̓awak**, or "Everything is One", a notion of the interconnected, interdependent and reciprocal relationship between the people, the land and the wider world(s) in a physical, spiritual, and social sense.

Further, Huu-ay-aht has developed a comprehensive Strategic Plan, with the following five posts:

1. **Our people** will be free from the negative effects of colonization.
2. **Our children** will grow up safe, healthy, and connected to our home and culture/values.
3. **Our home** will be a safe, healthy, appealing place where half our people choose to live.
4. **Our land** will provide sustainable wealth that respects Huu-ay-aht values of conservation.
5. **Our economy** will operate sustainably, is the major employer in the region, and the major source of revenue for the Nation.

1.1.2 The Developer

Kwispaa LNG (CF) Limited Partnership or the Developer, a subsidiary of Steelhead LNG, is an independent BC-based energy partnership focused on developing the Project to deliver Canadian LNG to global markets, benefiting local communities, BC, Canada, investors, and international customers.

The Developer believes BC's emerging LNG sector has the potential to create a wide range of long-term benefits for British Columbians and Canadians at large, and operates in a way that reflects the Developer's founding commitments, including:

- **Providing Significant Local Benefits:** The Developer is BC-based and focused on delivering the Project in a way that provides significant benefits for British Columbians while respecting the environment and considering the interests of British Columbians.
- **Collaborating with Indigenous Groups**: The Developer recognizes that all natural resource projects have the potential to affect the traditional territories of Indigenous peoples in BC. The Developer is committed to working together with potentially affected Indigenous groups to develop respectful relationships and ensure that engagement and consultation are conducted meaningfully. In addition, the Developer is committed to early engagement to develop projects that minimize potential adverse environmental, cultural, and socio-economic effects and that provide long-term benefits for current and future generations.
- **Protecting the Environment**: BC's greatest resource is the land that has sustained its people for millennia. The Developer's commitment to the land and waters in which the Project operates is transparent, unwavering, and science-based.
- **Building Canadian Capacity**: The Developer believes that Canadians have the entrepreneurial, educational, and natural resources to become world leaders in the responsible LNG development and is committed to supporting the development of Canada's LNG industry.
- **Engaging with Communities**: Communities have an important role to play in decisions that affect them. The Developer is committed to engagement with local communities and stakeholders that is meaningful, respectful, and transparent.
- **Creating Employment Opportunities**: The Developer is committed to developing and providing rewarding employment opportunities for British Columbians.
- **Realizing Social Benefits**: The Developer is committed to helping BC realize the enormous potential of the LNG industry to provide significant investments in health, education, and other programs for British Columbians.
- **Access to Markets**: The Developer is committed to helping Canadian natural gas producers access international markets and obtain fair prices for their products.
- **Return on Investment**: As a BC-based partnership unhampered by commitments to worldwide projects or non-LNG energy sectors, the Developer has adopted a focused and flexible approach to provide partners and customers with a fair and timely return on their investment.
- **Growing BC Businesses**: The Developer's investment in BC includes generating opportunities for BC-based businesses providing engineering, construction, accommodation, marine, transportation, and other LNG sector-related services.

Refer to **Section 1.3** for additional corporate information on the Developer.

1.1.3 Co-management Relationship

Steelhead LNG and Huu-ay-aht first met in February 2014 to discuss the idea of an LNG export project located in Huu-ay-aht's ḥahuułi. In May 2014, Steelhead LNG and Huu-ay-aht entered into an Opportunity Development Agreement, which established the principles and processes for exploring the development of an LNG project on Huu-ay-aht lands. From July to the end of November 2014, Huu-ay-aht and Steelhead LNG undertook a series of community engagement sessions within Huu-ay-aht communities on Vancouver Island (in Anacla, Port Alberni, Nanaimo, and Victoria) and in Vancouver to share information about the Project and listen to Huu-ay-aht citizens to understand any questions, concerns, and interests in respect of the Project. This early engagement included community engagement sessions, home visits, one-on-one meetings, workshops, and communications initiatives to build relationships with members of the community. In November 2014, Huu-ay-aht held their annual People's Assembly[1], which included a motion to support exploring the Project and a corresponding lease of Huu-ay-aht-owned lands for the Project. Huu-ay-aht citizens voted in favour of the motion, providing a mandate for Huu-ay-aht to negotiate lifecycle Relationship Agreements with Steelhead LNG.

Following the 2014 People's Assembly, Steelhead LNG and Huu-ay-aht leadership, under a newly elected Council (March 2015), spent three years negotiating Relationship Agreements. These agreements were framed by 14 conditions approved in the 2014 People's Assembly and were developed with input from Huu-ay-aht citizens, which was received in an extensive consultation process undertaken by Huu-ay-aht. In December 2016, Huu-ay-aht and Steelhead LNG reached an agreement-in-principle, and in February 2017, Huu-ay-aht consulted its citizens through a Special People's Assembly followed by a citizen referendum in March 2017 to approve a Project Agreement and Lease Agreement for the Project (the "Relationship Agreements"). Following endorsement by Huu-ay-aht's Ha'wiih Council and Executive Council, Huu-ay-aht citizens voted to approve the Relationship Agreements in the referendum. In June 2017, Steelhead LNG and Huu-ay-aht executed the Relationship Agreements for the Project.

Through these steps, Huu-ay-aht's elected government, Ha'wiih Council, and Huu-ay-aht citizens have given their free, prior, and informed consent for the Project in accordance with Huu-ay-aht's laws and traditions.

The Relationship Agreements ensure that economic prosperity is shared and recognize the full and fair return on the value that Huu-ay-aht places on its land, resource, and human capital investments. Unique among Canadian LNG projects, the Project features a co-management relationship, as set out in the Relationship Agreements, which ensures Huu-ay-aht and the Developer's interests are aligned, and the Project is advanced in a manner that reflects the values of Huu-ay-aht and the Developer. This innovative approach to project development embraces the principles of reconciliation and demonstrates how industry and Indigenous groups can work together to develop projects in a mutually beneficial manner that results in better projects delivering opportunities for local communities, BC, and Canada.

1.1.3.1 Co-management Governance

The Relationship Agreements establish the principles, terms, and processes between the Developer and Huu-ay-aht throughout the development, construction, operations, and decommissioning phases of the Project. The Relationship Agreements also establish a joint Project Oversight Board, which has three

[1] Enshrined in the *Huu-ay-aht First Nations Constitution Act* (HFNA 1/2011) the People's Assembly is a citizen's meeting where the assembly holds advisory powers and makes certain legally designated decisions.

representatives from each of the Developer and Huu-ay-aht, and is co-chaired to ensure the effective implementation of the Relationship Agreements and respect for the principle of co-management. Various joint workstreams report into the Project Oversight Board and are responsible for implementing key aspects of the Project (such as communications, environment and regulatory, Indigenous engagement, and stakeholder engagement). The Project Oversight Board provides guidance and oversight across the Project to ensure members of the Kwispaa LNG Team are progressing Project activities in a manner consistent with the agreed co-management approach.

In addition, to ensure the principle of co-management is integrated across all levels of the Project, the Relationship Agreements provide Huu-ay-aht with a seat as a Director on the Board of the general partner of the Developer.

1.1.3.2 Commitment to the Environment

One of the key issues identified through the early comprehensive engagement with Huu-ay-aht citizens was ensuring that the Project is developed, constructed, operated, and decommissioned in a manner that respects and protects the environment. As a result, the Relationship Agreements include a commitment to produce world-leading outcomes in respect of the environment, where economically and technically feasible. Key to the commitment to achieve world-leading outcomes is the successful implementation of an Environmental Management Framework, as defined in the Relationship Agreements, which seeks to address Huu-ay-aht interests in a manner that is timely, credible, effective, and adaptive. The Environmental Management Framework is implemented through the Kwispaa LNG Team's joint development and management of the EA process. This process includes joint scoping of all environmental studies, joint identification of Environmental Parameters (as established in the Relationship Agreements), and a joint team to conduct environmental studies and develop all submissions and environmental management plans to support and inform the regulatory approvals process. The Project Oversight Board, facilitated by a joint Environment and Regulatory Committee, oversees the implementation of the Environmental Management Framework.

In addition, the Relationship Agreements define the Project's site boundary, which was designed to avoid key cultural and other areas of importance to Huu-ay-aht, such as Santa Maria Island, the Nuumaqimyiis village site, the mouth of the Sarita River, a cemetery, and one adjacent residence.

The Relationship Agreements also provide funding to the ʔuuʔałuk Watershed Renewal and Fisheries Enhancement Fund to support renewal and enhancement activities for the Sarita, Sugsaw, and Pachena watersheds. Huu-ay-aht has developed and begun to implement the watershed renewal and enhancement program, which will help to restore fish and wildlife habitats and populations in and around Huu-ay-aht's "heart of the people".

1.1.3.3 Key Interests

During the negotiation of the Relationship Agreements, the Huu-ay-aht Government entered into a comprehensive consultation process with its citizens on their interests with respect to the Project. Through the Relationship Agreements, the Developer committed to ensuring that the Project is designed, constructed, operated, and decommissioned in a manner that avoids, minimizes, or offsets harmful impacts on the environment including environmental, economic, social, cultural, and health effects, where possible,

in accordance with the Environmental Management Framework. Key Huu-ay-aht interests were incorporated into the Relationship Agreements and Project design, which can be summarized as follows.

Environmental Interests

Environmental interests identified by Huu-ay-aht were incorporated into a comprehensive set of Environmental Parameters, which in turn were integrated into the Environmental Management Framework. The Environmental Parameters identify areas of concern, such as potential adverse effects on water quality, fish, and marine mammals. The Kwispaa LNG Team will study and collaboratively develop measures to mitigate potential adverse effects through the EA process to achieve world-leading outcomes on those identified Environmental Parameters, where technically and economically feasible.

Economic Interests

The Relationship Agreements are the mechanism to facilitate sharing Project benefits, including providing employment and business opportunities for qualified Huu-ay-aht citizens and immediate family members through the lifecycle of the Project. The Kwispaa LNG Team has established joint Employment and Training and Contract and Business Opportunities workstreams, which report directly to the Project Oversight Board to ensure implementation of the commitments in the Relationship Agreements. In addition, Huu-ay-aht has established a training and employment office for the life of the Project to support Huu-ay-aht citizens and immediate family members in accessing training and education to qualify for employment opportunities through each phase of the Project.

Facility Design

Through engagement with Huu-ay-aht, the Kwispaa LNG Team identified Huu-ay-aht interests that have influenced the planning and design of the Project, including:

- **avoiding key cultural sites**: the Sarita River and surrounding area, which encompasses the Project, comprise many culturally important and sensitive sites, including Santa Maria Island, as identified in Huu-ay-aht's Traditional Use and Occupancy Study (Traditions Consulting Services, Inc. 2016). To ensure the Project footprint avoids impacting any such sites identified by Huu-ay-aht, wherever possible, the Kwispaa LNG Team developed the Sarita Cultural Protection Line to define the area in which development may occur (the "Kwispaa LNG Area", **Figure 1-1**);
- **minimizing impacts on the marine environment**: a key concern is potential adverse effects of the Project on the marine environment and on marine harvesting by Huu-ay-aht citizens. Understanding the importance of minimizing potential adverse effects on the marine environment, including marine harvesting, the Developer has selected air cooling instead of water cooling as the cooling mechanism for the Project; and
- **reducing land disturbance**: the Kwispaa LNG Team sought to minimize the overall footprint and impact on the land, where possible. By utilizing Steelhead LNG's at-shore liquefied natural gas ("ASLNG™") technology, the Project will reduce its onshore footprint, thereby minimizing potential adverse effects on the land, as well as reducing decommissioning and reclamation activities following the end of the Project's lifespan.

Marine Safety

Huu-ay-aht citizens identified key concerns with respect to marine safety and the potential implications of an LNG carrier accident or malfunction. To mitigate this concern, the Developer committed to having a rescue tug as one of the tugs required for LNG carrier terminal operations at the Project site with enhanced capabilities to handle LNG carriers in the unlikely event of an accident or malfunction, such as a loss of power, that can operate in significant adverse weather conditions. The Developer has also committed to participate in Transport Canada's voluntary Technical Review Process of Marine Terminal Systems and Transhipment Sites ("TERMPOL"), a process focused on vessel safety and operation in Canadian waters along the proposed shipping route.

The Kwispaa LNG Team will continue to engage with Huu-ay-aht citizens to identify and understand their interests and concerns and will collaboratively identify measures to mitigate potential adverse effects through the process identified in the Environmental Management Framework.

1.2 Project Overview

The Project is an LNG processing and export facility, connecting plentiful natural gas resources in the Western Canadian Sedimentary Basin with markets worldwide while helping to ensure the development of and fair pricing for those provinces' natural gas resources. The Project will contribute to the advancement of the LNG sector in BC, promote the use of the cleanest-burning fossil fuel, generate economic opportunities for BC-based businesses, and provide long-term revenue generation for local, Provincial and Canadian economies to reinvest in health care, education, infrastructure, and other programs. Additional benefits include employment and business opportunities for Indigenous groups and other Vancouver Island community members.

The Project will source Canadian natural gas via a new pipeline between northeast BC and the west coast of Vancouver Island to the Project, using a combination of existing and new multi-utility corridors. The new natural gas pipeline will commence within the vicinity of the Chetwynd area (northeast BC) and terminate at the Kwispaa LNG Area. It will be approximately 1,000 km in length, with an anticipated diameter ranging in size from 36 inches to 48 inches. The pipeline is being developed by Steelhead Natural Gas Pipelines Ltd., a subsidiary of Steelhead LNG, which is owned separately from the Developer. The pipeline will undergo a separate environmental assessment process.

Feed gas received at site will be pipeline quality; however, further gas processing at the Kwispaa LNG facility will be required to remove components of the feed gas that may not meet LNG process specifications before entering the liquefaction trains where it will be chilled to its liquid form at approximately –162 degrees Celsius ("°C") to produce LNG for export to global markets.

The Project will include jetty-moored floating and onshore components. The Kwispaa LNG Area, shown on **Figure 1-1,** is the area where all Project components (aside from a potential electric transmission line) are anticipated to be located and includes an approximate 500 metre ("m") buffer (safety awareness zone) around the anticipated marine facility components. The approximate size of the Kwispaa LNG Area is 7.3 square kilometres ("km^2") or 730 ha, which is comprised of 255 ha of marine area and 475 ha of upland area. The arrangement of Project components within the Kwispaa LNG Area will be finalized based on ongoing Project design.

Key jetty-moored floating Project components will include up to four ASLNG™ production units (at full build-out), which will operate independently for the purposes of natural gas liquefaction and storage. The Project will store LNG in storage tanks integrated within the hull of the ASLNG™ sub-structure production units.

The ASLNG™ production units will be permanently moored to fixed jetties, and additional loading jetties will accommodate LNG carriers during loading. Onshore infrastructure will be comprised of pipeline receiving and metering facilities, a possible power generation facility, support buildings such as the central control room/administration building, maintenance workshop/warehouse and laboratory, site roads, and utility services. The infrastructure complex may also include worker accommodation and a facility for unloading and storing mixed refrigerant gases stored in a liquid state. Temporary construction infrastructure (e.g., storage and laydown areas) will also be based onshore within the Kwispaa LNG Area.

The Project is anticipated to be developed to a full build-out nameplate capacity of approximately 24 mtpa in two or three phases. The first phase will include construction and operation of two ASLNG™ production units; the remaining two ASLNG™ production units will be added as the second, and possible third, phase(s). Each ASLNG™ production unit, with a capacity of 6 mtpa, will require approximately 250 megawatts ("MW") of power (1,000 MW at full build-out), which may be supplied from either a self-generating power facility, Provincial (BC Hydro) transmission grid, or a combination thereof. The Kwispaa LNG Team is currently working with BC Hydro to explore options to power the Project with electricity provided from the Provincial grid. Electricity would be supplied to the site via a new electric transmission line constructed from the Dunsmuir substation approximately 20 km northwest of Qualicum Beach. Additional details on Project components and locations are provided in **Section 2** and **Section 3**, respectively.

Project design is currently in the conceptual stage. The first phase of Front-End Engineering Design ("FEED") for the Project is scheduled to start in early 2019. Design information from FEED will be incorporated into the Developer's Application for an Environmental Assessment Certificate ("Application") to the BC EAO[2]. Different options for certain Project components are currently being investigated, including:

- workforce accommodation;
- power supply; and
- source of freshwater for process and potable water as well as potential make-up water for a power generation facility.

The options currently under consideration are described in **Section 2**. Additional detail on the preferred options will be presented in the Application.

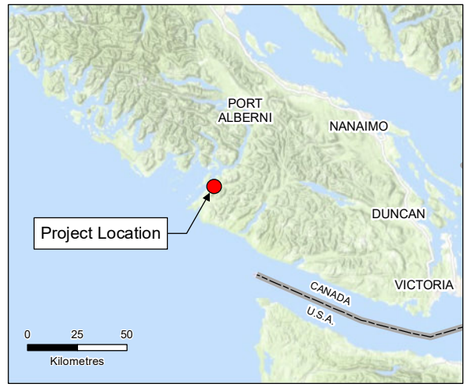
LNG carriers are anticipated to call at the Project approximately 160 times annually for the first phase (an average of three LNG shipments weekly) and approximately 320 times annually at full build-out (an average of six to seven LNG shipments weekly). The LNG carriers will travel from the Kwispaa LNG Area across the Pacific Ocean to LNG customers in Asia (**Figure 2-2**).

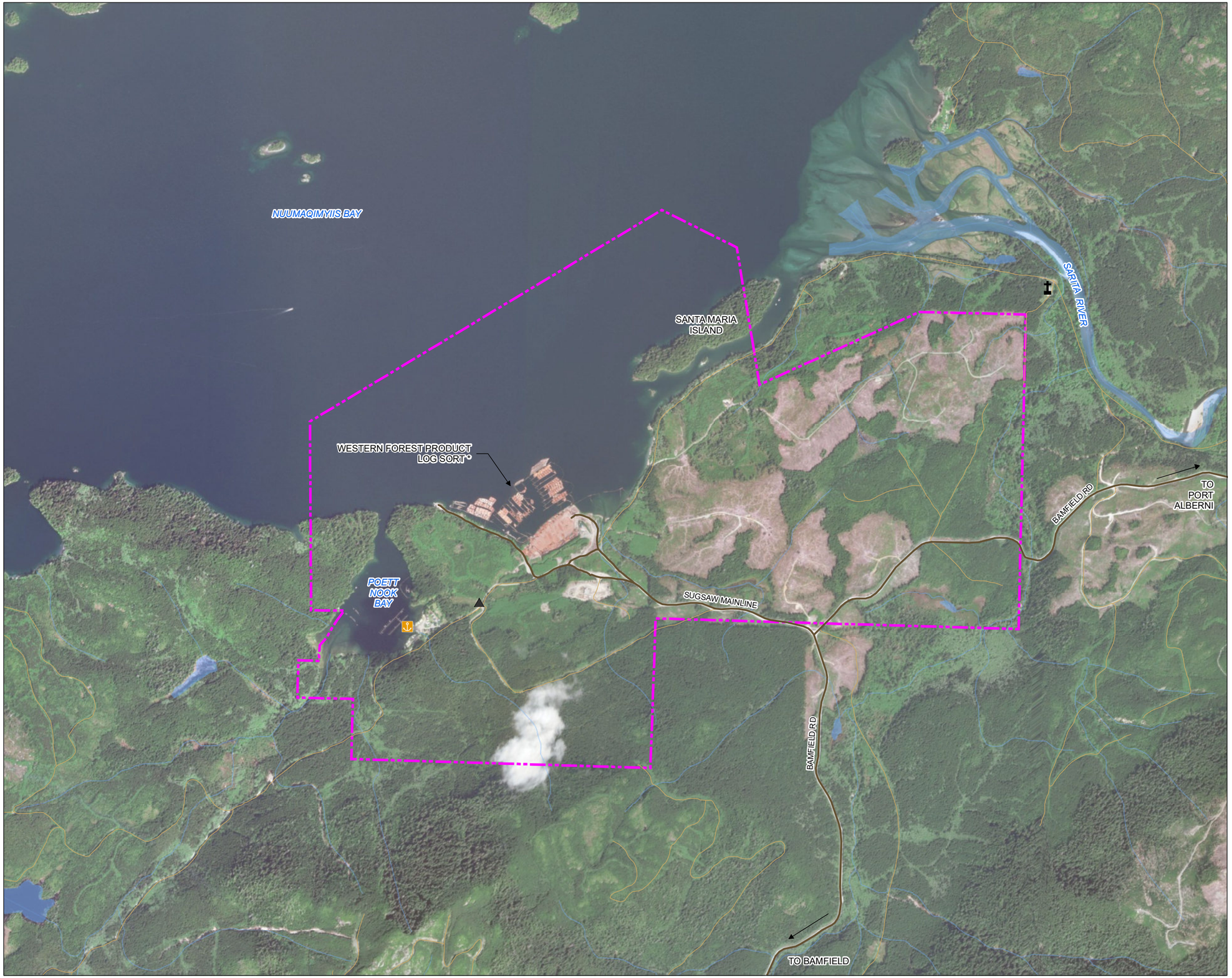
[2] Assuming a substituted Provincial EA process is undertaken.

KWISPAA LNG

Nuumaqimyiis Bay, BC

Proposed Kwispaa LNG Area Location





Legend

- Kwispaa LNG Area (Sarita Cultural Protection Line)
- Campground
- Cemetery
- Marina
- Loose Road (Maintained Gravel)
- Rough Road (Unmaintained Gravel or Dirt)

Notes

1. All mapped features are approximate and should be used for discussion purposes only.
2. This map is not intended to be a "stand-alone" document, but a visual aid of the information contained within the referenced Report. It is intended to be used in conjunction with the scope of services and limitations described therein.

Sources

- Marina: BCMCA
- Campground, Roads, Hydrological Features: Province of BC
- Aerial Image: ESRI World Imagery
- Inset Basemap: ESRI World Topo Base

N

1:20,000

0 200 400 600 800 1,000

Metres

NAD 1983 UTM Zone 10N

Page Size: 11" x 17"

102716-01	Production Date: Oct 5, 2018	Figure 1-1

Hemmera
An Ausenco Company

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1.3 Proponent Information

The Project will be developed by the Developer, a subsidiary of Steelhead LNG Limited Partnership, a private Canadian partnership. The Developer, drawing on the expertise, experiences, and resources of its staff, executive team, and consultants, will design, construct, and operate the Project.

Contact information for the Kwispaa LNG Team and the main contact person for the EA process is provided in **Table 1-1**.

Table 1-1 Proponent Information and Key Contacts

Name of the Designated Project	Kwispaa LNG Project
Name of the Proponent	Kwispaa LNG (CF) Limited Partnership
Proponent Corporate Address	1075 West Georgia, 22nd Floor Vancouver, BC Canada V6E 3C9
Proponent Contact Information	Email: info@kwispaalng.com Phone: 604 235 3800
Company Website	www.kwispaalng.com
Company President	Victor Ojeda
Principal Contact Person for Kwispaa LNG Project Description	Tiffany Murray VP, External Affairs tiffany.murray@steelheadlng.com 604 235 3800

1.4 Engagement with Huu-ay-aht First Nations

Through the Relationship Agreements, the Kwispaa LNG Team has developed an integrated approach to advance joint workstreams to implement key Project activities, including engagement with Indigenous, stakeholder, and public groups. See **Section 1.1.3** for an overview of relationship and engagement activities with Huu-ay-aht.

Huu-ay-aht's government leads consultation with its citizens on the Project in a manner consistent with the Nation's traditions and laws. The Developer supports and participates in this engagement as requested and appropriate. Huu-ay-aht's consultation with citizens includes:

- an LNG advisory committee composed of citizen representatives, chaired by a Huu-ay-aht government representative, and supported by administrative staff and advisors;
- community engagement sessions;
- reports to the Huu-ay-aht's People's Assembly; and
- communications materials available in Huu-ay-aht's office and on Huu-ay-aht's website/social media.

1.5 Potentially Affected Indigenous Groups

The Kwispaa LNG Team understands that the Project has the potential to affect the rights and interests of neighbouring Indigenous groups and is committed to engaging early and in a meaningful and respectful manner to develop the Project in a way that minimizes potential environmental, cultural, and socio-economic effects and provides long-term benefits for current and future generations.

An overview of the Kwispaa LNG Team's approach to engagement with other Maa-nulth First Nations and other potentially affected Indigenous groups is discussed in greater detail in **Section 6**.

1.6 Stakeholders and Other Parties

The Kwispaa LNG Team is committed to engaging early and meaningfully to understand interests and concerns regarding the potential effects to local communities and stakeholders, sharing Project information, seeking feedback, and addressing concerns in a timely and responsive manner.

An overview of the Kwispaa LNG Team's approach to engagement with the public, stakeholders, government, and interested parties is discussed in greater detail in **Section 6.3**.

1.7 Environmental Assessment Regulatory Requirements

The Kwispaa LNG Team anticipates that the Project will require reviews under both CEAA 2012 and BCEAA. Under CEAA 2012, the Project meets the criteria for a designated project under the *Regulations Designating Physical Activities* (Government of Canada 2012b) (**Table 1-2**). Under BCEAA, the Project meets the criteria for a reviewable project under the *Reviewable Projects Regulation* (Government of BC 2002) (**Table 1-3**).

Table 1-2 Regulations Designating Physical Activities

Section	Physical Activity/Threshold	Relevant Project Component/Capacity
2a	The construction, operation, decommissioning and abandonment of a new fossil fuel-fired electrical generating facility with a production capacity of 200 MW or more	The Project may include a power generation facility with a capacity of up to approximately 1,000 MW (at full build-out), pending outcome of power study with BC Hydro
14d	The construction, operation, decommissioning and abandonment of a new facility for the liquefaction, storage or regasification of LNG, with an LNG processing capacity of 3,000 tonnes ("t")/day or more or an LNG storage capacity of 55,000 t or more	The Project's LNG processing capacity will be a nameplate 24 mtpa (at full build-out), which averages approximately 69,164 t/day. The facilities will also be capable of storing up to approximately 1.2 million cubic metres ("m^3") of LNG
24c	The construction, decommissioning, and abandonment of a marine terminal designed to handle vessels larger than 25,000 deadweight tonnage unless the terminal is located on lands that are routinely and have been historically used as a marine terminal or that are designated for such use in a land use plan that has been the subject of public consultation	The Project will include development of a marine terminal capable of handling LNG carriers of more than 25,000 deadweight tonnage

Source: CEAA 2012

Table 1-3 Reviewable Projects Regulation Criteria

Project Category	Criteria/Threshold	Relevant Project Component
Part 4 – Energy Projects		
Power Plants (Table 7 within the Reviewable Projects Regulation)	A new facility with a rated nameplate capacity of ≥50 MW of electricity that is a thermal electric power plant	The Project may include a power generation facility with a capacity of up to approximately 1,000 MW (at full build-out), pending the outcome of power study with BC Hydro
Electric Transmission Lines (Table 7 within the Reviewable Projects Regulation)	A new electric transmission line >40 km in length on a new right-of-way	The Kwispaa LNG Team is currently investigating the use of Provincial grid power from BC Hydro to partially or entirely satisfy the requirement for a power generation facility. Using Provincial grid power would require construction of an electric transmission line >40 km in length
Energy Storage Facilities (Table 8 within the Reviewable Projects Regulation)	A new energy storage facility with the capability to store an energy resource in a quantity that can yield by combustion >3 picojoules of energy	The Project will be capable of storing an amount of LNG that can yield >3 picojoules of energy by combustion
Part 8 – Transportation Projects		
Marine Port Facilities (Other than Ferry Terminals) (Table 14 within the *Reviewable Projects Regulation*)	Construction of a new facility or modification of an existing facility, if the work entails dredging, filling, or other direct physical disturbance of: >1,000 m of linear shoreline, or ≥2 ha of foreshore or submerged land, or a combination of foreshore and submerged land, below the natural boundary of a marine coastline or marine estuary	Construction of the terminal and associated infrastructure is expected to result in the disturbance of approximately 1,250 m of linear shoreline and >2 ha of foreshore and submerged land

Source: BCEAA

Notes: > - greater than; ≥ - greater than or equal to

If both the BC EAO and CEA Agency determine that EAs are required, it is anticipated the BC EAO will request that the Federal Minister of Environment and Climate Change approve the substitution of the Provincial EA process for the Federal EA process. If substitution is approved, BC EAO will conduct a single EA for the Project that addresses the conditions in the Federal Minister of Environment and Climate Change's Substitution Decision. At the end of the EA, both the Federal Minister of Environment and Climate Change and the responsible Provincial ministers will make separate decisions regarding the Project. If substitution is not approved, it is anticipated that the BC EAO and the CEA Agency would coordinate their respective EA processes.

According to Chapter 22 of the Maa-nulth Final Agreement, Federal and Provincial laws apply in relation to EA on Maa-nulth First Nation Lands (MFNFA 2009). Maa-nulth First Nation Governments may each make laws applicable on their respective lands to protect, preserve, and conserve the environment, including:

- prevention, mitigation, and remediation of pollution and degradation of the environment;
- waste management, including solid wastes and wastewater;
- protection of local air quality; and
- environmental emergency response (MFNFA 2009).

Under the Maa-nulth Final Agreement, Huu-ay-aht has the ability to draw down authority for EA within Huu-ay-aht lands; however, Huu-ay-aht will not draw down that authority in respect of the Project.

Key permits anticipated to be required for the Project under laws enacted by Huu-ay-aht are summarized in **Section 4.3**.

1.8 Regional Environmental Study

The Project is not located in an area that has been the subject of a Federal regional environmental study as defined in CEAA 2012.

2. Project Information

2 Project Information

This section provides a general description of the Project, information regarding Project-related components and activities, a summary of the emissions, discharges, and wastes associated with the Project, and information regarding the proposed Project schedule.

2.1 General Description and Objectives

Over the last decade, global demand for LNG has steadily increased in Asia and Europe. According to BC's Natural Gas Strategy, this growth is expected to continue as countries pursue alternatives to diesel and coal to support cleaner electricity generation, heating, and transportation requirements (BC MEMPR n.d.). The Project will help meet the increasing demand, connecting plentiful natural gas resources in the Western Canadian Sedimentary Basin with markets worldwide to reduce global air pollution and GHGs while helping to ensure the development of and fair pricing for those provinces' natural gas resources.

The Project will contribute to the advancement of the LNG sector in BC, promote the use of the cleanest-burning fossil fuel, generate economic opportunities for BC-based businesses, and provide long-term revenue generation for local and Provincial economies to reinvest in health care, education, infrastructure, and other programs. The Project will also contribute to economic reconciliation in BC by recognizing and implementing Huu-ay-aht authority over economic development on Huu-ay-aht lands.

The Project will also assist Huu-ay-aht in implementing the right to self-determination, realizing the promise of its modern treaty, and implementing its Strategic Plan. Huu-ay-aht's vision includes reaching the following goals by 2033:

- Huu-ay-aht people will be free from the negative effects of colonization;
- Huu-ay-aht children will grow up safe, healthy, and connected to their home, culture, and values;
- Huu-ay-aht's home will be a safe, healthy, appealing place where half of its people choose to live;
- Huu-ay-aht land will provide sustainable wealth that respects Huu-ay-aht values of conservation; and
- Huu-ay-aht's economy will operate sustainably and will be the major employer in the region and the major source of revenue for the Nation.

2.2 Project Components and Activities

This section provides a summary of Project-related components and activities. The information included herein is based on conceptual design and may change as design progresses. Updated information will be provided in the Application.

2.2.1 Project Components

The Project will include up to four ASLNG™ production units that liquefy natural gas, each with a production capacity of approximately 6 mtpa (up to approximately 24 mtpa at full build-out). Each ASLNG™ production unit also includes integrated LNG storage of approximately 300,000 cubic metres ("m^3") (up to approximately 1.2 million m^3 at full build-out). The ASLNG™ production units will be permanently moored to fixed marine jetties with supporting infrastructure on land.

Consideration is being given for implementing carbon capture and treatment technology with a view to making high-quality carbon dioxide ("CO_2") available to a green technology demonstration and prototyping park. The Developer will continue to investigate and may enable promising technologies access to high-quality CO_2, infrastructure and utilities to prove out the technical and commercial viability of carbon use/conversion concepts in a dedicated technology park.

The key Project components include the following:

- feed gas distribution system, including pressure let-down facilities;
- power generation, supply aggregation, and distribution facility;
- electric transmission line (under investigation with BC Hydro);
- onshore gas processing and pre-treatment;
- ASLNG™ production units, including integrated LNG storage;
- marine terminals and jetties; and
- balance of plant-supporting infrastructure.

Individual components within each of the key components are identified in **Table 2-1**, shown in **Figure 2-1**, and discussed in the following sub-sections. The design information presented herein is conceptual and will be refined and finalized as Project design advances.

Table 2-1 Project Components

Key Components and Capacities	Individual Components
Feed gas distribution system Up to approximately 113 million m^3 of natural gas per day at full build-out	On-site natural gas piping to the ASLNG™ production units and power generation facility Pipeline isolation valves and pressure let-down facilities
Power generation, supply aggregation, and distribution facility Up to approximately 500 MW of power generation for 12 mpta and up to approximately 1,000 MW of power generation at full build-out	• Power generation ▪ Gas turbines ▪ Steam turbines ▪ Heat recovery steam generator ▪ Electrical generators ▪ Transformers ▪ Auxiliary equipment • Aggregation ▪ Switching station ▪ Transformers ▪ Auxiliary equipment • Distribution ▪ Electric transmission lines ▪ Auxiliary equipment

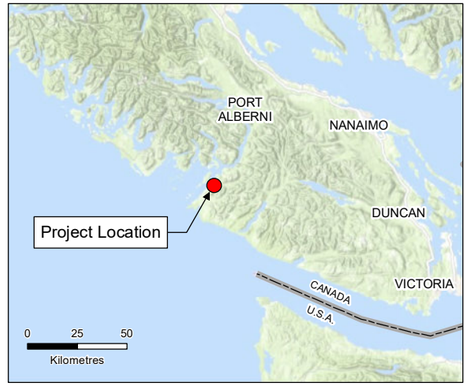
Key Components and Capacities	Individual Components
Onshore feed gas processing and pre-treatment facilities	• Removal of the following elements from the feed gas to prepare for liquefaction: ▪ CO_2 ▪ Mercury ▪ Heavier hydrocarbons ▪ Water ▪ Sulphur compounds
ASLNG™ production units Up to four units with an individual storage capacity of up to approximately 300,000 m^3 (1.2 million m^3 total) at full build-out	• Natural gas, LNG, high-voltage electrical and utilities interface connection • Liquefaction process system • Integral LNG storage • Boil-off gas compression system • Supporting utilities, including potential desalination for domestic and safety purposes • Marine systems • Process controls and safety systems • Safety flares and vent systems
Marine terminals Up to one jetty per ASLNG™ production unit, each up to approximately 300 to 400 m long Up to two LNG carrier berths	• Marine jetties for mooring of the ASLNG™ production units • Gas service marine loading arms for gas supply • Conventional marine loading arms or hoses for transfer of LNG to LNG carriers and vapour return • Tugs and small craft jetty • Dedicated marine offloading facility
Supporting infrastructure (either onshore or at-shore)	• Onshore flare • Central control room/administration building, maintenance workshop/warehouse, laboratory, and customs/port authority offices as appropriate • Utilities infrastructure, including water and wastewater treatment systems • Stormwater management system • Marine offloading facility • Permanent workforce accommodations for operations staff (approximately 300 individuals) • Temporary construction camp (1,500 to 2,000 individuals) • Temporary concrete batch plant • Storage and laydown areas • Access roads • Firewater system, including potential freshwater storage • Refrigerant storage • Medical services • Perimeter fencing

Key Components and Capacities	Individual Components
Electric transmission line (under investigation) Up to two dual 230 kilovolt ("kV") lines on single structures or one 500 kV line, approximately 90 km in right-of-way length	• Electric transmission line • Switching station • Transformers • Variable frequency drives • Auxiliary equipment

KWISPAA LNG | Shell LNG | huuayaht

Nuumaqimyiis Bay, BC

Proposed Kwispaa LNG Project



NUUMAQIMYIIS BAY

ASLNG™ AND MARINE TERMINAL LAYOUT

MARINE OFFLOADING FACILITY AND SMALL CRAFT JETTIES

POWER GENERATION AND DISTRIBUTION

GAS PROCESSING AND PRE-TREATMENT

PIPELINE GAS RECEIVING FACILITIES

SUPPORTING INFRASTRUCTURE

LAYDOWN STORAGE AND EQUIPMENT OFFLOADING

SUGSAW MAINLINE

SARITA RIVER

BAMFIELD RD

TO PORT ALBERNI

TO BAMFIELD

FREDRICK LAKE

Legend

- Kwispaa LNG Area (Sarita Cultural Protection Line)
- Marine Project Components
- Onshore Project Components
- Water Supply Intake and Pipe Option
- Road to be Upgraded
- Loose Road (Maintained Gravel)
- Rough Road (Unmaintained Gravel or Dirt)

Project Components

- ASLNG™ and Marine Terminal Layout
- Gas Processing and Pre-Treatment
- Laydown Storage and Equipment Offloading
- Marine Offloading Facility and Small Craft Jetties
- Pipeline Gas Receiving Facilities
- Power Generation and Distribution
- Supporting Infrastructure

Notes

1. All mapped features are approximate and should be used for discussion purposes only.
2. This map is not intended to be a "stand-alone" document, but a visual aid of the information contained within the referenced Report. It is intended to be used in conjunction with the scope of services and limitations described therein.

Sources

- Marina: BCMCA
- Campground, Roads, Hydrological Features: Province of BC
- Aerial Image: ESRI World Imagery
- Inset Basemap: ESRI World Topo Base

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Metres

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2.2.1.1 Feed Gas Distribution System

The Project will be supplied by a natural gas pipeline terminating within the Kwispaa LNG Area. It is expected that the pipeline will include a land or marine-based approach as it enters the receiving area, although the exact route of the pipeline is yet to be determined. The natural gas receiving facility, as part of the natural gas pipeline project, will consist of pipeline isolation valves for emergency isolation, a metering station, and pig receiver to ensure a smooth flow of natural gas. The area downstream of metering, as part of the Project, will consist of a feed gas distribution system to the Kwispaa LNG liquefaction facilities, including pressure let-down facilities, power generation, gas processing, and ancillary systems.

At full build-out, approximately 113 million m^3 of natural gas per day will be received at the pipeline receiving facility. Of this gas, approximately 107 million m^3 per day will be processed and liquefied, the remainder (approximately 5% to 7%) will be used to run the power generation facility (pending the outcome of the power study with BC Hydro, this volume of gas may be lower if power from the Provincial grid is integrated into Project design).

2.2.1.2 Power Generation Facility

Each 12 mtpa build-out of the Project will require approximately 500 MW of power, which may be supplied from either a self-generation power facility, Provincial (BC Hydro) transmission grid, or a combination thereof.

The Developer is currently investigating these power supply options. The preferred option will be described in the Application.

2.2.1.3 Onshore Feed Gas Processing and Pre-treatment Facilities

The onshore gas processing and pre-treatment facilities will include all of the infrastructure associated with the front-end conditioning of natural gas arriving via pipeline to the Kwispaa LNG Area into natural gas that is ready for the liquefaction process. The final configuration of the feed gas pre-treatment facilities will be developed during the FEED process; however, it is anticipated that the design will consist of parallel trains of feed gas pre-treatment, with each pre-treatment train being capable to treat the amount of feed gas required for one ASLNG™ production unit. Prior to the liquefaction process, the following elements will be removed from the feed gas:

- CO_2;
- mercury;
- heavier hydrocarbons;
- water; and
- sulphur compounds.

2.2.1.4 ASLNG™ Production Units

Feed gas will be transferred from the jetty to each ASLNG™ production unit via hoses or rigid marine loading arms with articulated joints. The dimensions of each ASLNG™ production unit are expected to be approximately 340 m long by 60 m wide. Approximately 12 m to 15 m of the hull will be below the water's surface; the height above water level to the main hull deck of each ASLNG™ production unit will be approximately 25 m.

The natural gas liquefaction process will involve the use of a mixed refrigerant gas to chill the feed gas to approximately −162°C and store it at near atmospheric pressure. The mixed refrigerant will comprise a mixture of hydrocarbons and inert gases and will operate in a closed-loop system with minimal make-up requirements. Make-up refrigerants are expected to be sourced from a commercial operator, and storage will be on the ASLNG™ production units or onshore. An air-cooling system is proposed as part of the refrigeration system of the liquefaction process. All boil-off and end flash gas will be recovered and either used as fuel gas in the power generation facility or re-liquefied.

Each ASLNG™ production unit will have integrated storage capacity. Total LNG storage for the Project will be approximately 1.2 million m^3 at full build-out, or up to approximately 300,000 m^3 for each ASLNG™ production unit. Integrated storage will comprise approximately five individual tanks within the hull of each ASLNG™ production unit. LNG will be transferred directly to an LNG carrier from the dedicated loading jetties.

The ASLNG™ production units will include the following ancillary systems to support the process requirements:

- hydraulic oil valve system;
- bilge system – the bilge system is normally used to drain bilge water from the bilge wells, but is also used for emergency situations such as flooding to ensure stability of the ASLNG™ production units;
- ballast water system – the ballast water system will use ballast water to control hull bending, shear forces, trim, and heel while maintaining the stability of ASLNG™ production units within acceptable limits; ballastless operations are currently being investigated, which utilize the internal transfer of ballast water within the ASLNG™ production units only;
- cofferdam heating system – the cofferdam heating system ensures that the structural steel of the ASLNG™ production units remains at a temperature within acceptable tolerances and prevents icing on the inner hull structure;
- freshwater generation and distribution system;
- firewater distribution system;
- nitrogen system – self-generated nitrogen membrane package system fed by air;
- service and instrument air systems;

- inert gas system – the main purpose of inert gas generation system is to produce and supply inert gas to replace the tank hydrocarbon gas environment as part of the sequence to achieving an atmospheric condition in the tank for maintenance; and
- high voltage electrical and utilities interface connection between onshore infrastructure and each ASLNG™ production unit.

Each ASLNG™ production unit will have its own automation system, which incorporates an emergency shutdown system for safe and reliable operation. These individual ASLNG™ controls and systems will be part of an integrated control and safety system ("ICSS").

Each ASLNG™ production unit will have its own dedicated flare system, which will enable the safe depressurization and disposal of hydrocarbon vapour from process, utility, LNG storage, and offloading systems. The flare system is not used during normal operations but may be used during start-up, preparation of equipment for maintenance, plant upset, and emergency and shutdown conditions. An additional flare will be located onshore (up to a total of five flares at full build-out). Flaring will not occur under normal operation.

2.2.1.5 Marine Terminals

The marine terminals consist of up to approximately four independent jetties for permanent mooring of the ASLNG™ production units and two independent jetties for LNG carrier berthing and loading. Components may include the following:

- up to four marine jetties for mooring of the ASLNG™ production units, equipped with pedestrian and vehicle access onto the ASLNG™ production units;
- mooring dolphins, mooring hooks, mooring bollards, and fenders;
- loading arms or hoses to transport gas from land to the ASLNG™ production units;
- LNG and vapour return loading arms or hoses for transfer of LNG from ASLNG™ production units;
- LNG and vapour return loading arms or hoses for transfer of LNG to LNG carriers;
- dedicated marine offloading facility;
- tugs and small craft jetty; and
- passenger ferry facility.

The mooring and berthing arrangements include a jetty at each ASLNG™ production unit. The jetties will accommodate the loading arms or cryogenic hoses, as well as the interconnecting piping, personnel gangway, and crane or ramp for material transfer to the ASLNG™ production units. If individual jetties are the preferred option, each jetty will be independently connected to the shore and will be serviced by a common roadway along the shoreline. Pipe racks for natural gas supply, LNG transfer, boil-off/end flash gas return, and electrical and communication cables for the ICSS will be located adjacent to, or beneath, the common roadway.

Infrastructure will include a tug and small craft jetty, which will allow tugboat(s) to be on stand-by as required, as well as a possible dedicated passenger ferry jetty. Infrequent support may also occasionally be required from supply vessels and small work barges (giving access for maintenance).

If required, a marine offloading facility will be built as a stand-alone bulkhead or jetty to facilitate roll-on, roll-off transfer of major construction, fabrication, and maintenance equipment, as well as any operational equipment required for the Project.

2.2.1.6 Supporting Infrastructure

In addition to an onshore power generation facility, proposed supporting infrastructure will include support buildings, utilities, electrical switchyard, access roadways, and pipe and cable racks. Dedicated workforce accommodation is also an option being considered.

2.2.1.6.1 Administration, Maintenance, and Support Buildings

Buildings for centralized administration and oversight, including a main central control room for monitoring and controlling the entire Project, will be developed onshore. Maintenance workshops, separate storage warehouses for equipment spares, and a laboratory will also be located onshore. Storage facilities will include both enclosed storage facilities and outdoor laydown areas.

Onshore medical facilities will include first-aid stations, medical room(s) with beds and certified first-aid staff, dedicated communications devices for requesting outside emergency aid, a helipad for emergency airlift, first-aid kits, and space for equipment storage.

2.2.1.6.2 Water and Wastewater Treatment

The Kwispaa LNG Area is not located near a municipal water supply or wastewater treatment system. Freshwater for process and potable water as well as potential make-up water for the power generation facility (if required) will be supplied using groundwater, surface water, or a combination thereof. Potential options for water sources are still being determined. Currently identified potential sources of surface water include Frederick Lake and Sarita River. Freshwater may be stored on-site with storage capacity based on demand and supply (e.g., firewater demand for manned buildings). Depending on the source, water for domestic use may require on-site treatment to comply with drinking water standards.

The Developer is committed to disposing of all wastes produced in accordance with applicable regulations. Wastewater treatment plant(s) will be built within the Kwispaa LNG Area; they will be designed based on the Project and site characteristics, and in accordance with applicable requirements (e.g., Provincial and Federal water quality guidelines). No untreated wastewater will be discharged. The location of the treatment plant and associated discharge point will be selected during the detailed design phase. Treated wastewater will be discharged to the marine environment in compliance with wastewater regulations.

2.2.1.6.3 Stormwater Management System

The Project will include systems to control surface water runoff. If required to meet water quality guidelines, stormwater will be collected, stored, and treated prior to discharge to the marine environment.

2.2.1.6.4 Workforce Accommodations

The construction and operations workforce will be recruited locally to the extent possible, including employing qualified Huu-ay-aht citizens. Project construction and operations will require some specialized trades and personnel with relevant qualifications and experience, including positions with LNG experience (particularly in the start-up phase) who will likely be sourced from elsewhere in BC, Canada, or internationally.

During Project construction, temporary workforce accommodations for non-local personnel capable of accommodating up to approximately 1,500 to 2,000 individuals may be required. These facilities may include a kitchen, dining areas, recreational areas, and laundry and would likely involve engaging a catering/facility services provider to administer and deliver accommodation services. During Project operations, permanent workforce accommodations may be required to house approximately 300 operations staff. The location and size of any required accommodations will be further defined as design progresses, and additional information will be provided in the Application.

2.2.1.6.5 Access Roads

The Kwispaa LNG Area is adjacent to the Bamfield Main (or "Bamfield Road"), a Forest Service Road between Port Alberni and Bamfield, which is regularly used for access to local communities, recreational activities and for industrial purposes. The Kwispaa LNG Area is accessible by the Sugsaw Mainline.

As a Forest Service Road, the Bamfield Road is administered by the Provincial Government and is currently maintained by Western Forest Products Inc. under a road use permit. Given that major Project components will likely be brought to the Kwispaa LNG Area by a marine route, no upgrades are being proposed to Bamfield Road as part of the Project. Upgrades to Sugsaw Mainline as well as the construction of new access roads within the Kwispaa LNG Area will be undertaken as part of the Project. These on-site access roads will be under the care and control of the Developer during Project construction and operations.

2.2.1.7 Electric Transmission Line

The Kwispaa LNG Team is currently working with BC Hydro to explore options to power the Project with electricity provided from the Provincial grid. Electricity would be supplied to the Project site via 230 kV or 500 kV electric transmission lines constructed from the Dunsmuir substation located approximately 20 km northwest of Qualicum Beach. In the case of 230 kV lines, up to two new dual 230 kV electric transmission lines on single structures would be required at full build-out. In the case of 500 kV lines, one new 500 kV electric transmission line would be required at full build-out. The anticipated length of the transmission line right-of-way is approximately 90 km. Where possible, the electric transmission line will be routed to align with existing utility corridors and roads to the Kwispaa LNG Area.

Studies are currently underway to determine the preferred electric transmission line route between the Dunsmuir substation and the Kwispaa LNG Area. The preliminary electric transmission line route is described herein; additional information will be provided in the Application Information Requirements document. From the Dunsmuir substation, the electric transmission line is expected to travel generally south toward Horne Lake. The optimal route past Horne Lake has not yet been determined; however, the current corridor under consideration follows an area west of Spider Lake and Cameron Lake and east of Mount Schofield and Esary Lake. The electric transmission line will then pass the City of Port Alberni to the east. South of Port Alberni, the electric transmission line will generally parallel the Bamfield Road to the Kwispaa LNG Area.

2.2.2 Project Activities

This section summarizes the main activities that will be required as part of each phase of the Project. All activities will be under the care and control of the Developer unless otherwise indicated.

2.2.2.1 Construction

Construction activities will include site preparation as well as the construction and installation of Project components described in **Section 2.2.1**. These activities are expected to include those listed below; the required activities will be refined as design progresses:

- potential localized removal and disposal of marine sediments to accommodate marine terminals and ASLNG™ production units[3];
- unloading of materials and equipment at Kwispaa LNG Area from trucks and barges;
- potential clearing and grubbing of areas not already cleared for existing industrial activity;
- potential blasting and grading, where required, to accommodate Project infrastructure;
- construction of the water supply system, including intake, treatment, and distribution;
- installation of stormwater management, erosion prevention, and sediment control measures;
- mobilization and construction of onshore components, including temporary workforce accommodation, administration buildings, power station and electrical transmission, external power reception, gas treatment plant, laydown areas, customs areas, and warehouses;
- potential mixing of concrete at an on-site batch plant;
- construction of marine jetties;
- upgrading and construction of on-site roads;
- installation of perimeter fencing and onshore access/security gates;
- permanent mooring of the ASLNG™ production units;
- construction of electric transmission line (under investigation);
- connection of utilities (e.g., electrical, controls, gas, water) to the ASLNG™ production units;
- potential rehabilitation or stabilization of areas not required for the operations phase;
- generation of electricity for construction activities (e.g., using portable generators);
- accommodation of workers in a temporary construction camp;
- waste disposal and recycling in accordance with applicable legislation; and
- decommissioning of any temporary facilities.

Construction activities may occur up to 24 hours per day, seven days per week.

[3] Dredging to allow for marine navigation is not proposed for the Project.

The Project is anticipated to be developed in two or three phases. The first phase will include two ASLNG™ production units, onshore infrastructure, and associated power generation once the applicable permits are in place and pre-construction requirements are met. The remaining two ASLNG™ production units, onshore infrastructure, and potential associated power generation facilities will be added as the second phase and potentially third phase, the timing of which will be subject to market demand (anticipated within two to three years of the first phase).

The ASLNG™ production units will be built offsite and towed to Kwispaa LNG Area for installation and commissioning.

Construction materials will be transported to the Kwispaa LNG Area using existing land access roads and marine transportation routes. The method of transporting materials to and from the Kwispaa LNG Area will be dictated by practicality and is anticipated to employ a combination of both marine and vehicle transportation modes.

2.2.2.2 Operations

The operations phase will include operation of Project components described above to produce, store, and ship LNG to international markets. Project-related activities during the operations phase are expected to include the following:

- start-up and commissioning support;
- delivery of natural gas via the feed gas distribution system;
- power generation, aggregation (potential power sources include power generation facilities and Provincial (BC Hydro) grid power), and distribution to Project components including ASLNG™ production units;
- gas reception and treatment in onshore gas processing units;
- liquefaction of natural gas at the ASLNG™ production units;
- storage and offloading of LNG at the ASLNG™ production units;
- mooring, loading and transit of LNG carriers, including the assistance of tugs;
- accommodation of workers in the workforce accommodation buildings, if required;
- water collection, treatment[4] and use;
- wastewater, stormwater, and process water treatment and disposal;
- waste disposal and recycling in accordance with applicable legislation;
- import of liquid refrigerant gases (by land or sea); and
- planned and unplanned maintenance.

[4] Desalination for domestic and safety use may occur on the ASLNG™ production units for small volumes of water. This water may be used for potable water, safety systems (e.g., safety shower, eye washes), and utility wash-down water.

2.2.2.3 Decommissioning

The decommissioning phase will comprise removal of the ASLNG™ production units for either re-use elsewhere or for full decommissioning and scrapping or recycling at a dedicated facility. Onshore infrastructure and facilities will be removed, vacated, and the Kwispaa LNG Area restored as appropriate in accordance with the Relationship Agreements and applicable regulatory requirements. The Project has an expected operational lifespan of at least 25 years for each phase, which may be extended.

2.2.2.4 Physical Activities Incidental to the Project

LNG produced by the Project will be offloaded from the ASLNG™ production units to LNG carriers via dedicated jetties, which are designed to accommodate LNG carriers with capabilities ranging from 125,000 m^3 to 216,000 m^3. The Kwispaa LNG Team anticipates that the average LNG carrier calling at the facility will have a capacity of approximately 180,000 m^3, which will result in approximately 160 shipments of LNG per year for the first phase (an average of three LNG shipments weekly) and approximately 320 shipments of LNG per year at full build-out (an average of six to seven LNG shipments weekly).

Such LNG carriers will be escorted and moored with the assistance of tugs. The number, size, and arrangement of tugs to potentially escort and berth the LNG carriers will be determined through a Project-specific navigational study (i.e., TERMPOL).

LNG carriers bound for the Project are expected to be boarded by BC Coast Pilots at the Cape Beale Pilot Station (**Figure 2-2**). LNG carriers will then proceed northeast into Trevor Channel to the Kwispaa LNG Area. Loaded LNG carriers would follow the same route back out to the Pacific Ocean. The LNG carriers will be operated by a third party with custody of the LNG transferred at each ASLNG™ production unit; however, the Developer will have the ability to require specific mitigation measures by the LNG carriers through contractual requirements.

EHTHLATEESE

COWISHULTH

PORT ALBERNI - UCLUELET - BAMFIELD - SECHART (BROKEN GROUP)

PACIFIC RIM NATIONAL PARK RESERVE OF CANADA

TZARTUS ISLAND

NUUMAQIMYIIS BAY

SANTA MARIA ISLAND

SARITA LAKE

SARITA RIVER

IMPERIAL EAGLE CHANNEL

FLEMING ISLAND

UCLUELET - BAMFIELD

TREVOR CHANNEL

DIANA ISLAND

BAMFIELD FLOAT PLANE DOCK

BAMFIELD

BAMFIELD AIRPORT

ANACLA

CAPE BEALE HELIPAD

CAPE BEALE LIGHTHOUSE

CAPE BEALE PILOT STATION

PACIFIC RIM NATIONAL PARK RESERVE OF CANADA

PACIFIC RIM NATIONAL PARK RESERVE OF CANADA

KWISPAA LNG

Nuumaqimyiis Bay, BC

Expected Shipping Route

Legend

- Kwispaa LNG Area
- Airport
- Helipad
- Lighthouse
- Pilot Station
- Kwispaa Shipping Route
- Coastal Ferry Route
- Recreational Boating Route
- Sea Kayaking Route
- Canadian Exclusive Economic Zone (EEZ)
- International Shipping Lanes (only shown between Vancouver, Seattle, and J-Buoy)
- National Park

Notes

1. All mapped features are approximate and should be used for discussion purposes only.
2. This map is not intended to be a "stand-alone" document, but a visual aid of the information contained within the referenced Report. It is intended to be used in conjunction with the scope of services and limitations described therein.

Sources

- Coastal Ferry Routes, Recreational Boating Routes, Sea Kayaking Routes: BCMCA
- Pilot Station: BC Coast Pilots
- International Shipping Lanes: NOAA
- National Park, EEZ: Government of Canada
- Basemap: ESRI World Topo Base

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Kilometres

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102716-01	Production Date: Oct 5, 2018	Figure 2-2

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2.3 Emissions, Discharges, and Waste

The Project will result in emissions, discharges, and wastes comparable to other world-leading BC LNG projects of similar configuration and scale. Anticipated emissions, discharges, and wastes are described below.

2.3.1 Atmospheric Emissions

Project atmospheric emissions will emanate from hydrocarbon-fuelled construction equipment, potential concrete batch plant, engines, generators, land and marine transport, and process facilities, including those listed in **Table 2-2** below:

Table 2-2 Potential Project-related Emissions

Constituent	Project Phase
Sulphur dioxide ("SO_2")	O, AM
Nitrogen dioxide ("NO_2")	C, O, D, AM
Carbon monoxide ("CO")	C, O, D, AM
Carbon dioxide* ("CO_2")	C, O, D, AM
Inhalable particulate matter (diameter less than 10 µm)	C, O, D, AM
Respirable particulate matter (diameter less than 2.5 µm)	C, O, D, AM
Hydrogen sulphide ("H_2S")	O, AM
Volatile organic compounds	O, AM
Fugitive emissions	O, AM
Dust	C, D
Light emissions from facilities and equipment	C, O, D
Noise emissions from operation of equipment	C, O, D

Notes: * – Greenhouse gas, as defined in the *Greenhouse Gas Reduction Targets Act*, SBC 2007, c. 42; µm – micrometre; AM – accidents and malfunctions; C – construction; O – operations; D – decommissioning

Modelling of Project air emission dispersion and deposition, anticipated light levels, and anticipated noise levels will inform ongoing Project design. The results of this modelling will be presented in the Application.

The Project will have a nominal (nameplate) production capacity of 24 mtpa at full build-out and will be constructed in two to three phases. The greenhouse gas ("GHG") intensity of the Project is anticipated to be at or less than the world-leading GHG emission intensity benchmark of 0.16 tonnes of CO_2 equivalent per tonne of LNG ("tCO_2e/tLNG") for LNG facilities set in the Provincial *Greenhouse Gas Industrial Reporting and Control Act*, SBC 2014, c. 29. The Kwispaa LNG Team is exploring the feasibility of additional power supply options to further reduce GHG emissions through potential electrification utilizing Provincial (BC Hydro) grid power, and the final emissions intensity will depend on the ratio of BC Hydro grid power to self-generated power using a power facility. The Kwispaa LNG Team will report emissions in accordance with the *Greenhouse Gas Industrial Reporting and Control Act* and associated regulations. The estimated range of annual GHG emissions for the Project is presented in **Table 2-3**.

Table 2-3 Estimated Annual GHG Emissions

Project Phase	Nominal LNG Production	GHG Emissions (tonnes CO_2 equivalent)	GHG Intensity (tCO_2e/tLNG)
Phase 1	12 mtpa	385,000 – 1,910,000	0.032 – 0.159
Phase 2	6 mtpa	193,000 – 955,000	
Phase 3	6 mtpa	193,000 – 955,000	

The GHG emissions presented in **Table 2-3** are preliminary based on conceptual Project design. Low intensity estimates are based on full electrification of the Project from the Provincial grid, and higher intensity estimates are based on power for the Project supplied exclusively through a self-generation power facility. Updated GHG emissions will be presented in the Application based on ongoing Project design, including equipment selection.

2.3.2 Wastes, Discharges, and Waste Management

This section describes the wastes that may be generated by the Project, the phase of the Project when they may be generated, and potential waste management approaches (**Table 2-4**). The Developer will dispose of waste in accordance with applicable regulations and where feasible, will re-use or recycle waste materials. Appropriate waste reduction, handling, storage, and disposal measures, determined through the EA process and ongoing design, will mitigate potential adverse effects of wastes and discharges.

2.3.2.1 Liquid Waste and Discharges

Typical liquid wastes associated with the construction, operation, and decommissioning of the Project will include used motor and hydraulic oils, chemicals from the laboratory, used chemical cleaning fluids, spent solvents, paints, stormwater and site runoff, spent hydrostatic test water, sanitary sewage, and liquid waste associated with LNG processing (**Table 2-4**).

2.3.2.2 Solid Waste

Typical solid waste associated with the construction, operation, and decommissioning of the Project will include biomass waste (chipped vegetative material), excavated overburden, organic material (e.g., peat), rocks, wood, scrap metal, concrete, used batteries, food waste, paper/cardboard waste, medical waste, dehydration molecular sieve bed material, mercury removal bed, and other solid wastes associated with LNG processing (**Table 2-4**).

The localized removal of marine sediment may be required as part of the Project to accommodate ASLNG™ production units and jetties. Sediment removal may also be required for the jetty and ASLNG™ production unit installation. Dredging to allow for marine navigation is not proposed for the Project. If required, removed marine sediments will be disposed of on land within the Kwispaa LNG Area or at an existing permitted facility in accordance with applicable regulations. Disposal at sea is not proposed for the Project. It is anticipated that less than 50,000 m^3 of localized sediment removal will be required.

The environmental quality of soil and marine sediment will be further determined prior to identifying suitable disposal locations.

2.3.2.3 Hazardous Wastes

Hazardous wastes generated by the Project may include used batteries, wastes associated with the mercury removal unit, waste oil, and spent chemicals and solvents.

Table 2-4 Potential Wastes

Potential Waste or Discharge	Project Phase	Potential Source	Waste Management
Solid Wastes			
Biomass waste (vegetative material), excavated overburden, organic material (e.g., peat), rocks, soil	C	Site clearing and grading	Materials will be stockpiled within Kwispaa LNG Area and reused where possible. Vegetative material will be chipped and used in site restoration or burned in accordance with applicable legislation
Marine sediment	C	Removal for jetties and ASLNG™ units	Disposal on land
Domestic wastes, including food, paper, and cardboard	C, O, D	Accommodation, offices, warehouses	Recycle where possible with disposable in an approved landfill
Plastic and vinyl waste from packaging, piping, etc.	C, O, D	Accommodation, offices, warehouses	Recycle where possible with disposable in an approved landfill
Scrap steel, rebar, metals, and tires	C, D	Construction, packaging, and protection of equipment and spares during transport, site decommissioning	Recycle where possible with disposable in an approved landfill
Concrete	C, D	Construction, site decommissioning	Recycle where possible with disposable in an approved landfill
Wood waste (e.g., pallets)	C, O, D	Packaging and protection of equipment and spares during transport	Recycle
Molecular sieve bed material (lifecycle replacement)	O	Molecular sieves for gas dehydration and mercury removal	Disposal to specialist processing facility

Potential Waste or Discharge	Project Phase	Potential Source	Waste Management
Liquid Wastes			
LNG	AM	Accidental release from ASLNG™ production units or LNG carrier	Containment, emergency shutdown, and isolation
Sewage/wastewater from toilets on the ASLNG™, worker accommodation, offices, and washroom facilities, and a sewage treatment plant	C, O, D	From onshore worker accommodation, offices, and washroom facilities	Primary treatment and septic tank with disposal by vacuum truck to approved facilities
Stormwater/site runoff	C, O, D	Runoff collection in production areas with hard standing to prevent contamination	Holding basins with treatment to water quality regulations (if required) prior to marine discharge
Spent hydrostatic test water	O	Commissioning activities	Holding basins with treatment to water quality regulations (if required) prior to marine discharge
Water	O	Natural gas dehydration	Re-use in LNG process or treatment to water quality regulations (if required) prior to discharge to marine environment
Hazardous Waste			
Gasoline, diesel, oil, and hydraulic fluid	AM	Accidental release from vehicles and construction equipment	Disposal of containment and clean-up supplies and other contaminated material (e.g., soil) at dedicated treatment facilities
Used batteries, wastes associated with the mercury removal unit, waste oil, paint, and spent chemicals and solvents	C, O, D	Construction and operations and maintenance activities	Recycling where appropriate and disposal at dedicated treatment facilities

Notes: AM – accidents and malfunctions; C – construction; O – operations; D – decommissioning

2.4 Schedules

Schedules for both the Project and the regulatory process are presented in this section.

Subject to receipt of approvals and corporate considerations, the Kwispaa LNG Team aims for the first production of LNG in the fourth quarter ("Q4") of 2024 or the first quarter ("Q1") of 2025. The estimated timing of key Project stages is presented in **Table 2-5**.

Table 2-5 Project Schedule

Project Phase	Project Activity	Timing
Project Studies	Geotechnical studies	Q4 2018-Q3 2019
	Engineering and technical studies	Q4 2018-Q4 2020
Environmental Assessment	Existing conditions field studies	Q1 2015 – Q4 2016 Q3 2018 – Q4 2019
	Application preparation	2019
	Application submission	December 2019
	Screening and review	December 2019 – July 2020
Financing	Final investment decision	September 2020
Construction	Construction start date – first phase	Q4 2020 / Q1 2021
	Start-up and commissioning – first phase	Q3 2024
	Construction start date – second/third phase	Q4 2023 / Q1 2024[1]
	Start-up and commissioning – second/third phase	Q4 2027 / Q1 2028[1]
Operations	First shipment of LNG from the facility	Q4 2024 / Q1 2025
	Operations and maintenance	Q4 2024 / Q1 2025
Decommissioning and Abandonment	Decommissioning and reclamation	Upon completion of operations
	Abandonment	Upon completion of reclamation

Notes: Q2 – second quarter; Q3 – third quarter

[1] Anticipated commissioning date to be determined by market conditions.

The EA schedule outlined in **Table 2-5** approximates the milestones identified as part of the Provincial and Federal EA processes. The actual duration of each stage of the process will depend on several factors, including the scope of the assessment, direction from the BC EAO and CEA Agency, and the resolution of issues raised during the EA process.

2.5 Project Capital Costs and Employment

The estimated capital cost of the first Project phase (12 mtpa) is expected to be approximately $10 billion ($ Canadian) and approximately $10 billion ($ Canadian) for the subsequent phase(s) (12 mtpa). Annual operating costs are anticipated to be in the range of approximately $250 to $300 million ($ Canadian). These costs will be refined as Project planning and definition advance; additional information will be provided in the Application.

The Project will create regional employment opportunities during the design, construction, operations, and decommissioning phases. Construction of each Project phase of 12 mtpa will require a peak workforce of up to approximately 1,500 to 2,000 over the 52-month construction period. During the approximately 25 - year operations of each phase, the Project will employ a pool of approximately 200 to 240 full-time employees to operate the first phase (12 mtpa) and approximately 240 to 300 full-time employees at full

build-out (24 mtpa). The Project will also create indirect and induced employment opportunities during the design, construction, operations, and decommissioning phases through the purchase of goods and services, and due to multiplier effects from those benefiting financially from Project spending and Project-related income.

The Developer has committed to providing employment and business opportunities for qualified Huu-ay-aht citizens through the lifecycle of the Project. This commitment is set out in the Relationship Agreements and will be implemented through the Employment and Training and the Contract and Business Opportunities workstreams reporting to the Project Oversight Board. The Huu-ay-aht training and employment office will facilitate support of Huu-ay-aht training and employment during each Project phase.

Moreover, where possible, the construction workforce will be sourced locally, including from other potentially affected Indigenous groups and local communities. Staff for the operations phase may initially be a combination of individuals from local communities, elsewhere in Canada, and other countries with LNG experience, but will transition to a local workforce over time.

3.
Project Location

3 Project Location

This section provides an overview of the location of the Project as well as descriptions of land ownership, Treaty Lands and Indigenous agreements, land use designations, and zoning within the Kwispaa LNG Area and adjacent areas. It also includes consideration of the local context for the Project. Past and current uses of the land and water within and surrounding the Kwispaa LNG Area are discussed in **Section 5.3.2**.

3.1 Overview

The Project will be situated on Huu-ay-aht-owned lands that are pre-approved Treaty Lands, as determined in the Maa-nulth Final Agreement, along Nuumaqimyiis Bay within Barkley Sound.

The Project site is an ideal location for an LNG processing and export facility, as it:

- provides an opportunity to develop the Project together with Huu-ay-aht on Huu-ay-aht-owned lands supporting the development of a self-sustaining economic future for Huu-ay-aht citizens;
- offers advantages for shipping due to its proximity to the open ocean;
- is situated in a remote location, yet is well-located for access to infrastructure and labour, and is removed from established communities;
- is situated in a natural deep-water port and a sheltered bay;
- has low site congestion with an abundance of onshore land available for associated infrastructure; and
- is located at a site that has been partially disturbed from industrial activities.

The Kwispaa LNG Area is within the Alberni-Clayoquot Regional District ("ACRD"). The closest communities to the Kwispaa LNG Area are Anacla and Bamfield, approximately 11.5 km and 10 km southwest respectively (**Figure 1-1**). The Kwispaa LNG Area site boundary, pursuant to the Lease Agreement, is defined through the Sarita Cultural Protection Line, which was designed to avoid cultural and other areas of importance to Huu-ay-aht. The closest residence is located 500 m east of the Kwispaa LNG Area on the west side of the Sarita River (**Figure 3-1**). The locations of communities, First Nations reserves, parks, and other features in relation to the Kwispaa LNG Area are shown in **Figure 3-1** and described in **Sections 3.3** and **3.4**.

The Kwispaa LNG Area falls within the Barkley Sound portion of the Maa-nulth Final Agreement Treaty area (**Figure 3-2**). Upland portions of the Kwispaa LNG Area include land owned by Huu-ay-aht in fee simple and as Treaty Land, as well as land administered by the Provincial Government. The Huu-ay-aht fee simple lands are pre-approved for conversion into Treaty Land, which Huu-ay-aht intends to convert prior to operations of the Project.

Water lot leases adjacent to the upland areas are currently held by Western Forest Products Inc. and a third party. Detailed information regarding land ownership, other tenures, and legal descriptions of the Kwispaa LNG Area lands is provided in **Section 3.2**.

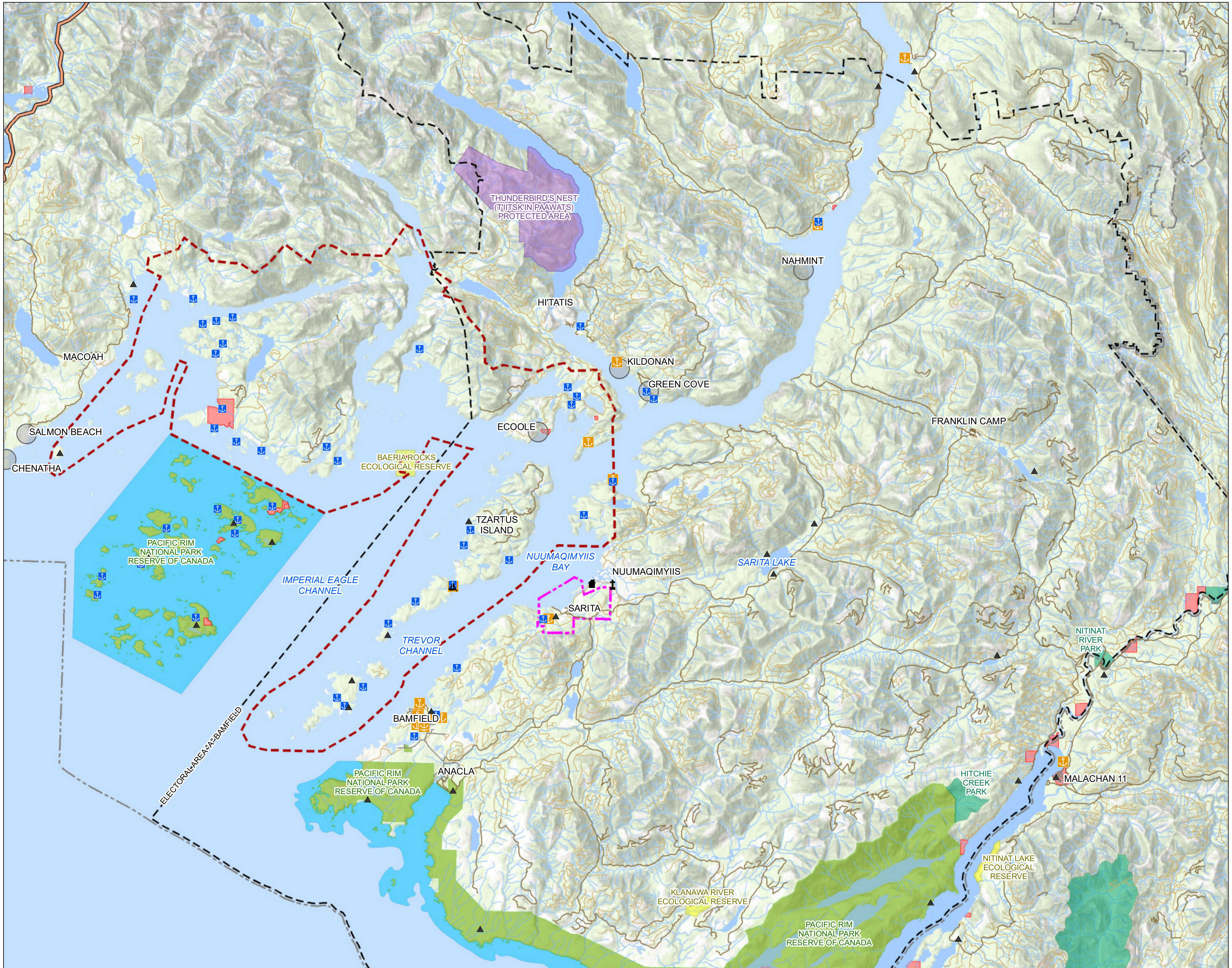
The onshore components of the Project will be located on up to 475 ha of land, and the at-shore components will be located on a water lot of up to 255 ha. The Kwispaa LNG Area will be adjusted to maintain a safety awareness zone once the Project footprint is confirmed and a quantitative risk assessment has been completed.

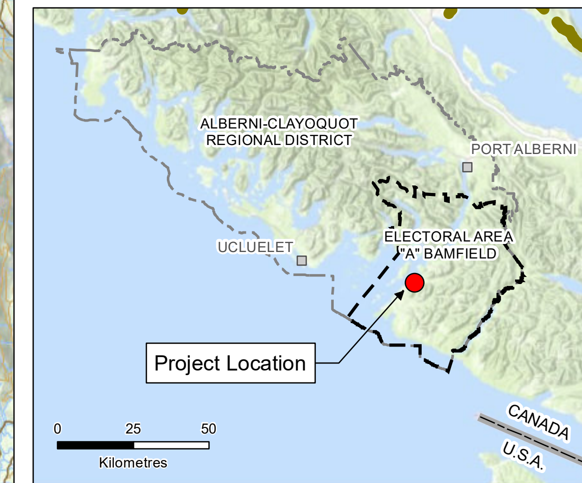
The onshore Project components can be accessed from Bamfield, Port Alberni, or Duncan via Sugsaw Mainline from Bamfield Road as shown on **Figure 1-1**. The at-shore components will be located along the shore of Nuumaqimyiis Bay. LNG carriers will access the facility via Trevor Channel from the Pacific Ocean and the Cape Beale Pilot Station (**Figure 2-2**).

KWISPAA LNG

Nuumaqimyiis Bay, BC

Regional Overview





Legend

- Kwispaa LNG Area
- Anchorage
- Campground
- Cemetary
- Closest Residence to Project Area
- Yacht Club
- Marina
- Transmission Line
- Paved Road
- Loose Road (Maintained Gravel)
- Rough Road (Unmaintained Gravel or Dirt)
- Alberni-Clayoquot Regional District Boundary
- Electoral Area "A" Bamfield Boundary
- Special Management Zone 14
- Ecological Reserve
- First Nations Reserve
- National Park
- National Marine Park
- Protected Area
- Provincial Park

Notes

1. All mapped features are approximate and should be used for discussion purposes only.
2. This map is not intended to be a "stand-alone" document, but a visual aid of the information contained within the referenced Report. It is intended to be used in conjunction with the scope of services and limitations described therein.

Sources

- Anchorages, Marinas: BCMCA
- Transmission Lines: BC Hydro
- Campgrounds, Regional Municipalities, Populated Places, First Nations Reserves: Province of BC
- Parks and Protected Areas: Government of Canada
- Special Management Zone 14: Vancouver Island Land Use Plan
- Basemap: ESRI World Topo Base

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KWISPAA LNG | Huu-ay-aht

Nuumaqimyiis Bay, BC

Huu-ay-aht First Nations Treaty Lands

TZARTUS ISLAND

BAMFIELD

BARKLEY SOUND

ANACLA

NITINAT LAKE

Legend

- Kwispaa LNG Area
- Huu-ay-aht First Nations Treaty Area

Maa-nulth First Nation Lands of the Huu-ay-aht First Nations

- Former First Nations Reserve
- Former Provincial Crown Land

Notes

1. All mapped features are approximate and should be used for discussion purposes only.
2. This map is not intended to be a “stand-alone” document, but a visual aid of the information contained within the referenced Report. It is intended to be used in conjunction with the scope of services and limitations described therein.

Sources

- Huu-ay-aht First Nations Treaty Area, Former First Nations Reserves, Former Provincial Crown Land: Province of BC
- Basemap: ESRI World Topo Base

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Kilometres

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3.2 Land Ownership, Tenure, and Legal Descriptions

The Kwispaa LNG Area is currently made up of 12 parcels of land and four water lots as shown on **Figure 3-3** and summarized in **Table 3-1**. Briefly, the ownership is as follows:

- six parcels are held in fee simple by Huu-ay-aht. These parcels are pre-approved for conversion into Treaty Land, which Huu-ay-aht intends to convert prior to operations of the Project;
- portions of four parcels are held by Huu-ay-aht as Treaty Land;
- two upland land parcels are administered by the Provincial Government;
- three water lots are leased by Western Forest Products Inc. from the Provincial Government; and
- one water lot is leased by a third party.

Legal descriptions of the Kwispaa LNG Area lands and information regarding Provincial land tenures (water lot leases) are provided in **Table 3-2** and **Table 3-3**, respectively. Land under water not included in the water lot leases, is administered by the Provincial Government.

Table 3-1 Kwispaa LNG Area Identification and Ownership

Site Owner/Administrator (Land)	Huu-ay-aht First Nations (Treaty Land and fee simple) Provincial Government
Site Owner/Administrator (Water Lot)	Provincial Government
Site Location	Sarita, BC
Geographic Coordinates	48° 53' 00.00" N, 125° 02' 00.00" W
UTM Coordinates	351000 m E, 5416500 m N (NAD 1983, UTM Zone 10)
Proposed Kwispaa LNG Area	7.68 km^2 (768 ha)

Table 3-2 Legal Description of Kwispaa LNG Area Lands

Parcel ID	Type	Owner/Administrator	Legal Description
007-729-723	Fee simple	Huu-ay-aht First Nations	East part of the fractional southwest ¼ of Section 12, Township 2, Barkley District
007-729-596	Fee simple	Huu-ay-aht First Nations	Fractional East ½ of Section 12, Township 2, Barkley District
005-155-916	Fee simple	Huu-ay-aht First Nations	Lot 1, Section 12, Township 2, Barkley District
007-730-677	Fee simple	Huu-ay-aht First Nations	The West ½ of the NW ¼ of Section 8, Township 4, Barkley District
007-730-381	Fee simple	Huu-ay-aht First Nations	The West ½ of the SW ¼ of Section 8, Township 4, Barkley District
007-730-250	Fee simple	Huu-ay-aht First Nations	Fractional Section 7, Township 4, Barkley District
012-169-757	Treaty	Huu-ay-aht First Nations	Treaty Land

Parcel ID	Type	Owner/Administrator	Legal Description
008-600-201	Treaty	Huu-ay-aht First Nations	Treaty Land
008-600-546	Treaty	Huu-ay-aht First Nations	Treaty Land
008-601-127	Treaty	Huu-ay-aht First Nations	Treaty Land
90042945	Crown	Provincial Government	District Lot 787, Barkley District
36494731	Crown	Provincial Government	Block A, Section 1, Township 2, Barkley District

Table 3-3 Descriptions of Kwispaa LNG Area Water Lots (Land Administered by the Provincial Government)

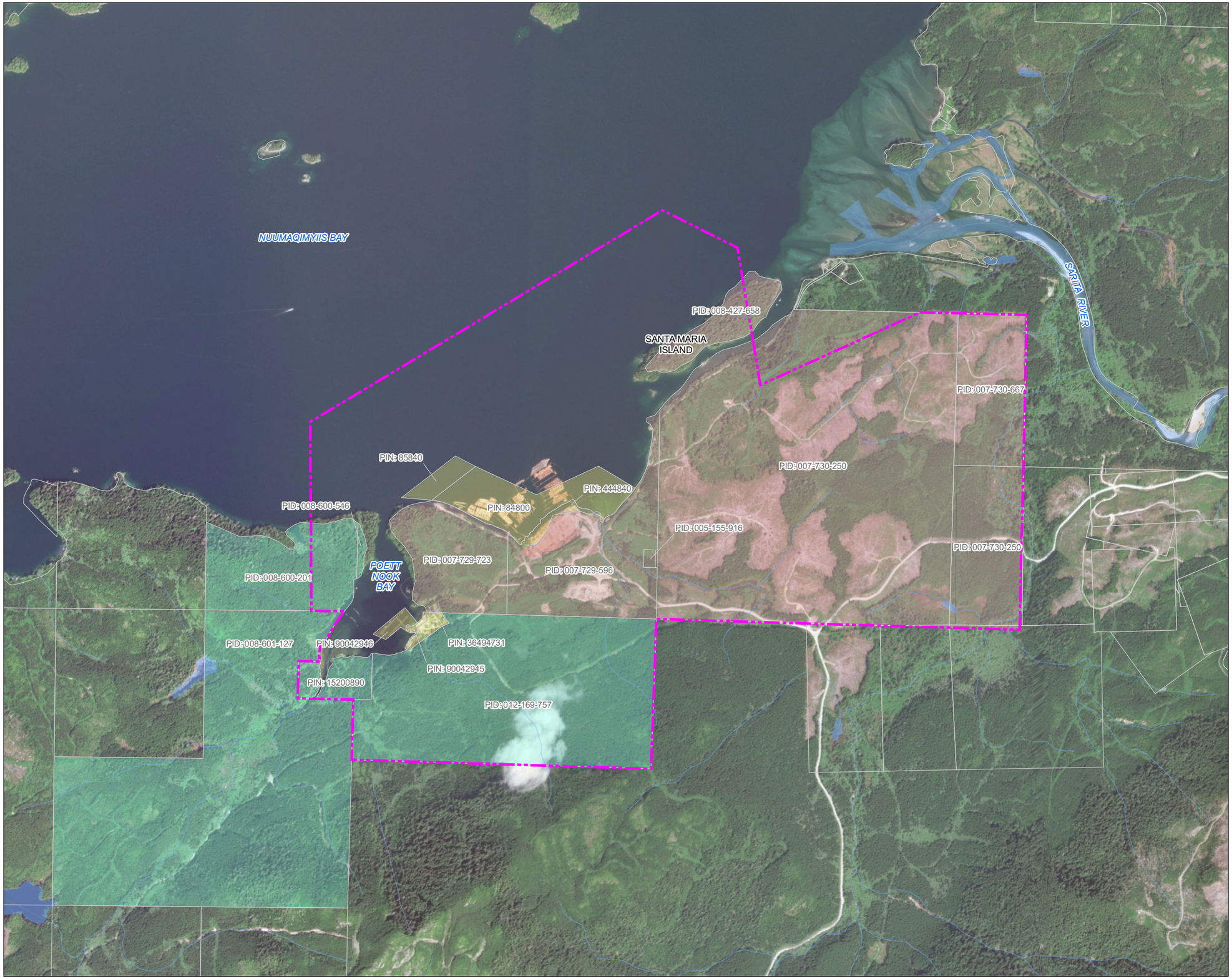
Parcel ID	Current Tenure Type and Number	Current Tenure Holder	Legal Description
84800	Lease No. 103507	Western Forest Products Inc.	District Lot 754, Barkley District
85840	Lease No. 103507	Western Forest Products Inc.	District Lot 765, Barkley District
444840	Licence of Occupation No. V914926	Western Forest Products Inc.	Unsurveyed Crown foreshore or land covered by water being part of the bed of Numukamis, Sarita, and Christie Bays, Barkley District
90042946	Lease No. 111698	Poett Nook Marina	District Lot 788, Barkley District

Two groundwater wells (tag 65541 and 65542) are located within Huu-ay-aht fee simple parcel PID 007-729-596 (iMap BC).

KWISPAA LNG | Shell LNG | huu-ay-aht

Nuumaqimyiis Bay, BC

Kwispaa LNG Area Land Titles



Legend

- Kwispaa LNG Area
- Crown Land
- Huu-ay-aht Treaty Lands
- Huu-ay-aht Fee Simple Lands
- Parcel Boundary

Notes

1. All mapped features are approximate and should be used for discussion purposes only.
2. This map is not intended to be a "stand-alone" document, but a visual aid of the information contained within the referenced Report. It is intended to be used in conjunction with the scope of services and limitations described therein.

Sources

- Parcel Boundaries: LTSA, ParcelMap BC
- Aerial Image: ESRI World Imagery

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3.3 Treaty Lands and Indigenous Agreements

This section describes the Maa-nulth Final Agreement and identifies Huu-ay-aht Treaty Lands and the traditional territories and First Nations reserves of other potentially affected Indigenous groups.

3.3.1 Maa-nulth Final Agreement

Huu-ay-aht is a member of the Nuu-chah-nulth Tribal Council and one of the five First Nations signatories to the Maa-nulth Final Agreement, which came into effect on April 1, 2011 (HFN 2017). The four other Maa-nulth First Nations are Yuułu?ił?ath Nation, Uchucklesaht Tribe, Toquaht Nation, and Ka:yu:kth/Che:k:tles7eth First Nations.

Under the Maa-nulth Final Agreement, Huu-ay-aht has the authority to make laws governing the use of its Treaty Lands, including management, planning, zoning, and development (MFNFA 2009). Huu-ay-aht operates under the Huu-ay-aht First Nations Constitution, which supports the laws and policies that establish how the Huu-ay-aht Government makes decisions on behalf of its citizens (HFN 2017). Relevant laws enacted by Huu-ay-aht include the following:

- *Government Act*;
- *Land Act*; and
- *Real Property Tax Act*.

Under the Maa-nulth Final Agreement and related documents, Huu-ay-aht and the other Maa-nulth First Nations also have certain harvesting and other rights, including the following rights:

- harvest Fish (including fish, shellfish, crustaceans, and marine animals) and Aquatic Plants for food, social, and ceremonial purposes in the Domestic Fishing Area;
- harvest Wildlife for food, social and ceremonial purposes in the Wildlife Harvest Area;
- harvest Migratory Birds for food, social, and ceremonial purposes in the Migratory Birds Harvest Area;
- trade and barter, among themselves and with other Indigenous peoples of Canada, any resource harvested pursuant to the right to harvest Fish, Wildlife, or Migratory Birds; and
- fish under their commercial fishing licences and Harvest Agreement licences[5].

The Project falls within the Maa-nulth Domestic Fishing Area (of) Barkley Sound (Appendix N-2 of the Maa-nulth Final Agreement), the Maa-nulth Wildlife Harvesting Area (of) Barkley Sound (Appendix Q-2), and the Maa-nulth Migratory Birds Harvesting Area (of) Barkley Sound (Appendix X-2). The territories traditionally occupied and used by the Maa-nulth First Nations, which are referred to as their respective ḥahuułi (spelled slightly differently by each Nation), are referred to in the Maa-nulth Final Agreement as the Maa-nulth First Nation Area of each Maa-nulth First Nation. The Project falls within the Maa-nulth First Nation Area of Huu-ay-aht (Appendix A-1). Maa-nulth First Nations have the right to govern and develop their own Treaty Lands within their traditional territories.

[5] All capitalized terms in the preceding paragraph as defined in the Maa-nulth Final Agreement.

Section 22.3.1 of the Maa-nulth Final Agreement states that if a Provincial Project is located within a Maa-nulth First Nation Area and may reasonably be expected to adversely affect Maa-nulth First Nation Lands, the residents of such lands, or Maa-nulth First Nation Section 35 Rights under the Maa-nulth Final Agreement, British Columbia will ensure that the applicable Maa-nulth First Nation:

a. is provided with timely notice of, and relevant available information on, the Provincial Project;

b. is Consulted regarding the environmental effects of the Provincial Project; and

c. receives an opportunity to participate in any Environmental Assessment of that Provincial Project (Government of Canada, Government of British Columbia, and the Maa-nulth First Nations 2009).

Further, Section 22.3.2 of the Maa-nulth Final Agreement states that British Columbia will respond to any views provided by the applicable Maa-nulth First Nation to British Columbia in accordance with Section 22.3.1 before making a decision that would have the effect of enabling the Provincial Project to be carried out in whole or in part (Government of Canada, Government of British Columbia and the Maa-nulth First Nations 2009).

3.3.2 Huu-ay-aht Ḥahuuɬi and Treaty Lands

As noted in **Section 3.3.1** above, under the Maa-nulth Final Agreement, Huu-ay-aht has ownership of and authority over its Treaty Lands, and the Huu-ay-aht Government has enacted laws and adopted policies with respect to those lands. Under the Maa-nulth Final Agreement, Huu-ay-aht citizens also have other constitutionally protected Treaty rights in their ḥahuuɬi. Huu-ay-aht citizens have always fished, harvested, traded, and otherwise lived and practised their culture throughout their ḥahuuɬi.

The Project will be located on Huu-ay-aht owned lands, which are located within Huu-ay-aht's larger ḥahuuɬi.

Under the Maa-nulth Final Agreement, former Huu-ay-aht reserves have been converted to Treaty Lands. Huu-ay-aht ḥahuuɬi and Treaty Lands are shown in **Figure 3-2**.

Section 5.3.2.1.1 provides a description of Huu-ay-aht's current use of lands and resources for traditional purposes, including whether the Project is going to require access to, use or occupation of, or the exploration, development, and production of lands and resources currently used for traditional purposes.

3.3.3 Other Indigenous Groups

The Kwispaa LNG Team is engaged with the following Indigenous groups potentially affected by the Project, including a possible electric transmission line, (in alphabetical order):

- Hupačasath First Nation;
- Maa-nulth Treaty Society –
    - Ka:'yu:'k't'h'/Che:k'tles7et'h' First Nations;
    - Toquaht Nation;
    - Uchucklesaht Tribe;
    - Yuułu?iɬ?atḥ Nation (formerly Ucluelet First Nation);

- Nanwakolas Council Society –
  - K'ómoks First Nation;
- Métis Nation British Columbia;
- Qualicum First Nation;
- Tseshaht First Nation; and
- We Wai Kai Nation.

Maa-nulth First Nations ḥahuułi and Treaty Lands are shown in **Figure 3-4**. The traditional territories of the Hupačasath First Nation and Tseshaht First Nation are shown in **Figure 3-5** in relation to the Kwispaa LNG facility. The traditional territories of K'ómoks First Nation, Qualicum First Nation, and We Wai Kai Nation may potentially be affected by an electric transmission line from the Dunsmuir substation located approximately 20 km northwest of Qualicum Beach, transiting southwest to the Kwispaa LNG facility. These traditional territories are shown in **Figure 3-5**.

Section 5.3.2.1 provides descriptions of current use of lands and resources for traditional purposes by other Maa-nulth First Nations and other Indigenous groups, including whether the Project is going to require access to, use or occupation of, or the exploration, development, and production of lands and resources currently used for traditional purposes.

Section 6.2 describes the Kwispaa LNG Team's approach to engaging with potentially affected Indigenous groups, including a summary of the early initial feedback received on the Project to date.

KWISPAA LNG

Nuumaqimyiis Bay, BC

Treaty Lands of the Maa-nulth First Nations Treaty Group

KYUQUOT SOUND

CAMPBELL RIVER

STRAIT OF GEORGIA

COURTENAY

PORT ALBERNI

TOFINO

PACIFIC OCEAN

UCLUELET

BARKLEY SOUND

BAMFIELD

NITINAT LAKE

Legend

- Kwispaa LNG Area
- Protected Area

Maa-nulth First Nations Treaty Areas

- Huu-ay-aht First Nations
- Ka:'yu:'k't'h'/Che:k'tles7et'h' First Nations
- Toquaht Nation
- Uchucklesaht Tribe
- Yuułuʔiłʔatḥ Nation (formerly Ucluelet First Nation)
- Former First Nations Reserve
- Former Provincial Crown Land

Notes

1. All mapped features are approximate and should be used for discussion purposes only.
2. This map is not intended to be a “stand-alone” document, but a visual aid of the information contained within the referenced Report. It is intended to be used in conjunction with the scope of services and limitations described therein.

Sources

- Maa-nulth First Nations Treaty Areas, Former First Nations Reserves, Former Provincial Crown Land: Province of BC
- Protected Areas: Government of Canada
- Basemap: ESRI World Topo Base

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Kilometres

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102716-01	Production Date: Oct 10, 2018	Figure 3-4

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KWISPAA LNG

Nuumaqimyiis Bay, BC

Traditional Territories

AHAHSWINIS (NO. 1)
KLEHKOOT (NO. 2)
QUALICUM
PORT ALBERNI
TSAHAHEH (NO. 1)
ALBERNI (NO. 2)
COUS (NO. 3)
CHUCHAKACOOK (NO. 4)
EQUIS (NO. 6)
AHMITSA (NO. 5)
UCLUELET
CLEHO (NO. 6)
NETTLE ISLAND (NO. 5)
TSEOOWA (NO. 4)
OMOAH (NO. 9)
KEITH ISLAND (NO. 7)
BARKLEY SOUND
BAMFIELD
NITINAT LAKE

Legend

- Kwispaa LNG Area
- First Nation Reserve
- Protected Area
- Tseshaht First Nation Traditional Territory
- K'omoks First Nation Traditional Territory
- Qualicum First Nation Traditional Territory
- Hupačasath First Nation Traditional Territory
- We Wai Kai Nation Traditional Territory

Notes

1. All mapped features are approximate and should be used for discussion purposes only.
2. This map is not intended to be a “stand-alone” document, but a visual aid of the information contained within the referenced Report. It is intended to be used in conjunction with the scope of services and limitations described therein.

Sources

- Hupačasath First Nation, K'omoks First Nation, and We Wai Kai Nation Traditional Territories, and First Nations Reserves: Province of BC
- Qualicum First Nation Traditional Territory: Digitized as per Qualicum First Nation Firest & Range Consultation and Revenue Sharing Agreement, 2016
- Tseshaht First Nation Traditional Territory: Digitized as per https://tseshaht.com/influential-figures/traditional-territory
- Protected Areas: Government of Canada
- Basemap: ESRI World Topo Base

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Page Size: 11" x 17"

102716-01	Production Date: Oct 10, 2018	Figure 3-5

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3.3.4 First Nation Reserves

There are no present day First Nation reserves (as defined under the Federal *Indian Act*, RSC 1985, c. I-5) within or in close proximity to the Kwispaa LNG Area. First Nation Reserve Tseoowa No. 4 and First Nation Reserve Ahmitsa No. 5 are closest to the Kwispaa LNG Area.

Reserves in the area surrounding the Kwispaa LNG Area, potential electric transmission line, and route to be used by LNG carriers are shown on **Figure 3-5** and listed in **Table 3-4**.

Table 3-4 Reserve Names and Locations by First Nation

First Nation	Reserve Name	Location Relative to Project
Tseshaht First Nation	Tseoowa (No. 4)	10 km north of the Kwispaa LNG Area, on the east shore of Rainy Bay in Barkley Sound (2.9 ha)
Tseshaht First Nation	Ahmitsa (No. 5)	9 km north of the Kwispaa LNG Area, at the mouth of Rainy Bay in Barkley Sound (10.2 ha).
Tseshaht First Nation	Omoah (No. 9)	Approximately 9 km northwest of Trevor Channel, on the east side of Effingham Island (11.8 ha)
Tseshaht First Nation	Keith Island (No. 7)	Approximately 12 km northwest of Trevor Channel, on Keith Island (6.6 ha)
Tseshaht First Nation	Cleho (No. 6)	Approximately 11 km northwest of Trevor Channel, on the southeast corner of Nettle Island (5.7 ha)
Hupačasath First Nation	Nettle Island (No. 5)	Approximately 11 km northwest of Trevor Channel, on the southeast corner of Nettle Island (25.1 ha)
Hupačasath First Nation	Chuchakacook (No. 4)	Approximately 7 km west of the potential electric transmission line route, on the west side of Alberni Inlet north of Nahmint Bay (2.2 ha)
Hupačasath First Nation	Cous (No. 3)	Approximately 4 km west of the potential electric transmission line route, on the west side of Alberni Inlet at Stamp Narrows (55 ha)
Tseshaht First Nation	Alberni (No. 2)	Approximately 5 km west of the potential electric transmission line route, on the east side of Alberni Inlet south of Port Alberni (62 ha)
Qualicum First Nation	Qualicum	Approximately 4 km east of the Dunsmuir substation, south of Qualicum Bay (72.8 ha)

3.4 Land Use Plans and Zoning

The following sections describe the Provincial and regional land use plans that apply to the Kwispaa LNG Area and adjacent areas. The Kwispaa LNG Area is outside the jurisdiction of the Port Alberni Port Authority, which extends up the Alberni Inlet from Tzartus Island to Somass River. The Kwispaa LNG Area and adjacent lands are not within the Provincial Agricultural Land Reserve. There are no Federal land use plans.

3.4.1 Huu-ay-aht Land Use Plan

Huu-ay-aht has established the following high-level goals to guide the direction of land use and development on Huu-ay-aht Treaty Lands (HFN 2013). All decisions made will reflect these goals:

- Huu-ay-aht lands support and sustain the economic, social, ecological, and cultural foundation of the Huu-ay-aht;
- land use decisions respect the plans of surrounding jurisdictions;
- all development and buildings meet Smart Growth and Leaders in Energy and Environmental Design ("LEED") principles to reduce the community's carbon footprint and dependency on fossil fuels;
- stewardship and protected areas receive special care and attention in all land use decisions;
- the impact on watercourses, including erosion and sedimentation, caused by land use changes and development are minimized and mitigated;
- life, property, and infrastructure are protected against flooding, erosion, tidal and wave action, and other known hazards; and
- infrastructure and facilities provide community services for the well-being and economic benefit of the Huu-ay-aht (HFN 2013).

By April 1, 2026, Huu-ay-aht will acquire land and resource interests in properties outside the Treaty Lands, both within the ḥahuuƚi and in other strategic areas. The land use goals established within the Land Use Plan will guide the acquisition and direction of development on these lands as well (HFN 2013).

3.4.2 Provincial Land Use Plan

The Kwispaa LNG Area is within the area covered by the Vancouver Island Land Use Plan. The terrestrial portions of Kwispaa LNG Area located on Huu-ay-aht Treaty Land and Huu-ay-aht fee simple land are not covered by the Land Use Plan. The terrestrial and marine portions of the Kwispaa LNG Area that are located on land administered by the Provincial Government are covered by the Land Use Plan.

Primary values for Barkley Sound under the Vancouver Island Land Use Plan are noted as visual resources associated with marine zone and islands, recreation values and opportunities, rare/threatened marine species and habitats, as well as archaeological values (Government of BC 2000). Overall management guidance emphasizes the maintenance of marine coastal recreation opportunities, as well as marine coastal habitats (Government of BC 2000). Resource management should be guided by the Barkley Sound Planning Strategy (Government of BC 1994), Vancouver Island Land Use Plan objectives, and requirements under the *Forest Practices Code of British Columbia Act*, RSBC 1996, c. 159 (Government of BC 2000).

Regional planning priorities under the Vancouver Island Land Use Plan for Barkley Sound include Special Management Zones of low to moderate priority. A sizable portion of Barkley Sound, north of the Kwispaa LNG Area, is designated as Special Management Zone 14 (Government of BC 2000). Special Management Zone 14 includes land administered by the Provincial Government on islands and along the ocean-facing slopes surrounding Barkley Sound (Government of BC 2000). The marine portion of the Kwispaa LNG Area falls within Special Management Zone 14.

3.4.3 Barkley Sound Planning Strategy

The Barkley Sound Planning Strategy was prepared by representatives of 15 Provincial, Federal, and Regional District agencies, as well as First Nations (Government of BC 1994). The purpose of the Barkley Sound Planning Strategy is to guide long-term use and development of Barkley Sound and Alberni Inlet. The Strategy represents agreement on the general terms under which land and resources will be managed in the marine and shoreline areas, up to 1,000 m inland, in Barkley Sound and Alberni Inlet (Government of BC 1994).

3.4.4 Parks and Protected Areas

There are no designated parks or protected areas within or adjacent to the Kwispaa LNG Area. The Federal Pacific Rim National Park Reserve is located approximately 15 km south and west of the Kwispaa LNG Area. The route to be used by LNG carriers calling on the Kwispaa LNG terminal through Trevor Channel passes in proximity to the Pacific Rim National Park Reserve as well as a Fisheries and Oceans Canada Rockfish Conservation Area in the southern portion of Barkley Sound. Locations of the Pacific Rim National Park Reserve and other Provincial parks and protected areas relative to the Kwispaa LNG Area are shown in **Figure 3-1**.

3.4.5 Alberni-Clayoquot Regional District

The Kwispaa LNG Area is situated within the ACRD Electoral Area A Bamfield (ACRD 2018a). The ACRD does not have a regional growth strategy. The closest Official Community Plan (for Bamfield) does not overlap the Kwispaa LNG Area; therefore, there are no ACRD land use planning designations within the Kwispaa LNG Area (ACRD 2018b).

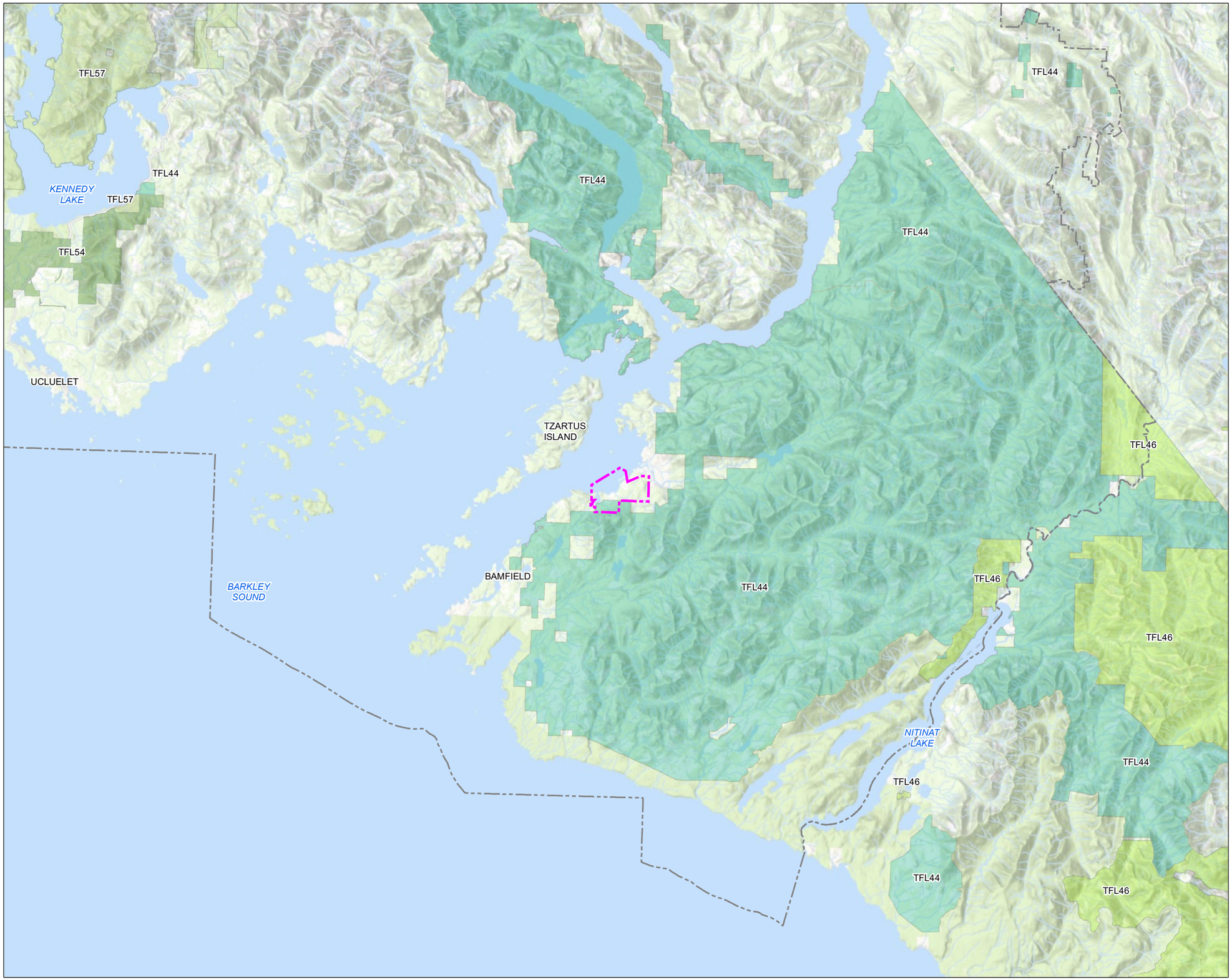
Lands and waters within the unincorporated limits of ACRD are classified into 12 zoning categories (ACRD 2017a). Land parcels within the Kwispaa LNG Area are zoned as Resource, Forest Reserve, intended for large-block resource use (ACRD 2017b) (**Figure 3-6**).

The Kwispaa LNG Area falls within the Alberni Water District.

KWISPAA LNG

Nuumaqimyiis Bay, BC

Kwispaa LNG Area Zoning



Legend

- Kwispaa LNG Area
- Alberni-Clayoquot Regional District Boundary

Tree Farm Licenses

- TFL44
- TFL46
- TFL54
- TFL57

Notes

1. All mapped features are approximate and should be used for discussion purposes only.
2. This map is not intended to be a "stand-alone" document, but a visual aid of the information contained within the referenced Report. It is intended to be used in conjunction with the scope of services and limitations described therein.

Sources

- Tree Farm Licenses, Regional District: Province of BC
- Basemap: ESRI World Topo Base

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3.5 Local Context

The size and make-up of the population and labour force of Huu-ay-aht and other Indigenous groups and neighbouring communities in relation to the workforce needs of the Project are provided in **Section 5.3.1**.

Previous experience of Huu-ay-aht with similar projects includes a large forestry operation that operated in and around the Kwispaa LNG Area (described in **Section 5.3.2.2**). A detailed discussion of Huu-ay-aht interests with respect to the Project is provided in **Section 1.4**. General community sentiment and feedback received to date from Huu-ay-aht citizens about the Project include the following:

- importance of economic benefits related to training, jobs, and contracting opportunities within a sustainable economy;
- environmental concerns, including those related to the impacts of widespread logging on local watersheds and fisheries;
- environmental concerns related to the Project; and
- cultural concerns related to preserving cultural heritage alongside sustainable economic development.

A very salient Huu-ay-aht concern regarding community resilience is related to the number of children presently in Provincial care. Huu-ay-aht has more than 30 children in care and has declared a public health emergency. More stable jobs and stronger families in Anacla would increase community resilience and provide more security and stability to Huu-ay-aht children.

Under the Maa-nulth Final Agreement, the Huu-ay-aht Government can develop and provide mechanisms for the Huu-ay-aht community to plan for and proactively address certain stressors. Those mechanisms include ongoing community engagement to identify concerns in relation to the Project and potential solutions as well as ongoing programs such as the Watershed Renewal and Fisheries Enhancement program.

Through the Environmental Management Framework in the Relationship Agreements, the Kwispaa LNG Team is committed to ensuring the Project is designed, constructed, operated, and decommissioned in a manner that avoids, minimizes, or offsets harmful impacts on the environment including environmental, economic, social, cultural, and health effects.

The Kwispaa LNG Team's approach to engaging with other Indigenous groups and neighbouring communities reflects the core values of ʔiisaak (Greater Respect), Hišuk ma ċawak (Everything is One), and ʔuuʔałuk (Taking Care Of…), as described in **Section 6**. A summary of public and stakeholder key areas of interest is provided in **Section 6.3.2**.

4. Government Involvement

4 Government Involvement

This section describes Huu-ay-aht Government as well as Federal and Provincial government involvement with the Project, including financial support, land tenure, and key permits.

4.1 Federal Financial Support

At this time, Federal funding is not anticipated to be required for the Project.

4.2 Federal and Provincial Lands

The locations of Federal lands, First Nation reserves, and Federal park lands in the region surrounding the Kwispaa LNG Area are shown in **Figure 3-1**.

The upland components of the Project will be primarily located on Huu-ay-aht fee simple and Treaty Land. The portions held by Huu-ay-aht as fee simple land are pre-approved for conversion into Treaty Land, which Huu-ay-aht intends to convert prior to operations of the Project. Small area(s) of land administered by the Provincial Government may also be required. No use of Federal lands (and therefore no requirement for the granting of any interest in Federal lands) will be required for the Project.

The marine components of the Project will overlap and extend beyond the existing water lots held by Western Forest Products Inc.

4.3 Permitting Requirements

The key Huu-ay-aht, Federal, and Provincial permits and authorizations expected to be required for the Project are outlined in **Table 4-1**. This list is preliminary and will be revised as necessary as the Project planning and design process progresses. Concurrent permitting will be sought from Huu-ay-aht, Federal, and Provincial responsible agencies.

Table 4-1 Anticipated Permitting and Regulatory Requirements

Permit/Authorization	Relevant Project Activity	Applicable Legislation/ Regulation	Responsible Agency
Huu-ay-aht First Nations			
Approval to grant the required interests in Huu-ay-aht Lands	Required for use of Huu-ay-aht Lands for the construction of Project infrastructure and tenure	*Land Act*, s. 11	Executive Council
Approval to grant any temporary interests	Required for use of Huu-ay-aht Lands for the construction of Project infrastructure and tenure	*Land Act*, s. 34	Lands and Natural Resources
Approval of applications to make any required amendments to the Land Use Plan or zoning regulation	Required for use of Huu-ay-aht Lands for the construction of Project infrastructure and tenure	s. 3 of the Development and Building Permits Regulation	Executive Council

Permit/Authorization	Relevant Project Activity	Applicable Legislation/ Regulation	Responsible Agency
Federal			
Environmental Assessment Decision Statement	Required prior to obtaining Federal authorizations and/or proceeding with a designated project or activity	CEAA 2012	Canadian Environmental Assessment Agency
LNG Export Licence	Required for the export of LNG to international markets (NOTE: four licences received in October 2015 for aggregate of 24 mtpa)	*National Energy Board Act*, RSC 1985, c. N-7	National Energy Board
Fisheries Act Authorization	Required if Project activities will likely result in serious harm to fish that are part of a commercial, recreational, or Indigenous fishery, or to fish that support such a fishery. May be required to construct marine infrastructure, including jetties and offloading facility	*Fisheries Act*, RSC 1985, c. F-14	Fisheries and Oceans Canada
Navigable Waters Approval	Required for any construction activity that is considered to substantially interfere with navigation of scheduled navigable waterways, which may include the jetties and mooring of the ASLNG™ production units	*Navigation Protection Act*, RSC 1985, c. N-22	Transport Canada
Transport Canada Marine Safety Compliance and Enforcement Certificate of Compliance	Required for operation of marine terminal facilities and vessels; will be required to allow LNG carriers to moor at the facility	*Canada Shipping Act*, SC 2001, c. 26; *Marine Transport Security Act,* SC 1994, c. 40; Marine Transportation Security Regulations, SOR/2004-144	Transport Canada
Aeronautical Obstruction Clearance	Required for tall structures that may interfere with air navigation, which may include the flare stack and loading arms	*Aeronautics Act*, RSC 1985, c. A-2; Canadian Aviation Regulations, SOR/96-433	Transport Canada

Permit/Authorization	Relevant Project Activity	Applicable Legislation/ Regulation	Responsible Agency
Non-objection to land use and construction proposals	Required for tall structures that may interfere with air navigation, which may include the flare stack and loading arms	*Aeronautics Act,* Canadian Aviation Regulations, and various zoning regulations and orders	NAV CANADA
Species at Risk Act Permit	May be required if any Project activities or components affect a Schedule 1 (*Species at Risk Act*) listed species or any part of its critical habitat or the residences of its individuals	*Species at Risk Act*, SC 2002, c. 29	Environment Canada, Fisheries and Oceans Canada, and Parks Canada
Licence or Certificate for the temporary storage of explosives	May be required if Project activities include blasting	*Explosives Act,* RSC, 1985, c. E-17; Explosives Regulations, 2013, SOR/2013-211	Natural Resources Canada
Provincial			
Environmental Assessment Certificate	Required prior to obtaining other Provincial permits or constructing the Project	BCEAA	BC Environmental Assessment Office
LNG Facility Permit, including Leave to Construct and Leave to Operate	Required prior to any construction activities for the Project and for operation of the Kwispaa LNG facility	*Oil and Gas Activities Act*, SBC 2008, c. 36; Liquefied Natural Gas Facilities Regulation, BC Reg. 146/2014	BC Oil and Gas Commission
Safety Management Plan – Alternative Safety Approach	Required for variances to prescriptive safety requirements	*Safety Standards Act*, SBC 2003, c. 39	Technical Safety BC
Heritage Site Alteration Permit	May be required during the construction phase to alter an archaeological site within the Project footprint, if any archaeological site(s) is confirmed to exist during an archaeological overview or impact assessment	*Heritage Conservation Act*, RSBC 1996, c. 187	BC Oil and Gas Commission (supported by Archaeology Branch, BC Ministry of Forests, Lands, Natural Resource Operations and Rural Development)

Permit/Authorization	Relevant Project Activity	Applicable Legislation/ Regulation	Responsible Agency
Wildlife Salvage Permit	May be required for site preparation during pre-construction, construction, and operations phases if wildlife salvages and bird nest removal or relocation are necessary	*Wildlife Act*, RSBC 1996, c. 488	BC Oil and Gas Commission (supported by BC Ministry of Forests, Lands, Natural Resource Operations and Rural Development)
Waste Discharge Permit(s)	Required prior to discharge of effluent (e.g., water from settling ponds or impoundments, potential cooling water discharge) to the environment; release of air emissions; and management of solid waste	*Environmental Management Act*, SBC 2003, c. 53; Waste Discharge Regulation, BC Reg. 320/2004; Oil and Gas Waste Regulation, BC Reg. 254/2005; Petroleum Storage and Distribution Facilities Storm Water Regulation, BC Reg. 168/94; Hazardous Waste Regulation, BC Reg. 63/88	BC Oil and Gas Commission (may be supported by BC Ministry of Environment and Climate Change Strategy)
Registration under the Code of Practice for the Concrete and Concrete Products Industry	May be required if a concrete batch plant is used on site during construction	*Environmental Management Act;* Waste Discharge Regulation	BC Oil and Gas Commission (may be supported by BC Ministry of Environment and Climate Change Strategy)
Water Licence	Required prior to withdrawal of surface water or groundwater	*Oil and Gas Activities Act; Water Sustainability Act*, SBC 2014, c. 15	BC Oil and Gas Commission (may be supported by BC Ministry of Forests, Lands, Natural Resource Operations and Rural Development)
Notification(s) and/or Change Approvals for Changes In and About a Stream	Notification is required prior to undertaking an authorized change in and about a stream as defined in section 39 of the *Water Sustainability Regulation*. A change approval is required prior to undertaking any other type of change	*Water Sustainability Act;* Water Sustainability Regulation, BC Reg. 36/2016	BC Oil and Gas Commission (supported by BC Ministry of Forests, Lands, Natural Resource Operations and Rural Development)

Permit/Authorization	Relevant Project Activity	Applicable Legislation/ Regulation	Responsible Agency
Land Allocation/Tenure/ Licence of Occupation	Required for use of land administered by the Provincial Government, including foreshore area and water lots, for the construction of Project infrastructure and tenure	*Land Act*	BC Ministry of Forests, Lands, Natural Resource Operations and Rural Development
Drinking Water System Permit(s)	Required prior to construction and operation of drinking water supply system	*Drinking Water Protection Act*, SBC 2001, c. 9*; Public Health Act*, SBC 2008, c. 28*;* Industrial Camps Regulation, BC Reg. 70/2012	BC Ministry of Health (Vancouver Island Health Authority)
Waterworks Construction and Operations Permit(s)	Required for the construction and operation of sewage facilities for a 100+ person camp with a daily design flow of 22,700 litres per day or more	*Environmental Management Act;* Municipal Wastewater Regulation, BC Reg. 87/2012	BC Ministry of Health (Vancouver Island Health Authority)
Camp Permit	Required for the construction and operation of a construction camp	*Public Health Act;* Industrial Camp Regulations, BC Reg. 70/2012; Food Premises Regulations, BC Reg. 210/99; Sewerage System Regulation, BC Reg. 326/2004	BC Ministry of Health/ BC Ministry of Environment and Climate Change Strategy

In addition to the required Federal, Provincial, and local government permits, authorizations, and licences, the Kwispaa LNG Team will be undertaking a voluntary TERMPOL review. This technical review is an analysis designed to assess the risks to navigation and public safety associated with shipping and navigation.

Land parcels within the Kwispaa LNG Area are classified by the ACRD as Resource, Forest Reserve, intended for large-block resource use (ACRD 2017b). Rezoning through the ACRD may be required for any parcels not held by Huu-ay-aht as Treaty Land.

5. Environmental Setting and Effects

5 Environmental Setting and Effects

The following sections provide an overview of the environmental settings in and around the Kwispaa LNG Area. Information was gathered from publicly available sources, including scientific literature, grey literature (e.g., technical reports, government reports), and EA documentation from other projects proximate to the Kwispaa LNG Area. Sources of information include the following:

- Maa-nulth Final Agreement;
- local knowledge and Traditional Ecological Knowledge; and
- publicly available data and reports from –
    - Statistics Canada;
    - BC Ministry of Environment and Climate Change Strategy;
    - BC Ministry of Forests, Lands, Natural Resource Operations and Rural Development;
    - Port Alberni – ACRD; and
    - consulting firms.

This information will be augmented with data from Project-specific studies that will be undertaken to support the environmental, economic, social, health, and heritage effects assessments for the Project.

5.1 Cultural Resources Setting

Huu-ay-aht people have always lived in their ḥahuułi. Just as the territory has shaped Huu-ay-aht's culture and practices, Huu-ay-aht's culture and practices have and continue to shape the territory, including the Kwispaa LNG Area. This interconnection is one expression of Huu-ay-aht's sacred principle Hišuk ma c̓awak, or "Everything is One". There is no sharp distinction between the biophysical and the cultural aspects of the Huu-ay-aht ḥahuułi. In short, Huu-ay-aht (and in particular Huu-ay-aht's culture) is an integral part of the environmental setting for the Project.

Important Huu-ay-aht cultural resources located in and around the Kwispaa LNG Area include the following:

- cedar trees and stands of cedar trees;
- the area between marine area and forest where certain plants are harvested;
- Santa Maria Island;
- intertidal areas such as clam gardens that Huu-ay-aht have traditionally developed and maintained;
- fishing grounds;
- hunting and gathering grounds; and
- Nuumaqimyiis, Huu-ay-aht's traditional winter village located at the mouth of the Sarita River.

The Kwispaa LNG Team has sought to protect these important cultural resources by establishing the Sarita Cultural Protection Line, which was developed through extensive feedback from Huu-ay-aht citizens and defines the site boundary (i.e., the Kwispaa LNG Area).

5.2 Biophysical Setting

The Kwispaa LNG Area supports a rich diversity of aquatic and terrestrial species and habitats. This section presents an overview of the atmospheric, marine, freshwater, and terrestrial environments surrounding the Kwispaa LNG Area.

5.2.1 Atmospheric Environment

5.2.1.1 Climate and Weather

The local climate of the Kwispaa LNG Area is one of the wettest in Canada with cool summers and mild winter temperatures (BC MOF 1994). Major rainfall events from moist Pacific air masses occur between October and March. Sea fog is experienced off Cape Beale between July and October, dropping the visibility down to 1.2 km or less on an average of 65 days annually.

At the Cape Beale weather station for the period of 1981 to 2010 (ECCC 2018), average monthly temperatures ranged from 3.3°C during the months of February and December to 14.0°C in August. Average monthly precipitation was 54.3 millimetres ("mm") in July and up to 428.5 mm in January. An extreme rainfall event during the period was 137.0 mm in August 1991. Snow falls from January through March and October through December with accumulations peaking at 4.1 centimetres ("cm") in February. An extreme snowfall event was 22.4 cm in November 1985. In general, snowfall accumulations tend to be short-lived, and average monthly accumulations during the period of record are 0.0 cm. The most frequent winds at Cape Beale range from 10 km per hour ("km/h") to 17 km/h and are expected to be oriented along the shoreline due to the local topography. Extreme winds at Cape Beale from 1981 to 2010 reached 97 km/h in February 1997. Data from the Wave Information Studies station 83001 (United States ("US") Army Corps of Engineers n.d.); located west of the entrance to the Strait of Juan de Fuca indicate that storm winds in the region are predominantly from the southeast, south, and northwest during the winter (storm) season.

5.2.1.2 Air Quality

The Kwispaa LNG Area lies within the Alberni basin airshed, which encompasses the head of Alberni Inlet and an area that is 40 km long to the northwest and between 8 km and 12 km wide. The airshed is characterized by frequent thermal inversions during winter months. Air quality within the airshed improved in recent decades due to improvements to industrial operations and burning practices (ACRD 2016).

The closest air quality monitoring stations to the Kwispaa LNG Area are located in Port Alberni. Port Alberni has a history of poor air quality due to poor circulation in the airshed (BC Lung Association 2010). A 2016 monitoring report indicated that there were few exceedences in ambient air quality objectives for certain air pollutants, including NO_2, SO_2, O_3, and air quality was generally considered good (BC MOE 2016). Exceedences in fine particulate matter were noted during winter months and were attributed to wood smoke sources (BC MOE 2016).

5.2.1.3 Ambient Light

Existing ambient light levels within the Kwispaa LNG Area are low (below Commission International de L'Éclairage, 2003 reference levels) based on initial studies conducted by WorleyParsons in 2015 (WorleyParsons 2016).

5.2.1.4 Acoustic Environment

Based on initial levels of sound measured within and near the Kwispaa LNG Area in 2015, audible noise sources include airplanes, vehicles, boats, birds, wildlife, wind in trees, flowing water, and waves. Levels recorded were within the range of 37.1 A-weighted decibels ("dBA") and 66.5 dBA for equivalent sound (WorleyParsons 2017). Current log-sorting activities in the Kwispaa LNG Area are an audible noise source and would cease if the Project is advanced.

5.2.2 Marine Environment

5.2.2.1 Ecosection

Marine portions of the Kwispaa LNG Area, including the shipping lanes, are situated in the Outer Pacific Shelf Marine Ecoregion (Demarchi 2011). This is a narrow continental shelf area that extends westward from Vancouver Island to the bottom edge of the continental slope, which is approximately 90 km wide off the southwest coast of Vancouver Island. Intense upwelling at the edge of the continental slope creates strong mixing resulting in a diverse community of marine life. This shelf is under the influence of the southeasterly flowing California Current during the late spring to early autumn period and brings northwest winds. Starting in late autumn or early winter, the California Current is shifted offshore by the Davidson Current, and this southward flowing current then persists until early spring when the California Current again moves inshore (Demarchi 2011). Within this ecoregion, the area is located in the Vancouver Island Shelf ecosection (Demarchi 2011), a shallow oceanic area with several isolated islands, islets, and reefs. It lies offshore from western Vancouver Island and extends westward as far as the top edge of the continental slope.

This is a very important area for Indigenous, recreational, and commercial fishing. The islands and islets are important seabird nesting areas, harbour seal breeding sites, and sea lion haulouts. Included as protected areas in this ecosection are the marine portion of Pacific Rim National Park and Checleset Bay Ecological Reserve; the Anne Valle (Triangle Island), Sartine Island, and Beresford Island ecological reserves; and Lanz and Cox Islands Parks (Demarchi 2011).

5.2.2.2 Oceanography

Trevor Channel is bordered by islands to the northwest. The majority of Trevor Channel and Nuumaqimyiis Bay have water depths varying from 100 m to 150 m, except along the southwest end of Trevor Channel where water depths decrease to approximately 30 m to 50 m. Bathymetric contours in the Nuumaqimyiis Bay vicinity are illustrated in **Figure 5-1**.

According to Nautical Chart No. 3671 (1994) published by Canadian Hydrographic Service, tidal range in the vicinity of the Kwispaa LNG Area is approximately 3.9 m. Water levels and tide elevations at Bamfield referencing to Chart Datum include:

- higher high-water large tide – 4 m;
- higher high-water mean tide – 3.2 m;
- mean water level – 2 m;
- lower low-water mean tide – 0.6 m; and
- lower low-water large tide – 0.1 m.

Tides are semi-diurnal and markedly declinational (i.e., influenced by the position of the moon). Generally, surface water velocity due to the tides is approximately 10 cm per second ("cm/sec") throughout Barkley Sound according to modelling by Stronach et al. (1993). The exception is around Cape Beale where flood and ebb tides reach up to 40 cm/sec.

Offshore waves in the Pacific Ocean are severe during the winter seasons, with frequent high swell waves associated with long wave periods. Based on the 32-year Wave Information Studies station 83001 wave data, more than half of the offshore waves come from the west. Storm waves typically occur between December and March. Significant wave heights higher than 5 m occur approximately 3% of the time (US Army Corps of Engineers n.d.).

Hydrodynamic and wave models have been developed for the Kwispaa LNG Area based on historic measurements at offshore locations as well as recent data collected in Trevor Channel and Nuumaqimyiis Bay. The data shows that annual offshore wind conditions are predominantly from the southwest direction in winter (October – March) and from the northwest in summer (June – September). Wind speeds greater than 15 metres per second ("m/s") occur for a period of 10 to 15 days per month in winter whereas the same conditions only occur for a period of one to two days in total over the summer months. The average wind speeds at the nearshore locations are generally less than 10 m/s.

Maximum significant wave height recorded at the Wave Information Studies station 83001 is approximately 10 m and wave period ranges from 3 to 25 seconds. Annual offshore swell wave height is approximately 8 m coming from the west; sea waves predominantly come from a west-northwest direction with wave height exceeding 8 m.

Nearshore wave conditions were measured using Acoustic Doppler Current Profilers in Trevor Channel and Nuumaqimyiis Bay between October 2016 and April 2017. The data indicates that the predominant wave direction in Trevor Channel is from the southwest with significant wave height rarely exceeding 3.5 m and a period rarely exceeding 20 seconds. At Nuumaqimyiis Bay, the waves come from nearly all directions with significant wave height rarely exceeding 0.4 m and a mean peak period of 10 seconds.

KWISPAA LNG

Nuumaqimyiis Bay, BC

Bathymetry of Nuumaqimyiis Bay Vicinity

KENNEDY LAKE

UCLUELET

TZARTUS ISLAND

BAMFIELD

BARKLEY SOUND

NITINAT LAKE

Legend

- Kwispaa LNG Area

Bathymetry - Depth Zones

- Shallow (0-20m)
- Photic (20-50m)
- Mid-depth (50-200m)
- Deep (200-1000m)

Notes

1. All mapped features are approximate and should be used for discussion purposes only.
2. This map is not intended to be a "stand-alone" document, but a visual aid of the information contained within the referenced Report. It is intended to be used in conjunction with the scope of services and limitations described therein.

Sources

- Bathymetry Depth Zones: Province of BC
- Basemap: ESRI World Topo Base

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Kilometres

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5.2.2.3 Marine Substrate, Vegetation, Invertebrates, Reptiles, and Fish

The substrate of Nuumaqimyiis Bay predominantly consists of soft to mixed substrate. North of Santa Maria Island there is bedrock and sand with some gravel along the shoreline. Based on current and past uses of land and water within Nuumaqimyiis Bay, marine sediment in the Kwispaa LNG Area may contain contaminants of concern (shown in **Figure 5-4**). Shorezone mapping (ShoreZone n.d.) has not been completed for Barkley Sound.

Intertidal zonation (banding) of flora and fauna is evident on rocky substrates and is believed to be consistent with the patterns that characterize non-estuarine bays along the Pacific Coast at this latitude (see Carefoot 1977).

Eelgrass areas are located in Sarita River estuary and a portion of Nuumaqimyiis Bay, 20 m to 40 m from shore (shown in **Figure 5-3** and **Figure 5-4**) (West Coast Aquatic 2012a, Pacificus Biological Services Ltd. 2014). Green, brown, and red algae are expected to be present in accordance with inter and subtidal zonation typical of this latitude. The occurrence and distribution of kelp forests near Nuumaqimyiis Bay is not documented.

Barkley Sound is highly productive, supporting many species of marine fish and invertebrates. Upwellings of nutrient-rich waters from the Juan de Fuca Plate and subsequent mixing with less saline and warmer surface waters support a diversity of marine life, from microscopic primary producers (i.e., phytoplankton) through apex predators such as killer whales (*Orcinus orca*).

Barkley Sound, including Trevor Channel, is an important area for pink shrimp (*Pandalus borealis*), Dungeness crab (*Cancer magister*), as well as Pacific and Olympia oysters (*Crassostrea gigas* and *Ostrea conchaphila*). Pacific spot prawn (*Pandalus platyceros*) is also present in Barkley Sound, although Nuumaqimyiis Bay and lower Trevor Channel are not documented as important areas (West Coast Aquatic 2012a). The northern abalone (*Haliotis kamtschatkana*) is found along the Pacific Coast in lower intertidal and subtidal zones; presence around the Kwispaa LNG Area is not documented. Invasive species documented in the Sarita River estuary and nearby include varnish clam (*Nuttallia obscurata*), Manilla clam (*Venerupis philippinarum*), which has been seeded into the area, and green crab (*Carcinus maenas*).

The leatherback sea turtle (*Dermochelys coriacea*) is a migratory species that breeds in tropical or subtropical waters before moving to temperate waters in search of food. In Canada, most of the sightings on the west coast occur between July and September (Government of Canada 2018b). The West Coast Aquatic website reports sightings of this species off the coast of Vancouver Island, including several inside Barkley Sound (West Coast Aquatic 2012a). The only other marine turtle reported in the region is the green turtle (*Chelonia mydas*). It is considered a rare vagrant in BC. Closest to the Kwispaa LNG Area, a live specimen was recorded near Ucluelet in 1954 (Matsuda et al. 2006).

Fisheries and Oceans Canada has noted Barkley Sound as unique for Pacific hake, green sturgeon (*Acipenser medirostris*) migrations, adult and juvenile salmon foraging and migrations, Pacific herring (*Clupea pallasii*) spawning and foraging, juvenile eulachon (*Thaleichthys pacificus*) rearing, sardine foraging, flatfish juvenile rearing, Pacific sand lance (*Ammodytes hexapterus*) burying habitats, and productive eelgrass (Fisheries and Oceans Canada 2013). Several species of marine fish, including pipefish, sculpin, eelpout, combfish, gunnel, perch, sanddab, flounder and stickleback species, were collected by beach seine along the Nuumaqimyiis Bay shore in preliminary studies conducted in June 2015 (WorleyParsons 2017). Other fish species known

to occur in Barkley Sound are the basking shark (*Cetorhinus maximus*) and bluntnose sixgill shark (*Hexanchus griseus*), which use the area as nursery habitat (Government of Canada 2018a). Pacific herring are known to spawn in Barkley Sound, although spawning activity has not been documented in the Kwispaa LNG Area. Recorded spawning densities in areas west of the Kwispaa LNG Area, including Poett Nook, are very low.

5.2.2.4 Marine Mammals

Marine mammals occupy the nearshore and offshore marine habitats of the Kwispaa LNG Area. The species that regularly occur in the waters of the Vancouver Island Shelf ecosection (Ford 2014) are listed in **Table 5-1**, followed by brief summaries of species use of the area.

Table 5-1 Species Occurrence and Use of the Kwispaa LNG Area

Species Common Name	Scientific Name	Provincial Conservation Status	Federal Conservation Status
Grey whale	*Eschrichtius robustus*	Blue	Special concern
Common minke whale	*Balaenoptera acutorostrata*	Yellow	Not at risk
Fin whale	*Balaenoptera physalus*	Red	Threatened
Humpback whale	*Megaptera novaeangliae*	Blue	Special concern
Cuvier's beaked whale	*Ziphius cavirostris*	Unknown	Not at risk
Risso's dolphin	*Grampus griseus*	Yellow	Not at risk
Pacific white-sided dolphin	*Lagenorhynchus obliquidens*	Yellow	Not at risk
Northern right whale dolphin	*Lissodelphis borealis*	Yellow	Not at risk
Southern resident killer whale	*Orcinus orca*	Red	Endangered
Transient killer whale	*Orcinus orca*	Red	Threatened
Harbour porpoise	*Phocoena*	Blue	Special concern
Dall's porpoise	*Phocoenoides dalli*	Yellow	Not at risk
Northern fur seal	*Callorhinus ursinus*	Red	Threatened under COSEWIC
Steller sea lion	*Eumetopias jubatus*	Blue	Special concern
California sea lion	*Zalophus californianus*	Yellow	Not at risk
Northern elephant seal	*Mirounga angustirostris*	Red	Not at risk
Harbour seal	*Phoca vitulina*	Yellow	Not at risk
Sea otter	*Enhydra lutris*	Blue	Special concern

Note: COSEWIC – Committee on the Status of Endangered Wildlife in Canada

Sea lions: No sea lion haulouts or rookeries are present in the immediate vicinity of Nuumaqimyiis Bay. The closest known haulout is a winter haulout on Folger Island, which is approximately 3 km north of the entrance to Trevor Channel and 16.5 km from the Kwispaa LNG Area. A total of 34 pups were observed at this location in a 2012 survey; however, Fisheries and Oceans Canada does not classify this site as a rookery (Olesiuk 2018). Two other year-round haulouts near the Kwispaa LNG Area located at Pachena Point and Wouwer Island, approximately 13 km southeast and 11 km northwest of Trevor Channel, respectively.

Harbour seals: Use of the area for breeding and birthing by harbour seals is possible. Whereas sea lions gather in large colonies to birth and mate, harbour seals give birth and mate in a non-colonial setting. Accordingly, any isolated rocky shore with easy access to the water has the potential to be used for birthing by harbour seals; mating occurs primarily in the water.

Sea otters: Much of Barkley Sound has suitable habitat for sea otters; the Kwispaa LNG Area and navigation route have moderate to high carrying capacity (Government of Canada 2018c).

Harbour porpoises: Barkley Sound is used by harbour porpoises as a foraging area (Government of Canada 2018d).

Grey whales: The seasonal foraging habitats of grey whales extend throughout Barkley Sound, with a primary feeding area located on the west side of the Sound, away from the proposed Kwispaa LNG Area and navigation route (West Coast Aquatic 2012a).

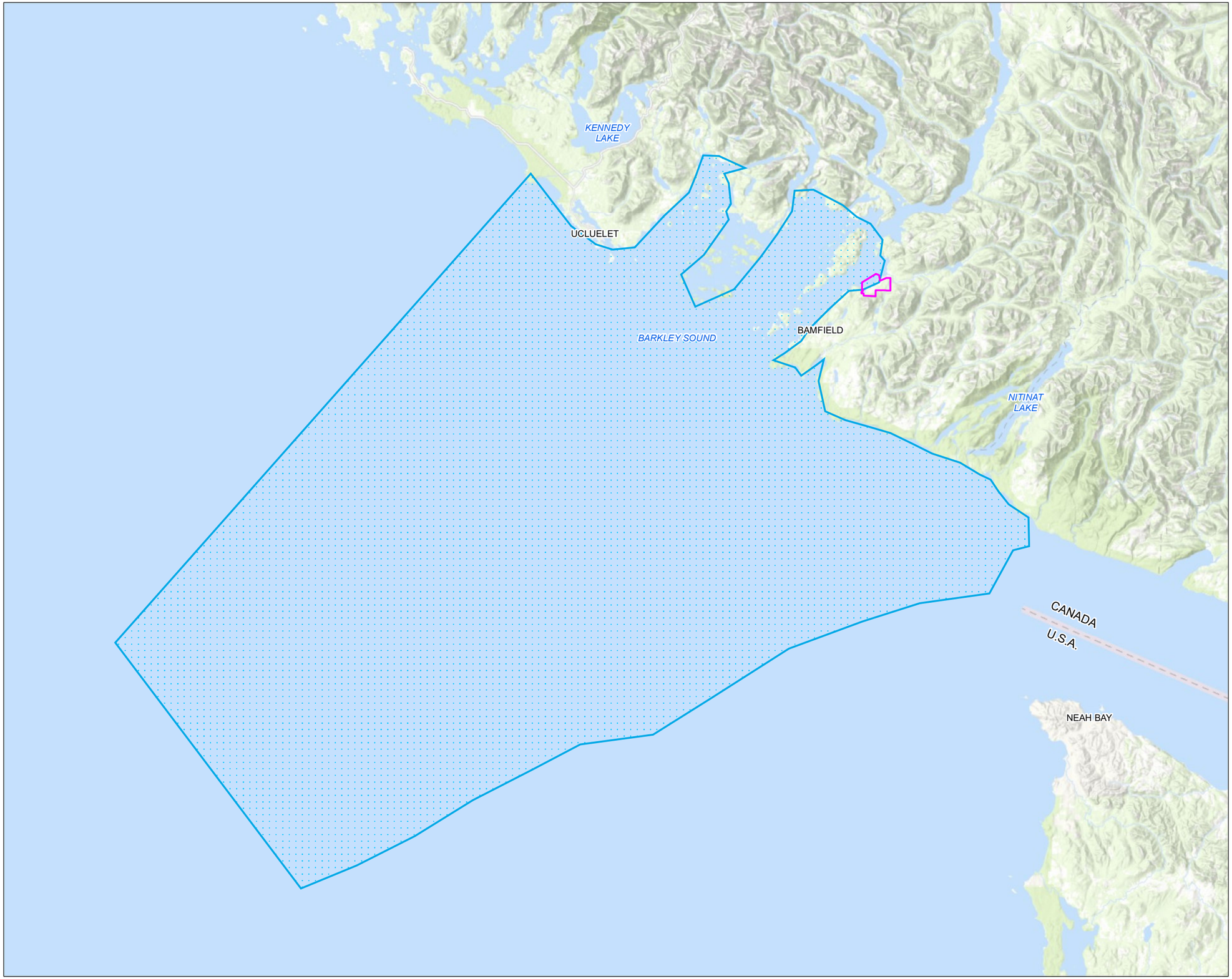
Humpback whales: An area of critical habitat for humpback whales for feeding and foraging has been designated over Barkley Sound waters, including Nuumaqimyiis Bay (Kwispaa LNG Area) as well as an area of marine water to the west (navigation route), as shown on **Figure 5-2** (Government of Canada 2018e).

Killer whales: Transient killer whales forage throughout Barkley Sound (Government of Canada 2018f). Southern resident killer whales are found off southern Vancouver Island (Government of Canada 2018g) and may use Barkley Sound for foraging. An amendment to the Species at Risk Recovery Plan for Northern and Southern Killer Whales has been proposed that would extend the definition of critical habitat for these populations to include the area between Swiftsure Bank and Amphitrite Point, and out to La Parouse Bank (Government of Canada 2018h). Offshore killer whales have been seen in the general vicinity of the Kwispaa LNG Area (Fisheries and Oceans Canada 2009).

KWISPAA LNG

Nuumaqimyiis Bay, BC

Humpback Whale Critical Habitat



Legend

- Kwispaa LNG Area
- Humpback Whale Critical Habitat

Notes

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2. This map is not intended to be a "stand-alone" document, but a visual aid of the information contained within the referenced Report. It is intended to be used in conjunction with the scope of services and limitations described therein.

Sources

- Critical Habitat: Province of BC
- Basemap: ESRI World Topo Base

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5.2.3 Freshwater Environment

5.2.3.1 Groundwater

Two groundwater wells (tag 65541 and 65542) are located within Huu-ay-aht fee simple parcel PID 007-729-596 (iMap BC). Based on current and past uses of land on portions of the Kwispaa LNG Area, groundwater has the potential to contain contaminants of concern. Potential contaminants of concern in groundwater in and around the Western Forest Products Inc. log sort area include BTEX (benzene, toluene, ethylbenzene and xylene), volatile organic compounds, light and heavy extractable petroleum hydrocarbons, phenols, polycyclic aromatic hydrocarbons, metals, and polychlorinated biphenyls (WorleyParsons 2015).

5.2.3.2 Surface Water

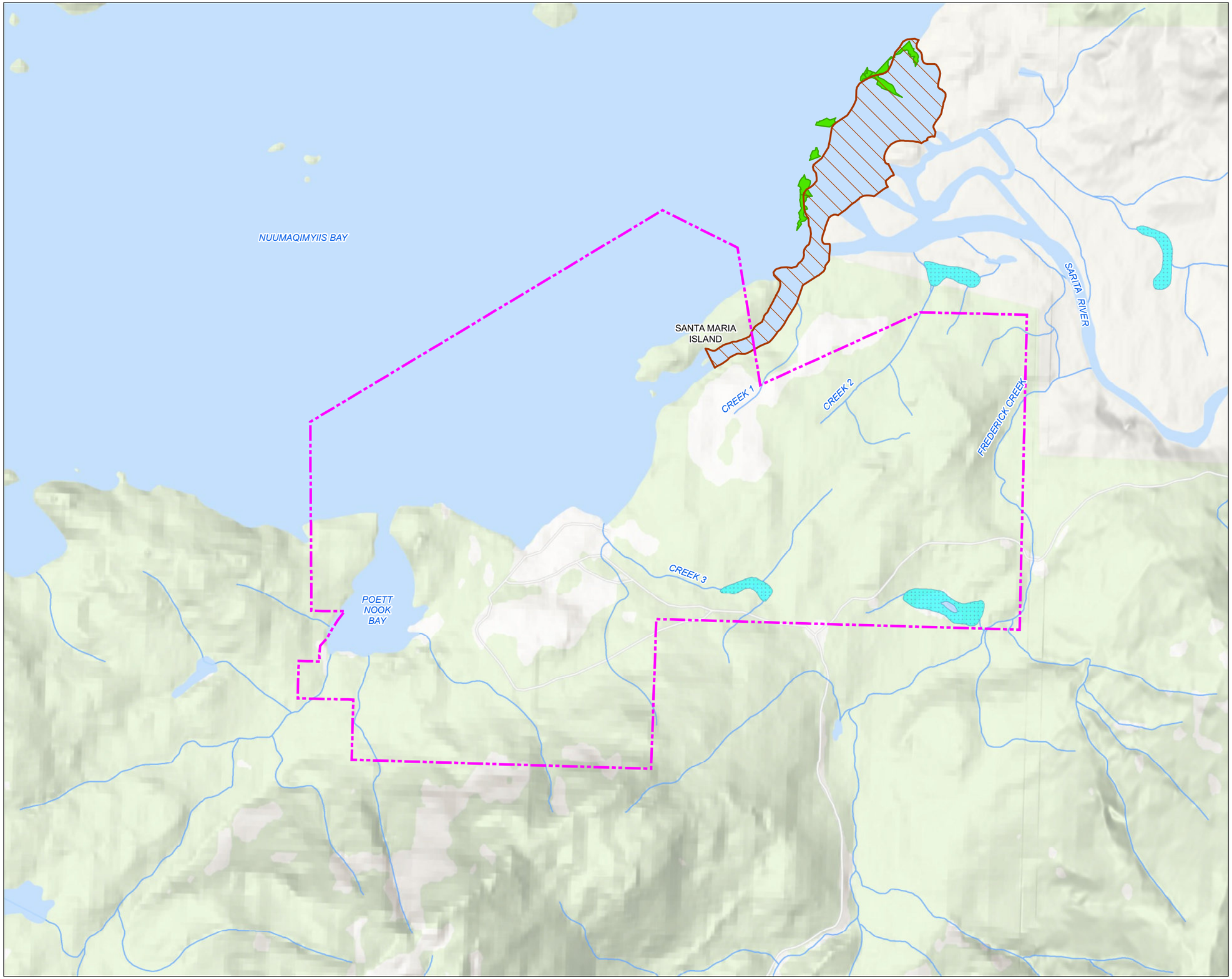
The upland portion of the Kwispaa LNG Area is located west of the Sarita River. Two tributaries to the Sarita River and two unnamed watercourses are located within the Kwispaa LNG Area (**Figure 5-3**).

Frederick Creek is approximately 5.5 km in length, flowing from Frederick Lake generally in a south-to-north direction and entering Sarita River approximately 700 m upstream from the river's mouth. The lower reach is an alluvial channel that contains a marsh area with very gentle gradients (0% to 10%). The defined channel is 2 m to 5 m wide. Logged during the 1930s and 1940s, the area features an advanced second-growth forest that is now in place (Barry 2010).

A lower tributary to the Sarita River (labelled as Creek 2 on **Figure 5-3**) is approximately 1 km long and flows generally from a southwest-to-northeast direction with a gradient up to 10% before entering the edge of the Sarita River Estuary. The surrounding forest was logged in 2013 with a vegetated buffer remaining around the watercourse. The channel flows along the ditch line of a logging road for approximately 500 m and receives the water from perpendicular tributaries via a culvert under the logging road. The channel is well defined and averages 1 m to 2 m in width.

A small creek (labelled as Creek 3 on **Figure 5-3**) flows in an east-to-west direction into Nuumaqimyiis Bay, east of the Western Forest Products Inc. log sort area. The surrounding lands have been logged in recent years, and the forested riparian zone has experienced extensive blow-down.

An additional small creek was identified during a 2015 field visit just south of Santa Maria Island (**Figure 5-3**).



KWISPAA LNG

Nuumaqimyiis Bay, BC

Surface Water Setting Around the Kwispaa LNG Area

Legend

- Kwispaa LNG Area
- Eelgrass
- Intertidal Bivalve Harvesting Area
- Wetland

Notes

1. All mapped features are approximate and should be used for discussion purposes only.
2. This map is not intended to be a "stand-alone" document, but a visual aid of the information contained within the referenced Report. It is intended to be used in conjunction with the scope of services and limitations described therein.

Sources

- Eelgrass: BCMCA
- Intertidal Bivalve Harvesting Areas: Province of BC
- Wetlands: BC Freshwater Atlas
- Basemap: ESRI World Topo Base

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5.2.3.3 Freshwater Fish and Fish Habitat

The Sarita River watershed is close to 9,000 ha in total size. The main watercourses in the watershed include the Sarita River, South Sarita River, Sabrina Creek, and Frederick Creek. Smaller tributaries of the Upper Sarita include Central, Hunter, Thompson, and Miller creeks. The mouth of the Sarita River is approximately 900 m wide and includes a wide salt marsh area with tidal channels and some small islands. Historically, the Sarita River supported many salmonid species including coho salmon (*Oncorhynchus kisutch*), pink salmon (*Oncorhynchus gorbuscha*), chinook salmon (*Oncorhynchus tshawytscha*), chum salmon (*Oncorhynchus keta*), and sockeye salmon (*Oncorhynchus nerka*), as well as steelhead trout (*Oncorhynchus mykiss*) and resident trout and char (cutthroat (*Oncorhynchus clarkii*), rainbow (*Oncorhynchus mykiss*), and Dolly Varden char (*Salvelinus malma*). In recent years, the most abundant species has been chum salmon with smaller numbers of coho and variable but increasing numbers of chinook (Barry 2010). On the west coast of Vancouver Island, chinook salmon are currently undergoing a status assessment by the Committee on the Status of Endangered Wildlife in Canada ("COSEWIC") and have been identified as a stock of concern by Fisheries and Oceans Canada.

There are several lakes in the watershed with the largest being Sarita Lake (147 ha). The watershed is regenerating following extensive logging including to the edge of banks. With little riparian area, the watershed has experienced channel widening, channel and bank instability, infilling of pools, reduced surface flows in summer, higher peak flows in winter, and reduced woody debris and nutrients due to the loss of riparian vegetation. A series of falls 1 km downstream of Sarita Lake create impassible barriers to fish (Barry 2010). Critical, important, and marginal freshwater fish habitat areas are shown in **Figure 5-4**.

Forestry activities around these critical fish habitat areas have resulted in adverse effects on the fish species described above and their habitat. Factors believed to be limiting salmon production in the Sarita watershed include: lack of deep pools for adults holding in the Sarita River, lack of summer rearing habitat for juveniles in both the estuary and in the Sarita River, and lack of stable spawning habitat in Sarita and South Sarita rivers (Barry 2010). While the Sarita River has abundant gravel as potential spawning substrate, gravel stability is also a concern and it is compacted in many areas.

Huu-ay-aht seeks to renew the Sarita, Pachena, and Sugsaw watersheds, and eventually other watersheds within their ḥahuuḥi, recognizing that this process may take many generations, which has been initiated through the Watershed Renewal and Fisheries Enhancement Fund through the Project. With the ongoing implementation of the Maa-nulth Final Agreement and emerging economic opportunities, Huu-ay-aht is in a strong position to renew the fish and wildlife productivity and ecological integrity of the watersheds while protecting cultural and heritage values.

Frederick Creek is documented to support coho and chinook salmon as well as steelhead trout (BC MOE 2018). An early field visit for the Project resulted in the capture of coho salmon, cutthroat trout rainbow trout, starry flounder (*Platichthys stellatus*), threespine stickleback (*Gasterosteus aculeatus*), and prickly sculpin (*Cottus asper*) within this watercourse. Fish habitat includes abundant off-channels, pools, refuge areas, and good gravel substrate for spawning (Barry 2010). Visual observations suggest that Frederick Creek is fish-bearing throughout most reaches and tributaries.

The upper half of Creek 2 (a lower tributary to the Sarita River, shown in **Figure 5-3**) was found to have moderate value for fish habitat during an early field visit for the Project. Coho salmon and rainbow and cutthroat trout have been reported in the lower reaches of Creek 2, up to the ephemeral reaches through the forest cut-blocks. Coho salmon, cutthroat trout, and prickly sculpin were captured in this watercourse during early Project field studies in August 2015.

Suitable freshwater fish habitat exists in the lower portion of Creek 3 (see **Figure 5-3**), where coho salmon, cutthroat trout, threespine stickleback, and prickly sculpin were captured during early Project field studies in August 2015.

5.2.4 Terrestrial Environment

5.2.4.1 Ecoregion and Biogeoclimatic Conditions

The Kwispaa LNG Area is located over a narrow coastal lowland – the Estevan Coastal Plain – adjacent to the Vancouver Island Ranges (Holland 1976). The area is within the Windward Island Mountains ecosection of the Western Vancouver Island ecoregion, an area on the western margin of Vancouver Island comprising lowlands, islands, and rugged mountains. Rocks are a heterogeneous group of sedimentary, volcanic rocks folded about northerly trending axes and intruded by granitic batholiths. Uplift and dissection of the surface produced rugged topography rising above the continental slope to the west. Glaciers built up along the crest of these mountains before flowing westward into the Pacific Ocean, rounding some of the summits and ridges and leaving vast quantities of glacial sediment along the coastline. In addition, the large ice sheet heavily impacted the many fjords, channels, and sounds by deepening them and straightening their margins (Demarchi 2011).

The lands within and around the Kwispaa LNG Area have been used for a variety of commercial and industrial purposes throughout the past century, including logging and log sorting. As such, much of the terrestrial habitat has been impacted by historical and ongoing activities.

The terrestrial portion of the Kwispaa LNG Area is located within the Coastal Western Hemlock ("CWH") biogeoclimatic zone, one of the most complex and highly productive biogeoclimatic zones in the province. This zone likely encompasses the greatest diversity and abundance of wildlife and habitat of any ecological zone in BC (BC MOF 1994). Its predominant features are the Coastal Mountains and the ocean, which affect the climate and the ecology of the region.

The Kwispaa LNG Area falls within the CWH southern very wet hyper-maritime variant 1 biogeoclimatic zone (CWHvh1), which features a wet, humid climate with cool summers and mild winters with relatively little snow limited to a narrow coastal area from near Port Renfrew to Quatsino Sound (BC MOF 1994).

5.2.4.2 Terrain, Geology, and Soils

The low-lying terrain contains minor elongated hills rising to 70 m above sea level ("masl"). Elevations within the Kwispaa LNG Area range from sea level at the coast to approximately 330 masl in the southeast corner.

Bedrock in the Kwispaa LNG Area is expected to include mainly igneous rocks, with minor sedimentary rocks and two roughly parallel east-west striking faults. The dominant bedrock type observed during a field visit in 2015 was basalt to dolerite with lesser felsic to intermediate (dacite to andesite) volcanics, diorite, siliceous rocks, and crystalline limestone (WorleyParsons 2017). The Nuumaqimyiis Bay shoreline comprises

gravel to boulder-sized rock fragments and pockets of bedrock. Where basalt bedrock is exposed it is strong to very strong and blocky, with steeply dipping (70-degree to 80-degree) joints.

The prominent surficial geology observed in the 2015 field visit was till; this material was observed to range from 0.5 m to greater than 2 m where exposed in road cuttings. The areas with shallower zones of till are associated with ridge lines; deeper zones of till are expected in the lower areas with thickness likely extending to 5 m at most of these locations. Some deeper weathered zones associated with fractured and shear zones may be present. The till material observed had a variable matrix content of sand, silt, and clay with poorly sorted gravel, cobble, and boulder fragments. Minor occurrence of alluvium was observed at one creek location and comprised fine-grained sediment that is possibly tide-influenced.

Subsurface conditions near the shore are likely to comprise marine deposits over glaciomarine sediments; with bedrock at depth. Closer to the shoreline, the sediment profile is expected to have gravel to cobble-sized rock debris as a thin veneer. Based on the past and current use of the lands around Nuumaqimyiis Bay, soil in Kwispaa LNG Area may contain contaminants of concern. Several areas of potential contamination have been identified in and around the Western Forest Products Inc. log sort area (**Figure 5-4**) (WorleyParsons 2015).

5.2.4.3 Terrestrial Vegetation

Growing seasons are long and although precipitation is high, it can vary throughout the CWHvh1 variant. Vegetation in CWHvh1 is dominated by western hemlock (*Tsuga heterophylla)*, amabilis fir (*Abies amabilis*), and to a lesser extent western red cedar (*Thuja plicata*) (BC MOF 1994). The predominant shrub layer is red huckleberry (*Vaccinium parvifolium*) and Alaskan blueberry (*Vaccinium ovalifolium*), with an abundant moss layer. The Kwispaa LNG Area consists of secondary-growth forest due to historic logging activity over several decades.

There are up to 139 provincially listed plant species present in the CWH biogeoclimatic zone of the South Island Forest District; of these species, 20 are listed as either special concern, threatened, or endangered under the *Species at Risk Act* ("SARA"). Along the Sarita River, paintbrush owl clover (*Castilleja ambigua*), nodding semaphore grass (*Pleuropogon refractus*), and graceful arrow-grass (*Triglochin concinna*) have been identified (**Figure 5-4**).

Two wetlands,1.9 ha and 4.4 ha in size, are located in the Kwispaa LNG Area (**Figure 5-3**). The potential electric transmission line is also likely to cross several wetlands, depending on final routing.

5.2.4.4 Terrestrial Wildlife

The CWH biogeoclimatic zone contains a diverse assemblage of wildlife species comprising invertebrates, amphibians, reptiles, birds, and mammals. Wildlife species expected to occur in the Kwispaa LNG Area are typical of terrestrial environments along Vancouver Island's west coast. Terrestrial wildlife species native to southern Vancouver Island are primarily forest dwelling and, owing to its accessibility, the area has experienced extensive human activities such as forestry, that have altered the physical structure of much of the area (see **Section 5.3.2**). Physical alteration of the landscape has subsequently caused changes to the wildlife community. In addition to habitat fragmentation, one of the main effects on habitat structure has been a substantial reduction of the most advanced stages of ecological forest succession (i.e., old-growth forests) and, presumably, the species that depend upon them.

5.2.4.4.1 Invertebrates, Amphibians, and Reptiles

Invertebrates in the Kwispaa LNG Area likely comprise a diverse array of taxa. For the purpose of the EA for the Project, the focus is on species of conservation concern, which include the dromedary jumping-slug (*Hemphillia dromedaries*) (**Figure 5-4**) and the warty jumping-slug (*Hemphillia glandulosa*). The dromedary jumping-slug is Red-listed provincially and listed as threatened federally. The warty jumping-slug is also Red-listed provincially and as a species of special concern federally.

Twelve species of amphibians and reptiles potentially occur in the terrestrial (including wetland) habitats of the Kwispaa LNG Area. These species are listed in **Table 5-2.**

Table 5-2 Amphibians and Reptile Species Potentially Occurring in the Kwispaa LNG Area

Species Common Name	Scientific Name	Provincial Conservation Status	Federal Conservation Status
Rough-skinned newt	*Taricha granulosa*	Yellow	Not at risk
Long-toed salamander	*Ambystoma macrodactylum*	Yellow	Not at risk
Northwest salamander	*Ambystoma gracile*	Yellow	Not at risk
Western red-backed salamander	*Plethodon vehiculum*	Yellow	Not at risk
Ensatina	*Ensatina eschscholtzii*	Yellow	Not at risk
Wandering salamander	*Aneides vagrans*	Blue	Special concern
Western toad	*Anaxyrus boreas*	Yellow	Special concern
Northern Pacific treefrog	*Pseudacris regilla*	Yellow	Not at risk
Northern red-legged frog	*Rana aurora*	Blue	Special concern
Common garter snake	*Thamnophis sirtalis*	Yellow	Not at risk
Northwestern garter snake	*Thamnophis ordinoides*	Yellow	Not at risk
Western Terrestrial garter snake	*Thamnophis elegans vagrans*	Yellow	Not at risk

Two species of conservation concern, northern red-legged frog and western toad (d'Entremont incidental observation August 2018), have been identified within the Kwispaa LNG Area (**Figure 5-4**).

5.2.4.4.2 Mammals

Mammal species potentially occurring in the Kwispaa LNG Area are presented in **Table 5-3** below.

Table 5-3 Mammal Species Potentially Occurring in the Kwispaa LNG Area

Species Common Name	Scientific Name	Provincial Conservation Status	Federal Conservation Status
California myotis	*Myotis californicus*	Yellow	Not assessed
Western long-eared myotis	*Myotis evotis*	Yellow	Not assessed
Little brown myotis	*Myotis lucifugus*	Yellow	Endangered
Long-legged myotis	*Myotis volans*	Yellow	Not assessed
Yuma myotis	*Myotis yumanensis*	Yellow	Not assessed
Hoary bat	*Lasiurus cinereus*	Yellow	Not assessed
Silver-haired bat	*Lasionycteris noctivagans*	Yellow	Not assessed
Big brown bat	*Eptesicus fuscus*	Yellow	Not assessed
Townsend's big-eared bat	*Corynorhinus townsendii*	Blue	Not assessed
Vagrant shrew	*Sorex vagrans*	Yellow	Not assessed
Dusky shrew	*Sorex monticolus*	Yellow	Not assessed
American water shrew	*Sorex palustris*	Red	Not assessed
Common water shrew	*Sorex palustris*	Blue	Not assessed
Deer mouse	*Peromyscus maniculatus*	Yellow	Not assessed
Keen's mouse	*Peromyscus keeni*	Yellow	Not assessed
Townsend's vole	*Microtus townsendii*	Yellow	Not assessed
Common muskrat	*Ondatra zibethicus*	Yellow	Not assessed
American beaver	*Castor canadensis*	Yellow	Not assessed
Red squirrel	*Sciurus vulgaris*	Yellow	Not assessed
American black bear	*Ursus americanus*	Yellow	Not at risk
Northern raccoon	*Procyon lotor*	Yellow	Not assessed
Grey wolf	*Canis lupus*)	Yellow	Not at risk
Cougar	*Puma concolor*	Yellow	Not assessed
North American river otter	*Lontra canadensis*	Yellow	Not assessed
Ermine	*Mustela erminea*	Yellow	Not assessed
American mink	*Neovison vison*	Yellow	Not assessed
American marten	*Martes americana*	Yellow	Not assessed
Wolverine, *vancouverensis* subspecies	*Gulo gulo vancouverensis*	Red	Special concern
Black-tailed (mule) deer	*Odocoileus hemionus*	Yellow	Not assessed
Roosevelt elk	*Cervus canadensis roosevelti*	Blue	Not assessed

5.2.5 Birds

Barkley Sound supports hundreds of species of resident and migratory birds, which occupy every environment from the open ocean of nearby international shipping lanes to the quiet understory of forested sites. Both Barkley Sound and the adjacent Amphitrite and Swiftsure Banks area are Important Bird Areas (IBA Canada n.d.). Seabirds that breed locally include Brandt's cormorant (*Phalacrocorax penicillatus)*, pelagic cormorant (*Phalacrocorax pelagicus*), pigeon guillemot[6] (*Cepphus columba*), tufted puffin[6] (*Fratercula cirrhata*), fork-tailed storm-petrel[6] (*Oceanodroma furcate)*, Leach's storm-petrel[6] (*Oceanodroma leucorhoa*), black oyster catcher[6] (*Haematopus bachmani*), glaucous-winged gull[6] (*Larus glaucescens*), Cassin's auklet[6] (*Ptychoramphus aleuticus*), rhinoceros auklet[6] (*Cerorhinca monocerata*), and marbled murrelet[6] (*Brachyramphus marmoratus*).

As there is a large number of species of birds that occur near the Project, only those species with a conservation listing are summarized in **Table 5-4** below.

Table 5-4 Bird Species of Conservation Concern in the Kwispaa LNG Area

Common Name	Scientific Name	Provincial Conservation Status	Federal Conservation Status
Marbled murrelet[1, 2]	*Brachyramphus marmoratus*	Blue	Threatened
Cassin's auklet[2]	*Ptychoramphus aleuticus*	Blue	Special concern
Double-crested cormorant	*Phalacrocorax auritus*	Blue	Not at risk
Great blue heron, fannini subspecies[2]	*Ardea herodias fannini*	Blue	Special concern
Band-tailed pigeon[2]	*Patagioenas fasciata*	Blue	Special concern
Barn swallow[2]	*Hirundo rustica*	Blue	Threatened
Common nighthawk[2]	*Chordeiles minor*	Yellow	Threatened
Northern goshawk, *laingi* subspecies	*Accipiter gentilis laingi*	Red	Threatened
Peregrine falcon, *pealei* subspecies	*Falco peregrinus pealei*	Blue	Special concern
Northern pygmy-owl, *swarthi* subspecies	*Glaucidium gnoma swarthi*	Blue	Not assessed
Western screech-owl, *kennicottii* subspecies	*Megascops kennicottii*	Blue	Threatened
Olive-sided flycatcher[2]	*Contopus cooperi*	Blue	Threatened

Note:

[1] Critical habitat identified within the Kwispaa LNG Area (**Figure 5-4**).

[2] Migratory bird under the *Migratory Birds Convention Act.*

6 Migratory bird under the *Migratory Birds Convention Act.*

KWISPAA LNG | Shell LNG | huuayaht

Nuumaqimyiis Bay, BC

Sensitive Areas Around the Kwispaa LNG Area

NUUMAQIMYIIS BAY

SANTA MARIA ISLAND

CREEK 1

CREEK 2

CREEK 3

FREDERICK CREEK

SARITA RIVER

POETT NOOK BAY

Legend

- Kwispaa LNG Area
- Marginal Fish Habitat
- Important Fish Habitat
- Critical Fish Habitat
- Historical Record of Herring Spawning
- Area of Potential Contamination
- Clam Bed
- Eelgrass
- Eelgrass (Field Observed)
- Intertidal Bivalve Harvesting Area
- Marbled Murrelet Critical Habitat

Species and Ecosystems at Risk

- Estuarine Paintbrush
- Northern Red-legged Frog
- Warty Jumping-slug

Notes

1. All mapped features are approximate and should be used for discussion purposes only.
2. This map is not intended to be a "stand-alone" document, but a visual aid of the information contained within the referenced Report. It is intended to be used in conjunction with the scope of services and limitations described therein.

Sources

- Historical Record of Herring Spawning, Clam Beds: DFO
- Fish Habitat Classifications, Areas of Potential Contamination, Field Observed Eelgrass: Worley Parsons
- Eelgrass: BCMCA
- Intertidal Bivalve Harvesting Areas, Critical Habitat, Species at Risk: Province of BC
- Basemap: ESRI World Topo Base

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5.3 Social, Economic, Health, and Heritage Setting

5.3.1 Social Setting

5.3.1.1 Huu-ay-aht First Nations

Huu-ay-aht has approximately 805 citizens, of which approximately 15% live at home, in or around Anacla, and the remainder live away from home. A major part of Huu-ay-aht's strategic vision is to increase sustainable economic and other opportunities within Huu-ay-aht's ḥahuuḥi to attract more Huu-ay-aht citizens to live and work at home.

Huu-ay-aht's population is growing rapidly. Approximately 7.5% of Huu-ay-aht citizens are over the age of 65, whereas 29.4% are under the age of 18. Currently, over 30 Huu-ay-aht children are "in care" with a Provincial or delegated agency. Huu-ay-aht's strategic vision and recent Social Services Project activities aim to reduce that number, to "bring our children home" and keep Huu-ay-aht children safe, healthy, and connected to their families and their Huu-ay-aht culture and community.

According to a 2015 survey of Huu-ay-aht citizens, approximately 48% of Huu-ay-aht adults have at least a high school education, 21% are employed full time, and 11% are self-employed.

5.3.1.2 Other Maa-nulth First Nations

The Kwispaa LNG Area relative to other Maa-nulth First Nation Treaty Lands is shown in **Figure 3-4**. Indigenous and Northern Affairs Canada (INAC) notes that Maa-nulth Nations are self-governing since 2008, but the registered population for each individual Maa-nulth First Nation is still reported and updated (INAC 2017). These population numbers are presented to provide context for Maa-nulth First Nations.

The Yuułuʔiłʔatḥ Government is located in the community of Hitacu, on the east shore of Ucluelet Inlet across the water from the District of Ucluelet. In 2018, Yuułuʔiłʔatḥ Nation had a registered population of 677, of which approximately 207 were reported by INAC as living "on own reserve" (INAC 2018a). The administrative centre and main community is the village of Hitacu, located 28 kms from the municipality of Ucluelet. Citizens also live in other communities, mainly on Vancouver Island (Yuułuʔiłʔatḥ n.d.).

The Uchucklesaht Tribe lives in West Barkley Sound. INAC data from 2018 reports that Uchucklesaht had a registered population of 228, with 26 living "on own reserve" (INAC 2018b). In 2014, the population included approximately 299 enrolees and citizens, of which three lived in the village of Ehthlateese at the head of Kildonen Inlet and 296 live away from the village (Uchucklesaht Tribe 2018). Other Uchucklesaht villages are Cowishulth on the west side of Barkley Sound, and Hilthatis, in Uchucklesaht Inlet (Uchucklesaht Tribe 2018).

The Toquaht Nation had 155 registered citizens in 2018 (INAC 2018c). Approximately 20 people live in the main community of Macoah, off Highway 4 along Kennedy Lake. The remainder live in Ucluelet, Port Alberni and other communities on Vancouver Island (Toquaht Nation 2018).

Ka:'yu:'k't'h'/Che:k'tles7et'h' First Nations had a registered population of approximately 578 in 2018 (INAC 2018d). Approximately 150 citizens live on reserve, with the remainder living Campbell River, Nanaimo, Courtenay, Victoria and Seattle (First Nations of Maa-Nulth Treaty Society n.d.). Ka:'yu:'k't'h'/Che:k'tles7et'h' First Nations is in the process of planning the construction of a new bighouse, which is proposed to include a separate multi-use building with commercial kitchen, gymnasium, library, museum and cultural centre (KFCN 2018).

Approximate populations of these communities are provided in **Table 5-5**.

Table 5-5 Maa-nulth First Nation Communities and Population

Maa-nulth Nations	Population Living at Home	Population Living away from Home	Total Population
Yuułuʔiłʔatḥ Nation	207	472	679
Uchucklesaht Tribe	26	202	228
Toquaht Nation	9	147	156
Ka:yu:kth/Che:k:tles7eth First Nations	164	414	578

5.3.1.3 Other Indigenous Groups

The Kwispaa LNG Area relative to other Indigenous communities (First Nation reserves) is shown in **Figure 3-1** and relative to the traditional territories of Hupačasath First Nation, Tseshaht First Nation, Qualicum First Nation, K'ómoks First Nation and We Wai Kai Nation are shown in **Figure 3-5.** Specific distances between these communities and the Kwispaa LNG Area are provided in **Table 3-4**.

Tseshaht First Nation is a Nuu-chah-nulth Nation, with a registered population of 1,214 in 2018, of which 443 lived on Tsahaheh IR 1 in Port Alberni (INAC 2018e).

Hupačasath First Nation consists of three original tribes: the Muuhulthaht, Klehkoot and Ahahswinis peoples (Hupačasath First Nation 2018a). Hupačasath First Nation has five reserves, of which two are occupied (Ahahswinis IR 1 and Kelhkoot IR 2). The registered population as of 2018 was 332, with 130 people living on Ahahswinis IR 1, located with the municipal boundaries of Port Alberni (Hupačasath First Nation 2018b, INAC 2018f).

Qualicum First Nation has a registered population of 127 in 2018, of which 49 lived on the Qualicum IR, at the mouth of the Big Qualicum River between Qualicum Beach and Bowser (INAC 2018g).

K'ómoks First Nation consisted of six original tribes: the Sathloot, Sasitla, Leeksun, Puntledge, Cha'chae, and Tat'poos (K'ómoks 2018). K'ómoks First Nation has four reserves: Comox 1, Goose Spit 3, Pentledge 2 and Salmon River 1 (K'omoks). The registered population as of 2018 was 335, with 106 people living on their reserves, with the highest population in Comox 1, located on the north shore of Comox Harbour (INAC 2018).

We Wai Kai Nation was previously known as the Cape Mudge Band (We Wai Kai, 2018). We Wai Kai Nation have a total of five reserves, of which three are occupied (Drew Harbour 9, Cape Mudge 10 and Quinsam 12). The registered population as of 2018 was 1148, with 340 living on the Nation's reserves (We Wai Kai, 2018,

INAC 2018). Approximately 40% of the population live on reserve in Cape Mudge 10, located on the south-west portion of Quadra Island, and 60% live on Quinsam 12, located within the city limits of Campbell River (Sasamans Society 2018).

Populations of these communities are provided in **Table 5-6**.

Table 5-6 Indigenous Communities and Population

Indigenous Groups	Population Living at Home	Population Living away from Home	Total Population
Tseshaht First Nation	443	768	1,211
Hupačasath First Nation	130	202	332
Qualicum First Nation	49	78	127
K'ómoks First Nation	106	229	335
We Wai Kai Nation	340	808	1148

The Métis Nation of BC ("MNBC") represents 38 Métis Chartered Communities in BC, including the Alberni Clayoquot Métis Society. The Métis population of the ACRD was 1,125 in 2016, or approximately 3.7% of the total population of the ACRD (Statistics Canada 2018a), and the Métis population of the City of Port Alberni was 705 (4.1% of the population of Port Alberni) (Statistics Canada 2018b). There are approximately 90,000 people who self-identify as Métis in BC, of which approximately 18,000 Métis Citizens are provincially registered with the MNBC (MNBC 2018a). The MNBC provides social and economic programs and services to Métis communities (MNBC 2018a). Métis history in BC is documented from the 18th century.

5.3.1.4 Other Communities

From a regional government administrative perspective, the Kwispaa LNG Area is located within the boundaries of the ACRD, which is bounded to the north by the Strathcona Regional District, to the east by the Comox Valley and Nanaimo Regional Districts, and to the south by the Cowichan Valley Regional District. The ACRD is a federation that includes the membership of Huu-ay-aht, the Yuułuʔiłʔatḥ Nation, Uchucklesaht Tribe, and Toquaht Nation, as well as the City of Port Alberni, District of Tofino, District of Ucluelet, and six unincorporated areas (Alberni-Clayoquot Electoral Areas A through F) (ACRD 2018a). The Kwispaa LNG Area is located in the boundaries of Alberni-Clayoquot Electoral Area A, and approximately 10 km northeast of the unincorporated community of Bamfield. The eastern portion of the electric transmission line will be located within Electoral Area H of the Nanaimo Regional District, and depending on the final route selected, a small section of the electric transmission line may cross Electoral Area C or Electoral Area F of the Nanaimo Regional District.

Communities in proximity to the Kwispaa LNG Area and their 2016 Census populations are presented in **Table 5-7**.

Table 5-7 Communities and Population

Communities	Population
Alberni-Clayoquot Regional District	
Alberni-Clayoquot Regional District	30,981
Alberni-Clayoquot Electoral Area A – Bamfield	243
Alberni-Clayoquot Electoral Area B – Beaufort	443
Alberni-Clayoquot Electoral Area C – South Long Beach	677
Alberni-Clayoquot Electoral Area D – Sproat Lake	1,616
Alberni-Clayoquot Electoral Area E – Beaver Creek	2,754
Alberni-Clayoquot Electoral Area F – Cherry Creek	1,935
City of Port Alberni	17,678
District of Tofino	1,932
District of Ucluelet	1,717
Nanaimo Regional District	
Nanaimo Regional District	155,698
Nanaimo Electoral Area C	2,808
Nanaimo Electoral Area F	7,724
Nanaimo Electoral Area H	3,884
City of Parksville	12,514
Town of Qualicum Beach	8,943

Source: ACRD 2018c, Regional District of Nanaimo 2018, Statistics Canada 2017.

The locations of the communities identified above in the relation to the Kwispaa LNG Area are shown in **Figure 5-5**.

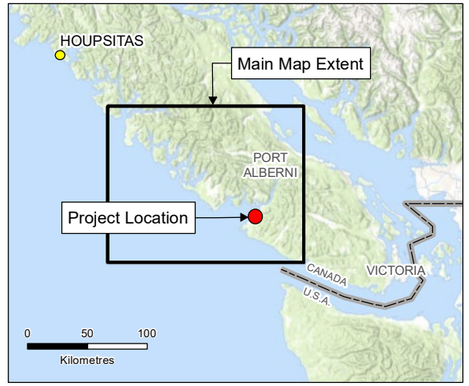
At the time of the 2016 Census, the ACRD had a population of 30,981, a decrease of 0.3% from 2011. During this same period, the population within the immediate vicinity of Kwispaa LNG Area (Electoral Area A of the ACRD) increased by 26.6% from 192 to 243 (Statistics Canada 2017a). Individuals identifying as Indigenous in the 2016 Census made up 19.9% of the ACRD population, 52.0% of whom were women (Statistics Canada 2017a). Overall, the population in the ACRD is aging. The population 65 years and older increased by 3.9% from 2011 to 2016 (Statistics Canada 2012, 2017a).

In 2016, the Nanaimo Regional District had a population of 155,698, increasing by 6.2% since 2011. Of this total, 74% live in the municipalities of Nanaimo, Parksville, Lantzville and Qualicum Beach, and the remaining 26% (40,132) live in Electoral Areas and First Nation communities (Regional District of Nanaimo 2018, Statistics Canada 2017). The population of Electoral Area H has increased by 10.7% since 2011, and the populations of the City of Parksville and the Town of Qualicum Beach have increased by 4.5% and 2.9%, respectively, in the same period (Regional District of Nanaimo 2018, Statistics Canada 2017). The Regional District population is older than the provincial population, with a larger proportion of people aged 65 and older (27.0%) than the province overall (18.3%) (Statistics Canada 2017b). The median age is 51.1, compared to 43.0 in BC overall (Statistics Canada 2017b).

KWISPAA LNG

Nuumaqimyiis Bay, BC

Location of Communities Around the Kwispaa LNG Area



ALBERNI-CLAYOQUOT C
ALBERNI-CLAYOQUOT D
ALBERNI-CLAYOQUOT B
ALBERNI-CLAYOQUOT E
HUPAASATH FIRST NATION: KLEHKOOT 1
TSESHAHT FIRST NATION: TSAHAHEH 1
HUPAASATH FIRST NATION: AHAHSWINIS 1
CITY OF PORT ALBERNI
ALBERNI-CLAYOQUOT F
DISTRICT OF TOFINO
EHTHLATEESE
MACOAH
COWISHULTH
HITACU
DISTRICT OF UCLUELET
ALBERNI-CLAYOQUOT A
BAMFIELD
ANACLA

Legend

- Kwispaa LNG Area
- Community Location
- Community / District
- First Nation Reserve
- Alberni-Clayoquot Regional District Boundary

Alberni-Clayoquot Electoral Areas

- A – Bamfield
- B – Beaufort
- C – South Long Beach
- D – Sproat Lake
- E – Beaver Creek
- F – Cherry Creek

Notes

1. All mapped features are approximate and should be used for discussion purposes only.
2. This map is not intended to be a “stand-alone” document, but a visual aid of the information contained within the referenced Report. It is intended to be used in conjunction with the scope of services and limitations described therein.

Sources

- Communities, Districts, Regional Boundaries, First Nation Reserves, and Electoral Areas: Province of BC
- Basemap: ESRI World Topo Base

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5.3.2 Land and Water Use

Current use of lands and resources for traditional purposes, and non-traditional land and water use in the vicinity of the Kwispaa LNG Area are described in **Section 5.3.2.1** and **Section 5.3.2.2** respectively.

5.3.2.1 Current Use of Lands and Resources for Traditional Purposes

5.3.2.1.1 Huu-ay-aht First Nations

The Sarita watershed, including the Kwispaa LNG Area, is known to Huu-ay-aht as the "heart of the people." It is an area of significant and ongoing cultural importance to Huu-ay-aht, including Santa Maria Island and the nearby cemetery, which will be protected from development through the Sarita Cultural Protection Line, a measure designed to avoid important cultural areas.

Much of the Kwispaa LNG Area has and continues to be disturbed by logging activities and the existing log sort. However, Huu-ay-aht citizens continue to use the lands and waters in and around the Kwispaa LNG Area for various purposes, including:

- fishing;
- navigating on water and land;
- harvesting bivalves, aquatic plants, and other resources in the intertidal areas;
- harvesting forest resources;
- harvesting wildlife; and
- cultural teaching and continuity.

5.3.2.1.2 Other Maa-nulth First Nations

The Project will be located on Huu-ay-aht owned lands, which are situated within Huu-ay-aht's larger ḥahuułi and which will be converted to Treaty Lands subject to Huu-ay-aht jurisdiction and exclusive use. The ḥahuułi of each Maa-nulth First Nation is recognized and shown on maps as part of the Maa-nulth Final Agreement, and rights are identified throughout the ḥahuułi. Huu-ay-aht, Yuułuʔiłʔatḥ Nation ("Yuułuʔiłʔatḥ"), Uchucklesaht Tribe ("Uchucklesaht"), Toquaht Nation ("Toquaht"), and Ka:'yu:'k't'h'/Che:k'tles7et'h' First Nations ("Ka:'yu:'k't'h'/Che:k'tles7et'h'") have certain harvesting and other rights on ḥahuułi outside of their respective Treaty Lands, including the right to harvest, trade and barter fish, wildlife and migratory birds for food, social and ceremonial purposes as set out in the Maa-nulth Final Agreement (INAC 2010).

Barkley Sound (and Kyuquot Sound, outside of the Kwispaa LNG Area) comprise the Maa-nulth Wildlife Harvest Area and Maa-nulth Migratory Bird Harvest Area, where Maa-nulth First Nations have non-exclusive harvesting rights for food, social, and ceremonial purposes. Any applicable conservation risks to wildlife or birds are addressed by the responsible Federal Minister, who sets the total allowable harvest after negotiations with Maa-nulth First Nations and the Provincial Government. The Maa-nulth Domestic Fishing Area includes Barkley Sound and Kyuquot Sound, with additional areas extending offshore at each location. The Maa-nulth Final Agreement provides harvesting allocation by species, species group, and for salmon specific runs by species (e.g., Henderson sockeye) (INAC 2010).

Maa-nulth Intertidal Bivalve Harvest Areas ("Bivalve Harvest Areas") are areas where Maa-nulth First Nations have exclusive rights to harvest intertidal bivalves, including oysters, razor clams, manila clams, varnish clams, butter clams and native littleneck clams (First Nations of the Maa-Nulth Treaty Society 2014). Bivalve Harvest Areas do not apply in areas closed for bivalve harvesting, such as Fisheries and Oceans Canada sanitation and navigation closures. Bivalve Harvest Areas near the Kwispaa LNG Area are described in the Maa-nulth First Nations Annual Fishing Plan for 2016. Bivalve Harvest Areas in northeast Nuumaqimyiis Bay at the mouth of Carnation Creek, and Kookswiis at the mouth of the Sarita River and extending south between Santa Maria Island and Vancouver Island are both identified as bivalve harvesting areas used by Huu-ay-aht First Nations and Toquaht First Nation (Maa-nulth First Nations 2016). North of the Kwispaa LNG Area, the Meade Islets and the Geer Islets to the north of Tzartus Island are used as Bivalve Harvest Areas by the Uchucklesaht Tribe (Maa-nulth First Nations 2016).

5.3.2.1.3 Other Indigenous Groups

Tseshaht First Nation ("Tseshaht") traditional territory extends from the Alberni Valley out to the Broken Group Islands. Historically, Tseshaht used their traditional territory as a seasonal round. In late winter and early spring, Tseshaht travelled to traditional sites in Barkley Sound to harvest sea mammals, halibut, rockfish, and salmon. As the seasons changed, Tseshaht followed the salmon up Alberni Inlet to the Somass River (Tseshaht First Nation 2012a).

Hupačasath First Nation ("Hupačasath") traditional territory includes lands around Port Alberni of approximately 232,000 ha, as well as shared interests in Barkley Sound and offshore. Hupačasath traditional use included the following.

- hunting, fishing, berry and fruit picking, and potlatching on Ahahswinis IR#1 and Kleekoot IR #2;
- spearing, trapping, and preparing fish, as well as hunting, potlatching, and berry picking on Kleekoot IR #2;
- hunting and fishing on Cous IR #3;
- fishing and stopovers on Chu-ca-ca-cook IR #4; and
- camping and seafood gathering on Nettle Island IR#5 (Hupačasath First Nation 2018b).

Hupačasath continue to practice traditional activities on the five reserves and surrounding areas. Nettle Island is in the Broken Group Islands in Pacific Rim Nation Park, and is often visited by tourists engaged in camping, fishing, and kayaking.

Qualicum First Nation traditional territory includes lands around Qualicum Bay, extending east to west side of Texada Island, north past Courtenay, south to Parksville and west around Port Alberni (Qualicum First Nation 2018). Qualicum First Nation trace their ancestry to the Coast Salish Pentlatch (Pəntl'áč) people and Kwakwaka'wakw groups from the north (Everson 1995, Millen 2004). Qualicum may be derived from a Hul'qumi'num word, *xwkw'olexwem* meaning "place having chum salmon" (Rozen 1985). Prior to European contact, the Pentlatch people lived in a seasonal round, living on Denman Island and other coastal sites to harvest herring and shellfish in the summer, and moving to the Puntledge and Tsolum Rivers in the fall to fish for coho and chum salmon (Millen 2004). No information has been obtained on current use of lands and resources by Qualicum First Nation.

K'ómoks First Nation traditional territory extends from the Salmon River watershed in the north to the Englishman River watershed in the south (K'ómoks First Nation 2018). The traditional territory includes all of the islands and portions of the mainland from Forward Harbour to Denman and Hornby Islands in the south. Their territory is known as the Land of Plenty, providing K'omoks people with traditional foods from hunting, fishing, and gathering (K'ómoks First Nation 2018).

We Wai Kai Nation traditional territory includes land and islands from Port Alberni up to Kelsey Bay and east on the mainland north to present day Alexis Creek. We Wai Kai First Nation cultural sites across the traditional territory include old village sites, fish traps, clam gardens and culturally modified trees. We Wai Kai members continue to fish, gather traditional foods and medicines, harvest cedar for textiles, and hunt and trap in the traditional territory. The Nation is active in protecting lands and waters of the traditional territory (Laich-Kwil-Tach Treaty Society 2017).

The Alberni Clayoquot Métis Society is a Métis Chartered Community based in Port Alberni, BC. No information was obtained on local or regional traditional use of land and resources by Métis.

5.3.2.2 Non-Traditional Land and Water Use

5.3.2.2.1 Land Use Within the Kwispaa LNG Area

The Kwispaa LNG Area falls within Tree Farm Licence 44 (**Figure 3-6**), held by Western Forest Products Inc. (MFLNRO 2011). The Allowable Annual Cut for Tree Farm Licence 44 is 800 000 m^3 (MFLNRO 2011). Western Forest Products Inc. currently operates a log sort on an upland portion of Kwispaa LNG Area and undertakes log booming within Nuumaqimyiis Bay as illustrated in **Figure 5-6**. The upland facility is partially covered with asphalt and includes infrastructure and other buildings, as well as a shoreline fill area with a dock. In the past, a larger forestry operation existed on the site with buildings, a fuel station, and a residential area, in addition to approximately 35 homes (from before 1952 to approximately 1967), as shown in **Figure 5-7**.

The at-shore Project components will be located on a water lot of up to 255 ha, portions of which are currently leased by Western Forest Products Inc. and a third party.

On-site logging activities, including the Western Forest Products Inc. log sort and log booming activities in Nuumaqimyiis Bay within the Kwispaa LNG Area, would conclude prior to the Project proceeding to its construction phase.

Figure 5-6 Log Sort Facility [September 2014]

Figure 5-7 Log Sort Facility with Residential Area [1948]

5.3.2.2.2 Water Use Within the Kwispaa LNG Area

Water supply to the forestry operations is piped from Frederick Lake, which is located approximately 3 km south of the upland sort.

5.3.2.2.3 Surrounding Land Use

The closest communities to the Kwispaa LNG Area are Anacla and Bamfield, approximately 10 km and 11.5 km southwest respectively of the Kwispaa LNG Area (**Figure 1-1**). Bamfield and Anacla straddle the Cape Beale headlands, which are on the south shore of Barkley Sound. Most of the land surrounding the Kwispaa LNG Area is designated for forestry use and is heavily logged. Road access to the Kwispaa LNG Area is via Bamfield, Port Alberni, or Duncan on existing gravel roads (**Figure 3-1**). The closest known residence is located on the west side of the Sarita River, approximately 500 m east of the Kwispaa LNG Area (**Figure 3-1**). A cemetery is located to the northeast of the Kwispaa LNG Area.

There are no Provincial parks or Provincial protected areas in or adjacent to the Kwispaa LNG Area. The Pacific Rim National Park Reserve is located approximately 15 km south and west of the Kwispaa LNG Area. The Pachena Bay Trailhead of the West Coast Trail is situated 5 km south of Bamfield.

5.3.2.2.4 Surrounding Water Use

The Barkley Sound and Alberni Inlet region remains an important commercial and recreational fishing area. As noted in **Section 5.3.2.1**, Maa-nulth fisheries are critically important as are other Indigenous fisheries. Barkley Sound is currently used for a variety of Indigenous, commercial, and recreational purposes, including finfish and shellfish fishing, diving, kayaking, and sail and marine transportation. Passenger ferries, fishing vessels, and whale and bear watching vessels travel through Barkley Sound from Tofino and Ucluelet. In addition, there are several anchorages and dive sites within Trevor Channel. Kayak routes follow the contours of the islands to the northwest of Trevor Channel. Broken Group Islands, a cluster of more than 90 islands situated within the marine portion of the Pacific Rim National Park Reserve in Barkley Sound, are popular sea kayaking destinations (**Figure 3-1**). Kayaks also travel along the southern shores of Barkley Sound from Bamfield to the Deer Group of islands across Trevor Channel. Boaters access the Port Alberni Yacht Club, located on Fleming Island in Robber's Pass (Port Alberni Yacht Club 2018). Poett Nook Marina and Campground is located approximately 15 km northeast of Bamfield and 1 km west of Sarita and has berths for 140 vessels as well as a 130-site campground (BC Marine Trails 2018). There is a Provincial ecological reserve within Barkley Sound, northwest of Tzartus Island.

The northwestern portion of Trevor Channel across from Nuumaqimyiis Bay is bordered by Tzartus Island and the Deer Group Islands. Campsites and day use areas are located on Fleming Island and Tzartus Island in the Deer Group, with marine access only. Campsites and day use areas are accessed by paddlers, boaters, and fishers as well as tourism operators (BC Marine Trails 2018). Campsites in the Deer Group Islands are wilderness campsites with no facilities or potable water and are considered a less crowded alternative to the campsites in the Broken Group Islands. The sites on Fleming Island and the Ross Islets have room for a small number of tents (BC Marine Trails 2017). Campsites on Diana Island on Treaty Lands are administered by Huu-ay-aht (BC Marine Trails 2018).

The waters of Alberni Inlet, Trevor Channel, and adjacent waters, are also used by large commercial vessels transiting to and from Port Alberni, including cargo ships, bulk carriers, hazardous material transports, tugs, and barge vessels, as well as pilot boats. Log booming occurs in Nuumaqimyiis Bay, where boom boats move logs onto the booms.

Subject to TERMPOL review, LNG carriers bound for the Project will be boarded by BC Coast Pilots at Cape Beale Pilot Station, which is located approximately 1.9 to 3.7 km (1 to 2 nautical miles) offshore from Cape Beale (**Figure 2-2**). LNG carriers will then proceed northeast into Trevor Channel to the Kwispaa LNG Area. Loaded LNG carriers would follow the same route back out to the Pacific Ocean.

5.3.3 Economic Setting

5.3.3.1 Regional Economy

Historically, the economy in the ACRD has been based on agriculture, forestry, fishing, and tourism. The relative importance of these resource industries has changed over the years, but they continue to serve as economic drivers (ACRD 2015).

Agricultural activities have declined from historic levels, with approximately 3,100 ha currently in production out of a total 7,700 ha of land in the Agricultural Land Reserve ("ALR") (ACRD 2011). The ACRD has set forth a plan to increase both agricultural production and the consumption of local food to 40% in 20 years (ACRD 2011).

Forestry has transitioned from a focus on first-growth logging, which has mostly been logged, to second and third-growth activities. A large paper mill is located on Port Alberni Inlet, along with a lumber mill, and several smaller sawmills are situated in the Alberni Valley (ACRD 2015). In 2007, a review of forestry activities in the Alberni Valley noted that the forest industry on the coast had been in decline for 20 years, with a substantive impact on local communities because of the past prosperity. Changes to the industry were in process as of 2007 to revitalize and increase the economic viability of the forest sector, including concentration of harvesting rights and aggregation of forest tenures (Macauley and Associates Consulting 2007).

The closest communities to the Kwispaa LNG Area are Anacla and Bamfield. The communities of Port Alberni, Tofino, Ucluelet, and Bamfield are all in the ACRD and serve as hubs for tourism activities.

5.3.3.1.1 Bamfield

Bamfield's largest employer is the Bamfield Marine Sciences Centre, which began operating in 1972 (ACRD 2015). Historically, Bamfield's economy was driven by forestry, commercial fishing, and fish processing. With the collapse of herring stocks and reductions in salmon fisheries, as well as decreased availability of first-growth timber, Bamfield's economy has reduced its dependence on resource industries and has begun to transition to a tourism and service-based economy (BC Community Networks Association n.d.). Bamfield's location in Barkley Sound is near the West Coast Trail, Broken Group Islands, and Pacific Rim National Park. Marine-based opportunities include kayaking, sailing, windsurfing, sport fishing, diving, whale watching, scuba diving, and other water-based recreational activities throughout Barkley Sound and area (ACRD 2015, BC Community Networks Association n.d.). Tourism operators based in Bamfield include fishing charters, whale watching operators and eco-tours, kayak guides, and water taxis (Bamfield Chamber of Commerce 2018). In addition to the Marine Sciences Centre and tourism, commercial fishing remains economically and culturally important to the community, including the seasonal prawn-by-trap fishery and aquaculture operations (BC Community Networks Association n.d.).

5.3.3.1.2 Anacla

Anacla is the territory in which Huu-ay-aht's primary village is located. The village lies along the eastern shores of the Pachena River and the west coast of Vancouver Island. It is one of Huu-ay-aht's village sites, and Huu-ay-aht's modern government is located in the upper village, overlooking beautiful Pachena Bay. Anacla is less than 2 km from Bamfield. Approximately 15% of Huu-ay-aht citizens and their families live in the village. Like Bamfield, the village is also close to many tourism opportunities, and some Anacla residents work in the tourism industry. Citizens living in the village also work for their Nation, in the forestry sector, in private business, and the commercial fishery. Huu-ay-aht is proud that their village has zero unemployment. The village is also home to an early childhood education centre (Paawats) and an education centre (čitxʷaama cixʷatin). Huu-ay-aht views creating a healthy, safe home for young families, retired people, and elders as a top priority, and acknowledges the importance of enjoying a healthy, respectful friendship with neighbours in Bamfield.

5.3.3.1.3 Port Alberni

As the largest city in the ACRD, the City of Port Alberni is the economic hub for the area. Historically, key economic drivers were forestry and commercial fishing, with tourism emerging more recently in the increasingly diversified economy (City of Port Alberni n.d.). Wood manufacturing is still a key driver for the local and regional economy, with wood products being manufactured and shipped from Port Alberni Terminals. Travellers stop in Port Alberni to shop for commodities, with resulting development of retail, box stores, and strip malls along Highway 4 (ACRD 2015). Eco-tourism companies based in Port Alberni include kayak guides as well as operators specializing in ATV touring, windsurfing, and gliders.

5.3.3.1.4 Tofino

Tofino, on the southern edge of Clayoquot Sound, is a tourist destination with a seasonal summer population that is many times larger than the winter population. A resort community, Tofino is economically dependent on tourism and hosts a number of festivals, including surf competitions, food and wine festivals, and a whale festival. Tofino is actively working to become a year-round destination and attracts surfers and storm watchers during the winter months (ACRD 2015).

5.3.3.1.5 Ucluelet

Ucluelet is located next to Long Beach in Pacific Rim National Park. The local economy was historically based on fishing and forestry. Similar to Tofino, Ucluelet now relies on tourism as a key economic driver with the construction of resorts, restaurants, and adventure tourism centres (ACRD 2015). Visitors to Ucluelet participate in outdoor activities including hiking, surfing, fishing, whale watching, and kayaking. Tourism, fishing, forestry, and the arts are viewed as the most important industries for economic development (Van Struth Consulting Group 2012).

5.3.3.1.6 Other Maa-nulth First Nations

Economic activities of other Maa-nulth First Nations include resource activities such as forestry operations, salmon aquaculture and hydroelectric development. Each Maa-nulth First Nation is responsible for management of resource activities on its respective Treaty Lands, which are located around Barkley Sound near Ucluelet, Hitacu, Macoah and Elhlateese (near Kildonan), and along inlets to the north and west of Huu-ay-aht Treaty Lands (INAC 2017).

As part of the Maa-Nulth Final Agreement, Yuułuʔiłʔatḥ received 199 ha of former reserve lands and 5,147 ha of former Provincial Crown lands, as well as 92 ha of fee simple and surplus Federal government lots (INAC 2017). Yuułuʔiłʔatḥ's economic development corporation, YFBN Holdings LP, has a portfolio that includes an oceanfront resort, two gift shops, a surf shop and a motel in Ucluelet (Aboriginal Business Match 2016).

Uchucklesaht Treaty Lands are located southwest of Port Alberni and include 233 ha of former reserves and 2,834 ha of former Provincial Crown lands (INAC 2017). The village of Elhlateese, which is accessible from Port Alberni by boat, was provided with an electricity generating station in 2012 (Ha-Shilth-Sa 2012a). Uchucklesaht also operate a business at Green Cove selling gas, tackle and groceries, and own Henderson Lake Lodge (Ha-Shilth-Sa 2012b).

Toquaht Treaty Lands are located near Ucluelet and the west side of Barkley Sound, and include 196 ha of former reserves and 1,293 ha of former Provincial Crown lands (INAC 2017). Current development projects of Toquaht include development of a kayak launch and campground, a run-of-river hydro project and a land-based salmon aquaculture project (Aboriginal Business Match 2017).

Ka:'yu:'k't'h'/Che:k'tles7et'h' Treaty Lands include 6,299 ha throughout Ka:'yu:'k't'h'/Che:k'tles7et'h' ḥahuuḥi. Current Ka:'yu:'k't'h'/ Che:k'tles7et'h' businesses include a resort, marina, and campground and a hostel in Kyuquot (KFCN 2018).

Maa-nulth commercial fishing is integrated into the general commercial fishery off the west coast of Vancouver Island. In 2006, a Harvest Agreement was implemented separately from the Maa-nulth Final Agreement, which included:

- Salmon: eight licences for Area D gillnet and Area G troll, as well as percentages of terminal salmon allowable catch;
- Halibut: licences equalling approximately 35% of the Canadian commercial total allowable catch;
- Rockfish: one licence;
- Crab: one license for Area E;
- Roe herring: four licences; and
- Sablefish: licenses equalling approximately 35% of the commercial total allowable catch (Government of Canada, Government of British Columbia and Maa-nulth First Nations 2006).

5.3.3.1.7 Other Indigenous Groups

Tseshaht's fisheries department manages and develops commercial and community salmon fisheries in the Port Alberni area. The Nation owns and manages five forest companies and three Limited Liability Partnerships through Tseshaht Forestry Corporation. Tseshaht Market, in Port Alberni, is a gas station owned by Tseshaht with additional services and supplies, located on Highway 4 on the way to Ucluelet and Tofino (Tseshaht First Nation 2012b).

Hupačasath operates several woodlots and is actively engaged in other business ventures including fisheries operations and bigleaf maple syrup production (Hupačasath First Nation 2018c). The Nation owns a majority of Upnit Power Corporation which is a 6.5 MW run-of-river project on China Creek (Hupačasath First Nation 2018c).

Qualicum First Nation operates a campground and cabin rentals in the Qualicum Beach area (Qualicum First Nation 2018).

K'ómoks First Nation owns and operates businesses in the Comox Valley which focus on tourism and natural resources. This includes the I-Hos Gallery, Puntledge RV campground, Pentlatch Seafood Ltd. and Salish Sea foods (K'ómoks First Nation 2018).

We Wai Kai Nation owns, or contributes to, several business ventures including the We Wai Kai Nation Sea Food Corporation, Ravin Raven, We Wai Kai Campground, Cape Mudge Boatworks, Tsa-Kwa-Luten Lodge and Nuyumbalees Cultural Centre.

5.3.3.2 Labour Force Characteristics

In 2016, 57.2% of the population aged 15 years and over in the ACRD were in the labour force. The unemployment rate at that time was 9.9%, compared to 6.7% in BC overall. The unemployment rate has fluctuated over time. In 2001, the unemployment rate in the Alberni Valley was 14.7%, which dropped to 7.7% in 2006 and rose to 10.4% in 2011. The prevalence of low-income earners in the ACRD was 19.6% in 2015, higher than the provincial average of 15.5%. Women make up most low-income households in the ACRD, at 52.6% (Statistics Canada 2017).

In 2015, Statistics Canada Census Program data reported the overall median household income in the ACRD was $55,278 (Statistics Canada 2017). The median employment income for full-time workers was $46,931.

The prevalent total labour occupations in the ACRD in 2015 included: sales and service occupations (25.4%); trades (18.5%); occupations in education, law, and government (11.0%); business and finance occupations (10.2%); and management (10.1%) (Statistics Canada 2017).

The top three industries in the ACRD in terms of employment numbers in 2015 were health care and social assistance (12.9%), retail (12.3%), and accommodation and food services (12.2%). Approximately 31% of the workforce was employed in goods-producing industries such as construction, forestry, mining, and manufacturing, while 69% of the workforce was employed in service industries (Statistics Canada 2017).

5.3.4 Health Setting

The locations of major communities, including Indigenous communities, in relation to the Kwispaa LNG Area are described in **Section 5.3.1**.

The Kwispaa LNG Area is located in the Alberni Local Health Area ("LHA"), which is one of 14 LHAs in the Central Island Health Service Delivery Area ("HSDA") which covers 6,904 km^2 and includes the communities of Port Alberni, Tofino, Ucluelet, and Bamfield (Island Health 2016).

In 2016, approximately 3.9% (30,221 people) of Island Health's total population of 775,500 lived in the Alberni LHA. The population of the Alberni LHA is generally younger (43.8 years) than the Island overall (44.9 years). People aged 65 years and older make up 22% of the population, which is higher than the BC average (17%) but similar to Vancouver Island overall (23%). Population projections over the long term suggest that the most growth will be in the group of people aged 75 years and older in the Alberni LHA (Island Health 2016).

5.3.4.1 Environmental Quality

Current conditions related to air quality, noise, surface water quality and soil and sediment quality are described in **Sections 5.2.1, 5.2.3.2**, and **5.2.4.2**.

The lands within and around the Kwispaa LNG Area are currently used for resource activities including logging and log sorting, and the lands and waters are used by Huu-ay-aht citizens for traditional and non-traditional land use activities (e.g., marine and terrestrial hunting, gathering, trapping and harvesting activities). Current land-based sources of air emissions and noise include log sorting and booming operations, and forestry activities. Current sources of air emissions and noise in marine areas include commercial, recreational and tourism vessels.

Two groundwater wells are located on Huu-ay-aht lands (iMapBC 2017), and watercourses in and adjacent to the Kwispaa LNG Area may also be used as drinking water sources. The potential for contaminants of concern in surface water, soils, and marine sediments will be investigated as part of the Human Health Risk Assessment ("HHRA"). The HHRA will characterize exposure potential by human receptors in the study area to all chemical and physical stressors based on measured (baseline) and predicted future concentrations/levels for Indigenous and non-Indigenous individuals.

5.3.4.2 Social Determinants of Health

Social determinants of health include income, education, adequate housing, food security, early childhood development and many other factors. Health profiles for the Alberni LHA indicate that health outcomes in these areas are generally lower than the BC average. Based on statistics from the 2011 Census Program, median household income and lone-parent family income were lower in the Alberni LHA than on Vancouver Island overall, and elsewhere in BC. The LHA also had a higher percentage of lone-parent families and seniors living alone than the averages in both Vancouver Island and across BC. This finding may illustrate the need for increased community support services. There were more children in low-income households as compared to elsewhere on Vancouver Island and BC, but the percentage of low-income seniors was lower than on Vancouver Island overall and in BC (Island Health 2016).

Fewer adults in the Alberni LHA had completed post-secondary education, but high school completion rates were observed to increase from 2006 to 2011. Housing indicators, such as dwellings in need of major repairs and housing affordability, are a key indicator of living conditions and community health and well-being. Dwellings in need of repairs totalled approximately 12.7% in the Alberni LHA, contrasting with 6.9% on Vancouver Island overall (Island Health 2016).

Child and youth health are critical to the overall health and well-being of a community. The vulnerability of young children in terms of social, physical, emotional, language, and communication development was similar in the Alberni LHA to Vancouver Island overall. The Alberni LHA had a higher rate of mental health-related hospitalizations for children and youth than Vancouver Island and BC (Island Health 2016). The child poverty rate in 2013, the most recent statistics available, noted that the after-tax poverty rate for children (aged 0 to 17) in the Alberni Valley was 30.8%, which is 10.4 percentage points more than the BC rate (20.4%) (Alberni Valley Community Foundation 2015).

Food security was studied in the Central Vancouver Island HSDA in 2011 and 2012. At this time, 91.5% of residents surveyed were found to be food secure, meaning that they were able to purchase food. No information was provided as to the quality, quantity, or source of food (Island Health 2016). The Food Security and Climate Disruption Committee is a standing committee appointed by the City of Port Alberni to recommend actions to the Alberni Council with respect to increasing urban food security and climate change concerns (City of Port Alberni 2016).

In terms of crime and substance abuse, the Alberni LHA had the highest rates of serious crimes over all LHAs on Vancouver Island. Consumption of alcohol is higher than the BC average. Trends show an increase in alcohol and drug-related hospitalizations (Island Health 2016).

5.3.4.3 Community Quality of Life

The Central Vancouver Island area, including the Alberni LHA, reported stress levels as similar to the rest of the province. Approximately 22.6% of people in the Central Vancouver Island area aged 15 years and older reported that they perceived their life stress as "quite a bit" or "highly stressful", compared to 23% in BC overall (Alberni Valley Community Foundation 2015). A sense of belonging is also a qualitative measure of community quality of life and social cohesion. In a 2014 Canadian Community Health Survey, nearly 79% of Alberni Valley residents noted that they felt a strong or somewhat strong sense of community belonging, compared to the provincial average at that time of 69.3% (Alberni Valley Community Foundation 2015). Similarly, Alberni Valley residents reported that they were either satisfied or very satisfied with their lives overall (Alberni Valley Community Foundation 2015).

5.3.5 Heritage Setting

5.3.5.1 Huu-ay-aht First Nations

A description of the Huu-ay-aht heritage setting is provided in the Cultural Resources Setting (**Section 5.1**).

5.3.5.2 Other Maa-nulth First Nations

The Maa-nulth Final Agreement contains provisions for cultural sites and activities throughout the ḥahuuƚi, including traditional harvesting activities for trade and barter, protection of important cultural sites, the ability to apply appropriate names to places and features in ḥahuuƚi, and transfer of Maa-nulth artifacts back to the First Nations from museums.

Chapter 21 of the Maa-nulth Final Agreement includes specific agreements for individual First Nations regarding important cultural sites and activities, including the following:

- T'iitsk'in Paawats/Thunderbird's Nest on the west side of Henderson Lake was established as a provincial protected area in 2011, stemming from the Maa-Nulth Final Agreement. T'iitsk'in Paawats is a sacred area for the Uchucklesaht and Nuu-chah-nulth First Nations. The area includes creeks, bathing pools, waterfalls and archaeological sites, and five named mountains: Tuutuuchpiika/Thunder Mountain/Eldest Brother, Titskakuulth/Thunder Face Mountain, Uusajuu-is/Ritual Bathing Mountain, Uu-aatsuu/Second Eldest Brother Mountain and Kalthaatik/Youngest Brother Mountain. Visitors are encouraged to contact Uchucklesaht before exploring the area (BC Parks 2011);

- Maa-nulth First Nations are assured a long-term supply of cedar and cypress in ḥahuułi for domestic and cultural uses (e.g., regalia, clothing, artisanal purposes, canoes, poles and house posts) (INAC 2017). Specific sections of Chapter 21 of the Maa-nulth Final Agreement state that Ka:'yu:'k't'h'/Che:k'tles7et'h' may procure up to two monumental cedars or cypress from the Power River Watershed Area each year, and that Uchucklesaht may procure up to two monumental cedar or cypress from the T'iitsk'in Paawats area each year; and
- cultural and spiritual sites on the Stopper Islands that are important to Toquaht are protected.

None of the cultural sites noted above are located within or adjacent to the Kwispaa LNG Area, and the Kwispaa LNG Team is not aware of any other Maa-nulth First Nations cultural sites located in or adjacent to the Kwispaa LNG Area.

5.3.5.3 Other Indigenous Groups

Tseshaht's traditional culture is shaped by the knowledge and use of traditional lands, and the passing of that knowledge and heritage value to subsequent generations (Nuu-chah-nulth Tribal Council 1991). Tseshaht culture is interconnected and overlaps with well-being, environmental health, community, and governance (Tseshaht First Nation 2017). The c̓išaaʔatḥ dialect of the nuučaanuł languages plays a key role in understanding and shaping Tseshaht culture (Nuu-chah-nulth Tribal Council 1991).

Tseshaht Tutuupata, the plural of tupaati, refers to the hereditary privileges or prerogatives that governed the ownership and use of essentially everything of value in Tseshaht society. These included resources like rivers, fish trap sites, and plant gathering sites, as well as intellectual property resources like names, ceremonial songs, dances, and regalia. Tseshaht tupaati included both "outside" and "inside" resources throughout its territory. This meant that in late winter and early spring the Tseshaht travelled to their "outside" tupaati to utilize the resources of these traditional sites, such as sea mammals, halibut, rockfish and salmon, and procurement areas in Barkley Sound. As the seasons changed, the resources changed, and the Tseshaht moved back to their "inside" tupaati, following the salmon up Alberni Inlet to the Somass River (Tseshaht First Nation 2012).

The Hupačasath people form three distinct tribes in Central Vancouver Island, who historically amalgamated for strength prior to European arrival: the Muh-uulth-aht; Kleh-koot-aht; and Cuu-ma-as-aht (Ahahswinis). They lived in the Great Central Lake area, the general vicinity of present-day Port Alberni City, and Kleh-koot (Sproat Lake), respectively. Hupačasath's language, nuučaanuł, is deeply connected with their culture (Hupačasath First Nation 2018c). The language plays an important role in passing knowledge of land, governance systems, and values to subsequent generations (Hupačasath First Nation 2003).

The Hupačasath identify cultural and resource values in the designated use areas of their territory; however, most values have not been identified on maps. Cultural values include: village and other sites; burial grounds; sacred areas; hunting and fishing areas; food and medicine gathering areas; and cedar and other forest use areas (Hupačasath First Nation 2018c). A list of individual cultural values has been identified for each designated use area (Hupačasath First Nation 2003). Hupačasath's culture is strongly tied to their land and resources, through respect for their territory. Hupačasath have identified that their culture is expressed through the land base via traditional use and archaeological sites, such as villages, camps, lithics and other artifacts, petroglyphs, culturally modified trees, and burials (Hupačasath First Nation 2004).

Qualicum First Nation members trace their ancestry to the Coast Salish Pentlatch (Pəntl'áč) people and Kwakwaka'wakw groups from the north (Everson 1995, Millen 2004). The Pentlatch people were recorded in the 1860s as the original Coast Salish inhabitants of the region from Cape Lazo south to Qualicum Beach, but were already reported to be extinct by the 1850s. The Pentlatch had a large territory along the east side of Vancouver Island, although the territory was reduced by warfare with the neighbouring Kwakwaka'wakw people, the Laich-Kwil-Tach (Millen 2004).

The Pentlatch were also greatly reduced by smallpox after European contact. Early European explorers of Vancouver Island reported that Pentlatch villages on Denman Island and along the Puntledge River in 1864 were "deserted" due to the smallpox epidemic, and further noted that Pentlatch survivors had joined the K'omoks people and resettled at Saatlem at the mouth of the Qualicum River (Everson 1995). Although Pentlatch traditions were passed on, the Pentlatch language became extinct as the remaining speakers adopted the Lik'wala language, and the last known speaker of the Pentlatch language passed away in 1940 (Millen 2004).

K'ómoks' First Nation cultural traditions teach that its people originated at the junction of the Quinsam and Campbell Rivers (K'omoks First Nation 2014). K'omoks First Nation members can trace their ancestry to the Coast Salish Pentlatch people and Kwakwaka'wakw. The K'omoks people adopted the Lik'wala language and later English (Millen 2004). The last speaker of the Island Comox dialect of the Lik'wala language died in 1995; however, there is currently a revival of teaching of the Lik'wala language to children (Everson 1995).

The values and teachings of K'omoks ancestors have been passed down through generations (K'ómoks, 2012). K'ómoks culture is directly linked to the marine environment, and K'ómoks members believe wide understanding and practice of their values and teachings will allow the marine environment to sustain their population once again. The canoe plays an important role in the passing down of the Nation's heritage to future generations and represented the only means to travel between communities. The K'ómoks identify burial grounds to have key cultural value to the community. Their ancestors were laid to rest on islands, in caves and within bent boxes in trees along with artifacts.

We Wai Kai Nation identify as Laich-Kwil-Tach (or Ligwilda'xw / Liqwiltokw) peoples, which translates in the Lik'wala language to "unkillable thing" (Laich-Kwil-Tach Treaty Society 2017). We Wai Kai are one of several Laich-Kwil-Tach groups that share a common history and the Lik'wala language. Other Laich-Kwil-Tach First Nations include Wei Wai Kum and Kwiakah First Nations (Laich-Kwil-Tach Treaty Society 2017). Oral traditions of We Wai Kai tell that the Laich-Kwil-Tach originated from Topaze harbour, east of Sayward BC, and that war with peoples to the south (including K'omoks) gave the Laich-Kwil-Tach control over much of Discovery Passage, Seymour Narrows and Yaculta Rapids (Laich-Kwil-Tach Treaty Society 2017). The Laich-Kwil-Tach divided into several groups, likely to maintain a presence over the wider territory. The We Wai Kai settled around Cape Mudge and Discovery Passage, the Wei Wai Kum settled at Campbell River and Greene Point, and the Walitsama people moved to the mouth of the Salmon River and later Cape Mudge, Comox and Campbell River (Laich-Kwil-Tach Treaty Society 2017).

5.4 Potential Environmental Effects in Relation to *Canadian Environmental Assessment Act, 2012* Requirements

As required by the *Prescribed Information for the Description of a Designated Project Regulations*, the following sub-sections describe the potential for changes caused as a result of carrying out the Project to fish (including marine mammals, which are defined as fish in the *Fisheries Act*, RSC 1985, c. F-14, but treated separately here), and fish habitat and marine plants as defined in the *Fisheries Act*, and migratory birds, as well as the potential for environmental changes on Federal lands, in a province other than the province in which the Project is proposed to be carried out, or outside of Canada. Potential effects of environmental changes on Indigenous peoples are discussed in **Section 5.4.6**.

5.4.1 Fish and Fish Habitat

The Project has the potential to cause serious harm to fish, as defined in the *Fisheries Act*. Potential for serious harm may include:

- permanent alteration or destruction of fish habitat due to the Project footprint (freshwater, marine) and changes in water quality and quantity;
- changes to fish food and nutrient content (freshwater, marine);
- acidification or eutrophication of water due to air emissions (freshwater);
- fish mortality (freshwater, marine); and
- changes in behaviour of fish due to altered marine habitat, underwater noise and pressure waves.

5.4.2 Marine Plants and Algae

Potential Project-related effects to aquatic plant species, as defined in SARA, and marine plants, as defined in the *Fisheries Act,* include:

- changes in habitat quality, including effects from seabed disturbance;
- loss of habitat from shading of marine vegetation, and construction and decommissioning of infrastructure; and
- mortality associated with Project construction.

5.4.3 Migratory Birds

Potential Project-related effects to migratory birds, as defined in the *Migratory Birds Convention Act*, SC1994, c. 22, include:

- direct loss of habitat and potential habitat due to Project footprint;
- indirect loss of habitat and potential habitat due to sensory disturbance;
- behavioural response due to sensory disturbance;
- creation of barriers to movement; and
- mortality (direct and indirect).

5.4.4 Marine Mammals

Potential Project-related effects to marine mammals, as defined in the *Fisheries Act*, include:

- direct loss of habitat and potential habitat due to Project footprint;
- indirect loss of habitat and potential habitat due to sensory disturbance;
- behavioural response due to sensory disturbance; and
- mortality (direct and indirect).

5.4.5 Federal Lands, Other Provinces, or Outside of Canada

The location of Federal lands in the region surrounding the Kwispaa LNG Area are shown in **Figure 3-1**. The Kwispaa LNG Area is located on Huu-ay-aht Treaty Land and fee simple land owned by Huu-ay-aht as well as land and water lots administered by the Provincial Government. The Kwispaa LNG Area is not located on any Federal lands or reserves and is not within the waters or lands administered by a Canada Port Authority. The route to be used by LNG carriers calling on the Project through Trevor Channel will pass in proximity to the Pacific Rim National Park Reserve. Atmospheric emissions from the Project (detailed in **Section 2.3.1**) have the potential to disperse over or deposit on nearby Federal lands (e.g., First Nations Reserves). The shipping activities associated with the Project also have the potential to affect the shorelines of Federal land parcels, specifically from accidents or malfunctions.

As the Project is located on Vancouver Island, it is not proximate to either the Yukon or Alberta borders; no adverse environmental effects in a territory or province other than BC are anticipated.

The Kwispaa LNG Area is approximately 50 km from the Canada-US border in the Strait of Juan de Fuca and approximately 60 km from the tip of the Olympic Peninsula in Washington state. Air emissions from the Project may disperse over or deposit on US lands or waters. This will be confirmed through dispersion modelling undertaken as part of the Project's EA.

5.4.6 Huu-ay-aht First Nations and Other Indigenous Groups

The Project may result in changes to the environment within Canada that may affect Huu-ay-aht and other Indigenous groups in relation to the following aspects pertaining to *CEAA 2012*, subsection 5(1)(c):

- health and socio-economic conditions;
- physical and cultural heritage;
- the current and future use of land and resources; and
- any structure, site, or thing that is of historical, archaeological, or architectural significance.

5.4.6.1 Huu-ay-aht First Nations

The Project will be located on Huu-ay-aht owned lands and Treaty Lands within Huu-ay-aht ḥahuuḥi. The Project and associated marine shipping activities may interrupt access to sites used for traditional purposes such as the harvesting of aquatic resources and may otherwise impact fish and other aquatic resources. The environmental impacts of the Project, including land clearing, will be concentrated on

Huu-ay-aht owned and Treaty Lands and the adjacent marine waters. For safety reasons, Huu-ay-aht citizens will not be able to use the Kwispaa LNG Area for any other purpose, including traditional purposes. For example, they will not be able to use boats close to the shoreline of the Kwispaa LNG Area for navigation, fishing, or other harvesting purposes. The Sarita Cultural Protection Line was designed to avoid Huu-ay-aht cultural heritage sites that have been identified by Huu-ay-aht citizens.

Emissions from the Project (including emissions of criteria air contaminants and noise) may affect the health of Huu-ay-aht citizens using lands and waters affected by those emissions through the degradation of local air quality. Sensory disturbance or degradation due to noise or light may also alter the current use of lands and waters for traditional purposes, especially any purposes that require peaceful conditions, and affect traditional lifestyle values. Disturbance from the Project may also affect Huu-ay-aht cultural continuity, including the ability to pass on certain traditions, as certain types of terrain (e.g., shoreline and intertidal zone) are made less accessible for the teaching of hereditary roles and responsibilities.

Changes to the environment that affect fish and wildlife habitat, or the quality or quantity of resources harvested by Huu-ay-aht citizens (such as fish, bivalves, plants, and other animals) may affect their health and their ability to sustain commercial livelihoods or cultural activities dependent on those resources. Increased reliance on non-traditional foods and other resources also may affect the health and socio-economic well-being of Huu-ay-aht citizens. At the same time, employment and contracting opportunities generated by the Project will result in local economic opportunities and economic benefits to Huu-ay-aht citizens.

The Project (including ground disturbance activities site preparation, and accidents and malfunctions arising from marine shipping activities associated with the Project) may damage sites of historical, archaeological, or architectural importance and potentially interrupt cultural heritage activities undertaken by Huu-ay-aht citizens. Similarly, site clearing may affect traditional terrestrial harvesting activities through loss of vegetation and specifically loss of community diversity (e.g., old forest, listed ecosystems, wetlands) and species diversity (e.g., listed species, traditional use plants). Site clearing may also affect streams via erosion and flooding, which could impact water quality and fish habitat.

5.4.6.2 Other Maa-nulth First Nations

Given that the Kwispaa LNG Area is located on Huu-ay-aht owned lands and Treaty Lands within Huu-ay-aht's ḥahuuḥi, potential effects to the rights and interests of other Maa-nulth Nations may arise from the dispersion of emissions and marine shipping activities.

Emissions from the Project (including emissions of criteria air contaminants and noise) may affect the health of other Maa-nulth First Nations using lands and waters affected by those emissions. Sensory disturbance due to noise or light could also potentially alter the current use of lands and waters by those Nations for traditional purposes.

Potential changes to the environment that affect the quality or quantity of marine resources harvested by other Maa-nulth First Nations (such as fish, bivalves, plants, and other animals) could potentially affect commercial livelihoods or cultural activities dependent on those resources.

The unlikely event of an accident or malfunction arising from marine shipping activities could alter sites of historical, archaeological, paleontological, or architectural importance and could interrupt cultural heritage activities undertaken by other Maa-nulth First Nations. The marine shipping activities associated with the Project could potentially interrupt access to sites used for traditional purposes such as the harvesting of aquatic resources.

Employment and contracting opportunities generated by the Project could result in economic benefits to other Maa-nulth First Nations.

Through the EA process, the Kwispaa LNG Team will engage with potentially affected Maa-nulth First Nations to understand how the Project may interact and affect each Nation and collaboratively identify potential measures to mitigate or address those effects, wherever possible.

5.4.6.3 Other Indigenous Groups

Given that the Kwispaa LNG Area is located on Huu-ay-aht owned lands and Treaty Lands within Huu-ay-aht's ḥahuuḥi, potential effects to the rights and interests of other Indigenous groups (identified in **Section 3.3.3**) may arise from the dispersion of emissions, the construction of an electric transmission line, and marine shipping activities.

Emissions from the Project (including emissions of criteria air contaminants and noise) may affect the health of other Indigenous groups using lands and waters affected by those emissions. Sensory disturbance due to noise or light could also potentially alter the current use of lands and waters by those Nations for traditional purposes (refer to **Section 5.3.5**).

Potential changes to the environment that affect the quality or quantity of marine resources harvested by other Indigenous groups (such as fish, bivalves, plants, and other animals) could potentially affect commercial livelihoods or cultural activities dependent on those resources.

Ground disturbance activities associated with the possible construction of an electric transmission line and accidents and malfunctions arising from marine shipping activities could alter sites of historical, archaeological, paleontological, or architectural importance and could interrupt cultural heritage activities undertaken by other Indigenous groups (refer to **Section 5.3.5**). Clearing of an electric transmission line right-of-way could potentially affect traditional terrestrial harvesting activities through loss of vegetation and loss of community diversity (e.g. old forest, listed ecosystems, wetlands) and species diversity (e.g. listed species, traditional use plants). The marine shipping activities associated with the Project could potentially interrupt access to sites used for traditional purposes such as the harvesting of aquatic resources.

Employment and contracting opportunities generated by the Project could result in economic benefits to other Indigenous groups.

Through the EA process, the Kwispaa LNG Team will engage with potentially affected Indigenous groups to understand how the Project may interact and affect each Nation and collaboratively identify potential measures to mitigate or address those effects, wherever possible.

5.5 Other Potential Environmental, Economic, Social, Heritage and Health Effects

To support the BC EAO in determining the need for and potential scope of a Provincial EA, a summary of the potential environmental, economic, social, heritage, and health effects of the Project has been prepared based on general knowledge of the Project and the existing natural and human environment.

The construction and operations of the Project will alter the physical environment at and around the Kwispaa LNG Area. Construction of the Project will involve disturbance of on-site vegetation, soils and underlying bedrock, surface water, marine sediments, and existing ecological processes. Marine water quality may be altered by sediment disturbance during Project construction and by the possible desalination of domestic and safety water on the ASLNG™ production units. The presence of the marine terminals/ jetties and the floating ASLNG™ production units has the potential to alter currents and sediment dynamics in or near the Kwispaa LNG Area. Light and noise generated by Project activities will alter visual and sound conditions at and for some distance around the Kwispaa LNG Area and activities. Construction of a new electric transmission line (should an option to power the Project with electricity from the Provincial grid be pursued) will involve vegetation clearing and ground disturbance. The electric transmission line also has the potential to alter the visual condition of the landscape. Accidents or malfunctions, including those arising from marine shipping activities associated with the Project could alter the quality of air, sediment, and water.

As set out in the Relationship Agreements, the Kwispaa LNG Team has committed to providing employment and business opportunities for qualified Huu-ay-aht citizens and immediate family members through the lifecycle of the Project. The Project will therefore increase the number and type of direct, indirect and induced opportunities for employment as well as create more diverse opportunities for local contracting and procurement. The Project will also provide employment and business opportunities for other Indigenous groups and local residents. Furthermore, Project expenditures (including taxes) throughout all phases of design, construction, operations, and decommissioning may positively affect government revenues and regional economic development.

These changes in the physical environment, as well as Project expenditures and employment, may result in potential environmental, economic, social, heritage, or health effects. The adverse effects (prior to the application of mitigation measures) are summarized in **Table 5-8** along with the Project-related activities with the potential to cause these effects. Residual adverse effects associated with the Project have the potential to interact cumulatively with the residual adverse effects from other past, present, and reasonably foreseeable projects and activities. Types of developments and activities with the potential to interact cumulatively with the Project include:

- past and current developments and activities at and near the Kwispaa LNG Area;
- industrial, commercial, and urban land development in the ACRD;
- development of natural gas pipelines associated with the Project and other projects in the area;
- marine shipping traffic associated with current and reasonably foreseeable projects in the area; and
- commercial and recreational boating activities (including fishing).

The potential for trans-BC-boundary effects from the Project are described in **Section 5.4.5**.

Table 5-8 Potential Project-related Effects

Component	Key Project Components/ Activities	Potential Adverse Project Effect
Environment		
Marine Vegetation	• **Construction**: Potential removal and disposal of marine sediments, construction of marine jetties, permanent mooring of the ASLNG™ production units, potential blasting and grading • **Operations:** Mooring, loading and transit of LNG carriers, wastewater, stormwater, and process water treatment and disposal • **Decommissioning**: Removal of marine jetties, removal of the ASLNG™ production units	• Distribution, abundance, and health of marine vegetation, including species at risk, may be affected by potential changes in marine water and sediment quality, currents, sediment dynamics, and light conditions (e.g., shading due to fixed or floating structures) • Changes to habitat quality, including the habitat of species at risk, may result from seabed disturbance • Marine vegetation, including species at risk, may be damaged by physical structures or accidental discharges • Introduction of exotic species from marine vessels and foreign equipment may alter local ecological conditions
Marine Invertebrates	• **Construction**: Potential removal and disposal of marine sediments, construction of marine jetties, permanent mooring of the ASLNG™ production units, potential blasting and grading • **Operations:** Mooring, loading and transit of LNG carriers, wastewater, stormwater, and process water treatment and disposal • **Decommissioning**: Removal of marine jetties, removal of the ASLNG™ production units	• Changes in currents, sediment dynamics, and marine water and sediment quality may affect the distribution, abundance, and health of marine invertebrates, including species at risk • Introduction of exotic species from marine vessels and foreign equipment may alter local ecological conditions

Component	Key Project Components/ Activities	Potential Adverse Project Effect
Marine Fish and Fish Habitat	• **Construction**: Potential removal and disposal of marine sediments, construction of marine jetties, permanent mooring of the ASLNG™ production units, potential blasting and grading • **Operations:** Mooring, loading and transit of LNG carriers, wastewater, stormwater, and process water treatment and disposal • **Decommissioning**: Removal of marine jetties, removal of the ASLNG™ production units	• Permanent alteration or destruction of fish habitat, including the habitat of species at risk, may occur due to Project footprint and activities as well as possible changes in marine water quality • Injury or mortality of marine fish, including species at risk, may result from changes in marine water and sediment quality (including turbidity), underwater noise, and possible seawater withdrawal (for desalination of domestic and safety water on the ASLNG™ production units) • Behavioural modifications in marine fish, including species at risk, may occur due to underwater noise and pressure waves associated with installation of Project marine structures • Changes in food sources (marine vegetation and invertebrates) and nutrient content may affect marine fish health, include species at risk • Introduction of exotic species from marine vessels and foreign equipment may alter local ecological conditions
Marine Mammals	• **Construction**: Potential removal and disposal of marine sediments, construction of marine jetties, permanent mooring of the ASLNG™ production units, potential blasting and grading • **Operations:** Mooring, loading and transit of LNG carriers, wastewater, stormwater, and process water treatment and disposal • **Decommissioning**: Removal of marine jetties, removal of the ASLNG™ production units	• Changes in marine water quality and food sources may affect marine mammal health, including species at risk • Potential injury or mortality to marine mammals, including species at risk, may result from collision with marine shipping associated with the Project • Underwater noise from construction activities, operations, and marine shipping activities associated with the Project may result in behavioural changes or interrupt communication or feeding of marine mammals, including species at risk • Introduction of exotic species from marine vessels and foreign equipment may alter local ecological conditions

Component	Key Project Components/ Activities	Potential Adverse Project Effect
Freshwater Fish and Fish Habitat	• **Construction**: Potential clearing and grubbing, potential blasting and grading, construction of water supply system, installation of stormwater management, erosion prevention, and sediment control measures, potential mixing of concrete, construction of electric transmission line • **Operations:** Water collection, treatment and use • **Decommissioning**: Removal of water supply system	• Permanent alteration or destruction of fish habitat, including the habitat of species at risk, may occur due to Project footprint and activities as well as changes in water quality/quantity. This may include acidification of water due to air pollution (sulphur and nitrogen levels) or eutrophication of surrounding water bodies • Quality of fish habitat, including the habitat of species at risk, may be degraded by sedimentation, removal of existing riparian vegetation, or discharges of deleterious substances • Quantity of fish habitat may be altered by diversion of surface water or changes in flow (drawdown) • Mortality of fish, including species at risk, may occur due to altered flow (stranding) and alteration of instream habitat
Terrestrial Vegetation (including wetlands)	• **Construction**: Potential clearing and grubbing, potential blasting and grading, construction of water supply system, installation of stormwater management, erosion prevention, and sediment control measures, mobilization and construction of onshore components, potential mixing of concrete, upgrading and construction of on-site roads, installation of perimeter fencing, construction of electric transmission line, potential rehabilitation and stabilization of areas not required for the operations phase • **Operations**: Power generation, aggregation and distribution, water collection, treatment and use, liquefaction of natural gas, storage and loading of LNG carriers, accommodation of workers • **Decommissioning**: Removal of onshore Project components	• Removal of vegetation may reduce available habitat, including the habitat of species at risk • Proliferation of non-native and invasive species may reduce biodiversity and reduce habitat quality, including the habitat of species at risk • Changes in air, sediment/soil, and/or water quality may damage vegetation and degrade or reduce available habitat, including the habitat of species at risk. This may include acidification of water bodies, soil and vegetation due to sulphur dioxide and nitrogen dioxide deposits or eutrophication of water bodies

Component	Key Project Components/ Activities	Potential Adverse Project Effect
Terrestrial Wildlife	• **Construction**: Potential clearing and grubbing, potential blasting and grading, construction of water supply system, installation of stormwater management, erosion prevention, and sediment control measures, mobilization and construction of onshore components, potential mixing of concrete, upgrading and construction of on-site roads, installation of perimeter fencing, construction of electric transmission line, potential rehabilitation and stabilization of areas not required for the operations phase • **Operations**: Power generation, aggregation and distribution, water collection, treatment and use, liquefaction of natural gas, storage and loading of LNG carriers, accommodation of workers • **Decommissioning**: Removal of onshore Project components	• Loss or degradation of terrestrial habitat may occur due to changes in vegetation, soil, water quality and quantity, and air quality, or to nuisance effects resulting from noise and light generated by the Project • Construction of an electric transmission line may result in habitat fragmentation • Changes in movement patterns of wildlife, including species at risk, may occur due to displacement by Project activities • Injury or mortality to wildlife, including species at risk, may result from land clearing activities and from traffic associated with Project infrastructure (e.g., roads)

Component	Key Project Components/ Activities	Potential Adverse Project Effect
Birds (including migratory birds as defined in subsection 2(1) of the *Migratory Birds Convention Act*)	• **Construction**: Potential clearing and grubbing, potential blasting and grading, mobilization and construction of onshore components, potential mixing of concrete, upgrading and construction of on-site roads, installation of perimeter fencing, construction of electric transmission line, potential rehabilitation and stabilization of areas not required for the operations phase • **Operations**: Power generation, aggregation and distribution, liquefaction of natural gas, mooring, loading and transit of LNG carriers, accommodation of workers • **Decommissioning**: Removal of onshore Project components	• Direct loss of habitat and potential habitat, including the habitat of species at risk, may result from activities on the Project footprint • Indirect loss of habitat and potential habitat, including the habitat of species at risk, may occur due to sensory disturbance and change in behaviour associated with construction and operations activities, including noise, light, air emissions, and human presence • Loss or degradation of habitat, including the habitat of species at risk, may occur due to changes in vegetation, soil, water quality and quantity, and air quality or to nuisance effects (e.g., noise, light, human presence) • Loss or degradation of potential marine foraging and roosting habitat, including the habitat of species at risk may occur due to reduced marine vegetation productivity (caused by shading from floating Project infrastructure), air emissions and underwater disturbance (e.g., noise during construction) • Increased energy expenditure may occur from disturbance relating to avoidance of transiting vessels • Disturbance or destruction of active nests, including those of species at risk, may occur during construction • Barriers to movement may be created • Injury or mortality to birds, including species at risk, may occur from increased collision risk associated with transiting vessels or other Project infrastructure (e.g., tall structures, powerlines, flares, cables)

Component	Key Project Components/ Activities	Potential Adverse Project Effect
Economic		
Local and Regional Economy	• **Construction**: All construction activities • **Operations**: All operations activities • **Decommissioning**: All decommissioning activities	• Direct and indirect Project demands for goods and services may influence the availability of goods and services at a local level • Potential disruption of local businesses (e.g., tourism operators) if new tourism customers hold a negative perception of the Project
Labour Market	• **Construction**: All construction activities • **Operations**: All operations activities • **Decommissioning**: All decommissioning activities	• Project employment may result in changes to the local and regional labour market • Project employment may result in changes in local annual wage and salary levels as well as labour income
Social		
Infrastructure and Services	• **Construction**: All construction activities • **Operations**: All operations activities • **Decommissioning**: All decommissioning activities	• Project employment may result in temporary and permanent in-migration of workers, which could increase the demand for supporting social and health infrastructure, services, and housing • Increased road traffic may result in degradation of Bamfield Road
Current and Future Use of Lands and Resources	• **Construction**: Potential clearing and grubbing, potential blasting and grading, construction of water supply system, mobilization and construction of onshore components, construction of marine jetties, upgrading and construction of on-site roads, installation of perimeter fencing, permanent mooring of the ASLNG™ production units, construction of electric transmission line, accommodation of workers in a temporary construction camp • **Operations**: Power generation, aggregation and distribution, liquefaction of natural gas, mooring, loading and transit of LNG carriers, accommodation of workers in the workforce accommodation buildings • **Decommissioning**: Removal of marine jetties, removal of the ASLNG™ production units, removal of onshore components	• Access to lands, waters, and resources currently used for traditional purposes may be affected or disrupted • The quality or quantity of resources currently used for traditional purposes may be affected or reduced (e.g., through site clearing, increased road traffic) • The quality of the current use experience may be affected due to nuisance effects (e.g., noise, light) or changes in air or water quality • The ability to transfer Indigenous knowledge and fulfil the cultural purpose of current use activities may be affected

Component	Key Project Components/ Activities	Potential Adverse Project Effect
Land, Water, and Resource Use (including recreational and commercial uses)	• **Construction**: Potential clearing and grubbing, potential blasting and grading, construction of water supply system, mobilization and construction of onshore components, construction of marine jetties, upgrading and construction of on-site roads, installation of perimeter fencing, permanent mooring of the ASLNG™ production units, construction of electric transmission line, accommodation of workers in a temporary construction camp • **Operations**: Power generation, aggregation and distribution, liquefaction of natural gas, mooring, loading and transit of LNG carriers, accommodation of workers in the workforce accommodation buildings • **Decommissioning**: Removal of marine jetties, removal of the ASLNG™ production units, removal of onshore components	• Current forestry and commercial land and water uses in the Kwispaa LNG Area will cease • Access to land, water, and resources at or adjacent to the Kwispaa LNG Area (and along the route to be used by LNG carriers) may be affected • Use of land, water, and resources at or adjacent to the Kwispaa LNG Area (and along the route to be used by LNG carriers) may be affected by potential changes in air or water quality, increases in road traffic, changes in the distribution, abundance, or quality of resources (e.g., shellfish, fish, plants, or other animals), and nuisance effects (e.g., noise, light)
Community Health and Well-being	• **Construction**: All construction activities • **Operations**: All operations activities • **Decommissioning**: All decommissioning activities	• The influx of workers to the local communities surrounding Kwispaa LNG Area may result in adverse effects on vulnerable sub-populations, such as children and youth, seniors and low-income families. Adverse effects may include: ▫ increased risk of communicable and non-communicable diseases ▫ increased drug and alcohol use ▫ increased crime ▫ adverse effects on mental health and wellness ▫ change in accidents and injuries ▫ increased pressure on health services structure and capacity ▫ adverse effects on community quality of life

Component	Key Project Components/ Activities	Potential Adverse Project Effect
Visual Quality	• **Construction**: Potential clearing and grubbing, potential blasting and grading, mobilization and construction of onshore components, construction of marine jetties, upgrading and construction of on-site roads, installation of perimeter fencing, permanent mooring of the ASLNG™ production units, construction of electric transmission line • **Operations**: Mooring, loading and transit of LNG carriers • **Decommissioning**: Removal of marine jetties, removal of the ASLNG™ production units, removal of onshore components	• Physical changes to the Project site may affect the visual quality at the Project site and surrounding area
Heritage		
Archaeological and Heritage Resources (including sites of historical, archaeological, palaeontological, and architectural importance)	• **Construction**: Potential clearing and grubbing, potential blasting and grading, mobilization and construction of onshore components, upgrading and construction of on-site roads, construction of electric transmission line • **Operations**: Planned and unplanned maintenance • **Decommissioning**: Removal of marine jetties, removal of the ASLNG™ production units, removal of onshore components	• Loss of or damage to archaeological and heritage resources (including contextual information) may occur due to ground disturbance, shoreline erosion (from wake waves), or accidental spills from marine shipping activities associated with the Project

Component	Key Project Components/ Activities	Potential Adverse Project Effect
Health		
Human Health	• **Construction**: Potential clearing and grubbing, potential blasting and grading, construction of water supply system, mobilization and construction of onshore components, construction of marine jetties, upgrading and construction of on-site roads, installation of perimeter fencing, permanent mooring of the ASLNG™ production units, construction of electric transmission line, accommodation of workers in a temporary construction camp • **Operations**: Power generation, aggregation and distribution, liquefaction of natural gas, mooring, loading and transit of LNG carriers, accommodation of workers in the workforce accommodation buildings • **Decommissioning**: Removal of marine jetties, removal of the ASLNG™ production units, removal of onshore components	• Changes in air, water, soil, or sediment quality may result in changes in health risks to individuals exposed to those media • Changes in air, water, soil, or sediment quality that alter the quality of country foods (both plants and animals) may affect the health of individuals who consume them • Changes in ambient noise and light conditions may result in direct and indirect changes to human health

5.6 Measures to Prevent or Reduce Potential Effects

Based on the preliminary identification of potential Project-related adverse effects summarized above, initial measures to prevent or reduce these effects to an acceptable level have been incorporated or are currently being considered in the design of the Project. These include siting the facility (i) away from human settlement, (ii) on an existing partially disturbed industrial site and on land that has been logged, (iii) at a location that is removed from the Sarita River and its estuary, and (iv) adjacent to existing shipping lanes. Use of air cooling instead of seawater cooling has been incorporated into the design to reduce potential effects on the marine environment. Design considerations include incorporating measures to minimize noise and light. Further, the selection of electric drives for the ASLNG™ production units support the possibility to further reduce emissions for the Project through electrification, if feasible. Additional design considerations include configuring the Project layout to minimize visual disturbance and maintain access to important traditional use areas as much as possible. Consideration will be given to siting the facility water intakes and design to minimize entrainment. As the design of the Project continues to progress, additional measures to mitigate potential effects will be incorporated based on compliance with:

- applicable Provincial and Federal regulations (preliminarily identified in **Section 4.3**);
- Project Agreement and Environmental Parameters Documents;

- standards and codes of practice (e.g., Canadian Standards Association LNG Production, Storage, and Handling standard (CSA 2014); International Gas Code for Ships Carrying Liquefied Gases in Bulk);
- best management practices (e.g., BC Noise Control Best Practices Guideline (BC OGC 2009); Guidelines for Raptor Conservation during Urban and Rural Land Development in BC (Government of BC 2013));
- future project management plans to be developed by the Kwispaa LNG Team (e.g., Access Management Plan, Emergency Response Plan, Security Management Plan, Environmental Management Plans); and
- Project-specific measures identified during the EA process, including engagement and consultation with Huu-ay-aht, other potentially affected Indigenous groups and stakeholders, and during permitting.

To confirm the effects of the Project and the effectiveness of the applied mitigation, the Kwispaa LNG Team will develop and implement monitoring programs during the construction and operations phases of the Project. Monitoring programs may include specifics for:

- air quality;
- atmospheric and underwater sound;
- marine fish and other aquatic life;
- marine mammals;
- marine birds;
- terrestrial wildlife;
- discharges to air, water, and land;
- effects to marine users; and
- cultural and heritage sites.

The above list is not exhaustive and will be refined throughout the EA process.

6. Engagement and Consultation

6 Engagement and Consultation

This section summarizes the Kwispaa LNG Team's approach to Project-related engagement and consultation and describes past and future engagement and consultation activities with Indigenous groups, regulators, public, government, and other parties.

6.1 The Kwispaa LNG Team Approach to Engagement and Consultation

The Kwispaa LNG Team understands and recognizes the importance of developing long-term, respectful, and meaningful relationships with Indigenous groups, communities and interested stakeholders potentially affected by the Project. Huu-ay-aht's core principles of ʔiisaak (Greater Respect), Hišuk ma c̓awak (Everything is One), and ʔuuʔałuk (Taking Care Of…) guide the Kwispaa LNG Team's activities to develop the Project in a manner that minimizes potential environmental, traditional, and socio-economic effects and provides long-term benefits for current and future generations.

The Kwispaa LNG Team's approach is based on the following principles:

Respect – The Kwispaa LNG Team and its contractors will be respectful of all people they interact with and are committed to creating meaningful relationships with communities based on mutual respect and understanding. The Kwispaa LNG Team will respect culture, traditions, values, and the environment, and will listen widely and deeply to understand concerns and interests to ensure that such are considered in Project planning.

Collaboration – The Kwispaa LNG Team understands that different communities and stakeholders are unique and has adapted its engagement approach to reflect the values and needs of each community while maintaining the Kwispaa LNG Team's overarching principles and commitments.

Responsiveness – The Kwispaa LNG Team will seek to listen and understand concerns and interests with respect to the Project and will strive to be responsive to all questions and concerns identified, including sharing how input received was considered in Project planning, and how mitigation plans have been developed.

Timeliness – The Kwispaa LNG Team is committed to developing relationships early and being responsive to concerns and questions in a timely and accurate manner.

Honest and Open Communication – The Kwispaa LNG Team will strive to share information as it is available and will be open and honest in its communication.

The Kwispaa LNG Team initiated early engagement with potentially affected Indigenous groups and communities to introduce the Project through 2014 and 2015 and re-initiated engagement activities through 2017 and 2018, following the signing of the Relationship Agreements between the Developer and Huu-ay-aht. The Kwispaa LNG Team is committed to ongoing, meaningful and comprehensive engagement and consultation with potentially affected Indigenous groups, communities and interested stakeholders through the EA process and life of the Project.

6.2 Indigenous Engagement

This section describes the Kwispaa LNG Team's approach to engaging with other Indigenous groups.

6.2.1 Huu-ay-aht First Nations

For detailed information on the co-management relationship between the Developer and Huu-ay-aht, please refer to **Section 1.1**. For information on the Developer's engagement activities carried out to date with Huu-ay-aht, please refer to **Section 1.4**.

6.2.2 Other Potentially Affected Indigenous Groups

Pursuant to the co-management principles (see **Section 1.1.3**), early relationship building and initial engagement with potentially affected Indigenous groups prior to filing the Project Description is being led by Huu-ay-aht following a traditional protocol approach. When appropriate, the Developer has supported and participated in this early engagement with potentially affected Indigenous groups. This approach seeks to build relationships at this early stage in a culturally appropriate manner and to understand how the potentially affected Indigenous groups wish to develop a relationship and be engaged in respect of the Project. The Developer, with ongoing support from Huu-ay-aht, will transition to leading engagement and consultation activities for the Project, particularly in relation to the regulatory approvals processes, including the EA. The Developer seeks to engage and consult potentially affected Indigenous groups in a manner that respects their interests, listens to feedback, is responsive to that feedback, and collaboratively seeks to identify solutions. The Developer is committed to ongoing, meaningful, and collaborative engagement and consultation in respect of the Project to build long-term positive relationships with all potentially affected Indigenous groups throughout the life of the Project.

Because each potentially affected Indigenous group is unique, the Kwispaa LNG Team will develop relationships and engage in respect of the Project in a manner that reflects the values of each community while maintaining the core values of ʔiisaak (Greater Respect), Hišuk ma c̓awak (Everything is One), and ʔuuʔałuk (Taking Care Of…).

The Kwispaa LNG Team has identified the following Indigenous groups as potentially being affected by aspects of the Project, including a possible electric transmission line (in alphabetical order):

- Hupačasath First Nation;
- Maa-nulth Treaty Society –
  - Ka:'yu:'k't'h'/Che:k'tles7et'h' First Nations;
  - Toquaht Nation;
  - Uchucklesaht Tribe;
  - Yuułuʔiłʔatḥ Nation (formerly Ucluelet First Nation);
- Nanwakolas Council Society –
  - K'ómoks First Nation;
- Métis Nation British Columbia;

- Qualicum First Nation;
- Tseshaht First Nation; and
- We Wai Kai Nation.

The Kwispaa LNG Team has initiated early engagement with potentially affected Indigenous groups to develop relationships, understand how each Nation wishes to be engaged, and seek initial feedback on their interests in respect of the Project. The Developer provided a draft of the Project Description to Indigenous groups potentially affected by the Project and has sought to include feedback received in a manner that respects each Nation's interests. Early initial feedback from potentially affected Indigenous groups in respect of the Project has included:

- interests and concerns in relation to potential effects on marine resources, including harvesting and access;
- potential effects on fish migration and abundance as a result of interactions with shipping activities;
- concerns regarding impacts from a possible seismic activity and/or tsunami and an interest in safety measures;
- potential effects on the marine environment as a result of potential accidents and malfunctions from shipping activities and an interest in emergency response and safety planning;
- cumulative effects of shipping, including an increase in carrier traffic, and other activities;
- concerns regarding an increase in GHG emissions;
- interest in participating in the EA process and understanding environmental studies;
- interests in long-term economic benefits and opportunities; and
- interests in training, employment, and business opportunities.

This feedback has been incorporated into the scoping of existing condition studies for the Project, some of which are currently underway. The Kwispaa LNG Team will continue to engage potentially affected Indigenous groups to share Project information, identify interests and concerns, listen to and consider feedback received and work collaboratively to identify measures to address potential adverse effects. Key planned activities include issues scoping workshops, LNG information sessions, sharing information through the regulatory process to seek feedback, including the Valued Components Selection document and draft Application Information Requirements, providing regular Project updates and communications materials through ongoing meetings and correspondence and participation in community events and activities.

The Kwispaa LNG Team recognizes that the Section 11 Order will identify and delegate procedural aspects of consultation to the Developer pursuant to the EA process. Activities conducted following the Section 11 Order will be guided by an Indigenous Consultation Plan, which will be developed pursuant to the requirements outlined in the Section 11 Order.

6.3 Engagement with the Public, Stakeholders, Government, and Other Parties

This section identifies the Kwispaa LNG Team's approach to engaging with stakeholders, interested parties, and the government as well as the engagement to date. It also summarizes engagement to date with government and regulatory agencies.

The Kwispaa LNG Team has developed an initial list of stakeholders and communities that may have an interest in the Project and its associated activities (**Table 6-1**). As a leader in the community, Huu-ay-aht played a leading role in identifying potentially interested stakeholders. This list is not exhaustive and will be updated throughout Project planning and development. The primary audience for the Kwispaa LNG Team's engagement activities are the communities located within the ACRD, specifically Bamfield, Port Alberni, and Ucluelet. Additional communities that may have an interest in the Project as a result of an electric transmission line include Qualicum Beach and Parksville, which are both located within the Regional District of Nanaimo.

Table 6-1 Identification of Stakeholders

Local, Provincial, and Federal Government
Alberni-Clayoquot Regional District
Local Members of the Legislative Assembly
City of Port Alberni
Local Members of Parliament
District of Ucluelet
District of Tofino
Regional District of Nanaimo
Economic Development and Infrastructure
Community Futures Alberni-Clayoquot
Island Coastal Economic Trust
Bamfield Chamber of Commerce
Alberni Valley Chamber of Commerce
Ucluelet Chamber of Commerce
Alberni Valley Regional Airport
Port Alberni Port Authority
Kiwanis Clubs
Lions Clubs
Port Alberni Rotary (Arrowsmith) Club
Port Alberni Rotary Club
INEO Employment Services
Vancouver Island Economic Alliance
Association of Vancouver Island and Coastal Communities

Tourism
Poett Nook Marina and Campground
Alberni Valley Tourism
Ucluelet Tourism
West Coast Trail, Bamfield Office
Other Tourism Operators
Recreational Sporting Groups
Marinas
Fisheries
West Coast Aquatic
Fishing Associations
Fishing Charter Companies
Marine Search & Rescue Groups
Labour
United Fishermen and Allied Workers Union-Unifor
Port Alberni and District Labour Council
Alberni District Teacher's Union
Environment
Ducks Unlimited Canada
Sierra Club BC
Alberni Environmental Coalition
Coal Free Port Alberni
Wilderness Committee
Canadian Parks and Wilderness Society BC
Health/Education/Social Services
North Island College
Vancouver Island University
Camosun College
Bamfield Community School Association
School District 70 Alberni
Vancouver Island Health Authority (Oceanside – Port Alberni)
Bamfield Health Centre
West Coast General Hospital
Adult Mental Health and Substance Use Services Port Alberni
Health Protection and Environmental Services Port Alberni
Alberni-Clayoquot Health Network
First Nations Health Authority
Alberni Valley Employment Centre
Bamfield Marine Sciences Centre

Emergency Services
Royal Canadian Mounted Police
Port Alberni First Department
Bamfield Volunteer Fire Department
Ambulance and Air Ambulance Port Alberni
Canadian Coast Guard

6.3.1 Activities to Date

Prior to the execution of the Relationship Agreements in June 2017, Steelhead LNG and Huu-ay-aht engaged with key stakeholders and communities to introduce the Project, provide information on their relationship and process to explore the Project, and seek feedback on interests and concerns in relation to the Project. Key activities prior to 2017 included meetings with the ACRD, City of Port Alberni and Bamfield community to introduce the Project, a town hall in Port Alberni, meetings with interested stakeholders including the Alberni Valley Chamber of Commerce, Westcoast Aquatic, and North Island College, and participation in local community events.

Since entering the co-management relationship, the Kwispaa LNG Team has initiated engagement with key stakeholders and communities through presentations and one-on-one meetings. As a community leader, Huu-ay-aht serves a key role in fostering relationships between the Kwispaa LNG Team and its neighbours in order to develop a fulsome understanding of community and stakeholder interests.

Key stakeholders engaged since re-initiating engagement following the signing of the Relationship Agreements are listed in **Table 6-2**.

Table 6-2 Stakeholder Engagement

Stakeholder	Date	Activity
Vancouver Island Economic Alliance	October 25-26, 2017	Participation in the Vancouver Island Economic Alliance Summit, including engagement with delegates in relation to the Project
ACRD	December 13, 2017	Presentation to the ACRD Directors to share Project information
City of Port Alberni	January 8, 2018	Presentation to the City of Port Alberni at a Council meeting to share Project information
District of Ucluelet	February 13, 2018	Presentation to the District of Ucluelet at a Council meeting to share Project information
Bamfield community members	February 19, 2018	Presentation to Bamfield community members at a Bamfield Community Association meeting to share Project information
Port Alberni Port Authority	February 28, 2018	Presentation to the Port Alberni Port Authority Board of Directors and staff to share Project information and discuss shipping activities
Alberni Valley Chamber of Commerce	February 28, 2018	Presentation to share Project information

Stakeholder	Date	Activity
Bamfield Marine Sciences Centre	March 27, 2018	Presentation to share Project information
Port Alberni Mayor's Breakfast	April 4, 2018	Presentation to share Project information
INEO Employment Services	April 12, 2018	Presentation to share Project information and discuss employment and business opportunities
Association of Vancouver Island Coastal Communities	April 13-15, 2018	Participation in the annual convention including engaging participants to share Project information
Ucluelet Chamber of Commerce	April 26, 2018	Presentation to share Project information
Vancouver Island Economic Alliance	April 27, 2018	Presentation to staff and the Board of Directors to share Project information
Port Alberni Rotary Club	May 1, 2018 and May 17, 2018	Presentations to members to share Project information
North Island College	May 17, 2018	Presentation to share Project information and discuss training and education opportunities
Ucluelet community members	June 26, 2018	Provided an LNG 101 session for interested community members
Port Alberni community members	June 27, 2018	Provided an LNG 101 session for interested community members
Bamfield community members	June 28, 2018	Provided an LNG 101 session for interested community members
Alberni District Fall Fair	September 6-9, 2018	Provided Project information to members of the community at a booth

To establish a local presence and provide ongoing informal opportunities for information sharing, the Kwispaa Team expects to hold office hours in the Huu-ay-aht Government Office and will continue to build its local presence in both Port Alberni and Bamfield/Anacla. Team members will have access to Project information, such as display boards, brochures, and information sheets.

Information on the Project is also available at www.kwispaalng.com and Huu-ay-aht's (www.huuayaht.org) websites. Interested stakeholders and others can also contact the Kwispaa LNG Team via email and telephone.

Email: info@kwispaaLNG.com

6.3.2 Key Areas of Interest

Through the Kwispaa LNG Team's early engagement with stakeholders and the public, several key areas of interest have been identified in relation to the Project, including:

- economic revitalization and diversification opportunities and local benefits, including direct and indirect business, contracting, and employment opportunities;

- broad support for the co-management relationship between the Developer and Huu-ay-aht and recognition of the unique approach as a strong example of reconciliation between industry and First Nations;
- potential effects from facility emissions and an interest in reducing emissions;
- potential effects on the natural environment, including marine mammals and resources;
- potential effects on marine mammals, including humpback whales, as a result of increased shipping activities;
- concerns regarding potential accidents or malfunctions, including marine accidents or fuel spills, and an interest in ensuring effective emergency response measures;
- concerns regarding potential effects as a result of a seismic event or tsunami;
- concerns regarding increased shipping traffic and impacts to recreational and commercial fisheries;
- potential socio-economic effects, including effects on housing prices, tourism activities, and an increase in regional traffic;
- concerns about the cumulative effects of the Project and the Port Alberni Transshipment Hub Project (https://biv.com/article/2017/05/new-path-port-alberni);
- the possibility of the Port Alberni Port Authority extending its jurisdiction to include the shipping route to/from the Kwispaa LNG Area, enabling the enforcement of formal exclusion zones; and
- interests from many groups regarding possible employment opportunities.

6.3.3 Ongoing and Proposed Activities

The Kwispaa LNG Team will continue to engage local communities and affected and interested stakeholders to listen to feedback and interests, understand community values and plans, understand how the Project may affect communities and stakeholders, and work collaboratively to identify measures to mitigate or address potential adverse Project effects.

Key planned engagement activities include:

- meetings with interested stakeholders to discuss the Project Description;
- targeted topic-specific workshops on key areas of interest;
- LNG 101 sessions to share information on LNG;
- ongoing Project information presentations to share Project updates and seek feedback throughout the regulatory process;
- sharing communications materials and Project information through the Project website, social media, radio, and brochures;
- town hall meetings to share Project information and seek feedback from interested community members; and
- ongoing engagement in relation to the regulatory process.

The Kwispaa LNG Team will work to continue to develop relationships that are lasting and positive with the communities in which it works with the goal of being a long-term, meaningful contributor to the local economy and participant in the community.

Engagement through the regulatory process will be guided by the Public Consultation Plan, which will be developed pursuant to the requirements outlined by the Section 11 Order issued by the BC EAO.

6.4 Government and Regulatory Agencies

The Kwispaa LNG Team has initiated engaged with a number of regulatory agencies and government ministries to date that may have an interest in the Project and its associated activities (**Table 6-3**). This list will be updated throughout Project planning and development. In addition to direct meetings with specific agencies, the Kwispaa LNG Team expects to work closely with the Working Group that will be established by the BC EAO for the duration of the EA process, which is expected to include many of the agencies identified. **Table 6-3** presents a list of agencies with whom discussions have been initiated; these discussions include email communication and meetings.

Table 6-3 Engagement with Federal and Provincial Government Agencies

Agency	Engagement to Date
Provincial Government Agencies	
BC Environmental Assessment Office	Preliminary discussions initiating in 2015 with ongoing meetings introducing Kwispaa LNG and discussions about regulatory requirements
BC Ministry of Indigenous Relations and Reconciliation	Preliminary discussions introducing Kwispaa LNG and the co-management relationship with Huu-ay-aht
BC Ministry of Energy, Mines, and Petroleum Resources	Ongoing meetings and discussions introducing Kwispaa LNG
BC Ministry of Environment and Climate Change Strategy	Preliminary discussions introducing Kwispaa LNG
BC Oil and Gas Commission	Preliminary discussions initiating in 2015 and ongoing discussions introducing Kwispaa LNG and discussing BC Oil and Gas Commission regulatory requirements
BC Ministry of Forests, Lands and Natural Resource Operations	Preliminary discussions through 2017 and 2018 introducing Kwispaa LNG and ongoing correspondence including permitting
BC Ministry of Jobs, Tourism and Skills Training and Responsible for Labour	Preliminary meetings and discussions in 2018 introducing Kwispaa LNG and initiating training and skills discussions
BC Hydro	Ongoing discussions through 2018 introducing Kwispaa LNG and potential opportunities to use electricity from BC Hydro
Federal Government Agencies	
Canadian Environmental Assessment Agency	Preliminary discussions initiating in 2015 and ongoing through 2018 introducing Kwispaa LNG and discussing regulatory requirements
Natural Resources Canada	Discussions through 2018 introducing Kwispaa LNG and ongoing discussions about regulatory requirements

Agency	Engagement to Date
Environment and Climate Change Canada	Preliminary discussions introducing Kwispaa LNG
Indigenous and Northern Affairs Canada	Preliminary discussions introducing Kwispaa LNG
Fisheries and Oceans Canada	Preliminary discussions introducing Kwispaa LNG
Transport Canada	Preliminary discussions introducing Kwispaa LNG

The Kwispaa LNG Team has engaged with the elected officials whose ridings overlap with the Kwispaa LNG Area to provide an overview of the Project and seek feedback on interests and concerns as the Project develops:

- Hon. Gord Johns, Courtenay-Alberni, BC (Member of Parliament), NDP; and
- Hon. Scott Fraser, Minister of Indigenous Relations and Reconciliation, Mid Island-Pacific Rim, BC (Member of the Legislative Assembly), NDP.

7.
Closing Remarks

7 Closing Remarks

The Project, being co-managed by the Developer and Huu-ay-aht, will connect natural gas resources in the Western Canadian Sedimentary Basin with global markets, help advance the LNG sector in BC, promote the global use of the cleanest-burning fossil fuel, while generating significant economic opportunities for BC businesses, and provide long-term revenue for local, Provincial and Canadian economies, including Indigenous communities. This unique co-management relationship, as defined in the Relationship Agreements between the Developer and Huu-ay-aht, is a strong example of how industry and Indigenous groups can work together in a mutually beneficial manner to develop better projects and support meaningful reconciliation.

The Kwispaa LNG Team is committed to ongoing and meaningful engagement and consultation with potentially affected Indigenous groups, stakeholders, and communities to develop the Project in a way that minimizes potential environmental, cultural, and socio-economic effects and provides long-term benefits for current and future generations.

Each phase of the Project will have an initial lifespan of approximately 25-years and is anticipated to be developed in two or three phases, producing and exporting approximately 24 mtpa of LNG at full build-out. The first phase will include construction and operation of two ASLNG™ production units; the remaining two ASLNG™ production units will be added in the second and potentially third phases. Power requirements for the Project may be supplied from either a self-generation power facility, Provincial (BC Hydro) transmission grid, or a combination thereof. The Kwispaa LNG Team is currently working with BC Hydro to explore options to power the Project with electricity provided from the Provincial grid to further reduce emissions. LNG carriers are anticipated to call at the Project approximately 160 times annually in the first phase (approximately three shipments weekly) and 320 times annually at full build-out (approximately six to seven LNG shipments weekly). The LNG carriers will travel between the Kwispaa LNG Area and LNG customers across the Pacific Ocean.

The Project will create regional employment opportunities during the design, construction, operations, and decommissioning phases, including for Huu-ay-aht through the Relationship Agreements. Construction of each Project phase of 12 mtpa will require a peak workforce of up to approximately 1,500 to 2,000 over the estimated 52-month construction period. During the approximately 25-year operations of each phase, the Project will employ a pool of approximately 200 to 240 full-time employees to operate the first phase (12 mtpa) and approximately 240 to 300 full-time employees at full build-out (24 mtpa). The Project will also create indirect and induced employment opportunities during the design, construction, and operations phases.

The Kwispaa LNG Team is committed to developing, constructing, operating, and decommissioning the Project in a manner that respects the environment. As stewards of the lands and waters in their ḥahuuḥi, Huu-ay-aht has an integral role through the joint approach to the EA and permitting processes for the Project as well as through the life of the Project. Environmental interests identified by Huu-ay-aht have been incorporated into a comprehensive set of Environmental Parameters that identify areas of particular concern to Huu-ay-aht citizens, such as potential adverse effects on water quality, fish, and marine mammals. To ensure that Project activities avoid impacting key sites identified by Huu-ay-aht, the Kwispaa LNG Team

developed the Sarita Cultural Protection Line to define the area where development may occur. The Project design has also been adapted to avoid key cultural sites such as Sarita River and Santa Maria Island.

The Kwispaa LNG Team is focused on developing the Project in a sustainable manner that benefits Indigenous and local communities, British Columbians and Canadians. The Project will respect the local environment while delivering clean LNG to global customers, thereby helping to reduce global GHG emissions and air pollution.

8. References

8 References

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