11.0 Haisla Nation

This section of the Application provides an assessment of the effects of the Project on Haisla Nation interests and is informed by engagement with Haisla Nation.

The assessment of potential project effects on Haisla Nation interests includes consideration of impacts to Indigenous or treaty rights recognized and affirmed by section 35 of the *Constitution Act*, *1982* as well as any other interests identified by the Nation. Information provided in this section of the Application includes:

- An overview of the Nation's governance context of the area affected by the Project including information regarding:
    - How Haisla Nation laws, governance or customs apply to this area, including how those processes may have evolved over time, and how they should be used to review the potential impacts of the Project on Indigenous interests (also known as Haisla Nuyem)
    - Haisla Nation laws, customs, or requirements for the area including any existing land use plans (LUPs)
    - Agreements with other Nations regarding governance of areas of territory overlap, as relevant to the Project
- A list of Haisla Nation interests that may be impacted by the Project
- A summary of historic and current use of the area in the vicinity of the Project by Haisla Nation people over time including consideration of cumulative effects, and practices in the vicinity of the Project with regard to the Haisla Nation interests. This summary includes any site-specific use values present in the vicinity of the Project, which are areas identified and/or mapped by Haisla Nation as having environmental, cultural, spiritual, transportation, subsistence and habitation value.

11.1 Overview and Context

Information about the Haisla Nation, ethnographic data, language, planning initiatives and land-use plans, governance, population and economy, reserve lands, health and social conditions and other contextual information (Sections 11.1.1 to 11.1.7) were provided by Haisla Nation or were identified in publicly available documents. A description of information used in this assessment is provided in Section 11.4. This section was provided to Haisla Nation for review; feedback provided by the Nation was incorporated, refer to Section 11.3.

11.1.1 Haisla Nation Traditional Territory

Haisla Nation traditional territory spans Douglas Channel and Kitimat Arm, comprising approximately 13,000 km^2 of land and sea along British Columbia's North Coast; "the entire area of Haisla traditional territory is considered to be spiritual" (Powell 2013:10) (Figure 11.9.1). The traditional territory of Haisla Nation encompasses the lands and waters from the northern ridge of the Kitimat River valley and Douglas Channel, extending 170 km south, including the mainland shores on both sides of the upper Douglas Channel and Kitimat Arm, and the saltwater channels, bays, arms, inlets, and coves that feed those waterways (Powell 2013). Haisla territory also includes Coste and Maitland Islands, the northern and central portions of Hawkesbury Island, northern and eastern Gribbell Island, the northeast coast of Princess Royal Island from Kingcome Point to Butedale, and several smaller islands throughout (Barbetti and Powell 2005:3-57 and 71-2).

Haisla traditional territory is comprised of matrilineal clan stewardship areas that are "owned" (and inherited) watersheds, called *wa'wais* (Powell 2013). There are 54 *wa'waises* in Haisla traditional territory (Barbetti and Powell 2005). The *wa'wais* owners inherit the responsibility to care for and maintain the area and all floral and faunal resources encompassed within; they determine who can access their *wa'wais* to hunt, fish, and engage in other cultural practices and are also obligated to "educate and retrain visitors in [their] territory" (Powell 2013:6). *Wa'wais* that are particularly rich in specific resources are known as *bagwaiyas; bagwaiyas* are shared by all Haisla people, regardless of clan affiliation. *Wa'wais and bagwaiyas* are integral to the Haisla Nation's stewardship and resource management initiatives (Powell 2013).

Portions of Haisla Nation traditional territory, *wa'waises,* and reserve lands are transected by all the project assessment areas (Figure 11.9.2 to Figure 11.9.13). These include:

- Air quality (shipping) and (marine terminal) LAA and RAA (Section 7.2)
- Acoustics (shipping) and (marine terminal) LAAs and RAAs (Section 7.3)
- Vegetation resources LAA and RAA (Section 7.4)
- Wildlife (shipping) and (marine terminal) LAAs and RAAs (Section 7.5)
- Freshwater fish LAA and RAA (Section 7.6)
- Marine resources (shipping) and (marine terminal) LAAs and RAAs (Section 7.7)
- Employment and economy LAA and RAA (Section 7.8)
- Land and resource use LAA and RAA (Section 7.9)
- Marine use LAA and RAA (Section 7.10)
- Infrastructure and services RAA and LAA (Section 7.11)
- Human health (shipping) and (marine terminal) LAAs and RAAs (Section 7.12)
- Heritage LAA and RAA (Section 7.13)

11.1.2 Ethnography

Haisla Nation have occupied their traditional territory for approximately 9,000 years (Haisla Nation 2021a). Haisla Nation's oral histories and ethnographic research suggest that the ancestors of the Haisla people migrated north, travelling along the coast to the mouth of the Kitimat River, to a location near Kitamaat Village during the early Holocene (Powell 2013). The *Xa'islak'ala* name "Haisla" translates to "dwellers downriver" (Haisla Nation 2021a). The numerous heritage (i.e., archaeological) sites in Haisla territory demonstrate the Nation's longstanding occupation and use of their lands and waters. The large 1,800-year-old fish weir complex that was recently identified during archaeological survey in Minette Bay is an impressive example of Haisla Nation pre-contact engineering and sustainable fish harvesting practices (Freeland 2019).

Haisla Nation is comprised of two different Haisla groups: the *Gitamaat* (Kitamaat) of Douglas Channel and the *Gitlop* (Kitlope) of the Gardner Canal (Powell 2011). The *Gitamaat* (people of the snow) and *Gitlop* (people of the rocks) were considered distinct communities; however, they spoke similar dialects and commonly intermarried (Powell 2013). The two different Haisla communities amalgamated around 1948/1949 following population decline resulting from illness contracted post-contact with European settlers (Hamori-Torok 1990:306; Powell 2011:7).

Haisla Nation social structure is centered on matrilineal clans. Traditionally, Haisla Nation was comprised of eight clans (Eagle, Beaver, Crow, Killer Whale, Wolf, Frog, Raven, and Salmon); each clan having its own hereditary chief (*himaas)*, resource areas, and winter village (Barbetti and Powell 2005). Haisla Nation recognize four clans today (Beaver, Eagle, Raven, and Fish) primarily due to population decline following contact (Powell 2013).

11.1.3 Language

Haisla Nation's traditional language is *Xa'islak'ala* (pronounced HA-ees-lah-KYAH-lah) (Powell 2013) and the language continues to be spoken and practiced by Nation members and remains an important part of Haisla Nation today. *Xa'islak'ala* is classified as part of the Wakashan language family and the *Xa'islak'ala* language is closely related to the Kwak'wala-speaking (Kwakwaka'wakw) peoples of Vancouver Island and the Heiltsuk of Bella Bella (Mithun 1999:549). Traditionally, there were two dialects spoken, split between the Gitamaat (Kitamaat) and the Gitlop (Kitlope) (Mithun 1999:549).

Today, the Haisla Nation Council (HNC) Culture and Language Department offers a range of programs and activities to help Nation members revive, engage with, and practice the *Xa'islak'ala* language (Haisla Nation 2021a). The Haisla Culture and Language Department are committed to the maintenance and development of Haisla Nation members sense of belonging and cultural identity; this includes both on and off-reserve members (Haisla Nation 2021a). The central values of the Haisla Culture and Language Department include supporting and building on Haisla cultural strength, rediscovering and healing through cultural practice, supporting Elders in the documentation and sharing of their knowledge of *Xa'islak'ala* and Haisla history, and establishing a centralized facility to develop culture and language initiatives (Haisla Nation 2021a). Some of the programs offered by the Haisla Culture and Language Department include the Haislakala Learner's Group, the Mentor Apprentice Program, First Voices, Culture Camp, Haisla Cultural Awareness Training, and the Rapid Word Collection Workshop (Haisla Nation 2021a).

In 2020, the Haisla Culture and Language Department and the First Nation Education Foundation partnered with Rio Tinto BC Works to develop a new *Xa'islak'ala* Language Revitalization Program with the goal of preserving and reviving the Haisla language (Rayment 2020). The Haisla Culture and Language Department

subsequently initiated a Rapid Word Collection Workshop, a multi-week-long word collection workshop open to Nation members and living keepers of Haisla Knowledge to come together and document known *Xa'islak'ala* words (Haisla Nation 2021a). The workshop resulted in the documentation of 3,940 *Xa'islak'ala words,* and the Haisla Nation is pursuing the development of a phone app and online platform with a digital dictionary to allow Nation members to access, connect with, and practice their language at any time (Haisla Nation 2021a). The results of the workshop are also being used to standardize the pre-kindergarten to post-secondary Haisla Language curriculums taught on-reserve.

11.1.4 Planning Initiatives and Land Use Plans

Haisla Nation have several planning initiatives for the management of lands, waters, and resources in their traditional territory. Land use management initiatives prioritize the attainment of self-sufficiency and economic development for their Nation members. Land use plans, agreements, and partnerships prioritize the management of fisheries, cultural heritage sites, and environmental conditions. Examples of Haisla Nation planning initiatives are described below.

Haisla Nation finalized their draft Haisla LUP in February 2021; the community vision for the Haisla LUP is "to build a powerful, prosperous and proud community, health in mind, body, and spirit" (Haisla Nation 2021b). The Haisla LUP provides background information on the Framework Agreement on First Nation Land Management, the Haisla Land Code, and existing Land Policies that are relevant to the management of Haisla reserve lands (Haisla Nation 2021b). The purpose of the Haisla LUP is to provide high level policies related to the location and use of lands governed by the Haisla Land Code and provides direction about how Haisla reserve lands and resources contained therein will be conserved, developed and used by Haisla Nation (Haisla Nation 2021b).

In 2006, Haisla Nation began their Marine Use Planning initiative, which culminated in the production of the Haisla Community Marine Use Plan (MUP) in 2014. Haisla Nation vision for the MUP is to "build a powerful, prosperous and proud community, where all community members are healthy in mind, body, and spirit" (Haisla Nation 2014a). The MUP guides marine resource management in Haisla territory and supports a shift towards Ecosystem Based Management of marine resources (Haisla Nation 2014a). Haisla Nation is currently developing an updated community-based marine use plan for their traditional territory that will continue to support sustainable economic development initiatives (Haisla First Nation 2021).

In 2017, Haisla Nation became signatories of the General Protocol Agreement on Land Use Planning and Interim Measures between eight Coastal First Nations and the Government of British Columbia; the parties committed to working together "in the spirit of mutual recognition, respect and reconciliation on a government-to-government basis to resolve land-use conflicts and to implement interim measures initiatives (Coastal First Nations and British Columbia Provincial Government 2017:1). Haisla Nation also re-joined the Coastal First Nation Turning Point Initiative Society in 2017 after ending their membership in 2012 (Coastal First Nations 2017). The Turning Point Initiative Society is comprised of 10 Coastal First Nation groups; the board of directors consists of a representative from each group (Coastal First Nations 2017). The society received a $120 million investment package (the Conservation Investments and Incentives Initiative fund) in 2017. The Conservation Investments and Incentives Initiative fund is used to support conservation-based economic developments that increase local capacity of the participating Nations and increase economic initiatives for their communities (Coastal First Nations 2017). Examples of economic initiatives and sustainable businesses eligible for Conservation Investments and Incentives Initiative funds include eco-tourism, non-timber forest products, green building projects, and sustainable

fisheries; open-net cage fish farms, trophy hunting, resource extraction (e.g., oil and gas projects), and non-sustainable forestry projects are not eligible (Coastal First Nations 2017).

In 2015, Haisla Nation members passed the Haisla Nation Land Code, a comprehensive and fundamental land law granting control of reserve lands to the HNC (Haisla Nation 2014b; Haisla Nation 2021a). The Haisla Nation Land Code "set's out the principles and legislative and administrative structures that apply to the Nation's Land and through which the Nation exercises its authority over those lands" (Haisla Nation 2014b: 9). The Haisla Lands Advisory Committee was created under the Haisla Land Code and the committee works closely with the Haisla Lands Department to make recommendations to the HNC (Haisla Nation 2014b; Haisla Nation 2021a).

In 2013, through Haisla Nation support and agreement, the Government of Canada issued the Haisla Nation Liquefied Natural Gas Facility Regulations under authority of the *First Nations Commercial and Industrial Development Act* allowing the Province of British Columbia to administer, enforce, and monitor compliance with applicable provincial legislation on Bees 6 as part of the Kitimat LNG Project development on Haisla Nation reserve land (Haisla Nation 2013).

Earlier planning initiatives and agreements established in 2006 (upon which the more recent initiatives were founded) include the Strategic Land Use Planning Agreement between Haisla Nation and the Province of British Columbia (Haisla Nation and Province of British Columbia 2006), and the Land and Resource Protocol Agreement between Gitga'at First Nation, Haisla Nation, Heiltsuk Nation, Kitasoo/Xaixais First Nation, Metlakatla First Nation, Wuikinuxv First Nation and the Province of British Columbia (Coastal First Nations and the Province of British Columbia 2006).

Cedar is not aware of any existing agreements made directly between Haisla Nation and other Indigenous nations regarding governance of areas of territory overlap, as relevant to the Project.

11.1.5 Governance

Haisla Nation recognizes both traditional Hereditary Chiefs and nobles, and a contemporary elected Chief and Council system, also known as the HNC (Powell 2013).

Hereditary Chiefs are "the traditional leaders of high status in the Haisla Nation community" who derive their authority through traditional law and ceremonies that have been perpetuated since pre-contact times (Powell 2013:4). The perspectives and opinions of Hereditary Chiefs often influence the broader opinion of Haisla Nation, and Hereditary Chiefs are consulted for decisions regarding resource and lands management for the broader traditional territory, as well as for Nation member activities, events, and other important matters pertaining to governance, Haisla well-being, and nuyem. Haisla Nuyem comprise the oral history and traditional laws of Haisla Nation (Barbetti and Powell 2005).

The elected HNC upholds a contemporary leadership structure and make political decisions regarding reserve lands and supporting infrastructures (e.g., public health, education, housing) as well as decision making as this pertains to the Aboriginal rights and title of the Nation. The HNC is comprised of a Chief Councillor and 10 elected Councillors, with 1 appointed Deputy Chief. Haisla Nation's elected Council runs on a four-year staggered term for five Councillors to ensure continuity of their governance. The Council appoints two separate standing committees every two years, which are the Executive Committee and the Stakeholder Relations Committee. Each committee is comprised of five Councillors and the Deputy Chief; however, final decisions are made by the Council at duly convened meetings. HNC oversees the Chief Operating Officer as well as the Chief Executive Officer who manage the day-to-day and annual operation of the Nation via HNC administration (approximately 160 personnel and variety of

departments including education, employment and training, economic development, culture, health, social development, fisheries, lands and resources and community development).

Haisla Nation (Band No. 676) are currently in Stage 4 Agreement in Principle Treaty negotiations with the Province of British Columbia (British Columbia Treaty Commission 2021).

11.1.6 Social and Economic Conditions

This section provides information regarding Haisla Nation population, education, economy, housing, health, and social conditions. Information in this section was derived from Statistics Canada (2021) and publicly available documents produced by Haisla Nation.

11.1.6.1 HOUSING

There are approximately 1,990 Haisla Nation members today, and approximately 621 of those members reside on-reserve in Kitamaat Village (Kitamaat 2), on the east side of Douglas Channel, approximately 9 km southeast of the District of Kitimat (INAC 2021; British Columbia Treaty Commission 2021). Approximately 1,370 Haisla people live off-reserve; they are primarily located throughout the region, including other reserve lands, and cities such as Kitimat, Terrace, Prince Rupert, Prince George, Nanaimo, Vancouver, Victoria, and elsewhere (Powell 2013; INAC 2021; Haisla Nation 2021b). There are several large industrial developments currently proposed and/or under construction within the region and it is possible that more Haisla community members will return to Kitamaat Village to seek employment linked to these projects; returning community members will require housing and it may put additional pressure on Haisla Nation to develop housing for various household compositions (Haisla Nation 2021b).

The HNC Community Development Department, Housing Corporation, and associated low-income housing board, oversees housing needs for Nation members living on and off-reserve, within Haisla Nation traditional territory (Haisla Nation 2021a). Housing also remains a major focus of Haisla Nation's Comprehensive Community Plan (Haisla Nation 2021a).

Although specific information regarding on-reserve housing issues is not publicly available, a recent study conducted by the Community Vitality Advisory Group and Research Team (informed by a group of Haisla women) found that some on-reserve Nation members are facing problems with mould, overcrowding, maintenance issues, and a lack of affordable housing options (CVAGRT 2018:18).

Haisla Nation have several initiatives in place to address housing issues for Nation members living on and off-reserve. In February 2021, HNC approved a motion to provide $2.7 million for the Wathl Creek Subdivision Expansion Project, which is a component of housing capacity expansion on-reserve (Haisla Nation 2021a). Haisla Nation is also developing an affordable apartment complex in Kitamaat Village, with 23 units to house Nation members (Haisla Nation 2021a). Haisla Nation is also constructing three duplexes on-reserve; this project is being funded by the Canadian Mortgage and Housing Corporation (Haisla Nation 2021a).

Haisla Nation Council is also developing two new programs to address housing in the Nation. The Haisla Housing Upkeep and Maintenance Program was created to support Nation members in caring for and maintaining their homes, with the goal that all Nation members have safe and healthy places to live (Haisla Nation 2020). The Haisla Social Purpose Real Estate Development Program provides Nation member benefits (housing) while generating financial returns for other Haisla Nation programs; the program is aimed at developing Haisla Nation capacity, expertise, real estate vision, and strategy development (Haisla Nation 2020). The Haisla Social Purpose Real Estate Development Program will

also support community members living off-reserve, through the implementation of “social purpose real estate projects in Haisla population centers like Vancouver, Terrace, and Prince Rupert” (Haisla Nation 2020: 2).

11.1.6.2 EDUCATION

Haisla Nation offer educational services to support their Nation members living on and off-reserve; Haisla community education goals center on providing access to high-quality education, capacity building, and employment training for all members (Haisla Nation 2020). The Haisla Community School located on-reserve, blends Haisla traditional teachings with contemporary education plans to provide a unique learning experience for elementary students (Haisla Nation 2021a). The Haisla Community School curriculum includes Haisla language and cultural classes; it is open to non-Haisla and non-Indigenous elementary students, and bus transportation is available for Nation members living in Kitimat, adjacent to Kitimaat Village.

The Haisla Nation Education and Employment Department have a post-secondary coordinator that supports members apply for funding for college and university programs, and an academic advisor that develops education plans specifically tailored for Nation member needs and offer advocacy and other support for students when requested (Haisla Nation 2021a).

Haisla Nation also supports Nation members that have not graduated from high school through the CEDARS Program (high school equivalency and capacity building program) offered at the Kitimat Valley Institute (Powell 2013). Correspondence programs are also available to Haisla Nation members through North Coast Distance Education (based out of Terrace, British Columbia); graduates receive a diploma through the Ministry of Education (Powell 2013).

The HNC are also offers Eco-Cultural Tourism Programs to support Haisla cultural programming and learning, and to help Nation members experience on-the-land cultural education (Haisla Nation 2020).

11.1.6.3 EMPLOYMENT AND INCOME

In 2015, the average total income of Haisla Nation members was reported to be $28,608 CAD (Statistic Canada 2021). Reported occupations for Haisla Nation members in 2016 included sales and services, trades, transport and equipment operators and related, management, natural sciences and health, social services and government (Statistic Canada 2021). Data collected through the 2016 Census stated an unemployment rate of 16% for Haisla Nation.

Haisla Nation identify economic development as one of nine interconnected community goals; the Nation seeks and promotes projects that respect community values and create job opportunities for Nation members (Haisla Nation 2020). The Haisla Nation Education and Employment Department offer employment services for Nation members, including job coaches, work placement coordinators, and administrative liaison (Haisla Nation 2021a). They also offer capacity development funds and employment supports for Nation members, including the Bridge Funding to New Employment Program, and support with resume development, personal protective equipment/work attire, internships and mentorships, employment referrals, resource referrals, wage subsidy, reimbursement of student loans, criminal record check fees, medical clearance fees, and union dues (Haisla Nation 2021a).

The Haisla Nation Stakeholder Relation Committee collaborate with the HNC, and works with external groups, proponents, and other stakeholders to create positive and sustainable economic opportunities that will benefit Haisla Nation members (Haisla Nation 2021a). HNC currently has a staff of five

overseeing the Economic Development Department. In addition, individual Haisla Nation members own businesses in the arts and services sectors (e.g., food truck owner/catering, carving, painting, guiding, and janitorial). Haisla Nation also operates a gas station, the HNC Gas Bar. The Haisla Business Incubator Project is a medium-term strategy concept being developed by Haisla Nation that aims to provide increased support and infrastructure to Haisla members interested in starting their own businesses (Haisla Nation 2020).

The ultimate goal of the HNC Economic Development Department is to identify sustainable economic opportunities that will effectuate positive changes for their Nation members through projects and partnerships that represent low risk to the environs and resources within their traditional territory, these include partnerships that involve stream restoration efforts, reductions in air emissions, and other conservation and enhancement strategies (Haisla Nation 2021a). The HNC ensures that export terminals and other projects proposed for Douglas Channel, and elsewhere in their traditional territory, are focused on the protection of culturally important areas, with minimal and manageable environmental footprints (Haisla Nation 2021a). The HNC has established partnership agreements with over 25 businesses operating in Haisla territory. Examples of these include Allteck, ATCO, Bridgeman, NorthPac Forestry Group, Brock Canada, Civeo, ESS Support Services, First Canada, Kentron Construction, Kuehne and Nagel, Ledcor, Mammoet Canada Western, Medcor, NationFUEL/Iron Clad, ONEC Logistics, Progressive Ventures Construction, Refraco-British Columbia, Ruskin Construction, Seaspan UCL, Securiguard, Servco Canada, Solaris, Summit Air, Triton Environmental, and Waste Management (Haisla Nation 2021a).

As discussed in Section 7.8, Haisla Nation Council commissioned an employment survey in 2021 to collect labour force information on its membership. At the time of writing a finalized report detailing survey methods and findings was unavailable; however, draft survey results were made available (Haisla Nation Council 2022).

A total of 266 individuals responded to the employment survey, 88% (n = 233) of whom were registered Haisla Nation members, 12% (n = 33) of whom were spouses of Haisla members (spouse defined as a person who had lived with a Haisla member as a partner for a period of not less than one year). Of total respondents (n = 266), 65% (n = 173) indicated that they were currently employed, 35% (n = 93) not currently employed. Of employed respondents (n = 173), 38% (n = 65) were looking for other employment opportunities, 62% [n = 108] were not. Of respondents who indicated that they were not currently employed (n = 93), 20% (n = 53) were unemployed and looking for work, 6% (n = 17) were unemployed and not looking for work, 6% (n = 16) were fulltime students, and 3% (n = 7) were retired.

When asked if employed respondents were currently working on a list of identified regional projects (n = 231), 11% (n = 25) indicated that they were working on Rio Tinto Alcan, 6% (n = 13) on LNG Canada Export Terminal, 4% (n = 9) on Kitimat LNG, 3% (n = 6) on Coastal GasLink, and less than 1% (n = 1) on the Cedar LNG Project. The remaining 76% (n = 177) indicated that they worked on other projects/with other employers. Employed respondents were also asked to identify whether their role was unionized (n = 210), to which 37% (n = 77) of respondents indicated their role was unionized while 63% (n = 133) of respondents indicated that their role was not unionized.

Respondents to the employment survey were asked to identify their highest level of education and whether they held a valid drivers license (potential barriers to employment). Of the 266 respondents, 3% (n = 9) held a degree at or above the undergraduate level, 3% (n = 7) were Red Seal/Journeyman certified, 35% (n = 92) held a certificate or diploma/associate degree, 7% (n = 19) completed a trade apprenticeship, and 52% (n = 139) held a high school diploma or equivalent certificate. Approximately

72% (n = 191) of respondents (n = 266) had a valid drivers license, 28% (n = 75) did not. For drivers with a valid license (n = 191), class five was the most common (69%, n = 131), followed by class seven (25%, n = 48). Less than 1% of respondents held a class six license (n = 1). The remainder of respondents with a valid driver's license (6%; n = 11) held a commercial class license (class one, two, three, or four).

11.1.6.4 SEASONAL ROUND (TRADITIONAL ECONOMY)

In addition to the aforementioned economic initiatives, Haisla Nation continue to develop their traditional economy centered on subsistence gathering activities and associated seasonal mobility pattern, often termed a seasonal round. Haisla Nation oral traditions and laws describe the necessity for Nation members to "live to the rhythm of [their] annual cycle" and describes monthly activities (Barbetti and Powell 2005:73).

Through the seasonal round, Haisla members traditionally spent winters in larger permanent villages with many different families inhabiting the same location (Powell 2013:26-27). Village life comprised larger communities of a single clan, or allied clans, spending the winter together in multiple family dwellings called longhouses. These houses form the backbone of Haisla traditional life, with group events, feasting, name giving, and telling of stories making up an important aspect of winter life (Muckle 2007:44). After the winter season, families would disperse to seasonal family settlements centered on specific harvestable resources (Powell 2011:5). During the spring, Haisla families travelled to fishing sites, with an emphasis on oolichan harvesting, as well as other floral and faunal resources. Oolichan are called "*za ' X w en*" (pronounced "jax-quin") in the Haisla Language (*X̄a'islaḵala*) (Green 2008). Today, Haisla Nation members continue to travel from Kitamaat Village to known oolichan spawning sites (e.g., Kemano River) in their traditional territory to harvest and make oolichan grease (Haisla Nation 2021a; Gauvreau 2021). Many Haisla Nation members also bring oolichan back to Kitamaat Village to smoke and/or store in salt to preserve for future consumption; alder wood is a preferred tree species for smoking oolichan (Gauvreau 2021).

Around the same time of year, Haisla Nation harvest seasonally available intertidal resources, such as shellfish and kelp from intertidal areas and rocky promontories throughout their territory. Berries and plants are collected spring through fall throughout the territory. During summer months, when the salmon run begins, families may move to fishing sites along rivers or do periodic trips from their live-aboard vessels, and spend the season catching and preserving their catch for the winter months. In the past, when Nation members were dispersed throughout their territory by clan area, the groups would return to their winter village sites after the salmon had stopped running (Hamori-Torok 1990).

The Haisla people traditionally emphasized marine resources for their subsistence, especially the yearly runs of salmon and oolichan (Powell 2013:31; Gauvreau 2021). Salmon was dried and preserved, whereas oolichan was typically rendered into highly prized fatty oil, commonly referred to as "grease". In between the seasonal runs, numerous terrestrial and marine mammals, shellfish, rockfish, and plant species were harvested (Hamori-Torok 1990:306-307; Muckle 2007:43). The importance of coastal ecosystem resources to Haisla Nation continues today. Haisla's use of and relationship to their territory is maintained through traditional subsistence activities of hunting and gathering, and cultural practices such as trading, potlatch, and spiritual ceremonies (Haisla Nation 2021a).

11.1.6.5 HEALTH SERVICES

Haisla Nation are greatly invested in the health and well-being of their community. Haisla Nation's Health's Wellness Team offer a variety of health services and wellness support for Nation members living on and off-reserve (Haisla Nation 2021a). The Haisla Health Center is located in Kitamaat Village (Kitamaat 2). The Haisla Health Wellness Team employs nursing staff, patient travel clerks, mental health counsellors (for adults, youth, and children), alcohol and addiction workers, community health representatives, Elder programming facilitators, and home care providers (Haisla Nation 2021a).

Recently, the HNC initiated a joint-venture partnership with International SOS to address coronavirus concerns and support the HNC acquire equipment and supplies to support health service staff and community first responders (Haisla Nation 2021a). The HNC is also working closely with the District of Kitimat to work through the coronavirus pandemic (Haisla Nation 2021a).

11.1.7 Reserves

Haisla Nation has 19 reserves: reserve land area totals 726.1 ha (INAC 2019). Most Haisla Nation members reside at Kitamaat Village (Kitamaat 2) located on the east side of Douglas Channel (INAC 2019). As described in the Haisla LUP, "while some of the reserves are traditional village sites, Kitamaat Village is the centre of the Haisla Nation, and the sole remaining year-round settlement. Kitamaat Village core is located at sea level with direct access to the ocean. There is additional development accessed by road further uphill from the main village core. Other reserves are largely undeveloped, and some are only accessible by water" (Haisla Nation 2021b). A list of Haisla Nation reserve lands is provided in Table 11.1.1 (INAC 2019).

TABLE 11.1.1 HAISLA NATION RESERVES

Number	Name	Location	Size (ha)
07624	Bees 6	COAST DIST. RGE. 4, LOT 2578, AT MOUTH OF BISH CREEK WEST SHORE OF KITIMAT ARM, DOUGLAS CHANNEL	70.60
07636	Crab River (Crab Harbour) 18	COAST DISTRICT, RANGE 4, LOT 2583, AT MOUTH OF CRAB RIVER ON GARDNER CANAL	7.10
07856	Gander Island 14	COAST DIST, RGE 3, LOT 1369, 1 OF ISLS OF THE MOORE GRP. OFF THE W. COAST OF ARISTAZABAL ISL. IN HECATE STRAIT	121.40
07631	Giltoyees 13	COAST DISTRICT RANGE 4, LOT 2577 AT THE HEAD OF GILTTOYEES INLET OF DOUGLAS CHANNEL	4.20
07629	Henderson's Ranch 11	COAST DIST. RGE.4 LOT 1022, EAST SHOR6 OF KITIMAT ARM OF DOUGLAS CHNL. ABOUT 1 MILE S. OF ENTRANCE TO MINETTE BAY	31.90
08392	Ja We Yah's 99	LOT 3059 KILDALO RIVER RGE 4	2.40
07623	Jugwees (Minette Bay) 5	COAST DISTRICT, RGE 5, LOT 6011, AT HEAD OF MINETTE BAY OF KITIMAT ARM OF DOUGLAS CHANNEL	35.90

TABLE 11.1.1 HAISLA NATION RESERVES

Number	Name	Location	Size (ha)
07635	Kemano 17	COAST DISTRICT RANGE, 4M AT ENTRANCE TO KEMANO BAY, AT HEAD OF BARRIE REACH OF GARDNER CANAL	10.30
07628	Kildala River (Thala) 10	COAST DIST., RGE 4, LOT 2582 RIGHT BANK OF THE KILDALA RVE ABOUT 1 MLE FROM MOUTH ON KILDALA ARM OF DOUGLAS CHANNEL	1.40
07619	Kitamaat 1	COAST DISTRICT RANGE 5, ON LEFT BANK OF KITIMAT RIVER 1/2 MILE NORTH OF MOUTH ON KITIMAT ARM OF DOUGLAS CHANNEL	101
07620	Kitamaat 2	COAST DISTRICT RANGE 4, ON EAST SHORE OF KITIKAT ARM OF DOUGLAS CHANNEL, ABOUT 3 MILES BELOW NORTH END	188
07625	Kitasa 7	COAST DISTRICT RANGE 4, LOT 2581 ON WEST SHORE OF EMSLEY COVE ON WEST SIDE OF KITIMAT ARM, DOUGLAS CHANNEL	4.10
07634	Kitlope 16	COAST DISTRICT RANGE 4, ON NORTH SHORE OF KITLOPE ANCHORAGE GARDNER CANAL	45.90
07626	Kuaste (Mud Bay) (Kildala Arm) 8	COAST DIST. RGE 4 LOT 2579, ON NORTH SHORE OF KILDALA ARM 3 MILES SOUTH OF CLIO BAY, KITIMAT ARM OF DOUGLAS CHANNEL	3
07632	Misgatlee 14	COAST DISTRICT RANGE 4, LOT 2576, AT THE HEAD OF FOCH LAGOON NORTH OF PAISLEY POINT, DOUGLAS CHANNEL	4.70
07622	Tahla (Kildala) 4	COAST DISTRICT, RANGE 4, AT MOUTH OF KILDALA RIVER, KILDALA ARM OF DOUGLAS CHANNEL	5.10
07630	Tosehka (Eagle Bay) 12	COAST DISTRICT, RANGE 4, LOT 2580, ON SHORE OF EAGLE BAY OF DOUGLAS INLET, OPPOSITE COSTE ISLAND	2.50
07621	Walth 3	COAST DISTRICT, RANGE 4, ON EAST SHORE OF KITIMAT ARM OF DOUGLAS CHANNEL, ABOUT 4 MILES FROM NORTH END	16.80
07633	Wekellals 15	COAST DISTRICT, RGE 4, AT MOUTH OF THE KITLOPE RIVER ON EGERIA REACH, HEAD OF THE GARDNER CANAL	69.80

11.2 Existing Conditions

This section describes historic and current use in the vicinity of identified project activities (e.g., RAAs and LAAs) by Haisla Nation over time including consideration of cumulative effects. A description of Haisla Nation practices in the vicinity of the Project (including reference to specific sites, values, and species of interests, where applicable) and the relative importance of the area that will be affected by the Project, including any special characteristics or unique features, to Haisla Nation interests, is provided below.

Portions of Haisla traditional territory are encompassed within the project assessment areas for 12 valued components (see Figure 11.9.2 to Figure 11.9.13). These include:

- Air quality (marine terminal) and (shipping) LAAs and RAAs (Section 7.2)
- Acoustic (marine terminal) and (shipping) LAAs and RAAs (Section 7.3)
- Vegetation resources LAA and RAA (Section 7.4)
- Wildlife (marine terminal) and (shipping) LAAs and RAAs (Section 7.5)
- Freshwater fish LAA and RAA (Section 7.6)
- Marine resources (marine terminal) and (shipping) LAAs and RAAs (Section 7.7)
- Employment and economy LAA and RAA (see Section 7.8)
- Land and resource use LAA and RAA (Section 7.9)
- Marine use LAA and RAA (Section 7.10)
- Infrastructure and services LAA and RAA (Section 7.11)
- Human health (marine terminal) and (shipping) LAA and RAA (Section 7.12)
- Heritage LAA and RAA (Section 7.13)

11.2.1 Historic and Current Use

Haisla Nation have occupied their traditional territory for over 9,000 years (Haisla Nation 2021a). The lands encompassed within their territory are part of the Coastal Western Hemlock (CWH) Biogeoclimatic Zone. The CWH zone flora is dominated by western hemlock, sparse herb layers, and several moss species (Pojar et al. 1991:98). The CWH Zone climate is characterized by cool summers and wet winters (Pojar et al. 1991:98).

Haisla Nation harvest a variety of culturally important fish species from the marine waters of their traditional territory. Examples include herring, oolichan, salmon, steelhead, cod, halibut, cuttlefish, bullhead, flounder, skate, and rockfish. Although all these species are important to Haisla Nation, some play more significant roles than others in Haisla diet and cultural practices. For example, oolichan, a small anadromous fish, are a cultural keystone species of Haisla Nation (Garibaldi and Turner 2004; Gauvreau 2021; Green 2008; Hagan 2010; Senkowsky 2007). Oolichan are a cultural keystone species as they shape, in a major way, the cultural identity of Haisla people, as reflected in the fundamental roles that the fish and rendered grease play in Haisla Nation diet, economy, materials, medicine, and spiritual and cultural practices (Gauvreau 2021). Oolichan feature prominently in the Haisla Nation origin story, and oolichan fishing is considered “one of the most important aspects of Haisla life, along with trapping, hunting, and seafood fishing” (Green 2008:15).

A recent traditional ecological knowledge study of oolichan was conducted for LNG Canada's *Fisheries Act* Authorization in collaboration with Haisla Nation. The traditional ecological knowledge study (Gauvreau 2021) revealed the social, ecological, and cultural aspects of Haisla Nations deep-time relationships with oolichan and oolichan-bearing river systems, and how these relationships have changed over time. Haisla Nation have well-established oolichan harvesting and processing methods which they have been developing and refining over millennia. Oolichan was identified as being integral to the well-being of all six interview participants, as well as their immediate and extended families; the tiny fatty fish plays an important role in Haisla Nation trade economy, diet, and health (Gauvreau 2021). The Haisla oolichan traditional ecological knowledge study (Gauvreau 2021) has demonstrated how oolichan are a cultural keystone species for Haisla Nation and how declines in oolichan biomass threaten the role and transmission of Haisla Nation knowledge and management of oolichan in their traditional territory. The concept of cultural keystone species was first coined by Garibaldi and Turner (2004), and subsequent work supports the designation of oolichan as a cultural keystone species for several other Indigenous Nations living on the coast of British Columbia (e.g., Senkowsky 2007; Hagan 2010).

Marine mammals of value to Haisla Nation include seals and sea lions, sea otters, porpoises, and whales. Sea lions and porpoises were not usually hunted however seals were commonly harvested and are still occasionally harvested during other fishing activities (Powell 2013). Sea-otters were not hunted out of respect, and blackfish (orca) were not hunted because they are a crest animal (Powell 2013:21). In fact, no whale species were or are hunted by Haisla people (Powell 2013). The resource-rich intertidal zones of Haisla territory provide shellfish and other invertebrates, seaweed, and kelp that are of significant importance to Haisla Nation (Powell 2013:21).

The terrestrial environment of Haisla territory provides Nation members with various food and medicinal plants, as well as material for weaving and construction (e.g., bark and timber). Powell (2013) and Moerman (1998) list many species that are used for food and medicinal purposes, and species harvested for building materials. Examples include western red and yellow cedar, spruce, pine, red alder, and grasses; devil's club, hellebore, juniper, Labrador tea, and seaweeds are among the list of recorded medicinal plants (Powell 2013). Plant resources used for food are numerous and include a variety of berries, roots, crab apples, seaweeds, and kelp (Powell 2013).

Large mammals, including black bear, moose, deer, mountain goat, wolf, wolverine, and grizzly bear occupy the terrestrial environments of Haisla territory, and have significant subsistence and spiritual values for Haisla Nation (Powell 2013). Smaller mammals, such as beaver, porcupine, marmot, marten, fisher, otter, mink, weasel, and muskrat are also hunted and trapped, while migratory waterfowl are hunted along the flats and mouths of rivers. Seagull eggs are collected from rocky nesting sites, and other bird species are hunted for feathers and materials for tool and jewelry production (e.g., bird bones) (Powell 2013:21-22).

11.2.2 Cumulative Effects / Regional Context

Haisla Nation interact with their history (e.g., heritage sites, spiritual sites, oral history, laws), grow their Nation, exercise self-determination, govern, and enrich the future of their members through ongoing connection, use, and access to the waters and lands of their traditional territory. Changes in Haisla Nation territory brought about after contact with European settlers resulted in changes to Haisla land use and lifestyle, beginning with the fur trade in the 19th century. Between 1890 and 1950, the increase in farming and cannery operation affected the lifeways of Haisla Nation members (Hamori-Torok 1996; Powell 2013:26), and industrial developments around the town of Kitimat resulted in the restriction of use of

areas along Kitimat Arm (Powell 2011). Prior to the early-1970s, the Kitimat River was a primary source of oolichan for Haisla Nation, yielding 27,000 to 81,000 kg per year from 1969 to 1971 (Gordon et al. n.d.). By 1972, Haisla reported that the oolichan harvested from the Kitimat River was “foul-tasting and inedible”, and this was attributed to pollution from industrial and municipal effluent discharges (Tirrul-Jones 1985).

Regional industrial developments such as commercial fishing, logging, and large industrial facilities are perceived by some Haisla members to be a major factor influencing the decline in oolichan abundance in their territory (Gauvreau 2021). Daily operation and maintenance of specific facilities have been observed to impact oolichan spawning substrate and water quality over time (e.g., pollution, destruction of habitat); employee travel to and from facilities has also been observed to impact oolichan harvesting sites (e.g., wave action, erosion, noise) (Gauvreau 2021). Participants reported that industrial developments have influenced the lack of consistent annual return to the spawning areas in their territory (Gauvreau 2021). Some Haisla members have reported that Haisla Nation’s ability to harvest oolichan has been negatively impacted by industrial expansion within their territory (Gauvreau 2021). Oolichan conservation and recovery planning is ongoing in Haisla Nation territory; Haisla Nation working with industry and scientists to develop enhancement studies to actualize oolichan recovery in formerly active harvesting sites (Gauvreau 2021).

11.3 Haisla Nation Summary of Engagement

The Project is a key element of the Haisla Nation’s economic and social development strategy and will further advance reconciliation by allowing the Haisla Nation to—for the first time ever—directly own and participate in a major industrial development in its territory (see Section 1.2 Proponent Description). The Project is also anticipated to be the first Indigenous-majority owned export facility in Canada, which will create jobs, contracting and other economic opportunities for the Haisla Nation, the local community, neighbouring Indigenous Nations and northwest British Columbia. In addition, income generated by the Project will be invested in the Haisla community.

The Haisla people have lived off the land and water resources of their traditional territory and Douglas Channel for thousands of years and strive to achieve self-sufficiency through economic development. The Haisla Nation business philosophy is to advance commercially successful initiatives and promote environmentally responsible and sustainable development while minimizing the impacts on land and water. Liquefied natural gas development has been identified as one such opportunity. In keeping with Haisla Nation’s values, Cedar has planned the Project to minimize impacts to the local community and environment by using an innovative design philosophy that fits the facility into the local environment. Based on Haisla Nation guidance, Cedar selected electricity to power the FLNG facility and air cooling of the natural gas liquefaction process (Section 1.9).

In addition to Haisla Nation’s ownership role on the Project, Cedar is engaging with the Haisla Nation to ensure project-related effects are assessed and evaluated in a manner similar to other projects within Haisla Nation territory. As part of project review, Cedar working groups were established with Haisla Nation Technical (Lands and Resources), Employment and Training, Cultural, and Health and Social Services Departments.

Cedar's approach to engagement includes the following activities:

- Provide preliminary drafts of environmental assessment documents and technical data reports for review in advance of submission to the EAO
- Meet with Haisla Nation representatives regularly to provide updates regarding the Project and the environmental assessment process
- Provide updates regarding project design

Haisla Nation do not have a Communication and Cooperation Agreement with Cedar, as Haisla Nation are co-owners of the Project. Cedar undertook to collect project-related feedback and information from Haisla Nation for incorporation into the assessment. Mechanisms to collect this information include engagement with Haisla Nation and opportunities to validate the list of information sources, as well as to validate data compiled through secondary, publicly available sources, and drafts of this section of the Application. Cedar working groups were established with Haisla Nation Employment and Training, Technical (Lands and Resources), Cultural and Health and Social Services Departments.

Haisla Nation has not explicitly provided its views on Cedar's consultation approach and resolution of issues raised; however, the engagement activities undertaken to date directly respond to the manner in which Haisla Nation sought to participate in the Project. Prior to submission, Cedar provided a complete draft of the Application to Haisla Nation as well as held a workshop to discuss the Application. As a result of the workshop, Haisla Nation supported submission of the Application. Cedar will remain available through Application Review should concerns arise or requests for alternate engagement approaches be requested by Haisla Nation.

Additional information regarding engagement between Cedar and Haisla Nation is provided in the Indigenous Consultation Report.

11.3.1 Key Areas of Concern

Early in project development, Haisla Nation and the Haisla Nation Technical Committee set several environmental criteria for Cedar for engineering design and regulatory planning, specifically:

- Use of air cooling is preferred over water cooling for liquefaction
- Use of electricity is preferred over self-generation
- Project design should seek to avoid effects to terrestrial and marine habitats whenever practicable
- Use of existing studies should be leveraged to the extent possible

Based on discussions with Haisla Nation to-date and review of the project activities, Cedar understands that key areas of concern for Haisla Nation are as follows:

- Potential effects on the biophysical environment as assessed in Section 7.2 to Section 7.13, with a particular focus on air quality, noise, and marine resources
- Potential effects on social and economic conditions as assessed in Section 7.2 to Section 7.13, with a particular focus on employment, land and resource use, and marine use

Key areas of concern to Haisla Nation have informed this assessment. Concerns made available to Cedar were also reviewed and incorporated into the selection of valued components and effects pathways, spatial and temporal boundaries, the collection of baseline information for each valued component, and the refinement of mitigation and management planning, as described in the Section 11.X.2 (The Influence of Consultation and Engagement), specific to each valued component.

11.4 Information Sources

Cedar recognizes that Haisla Nation is best positioned to identify the sources of information, including Indigenous Knowledge[1], appropriate for this assessment. The sources of information and Indigenous Knowledge used in preparing the overview, context, existing conditions and assessment of effects on Haisla Nation interests were identified through engagement with Haisla Nation. This included meeting with representatives of Haisla Nation to determine preferred approach, use of appropriate publicly available documents, and review of draft confidential documents provided by Haisla Nation. Cedar will remain available through Application review should Haisla Nation bring forward additional information related to this assessment.

11.5 Assessing Effects on Haisla Nation Interests

The following sections describe the scope, methods and results of the assessment of effects on Haisla Nation's interests.

11.5.1 Scope of the Assessment

This section of the Application:

- Identifies and assesses the potential effects of the Project on Haisla Nation's interests
- Describes how Haisla Nation's interests were identified, through engagement with the Indigenous Nation or otherwise
- Summarizes the valued components used in the assessment of effects on the Indigenous interest and whether they were carried forward from Section 5.1 (Valued Components Selected for the Assessment) or developed specifically for the assessment of Haisla Nation's interest
- Describes linkages with other Haisla Nation interests[2]

[1] Cedar understands Indigenous Knowledge to include Nation-specific direct observations about the biophysical world, as well as ecological indicators, oral histories, community practices, language, teachings, laws, relationships, rituals, cultural identity, spirituality, cultural values and other ways of knowing that have been identified by the Nation (EAO 2020). Indigenous Knowledge used in this Application is derived from secondary sources and publicly available information identified through engagement with Haisla Nation and the treatment of Indigenous Knowledge within this section of the Application is presented with any changes requested by Haisla Nation following iterative opportunities for review and comment.

[2] Cedar understands that Indigenous interests are intricately linked and are also connected to the Nation's rights, culture, history, protocols, health and wellbeing, as identified through commonalities in potential effect pathways. However, the Indigenous interests have been disaggregated according to the preference of each Indigenous Nation to facilitate assessment.

Indigenous interests have the meaning of "Aboriginal interests" as defined in the section 11 Order which are understood to include "asserted or determined Indigenous rights, including title and treaty rights". Indigenous interests are also understood to include Aboriginal or treaty rights recognized and affirmed by section 35 *of the Constitution Act, 1982* as well as any other interests identified by the Nation.

11.5.1.1 Statutory Requirements Under the Federal *Impact Assessment Act*

The scope of this assessment is also designed to address statutory requirements under the federal *Impact Assessment Act*. For clarity, Table 11.5.1 describes how the equivalent requirements of British Columbia *Environmental Assessment Act* addressed within the Application are also intended to address the specific requirements of the *Impact Assessment Act* for the assessment of project-related effects on Haisla Nation's interests. A complete listing and analysis of the Application's concordance to federal requirements can be found in Section 20.0 (Summary of Statutory Requirements under the Federal *Impact Assessment Act*). Cedar's summary of engagement on the federal statutory requirements is found in the Indigenous Consultation Report.

TABLE 11.5.1 APPLICATION CONCORDANCE TO IAA REQUIREMENTS FOR HAISLA NATION

IAA Requirement	Consideration within Application
Factors defined in section 22(1) of the IAA	
(c) the impact that the designated project may have on any Indigenous group and any adverse impact that the designated project may have on the rights of the Indigenous peoples of Canada recognized and affirmed by section 35 of the *Constitution Act, 1982*.	Section 11.1: Overview and Context, Section 11.2.1: Historic and Current Use and Section 11.3.1: Key Areas of Concern describe Cedar's understanding of Haisla Nation's interests relative to the Project, which include Haisla Nation's rights as recognized and affirmed by section 35 of the *Constitution Act, 1982.* The impact of the Project on Haisla Nation and any adverse impacts that the Project may have on Haisla Nation's rights as recognized and affirmed by section 35 of the *Constitution Act, 1982* are assessed in Section 11.5: Assessing Effects on Haisla Nation interests.
(g) Indigenous knowledge provided with respect to the designated project.	Cedar has engaged with Haisla Nation to obtain Indigenous knowledge to support the effects assessments. This is described in the existing conditions sections (i.e., Section 11.X.2) of each valued component section. Sections of this Application where greater levels of Indigenous knowledge have been provided include Section 7.4 (Vegetation Resources), Section 7.5 (Wildlife); Section 7.7 (Marine Use); and Section 7.9 (Land and Resource Use). The development this Application was influenced by Cedar's consultation with members of Indigenous Nations. Within each associated valued component section, a summary of the topics and key information and concerns that Cedar identified as part of its consultation and engagement efforts is provided. It also summarizes the influence that the outcomes of this consultation and engagement has had on the assessment. As noted in Section 11.4, Cedar recognizes that Haisla Nation is best positioned to identify the sources of information appropriate for this assessment, which may include Indigenous knowledge. The sources of information used in preparing the overview, context, existing conditions and assessment of effects on Haisla Nation interests were provided to Haisla Nation for review and comment. This included meeting with Haisla Nation to discuss the Nation's preferred approach and use of appropriate publicly available documents, and review of reports prepared by Haisla Nation. Cedar working groups were established with Haisla Nation Employment and Training, Technical (Lands and Resources), Cultural and Health and Social Services Departments. Cedar will remain available through Application review should Haisla Nation bring forward additional information related to this assessment.

TABLE 11.5.1 APPLICATION CONCORDANCE TO IAA REQUIREMENTS FOR HAISLA NATION

IAA Requirement	Consideration within Application
Factors defined in section 22(1) of the IAA	
(l) considerations related to Indigenous cultures raised with respect to the designated project.	Where appropriate and information available, considerations related to Haisla Nation culture with respect to the Project are described in Section 11.1: Overview and Context, Section 11.2: Existing Conditions and Section 11.3.1: Key Areas of Concern. Changes to Haisla Nation's culture are discussed in Section 11.5: Assessing Effects on Haisla Nation interests, as applicable.
(m) the intersection of sex and gender with other identity factors.	Where appropriate and information has been available, GBA + information for Haisla Nation is described in Section 11.1.6: Social and Economic Conditions, GBA+ analyses have been used in Section 7.8 (Employment and Economy), Section 7.11 (Infrastructure and Services), and Section 21 (Summary of Human and Community Well-Being) to assess potential disproportionate effects on diverse subgroups, including those identified by sex, age, and other relevant identity factors. The outcomes of these assessments relative to Haisla Nation are discussed within Section 11.5: Assessing Effects on Haisla Nation interests, as applicable.
(c) with respect to the Indigenous peoples of Canada, an impact—occurring in Canada and resulting from any change to the environment—on: (i) physical and cultural heritage,	Where appropriate and information has been available, physical and cultural heritage information for Haisla Nation is described in Section 11.1.1: Traditional Territory, Section 11.2.1: Historic and Current Use and Section 11.3.1: Key Areas of Concern. Section 7.13: of this Application assessed potential effects to physical heritage resources, including culturally modified trees, archaeological resources, and materials or other physical evidence of human habitation or use before 1846. Section 7.13: Heritage has considered effects on physical and cultural heritage that may result from the Project. The outcomes of this assessment relative to Haisla Nation are discussed within Section 11.5: Assessing Effects on Haisla Nation interests, as applicable.
(ii) the current use of lands and resources for traditional purposes, or	Section 2.3 provides a summary of the land and marine use plans published by Indigenous Nations with traditional territories that overlap the Project Area or the shipping route between Kitimat and Triple Islands, including Haisla Nation, as available. Land and marine use plans specific to Haisla Nation are described in Section 11.1.4: Planning Initiatives and Land Use Plans. Where appropriate and information has been available, current use of lands and resources for traditional purposes by Haisla Nation is described in Section 11.1.1: Traditional Territory, Section 11.2.1: Historic and Current Use and Section 11.3.1: Key Areas of Concern. Changes to Haisla Nation's current use of lands and resources for traditional purposes are discussed within Section 11.5: Assessing Effects on Haisla Nation interests, as applicable.
(iii) any structure, site or thing that is of historical, archaeological, paleontological or architectural significance.	Where appropriate and information has been available, historical, archaeological, paleontological or architectural significance information for Haisla Nation is described in Section 11.1.1: Traditional Territory, Section 11.2.1: Historic and Current Use and Section 11.3.1: Key Areas of Concern. Section 7.13 of this Application assesses potential effects to structures, sites, or other physical resource of archaeological, paleontological or architectural significance. The provincial *Heritage Conservation Act* defines the extent of historical as physical evidence of human habitation or use before 1846. Section 7.13: Heritage has considered effects on historical, archaeological, paleontological or architectural significance. that may result from the Project. The outcomes of this assessment relative to Haisla Nation are discussed within Section 11.5: Assessing Effects on Haisla Nation interests, as applicable

TABLE 11.5.1 APPLICATION CONCORDANCE TO IAA REQUIREMENTS FOR HAISLA NATION

IAA Requirement	Consideration within Application
Factors defined in section 22(1) of the IAA	
(d) any change occurring in Canada to the health, social or economic conditions of the Indigenous peoples of Canada.	Where appropriate and information has been available, the health, social and economic conditions for Haisla Nation are described in Section 11.1.6: Social and Economic Conditions Changes to the health, social or economic conditions of the Indigenous Groups of Canada are assessed in Section 7.8: Employment and Economy, Section 7.10: Marine Use, Section 7.11: Infrastructure and Services and Section 7.12: Human Health. The outcomes of this assessment relative to the Haisla Nation are discussed within Section 11.5: Assessing Effect on Haisla Nation interests, as appliable.

11.5.2 Preliminary List of Potential Effects

Based on the key areas of concern for Haisla Nation, the preliminary list of potential effects on Haisla Nation interests are as follows:

- Aboriginal title and rights
- Changes in consumption and harvest
- Changes in the use and integrity of sacred and culturally important sites and landscape features
- Changes that affect aspects of Haisla Nation governance

No additional potential effects were recommended for this assessment by Haisla Nation following provision of drafts of this section of the Application for review.

11.5.3 Assessment Boundaries

The spatial, temporal, administrative, and technical boundaries for the assessment of effects on Haisla Nation interests are described below.

11.5.3.1 SPATIAL BOUNDARIES

Spatial boundaries consider the geographic extent over which project activities may affect Haisla Nation's interests and are illustrated in Figure 11.9.1 to Figure 11.9.13.

- The **project footprint** will encompass the physical footprint of onsite and offsite components (i.e., the extent of planned clearing and development within the Project Area and transmission line corridor) (see Figure 11.9.1). To be conservative, assessment areas are based on the reasonable maximum extent of the Project Area and transmission line corridor. The transmission line corridor is approximately 300 m wide and the transmission line right-of-way will take up approximately 45 m within this area.
- The **Project Area** is within District Lot 99 and the adjacent water lot (Lot A District Lot 5469). The Project Area encompasses an area of approximately 125 ha.

The project footprint and the Project Area are located within Haisla Nation's traditional territory (Figure 11.9.2 to Figure 11.9.13).

- The **marine shipping** route is the route followed by LNG carriers between the marine terminal and the British Columbia Coast Pilot boarding location near Triple Islands (Figure 1.3.2). Overlapping with Haisla Nation's traditional territory are the following spatial boundaries associated with the marine shipping route (i.e., shipping and marine components) which will be referred to as the **marine shipping LAA** in this assessment[3]:
- The **air quality (shipping) LAA and RAA** and the **human health (shipping) LAA and RAA** are the same and consist of a 1.5 km zone on either side of the marine shipping route from the marine terminal and a pilot boarding location near Triple Islands, and includes the Indigenous communities of Hartley Bay, Kitkatla, and Metlakatla Village, which are located outside of the 1.5 km zone (see Section 7.2: Air Quality and Section 7.12: Human Health).
- The **acoustic (shipping) LAA and RAA** are the same and are defined by a 3 km buffer in all directions from the Project Area and transmission line corridor and encompasses the nearest community Kitamaat Village (Kitamaat 2) (Section 7.3: Acoustic).
- The **wildlife** (**shipping) LAA** is defined by a 1-km buffer around the marine shipping route which encompasses the northern end of Kitimat Arm and extends between the floating terminal and a pilot boarding location at or near the Triple Islands. The wildlife (shipping) LAA is confined to the marine environment by the high-tide line and is 55,695 ha and is assessed for marine birds (see Section 7.5: Wildlife).
- The **wildlife (shipping) RAA** and the **marine resources (shipping) LAA** and **RAA** are the same and are defined by a 10 km buffer around the marine shipping route, where the route is not confined by geography, which encompasses the northern end of Kitimat Art and extends between the marine terminal and a pilot boarding location near Triple Islands. The wildlife (shipping) RAA and the marine resources (shipping) LAA and RAA is confined to the marine environment by the high-tide line and is 312,677 ha and is assessed for marine birds (see Section 7.5 Wildlife and Section 7.7: Marine Resources).
- The **marine use LAA** encompasses water where project marine activities have the greatest potential to adversely affect navigation, fisheries, and other uses. The LAA includes waters surrounding the marine terminal plus confined channels (i.e., Kitimat Arm, Douglas Channel, and Principe Channel) along the shipping route and waters extending 6 km on both sides of the marine shipping route between Browning Entrance and the pilot boarding location near Triple Islands (see Section 7.10: Marine Use).
- The **marine use RAA** includes the marine use LAA plus a 5 km buffer on each side where not confined by geography (see Section 7.10 Marine Use).

[3] In reference to Project effects within LAAs only; RAAs are referred to uniquely for cumulative effects.

Also overlapping with Haisla Nation's traditional territory are the following spatial boundaries associated with land or terminal components, which will be referred to as the marine terminal LAA in this assessment[4]::

- The **air quality (marine terminal) LAA and RAA** and **human health (marine terminal) LAA and RAA** are the same and are made up of a 40 km by 40 km square domain centered on the Project Area, which is used to predict project-related changes in air quality and predicted or modelled changes in the exposure media. The air quality (marine terminal) LAA was established based on the ENV Dispersion Modelling Guideline and is sized to encompass 10% of the air quality objective on a project-alone basis (Section 7.2: Air Quality and Section 7.12: Human Health).
- The **vegetation resources (marine terminal) LAA** is 281.5 ha and includes the areas anticipated to be disturbed within the Project Area and transmission line corridor (termed project footprint as described above) plus a 120 m buffer. This boundary was selected to assess the effects to vegetation resources, except for air emissions effects which are assessed within the air emissions LAA (see definition below). The vegetation resources (marine terminal) LAA boundary is selected because vegetation species and communities are potentially susceptible to direct and indirect effects associated with vegetation clearing and other activities around the project footprint. This boundary encompasses direct and indirect effects (e.g., edge effects) which could extend to 120 m beyond the edge where forest removal occurs. Direct effects within the transmission line corridor are calculated for the approximate 45 m right-of-way based on pre-FEED studies, though the exact location within the transmission line corridor may shift. Indirect effects beyond the transmission line right-of-way are included within the permitting corridor to the edge of the vegetation resources (marine terminal) LAA (Section 7.4: Vegetation Resources).
- The **vegetation resources (marine terminal) RAA** is approximately 1,997 ha and includes the areas to be disturbed within the Project Area and transmission line corridor (termed project footprint) plus a 1 km buffer. This boundary was selected to describe vegetation resources at a regional scale and provide context for project and cumulative effects (Section 7.4: Vegetation Resources).
- The **vegetation resources (air emissions) LAA** is approximately 64,198 ha and is the boundary used in assessing change in native vegetation health and diversity due to air emissions. It is based on the CALPUFF air quality dispersion modelling results encompassing the outermost boundary where modelled empirical critical levels or screening thresholds are exceeded within the air quality modelling domain (Section 7.4: Vegetation Resources).
- The **vegetation resources (air emissions) RAA** spatial boundary for assessing cumulative change in native vegetation health and diversity due to air emissions is the air dispersion modelling domain and is 40 km by 40 km in area, covering approximately 160,027 ha (Section 7.4: Vegetation Resources).

[4] In reference to Project effects within LAAs only; RAAs are referred to uniquely for cumulative effects.

- The **wildlife** (**marine terminal) LAA** is defined by a 1 km buffer around the Project Area and transmission line corridor (including access roads). For Wildlife, project-specific surveys, publicly available data from past environmental assessment projects, historical observations, and a literature review provided information on terrestrial wildlife species and their habitats, as well as marine birds within the wildlife (marine terminal) LAA. The wildlife (marine terminal) LAA encompasses low elevation coastal forests, riparian areas, wetlands, shoreline habitats, and nearshore waters and is 1,997 ha (1,759 ha of which is terrestrial habitat [i.e., non-ocean areas]) (Section 7.5: Wildlife).
- The **wildlife (marine terminal) RAA** is defined by a 15 km buffer around the Project Area and transmission line corridor (including access roads), which will provide landscape-level context for the assessment of cumulative effects on wildlife. The marine terminal RAA is 98,626 ha and extends from sea level to over 1,200 m elevation and includes mountains on the east and west side of upper Kitimat Arm and the lower Kitimat River and estuary. The marine terminal RAA represents the area where existing data were reviewed and compiled and provides a regional perspective of wildlife resources (Section 7.5: Wildlife).
- The **freshwater fish (marine terminal) LAA** includes the project footprint plus up to 100 m upstream and 300 m downstream from potentially affected stream and riparian habitat. The freshwater fish LAA extends up to 1 km downstream of potentially affected habitat in Moore Creek and Anderson Creek. The freshwater fish LAA includes crossings of approximately 12 unnamed tributaries to Beaver, Moore, and Anderson creeks as well as 10 unnamed tributaries that flow directly into Douglas Channel (Section 7.6: Freshwater Fish).
- The **freshwater fish (marine terminal) RAA** includes the entirety of the watersheds intersected by the project footprint: Beaver, Anderson, Moore creeks and unnamed tributaries to Douglas Channel. These streams and their tributaries flow into the Kitimat River estuary and Kitimat Arm of Douglas Channel (Section 7.6: Freshwater Fish).
- The **freshwater fish (acidification and eutrophication) LAA** is the area with a predicted sulphur plus nitrogen (S+N) deposition level of 100 S+N eq ha^{-1} yr^{-1} as predicted by air quality modelling for the Project “project alone” scenario as per provincial guidance (Section 7.6: Freshwater Fish).
- The **freshwater fish (acidification and eutrophication) RAA** is the area with a predicted sulphur plus nitrogen deposition level of 100 S+N eq ha^{-1} yr^{-1} from air quality modelling the predicted potential cumulative air deposition from the Cedar LNG Project, Rio Tinto Aluminum Smelter, LNG Canada Export Terminal Project and Kitimat LNG Project within a 40 by 40 km air quality modelling domain centered over the Project Area (Section 7.6: Freshwater Fish).
- The **marine resources (marine terminal) LAA** includes the marine portion (i.e., intertidal, subtidal, and pelagic) of the Project Area, plus a minimum 4 km buffer beyond the boundary of this portion of the Project Area. The marine terminal LAA encompasses the area where the marine terminal and FLNG facility construction, operation, or decommissioning may directly interact with marine resources. The 4 km buffer around the marine terminal was selected based on the results of previous underwater noise modelling studies conducted for other recent environmental assessments of British Columbia north and central coast LNG projects (Section 7.7: Marine Resources).

- The **marine resources (marine terminal) RAA** is a broader marine area (i.e., intertidal, subtidal, and pelagic) of Kitimat Arm extending southward to Emsley Cove, the northern tip of Coste Island and Gobeil Islet to provide regional ecological context. The marine terminal RAA is the area where potential project effects to marine resources during marine terminal construction, operation or decommissioning could interact with existing or reasonably foreseeable projects and activities regionally (Section 7.7: Freshwater Fish).
- The **heritage[5] LAA and RAA** are the same and are defined by the area where clearing and/or ground disturbance (including terrestrial, intertidal and subtidal areas) may occur for the Project, (i.e., the Project Area, including the marine portion of the facility) and transmission line corridor (Section 7.13: Heritage).

Also overlapping with Haisla Nation's traditional territory are the following spatial boundaries associated with socio-economic valued components**:**

- The **employment and economy LAA** encompasses communities with the greatest potential to experience effects related to project requirements for labour, goods, and services. The LAA is comprised of the following Statistics Canada Census Subdivisions and Census Agglomerations: Kitamaat Village (Kitamaat 2), Kitimat District Municipality, Terrace Census Agglomerations (this includes the City of Terrace, Kitimat-Stikine E Regional District Electoral Area and Kulspai 6), Kitselas 1, Kshish 4, Kitsumkaylum 1 (Section 7.8: Employment and Economy).
- The **employment and economy RAA** includes the employment and economy LAA as well as North Coast Regional District Electoral Areas A[6] and C[7], and Kitimat-Stikine Electoral Areas C and E (see Section 7.8: Employment and Economy).
- The **infrastructure and services LAA and RAA** are the same as the employment and economy LAA and RAA (Section 7.11: Infrastructure and Services).

[5] As described in Section 7.13: Heritage, marine shipping is not anticipated to result in effects on the heritage valued component within the Marine Shipping LAA. Results from publicly available wake effects studies indicate that wake generated by large liquid bulk carriers will be less severe than waves created naturally by weather. Coastal archaeological and heritage sites potentially exposed to wake waves from LNG carriers and their escort tugs are currently exposed to natural wave action, including storm waves. Project-related shipping traffic will not introduce any new, previously unassessed, wave effects. As a result, wake from LNG carriers and tugs are not anticipated to affect Haisla Nation shoreline heritage sites (Section 7.13). However, where information is available and appropriate, changes to Haisla Nation use and integrity of sacred and culturally important sites and landscape features, including those that are not subject to protection under the *Heritage Conservation Act),* are considered within this assessment in Section 11.5.6.2.

[6] Includes the City of Prince Rupert, District Municipality of Port Edward, Skeena-Queen Charlotte A RDA, Lax Kw'alaams 1, and S1/2 Tsimpsean 2.

[7] Includes Skeena-Queen Charlotte C RDA, Dolphin Island 1, and Kulkayu (Hartley Bay) 4.

- The **land and resource use LAA** encompasses the area where changes in access and use of lands and resources could result from the development of the Project (i.e., the Project Area and transmission line corridor) and combines the physical extent of the combined LAAs used to assess the effects on the acoustic, freshwater fish, vegetation resources, and wildlife (marine terminal) valued components where terrestrial project-related activities could conflict with land and resource use (i.e., 8,379 ha) (Section 7.9: Land and Resource Use).
- The **land and resource use RAA** is defined as defined as the Kalum Land and Resource Management Plan (LRMP) area (i.e., 2,168,307 ha). In British Columbia, strategic land use planning is completed at the LRMP area level as LRMPs guide land uses within geographically defined areas of the province (Section 7.9: Land and Resource Use).

All project assessment areas overlap with Haisla Nation traditional territory therefore all valued components are considered in the assessment of effects on Haisla Nation interests.

11.5.3.2 TEMPORAL BOUNDARIES

Temporal boundaries identify when an environmental effect is evaluated in relation to specific project phases and activities. Temporal boundaries are based on the timing and duration of project activities and the nature of the interactions with Haisla Nation's interests, where relevant. Temporal boundaries also consider seasonal sensitivities, as applicable, (e.g., seasonal round) associated with project activities within each project phase.

The temporal boundaries for the assessment of effects on Haisla Nation interests are the same as those described in Section 6.4.2:

- **Construction:** up to approximately four years long, commencing following receipt of necessary regulatory approvals and a final investment decision by Cedar.
- **Operation:** pursuant to Licence GL-327 issued by the National Energy Board (now the Canada Energy Regulator), the Project will operate for 25 years following completion of construction. Cedar may apply to extend GL-327 to a 40-year term. A 40-year lifespan will be used for the purposes of this Application.
- **Decommissioning:** approximately 12 months following the end of operation.

Where relevant, temporal boundaries that are less than the boundaries defined above are described within the assessment for specific valued components that relate to Haisla Nation's interests.

11.5.3.3 ADMINISTRATIVE AND TECHNICAL BOUNDARIES

Administrative boundaries describe the limitations imposed on the project assessment by political, economic, or social constraints. The administrative and technical boundaries for the assessment of effects on Haisla Nation interests are specific to each of the identified project assessment areas that overlap with Haisla Nation traditional territory. As applicable, these boundaries are described in:

- Section 7.3: Acoustic
- Section 7.4: Vegetation Resources
- Section 7.5: Wildlife
- Section 7.6: Freshwater Fish

- Section 7.7: Marine Resources
- Section 7.8: Employment and Economy
- Section 7.9: Land and Resource Use
- Section 7.10: Marine Use
- Section 7.11: Infrastructure and Services
- Section 7.13: Heritage

The implications of these administrative and technical boundaries relative to Haisla Nation's interests are discussed within the assessment, as applicable.

Section 11.5.3.1 defines the way in which project components and potential effects overlap with Haisla Nation's traditional territory; Haisla Nation's administration, governance and guardianship of its territory are described in Sections 11.1 and 11.2 and inform this assessment. Haisla Nation signed the North Coast Strategic Land Use Planning Agreement in 2006, which sets out land use zones, designations and allowable uses, and management objectives for the designated LRMP; the LRMP boundary overlaps with portions of the marine shipping route and includes protections for portions of adjacent islands and mainland areas at the entrance to Douglas Channel (Haisla Nation and the Province of British Columbia 2006). Haisla Nation finalized their draft Haisla LUP in February 2021; the community vision for the Haisla LUP is "to build a powerful, prosperous and proud community, health in mind, body, and spirit" (Haisla Nation 2021b). The Haisla LUP provides background information on the Framework Agreement on First Nation Land Management, the Haisla Land Code, and existing Land Policies that are relevant to the management of Haisla reserve lands (Haisla Nation 2021b). The purpose of the Haisla LUP is to provide high level policies related to the location and use of lands governed by the Haisla Land Code; the Haisla LUP provides direction about how Haisla reserve lands and resources contained therein will be conserved, developed and used by Haisla Nation (Haisla Nation 2021b).

In 2006, Haisla Nation also began their Marine Use Planning initiative, which culminated in the production of the Haisla Community MUP in 2014. The MUP guides marine resource management in Haisla territory and supports a shift towards Ecosystem Based Management of marine resources (Haisla Nation 2014a). Haisla Nation is currently developing an updated community-based marine use plan for their traditional territory that will continue to support sustainable economic development initiatives (Haisla Nation 2021). Haisla Nation are also members of the Marine Plan Partnership (MaPP) for the North Pacific Coast (MaPP 2020). The study area for the MaPP for the North Pacific Coast encompasses the project footprint and marine shipping LAA (see Section 7.10: Marine Use); the boundaries of the MaPP study area are "based on a mix of ecological considerations and administrative boundaries" (MaPP 2021) As described in Section 7.10, escort and berthing tugs, which will assist LNG carriers navigate the marine shipping route and to berth and de-berth, will be utilized as determined by the Pacific Pilotage Authority, BC Coast Pilots, and in accordance with the draft North Coast Waterway Management Guidelines (NCWMG 2021). The Project is aligned with the strategic marine planning objectives outlined in the MaPP Initiative (2021), and the draft North Coast Waterway Management Guidelines (NCWMG 2021).

11.5.4 Effects Assessment

The assessment of potential effects on Haisla Nation's interests considers changes to the Nation's interests as a result of project effects mechanisms.

This assessment uses a conservative approach that recognizes that an absence of information regarding Haisla Nation's interests does not necessarily represent an absence of the exercise or practice of an Indigenous right. As such, this assessment assumes that Haisla Nation interests have the potential to occur on accessible lands and waters within project assessment areas that overlap with the Nation's traditional territory. This assessment reflects the best available information regarding Haisla Nation's interests in relation to the Project and efforts to validate assessment assumptions are described in Section 11.3.

11.5.4.1 SELECTION OF POTENTIAL EFFECTS AND INDICATORS/MEASURABLE PARAMETERS

The potential effects on Haisla Nation's interests listed in Table 11.5.2 were identified through ongoing consultation with Haisla Nation. For each effect in Table 11.5.2, effect pathways and indicators/ measurable parameters have been identified to facilitate the quantitative and/or qualitative measurement of change in project-specific and cumulative effects potentially caused by the Project.

Effects may occur through multiple pathways including but not limited to the following:

- Biophysical (e.g., effects to marine resources)
- Related to the ability to use and access Crown lands and waters
- Cultural/experiential (e.g., presence of industrial activity disrupts peaceful enjoyment)

Where possible, the assessment of potential effects on Haisla Nation's interests considered measurable parameters that are quantifiable (e.g., area of direct marine habitat loss). However, not all effects pathways can be quantified (e.g., cultural/experiential). Therefore, some effects are predicted qualitatively through use of feedback shared by Haisla Nation, the results of other the assessments for relevant valued components, and professional judgment. Finally, this assessment was shared in draft form with Haisla Nation for review and comment. Feedback shared by Haisla Nation on the draft assessment was incorporated, where noted.

TABLE 11.5.2 POTENTIAL EFFECTS, EFFECTS PATHWAYS AND INDICATORS/MEASURABLE PARAMETERS FOR HAISLA NATION INTERESTS

Potential Effect	Effect Pathway	Indicator(s) and/or Measurable Parameter(s) and Units of Measurement
Changes in consumption and harvest	• Loss or alteration of preferred harvesting methods, locations or opportunities • Loss or alteration of time and resources for members to care for elders • Loss or alteration of access to preferred harvesting locations • Loss or alteration of harvested species • Alteration to the harvesting experience • Alteration of subsistence-based livelihoods • Alteration or loss of relationships with neighboring Indigenous Nations	• Quantitative consideration of change in availability of habitat for harvested resources with qualitative consideration for indirect effects on habitat (e.g., changes in underwater noise and sensory disturbances, changes in light conditions, increased risk of species mortality or injury) • Quantitative consideration of change in water quality and quantity parameters (i.e., salinity, total suspended solids [mg/L], nutrients [nitrogen], hydrocarbon [from stormwater]) • Qualitative consideration of factors contributing to lost or altered access, opportunities, and quality of experience (e.g., sensory disturbance associated with marine vessel traffic, increased vessel traffic and type, changes in aesthetic qualities) • Other changes identified by Haisla Nation
Changes in the use and integrity of sacred and culturally important sites and landscape features	• Loss or alteration of use or access to sacred and cultural sites • Loss or alteration of ability to share traditional knowledge at sacred and cultural sites • Reduced quality of experience as a result of sensory disturbance	• Qualitative consideration of factors contributing to lost or altered access and opportunities (e.g., associated with marine vessel traffic, increased vessel traffic and type, changes in aesthetic qualities) • Quantitative consideration of affected heritage and cultural sites • Other changes identified by Haisla Nation
Changes that affect aspects of Haisla Nation governance	• Changes in human health (e.g., mental and physical) due to outside stressors and loss of culture • Changes to quality of country foods • Changes in the ability to make decisions regarding land and marine use • Changes in infrastructure, services, accommodation, and transportation • Changes in regional employment, business, and economy	• Qualitative consideration of factors contributing to changes in human exposure to chemicals of potential concern, noise level and electric and magnetic fields, and subsequent health effects • Qualitative consideration of available opportunities for Haisla Nation involvement in development decision making • Qualitative consideration of Nation members ability to access suitable accommodations, heath care and social services, emergency services, travel (land, sea, air), employment opportunities, training for youth and existing workforce • Other changes identified by Haisla Nation
Changes to Aboriginal title and rights	• Combined effect pathways, measurable parameters and indicators listed for each of the potential effects above.	• Combined measurable parameters and indicators listed for each of the potential effects above.

11.5.4.2 PROJECT INTERACTIONS

Table 11.5.3 identifies which project components and physical activities have the potential to result in effects on Haisla Nation's interests. Interactions that have been identified (ranked as 1 or 2) are carried forward and assessed within this section. Where a ranked interaction has been identified, Table 11.5.3 identifies the potential effects on Haisla Nation's interests. Each of the effects identified are discussed in detail, in the context of effects pathways, mitigation/enhancement, and residual effects. Interactions with Haisla Nation's interests were compiled through ongoing consultation with the Nation and through a review of potential interactions between the Project's components and physical activities with applicable environmental or socio-economic conditions, as identified in Table 6.6.1, Section 6.6. The highest-ranking interaction was selected in cases where multiple valued components or potential effects inform the Nation-specific assessment (e.g., change in marine habitat and changes due to sensory disturbance which both inform Haisla Nation's consumption and harvest practices). Ranking of interactions was further informed by input received from Haisla Nation, which included consideration for legal (e.g., rights under section 35 of the *Constitution Act*, *1982*) and socio-cultural contexts of applicable valued components.

The non-interactions (i.e., the 0) identified in Table 11.5.3 vary by effect and indicate a lack of cause-effect mechanism between the Project and Haisla Nation's interests. For example, the procurement of labour, goods and services will not affect the use and integrity of sacred and culturally important sites and landscape features.

Interactions rated as 1 or 2 are evaluated in the assessment of effects.

TABLE 11.5.3 POTENTIAL PROJECT INTERACTIONS WITH HAISLA NATION'S INTERESTS

Project Activities and Physical Works	Potential Project Effects			
	Changes to Haisla Nation consumption and harvest	Changes to Haisla Nation use and integrity of sacred and culturally important sites and landscape features	Changes that affect Haisla Nation governance	Changes to Haisla Nation title and rights
Construction				
Procurement of labour, goods, and services	1	1	1/+	1/+
Site preparation and clearing	2	2	2	2
Construction of land-based infrastructure	1	1	1	1
Construction of marine-based infrastructure	1	1	1	1
Marine transport of construction materials to the site	2	2	2	2
Vehicle traffic	1	1	1	1
Waste management	0	0	1	1

TABLE 11.5.3 POTENTIAL PROJECT INTERACTIONS WITH HAISLA NATION'S INTERESTS

Project Activities and Physical Works	Potential Project Effects			
	Changes to Haisla Nation consumption and harvest	Changes to Haisla Nation use and integrity of sacred and culturally important sites and landscape features	Changes that affect Haisla Nation governance	Changes to Haisla Nation title and rights
Operation				
Procurement of labour, goods, and services	1	1	1/+	1/+
Pre-treatment, liquefaction, storage and offloading of natural gas at the FLNG facility	2	2	1	2
LNG carrier loading	1	1	1	1
Marine shipping and transportation	2	2	2	2
Facility and infrastructure maintenance	1	1	1	1
Vehicle traffic	1	1	1	1
Waste management	1	1	1	1
Decommissioning				
Procurement of labour, goods and services	1	1	1/+	1/+
Decommissioning of land-based infrastructure	1	1	1	1
Decommissioning of marine-based infrastructure	1	1	1	1
Marine transport of decommissioned infrastructure	2	2	2	2
Vehicle traffic	1	1	1	1
Waste management	1	1	1	1

Key:

0 = No interaction

1 = Potential adverse effect requiring additional mitigation; warrants further consideration.

2 = Key interaction resulting in potential adverse effect of particular importance or concern; warrants further detailed consideration

+ = Potential positive effect that can be enhanced; warrants further consideration

NOTE:

Only activities with an interaction of 1, 2 or + for at least one effect are shown

11.5.4.3 ASSESSMENT METHODS

The assessment of potential effects on Haisla Nation's interests presented in Section 11.5.6 considers changes to consumption and harvest, changes in the use and integrity of sacred and culturally important sites and landscape features, and changes to aspects of Haisla Nation governance, and changes to Aboriginal title and rights because of project effects mechanisms.

Analytical Methods

The approach used to assess residual effects from the Project on Haisla Nation's interests includes:

- Identifying project activities (Table 11.5.3) that could result in potential effects on Haisla Nation's interests (Sections 11.1 and 11.2)
- Using measurable indicators defined in Section 11.5.4.1 to identify the project effect pathway for each effect as a result of project activities, the location where these effects are likely to occur, and the residual effects
- Providing a summary of mitigation and enhancement measures to avoid, reduce, or otherwise manage adverse residual effects on Haisla Nation's interests (Section 11.5.5)
- Characterizing residual effects using specific criteria (see Table 11.5.4 and Section 11.5.7)
- Predicting likelihood of residual effects on Indigenous interests (Section 11.5.7)

Residual Effects Characterization

The context for the effects assessment on Haisla Nation's interests is considered in the assessment of potential project and cumulative effects. Sections 11.1 and 11.2 describe the context and existing conditions for Haisla Nation interests in the spatial boundaries used in this assessment. Potential effects or issues identified in Section 11.3 have also been considered, where applicable.

Each residual effect on Haisla Nation's interests is characterized using nine characterization terms: direction, magnitude, extent, duration, frequency, reversibility, affected population, risk and uncertainty, and likelihood (see Section 6.8.1: Characterization of Residual Effects). The definitions for these terms as they relate to this assessment are provided in Table 11.5.4.

TABLE 11.5.4 CHARACTERIZATION OF RESIDUAL EFFECTS

Characterization	Description	Quantitative Measure or Definition of Qualitative Categories
Direction	The long-term trend of the residual effect	**Positive—**a residual effect that moves the measurable parameters related to the effect in a beneficial direction relative to baseline **Adverse—**a residual effect that moves the measurable parameters related to the effect in a detrimental direction relative to baseline **Neutral—**no net change in measurable parameters relative to baseline
Magnitude	The amount of change in measurable parameters or the valued component relative to existing conditions	**No Measurable Change—**no measurable change from existing conditions can be noted **Low—**effect may increase the effort necessary to maintain the interest but will not reduce the ability to maintain the interest, based on existing conditions **Moderate—**effect may reduce but not eliminate the ability to maintain the interest, based on existing conditions **High—**effect will greatly reduce or eliminate the ability to maintain the interest, based on existing conditions
Extent	The geographic area in which a residual effect occurs	**Project footprint—**residual effects are restricted to the project footprint **LAA—**residual effects extend into an LAA(s) **RAA—**residual effects extend into an RAA(s)
Duration	The time required until the measurable parameter or the valued component returns to its existing condition, or the residual effect can no longer be measured or otherwise perceived	**Short-term—**the residual effect is restricted to no more than the duration of the construction phase (4 years) or the duration of the decommissioning phase (12 months) **Medium-term—**the residual effect extends beyond the construction or decommission phases but is less than the timespan of a single generation (25 years)[8] **Long-term—**the residual effect extends beyond the timespan of a single generation (>25 years)
Reversibility	Pertains to whether a measurable parameter or the valued component can return to its existing condition after the project activity ceases	**Reversible—**the residual effect is likely to be reversed after activity completion and reclamation **Irreversible—**the residual effect is unlikely to be reversed

[8] Cedar considers “twenty-five years” as representative of a single generation as established by environmental assessments conducted for comparable projects on the North Coast and based on Cedar’s understanding that Indigenous knowledge and associated customs, traditions, practices or locales can be displaced from collective memory if transmission of knowledge and/or ability to engage in associated cultural activities are disrupted beyond a single generation’s time.

TABLE 11.5.4 CHARACTERIZATION OF RESIDUAL EFFECTS

Characterization	Description	Quantitative Measure or Definition of Qualitative Categories
Frequency	How often the residual effect occurs and how often during the Project or in a specific phase	**Single event—**effect occurs once **Multiple irregular event—**occurs at no set schedule **Multiple regular event—**occurs at regular intervals **Continuous—**occurs continuously
Affected Populations	The distribution of the effect amongst the population of affected people	**Evenly distributed—**the effect will be experienced by any or all subpopulations **Disproportionally distributed—**the effect will be experienced only by certain subpopulations or experienced more acutely by certain subpopulations
Risk and Uncertainty	The level of uncertainty of the residual effect.	**Underestimated—**the effects assessed are predicted to be an underestimate quantitively or qualitatively **Overestimated**—the effects assessed are predicted to be an overestimate quantitively or qualitatively

Likelihood of Residual Effects

The likelihood of a residual effect occurring was also assessed for each potential effect. Likelihood is the probability of an adverse residual effect occurring to Haisla Nation's interests. Likelihood is determined based on an understanding of the potential effect and the likely effectiveness of available mitigation measures to reduce or avoid the residual effect. The categories and definitions for the likelihood of a residual effect on Haisla Nation's interests are:

- **Low**—adverse interactions between the Project and Haisla Nation's interests can largely be avoided or mitigated and adverse residual effects are unlikely to occur
- **Medium**—adverse interactions between the Project and Haisla Nation's interests may be difficult to avoid or mitigate, and adverse residual effects are likely to occur
- **High**—adverse interactions between the Project and Haisla Nation's interests cannot be practically avoided or mitigated and adverse residual effects are highly likely to occur

Context

The characterization of every residual effect inherently considers the effects of past and present projects and activities, and potential trends in the condition of the interest, as applicable. Literature reviewed, and feedback received from Haisla Nation describes historical, ongoing, and future development as modifications to the existing conditions of their interests.

Resilience is notionally understood as the ability of a receptor to recover from or adapt to a change in its environment, real or perceived. The degree of resilience may be measured or characterized for species or ecosystems relied upon by Indigenous peoples for the exercise of their rights, traditional activities, and practices. Such characterization may be relevant and incorporated to this assessment, where noted, given the interdependence of community health, well-being and culture and the health and availability of

the land and water. However, the ability of Indigenous peoples to recover from or adapt to environmental effects of the Project remains contingent on personal, cultural, esthetic, or spiritual values that are subjective and cannot be meaningfully reduced to EAC assessment criteria. When applied to human receptors, resilience in this sense, or as a concept overall, is viewed as uniquely personal as it is informed by an individual's lived experience, individually and/or collectively in social and community groups. It would not be appropriate given the subjective and complex nature of these considerations for anyone but the affected party to characterize resilience. As such, the "resilience" criterion is not carried forward for the assessment of project effects on the collectively held rights and interests of Haisla Nation.

The more commonly understood and accepted criteria defined for this assessment, including: (1) consideration for disproportionate effects on vulnerable populations, (2) Haisla Nation views regarding existing environmental, social or economic barriers, and (3) Haisla Nation preferred conditions required to maintain or enhance their rights and interests, are viewed as sufficient to assist the EAO in determining the overall seriousness of the project effects on Haisla Nation interests.

11.5.5 Mitigation and Enhancement Measures

Mitigation and enhancement measures described throughout this Application are proposed to also reduce adverse residual effects and enhance positive effects on Haisla Nation's interests, as applicable, and are discussed relative to specific potential effects in Section 11.5.6. Additionally, mitigation or enhancement measures, review processes or monitoring initiatives that are specific to Haisla Nation's interests and are applicable to all project phases are provided below in Table 11.5.5. Mitigation measures were selected based on their effectiveness to mitigate potential changes in health, technical and economic feasibility, inclusion as mitigation measures in similar projects proposed for the Pacific North Coast, the views of Haisla Nation regarding mitigation appropriateness, and professional judgment of the effects assessment team.

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TABLE 11.5.5 MITIGATION AND/OR ENHANCEMENT MEASURES, REVIEW PROCESS AND MONITORING INITIATIVES FOR HAISLA NATION

Potential Effect	Mitigation and/or Enhancement Measures, Review Process and Monitoring Initiatives
Changes in consumption and harvest	• Cedar will establish an LNG carrier shipping schedule notification processes for Indigenous Nations with traditional territories and harvesting areas overlapping the shipping route (Section 7.10). Cedar will continue to consult with Haisla Nation, and other communities identified in the section 11 Order, for the development of a marine shipping notification process and associated communication protocols that facilitate the process for both Cedar and Indigenous communities. The marine shipping notification process will contribute to a reduction of adverse effects (e.g., avoidance, displacement, lost time) due to safety concerns (e.g., wake waves), inconvenience (e.g., pulling fishing gear), or reduced enjoyment (e.g., sensory disturbance). This mitigation measure is intended to reduce project marine vessel traffic impacts to Haisla Nation access to and use of their culturally important areas for consumption and harvesting purpose. The effectiveness of this measure is contingent upon Haisla Nation's specific communication protocol needs and implementation of additional public notices. • Cedar has incorporated avoidance measures directly into the project design to align the Project with Haisla Nation's business philosophy of promoting environmentally sustainable development that minimizes impacts to land and water resources. In keeping with this approach, the gas-treatment, LNG production, and LNG storage and related infrastructure will be located on a FLNG facility, thereby limiting interaction with freshwater surface water. Riparian vegetation clearing is anticipated to be minimized where possible; large spans between transmission line structures will reduce the need for riparian clearing along the transmission line route. In addition, Cedar has committed to electrification of the Project to reduce potential acidifying and eutrophying emissions (Section 7.6). • Mitigation and enhancement measures described throughout this Application are proposed to also reduce adverse residual effects and enhance positive effects on Haisla Nation's interests, as applicable, and are discussed relative to specific potential effects in Table 11.5.6.
Changes in the use and integrity of sacred and culturally important sites and landscape features	• Cedar will implement a Worker Code of Conduct and provide cultural awareness training for all workers that includes local and cross-cultural awareness. Implementing a Worker Code of Conduct and the delivery of cultural awareness training will assist in reducing adverse behaviours of workers in local communities and limit demand on local police and emergency services. The rationale for this measure is based on evidence that suggests that cultural awareness training improves worker understanding of local communities and reduces the likelihood of conflict between non-local workers and local community members (Section 7.11). • Cedar has committed to developing avoidance and/or mitigation strategies in collaboration with the Haisla Nation for any known heritage sites affected by the Project (Section 7.13). Indigenous concerns identified during the engagement process are also considered by the Ministry of Forests, Lands, Natural Resource Operations and Rural Development relative to site-specific mitigation, as part of their evaluation of heritage value. Cedar commits to fulfilling all requirements for field assessment and mitigation required by the Project under the *Heritage Conservation Act and Land Act*. With this commitment and with project-specific avoidance or mitigation of known or chance find sites having heritage value, as specified by Ministry of Forests, Lands, Natural Resource Operations and Rural Development and/or Haisla Nation, and with the implementation of the CEMP and chance find procedure. • Where feasible, based on environmental, geophysical and engineering considerations, Cedar will avoid known heritage sites when siting project infrastructure (Section 7.13). This may involve archaeological monitoring during construction in the immediate vicinity of known sites as determined by Ministry of Forests, Lands, Natural Resource Operations and Rural Development and developed in collaboration with the Haisla Nation. • If avoidance of heritage sites is not feasible, Cedar will consult with Haisla Nation on any CMT sites that may be removed by clearing work and any surface/subsurface heritage sites that may be disturbed by construction (Section 7.13). Any additional mitigation determined through consultation with Haisla Nation will be implemented. • Mitigation and enhancement measures described throughout this Application are proposed to also reduce adverse residual effects and enhance positive effects on Haisla Nation's interests, as applicable, and are discussed relative to specific potential effects in Table 11.5.6.
Changes that affect aspects of Haisla Nation governance	• Cedar will implement a Worker Code of Conduct and provide cultural awareness training for all workers that includes local and cross-cultural awareness. Implementing a Worker Code of Conduct and the delivery of cultural awareness training will assist in reducing adverse behaviours of workers in local communities and limit demand on local police and emergency services. The rationale for this measure is based on evidence that suggests that cultural awareness training improves worker understanding of local communities and reduces the likelihood of conflict between non-local workers and local community members (Section 7.11). • Cedar will continue to consult with Haisla Nation regarding economic opportunities related to the Project (Sections 7.8 and 7.11). The rationale for this measure is that continuous engagement regarding economic opportunities with Haisla Nation will help reduce adverse effects on community equality and equity. The effectiveness of the mitigation measure is contingent upon the mitigations proposed in Section 7.8 Employment and Economy and Section 7.11 Infrastructure and Services which are linked to economic opportunities related to the Project and project agreements achieved through Cedar's engagement with Haisla Nation. • Cedar will implement a local hire and procurement policy during construction and operation and promote training opportunities where feasible (Sections 7.8 and 7.11). By hiring local employees and businesses, the Project will limit an increase in demand on local infrastructure and services from non-locally resident workers. The rationale for this measure is to reduce adverse effects on social cohesion through a continuation of existing community equity and equality. The effectiveness of this measure is contingent upon the efficiency of the mitigations developed in Section 7.8 Employment and Economy and Section 7.11 Infrastructure and Services which are linked to the implementation of a local hire and procurement policy and solutions achieved through Cedar's engagement with Haisla Nation. • Cedar will identify potential shortages of workers with specific skill requirements and training, and work with the Haisla Nation employment department, local and regional Indigenous employment centers, local and regional training and education facilities, and communities to increase opportunities for Indigenous and local community members to obtain training required for project participation (Section 7.8). Cedar will enhance local benefits by working with stakeholders to understand and address gaps in skills and training needed to gain employment with the Project. • Cedar will develop a contracting and procurement strategy that recognizes and acknowledges Indigenous Businesses. Cedar's rationale for this measure is that the development of contracting and procurement strategies with Indigenous Businesses is to reduce adverse effects on community services and infrastructure due to a potential project-worker increase in temporary and permanent population. The effectiveness of the contracting and procurement strategy is not known at present as it has not been finalized with the Indigenous Nations, however this mitigation measure has been partially effective for other projects (Section 7.11). • Cedar will notify Haisla Nation of employment and training opportunities related to the Project (Sections 7.8 and 7.11). The rationale for this measure is changes to community equity and equality are dependent on changes in wealth disparity among Haisla Nation. The effectiveness of this measure is contingent upon the efficacy of mitigations developed for Section 7.8 Employment and Economy and Section 7.11 Infrastructure and Services, which are linked to Haisla Nation socio-economic conditions and solutions developed through Cedar's engagement with Haisla Nation. This approach has been partially effective for other projects. • Mitigation and enhancement measures described throughout this Application are proposed to also reduce adverse residual effects and enhance positive effects on Haisla Nation's interests, as applicable, and are discussed relative to specific potential effects in Table 11.5.8
Changes to Aboriginal title and rights	• To verify compliance of the Project with commitments in the Application, and conditions of an EAC, Cedar is committed to the development of a CEMP that will contain the mitigation measures presented in this assessment. This plan will be developed in consultation with Haisla Nation and will be provided to the OGC, EAO, and Impact Assessment Agency of Canada to document compliance with this commitment. • Cedar will implement the measures, review processes and monitoring initiatives listed in this table to reduce overall project residual effects on changes to Aboriginal title and rights. • Mitigation and enhancement measures described throughout this Application are proposed to also reduce adverse residual effects and enhance positive effects on Haisla Nation's interests, as applicable, and are discussed relative to specific potential effects in Table 11.5.6 to Table 11.5.8.

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11.5.6 Assessing Adverse Effects

This section describes the residual effects of the Project on Haisla Nation's interests after the application of mitigation measures. This evaluation focuses on the effect pathways listed in Section 11.5.4 and characterizes residual effects according to the approach described in Section 11.5.4.3.

The analysis in this section incorporates the findings of the relevant and applicable valued component assessments found in the Application that are relevant to Haisla Nation's interests; however, potential effects may not fully align with effects on Haisla Nation's interests. This is considered when evaluating the need for additional mitigation, enhancement measures, review processes or monitoring initiatives that are specific to Haisla Nation's interests.

11.5.6.1 CHANGES IN CONSUMPTION AND HARVEST

Haisla Nation have occupied their traditional territory for over 9,000 years (Haisla Nation 2021a; see Section 11.2). Haisla Nation continue to interact with their history (e.g., heritage sites, spiritual sites, oral history, laws), grow their Nation, exercise self-determination, govern, and enrich the future of their members through ongoing connection, use, and access to the waters and lands of their traditional territory.

Haisla Nation traditional territory is comprised of matrilineal clan stewardship areas that are "owned" (and inherited) watersheds, called *wa'wais* (Powell 2013). There are 54 *wa'waises* in Haisla traditional territory (Barbetti and Powell 2005). The *wa'wais* owners inherit the responsibility to care for and maintain the area and all floral and faunal resources encompassed within; they determine who can access their *wa'wais* to hunt, fish, and engage in other cultural practices and are also obligated to "educate and retrain visitors in [their] territory" (Powell 2013:6). *Wa'wais* that are particularly rich in specific resources are known as *bagwaiyas; bagwaiyas* are shared by all Haisla people, regardless of clan affiliation. *Wa'wais and bagwaiyas* are integral to the Haisla Nation's stewardship and resource management initiatives (Powell 2013).

Haisla Nation traditionally emphasized marine resources for their subsistence, especially the yearly runs of salmon and oolichan (Powell 2013:31; Gauvreau 2021). Salmon was dried and preserved, whereas oolichan was typically rendered into highly prized fatty oil, commonly referred to as "grease". In between the seasonal runs, numerous terrestrial and marine mammals, shellfish, rockfish, and plant species were harvested (Hamori-Torok 1990:306-307; Muckle 2007:43). The importance of coastal ecosystem resources to Haisla Nation continues today. Haisla's use of and relationship to their territory is maintained through traditional subsistence activities of hunting and gathering, and cultural practices such as trading, potlatch, and spiritual ceremonies (Haisla Nation 2021a).

Haisla Nation harvest a variety of culturally important fish species from the marine waters of their traditional territory. Examples include herring, oolichan, salmon, steelhead, cod, halibut, cuttlefish, bullhead, flounder, skate, and rockfish. Although all these species are important to Haisla Nation, some play more significant roles than others in Haisla diet and cultural practices. For example, oolichan, a small anadromous fish, are a cultural keystone species of Haisla Nation (Garibaldi and Turner 2004; Gauvreau 2021; Green 2008; Hagan 2010; Senkowsky 2007). Oolichan are a cultural keystone species as they shape, in a major way, the cultural identity of Haisla people, as reflected in the fundamental roles that the fish and rendered grease play in Haisla Nation diet, economy, materials, medicine, and spiritual and cultural practices (Gauvreau 2021). Oolichan feature prominently in the Haisla Nation origin story, and

oolichan fishing is considered “one of the most important aspects of Haisla life, along with trapping, hunting, and seafood fishing” (Green 2008:15).

Marine mammals of value to Haisla Nation include seals and sea lions, sea otters, porpoises, and whales. Sea lions and porpoises were not usually hunted; however, seals were commonly harvested and are still occasionally harvested during other fishing activities (Powell 2013). Sea otters were not hunted out of respect, and blackfish (orca) were not hunted because they are a crest animal (Powell 2013:21). In fact, no whale species were or are hunted by Haisla people (Powell 2013).

The resource-rich intertidal zones of Haisla territory provide shellfish and other invertebrates, seaweed, and kelp that are of significant importance to Haisla Nation (Powell 2013:21).

The terrestrial environment of Haisla territory provides Haisla Nation with various food and medicinal plants, as well as material for weaving and construction (e.g., bark and timber). Powell (2013) and Moerman (1998) list many species that are used for food and medicinal purposes, and species harvested for building materials. Examples include western red and yellow cedar, spruce, pine, red alder, and grasses; devil’s club, hellebore, juniper, Labrador tea, and seaweeds are among the list of recorded medicinal plants (Powell 2013). Plant resources used for food are numerous and include a variety of berries, roots, crab apples, seaweeds, and kelp (Powell 2013).

Large mammals, including black bear, moose, deer, mountain goat, wolf, wolverine, and grizzly bear occupy the terrestrial environments of Haisla territory, and have significant subsistence and spiritual values for Haisla Nation (Powell 2013). Smaller mammals, such as beaver, porcupine, marmot, marten, fisher, otter, mink, weasel, and muskrat are also hunted and trapped, while migratory waterfowl are hunted along the flats and mouths of rivers. Seagull eggs are collected from rocky nesting sites, and other bird species are hunted for feathers and materials for tool and jewelry production (e.g., bird bones) (Powell 2013:21-22).

Changes in Haisla Nation traditional territory brought about after contact with European settlers resulted in changes to Haisla land use and lifestyle, beginning with the fur trade in the 19th century (see Section 11.2.2). Between 1890 and 1950, the increase in farming and cannery operation affected the lifeways of Haisla Nation members (Hamori-Torok 1996, Powell 2013:26), and industrial developments around the town of Kitimat resulted in the restriction of use of areas along Kitimat Arm (Powell 2011). Prior to the early-1970s, the Kitimat River was a primary source of oolichan for Haisla Nation, yielding 27,000 to 81,000 kg per year from 1969 to 1971 (Gordon et al. n.d.). By 1972, Haisla reported that the oolichan harvested from the Kitimat River was “foul-tasting and inedible”, and this was attributed to pollution from industrial and municipal effluent discharges (Tirrul-Jones 1985).

Regional industrial developments such as commercial fishing, logging, and large industrial facilities are perceived by some Haisla Nation members to be a major factor influencing the decline in oolichan abundance in Haisla Nation territory (Gauvreau 2021). Some Haisla members have reported that Haisla Nation’s ability to harvest oolichan has been negatively impacted by industrial expansion within their territory (Gauvreau 2021). Oolichan conservation and recovery planning is ongoing in Haisla Nation territory; Haisla Nation is working with industry and scientists to develop enhancement studies to actualize oolichan recovery in formerly active harvesting sites (Gauvreau 2021).

Project Pathways

All phases of the Project (construction, operation and decommissioning) have the potential to affect to Haisla Nation consumption and harvest. Changes to Haisla Nation consumption and harvest could result through the following pathways:

- Loss or alteration of preferred harvesting methods, locations or opportunities to harvest marine resources due to increased marine vessel traffic in the marine shipping LAA and associated sensory disturbances (Section 7.3 Acoustic and Section 7.10 Marine Use), including changes in air quality (Section 7.2 Air Quality and Section 7.12: Human Health).
- Loss or alteration of preferred harvesting methods, locations or opportunities to harvest terrestrial resources and freshwater fish due to construction activities within the marine terminal LAA and resulting changes in vegetation (Section 7.4 Vegetation Resources), wildlife (Section 7.5 Wildlife), freshwater fish (Section 7.5), air quality (Sections 7.2 Air Quality and 7.12 Human Health).
- Loss of time when harvesting, including when harvesting for Elders and for community redistribution due to an increase in marine vessel traffic in the marine shipping LAA and potential for interference with Haisla fishing vessels engaged in, and equipment used for, harvesting salmon and halibut (Section 7.10 Marine Use).
- Loss or alteration of access to preferred harvesting locations due an increase in marine vessel traffic and type in the marine shipping LAA (Section 7.10 Marine Use).
- Loss or alteration of harvested species due to disruption of marine bird movement due to marine vessel traffic (Section 7.5 Wildlife), change in marine mammal and marine fish behaviour and increased risk of marine fish, marine bird, and marine mammal injury and mortality due to potentially fatal strikes with marine vessels transiting the marine shipping LAA (Section 7.5 Wildlife and Section 7.7 Marine Resources).
- Loss or alteration of harvested species due to construction activities within the marine terminal LAA and resulting changes in vegetation (Section 7.4 Vegetation Resources), wildlife habitat (Section 7.5 Wildlife), freshwater fish habitat used for spawning, rearing, feeding or migration (Section 7.6 Freshwater Fish), marine water quality with the potential to affect marine fish and marine mammal health (Section 7.7 Marine Resources), and due to changes in air quality (Sections 7.2 Air Quality and 7.12 Human Health).
- Alterations to the harvesting experience along the marine shipping LAA due to an increase in vessel traffic and type, wake waves, sensory disturbances (Section 7.10 Marine Use) and change in noise and air quality (Section 7.2 Air Quality, Section 7.3 Acoustic, and Section 7.12 Human Health).
- Alteration of subsistence-based livelihoods and alteration of trade relationships with neighboring Indigenous nations due to project construction and decommissioning activities in the marine terminal LAA with the potential to permanently alter or destroy marine species habitat (e.g., salmon, shellfish) (Section 7: Marine Resources), wildlife habitat (Section 7.5 Wildlife), and vegetation (Section 7.4 Vegetation), and due to marine vessel traffic in the marine shipping LAA with the potential to cause disruption of marine bird movement (Section 7.5 Wildlife), change in marine mammal and fish behaviour and increased risk of marine fish, marine bird, and marine mammal mortality (Sections 7.5 Wildlife and Section 7.7 Marine Resources), and displacement of marine users due to an increase in vessel traffic, type, and associated wake waves (Section 7.10 Marine Use).

While changes to quality of country foods were identified as an effect pathway in Table 11.5.2, the assessment of project interactions conducted in Section 7.2 Air Quality and Section 7.12 Human Health indicates that the Project will not contribute chemical(s) of potential concern (COPCs) to the soil, surface water, or marine environment. No project-related changes to the quality of vegetation, wild game or marine resources are anticipated. As such, the effect pathway of changes to quality of country foods is not carried further through this assessment.

Project Residual Effect

The anticipated project interactions and the key mitigation and enhancement measures to reduce or enhance resulting effects, and the remaining residual effects for valued components related to Haisla Nation consumption and harvest that remain are described in Table 11.5.6. This information is presented in Table 11.5.6 to transparently inform the assessment of residual effects on changes in consumption and harvest. Residual effects are characterized specifically for changes in consumption and harvest following Table 11.5.6.

TABLE 11.5.6 CHANGES TO HAISLA NATION CONSUMPTION AND HARVEST

Description of Project Interaction(s) and Effect Pathway(s) Specific to Haisla Nation	Description of Project Interaction(s) and Effect Pathway(s) for Related Valued Components	Key Mitigation and Enhancement Measures for Related Valued Components[1]	Residual Effect(s) for Related Valued Components that Remain After Application of Mitigation
Haisla Nation harvest a variety of culturally important fish species from the marine waters of their traditional territory (see Section 11.2). Examples include herring, oolichan, salmon, steelhead, cod, halibut, cuttlefish, bullhead, flounder, skate, and rockfish. Although all these species are important to Haisla Nation, some play more significant roles than others in Haisla diet and cultural practices. For example, oolichan, a small anadromous fish, are a cultural keystone species of Haisla Nation. Haisla Nation also harvest seaweed, shellfish, and other resources including, seagull eggs, herring eggs (roe on kelp), deer from boats on or near exposed shorelines for consumption, economic, trade, ceremonial and other purposes; the activities require the ability safely and efficiently access their preferred harvesting sites at suitable times of the year (i.e., a consideration of seasonality, tide levels). Haisla Nation's shellfish and seaweed harvesting sites located on or near exposed shorelines. Haisla Nation rely on unhindered access to salmon, halibut, and groundfish harvesting sites to support the commercial livelihood of Haisla fishermen, as well as the traditional food fishery for Nation gatherings and events related to governance, and for distribution to Elders and others in the community who are unable to get out on the water. During all project phases, though predominantly during the operation phase, Haisla Nation may experience change in the **quality of their fishing and harvesting experience** through an increase in vessel traffic and type, change in vessel generated wake waves that may displace fishers and harvesters or result in a safety risk when fishing and harvesting, change in noise, light levels, and air quality due to vessels transiting the shipping LAA and RAA.	**Air Quality (Section 7.2), Acoustic (Section 7.3) and Human Health and Human Health (Section 7.12)** Operable pathways for emissions and noise may result in effects on human health. Inhalation exposures to COPC in ambient air during the construction, operation and decommissioning phases of the Project could contribute to potential changes in human health risk in the vicinity of the marine terminal LAA and the within the marine shipping LAA (due to marine vessel traffic). The change to human health from these pathways is generally a function of the person's proximity to the marine shipping LAA and the marine terminal LAA (due to dispersion of air emissions and the duration of the exposure). Project-related changes to the quality (i.e., chemical content) of air, soil, sediment, water, and biota can result in changes in human exposure to chemicals of potential concern along the marine shipping LAA (i.e., sulfur dioxide and nitrogen dioxide). Project-related changes to levels of noise (i.e., percent highly annoyed [%HA) and sleep disturbance) can result in changes in human exposure and subsequent health effects along the marine shipping LAA.	**Air Quality (Section 7.2), Acoustic and Human Health** • Shipping emissions result in predicted nitrogen dioxide and sulphur dioxide concentrations well below applicable regulatory criteria along the shipping route and do not persist in any location due the motion of the LNG carriers and tugboats. • Use of electricity power from the BC Hydro grid for the facility during operation. The use of electricity power from the BC Hydro grid eliminates the need to produce power onsite from gas-fired turbines and associated emissions. • Diesel fired equipment used during construction (vehicles and equipment) and during operation (emergency power generators) will be powered by low sulphur fuel. The use of low sulphur diesel fuel will reduce emissions of SO_2. • Noise emissions onsite are reduced during the construction phase as the FLNG facility is being constructed overseas and towed to site, instead of constructed onsite (Section 7.3). • The decision to electrify the Project from the BC Hydro grid during operation reduces noise effects as electric equipment is generally quieter. • Nearby residents (i.e., within 3 km of activities) will be notified in advance of planned high disturbance noise-causing activities at the Project Area (i.e., pile driving). Provide notification to the closest residents to reduce annoyance. • Fit gas or diesel engine exhausts with noise mufflers, where available. Turn off equipment when not in use to minimize idling (where appropriate). Reduce exhaust noise from gas or diesel mobile equipment and therefore, reduce the magnitude of increase in noise levels. • Where possible quieter equipment will be prioritized over louder equipment (e.g., vibratory or drill pilling over impact pilling and rubber-wheeled equipment over steel-tracked equipment or electrified over gas/diesel powered). Reduce noise from equipment and therefore, reduce the magnitude of increase in noise levels. • Carry out noisy fabrication work at another site (e.g., within enclosed factory premises) and then transport products to the project site (as appropriate). Reduce noise from equipment and therefore, reduce the magnitude of increase in noise levels. • Noise ratings of construction and operation equipment are based on acoustic specifications of equipment (e.g., refrigerant compressor, process cooler) and will be considered in the procurement process. Noise ratings of construction and operation equipment are based on acoustic specifications of equipment (e.g., refrigerant compressor, process cooler) and will be considered in the procurement process. • Noise effects of the project site and shipping activities will comply with federal and provincial noise guidance.	**Air Quality (Section 7.2), Acoustic (Section 7.3), and Human Health (Section 7.12)** Residual effects of emissions and noise on human health (and quality of harvesting experience) due to project construction and operation (including shipping) are anticipated. Shipping emissions result in predicted nitrogen dioxide and sulphur dioxide concentrations well below applicable regulatory criteria along the shipping route and do not persist in any location due the motion of the LNG carriers and tugboats. Maximum nitrogen dioxide concentrations occur under adverse meteorological conditions which occur infrequently. During most frequent meteorological conditions, predicted concentrations are lower and the plume travel away from locations frequented by people (i.e., Hecate Strait, elevated terrain). The magnitude of residual effect on air quality as a result shipping associated with the Project is negligible (i.e., no measurable change). The extent of residual effects is limited to within the shipping air quality LAA and RAA and to the vicinity of the LNG carrier and tugboats. Overall, the direction of change to human health is adverse for all phases of the Project. The magnitude of effect is low for all phases of the Project. The spatial extent of the residual effects is within the marine shipping LAA and the marine terminal LAA for their respective types of effects (air quality or noise effects). The duration of effect is long-term because all phases of the Project last more than one year. The effects are reversible for all phases of the Project because COPC emissions to the air and noise emissions stop after the Project is completed. The frequency of the effect is continuous over the life of the Project. There is a disproportionate distribution of effects to the subpopulation of residents living closest to the Project Area (i.e., in vicinity of marine terminal LAA) because the effects are typically associated with proximity to the Project's source of air emissions or noise. Overall, the human health risks have been overestimated because the predictive modelling techniques used in the CALPUFF air dispersion model and noise acoustic model are conservative (e.g., applying worst case scenarios), in addition, the methods used in the HHRA are also inherently conservative (e.g., applying TRVs that are protective of sensitive people). Given these characterizations, and the overestimation of risk associated with human health, the likelihood of residual effects on human health is low. No substantive adverse residual effect for human health (and quality of harvesting experience) is predicted because the predicted change to human health is less than the key residual effects threshold.

TABLE 11.5.6 CHANGES TO HAISLA NATION CONSUMPTION AND HARVEST

Description of Project Interaction(s) and Effect Pathway(s) Specific to Haisla Nation	Description of Project Interaction(s) and Effect Pathway(s) for Related Valued Components	Key Mitigation and Enhancement Measures for Related Valued Components[1]	Residual Effect(s) for Related Valued Components that Remain After Application of Mitigation
Haisla Nation may experience **alteration to the quality of the harvesting experience, loss or alteration of preferred harvesting methods, locations**, or **opportunities, loss of time when harvesting, loss or alteration of access to preferred harvesting locations, and alteration of subsistence-based livelihoods and trade relationships with neighbouring Indigenous nations** due to increased vessel traffic and type, associated sensory disturbance (noise), change in air quality, vessel generated wake waves, change in marine navigation, and change in marine fisheries.	**Marine Use (Section 7.10)** Construction and operation activities within the marine terminal LAA may affect the ability of Haisla commercial and recreational marine vessels to navigate at the head of Kitimat Arm and may result in a change in noise and light levels, which may affect marine fisheries and the quality of the experience for marine users in the vicinity of the marine terminal LAA . Wake waves generated by LNG carriers and escort tugs, if large enough, may result in a safety risk to fishers, shoreline harvesters and recreationalists or in an interference or displacement to shoreline harvesting activities or other marine use activities. During construction, the method of transporting materials to and from the Project Area will be dictated by practicality. It is anticipated that the Project will employ a combination of marine and land-based transportation modes. Marine access using existing shipping routes will be the primary transport means for major project components (e.g., FLNG facility, struts). The effect of marine transport of construction materials to the site on the change in marine navigation will be short term (only occur during the construction phase of the Project). During peak construction, the number of barge and project-related vessel movements could be in the range of two movements per week (up to eight per month). Vessels used during the construction phase will be similar to the types of vessels already present in the port of Kitimat. An increase in marine vessel traffic during project construction and decommissioning (e.g., construction vessels) and operation (e.g., LNG carriers and escort tugs) may interfere with Haisla fishing vessels engaged in salmon fishing activities along the marine shipping route, which could result in lost fishing time (up to one hour of fishing every 7 to 10 days) if the gear type used needs to be pulled in and reset (e.g., gillnets, seines). An increase in shipping traffic may interfere with Haisla fishing vessels engaged in, and equipment used for, halibut (and other groundfish) fishing activities along the marine shipping route. Gear types used that are passively fished (i.e., they are deployed and left unattended), such as long lines, may become entangle in the propeller of an LNG carrier or escort tug as they can be difficult for large vessels to locate or they may drift from their original locations. This could result in lost fishing time (up to one hour of fishing every 7 to 10 days) if the gear type used needs to be pulled in and reset or is destroyed (e.g., long lines).	**Marine Use (Section 7.10)** • Regular communication of project activities with Haisla marine users will be undertaken. Cedar will provide project updates provided using appropriate engagement methods and media outlets (e.g., online notifications, newspaper, VHF broadcasts through the MCTS) will give marine users advanced notice of the Project's marine shipping activities. • Project LNG carriers will use the Canadian Coast Guard's MCTS to provide notice of planned vessel arrival time at Triple Islands. Updates provided using VHF broadcasts through the MCTS will give marine users advanced notice of the Project's marine shipping activities. • Cedar will establish LNG carrier shipping schedule notification processes for Indigenous Nations with traditional territories overlapping the shipping route. Engagement with Indigenous communities in the development of a marine shipping notification process will promote the use of methods of notification that facilitate the process for both Cedar and Indigenous communities. • Cedar will establish methods of initiating safety zones around the marine terminal during operation. The safety zone will increase safety by reducing the risk to other mariners, associated with LNG loading and other terminal operation. • Cedar will use escort tugs between Triple Islands and Kitimat during LNG carrier transits and to assist with berthing and de-berthing/departure. The use of escort tugs will assist in mitigating drift and powered grounding and with provide more maneuverability if required to avoids collisions and during and speed control of the LNG carriers berthing, thus reducing the likelihood of collision or other adverse interaction with other maritime traffic. • LNG carriers will adhere to the prescribed route and passing restrictions. This mitigation will decrease the potential for interaction between the Project's marine traffic and other marine users as LNG carriers will be adhering to a well-established marine shipping route and reduce the potential for collisions by following the passing restrictions described in previous technical review process of marine systems and transshipment sites (TERMPOL) studies and in the draft North Coast Waterways Management Guidelines. • LNG carriers will maintain safe operating distances from other marine craft. This mitigation will decrease the potential for interaction between the Project's marine traffic and other marine users as LNG carriers will be adhering to a well-established marine shipping route and follow the Collision Regulations as set out in the Canada Shipping Act. Cedar will follow reduce the potential for collisions by following the safe operating distances and passing restrictions described in previous TERMPOL studies and in the draft North Coast Waterways Management Guidelines. • LNG carriers will maintain safe speeds as described in Rule 6 of the Collision Regulations. When implemented, Cedar will follow the draft North Coast Waterway Management Guidelines' recommendations regarding vessel speed and position. The vessel Master and pilots will use their expertise to navigate the carrier at a safe operating speed as defined in the Collision Regulations, by following and in the draft North Coast Waterway Management Guidelines' (when implemented) recommendations regarding vessel speed and position., the Project will minimize its wash and wake effects on marine users.	**Marine Use (Section 7.10)** The Project will follow the draft North Coast Waterway Management Guidelines' (2021) recommendations regarding vessel speed and position to minimize its wash and wake effects when fishing, harvesting, or recreational activities are occurring. Waves created by the movement of vessels, are distinct from wind-driven waves and are capable of reaching shorelines that are usually protected from natural waves. However, the shoreline along the Project's marine shipping route, which will be exposed to wake from LNG carriers and their escort tugs, is an exposed shoreline that is currently subject to natural wave action, including storm waves. Based on previous wake studies conducted in the region, the height of wake waves generated by large liquid bulk carriers and tugs, when operating under normal conditions, will be within the range of natural wave conditions and will be less severe than some waves created naturally by weather. Wave heights from LNG carriers are estimated to be in the order of 0.1 m within the shore region (based on travelling at speeds up to 16 knots), while tugs are estimated to generate 0.2 to 0.3 m at the shoreline (based on travelling at speeds from 12 to 16 knots). Considering that the Project's LNG carriers will be relatively infrequent (1 return trip every 7 to 10 days), and because the wake waves will be within the range of naturally generated waves, due to the reduced speeds of the LNG carriers, there is a small probability that shoreline harvesters will be affected by project-related shipping traffic. Project-related shipping traffic will not introduce any new, previously unassessed, wave effects. The additional increase in large vessel movements in the port and along the marine shipping route attributable to the Project may prevent or reduce access to fishing or shoreline harvesting sites, which would disproportionately affect Indigenous communities, who heavily rely on the marine environment and its resources for FSC purposes and for other purposes (e.g., cultural, spiritual, trade). If access to harvesting sites or the quality and quantity of resources available is diminished, Indigenous Nations' culture, identity, and well-being may be affected. The application of the mitigation measures, including communication with MCTS and following the guidelines on reducing wake and wash, as outlined in the draft North Coast Waterways Management Guidelines, will reduce the potential residual effects on shoreline harvesters. Substantial adverse residual effects to marine use are not anticipated, as the Project is not expected to contravene established marine use plans or policies or create a change or disruption that widely restricts or degrades present marine uses to a point where activities cannot continue at current levels. Effects on marine navigation and marine fisheries and other uses from the construction, operation, and decommissioning of the Project will result in low residual effects. Construction, operation, and decommissioning will result in an increase in new in-water infrastructure in Kitimat Arm and an increase in project-related vessel traffic along the Project's marine shipping route; however, the magnitude of adverse residual effects is low. These adverse residual effects will be limited to the LAA, short- to medium-term in duration, occur at multiple irregular events during the construction and decommissioning phases and occur at multiple regular events or continuously throughout the operation phase, and have a disproportionate effect on Indigenous Nations that heavily rely on the marine environment and its resources for FSC purposes and for other purposes, including spiritual and economic development. The adverse residual effects will be reversible upon completion of the Project.

TABLE 11.5.6 CHANGES TO HAISLA NATION CONSUMPTION AND HARVEST

Description of Project Interaction(s) and Effect Pathway(s) Specific to Haisla Nation	Description of Project Interaction(s) and Effect Pathway(s) for Related Valued Components	Key Mitigation and Enhancement Measures for Related Valued Components[1]	Residual Effect(s) for Related Valued Components that Remain After Application of Mitigation
	During the operation phase, visits to the FLNG facility will occur at regular intervals (up to approximately 50 vessel calls per year) for up to 40 years, but will not be permanent fixtures in Kitimat Arm. In consideration of all large vessel movements in the marine shipping LAA, including piloted vessels, ferry traffic, and cruise ship traffic (see Section 7.10.7.2), the Project will increase large vessel movements within the marine shipping LAA by 15.7% annually.	• Cedar will develop and implement a Marine Transportation Management Plan (MTMMP), in accordance with applicable federal and provincial legislation and regulations, to communicate project construction activities to other marine users. The MTMMP will include safety measures, communication protocols and recommended monitoring metrics designed to improve safe shipping and enhance communications between the Project's marine activities and other mariners. As development of the plan will likely involve engagement with DFO, Transport Canada, CCG, District of Kitimat, Pacific Pilotage Authority, and Indigenous Groups, it will include measures and communication protocols that are supported by regulatory agencies and marine users, increasing the likelihood that it will minimize effects.	The port of Kitimat is a private port that has a long history of industrial development. Kitimat has continued to manage large industrial vessel traffic since the beginning of its industrial development in the 1950s (Tourism Kitimat 2021b). The socio-economic context in which residual effects have been assessed includes a local marine use environment that has been influenced by other major projects including, but not limited to, the Eurocan pulp and paper plant, the Ocelot Methanol Plant (now known as Methanex), and LNG Canada. It is expected that government agencies, such as Transport Canada and the Canadian Coast Guard, will continue to maintain the high safety standards in the adjacent waters of the Project. Given the experience of the port of Kitimat and other government agencies involved in maintaining navigable waters, the existing conditions, and the proposed mitigations listed in Table 7.10.13, there is low likelihood of residual effects for change in marine navigation as adverse interactions between the Project and marine navigation can largely be avoided or mitigated.
The terrestrial environment of Haisla Nation traditional territory provides Haisla Nation with various food and medicinal plants, as well as material for weaving and construction (e.g., bark and timber; see Section 11.2). Examples of species that are used for food and medicinal purposes, and species harvested for building materials include western red and yellow cedar, spruce, pine, red alder, and grasses. Devil's club, hellebore, juniper, and Labrador tea are among the list of recorded medicinal plants. Plant resources used for food are numerous and include a variety of berries, roots, crab apples, seaweeds, and kelp. Haisla Nation harvest traditional use plant species within the marine terminal RAA. Haisla Nation may **experience loss or alteration of preferred harvesting methods, locations or opportunities for terrestrial plants, change in quantity of traditional plant use species,** and **alterations to the harvesting experience** due to change in noise and air quality.	**Vegetation Resources (Section 7.4)** Vegetation clearing of the project footprint during site preparation of the construction phase has potential to change the abundance of plant species of interest. Specifically, vegetation clearing can remove traditional use plants. As noted earlier, no plant species at risk were identified in the project footprint; therefore, there is no project pathway to change the abundance of plant species at risk. Vehicle and equipment use in the construction phase (primarily), operation phase, and decommissioning phase, have the potential to increase the abundance of invasive plants. Invasive plant species are considered to be a management concern because they can decrease biodiversity in the area, affect ecosystem structure and functions, and can have economic impacts (e.g., cost to manage invasive plant species). Vehicle and equipment use may also cause edge effects to traditional use plants adjacent to the project footprint. Vegetation clearing in the project footprint during site preparation of the construction phase can reduce the abundance of ecological communities of interest. The condition of ecological communities could also be affected due to edge effects, including, but not limited to, changes in temperature (air and soil), light conditions, soil moisture and nutrients, plant competition (particularly from invasive plants), and pathogens and/or windthrow (the fall/overthrow of trees due to wind). These edge effects could extend out to the marine terminal LAA (i.e., up to 120 m from the edge of the project footprint).	**Vegetation Resources (Section 7.4)** • Clearing boundaries will be delineated prior to site preparation to keep clearing activities within the designated project footprint. This may be via physical flagging or electronic delineation where appropriate. This mitigation measure provides a physical marker of where construction activities may occur. • Standard best practices to prevent and control the spread of invasive plants will be incorporated into the Project's CEMP. Where invasive species have been discovered onsite, action will be implemented for controlling them. Invasive plant management to prevent and control the spread or introduction of invasive species reduces the increase of invasive species in the marine terminal LAA and reduces the indirect effects to native plant communities. • Any temporary workspace on Crown land will be subject to natural revegetation or active reclamation, as per measures stated in the CEMP. Reclamation on private property will follow requirements of the lease agreements with the owner(s). Reclaiming temporary workspaces as soon as practicable will use best management practices such as purchasing seed for reclamation activities that is certified weed-free, which reduces the chance that invasive species will be introduced through reclamation activities. Reclamation of temporary workspaces will reduce erosion and therefore soil loss. This reduces loss of native plant communities. • If requested by Haisla Nation, traditional use plants will be incorporated into reclamation planning for temporary construction areas on Crown land (if required). The incorporation of traditional use plants in the reclamation of temporary construction areas or compensation areas reduces long-term loss of these species in the marine terminal LAA and RAA. • Cedar will locate natural gas pre-treatment and liquefaction equipment and LNG storage on the FLNG facility. This mitigation measure reduces clearing and construction activities in vegetated areas.	**Vegetation Resources (Section 7.4)** With the proposed mitigation measures in place, the Project is anticipated to have low magnitude adverse residual effects on vegetation resources associated with construction, operation and decommissioning activities of the marine terminal and supporting infrastructure (land-based) and transmission line (right-of-way and access roads). Although measurable changes of plants and ecological communities of interest, wetland functions, and native vegetation health and diversity (due to air emissions) are predicted from existing conditions, the regional extent of these parameters are sufficient to sustain the affected species and communities without active management. Potential adverse effects associated with these losses due to the transmission line will be reversible and effects associated with the marine terminal and supporting infrastructure (land-based) will be irreversible because the project footprint will be decommissioned to support future uses. Potential adverse effects associated with sulphur dioxide emissions are reversible; however, soil acidification effects (should they occur) may be irreversible following operation. Although there is high confidence in the reliability of site specific and regional information collected in support of this effects assessment, there is moderate confidence, overall, given the uncertainty of the actual vegetation responses to air emissions over the 40-year operation phase. No substantive adverse residual effect for vegetation resources is predicted because following the application of avoidance and mitigation measures, the long-term viability of plants and ecological communities of interest, including those of cultural or traditional importance, will persist in the marine terminal LAA and RAA and there will be no loss of wetland functions of ecologically important wetland.

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	Vegetation clearing in the project footprint during site preparation of the construction phase can cause an adverse change in wetland functions, including hydrological, biogeochemical, and habitat functions. In addition, wetland functions may be affected due to edge effects, including, but not limited to, changes in temperature (air and soil), light conditions, hydrology, soil moisture and nutrients, plant competition (particularly from invasive plants), and pathogens and/or windthrow. These edge effects could extend out to the marine terminal LAA (i.e., up to 120 m from the edge of the project footprint). Emissions during pre-treatment and liquefaction of natural gas and storage and offloading of LNG at the floating LNG facility during the operation phase have the potential to affect vegetation health and diversity through: • Increased sulphur dioxide and nitrogen dioxide air concentrations (direct effect) • Sulphate and acid deposition (indirect effects of soil acidification) • Nitrogen deposition (direct and indirect effects of eutrophication) • These effects are expected to occur within the vegetation resources air emissions LAA.	• Cedar will incorporate erosion and sediment control best practices into the CEMP to manage surface water and avoid sedimentation in sensitive vegetation communities. Surface sediment and erosion control measures reduce effects from either erosion or sedimentation into ecological communities adjacent to the project footprint. This mitigation measure would help protect ecological communities at risk and water quality and hydrology in adjacent wetlands. Cedar will implement windthrow management strategies such as edge stabilization techniques in areas of old growth forest on Crown land. This mitigation measure will reduce the edge effect of windthrow on ecological communities of interest. • During detailed design, Cedar will work with the engineering team to reduce impacts to wetlands. This mitigation measure will avoid wetland where possible (e.g., along the transmission line right-of-way and access roads) and where wetland occurs adjacent to clearing activities, reducing loss of wetland functions. Cedar will undertake the following mitigation to avoid or reduce change in native vegetation health and diversity due to air emissions: • Manage vehicle and equipment emissions by conducting regular maintenance. Conducting regular maintenance leads to reliable equipment operability, prolonged lifetime of equipment, good fuel efficiency, and adequate combustion (limited incomplete combustion). • Use of electricity power from the BC Hydro grid for the facility during operation. The use of electricity power from the BC Hydro grid eliminates the need to produce power onsite from gas-fired turbines and associated emissions. • Diesel fired equipment used during construction (vehicles and equipment) and during operation (emergency power generators) will be powered by low sulphur fuel. The use of low sulphur diesel fuel will reduce emissions of sulphur dioxide.	
Haisla Nation harvest a variety of culturally important fish species that rely on freshwater systems within their traditional territory (see Section 11.2). Examples of fish species within the freshwater fish RAA that are harvested by Haisla Nation include coho salmon, chinook salmon, chum salmon, pink salmon, coastal cutthroat trout, rainbow trout, Dolly Varden, oolichan, sculpin, flounder. These species are important for Haisla Nation FSC, economic, and other purposes, including to support their subsistence-based livelihood and trade relationships with neighboring Indigenous Nations. Although all these species are important to Haisla Nation, some play more significant roles than others in Haisla diet and cultural practices. For example, oolichan, a small anadromous fish, are a cultural keystone species of Haisla Nation. Haisla Nation may experience alteration to the quality of the harvesting experience, loss or **alteration of access to preferred harvesting locations, and alteration of subsistence-**	**Freshwater Fish (Section 7.6)** During the construction phase (e.g., site preparation and clearing and construction of land-based infrastructure), the operation phase (e.g., facility and infrastructure maintenance), and during the decommissioning phase (e.g., decommissioning of land-based facilities) increased TSS concentrations, change in nutrient concentrations, introduction of deleterious substances from spills (i.e., from construction equipment) and blasting residues, and deposition of sulphur and nitrogen compounds in area lakes and streams from project air emissions during operation could result in potential effects on freshwater fish due to a change in surface water quality. Activities during construction, operation, and decommissioning of the Project have the potential to permanently alter or destroy freshwater fish habitat used for spawning, egg incubation, rearing, feeding or migration by fish species, due to alteration or loss of riparian vegetation, alteration or loss of instream habitat, and alteration of instream habitat availability.	**Freshwater Fish (Section 7.6)** • Cedar has incorporated avoidance measures directly into the project design to align the Project with Haisla Nation's business philosophy of promoting environmentally sustainable development that minimizes impacts to land and water resources. In keeping with this approach, the gas-treatment, LNG production, and LNG storage and related infrastructure will be located on a FLNG facility, thereby limiting interaction with freshwater surface water. Riparian vegetation clearing is anticipated to be minimized where possible; large spans between transmission line structures will reduce the need for riparian clearing along the transmission line route. In addition, Cedar has committed to electrification of the Project to reduce potential acidifying and eutrophying emissions. • Avoidance measures have been incorporated into the project design that limit or reduce potential effects on fish health and mortality risk, including: (1) electrification of the Project which reduces potential acidifying and eutrophying emissions, (2) no instream works, or water withdrawals, are anticipated for fish-bearing watercourses, and (3) large spans between transmission line structures which reduce the need for riparian clearing along the transmission line route. • Clearing of riparian areas will be limited to the extent necessary to meet the Project's design and safety requirements, as determined by a qualified professional. Limiting riparian vegetation clearing reduces the amount of erosion and sediment entering waterbodies. Areas for protection will be delineated.	**Freshwater Fish (Section 7.6)** No instream works, channel realignments, or water withdrawals in fish-bearing watercourses are expected to occur for land-based infrastructure construction, including access road and transmission line crossings. As a result, no residual effects to fish health and mortality are expected to occur due to these PoE with the implementation of BMPs to reduce sediment and erosion during site preparation and while working in areas of exposed soil during construction, TSS levels are expected to meet guidelines established within the Land Development Guidelines during storm events and the BCWQG FAL for dry periods during all project phases. Therefore, residual effects to fish health and mortality risk are expected to be low in magnitude. With the implementation of mitigation measures, the likelihood of a change in fish health and mortality risk during construction, operation and decommissioning is predicted to be low. The Project is anticipated to have low magnitude adverse residual effects on freshwater fish associated with the construction, operation and decommissioning of the land-based infrastructure, transmission line, and associated access roads. Clearing, grading and construction and subsequent removal of the land-based infrastructure is expected to have adverse residual effects on surface water quality and fish health and mortality risk (due to infrequent TSS releases) that are low in magnitude, irregular events during each project phase (i.e., short term). Potential adverse effects due to TSS releases will be reversible.

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based livelihoods and trade relationships with neighbouring Indigenous nations through changes to surface water quality, habitat, and health of freshwater fish species harvested by Haisla Nation within the freshwater fish LAA.	During the construction phase (e.g., site preparation and clearing and construction of land-based infrastructure), the operation phase (e.g., facility and infrastructure maintenance), and during the decommissioning phase (e.g., decommissioning of land-based facilities) increased TSS concentrations may result in potential changes in fish health or mortality risk. During site preparation and construction of land-based infrastructure, destruction of fish and/or eggs during instream work could occur and may result in potential changes in fish health or mortality risk. During site preparation and clearing and construction of land-based infrastructure during construction, infrastructure maintenance during operation, and decommissioning of land-based infrastructure during decommissioning a change in timing, duration, and frequency of flow (including during isolation of stream crossings and temporary diversions) may result in fish mortality by stranding or by preventing access to spawning areas or food supply. During operation, acidification and/or eutrophication of freshwater lakes and streams causing change in the production of aquatic invertebrates and food available for fish due to deposition of sulphur and nitrogen compounds from project air emissions (Section 7.6).	• Cedar will incorporate erosion and sediment control best practices into the CEMP to manage surface water runoff and erosion and minimize the introduction of sediment to streams. Documentation and communication of best practices during construction will reduce the amount of erosion occurring and sediment entering waterbodies through education and accountability. • Cedar will establish designated equipment refueling areas and develop a spill response plan. These measures will be incorporated into the CEMP. Documentation and communication of best practices during construction and decommissioning to prevent spill will reduce the risk of deleterious substances entering waterbodies. • Measures related to protection of freshwater fish and fish habitat, including protection of water quality, will be incorporated into the construction CEMP and will include BMPs for sediment and erosion control, spill prevention, and water quality monitoring. Documentation and communication of best practices during construction and decommissioning to prevent spill will reduce the risk of deleterious substances entering waterbodies. • Clearing boundaries will be delineated prior to site preparation to keep clearing activities within the designated project footprint. This may be done with physical flagging or electronic delineation, where appropriate. Clear delineation of clearing boundaries will help limit unnecessary and unapproved riparian vegetation impacts and subsequent impacts on associated riparian functions for fish habitat. • Watercourse crossing structures will follow DFO's Interim Code of Practice: Temporary Steam Crossings and include mitigation measures in the Fish-stream Crossing Guidebook. Following best practices during construction will reduce impacts on fish habitat. • Cedar will obtain all necessary approvals for works affecting freshwater environments. This will include (1) Submitting a request for review to DFO for any works that will affect fish-bearing watercourses to obtain a determination if an authorization is needed, (2) obtaining a use approval under section 10 or a licence under section 9 of the *Water Sustainability Act* for any temporary or permanent water withdrawals, and (3) obtaining an approval under section 11 of the *Water Sustainability Act* for changes in and about a stream. Following these permitting processes and obtaining government approval of the detailed plans and mitigation measures will limit impacts on fish habitat.	Clearing of riparian vegetation and installation of access road crossings will have low magnitude residual effects on freshwater fish and fish habitat. This is because clearing of riparian vegetation and installation of access road crossing have been eliminated on fish-bearing watercourses, the large spans for the transmission line across Moore and Anderson creeks, and by following BMPs where riparian clearing or access road crossings are required on non-fish-bearing streams. Residual effects to fish habitat from these PoE are anticipated to be reversible at the end of decommissioning. No substantial adverse residual effect to fish habitat are not anticipated for the Project. The Project is not anticipated to result in: death of fish by means other than fishing as per section 34.4; a HADD of fish habitat under section 35; nor, the introduction of a deleterious substance in contravention of section 36 of the Fisheries Act. Cedar will submit a request for review to DFO for works requiring riparian habitat clearing for fish-bearing watercourses or realignment of non-fish-bearing watercourses to confirm if an authorization is required for the Project. Many avoidance measures have been incorporated into the project design that eliminate or reduce potential adverse residual effects on freshwater fish, including: • Electrification of the Project which reduces potential acidifying and eutrophying emissions • No instream works or water withdrawals are anticipated for fish-bearing watercourses • Large spans between transmission line structures, which reduce the need for riparian clearing along the proposed transmission line right-of-way

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Haisla Nation hunt and consider the following terrestrial wildlife species to be of spiritual importance: black bear, moose, deer, mountain goat, wolf, wolverine, grizzly bear (see Section 11.2). Smaller mammals such as beaver, porcupine, marmot, marten, fisher, otter, mink, weasel, and muskrat are also hunted and trapped, while migratory waterfowl are hunted along the flats and mouths of rivers. Seagull eggs are collected from rocky nesting sites, and other bird species are hunted for feathers and materials for tool and jewelry production (e.g., bird bones). Haisla Nation hunt, trap, and harvest some of these wildlife species for FSC, economic, and other purposes, including to support their subsistence-based livelihood and trade relationships with neighboring Indigenous Nations; project effects on wildlife and land and resource use could result **in loss or alteration of preferred harvesting methods, locations or opportunities for terrestrial resources,** as well as **alteration of the harvesting experience, and alteration of subsistence-based livelihoods and trade relationships.**	**Wildlife (Section 7.5)** Project activities during construction, operation, and decommissioning are expected to change wildlife habitat, directly and indirectly, within the marine terminal LAA and marine shipping LAA. Site preparation and clearing and construction of land-based infrastructure is expected to change habitat for terrestrial wildlife through direct removal or alteration (e.g., from a treed state to a shrub state) of vegetation. Indirect effects (e.g., noise, vibration, human activity) during these activities are expected to cause wildlife to avoid or have reduced use of otherwise suitable habitat proximal to the Project. Removal of vegetated beachland (rocks, pebbles, sand) and intertidal habitat near the marine terminal LAA will result in direct effects to shoreline habitat for certain marine bird species. Increased vehicle traffic during construction could also result in a change in habitat suitability near project travel routes. Construction of marine-based infrastructure and marine transport of construction materials to the site is expected to change habitat for marine birds that use shoreline habitats and nearshore waters. Indirect effects during these activities could also change habitat suitability for marine birds if they avoid the area due to sensory disturbance (e.g., lighting and noise). Activities such as pile driving are known to disturb some species of marine birds, including marbled murrelet. Project activities during operation are expected to result in indirect effects that could change habitat for terrestrial wildlife and marine birds. Sensory disturbance (e.g., noise, lighting) from the pre-treatment and liquefaction of natural gas and storage and offloading of LNG at the FLNG facility as well as LNG carrier loading and infrastructure maintenance may change habitat suitability for terrestrial wildlife and marine birds. Vehicle traffic during operation could also result in sensory disturbance to terrestrial wildlife. Marine shipping and transportation will consist of an LNG carrier visiting the FLNG facility every 7 to 10 days and is expected to change habitat suitability for marine birds along the shipping route and near the FLNG facility when a carrier is in motion. Habitat suitability for marine birds is expected to change while LNG carriers are moving within or near habitat occupied by marine birds through reduced foraging opportunities and displacement. The decommissioning phase is expected to take 12 months and include removal of the FLNG facility and removal of onshore infrastructure. The transmission line right-of-way and temporary workspaces on Crown land will be left to revegetate naturally or will be subject to active reclamation. Reclamation on private property (e.g., DL 99 in the Project Area, parts of the transmission line corridor) will follow requirements of the lease agreements with the owner(s). Similar to operation, project activities during decommissioning are expected to result in indirect effects that could change habitat for terrestrial wildlife and marine birds.	**Wildlife (Section 7.5)** • Cedar will locate natural gas pre-treatment and liquefaction equipment and LNG storage on the FLNG facility. • Clearing boundaries will be delineated prior to site preparation to keep clearing activities within the designated project footprint. This may be via physical flagging or electronic delineation, where appropriate. This mitigation measure provides a marker of the permitted clearing boundary to reduce the potential for accidental clearing of vegetated areas and resulting impediment of wildlife movement and risk of injury or mortality of wildlife beyond the designated project footprint. • Grubbing and grading should be limited within 30 m of watercourses known to be occupied by coastal tailed frog at all times of the year. If grubbing or grading cannot be avoided within 30 m of a watercourse known to be occupied by coastal tailed frog, additional measures may be specified by an environmental monitor (e.g., additional sediment control measures, use of clear-span bridges to cross the watercourse). Limiting grubbing and grading within riparian corridor around will reduce potential for effects on coastal tailed frog habitat and will reduce the risk of injury or mortality of adult coastal tailed frogs. • Avoidance buffers around identified wildlife habitat features will be specified by an Environmental monitor and clearly delineated and marked in the field prior to clearing and construction. Maintaining buffers reduces the potential for accidental clearing of wildlife habitat features and resulting risk of injury or mortality of wildlife and will decrease the extent of sensory disturbance in the vicinity of identified wildlife habitat features. • Wildlife habitat features (e.g., dens, raptor nests, mineral licks) discovered during construction will be reported to Cedar's environmental manager and feature-specific mitigation will be developed by an environmental monitor. Reporting of discoveries of wildlife habitat features allows for implementation of effective feature-specific mitigation to decrease the loss of wildlife habitat and resulting impediment of wildlife movement and injury or mortality of wildlife. • Project personnel will avoid work within identified wildlife habitat feature buffers during sensitive timing windows. For any work within the buffer zone during a sensitive timing window, Cedar will consult with an environmental monitor to determine whether additional feature-specific mitigation is required. Maintaining buffers during sensitive timing windows will decrease the extent of physical and sensory disturbance in the vicinity of wildlife habitat features during the nesting, denning, roosting, and breeding periods and will reduce the potential for injury or mortality of wildlife. • Lighting for the Project will be designed in a manner that is consistent with the OGC's Light Control Best Practices Guideline and will consider the measures (i.e., directional or shielded lighting to reduce the vertical or horizontal distribution of light, and Adaptive controls and variable lighting regimes) to reduce risk of injury or mortality and change in movement for bats, marine birds, and migratory birds. Reducing the vertical or horizontal distribution of light and using lighting products with adaptive controls will decrease the likelihood that lit infrastructure will serve as a mechanism for interaction with bats and birds that could result in change in movement patterns due to sensory disturbance and injury or mortality due to collisions.	**Wildlife (Section 7.5)** The Project is predicted to result in low to moderate magnitude adverse residual effects on wildlife, based on project phase and key species and species group. Residual effects are expected to directly affect wildlife during construction (e.g., removal of terrestrial habitat due to site preparation and vegetation clearing), operation, and decommissioning (e.g., potential for direct mortality during marine shipping during operation and decommissioning). Residual effects are also expected to indirectly affect wildlife during all project phases due to sensory disturbance (e.g., noise, vibration, presence of LNG carriers). The Project is not anticipated to result in a substantive adverse residual effect for wildlife because the Project is not predicted to cause or further contribute to the exceedance of a conservation-based threshold or threaten the long-term persistence or viability of species of management concern, or species of cultural or traditional importance.

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	Decommissioning of land-based infrastructure and vehicle traffic could change habitat suitability for terrestrial wildlife and decommissioning of marine-based infrastructure and marine transport of decommissioned infrastructure could change habitat suitability for marine birds. For terrestrial wildlife and shorebirds, project-related activities that may result in alteration or impediment of movement are site preparation and clearing (i.e., gap creation that is maintained through to decommissioning by the presence of the marine terminal and supporting infrastructure); construction of land- and marine-based infrastructure (i.e., avoidance due to sensory disturbance); and vehicle traffic (i.e., as a road crossing impediment). During operation, night lighting of the marine terminal and the FLNG facility may alter bird and bat movement patterns. For marine birds, the primary effect mechanism is disruption of movement on or over the water due to marine vessel traffic; secondarily, sensory disturbance (e.g., lighting) associated with the marine-based infrastructure may also affect marine bird movement. Change in mortality risk for wildlife may occur through project-related activities resulting in physical destruction of key habitat features (e.g., nests, dens, roosts, hibernacula). Change in mortality risk for wildlife may occur through project-related activities resulting in accidental mortality of birds, amphibians, and mammals (particularly small, less mobile species or individuals)". In the context of this particular effect pathway, project-related activities that may result in accidental mortality are site preparation and clearing (i.e., machinery use); construction of land-based and marine-based infrastructure (i.e., machinery use); facility and infrastructure maintenance during operation (i.e., flaring during commissioning, transmission line bird strikes); and waste management during all phases (i.e., contact with contaminants). This effect pathway is relevant to terrestrial wildlife and marine birds (including shorebirds). Accidental mortality is also a characteristic of three other effect pathways: physical destruction of key habitat features, project lighting, and wildlife-vehicle collisions. Lighting on vessels, facilities, and infrastructure is an effect pathway for mortality risk for migratory birds and marine birds. For birds, the effect mechanism is individuals being either disoriented by, or attracted to, vessel, facility or infrastructure lights and the subsequent potential for a fatal strike. The operating land-based facilities and infrastructure, marine terminal, and FLNG facility (including the flare stack pilot flame) plus the following project-related activities are the artificial light sources that create this project pathway: marine transport of construction materials to the site; marine shipping and transportation; and marine transport of decommissioned infrastructure.	• Project-related wildlife deaths and conflict animals will be reported as required to appropriate authorities. Reporting requirements and contact information will be provided in the CEMP and the HSSE program (operation). Reporting wildlife deaths and conflict animals allows for monitoring and adaptive management of waste management practices and other mitigation measures relevant to avoiding or reducing human-wildlife conflict. • A wildlife management plan will be incorporated into the CEMP and will include wildlife-related mitigation measures, monitoring plans, and reporting requirements. The wildlife management plan will include guidelines to avoid or reduce project-related loss or alteration of wildlife habitat, impediment of wildlife movement, and injury or mortality of wildlife. • Vegetation clearing and grubbing should occur outside of the primary nesting period for migratory birds (April 11 to August 8 in Nest Zone A2 [ECCC 2021a]). Where clearing and grubbing cannot be avoided during these periods, Cedar will incorporate mitigation measures (e.g., pre-clearing bird nest surveys, establishment of setbacks around protected nests) to protect birds and their eggs. Scheduling vegetation clearing and grubbing outside of restricted activity periods will reduce the risk of incidental take of breeding birds. • Year-round protection is required for specific nests protected under the *Wildlife Act* (e.g., eagle, osprey, heron). If a nest protected under the *Wildlife Act* is identified, setbacks and restricted activity periods will be specified by an environmental monitor according to provincial guidance. Implementation of setbacks and restricted activity periods will reduce the risk of incidental take of nests protected year-round under the *Wildlife Act*.	

TABLE 11.5.6 CHANGES TO HAISLA NATION CONSUMPTION AND HARVEST

Description of Project Interaction(s) and Effect Pathway(s) Specific to Haisla Nation	Description of Project Interaction(s) and Effect Pathway(s) for Related Valued Components	Key Mitigation and Enhancement Measures for Related Valued Components[1]	Residual Effect(s) for Related Valued Components that Remain After Application of Mitigation
	The creation of the Project's transmission line right-of-way and its associated access roads (new build and upgrades to existing resource roads) for construction will result in an increase in linear feature density. An increase in linear feature density can increase mortality risk for bears, ungulates, and furbearers due to increased human and predator access. Increased traffic volumes due to project-related vehicles will increase mortality risk for terrestrial wildlife during construction, operation, and decommissioning. The affected roads are Bish Creek Forest Service Road, Alcan Way, and Haisla Boulevard, which are already active industrial use roads, plus access roads related to the construction and maintenance of the transmission line. Wildlife-human conflict is a mortality risk as conflict wildlife may need to be destroyed. The primary project-related activity that may result in wildlife-human conflict is waste management during all phases, specifically related to wastes that may be attractive to wildlife (e.g., food wastes). There is also potential for adverse wildlife encounters during the initial stages of site preparation and clearing (e.g., surveying); however, such encounters are less likely to be conflicts that result in wildlife mortality. This effect pathway is relevant to terrestrial wildlife, particularly bears and canids.		
Haisla Nation harvest a variety of culturally important fish species from the marine waters of their traditional territory. Examples include herring, oolichan, salmon, steelhead, cod, halibut, cuttlefish, bullhead, flounder, skate, and rockfish. Although all these species are important to Haisla Nation, some play more significant roles than others in Haisla diet and cultural practices. For example, oolichan, a small anadromous fish, are a cultural keystone species of Haisla Nation (Garibaldi and Turner 2004; Gauvreau 2021; Green 2008; Hagan 2010; Senkowsky 2007). Oolichan are a cultural keystone species as they shape, in a major way, the cultural identity of Haisla people, as reflected in the fundamental roles that the fish and rendered grease play in Haisla Nation diet, economy, materials, medicine, and spiritual and cultural practices (Gauvreau 2021). Marine mammals of value to Haisla Nation include seals and sea lions, sea otters, porpoises, and whales. Sea lions and porpoises were not usually hunted however seals were commonly harvested and are still occasionally harvested during other fishing activities (Powell	**Marine Resources (Section 7.7)** Construction activities (i.e., site preparation and clearing and decommissioning of marine infrastructure) have the potential to permanently alter or destroy fish habitat used for spawning, rearing, feeding or migration. During in-water construction, exposure to elevated levels of total suspended solids (TSS) has the potential to affect fish and marine mammal health. Underwater noise associated with in-water construction, operation and shipping activities has the potential to alter fish or marine mammal behaviour. Changes in light conditions associated with in-water construction activities, marine infrastructure, and shipping have the potential to alter fish behaviour. Construction activities have the potential to cause physical injury or direct mortality of marine fish through burial or crushing (Section 7.7). Underwater noise associated with in-water construction (e.g., impact pile installation) have the potential to injure fish or marine mammals or kill fish. During operation, seawater intake has the potential to injure or kill fish through entrainment and impingement.	**Marine Resources (Section 7.7)** • Cedar will incorporate erosion and sediment control best practices into the CEMP to manage surface water and avoid sedimentation of nearshore marine areas. Managing sedimentation reduces changes to habitat as a result of the settling of fine particles. • Cedar will establish designated equipment refueling areas and develop a spill response plan for construction. This will be incorporated into the CEMP. Maintain a designated area for refuelling to reduce the likelihood and spatial extent of potential fuel spills to the marine environment. • Pile installation in the intertidal zone for the FLNG facility strut mooring system will occur at lower tides to avoid in-water pile installation. Alternatively, Cedar may construct a cofferdam that allows the piles to be installed in the dry. Avoiding in-water pile installation will limit or eliminate underwater noise from this activity. • If the small craft jetty is required, an underwater noise monitoring plan (as part of the CEMP will be developed prior to construction to specify mitigation and monitoring measures for protection of marine mammals and fish during in-water pile driving. Pile driving for the small craft jetty will use vibratory methods to the extent possible. Where in-water impact pile driving is necessary, Cedar will use bubble curtains to mitigate underwater noise levels. Bubble curtains attenuate SPLs and can exclude fish from the work area. Bubble curtains are expected to reduce changes in marine fish and marine mammal behaviour caused by underwater noise generated by impact pile driving.	**Marine Resources (Section 7.7)** To prevent the introduction of contaminants and non-native species into the marine environment, all LNG carriers calling at the marine terminal will follow requirements for bilge and ballast water management and discharge under the *Canada Shipping Act*, 2001, Ballast Water Regulations, and will implement a vessel-specific Ballast Water Management Plan that complies with the International Convention for the Control and Management of Ship's Ballast Water and Sediments, 2017. Liquified natural gas carriers will be required carry a Ballast Water Management Certificate, meet a performance standard that limits the number of organisms capable of reproducing in order to reduce the risk of aquatic species invasions, record ballast water operation, and maintain a Ballast Water Record Book on board, and be subject to inspections in ports or offshore terminals to confirm compliance. As of September 8, 2017, new ships must meet the Ballast Water Management Convention D2 standard, which restricts the number and type of viable organisms per cubic metre of ballast water discharged. All ships must meet this standard by September 8, 2024; the standard will be implemented prior to the construction. All LNG carriers calling at the marine terminal will follow requirements for ballast water management and discharge under the Ballast Water Regulations and to implement an International Maritime Organization approved Ballast Water Management Plan. Liquified natural gas carriers will have segregated ballast on board that has been exchanged not less than 200 nautical miles from shore in waters at least 2,000 m deep, whenever possible, as described by the Ballast Water Management Procedures under the Ballast Water Regulations. Oily ballast water will not be discharged at the marine terminal and solid waste and liquid waste will be managed according to the *Canada Shipping Act*, 2001.

TABLE 11.5.6 CHANGES TO HAISLA NATION CONSUMPTION AND HARVEST

Description of Project Interaction(s) and Effect Pathway(s) Specific to Haisla Nation	Description of Project Interaction(s) and Effect Pathway(s) for Related Valued Components	Key Mitigation and Enhancement Measures for Related Valued Components[1]	Residual Effect(s) for Related Valued Components that Remain After Application of Mitigation
2013). Sea-otters were not hunted out of respect, and blackfish (orca) were not hunted because they are a crest animal (Powell 2013:21). In fact, no whale species were or are hunted by Haisla people (Powell 2013). The resource-rich intertidal zones of Haisla territory provide shellfish and other invertebrates, seaweed, and kelp that are of significant importance to Haisla Nation (Powell 2013:21). Haisla Nation may experience alteration to the quality of the harvesting experience, loss or alteration of preferred harvesting methods, locations, or opportunities, loss of time when harvesting, loss or alteration of access to preferred harvesting locations, and alteration of subsistence-based livelihoods and trade relationships with neighbouring Indigenous nations through changes to marine fish habitats used for spawning, rearing, feeding or migration by fish species, and changes to marine fish and marine mammal behaviour and mortality risk.	During construction and operation, project-related vessel traffic (i.e., LNG carriers, support tugs) could strike marine mammals resulting in potential injury or mortality.	• Lighting for the Project will be designed in a manner that is consistent with the OGC's Light Control Best Practices Guideline and will consider the following measures: (1) Directional or shielded lighting to reduce the vertical or horizontal distribution of light, and (2) Adaptive controls and variable lighting regimes (e.g., timers, dimmers, motion sensors). The use of task orientated lighting and hooded lamps limits the area and intensity of illumination surrounding near-water structures and vessels (LNG carriers, support vessels and tugs). Reduced light intensity and duration is expected to reduce changes in fish and marine mammal (seals and sea lions) behaviour associated with artificial light. • Water intakes will be located on the bottom east (offshore) side of the FLNG facility. Water depths in this area are approximately -60 m to -90 m chart datum. This will situate the intakes approximately 12 m below the surface, away from the shoreline, and above the seabed. These measures to mitigate injury or mortality of juvenile fish associated with entrainment and impingement. • Erosion protection and installation of the marine terminal piles within the intertidal zone will occur at lower tides to avoid in-water work. Alternatively, Cedar may construct a cofferdam that allows the work to be completed in isolation of fish-bearing waters. Installation of armouring and piles outside of the marine environment would eliminate injury and mortality risk in marine fish, and hearing injury risk in marine mammals (for pile installation). • If the small craft jetty is required, Cedar proposes to use a project-specific least risk work window of September 1 to February 15 for in-water work. Conducting in-water work during periods of lower fish presence will reduce the risk of interactions that may lead to injury or mortality. • If the small craft jetty is required, an underwater noise monitoring plan will be developed to specify mitigation and monitoring measures for protection of marine mammals and fish during pile driving. Pile driving will use vibratory methods to the extent possible. Where impact pile driving is necessary, Cedar will use bubble curtains to mitigate underwater noise levels. Impact pile driving will occur only during daylight hours. Bubble curtains attenuate SPLs and can exclude fish from the work area. The use of bubble curtains will reduce the area within which marine fish could be injured or killed or marine mammals could experience hearing injury, during impact pile driving	The Project is predicted to result in low to moderate magnitude residual effects on marine resources based on project phase. Adverse residual effects are expected to affect marine resources during construction (e.g., pile installation during the construction of marine-based infrastructure), operation (e.g., impingement or entrainment of the eggs and larvae of fish species at seawater intakes), and decommissioning (e.g. temporary increase in TSS levels during deconstruction of marine infrastructure). Residual effects during all project phases are expected due to noise emitted into the marine environment. The Project is not anticipated to result in a substantive adverse residual effect for marine resources because it is not predicted to threaten the long-term persistence or viability of species of management concern, or species of cultural or traditional importance.

NOTE:
[1] Additional information regarding the rationale for selection, the expected success, risks and uncertainty, and timing of proposed mitigation and enhancement measures specific to the valued components discussed can be found at the referenced Application chapters noted throughout this table.

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Characterization of Project Residual Effect

The application of the mitigation measures, including communication with marine communications and traffic services (MCTS), guidelines on reducing wake and wash, and the Marine Transportation Management Plan developed through Cedar's engagement with Haisla Nation will reduce the potential effects on Haisla Nation shoreline harvesters and marine fishers. However, adverse residual effects are anticipated on Haisla Nation consumption and harvest and, as identified in Table 11.5.6, on valued components related to Haisla Nation consumption and harvest within the marine shipping LAA.

Residual effects are anticipated to result in alteration to Haisla Nation harvesting experience due to project-related changes in noise and air quality within the marine shipping LAA and the marine terminal LAA.

Residual effects from marine vessel traffic and vessel generated wake waves within the marine shipping LAA and project activities and physical works within the marine terminal LAA are anticipated to result in alteration to Haisla Nation quality of the harvesting experience, loss or alteration of preferred harvesting methods, locations, or opportunities, loss of time when harvesting for Elders and community redistribution, loss or alteration of access to preferred harvesting locations, and alteration of subsistence-based livelihoods and trade relationships with neighbouring Indigenous nations.

The additional increase in large vessel movements within the marine shipping LAA attributable to the Project may prevent or reduce access to fishing or shoreline harvesting sites, which would disproportionately affect Haisla Nation members who heavily rely on the marine environment and its resources for food, social, ceremonial (FSC), economic, subsistence, and trade purposes. Project construction, operation, and decommissioning activities will result in the alteration of the quality and quantity of terrestrial wildlife, freshwater fish, and invertebrate habitat within Haisla territory.

If access to harvesting sites, hunting sites, fishing sites, trapping sites, and habitat sites for non-consumptive species, or the quality and quantity of resources and non-consumptive species is diminished, Haisla Nation culture, identity, mental health and physical health, and well-being may be impacted. Effects may be further disproportionately distributed as the effect may be experienced only by Haisla Nation members (i.e., subpopulations) that hold hereditary rights to harvest, hunt, fish, and trap (and manage) at discrete areas (i.e., *Wa'wais*) overlapping or in the vicinity of the marine shipping LAA or the marine terminal LAA, during their seasonal round.

Residual effects from construction of the marine terminal are anticipated to result in changes to abundance of traditional use plant species that are harvested by Haisla Nation, as well as changes in the abundance or condition of ecological communities of interest (i.e., ecological communities at risk and old forests); however, the Project Area is located on fee simple land owned by Haisla Nation and being developed for the purpose for which it was acquired.

Residual effects from marine terminal construction and marine shipping and transportation are anticipated to result in changes in wildlife habitat, movement and mortality risk. Terrestrial wildlife species (i.e., grizzly bear, moose, Pacific marten, bats, marbled murrelet, old and young forest songbird communities, western toad, coastal tailed frog, marine birds and shorebirds), are culturally important to Haisla Nation; these species are important for a variety of purposes, including FSC, economic, and/or non-consumptive purposes, and/or supporting their subsistence-based livelihood and trade relationships with neighboring Indigenous nations. However, the Project is not anticipated to cause or further contribute to the exceedance of a conservation-based threshold or threaten the long-term persistence or viability of species of management concern, or species of cultural or traditional importance.

Residual effects from marine terminal construction, operation, and construction vessel and other project-related vessel movements are anticipated to result in a change in behaviour and change in injury or mortality risk for marine fish and marine mammals due to underwater noise; marine fish and marine mammals are important for Haisla Nation FSC, economic, and other purposes, including non-consumptive purposes.

Residual effects from construction of the marine terminal are anticipated to result in changes to marine fish habitats used for spawning, rearing, feeding or migration by fish species that are important for Haisla Nation FSC, economic, and other purposes. However, no instream works, channel realignments, or water withdrawals in fish-bearing watercourses are expected to occur for land-based infrastructure construction, including access road and transmission line crossings. As a result, residual effects to culturally important fish health and mortality are not expected to occur.

Residual effects from marine terminal construction, operation, and decommissioning are anticipated to result in changes to water quality in marine areas frequented by pelagic and/or anadromous fish species that are important for Haisla Nation FSC, economic, and other purposes. However, potential residual effects to surface water quality will be managed through implementation of the CEMP, which will include guidelines, best management practices, and mitigation measures to limit project-related effects on surface water quality.

Residual effects on Haisla Nation consumption and harvest have been conservatively overestimated with consideration for the interconnectedness of the effect pathways that inform Haisla Nation consumption and harvest. As a result, the characterizations of residual effects on Haisla Nation consumption and harvest are ranked higher than the residual effects characterized for related valued components, specifically, duration, magnitude, and likelihood.

With the implementation of mitigation measures outlined in Table 11.5.5 and Table 11.5.6, residual effects on Haisla Nation consumption and harvest are anticipated to be long-term within the marine shipping LAA and marine terminal LAA due to increased marine vessel traffic and associated sensory disturbances, and habitat alteration that will occur through the operation and decommissioning phases. However, residual effects are largely considered reversible as they are primarily tied to project marine shipping traffic and associated effects. For example, temporary displacement of Haisla Nation fishing vessels and harvesters, wake waves, and behavioural changes for marine bird, mammal, and fish are reversible following the vessel's transit through the marine shipping LAA (i.e., after the vessel passes by, wake waves will cease, and harvesting and fishing activities can continue).

The frequency of the residual effects is intermittent and will vary according to project phase. Residual effects will occur as multiple irregular events during the construction and decommissions phases due to marine transport of construction materials, and residual effects will occur as multiple regular events during the operation phase because one LNG vessel is predicted to visit the Project every 7 to 10 days (up to approximately 50 vessels annually). The likelihood of residual effects occurring is characterized as high due to Haisla Nation existing travel, access, and harvesting activities within the marine shipping LAA and in the vicinity of the marine terminal LAA. Overall, residual effects on Haisla Nation consumption and harvest are anticipated to be moderate in magnitude. Sensory disturbances, both real and perceived, may further deter harvesters from accessing preferred areas within the marine shipping LAA and in the vicinity of the marine terminal LAA. However, the Project Area is located on fee simple land owned by Haisla Nation and being developed for the purpose for which it was acquired, and project activities will occur within an established shipping route where marine activities will be able to safely continue in a manner

that is generally consistent with existing conditions. The Project is not predicted to threaten the long-term persistence or viability of harvested resources.

11.5.6.2 CHANGES IN THE USE AND INTEGRITY OF SACRED AND CULTURALLY IMPORTANT SITES AND LANDSCAPE FEATURES

Haisla Nation have occupied their traditional territory for approximately 9,000 years (Haisla Nation 2021a; see Section 11.2.1). Haisla Nation's oral histories and ethnographic research suggest that the ancestors of the Haisla people migrated north, travelling along the coast to the mouth of the Kitimat River, to a location near Kitamaat Village during the early Holocene (Powell 2013). Haisla Nation traditional territory is comprised of matrilineal clan stewardship areas that are "owned" (and inherited) watersheds, called *wa'wais* (Powell 2013). There are 54 *wa'waises* in Haisla traditional territory (Barbetti and Powell 2005). The *wa'wais* owners inherit the responsibility to care for and maintain the area and all floral and faunal resources encompassed within; they determine who can access their *wa'wais* to hunt, fish, and engage in other cultural practices and are also obligated to "educate and retrain visitors in [their] territory" (Powell 2013:6). *Wa'wais* that are particularly rich in specific resources are known as *bagwaiyas; bagwaiyas* are shared by all Haisla people, regardless of clan affiliation. *Wa'wais and bagwaiyas* are integral to the Haisla Nation's stewardship and resource management initiatives (Powell 2013).

As described in Appendix 7.13-A of Section 7.13: Heritage, the Project including transmission line is within the *Yaksda Wa'wais (*inherited territory) (Powell 2013). Named places are locations on the modern landscape that have been identified by Indigenous people as having an associated name often ascribing the nature of past land use or cultural practice by past and contemporary peoples at that location. Culturally named places identified by Powell (2006, 2013) in proximity to the Project Area can denote both tangible and intangible aspects of cultural heritage on the landscape. *Yaksda*, which takes its name from Moore Creek, was on the west side of the lower reaches of Kitimat River and the Alcan Site, along Moore and Anderson Creeks. Anderson Creek is called *Kwoxwp'iga* 'the platter fungus that grows on tree trunks' or *Sexemas* 'sawbill duck place". *Kwengad,* referring to a waterfall historically known as Frog Falls, is near the west shoreline of Kitimat Arm approximately 200 m south of the proposed marine terminal facility component of the Project. *Kwengad* marks the boundary of the traditional Haisla stewardship areas of *Wo'exdu* and *Yaksda* (Powell 2011). Here, food resources were collected, including fish, birds, mammals, and plants. This area was also important for traditional cultural activities (Barbette and Powell 2005; Powell 2006, 2011, 2013).

There are several other named places within *Yaksda*, including *Paxw*, a location of one of Haisla's permanent, main villages according to oral histories; Monumental Rock, which was a rock where young men were reportedly taught lessons during their transition to adulthood and relates to much storytelling and folklore; and *Qelxat'sinuxw*, between Moore and Anderson Creek, which is an area associated with shamanic activities according to a Haisla story, a pond where red and yellow cedar bark would be soaked, and a trapline (611T007) (Powell 20016, 2011, 2013; see Appendix 7.13-A of Section 7.13: Heritage). *Gel'wanuxw* "canoe", is the name of the ridge extending up towards Bish Creek from Frog Falls, which was used as a resource procurement calendar to track the setting sun from the southern nub *wa'ni* "herring" to the northern nub *zaxwan* "oolichan" (Powell 2013).

Numerous archaeological sites have been recorded in the vicinity of the Project Area, including CMTs shell middens, lithic scatters, burials, pictographs, petroglyphs, and village sites; these sites are considered to be sacred and/or culturally important sites or landscape features for Haisla Nation.

Haisla Nation continue to develop their traditional economy centered on subsistence gathering activities and associated seasonal mobility pattern, often termed a seasonal round. Haisla Nation oral traditions and laws describe the necessity for Haisla Nation members to "live to the rhythm of [their] annual cycle" and describes monthly activities (Barbetti and Powell 2005:73; see Section 11.1.6.4). The importance of coastal ecosystem resources to Haisla Nation continues today. Haisla Nation's use of, and relationship to, their territory is maintained through traditional subsistence activities of hunting and gathering, and cultural practices such as trading, potlatch, and spiritual ceremonies (Haisla Nation 2021a). Large mammals, including black bear, moose, deer, mountain goat, wolf, wolverine, and grizzly bear occupy the terrestrial environments of Haisla territory, and have significant subsistence and spiritual values for Haisla Nation (Powell 2013); hunting sites and areas with the opportunity to observe these species are therefore considered culturally important to Haisla Nation. Traditional use plant harvesting sites are also considered culturally important to Haisla Nation (i.e., food and medicinal plants).

The HNC offers Eco-Cultural Tourism Programs to support Haisla cultural programming and learning, and to help Haisla Nation members experience on-the-land cultural education (Haisla Nation 2020; see Section 11.1.6.2). Harvesting sites, fishing sites, and hunting or trapping sites are considered culturally important to Haisla Nation as they allow opportunities for Haisla Nation to share traditional knowledge and experience on-the-land cultural education.

Project Pathways

All phases of the Project (construction, operation and decommissioning) have the potential to affect to Haisla Nation use and integrity of sacred and culturally important sites and landscape features. Changes to Haisla Nation interests related to the use and integrity of sacred and culturally important sites and landscape features could result through the following pathways:

- Loss or alteration of use or access to sacred and culturally important sites and landscape features due to increased marine vessel traffic in the shipping LAA and RAA, associated wake waves, and sensory disturbances (Section 7.3 Acoustic and Section 7.10 Marine Use).
- Loss or alteration of use and access to sacred and culturally important sites and landscape features due to construction of the marine terminal and linear components (i.e., the transmission line) (Section 7.4 Vegetation Resources [assessed for traditional use plants], Section 7.5 Wildlife [assessed for moose, grizzly bear, and marine birds], Section 7.13 Heritage)
- Loss or alteration of ability to share traditional knowledge at sacred and culturally important sites and landscape features due to increased marine vessel traffic in the shipping LAA and RAA, including associated wake waves, sensory disturbances (Section 7.3 Acoustic and Section 7.10 Marine Use), and change in air quality (Section 7.12 Human Health).
- Loss or alteration of ability to share traditional knowledge at sacred and culturally important sites and landscape features due to construction of the marine terminal and linear components (i.e., the transmission line) (Section 7.4 Vegetation Resources [assessed for traditional use plants], Section 7.5 Wildlife [assessed for moose, grizzly bear, and marine birds], Section 7.13 Heritage) and due to change in air quality (Sections 7.2 Air Quality and 7.12 Human Health).

- Reduced quality of experience at sacred and culturally important sites and landscape features as a result of sensory disturbance due to increased marine vessel traffic in the shipping LAA and RAA, including associated wake waves, sensory disturbances (Section 7.3 Acoustic and Section 7.10: Marine Use), and change in air quality (Section 7.2 Air Quality and Section 7.12 Human Health).
- Reduced quality of experience at sacred and culturally important sites and landscape features due to construction of the marine terminal and linear components (i.e., the transmission line) (Section 7.4 Vegetation Resources [assessed for traditional use plants], Section 7.5 Wildlife [assessed for moose, grizzly bear, and marine birds], Section 7.13 Heritage) and change in air quality (Section 7.2 Air Quality and Section 7.12 Human Health).

Project Residual Effect

The anticipated project interactions and the key mitigation and enhancement measures to reduce or enhance resulting effects, and the remaining residual effects for valued components related to Haisla Nation use and integrity of sacred and culturally important sites and landscape features that remain are described in Table 11.5.7. This information is presented in Table 11.5.7 to transparently inform the assessment of residual effects on changes in use and integrity of sacred and culturally important sites and landscape features. Residual effects are characterized specifically for changes in the use and integrity of sacred and culturally important sites and landscape features following Table 11.5.7.

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TABLE 11.5.7 CHANGES TO HAISLA NATION USE AND INTEGRITY OF SACRED AND CULTURALLY IMPORTANT SITES AND LANDSCAPE FEATURES

Description of Project Interaction(s) and Effect Pathway(s) Specific to Haisla Nation	Description of Project Interaction(s) and Effect Pathway(s) for Related Valued Components	Key Mitigation and Enhancement Measures[1]	Residual Effect(s) that Remain After Application of Mitigation
Haisla Nation have occupied their traditional territory for approximately 9,000 years (Haisla Nation 2021a). The numerous heritage (i.e., archaeological) sites in Haisla territory demonstrate the Nation's longstanding occupation and use of their lands and waters. The large 1,800-year-old fish weir complex that was recently identified during archaeological survey in Minette Bay is an impressive example of Haisla Nation pre-contact engineering and sustainable fish harvesting practices (Freeland 2019). Haisla Nation may experience **loss or alteration of use or access to sacred and cultural sites, loss or alteration of ability to share traditional knowledge at sacred and cultural sites**, and **reduced quality of experience due** at sacred and culturally important sites and landscape features in the vicinity of the marine terminal LAA.	**Heritage (Section 7.13)** There are seven heritage sites recorded in the heritage LAA and RAA. Potential effects on identified sites resulting from the Project will be mitigated in accordance with applicable heritage legislation and the project CEMP. Construction will involve tree clearing and ground disturbing activities that could disturb or destroy heritage resources, which could result in the loss of information about, or alteration to, Haisla Nation heritage (i.e., archaeological) site contents or context; Haisla Nation heritage sites comprised sacred sites, culturally important sites, and landscape features.	**Heritage (Section 7.13)** • Avoidance. Where feasible, based on environmental, geophysical and engineering considerations, Cedar will avoid known heritage sites when siting project infrastructure. This may involve archaeological monitoring during construction in the immediate vicinity of known sites as determined by Ministry of Forests, Lands, Natural Resource Operations and Rural Development and developed in collaboration with the Haisla Nation. • Consultation with Haisla Nation. If avoidance of heritage sites is not feasible, Cedar will consult with Haisla Nation on any CMT sites that may be removed by clearing work and any surface/subsurface heritage sites that may be disturbed by construction. Any additional mitigation determined through consultation with Haisla Nation will be implemented. • Systematic Data Recovery. If avoidance of heritage sties is not feasible or a chance find site require alteration or disturbance, Cedar will obtain a *Heritage Conservation Act* section 12.4 alteration permit and complete systematic data recovery for any: (1) CMT sites that will be removed by clearing work, (2) Systematic data recovery may involve collection and dating of CMT stem round samples, (3) Surface/subsurface heritage sites that will be disturbed by construction, and (4) Systematic data recovery may involve additional field investigation, surface collection, and/or controlled excavation. • Chance Find Procedure. Cedar will work with Haisla Nation to develop and implement of a project-specific chance find procedure for heritage resources. This procedure will be included as part of the CEMP. Any archaeological inspection or investigation work required to assess a potential chance find will be executed under the authority of a *Heritage Conservation Act* permit and follow methods reviewed by the Archaeology Branch and Haisla Nation.	**Heritage (Section 7.13)** There are no formal thresholds for determining the value of heritage resources as a single, comprehensive valued component. Instead, site-specific evaluation is conducted. Cedar has committed to avoidance or mitigation of all known heritage sites and will implement the CEMP chance find procedure should a site be identified during construction. Although engagement and traditional knowledge and traditional use studies did not identify any site-specific concerns related to heritage resources, Haisla Nation may have special interests and concerns regarding cultural heritage beyond the authority of Ministry of Forests, Lands, Natural Resource Operations and Rural Development. Loss of information from heritage resource sites affected by the Project could hinder the reconstruction of past human activities at the site-specific level and at the level of broader cultural and temporal reconstruction. Cedar has committed to developing avoidance and/or mitigation strategies in collaboration with the Haisla Nation for any known heritage sites affected by the Project. Indigenous concerns identified during the engagement process are also considered by Ministry of Forests, Lands, Natural Resource Operations and Rural Development relative to site-specific mitigation, as part of their evaluation of heritage value. Cedar commits to fulfilling all requirements for field assessment and mitigation required by the Project under the *Heritage Conservation Act and Land Act*. With this commitment and with project-specific avoidance or mitigation of known or chance find sites having heritage value, as specified by Ministry of Forests, Lands, Natural Resource Operations and Rural Development and/or Haisla Nation, and with the implementation of the CEMP and chance find procedure, the Project is not anticipated to have residual effects on heritage resources as a valued component.
Harvesting sites, fishing sites, and hunting or trapping sites are considered culturally important to Haisla Nation as they allow opportunities for Haisla Nation to share traditional knowledge and experience on-the-land cultural education. Haisla Nation rely on uninterrupted use of and access to their sacred and culturally important sites (includes harvesting sites) and landscape features for Nation members' physical and mental health, well-being, cultural identity, and cultural practices; alteration of use of sacred and culturally important sites and landscape features may occur through a change in navigation, sense of safety, and quality of experience (e.g., sensory, aesthetic).	**Air Quality (Section 7.2), Acoustic (Section 7.3) and Human Health and Human Health (Section 7.12)** Operable pathways for emissions and noise may result in effects on human health. Inhalation exposures to COPC in ambient air during the construction, operation and decommissioning phases of the Project could contribute to potential changes in human health risk in the vicinity of the marine terminal LAA and the within the marine shipping LAA (due to marine vessel traffic). The change to human health from these pathways is generally a function of the person's proximity to the marine shipping LAA and the marine terminal LAA (due to dispersion of air emissions and the duration of the exposure). Project-related changes to the quality (i.e., chemical content) of air, soil, sediment, water, and biota can result in changes in human exposure to chemicals of potential concern along the marine shipping LAA (i.e., sulfur dioxide and nitrogen dioxide). Project-related changes to levels of noise (i.e., %HA and sleep disturbance) can result in changes in human exposure and subsequent health effects along the marine shipping LAA.	**Air Quality (Section 7.2), Acoustic (Section 7.3) and Human Health (Section 7.12)** • Shipping emissions result in predicted nitrogen dioxide and sulphur dioxide concentrations well below applicable regulatory criteria along the shipping route and do not persist in any location due the motion of the LNG carriers and tugboats. • Use of electricity power from the BC Hydro grid for the facility during operation. The use of electricity power from the BC Hydro grid eliminates the need to produce power onsite from gas-fired turbines and associated emissions. • Diesel fired equipment used during construction (vehicles and equipment) and during operation (emergency power generators) will be powered by low sulphur fuel. The use of low sulphur diesel fuel will reduce emissions of SO_2. • Noise emissions onsite are reduced during the construction phase as the FLNG facility is being constructed overseas and towed to site, instead of constructed onsite. • The decision to electrify the Project from the BC Hydro grid during operation reduces noise effects as electric equipment is generally quieter. • Nearby residents (i.e., within 3 km of activities) will be notified in advance of planned high disturbance noise-causing activities at the Project Area (i.e., pile driving). Provide notification to the closest residents to reduce annoyance.	**Air Quality (Section 7.2), Acoustic (Section 7.3), and Human Health (Section 7.12)** Residual effects of emissions and noise on human health (and quality of harvesting experience) due to project construction and operation (including shipping) are anticipated. Shipping emissions result in predicted nitrogen dioxide and sulphur dioxide concentrations well below applicable regulatory criteria along the shipping route and do not persist in any location due the motion of the LNG carriers and tugboats. Maximum nitrogen dioxide concentrations occur under adverse meteorological conditions which occur infrequently. During most frequent meteorological conditions, predicted concentrations are lower and the plume travel away from locations frequented by people (i.e., Hecate Strait, elevated terrain). The magnitude of residual effect on air quality as a result shipping associated with the Project is negligible (i.e., no measurable change). The extent of residual effects is limited to within the shipping air quality LAA and RAA and to the vicinity of the LNG carrier and tugboats (Section 7.2).

TABLE 11.5.7 CHANGES TO HAISLA NATION USE AND INTEGRITY OF SACRED AND CULTURALLY IMPORTANT SITES AND LANDSCAPE FEATURES

Description of Project Interaction(s) and Effect Pathway(s) Specific to Haisla Nation	Description of Project Interaction(s) and Effect Pathway(s) for Related Valued Components	Key Mitigation and Enhancement Measures[1]	Residual Effect(s) that Remain After Application of Mitigation
Haisla Nation share cultural knowledge and gain experience through direct interaction with their territory, including sacred and culturally important sites and landscape features; these sites are often visited when Haisla Nation are harvesting resources (i.e., marine fishing sites, wildlife hunting sites, traditional use plant sites), travelling to visit neighboring communities, and in preparation for Nation events (feasts, potlatches, and other ceremonies). As described in Section 11.2, Haisla Nation hunt and consider the following terrestrial wildlife species to be of spiritual importance: black bear, moose, deer, mountain goat, wolf, wolverine, grizzly bear. Haisla Nation also hunt migratory waterfowl along the flats and mouths of rivers (see Section 11.2). Seagull eggs are collected from rocky nesting sites, and other bird species are hunted for feathers and materials for tool and jewelry production (e.g., bird bones). Haisla Nation ability to hunt, observe, or share traditional knowledge about grizzly bear, moose, and migratory (i.e., marine birds) may be affected by project activities. Haisla Nation require a consistent quality of experience (i.e., predictable noise, light, and air quality) at sacred and culturally important sites, and landscape features, free of sensory disturbances. **Loss or alteration of Haisla Nation ability to share traditional knowledge at sacred and cultural sites** may occur through a change in navigation, sense of safety, and quality of experience (e.g., sensory, aesthetic) in the vicinity of the marine terminal LAA.		• Fit gas or diesel engine exhausts with noise mufflers, where available. Turn off equipment when not in use to minimize idling (where appropriate). Reduce exhaust noise from gas or diesel mobile equipment and therefore, reduce the magnitude of increase in noise levels. • Where possible quieter equipment will be prioritized over louder equipment (e.g., vibratory or drill pilling over impact pilling and rubber-wheeled equipment over steel-tracked equipment or electrified over gas/diesel powered). Reduce noise from equipment and therefore, reduce the magnitude of increase in noise levels. • Carry out noisy fabrication work at another site (e.g., within enclosed factory premises) and then transport products to the project site (as appropriate). Reduce noise from equipment and therefore, reduce the magnitude of increase in noise levels. • Noise ratings of construction and operation equipment are based on acoustic specifications of equipment (e.g., refrigerant compressor, process cooler) and will be considered in the procurement process. Noise ratings of construction and operation equipment are based on acoustic specifications of equipment (e.g., refrigerant compressor, process cooler) and will be considered in the procurement process. • Noise effects of the project site and shipping activities will comply with federal and provincial noise guidance.	Overall, the direction of change to human health is adverse for all phases of the Project. The magnitude of effect is low for all phases of the Project. The spatial extent of the residual effects is within the marine shipping LAA and the marine terminal LAA for their respective types of effects (air quality or noise effects). The duration of effect is long-term because all phases of the Project last more than one year. The effects are reversible for all phases of the Project because COPC emissions to the air and noise emissions stop after the Project is completed. The frequency of the effect is continuous over the life of the Project. There is a disproportionate distribution of effects to the subpopulation of residents living closest to the Project Area (i.e., in vicinity of marine terminal LAA) because the effects are typically associated with proximity to the Project's source of air emissions or noise. Overall, the human health risks have been overestimated because the predictive modelling techniques used in the CALPUFF air dispersion model and noise acoustic model are conservative (e.g., applying worst case scenarios), in addition, the methods used in the HHRA are also inherently conservative (e.g., applying TRVs that are protective of sensitive people). Given these characterizations, and the overestimation of risk associated with human health, the likelihood of residual effects on human health is low. No substantive adverse residual effect for human health (and quality of harvesting experience) is predicted because the predicted change to human health is less than the key residual effects threshold.
	Marine Use (Section 7.10) Construction and operation activities within the marine terminal LAA may affect the ability of Haisla commercial and recreational marine vessels to navigate at the head of Kitimat Arm and may result in a change in noise and light levels, which may affect marine fisheries and the quality of the experience for marine users in the vicinity of the marine terminal LAA. Wake waves generated by LNG carriers and escort tugs, if large enough, may result in a safety risk to fishers, shoreline harvesters and recreationalists or in an interference or displacement to shoreline harvesting activities or other marine use activities. During construction, the method of transporting materials to and from the Project Area will be dictated by practicality. It is anticipated that the Project will employ a combination of marine and land-based transportation modes. Marine access using existing shipping routes will be the primary transport means for major project components (e.g., FLNG facility, struts). The effect of marine transport of construction materials to the site on the change in marine navigation will be short term (only occur during the construction phase of the Project). During peak construction, the number of barge and project-related vessel movements could be in the range of two movements per week (up to eight per month). Vessels used during the construction phase will be similar to the types of vessels already present in the port of Kitimat. An increase in marine vessel traffic during project construction and decommissioning (e.g., construction vessels) and operation (e.g., LNG carriers and escort tugs) may interfere with Haisla fishing vessels engaged in salmon fishing activities along the marine shipping route, which could result in lost fishing time (up to one hour of fishing every 7 to 10 days) if the gear type used needs to be pulled in and reset (e.g., gillnets, seines). An increase in shipping traffic may interfere with Haisla fishing vessels engaged in, and	**Marine Use (Section 7.10)** • Regular communication of project activities with Haisla marine users will be undertaken. Cedar will provide project updates provided using appropriate engagement methods and media outlets (e.g., online notifications, newspaper, VHF broadcasts through the MCTS) will give marine users advanced notice of the Project's marine shipping activities. • Project LNG carriers will use the Canadian Coast Guard's MCTS to provide notice of planned vessel arrival time at Triple Islands. Updates provided using VHF broadcasts through the MCTS will give marine users advanced notice of the Project's marine shipping activities. • Cedar will establish LNG carrier shipping schedule notification processes for Indigenous Nations with traditional territories overlapping the shipping route. Engagement with Indigenous communities in the development of a marine shipping notification process will promote the use of methods of notification that facilitate the process for both Cedar and Indigenous communities. • Cedar will establish methods of initiating safety zones around the marine terminal during operation. The safety zone will increase safety by reducing the risk to other mariners, associated with LNG loading and other terminal operation. • Cedar will use escort tugs between Triple Islands and Kitimat during LNG carrier transits and to assist with berthing and de-berthing/departure. The use of escort tugs will assist in mitigating drift and powered grounding and with provide more maneuverability if required to avoids collisions and during and speed control of the LNG carriers berthing, thus reducing the likelihood of collision or other adverse interaction with other maritime traffic.	**Marine Use (Section 7.10)** The Project will follow the draft North Coast Waterway Management Guidelines' (2021) recommendations regarding vessel speed and position to minimize its wash and wake effects when fishing, harvesting, or recreational activities are occurring. Waves created by the movement of vessels, are distinct from wind-driven waves and are capable of reaching shorelines that are usually protected from natural waves. However, the shoreline along the Project's marine shipping route, which will be exposed to wake from LNG carriers and their escort tugs, is an exposed shoreline that is currently subject to natural wave action, including storm waves. Based on previous wake studies conducted in the region, the height of wake waves generated by large liquid bulk carriers and tugs, when operating under normal conditions, will be within the range of natural wave conditions and will be less severe than some waves created naturally by weather. Wave heights from LNG carriers are estimated to be in the order of 0.1 m within the shore region (based on travelling at speeds up to 16 knots), while tugs are estimated to generate 0.2 to 0.3 m at the shoreline (based on travelling at speeds from 12 to 16 knots). Considering that the Project's LNG carriers will be relatively infrequent (1 return trip every 7 to 10 days), and because the wake waves will be within the range of naturally generated waves, due to the reduced speeds of the LNG carriers, there is a small probability that shoreline harvesters will be affected by project-related shipping traffic. Project-related shipping traffic will not introduce any new, previously unassessed, wave effects. The additional increase in large vessel movements in the port and along the marine shipping route attributable to the Project may prevent or reduce access to fishing or shoreline harvesting sites, which would disproportionately affect Indigenous communities, who heavily rely on the marine environment and its resources for FSC purposes and for other purposes (e.g., cultural, spiritual, trade). If access to harvesting sites or the quality and quantity of resources available is diminished, Indigenous Nations' culture, identity, and well-being may be affected. The application

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Haisla Nation may experience **loss or alteration of use or access to sacred and cultural sites, loss or alteration of ability to share traditional knowledge at sacred and cultural sites**, and **reduced quality of experience due** to increased marine vessel traffic in the marine shipping LAA and associated change in navigation, sense of safety, and sensory disturbance (e.g., noise).	equipment used for, halibut (and other groundfish) fishing activities along the marine shipping route. Gear types used that are passively fished (i.e., they are deployed and left unattended), such as long lines, may become entangle in the propeller of an LNG carrier or escort tug as they can be difficult for large vessels to locate or they may drift from their original locations. This could result in lost fishing time (up to one hour of fishing ever 7 to 10 days) if the gear type used needs to be pulled in and reset or is destroyed (e.g., long lines). During the operation phase, visits to the FLNG facility will occur at regular intervals (up to approximately 50 vessel calls per year) for up to 40 years, but will not be permanent fixtures in Kitimat Arm. In consideration of all large vessel movements in the marine shipping LAA, including piloted vessels, ferry traffic, and cruise ship traffic (see Section 7.10.7.2), the Project will increase large vessel movements within the marine shipping LAA by 15.7% annually.	• LNG carriers will adhere to the prescribed route and passing restrictions. This mitigation will decrease the potential for interaction between the Project's marine traffic and other marine users as LNG carriers will be adhering to a well-established marine shipping route and reduce the potential for collisions by following the passing restrictions described in previous technical review process of marine systems and transshipment sites (TERMPOL) studies and in the draft North Coast Waterways Management Guidelines. • LNG carriers will maintain safe operating distances from other marine craft. This mitigation will decrease the potential for interaction between the Project's marine traffic and other marine users as LNG carriers will be adhering to a well-established marine shipping route and follow the Collision Regulations as set out in the Canada Shipping Act. Cedar will follow reduce the potential for collisions by following the safe operating distances and passing restrictions described in previous TERMPOL studies and in the draft North Coast Waterways Management Guidelines. • LNG carriers will maintain safe speeds as described in Rule 6 of the Collision Regulations. When implemented, Cedar will follow the draft North Coast Waterway Management Guidelines' recommendations regarding vessel speed and position. The vessel Master and pilots will use their expertise to navigate the carrier at a safe operating speed as defined in the Collision Regulations, by following and in the draft North Coast Waterway Management Guidelines' (when implemented) recommendations regarding vessel speed and position., the Project will minimize its wash and wake effects on marine users. • Cedar will develop and implement a Marine Transportation Management Plan (MTMMP), in accordance with applicable federal and provincial legislation and regulations, to communicate project construction activities to other marine users. The MTMMP will include safety measures, communication protocols and recommended monitoring metrics designed to improve safe shipping and enhance communications between the Project's marine activities and other mariners. As development of the plan will likely involve engagement with DFO, Transport Canada, CCG, District of Kitimat, Pacific Pilotage Authority, and Indigenous Groups, it will include measures and communication protocols that are supported by regulatory agencies and marine users, increasing the likelihood that it will minimize effects.	of the mitigation measures, including communication with MCTS and following the guidelines on reducing wake and wash, as outlined in the draft North Coast Waterways Management Guidelines, will reduce the potential residual effects on shoreline harvesters. Substantial adverse residual effects to marine use are not anticipated, as the Project is not expected to contravene established marine use plans or policies or create a change or disruption that widely restricts or degrades present marine uses to a point where activities cannot continue at current levels. Effects on marine navigation and marine fisheries and other uses from the construction, operation, and decommissioning of the Project will result in low residual effects. Construction, operation, and decommissioning will result in an increase in new in-water infrastructure in Kitimat Arm and an increase in project-related vessel traffic along the Project's marine shipping route; however, the magnitude of adverse residual effects is low. These adverse residual effects will be limited to the LAA, short- to medium-term in duration, occur at multiple irregular events during the construction and decommissioning phases and occur at multiple regular events or continuously throughout the operation phase, and have a disproportionate effect on Indigenous Nations that heavily rely on the marine environment and its resources for FSC purposes and for other purposes, including spiritual and economic development. The adverse residual effects will be reversible upon completion of the Project. The port of Kitimat is a private port that has a long history of industrial development. Kitimat has continued to manage large industrial vessel traffic since the beginning of its industrial development in the 1950s (Tourism Kitimat 2021b). The socio-economic context in which residual effects have been assessed includes a local marine use environment that has been influenced by other major projects including, but not limited to, the Eurocan pulp and paper plant, the Ocelot Methanol Plant (now known as Methanex), and LNG Canada. It is expected that government agencies, such as Transport Canada and the Canadian Coast Guard, will continue to maintain the high safety standards in the adjacent waters of the Project. Given the experience of the port of Kitimat and other government agencies involved in maintaining navigable waters, the existing conditions, and the proposed mitigations listed in Table 7.10.13, there is low likelihood of residual effects for change in marine navigation as adverse interactions between the Project and marine navigation can largely be avoided or mitigated.

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	Vegetation Resources (Section 7.4) Vegetation clearing of the project footprint during site preparation of the construction phase has potential to change the abundance of plant species of interest. Specifically, vegetation clearing can remove traditional use plants. As noted earlier, no plant species at risk were identified in the project footprint; therefore, there is no project pathway to change the abundance of plant species at risk. Vehicle and equipment use in the construction phase (primarily), operation phase, and decommissioning phase, have the potential to increase the abundance of invasive plants. Invasive plant species are considered to be a management concern because they can decrease biodiversity in the area, affect ecosystem structure and functions, and can have economic impacts (e.g., cost to manage invasive plant species). Vehicle and equipment use may also cause edge effects to traditional use plants adjacent to the project footprint (Section 7.4). Vegetation clearing in the project footprint during site preparation of the construction phase can reduce the abundance of ecological communities of interest. The condition of ecological communities could also be affected due to edge effects, including, but not limited to, changes in temperature (air and soil), light conditions, soil moisture and nutrients, plant competition (particularly from invasive plants), and pathogens and/or windthrow (the fall/overthrow of trees due to wind). These edge effects could extend out to the marine terminal LAA (i.e., up to 120 m from the edge of the project footprint) (Section 7.4). Vegetation clearing in the project footprint during site preparation of the construction phase can cause an adverse change in wetland functions, including hydrological, biogeochemical, and habitat functions. In addition, wetland functions may be affected due to edge effects, including, but not limited to, changes in temperature (air and soil), light conditions, hydrology, soil moisture and nutrients, plant competition (particularly from invasive plants), and pathogens and/or windthrow. These edge effects could extend out to the marine terminal LAA (i.e., up to 120 m from the edge of the project footprint) (Section 7.4). Emissions during pre-treatment and liquefaction of natural gas and storage and offloading of LNG at the FLNG facility during the operation phase have the potential to affect vegetation health and diversity through: • Increased sulphur dioxide and nitrogen dioxide air concentrations (direct effect) • Sulphate and acid deposition (indirect effects of soil acidification) • Nitrogen deposition (direct and indirect effects of eutrophication) These effects are expected to occur within the vegetation resources air emissions LAA.	**Vegetation Resources (Section 7.4)** • Clearing boundaries will be delineated prior to site preparation to keep clearing activities within the designated project footprint. This may be via physical flagging or electronic delineation where appropriate. This mitigation measure provides a physical marker of where construction activities may occur. • Standard best practices to prevent and control the spread of invasive plants will be incorporated into the Project's CEMP. Where invasive species have been discovered onsite, action will be implemented for controlling them. Invasive plant management to prevent and control the spread or introduction of invasive species reduces the increase of invasive species in the marine terminal LAA and reduces the indirect effects to native plant communities. • Any temporary workspace on Crown land will be subject to natural revegetation or active reclamation, as per measures stated in the CEMP. Reclamation on private property will follow requirements of the lease agreements with the owner(s). Reclaiming temporary workspaces as soon as practicable will use best management practices such as purchasing seed for reclamation activities that is certified weed-free, which reduces the chance that invasive species will be introduced through reclamation activities. Reclamation of temporary workspaces will reduce erosion and therefore soil loss. This reduces loss of native plant communities. • If requested by Haisla Nation, traditional use plants will be incorporated into reclamation planning for temporary construction areas on Crown land (if required). The incorporation of traditional use plants in the reclamation of temporary construction areas or compensation areas reduces long-term loss of these species in the marine terminal LAA and RAA. • Cedar will locate natural gas pre-treatment and liquefaction equipment and LNG storage on the FLNG facility. This mitigation measure reduces clearing and construction activities in vegetated areas. • Cedar will incorporate erosion and sediment control best practices into the CEMP to manage surface water and avoid sedimentation in sensitive vegetation communities. Surface sediment and erosion control measures reduce effects from either erosion or sedimentation into ecological communities adjacent to the project footprint. This mitigation measure would help protect ecological communities at risk and water quality and hydrology in adjacent wetlands. • Cedar will implement windthrow management strategies such as edge stabilization techniques in areas of old growth forest on Crown land. This mitigation measure will reduce the edge effect of windthrow on ecological communities of interest. • During detailed design, Cedar will work with the engineering team to reduce impacts to wetlands. This mitigation measure will avoid wetland where possible (e.g., along the transmission line right-of-way and access roads) and where wetland occurs adjacent to project clearing activities, reducing loss of wetland functions. Cedar will undertake the following mitigation to avoid or reduce change in native vegetation health and diversity due to air emissions: • Manage vehicle and equipment emissions by conducting regular maintenance. Conducting regular maintenance leads to reliable equipment operability, prolonged lifetime of equipment, good fuel efficiency, and adequate combustion (limited incomplete combustion).	**Vegetation Resources (Section 7.4)** With the proposed mitigation measures in place, the Project is anticipated to have low magnitude adverse residual effects on vegetation resources associated with construction, operation and decommissioning activities of the marine terminal and supporting infrastructure (land-based) and transmission line (right-of-way and access roads). Although measurable changes of plants and ecological communities of interest, wetland functions, and native vegetation health and diversity (due to air emissions) are predicted from existing conditions, the regional extent of these parameters are sufficient to sustain the affected species and communities without active management. Potential adverse effects associated with these losses due to the transmission line will be reversible and effects associated with the marine terminal and supporting infrastructure (land-based) will be irreversible because the project footprint will be decommissioned to support future uses. Potential adverse effects associated with sulphur dioxide emissions are reversible; however, soil acidification effects (should they occur) may be irreversible following operation. Although there is high confidence in the reliability of site specific and regional information collected in support of this effects assessment, there is moderate confidence, overall, given the uncertainty of the actual vegetation responses to air emissions over the 40-year operation phase. No substantive adverse residual effect for vegetation resources is predicted because following the application of avoidance and mitigation measures, the long-term viability of plants and ecological communities of interest, including those of cultural or traditional importance, will persist in the marine terminal LAA and RAA and there will be no loss of wetland functions of ecologically important wetland.

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		• Use of electricity power from the BC Hydro grid for the facility during operation. The use of electricity power from the BC Hydro grid eliminates the need to produce power onsite from gas-fired turbines and associated emissions. • Diesel fired equipment used during construction (vehicles and equipment) and during operation (emergency power generators) will be powered by low sulphur fuel. The use of low sulphur diesel fuel will reduce emissions of sulphur dioxide.	
	Wildlife (Section 7.5) Project activities during construction, operation, and decommissioning are expected to change wildlife habitat, directly and indirectly, within the marine terminal LAA and marine shipping LAA. Site preparation and clearing and construction of land-based infrastructure is expected to change habitat for terrestrial wildlife through direct removal or alteration (e.g., from a treed state to a shrub state) of vegetation. Indirect effects (e.g., noise, vibration, human activity) during these activities are expected to cause wildlife to avoid or have reduced use of otherwise suitable habitat proximal to the Project. Removal of vegetated beachland (rocks, pebbles, sand) and intertidal habitat near the marine terminal LAA will result in direct effects to shoreline habitat for certain marine bird species. Increased vehicle traffic during construction could also result in a change in habitat suitability near project travel routes. Construction of marine-based infrastructure and marine transport of construction materials to the site is expected to change habitat for marine birds that use shoreline habitats and nearshore waters. Indirect effects during these activities could also change habitat suitability for marine birds if they avoid the area due to sensory disturbance (e.g., lighting and noise). Activities such as pile driving are known to disturb some species of marine birds, including marbled murrelet. Project activities during operation are expected to result in indirect effects that could change habitat for terrestrial wildlife and marine birds. Sensory disturbance (e.g., noise, lighting) from the pre-treatment and liquefaction of natural gas and storage and offloading of LNG at the FLNG facility as well as LNG carrier loading and infrastructure maintenance may change habitat suitability for terrestrial wildlife and marine birds. Vehicle traffic during operation could also result in sensory disturbance to terrestrial wildlife. Marine shipping and transportation will consist of an LNG carrier visiting the FLNG facility every 7 to 10 days and is expected to change habitat suitability for marine birds along the shipping route and near the FLNG facility when a carrier is in motion. Habitat suitability for marine birds is expected to change while LNG carriers are moving within or near habitat occupied by marine birds through reduced foraging opportunities and displacement.	**Wildlife (Section 7.5)** • Cedar will locate natural gas pre-treatment and liquefaction equipment and LNG storage on the FLNG facility. • Clearing boundaries will be delineated prior to site preparation to keep clearing activities within the designated project footprint. This may be via physical flagging or electronic delineation, where appropriate. This mitigation measure provides a marker of the permitted clearing boundary to reduce the potential for accidental clearing of vegetated areas and resulting impediment of wildlife movement and risk of injury or mortality of wildlife beyond the designated project footprint. • Grubbing and grading should be limited within 30 m of watercourses known to be occupied by coastal tailed frog at all times of the year. If grubbing or grading cannot be avoided within 30 m of a watercourse known to be occupied by coastal tailed frog, additional measures may be specified by an environmental monitor (e.g., additional sediment control measures, use of clear-span bridges to cross the watercourse). Limiting grubbing and grading within riparian corridor around will reduce potential for effects on coastal tailed frog habitat and will reduce the risk of injury or mortality of adult coastal tailed frogs. • Avoidance buffers around identified wildlife habitat features will be specified by an environmental monitor and clearly delineated and marked in the field prior to clearing and construction. Maintaining buffers reduces the potential for accidental clearing of wildlife habitat features and resulting risk of injury or mortality of wildlife and will decrease the extent of sensory disturbance in the vicinity of identified wildlife habitat features. • Wildlife habitat features (e.g., dens, raptor nests, mineral licks) discovered during construction will be reported to Cedar's environmental manager and feature-specific mitigation will be developed by an environmental monitor. Reporting of discoveries of wildlife habitat features allows for implementation of effective feature-specific mitigation to decrease the loss of wildlife habitat and resulting impediment of wildlife movement and injury or mortality of wildlife. • Project personnel will avoid work within identified wildlife habitat feature buffers during sensitive timing windows. For any work within the buffer zone during a sensitive timing window, Cedar will consult with an environmental monitor to determine whether additional feature-specific mitigation is required. Maintaining buffers during sensitive timing windows will decrease the extent of physical and sensory disturbance in the vicinity of wildlife habitat features during the nesting, denning, roosting, and breeding periods and will reduce the potential for injury or mortality of wildlife.	**Wildlife (Section 7.5)** The Project is predicted to result in low to moderate magnitude adverse residual effects on wildlife, based on project phase and key species and species group. Residual effects are expected to directly affect wildlife during construction (e.g., removal of terrestrial habitat due to site preparation and vegetation clearing), operation, and decommissioning (e.g., potential for direct mortality during marine shipping during operation and decommissioning). Residual effects are also expected to indirectly affect wildlife during all project phases due to sensory disturbance (e.g., noise, vibration, presence of LNG carriers). The Project is not anticipated to result in a substantive adverse residual effect for wildlife because the Project is not predicted to cause or further contribute to the exceedance of a conservation-based threshold or threaten the long-term persistence or viability of species of management concern, or species of cultural or traditional importance.

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	The decommissioning phase is expected to take 12 months and include removal of the FLNG facility and removal of onshore infrastructure. The transmission line right-of-way and temporary workspaces on Crown land will be left to revegetate naturally or will be subject to active reclamation. Reclamation on private property (e.g., DL 99 in the Project Area, parts of the transmission line corridor) will follow requirements of the lease agreements with the owner(s). Similar to operation, project activities during decommissioning are expected to result in indirect effects that could change habitat for terrestrial wildlife and marine birds. Decommissioning of land-based infrastructure and vehicle traffic could change habitat suitability for terrestrial wildlife and decommissioning of marine-based infrastructure and marine transport of decommissioned infrastructure could change habitat suitability for marine birds. For terrestrial wildlife and shorebirds, project-related activities that may result in alteration or impediment of movement are site preparation and clearing (i.e., gap creation that is maintained through to decommissioning by the presence of the marine terminal and supporting infrastructure); construction of land- and marine-based infrastructure (i.e., avoidance due to sensory disturbance); and vehicle traffic (i.e., as a road crossing impediment). During operation, night lighting of the marine terminal and the FLNG facility may alter bird and bat movement patterns. For marine birds, the primary effect mechanism is disruption of movement on or over the water due to marine vessel traffic; secondarily, sensory disturbance (e.g., lighting) associated with the marine-based infrastructure may also affect marine bird movement. Change in mortality risk for wildlife may occur through project-related activities resulting in physical destruction of key habitat features (e.g., nests, dens, roosts, hibernacula). The project-related activities that may result in physical destruction of key habitat features are site preparation and clearing (i.e., vegetation clearing and ground disturbance); facility and infrastructure maintenance during operation (i.e., vegetation management along transmission line right-of-way); and decommissioning of land-based and marine-based facilities (as it pertains to bird nests and bat roosts). This effect pathway may result in accidental mortality if the affected key habitat feature is active (e.g., nests) or occupied (e.g., dens). This effect pathway is relevant to terrestrial wildlife and shorebirds. Change in mortality risk for wildlife may occur through project-related activities resulting in accidental mortality of birds, amphibians, and mammals (particularly small, less mobile species or individuals)". In the context of this particular effect pathway, project-related activities that may result in accidental mortality are site preparation and clearing (i.e., machinery use); construction of land-based and marine-based infrastructure (i.e., machinery use); facility and infrastructure maintenance during operation (i.e., flaring during commissioning, transmission line bird strikes); and waste management during all phases (i.e., contact with contaminants). This effect pathway is relevant to terrestrial wildlife and marine birds (including shorebirds). Accidental mortality is also a characteristic of three other effect pathways: physical destruction of key habitat features, project lighting, and wildlife-vehicle collisions.	• Lighting for the Project will be designed in a manner that is consistent with the OGC's Light Control Best Practices Guideline and will consider the measures (i.e., directional or shielded lighting to reduce the vertical or horizontal distribution of light, and Adaptive controls and variable lighting regimes) to reduce risk of injury or mortality and change in movement for bats, marine birds, and migratory birds. Reducing the vertical or horizontal distribution of light and using lighting products with adaptive controls will decrease the likelihood that lit infrastructure will serve as a mechanism for interaction with bats and birds that could result in change in movement patterns due to sensory disturbance and injury or mortality due to collisions. • Project-related wildlife deaths and conflict animals will be reported as required to appropriate authorities. Reporting requirements and contact information will be provided in the CEMP and the HSSE program (operation). Reporting wildlife deaths and conflict animals allows for monitoring and adaptive management of waste management practices and other mitigation measures relevant to avoiding or reducing human-wildlife conflict. • A wildlife management plan will be incorporated into the CEMP and will include wildlife-related mitigation measures, monitoring plans, and reporting requirements. The wildlife management plan will include guidelines to avoid or reduce project-related loss or alteration of wildlife habitat, impediment of wildlife movement, and injury or mortality of wildlife. • Vegetation clearing and grubbing should occur outside of the primary nesting period for migratory birds (April 11 to August 8 in Nest Zone A2 [ECCC 2021a]). Where clearing and grubbing cannot be avoided during these periods, Cedar will incorporate mitigation measures (e.g., pre-clearing bird nest surveys, establishment of setbacks around protected nests) to protect birds and their eggs. Scheduling vegetation clearing and grubbing outside of restricted activity periods will reduce the risk of incidental take of breeding birds. • Year-round protection is required for specific nests protected under the *Wildlife Act* (e.g., eagle, osprey, heron). If a nest protected under the *Wildlife Act* is identified, setbacks and restricted activity periods will be specified by an environmental monitor according to provincial guidance. Implementation of setbacks and restricted activity periods will reduce the risk of incidental take of nests protected year-round under the *Wildlife Act*.	

TABLE 11.5.7 CHANGES TO HAISLA NATION USE AND INTEGRITY OF SACRED AND CULTURALLY IMPORTANT SITES AND LANDSCAPE FEATURES

Description of Project Interaction(s) and Effect Pathway(s) Specific to Haisla Nation	Description of Project Interaction(s) and Effect Pathway(s) for Related Valued Components	Key Mitigation and Enhancement Measures[1]	Residual Effect(s) that Remain After Application of Mitigation
	Lighting on vessels, facilities, and infrastructure is an effect pathway for mortality risk for migratory birds and marine birds. For birds, the effect mechanism is individuals being either disoriented by, or attracted to, vessel, facility or infrastructure lights and the subsequent potential for a fatal strike. The operating land-based facilities and infrastructure, marine terminal, and FLNG facility (including the flare stack pilot flame) plus the following project-related activities are the artificial light sources that create this project pathway: marine transport of construction materials to the site; marine shipping and transportation; and marine transport of decommissioned infrastructure. The creation of the Project's transmission line right-of-way and its associated access roads (new build and upgrades to existing resource roads) for construction will result in an increase in linear feature density. An increase in linear feature density can increase mortality risk for bears, ungulates, and furbearers due to increased human and predator access. Increased traffic volumes due to project-related vehicles will increase mortality risk for terrestrial wildlife during construction, operation, and decommissioning. The affected roads are Bish Creek Forest Service Road, Alcan Way, and Haisla Boulevard, which are already active industrial use roads, plus access roads related to the construction and maintenance of the transmission line. Wildlife-human conflict is a mortality risk as conflict wildlife may need to be destroyed. The primary project-related activity that may result in wildlife-human conflict is waste management during all phases, specifically related to wastes that may be attractive to wildlife (e.g., food wastes). There is also potential for adverse wildlife encounters during the initial stages of site preparation and clearing (e.g., surveying); however, such encounters are less likely to be conflicts that result in wildlife mortality. This effect pathway is relevant to terrestrial wildlife, particularly bears and canids.		

NOTE:

[1] Additional information regarding the rationale for selection, the expected success, risks and uncertainty, and timing of proposed mitigation and enhancement measures specific to the valued components discussed can be found at the referenced Application chapters noted throughout this table.

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Characterization of Project Residual Effect

The application of the mitigation measures, including communication with MCTS, guidelines on reducing wake and wash, and the Marine Transportation Management Plan developed through Cedar's engagement with Haisla Nation will reduce the potential effects on Haisla Nation use and integrity of sacred and culturally important sites and landscape features along the marine shipping LAA[9]. However, adverse residual effects are anticipated on Haisla Nation use and integrity of sacred and culturally important sites and landscape features and, as identified in Table 11.5.7, on valued components related to Haisla Nation interests within the marine shipping LAA and marine terminal LAA.

Residual effects from increased marine vessel traffic and construction of the Project are anticipated to result in changes to Haisla Nations use, access, and reliance on marine and terrestrial environments and landscape features considered sacred and culturally important along the marine shipping LAA, the marine terminal LAA, and the heritage LAA. Important travel routes, anchorages, and designated sensitive areas used by Haisla Nation are recorded in Douglas Channel, overlapping the marine shipping route. Haisla Nation also have terrestrial wildlife hunting areas and traditional plant use harvesting areas that are considered culturally important that overlap with the marine terminal LAA. Marine and terrestrial harvesting sites are important to Haisla Nation for the transmission of traditional knowledge, language, health, and well-being.

The additional increase in large vessel movements along the marine shipping route and construction activities within the heritage LAA attributable to the Project may prevent or reduce Haisla Nation access to sacred and culturally important sites (including harvesting sites) and landscape features, which would disproportionately affect Haisla Nation members who heavily rely on access to these sites and landscape features for spiritual, social, and cultural purposes (e.g., ritual bathing, medicinal plant collection, sharing traditional knowledge) or for harvesting resources for FSC, economic and trade purposes. If access to sacred and culturally important sites or landscape features, or the quality of experience is diminished, Haisla Nation's culture, identity, mental health and physical health, and well-being may be impacted. Effects may be further disproportionately distributed as the effect may be experienced only by Haisla Nation members (i.e., subpopulations) that hold hereditary rights to access and manage sacred and culturally important sites and landscape features at discrete areas (i.e., hereditary owners of *Yaksda Wa'wais)* overlapping or in the vicinity of the shipping LAA, the marine terminal LAA, and/or the air quality and human health LAA and RAA.

Residual effects on Haisla Nation use and integrity of sacred and culturally important sites and landscape features have been conservatively overestimated with consideration for the interconnectedness of the effect pathways that inform on Haisla Nation interests. As a result, the characterizations of residual effects on Haisla Nation use and integrity of sacred and culturally important sites and landscape features are ranked higher than the residual effects characterized for related valued components, specifically, duration, magnitude, and likelihood.

With the implementation of mitigation measures outlined in Table 11.5.5 and Table 11.5.7, residual effects on Haisla Nation interests related to the use and integrity of sacred and culturally important sites and landscape features are anticipated to be long-term within the marine shipping LAA and marine terminal LAA due to increased marine vessel traffic and associated sensory disturbances and clearing and construction activities within Project Area. However, residual effects within the marine shipping LAA

[9] Air Quality (Section 7.2), Acoustic (Section 7.3), Marine Use (Section 7.10), and Human Health (Section 7.12)

are largely considered reversible as they are primarily tied to project marine shipping traffic and associated effects. For example, temporary displacement of Haisla vessels travelling to culturally important sites and associated sensory disturbances are reversible following the project-vessel's transit through the marine shipping LAA (i.e., after the vessel passes by the sensory disturbance will cease to occur, and Haisla access to sacred and culturally important sites can continue). Whereas residual effects on traditional use plants are largely considered reversible for the transmission line right-of way but partially reversible for the other site components and residual effects on old forests are considered partially reversible for the transmission line portion of the project footprint, which will be decommissioned, and trees left to regenerate. However, the traditional use plant species that will be removed from the project footprint are all species common to the Cedar site and are not limited to the project footprint; most were identified in the marine terminal RAA (beyond the project footprint).

The frequency of the residual effects is intermittent and will vary according to project phase. Residual effects will occur as multiple irregular events during the construction and decommissions phase due to marine transport of construction materials, and residual effects will occur as multiple regular events during the operation phase because one LNG vessel is predicted to visit the Project every 7 to 10 days (up to approximately 50 vessels annually). The likelihood of residual effects occurring is characterized as high, due to Haisla Nation's existing and ongoing travel, access, and use and integrity of sacred and culturally important sites and landscape features within the marine shipping LAA and in the vicinity of the marine terminal LAA. Overall, residual effects on Haisla Nation use and integrity of sacred and culturally important sites and landscape features are anticipated to be moderate in magnitude. Sensory disturbances, both real and perceived, may further deter Haisla Nation members from accessing sacred places within the marine shipping LAA and in the vicinity of the marine terminal LAA. However, the Project Area is located on fee simple land owned by Haisla Nation and being developed for the purpose for which it was acquired, and project activities will occur within an established shipping route where marine activities will be able to safely continue in a manner that is generally consistent with existing conditions.

11.5.6.3 CHANGES THAT AFFECT ASPECTS OF HAISLA NATION GOVERNANCE

Haisla Nation recognizes both traditional Hereditary Chiefs and nobles, and a contemporary elected Chief and Council system, also known as the HNC (Powell 2013; see Section 11.1.5). Hereditary Chiefs are "the traditional leaders of high status in the Haisla Nation community" who derive their authority through traditional law and ceremonies that have been perpetuated since pre-contact times (Powell 2013:4). The perspectives and opinions of Hereditary Chiefs often influence the broader opinion of Haisla Nation members, and Hereditary Chiefs are consulted for decisions regarding resource and lands management for the broader traditional territory, as well as for Nation member activities, events, and other important matters pertaining to governance, well-being, and nuyem (oral history and traditional law) (Powell 2013). The elected HNC upholds a contemporary leadership structure and make political decisions regarding reserve lands and supporting infrastructures (e.g., public health, education, housing) as well as decision making as this pertains to the Aboriginal rights and title of the Nation.

Haisla Nation traditional territory is comprised of matrilineal clan stewardship areas that are “owned” (and inherited) watersheds, called *wa’wais* (Powell 2013; see Section 11.2). There are 54 *wa’waises* in Haisla traditional territory (Barbetti and Powell 2005). The *wa’wais* owners inherit the responsibility to care for and maintain the area and all floral and faunal resources encompassed within; they determine who can access their *wa’wais* to hunt, fish, and engage in other cultural practices and are also obligated to “educate and retrain visitors in [their] territory” (Powell 2013:6).

Haisla Nation has 19 Indigenous Reserves: reserve land area totals 726.1 ha (INAC 2019; see Section 11.1.7). Four of Haisla Nation’s Indigenous reserves overlap with the land and resource use LAA—Kitamaat 1 and Kitamaat 2, Walth 3, and Henderson’s Ranch 11 (see Section 7.9: Land and Resource Use).

There are approximately 1,988 Haisla Nation members today, and approximately 623 of those members reside on-reserve in Kitamaat Village (Kitamaat 2), on the east side of Douglas Channel, approximately 9 km southeast of the District of Kitimat (INAC 2021; British Columbia Treaty Commission 2021; see Section 11.1.6.1). Approximately 1,365 Haisla people live off-reserve; they are primarily located throughout the region, including other Indigenous Nation reserve lands, and cities such as Kitimat, Terrace, Prince Rupert, Nanaimo, Vancouver, Victoria, and elsewhere (Powell 2013; INAC 2021). Although specific information regarding on-reserve housing issues is not publicly available, a recent study conducted by the Community Vitality Advisory Group and Research Team (informed by a group of Haisla women) found that some on-reserve Nation members are facing problems finding suitable and affordable housing options (CVAGRT 2018:18). Haisla Nation have several initiatives in place to address housing issues for Nation members living on and off-reserve.

Haisla Nation offer educational services to support their Nation members living on and off-reserve; Haisla community education goals center on providing access to high-quality education, capacity building, and employment training for all members (Haisla Nation 2020; see Section 11.1.6.2). Haisla Nation therefore rely on existing infrastructure and educational services offered off-reserve to meet the educational and training needs of their youth.

The average total income of Haisla Nation members in 2015 was reported to be $28,608 CAD, approximately $36,000 less than the median total income of other households in British Columbia (Statistic Canada 2021; see Section 11.1.6.3). Haisla Nation identify economic development as one of nine interconnected community goals; the Nation seeks and promotes projects that respect community values and create job opportunities for Nation members (Haisla Nation 2020). Haisla Nation members therefore seek employment opportunities both on- and off-reserve, including employment with various industries in the region (see Section 7.11: Infrastructure and Services).

Haisla Nation are greatly invested in the health and well-being of their Nation members. Haisla Nation’s Health’s Wellness Team offer a variety of health services and wellness support for Nation members living on and off-reserve (Haisla Nation 2021a; see Section 11.1.6.5). In addition to health services offered on-reserve, Haisla Nation rely on existing health and emergency services in Terrace and Kitimat (see Section 7.11: Infrastructure and Services).

Project Pathways

All phases of the Project (construction, operation and decommissioning) have the potential to affect Haisla Nation interests related to aspects of Haisla Nation governance. Changes to Haisla Nation interests related to aspects of Haisla Nation governance could result through the following pathways:

- Changes in human health (e.g., mental and physical) due to outside stressors and loss of culture may occur due to increased marine vessel traffic in the shipping RAA and construction, operation, and decommissioning activities in the project footprint and linear components, due to associated sensory disturbances (Section 7.10 Marine Use), changes in air quality (Section 7.2 Air Quality and Section 7.12 Human Health), changes in noise levels (Section 7.3 Acoustic), and social impacts from project personnel (Section 7.11 Infrastructure and Services).
- Changes in the ability to make decisions regarding marine use may occur due to increased marine vessel traffic in the shipping RAA (Section 7.10 Marine Use).
- Change in the ability to make decisions regarding land use may occur due to changes in private property and tenured land use and non-tenured land use within the land and resource use LAA and RAA (Section 7.9 Land and Resource Use).
- Changes in infrastructure, services, accommodation, and transportation may occur through increased demand from project personnel (and their families) on utilities (e.g., water, sewer, waste infrastructure), health care and emergency services, policing services, educational services (e.g., kindergarten to grade 12), housing and temporary accommodations, and local transportation infrastructure (Section 7.11 Infrastructure and Services).
- Changes in regional employment, business, and economy may occur through increased demand for labour and inability for certain sub-populations to participate equitably in employment, as well as wage inflation, labour drawdown, increased operation costs for businesses, increased cost of living, and increased cost of housing and accommodations (Section 7.8 Employment and Economy).

Project Residual Effect

The anticipated project interactions and the key mitigation and enhancement measures to reduce or enhance resulting effects, and the remaining residual effects for valued components related to Haisla Nation governance are described in Table 11.5.8. This information is presented in Table 11.5.8 to transparently inform the assessment of residual effects on changes in governance. Residual effects are characterized specifically for changes in governance following Table 11.5.8.

TABLE 11.5.8 CHANGES THAT AFFECT ASPECTS OF HAISLA NATION GOVERNANCE

Description of Project Interaction(s) and Effect Pathway(s) Specific to Haisla Nation	Description of Project Interaction(s) and Effect Pathway(s) Related to Valued Components	Key Mitigation and Enhancement Measures for Related Valued Components[1]	Residual Effect(s) that Remain for Valued Components After Application of Mitigation
Haisla Nation *wa'wais* owners inherit the responsibility to care for and maintain the area and all floral and faunal resources encompassed within; they determine who can access their *wa'wais* to hunt, fish, and engage in other cultural practices and are also obligated to "educate and retrain visitors in [their] territory" (Powell 2013:6; see Section 11.2). Four of Haisla Nation's Indigenous Reserves overlap with the land and resource use LAA, these include Kitamaat 1 and Kitamaat 2, Walth 3, and Henderson's Ranch 11 (see Section 7.9: Land and Resource Use). Project activities, including construction, operation, and decommissioning of the marine terminal, increased marine vessel traffic in the shipping LAA, and increased recreation within the land and resource use LAA and RAA. Changes in air quality could affect Haisla Nation health and may also affect Haisla Nation quality of experience at important marine and terrestrial harvesting, cultural, spiritual, and feasting sites with implications for potential loss of opportunities to engage in cultural activities and share traditional knowledge. Haisla Nation's ability to harvest seaweed and shellfish (and other resources) on or near exposed shorelines for consumption, economic, trade, ceremonial and other purposes relies on their ability to access their preferred shoreline harvesting areas safely and efficiently at suitable times of the year (i.e., a consideration of seasonality, tide levels). Increased marine vessel traffic, associated sensory disturbances, and wake	**Air Quality (Section 7.2), Acoustic (Section 7.3) and Human Health and Human Health (Section 7.12)** Operable pathways for emissions and noise may result in effects on human health. Inhalation exposures to COPC in ambient air during the construction, operation and decommissioning phases of the Project could contribute to potential changes in human health risk in the vicinity of the marine terminal LAA and the within the marine shipping LAA (due to marine vessel traffic). The change to human health from these pathways is generally a function of the person's proximity to the marine shipping LAA and the marine terminal LAA (due to dispersion of air emissions and the duration of the exposure). Project-related changes to the quality (i.e., chemical content) of air, soil, sediment, water, and biota can result in changes in human exposure to chemicals of potential concern along the marine shipping LAA (i.e., sulfur dioxide and nitrogen dioxide). Project-related changes to levels of noise (i.e., %HA and sleep disturbance) can result in changes in human exposure and subsequent health effects along the marine shipping LAA.	**Air Quality (Section 7.2), Acoustic (Section 7.3) and Human Health (Section 7.12)** • Shipping emissions result in predicted nitrogen dioxide and sulphur dioxide concentrations well below applicable regulatory criteria along the shipping route and do not persist in any location due the motion of the LNG carriers and tugboats. • Use of electricity power from the BC Hydro grid for the facility during operation. The use of electricity power from the BC Hydro grid eliminates the need to produce power onsite from gas-fired turbines and associated emissions. • Diesel fired equipment used during construction (vehicles and equipment) and during operation (emergency power generators) will be powered by low sulphur fuel. The use of low sulphur diesel fuel will reduce emissions of SO_2. • Noise emissions onsite are reduced during the construction phase as the FLNG facility is being constructed overseas and towed to site, instead of constructed onsite. • The decision to electrify the Project from the BC Hydro grid during operation reduces noise effects as electric equipment is generally quieter. • Nearby residents (i.e., within 3 km of activities) will be notified in advance of planned high disturbance noise-causing activities at the Project Area (i.e., pile driving). Provide notification to the closest residents to reduce annoyance. • Fit gas or diesel engine exhausts with noise mufflers, where available. Turn off equipment when not in use to minimize idling (where appropriate). Reduce exhaust noise from gas or diesel mobile equipment and therefore, reduce the magnitude of increase in noise levels. • Where possible quieter equipment will be prioritized over louder equipment (e.g., vibratory or drill pilling over impact pilling and rubber-wheeled equipment over steel-tracked equipment or electrified over gas/diesel powered). Reduce noise from equipment and therefore, reduce the magnitude of increase in noise levels. • Carry out noisy fabrication work at another site (e.g., within enclosed factory premises) and then transport products to the project site (as appropriate). Reduce noise from equipment and therefore, reduce the magnitude of increase in noise levels. • Noise ratings of construction and operation equipment are based on acoustic specifications of equipment (e.g., refrigerant compressor, process cooler) and will be considered in the procurement process. Noise ratings of construction and operation equipment are based on acoustic specifications of equipment (e.g., refrigerant compressor, process cooler) and will be considered in the procurement process. • Noise effects of the project site and shipping activities will comply with federal and provincial noise guidance.	**Air Quality (Section 7.2), Acoustic (Section 7.3), and Human Health (Section 7.12)** Residual effects of emissions and noise on human health (and quality of harvesting experience) due to project construction and operation (including shipping) are anticipated. Shipping emissions result in predicted nitrogen dioxide and sulphur dioxide concentrations well below applicable regulatory criteria along the shipping route and do not persist in any location due the motion of the LNG carriers and tugboats. Maximum nitrogen dioxide concentrations occur under adverse meteorological conditions which occur infrequently. During most frequent meteorological conditions, predicted concentrations are lower and the plume travel away from locations frequented by people (i.e., Hecate Strait, elevated terrain). The magnitude of residual effect on air quality as a result shipping associated with the Project is negligible (i.e., no measurable change). The extent of residual effects is limited to within the shipping air quality LAA and RAA and to the vicinity of the LNG carrier and tugboats (Section 7.2). Overall, the direction of change to human health is adverse for all phases of the Project. The magnitude of effect is low for all phases of the Project. The spatial extent of the residual effects is within the marine shipping LAA and the marine terminal LAA for their respective types of effects (air quality or noise effects). The duration of effect is long-term because all phases of the Project last more than one year. The effects are reversible for all phases of the Project because COPC emissions to the air and noise emissions stop after the Project is completed. The frequency of the effect is continuous over the life of the Project. There is a disproportionate distribution of effects to the subpopulation of residents living closest to the Project Area (i.e., in vicinity of marine terminal LAA) because the effects are typically associated with proximity to the Project's source of air emissions or noise. Overall, the human health risks have been overestimated because the predictive modelling techniques used in the CALPUFF air dispersion model and noise acoustic model are conservative (e.g., applying worst case scenarios), in addition, the methods used in the HHRA are also inherently conservative (e.g., applying TRVs that are protective of sensitive people). Given these characterizations, and the overestimation of risk associated with human health, the likelihood of residual effects on human health is low. No substantive adverse residual effect for human health (and quality of harvesting experience) is predicted because the predicted change to human health is less than the key residual effects threshold (Section 7.12).

TABLE 11.5.8 CHANGES THAT AFFECT ASPECTS OF HAISLA NATION GOVERNANCE

Description of Project Interaction(s) and Effect Pathway(s) Specific to Haisla Nation	Description of Project Interaction(s) and Effect Pathway(s) Related to Valued Components	Key Mitigation and Enhancement Measures for Related Valued Components[1]	Residual Effect(s) that Remain for Valued Components After Application of Mitigation
waves produced by project marine vessels represent an outside stressor that may affect Haisla Nation food security and ability to share cultural teachings. Haisla Nation may experience **changes in human health (e.g., mental and physical) due to outside stressors and loss of culture**) due to an increase in project workers relocating to Terrace and Kitimat. Haisla Nation may experience **changes in human health (e.g., mental and physical) due to outside stressors and loss of culture**) (e.g., change in sensory disturbance resulting in alienation from harvesting and sacred sites) and **changes in the ability to make decisions regarding marine use** due to increased marine vessel traffic in the shipping LAA.	**Land and Resource Use (Section 7.9)** Change in private property and tenured land use during construction and operation could lead to direct loss, or access to, associated resources, as well as disruption to resource use activities (e.g., forestry, oil and gas, mining, recreation, hunting). Decommissioning activities have the potential to disrupt land use but may ultimately result in the restoration of access and land use. Proposed changes also have the potential to cause disturbance and nuisance effects (e.g., construction noise, visual effect, light for private land owners, and tenured users in the LAA). Disturbance effects on resource use considers the reduction in wildlife harvesting success because of disturbance (e.g., noise, visual/light) on the resource (e.g., guiding/hunting and trapping). Furthermore, the construction and operation of the facility will change the visual character and quality, and light conditions of the proposed project footprint. Decommissioning activities could also disrupt or intrude on local resource use activities. Project activities and physical works may result in change to non-tenured land and resource use and affect the viability of, restrict access to, or cause loss of area used for, recreation The proposed changes may lead to direct loss of, or loss of access to, recreation areas and may disrupt recreational enjoyment due to disturbance (e.g., noise, visual/light). Decommissioning activities may also disrupt or intrude on recreation activities but may ultimately restore access. Clearing and construction activities for the facility and proposed transmission line corridor right-of-way will alter the topography and vegetation patterns within the project footprint and will introduce new human alterations to the landscape. The effect of the alterations may result in the change in the existing visual condition for one or more viewpoints affecting the visual character and quality. The FLNG facility and marine terminal will be illuminated to ensure worker safety during construction, operation and decommissioning. Project lighting may result in emanating light effects including light spill (trespass), glare, and sky glow changing the ambient light conditions in the project footprint.	**Land and Resource Use (Section 7.9)** • Cedar will engage with and notify affected property owners and holders of affected tenures on the location and timing of project activities. • Cedar will negotiate agreements for use of private property and compensate registered trappers as per provincial agreement on notification and compensation. Engagement and notification will reduce interactions by managing potential land use conflicts. • Cedar will adhere to cutting permits or authorization agreements/conditions for clearing activities. Clearing boundaries will be delineated prior to site preparation to keep clearing activities within the designated project footprint. This may be via physical flagging or electronic delineation where appropriate. Standard practice to reduce unnecessary impacts on natural vegetation. • Use existing access roads, trails, and rights-of-way to the extent possible. Access control measures (e.g., gated approach, placing large boulders) will be implemented along the cleared transmission line corridor across Crown land to restrict public vehicle access. Cedar will post warning signs to discourage public access and use along the transmission line corridor. Cedar will work with the OGC, Ministry of Forests, Lands, Natural Resource Operations and Rural Development, and the road permit holder to implement traffic safety measures at the project intersection with Bish Creek Forest Service Road (e.g., a stop light). Cedar will post signage on fencing around the Project Area clarifying that the land is private property. Standard practice to manage effects from increased access and limit uncontrolled access within legal requirements. • Any temporary workspace on Crown land will be subject to natural revegetation or active reclamation. Reclamation on private property will follow requirements of the lease agreements with the owner(s). Standard practice to reduce unnecessary impacts on natural vegetation. • High disturbance project-related construction activities will be limited to daytime hours only. If nighttime construction is required, Cedar will seek the necessary permits to undertake this work. Implement standard measures to reduce dust and noise levels. Standard practice to manage dust and noise levels. • Cedar will work with the OGC, Ministry of Forests, Lands, Natural Resource Operations and Rural Development, and the road permit holder to implement traffic safety measures at the project intersection with Bish Creek Forest Service Road (e.g., a stop light), and implement standard measures to reduce dust and noise levels. • Cedar will enforce no hunting and fishing policies for non-resident workforce personnel during off-time hours in the LAA. Implementation of policies lowers potential for workers to engage in hunting and fishing practices. • Clearing will be kept to the minimum required and buffer will be maintained along existing road access. Maintaining buffer will partially shield project components.	**Land and Resource Use (Section 7.9)** The residual effect from the Project on non-tenured land use, including recreation and changes to access (i.e., new access and upgraded access), are anticipated to be low in magnitude for each project phase. Residual effects are expected to be limited to the project footprint and LAA, short- to medium-term, irregular to continuous (occurring throughout the life of the Project) and are reversible following project decommissioning. The Project will increase the amount of industrialized landscape within the LAA but will not change the overall visual character in the Kitimat area, which has already been altered by waterfront developments (e.g., LNG Canada). With implementation of vegetative buffer, around the perimeter of the Project Area and along the transmission line right-of-way, proximal distance to Kitamaat Village, the project footprint is not expected to stand out on the landscape. The Project is expected to have low to moderate magnitude effect through construction and operation. Upon decommissioning, the effects are anticipated to be reversible. Residual effects from project lighting (i.e., sky glow, glare, light trespass) on non-tenured land use within the LAA are expected to be low to moderate with application of mitigation measures. There are no sensitive receptors (i.e., residences) in the immediate vicinity of the project footprint. While the Project will increase the amount of facility lighting visible from Kitamaat Village, the distance to the Project Area and application of lighting mitigation measures will reduce adverse effects associated with glare or light trespass. Other recent light impact assessments have shown that light trespass (predicted illuminance) rapidly decreases with increasing distance of receptors from the light source. Sky glow effects from the Project are possible, particularly during low cloud overcast conditions, but will be minimized through the use of directional or shielded lighting to reduce the vertical or horizontal distribution of light. The current and historic use in the LAA by members of the Haisla Nation is described in Section 11.0. Because of the proximity of the Project to Kitimaat Village, some effects (i.e., visual quality/lighting) will be felt more by Indigenous people (Haisla Nation) than the general population. However, the potential effects are considered low to moderate in magnitude for this subpopulation. There will be limited potential for adverse effects to current and future generations from proposed changes to tenured and non-tenured land and resource use because of the small effects on environmental and land use components on a local and regional basis. Residual effects are anticipated to be low, and the Project will use previously disturbed lands were possible. The Project does not conflict with established land use plans, policies or bylaws related to land use development. Land and resource use is anticipated to continue at current levels in the LAA and RAA because there are alternative lands available for recreational pursuits and activities, and alternative wildlife resources for hunting, outfitting, trapping, and fishing. The residual effects prediction includes consideration of risk and uncertainty factors. The risk and uncertainty associated with potential effects has been overestimated for private property and tenured land use, and non-tenured land use (including visual quality and light as well as access). The assessment assumes local recreational users and tenure holders are regularly using the areas close to the project footprint and does not take into account alternative lands or resources that are likely accessed by private, tenured and nontenured users. In consideration of the high-quality land resources available in the RAA, effects have likely been overestimated. The extent (i.e., magnitude) and ways in which visual and ambient light effects may be perceived by different land users could be different depending upon location. The risk and uncertainty in the predictions is addressed by making conservative assumptions that overestimate the magnitude of those effects (e.g., moderate for both visual and light effects).

TABLE 11.5.8 CHANGES THAT AFFECT ASPECTS OF HAISLA NATION GOVERNANCE

Description of Project Interaction(s) and Effect Pathway(s) Specific to Haisla Nation	Description of Project Interaction(s) and Effect Pathway(s) Related to Valued Components	Key Mitigation and Enhancement Measures for Related Valued Components[1]	Residual Effect(s) that Remain for Valued Components After Application of Mitigation
		• Lighting for the Project will be designed in a manner that is consistent with the OGC's Light Control Best Practices Guideline and will consider the following measures: (1) Directional or shielded lighting to reduce the vertical or horizontal distribution of light, and (2) Adaptive controls and variable lighting regimes (e.g., timers, dimmers, motion sensors). Adopting these measures decreases the likelihood of project lighting creating light trespass and will reduce glare and spill-over light. • Cedar will engage with and notify affected non-tenured land use holders on the location and timing of project activities. Notify identified non-tenure holders and solicit feedback on potential issues and concerns. Engagement and notification will reduce interactions by managing potential land use conflicts. • Clearing boundaries will be delineated prior to site preparation to keep clearing activities within the designated project footprint. This may be via physical flagging or electronic delineation where appropriate. Cedar will adhere to cutting permits or authorization agreements/conditions for clearing activities. Standard practice to reduce unnecessary impact to adjacent natural vegetation. • Use existing access roads, trails, and rights-of-way to the extent possible. Cedar will work with the OGC, Ministry of Forests, Lands, Natural Resource Operations and Rural Development, and the road permit holder to implement traffic safety measures at the project intersection with Bish Creek Forest Service Road (e.g., a stop light). Cedar will post warning signs to discourage unauthorized access and use along the transmission line corridor. Cedar will post signage on fencing around the Project Area clarifying that the land is private property. Access control measures (e.g., gated approach, placing large boulders) will be implemented along the cleared transmission line corridor across Crown land to restrict public access. Standard practice to manage effects from increased access and limit uncontrolled access within legal requirements. • High disturbance project-related construction activities will be limited to daytime hours only. If nighttime construction is required, Cedar will seek the necessary permits to undertake this work. Implement standard measures to reduce dust and noise. Standard practice to manage dust and noise levels. • Prohibit recreational use of ATVs by employees onsite, on access roads, trails, and along rights-of-way. Implementation of policies lowers potential for workers to engage in off-hour ATV practices. • Clearing will be kept to the minimum required and a buffer will be maintained around the site along existing road access. Maintaining buffer will partially shield project components.	Although the Project will adversely affect land and resource use during construction, operation, and decommissioning, the overall effects are negligible to low for private property and tenured land use (low to moderate for visual quality/light) and low for non-tenured land use (low to moderate for visual quality/light). With the implementation of mitigation or enhancement measures, or the application of current or anticipated programs or policies, the Project is not expected to exceed the key residual effects threshold. It is not expected to contravene established LUPs, policies or by-laws, or create a change or disruption that restricts or degrades present land use capability to a point where the activities cannot continue at or near current levels and where compensation is not possible, or substantially decrease the quality of a service provided, on a persistent and ongoing basis.

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	Marine Use (Section 7.10) Construction and operation activities within the marine terminal LAA may affect the ability of Haisla commercial and recreational marine vessels to navigate at the head of Kitimat Arm and may result in a change in noise and light levels, which may affect marine fisheries and the quality of the experience for marine users in the vicinity of the marine terminal LAA. Wake waves generated by LNG carriers and escort tugs, if large enough, may result in a safety risk to fishers, shoreline harvesters and recreationalists or in an interference or displacement to shoreline harvesting activities or other marine use activities. During construction, the method of transporting materials to and from the Project Area will be dictated by practicality. It is anticipated that the Project will employ a combination of marine and land-based transportation modes. Marine access using existing shipping routes will be the primary transport means for major project components (e.g., FLNG facility, struts). The effect of marine transport of construction materials to the site on the change in marine navigation will be short term (only occur during the construction phase of the Project). During peak construction, the number of barge and project-related vessel movements could be in the range of two movements per week (up to eight per month). Vessels used during the construction phase will be similar to the types of vessels already present in the port of Kitimat. An increase in marine vessel traffic during project construction and decommissioning (e.g., construction vessels) and operation (e.g., LNG carriers and escort tugs) may interfere with Haisla fishing vessels engaged in salmon fishing activities along the marine shipping route, which could result in lost fishing time (up to one hour of fishing every 7 to 10 days) if the gear type used needs to be pulled in and reset (e.g., gillnets, seines). An increase in shipping traffic may interfere with Haisla fishing vessels engaged in, and equipment used for, halibut (and other groundfish) fishing activities along the marine shipping route. Gear types used that are passively fished (i.e., they are deployed and left unattended), such as long lines, may become entangle in the propeller of an LNG carrier or escort tug as they can be difficult for large vessels to locate or they may drift from their original locations. This could result in lost fishing time (up to one hour of fishing ever 7 to 10 days) if the gear type used needs to be pulled in and reset or is destroyed (e.g., long lines).	**Marine Use (Section 7.10)** • Regular communication of project activities with Haisla marine users will be undertaken. Cedar will provide project updates provided using appropriate engagement methods and media outlets (e.g., online notifications, newspaper, VHF broadcasts through the MCTS) will give marine users advanced notice of the Project's marine shipping activities. • Project LNG carriers will use the Canadian Coast Guard's MCTS to provide notice of planned vessel arrival time at Triple Islands. Updates provided using VHF broadcasts through the MCTS will give marine users advanced notice of the Project's marine shipping activities. • Cedar will establish LNG carrier shipping schedule notification processes for Indigenous Nations with traditional territories overlapping the shipping route. Engagement with Indigenous communities in the development of a marine shipping notification process will promote the use of methods of notification that facilitate the process for both Cedar and Indigenous communities. • Cedar will establish methods of initiating safety zones around the marine terminal during operation. The safety zone will increase safety by reducing the risk to other mariners, associated with LNG loading and other terminal operation. • Cedar will use escort tugs between Triple Islands and Kitimat during LNG carrier transits and to assist with berthing and de-berthing/departure. The use of escort tugs will assist in mitigating drift and powered grounding and with provide more maneuverability if required to avoids collisions and during and speed control of the LNG carriers berthing, thus reducing the likelihood of collision or other adverse interaction with other maritime traffic. • LNG carriers will adhere to the prescribed route and passing restrictions. This mitigation will decrease the potential for interaction between the Project's marine traffic and other marine users as LNG carriers will be adhering to a well-established marine shipping route and reduce the potential for collisions by following the passing restrictions described in previous technical review process of marine systems and transshipment sites (TERMPOL) studies and in the draft North Coast Waterways Management Guidelines. • LNG carriers will maintain safe operating distances from other marine craft. This mitigation will decrease the potential for interaction between the Project's marine traffic and other marine users as LNG carriers will be adhering to a well-established marine shipping route and follow the Collision Regulations as set out in the Canada Shipping Act. Cedar will follow reduce the potential for collisions by following the safe operating distances and passing restrictions described in previous TERMPOL studies and in the draft North Coast Waterways Management Guidelines.	**Marine Use (Section 7.10)** The Project will follow the draft North Coast Waterway Management Guidelines' (2021) recommendations regarding vessel speed and position to minimize its wash and wake effects when fishing, harvesting, or recreational activities are occurring. Waves created by the movement of vessels, are distinct from wind-driven waves and are capable of reaching shorelines that are usually protected from natural waves. However, the shoreline along the Project's marine shipping route, which will be exposed to wake from LNG carriers and their escort tugs, is an exposed shoreline that is currently subject to natural wave action, including storm waves. Based on previous wake studies conducted in the region, the height of wake waves generated by large liquid bulk carriers and tugs, when operating under normal conditions, will be within the range of natural wave conditions and will be less severe than some waves created naturally by weather. Wave heights from LNG carriers are estimated to be in the order of 0.1 m within the shore region (based on travelling at speeds up to 16 knots), while tugs are estimated to generate 0.2 to 0.3 m at the shoreline (based on travelling at speeds from 12 to 16 knots). Considering that the Project's LNG carriers will be relatively infrequent (1 return trip every 7 to 10 days), and because the wake waves will be within the range of naturally generated waves, due to the reduced speeds of the LNG carriers, there is a small probability that shoreline harvesters will be affected by project-related shipping traffic. Project-related shipping traffic will not introduce any new, previously unassessed, wave effects. The additional increase in large vessel movements in the port and along the marine shipping route attributable to the Project may prevent or reduce access to fishing or shoreline harvesting sites, which would disproportionately affect Indigenous communities, who heavily rely on the marine environment and its resources for FSC purposes and for other purposes (e.g., cultural, spiritual, trade). If access to harvesting sites or the quality and quantity of resources available is diminished, Indigenous Nations' culture, identity, and well-being may be affected. The application of the mitigation measures, including communication with MCTS and following the guidelines on reducing wake and wash, as outlined in the draft North Coast Waterways Management Guidelines, will reduce the potential residual effects on shoreline harvesters. Substantial adverse residual effects to marine use are not anticipated, as the Project is not expected to contravene established marine use plans or policies or create a change or disruption that widely restricts or degrades present marine uses to a point where activities cannot continue at current levels. Effects on marine navigation and marine fisheries and other uses from the construction, operation, and decommissioning of the Project will result in low residual effects. Construction, operation, and decommissioning will result in an increase in new in-water infrastructure in Kitimat Arm and an increase in project-related vessel traffic along the Project's marine shipping route; however, the magnitude of adverse residual effects is low. These adverse residual effects will be limited to the LAA, short- to medium-term in duration, occur at multiple irregular events during the construction and decommissioning phases and occur at multiple regular events or continuously throughout the operation phase, and have a disproportionate effect on Indigenous Nations that heavily rely on the marine environment and its resources for FSC purposes and for other purposes, including spiritual and economic development. The adverse residual effects will be reversible upon completion of the Project. The port of Kitimat is a private port that has a long history of industrial development. Kitimat has continued to manage large industrial vessel traffic since the beginning of its industrial development in the 1950s (Tourism Kitimat 2021b). The socio-economic context in which residual effects have been assessed includes a local marine use environment that has been influenced by other major projects including, but not limited to, the Eurocan pulp and paper plant, the Ocelot Methanol Plant (now known as Methanex), and LNG Canada. It is expected that government agencies, such as Transport Canada and the Canadian Coast Guard, will continue to maintain the high safety standards in the adjacent waters of the Project. Given the experience of the port of Kitimat and other government agencies involved in maintaining navigable waters, the existing

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	During the operation phase, visits to the FLNG facility will occur at regular intervals (up to approximately 50 vessel calls per year) for up to 40 years, but will not be permanent fixtures in Kitimat Arm. In consideration of all large vessel movements in the marine shipping LAA, including piloted vessels, ferry traffic, and cruise ship traffic (Section 7.10.7.2), the Project will increase large vessel movements within the marine shipping LAA by 15.7% annually.	• LNG carriers will maintain safe speeds as described in Rule 6 of the Collision Regulations. When implemented, Cedar will follow the draft North Coast Waterway Management Guidelines' recommendations regarding vessel speed and position. The vessel Master and pilots will use their expertise to navigate the carrier at a safe operating speed as defined in the Collision Regulations, By following and in the draft North Coast Waterway Management Guidelines' (when implemented) recommendations regarding vessel speed and position., the Project will minimize its wash and wake effects on marine users. • Cedar will develop and implement a Marine Transportation Management Plan (MTMMP), in accordance with applicable federal and provincial legislation and regulations, to communicate project construction activities to other marine users. The MTMMP will include safety measures, communication protocols and recommended monitoring metrics designed to improve safe shipping and enhance communications between the Project's marine activities and other mariners. As development of the plan will likely involve engagement with DFO, Transport Canada, CCG, District of Kitimat, Pacific Pilotage Authority, and Indigenous Groups, it will include measures and communication protocols that are supported by regulatory agencies and marine users, increasing the likelihood that it will minimize effects.	conditions, and the proposed mitigations listed in Table 7.10.13, there is low likelihood of residual effects for change in marine navigation as adverse interactions between the Project and marine navigation can largely be avoided or mitigated.
Haisla Nation traditional territory is comprised of matrilineal clan stewardship areas that are "owned" (and inherited) watersheds, called *wa'wais*. The *wa'wais* owners inherit the responsibility to care for and maintain the area and all floral and faunal resources encompassed within; they determine who can access their *wa'wais* to hunt, fish, and engage in other cultural practices and are also obligated to "educate and retrain visitors in [their] territory" (see Section 11.2). Haisla Nation offer educational services to support their Nation members living on and off-reserve. Haisla Nation rely on existing infrastructure and educational services offered off-reserve to meet the educational and training needs of their youth (see Section 11.1.6.2). Haisla Nation offer health care services on-reserve; however, they also rely on locally available health care and emergency services in Terrace and Kitimat (see Section 11.1.6.5).	**Infrastructure and Services (Section 7.11)** While it is unlikely that project construction workers from outside the RAA will bring their families to settle in local communities during project construction, it is likely that workers will bring families to communities nearby the Project for the 40-year operation phase. If workers have school-aged children, this will place additional demands on schools in the LAA. Health care and emergency services may be required by temporary project workers, and/or related to accidents or malfunctions at the Project, increasing the potential need for first responders, such as fire and ambulance services. Project workers may require health care as a result of illness or workplace injuries. It is expected that for conditions that require long-term care, non-local workers will continue to use the services of family physicians or specialists located in their home communities. Policing services can be affected by interactions between project workers and residents and by increased disposable income. Demands on local policing and other social service providers may increase if project-related income is spent on illicit activities, or if it increases income differentials and hence tensions among residents. The presence of the project workforce and project activities could also result in higher demand for services such as police, fire protection, and ambulance. Haisla Nation could experience health stressors as a result of social impacts from the temporary workforce	**Infrastructure and Services (Section 7.11)** • Cedar will implement a Code of Ethics and Respectful workplace Policies and provide cultural awareness training for all workers that includes local and cross-cultural awareness. Implementing a Code of Ethics and Respectful Workplace Policies and the delivery of cultural awareness training will assist in reducing adverse behaviours of workers in local communities and limit demand on local police and emergency services. • Cedar will provide onsite first-aid stations, medical room(s) with beds and certified first-aid staff, and dedicated communications devices for requesting outside emergency aid, during construction in accordance with WorkSafeBC requirements. Project workers will use first aid services at lodges where available. Cedar will also provide an employee and family assistance program. The use of onsite first aid services, will limit the demand on local health services, by addressing non-emergency medical issues at Site. • Security services and a security gate will be provided at the Cedar site. Onsite security services will increase safety (reduce unauthorized access and crime) at the Cedar site, reducing the demand on police services in Kitimat. • Cedar will prepare and implement an emergency management program for operation in accordance CSA Z246.2 and the Environmental Management Regulation under the *Oil and Gas Activity Act*, as amended from time to time. This mitigation will include the development and implementation of project-specific Emergency Response and Spill Prevention and Contingency Plans. It will also include safety orientations for employees. An emergency management plan will assist in the avoidance of and management of emergencies at the Cedar site limiting the demand on emergency services in the LAA.	**Infrastructure and Services (Section 7.11)** With the application of mitigation and enhancement measures, including the use of existing work camps during project construction and the implementation of project-specific management plans, such as those for waste and an Emergency Management Plan that will require provision of onsite first aid and fire suppression equipment, the adverse residual effects on change in infrastructure and services are predicted to be low to moderate in magnitude, occur in the LAA over the short-term to medium-term, and continuous. Effects are likely to be reversed following operation and decommissioning. The risk and uncertainty associated with this prediction have been overestimated through a conservative approach to the assessment of adverse effects. The likelihood of adverse effects is low to medium. Adverse residual effects on change in housing availability are predicted to occur in the LAA, be low to moderate in magnitude, short-term to medium-term, and continuous. Effects are likely to be reversed following operation and decommissioning. Measures implemented by Cedar to hire locally during construction and operation and to house non-locally resident project construction workers at existing work camps in the LAA will reduce the adverse effects of the Project on the availability of housing, and housing need in LAA communities. The risk and uncertainty associated with this prediction have been overestimated through a conservative approach to the assessment of adverse effects. The likelihood of adverse effects is low to medium. With the use of a traffic management measures and a Traffic Management Plan (if required) to reduce project-related traffic and use of transportation infrastructure, the adverse residual effects on change in transportation infrastructure are predicted to be low, occur in the LAA over the short- to medium-term, be continuous and reversible. The risk and uncertainty associated with this prediction have been overestimated through a conservative approach to the assessment of adverse effects. The likelihood of adverse effects is low. Project and project workers are likely to rely on infrastructure and services and housing in the main service centres in the LAA (Kitimat and Terrace). Groups that already experience challenges in accessing infrastructure and services and housing in these larger centres (e.g., Indigenous women requiring specific health services, low-income families requiring housing), may be more adversely affected than other groups

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Haisla Nation rely on locally available policing services in Terrace and Kitimat and may be affected by interactions with project workers engaged in illicit activities, or potential tensions may arise between residents and project workers due to potential lack of respect for Haisla Nation. Haisla Nation may experience **changes in infrastructure and services** (e.g., education, health care and emergency services, demand on waste services) due to an increase in project workers relocating to Terrace and Kitimat. Two-thirds of Haisla Nation population live off-reserve, and many Haisla Nation members rely on housing accommodations (both privately-owned and rentals) in Terrace and Kitimat (Section 11.1.6.2). Haisla Nation may experience **changes in accommodation** as a result of a temporary population increase. Haisla Nation rely on local land-based transportation infrastructure to access harvesting sites, sacred and cultural sites, as well for work, education, and other purposes (Section 11.1). Haisla Nation may experience **changes in transportation** as a result of increased demand on local transportation.	(e.g., adverse interactions between project workers and residents). Project activities will place increased demand on utilities, including water, sewer, and waste infrastructure. The project workforce and project activities will likely draw on the existing water and wastewater systems and waste management infrastructure in the LAA communities. Project construction workers living at existing work camps in Kitimat will be able to use camp recreation facilities and are less likely to place additional demands on recreation infrastructure and services in the LAA, as observed in the LNG Canada Export Terminal Project. The presence of the Project in these communities may lead to positive effects if it leads to financial support for recognized needed improvements to the sports and recreation facilities in Kitimat and Terrace. Amenities such as groomed cross-country skiing and snowmobiling trails, which are maintained by local clubs, may benefit from an increase in the number of users as a result of the Project. Also, tax revenue from operation and increased local spend, within the LAA will contribute economically to the LAA. This may lead to an expansion of municipal tax bases and investment in local infrastructure and services. A temporary increase in population in the LAA is expected as a result of the Project, which has potential to place additional demands on local availability of housing and temporary accommodations. Some project-related activities during construction and operation, including the transportation of project goods, services, and workers, will place increased demands on local transportation infrastructure.	• A waste management plan will be developed and implemented as part of the CEMP. To the extent that use of local landfills is part of that plan, Cedar will engage with the RDKS during development of the plan. Non-hazardous solid wastes will be recycled, reused, or collected in a central secure area onsite and then disposed of in a licensed waste receiver facility. Hazardous liquid and solid waste will be collected in a secure, enclosed location and transported offsite to a licensed hazardous waste facility. A waste management plan will assist in reducing waste to be sent to local landfills, limiting demand on waste management facilities in the LAA. • Cedar will develop and implement a community feedback tool or process to receive and address community concerns and complaints. A community feedback tool will enable Cedar to respond to community concerns and if applicable, adapt mitigation measures to limit demand on local infrastructure and services. • Cedar will use local workforce accommodation centers to reduce adverse effects on local infrastructure and services. Use of local accommodation centers to house non-local workers, will limit the demand on local services, as workers will use recreational facilities and health services at lodges. • Cedar will implement a local hire and procurement policy during construction and operation and promote training opportunities where feasible. By hiring local employees and businesses, the Project will limit an increase in demand on local infrastructure and services from non-locally resident workers. • Cedar will work with the OGC, Ministry of Forests, Lands, Natural Resource Operations and Rural Development, and the road permit holder to implement traffic safety measures at the project intersection with Bish Creek Forest Service Road (e.g., a stop light). Implementation of project traffic safety measures at the project intersection will assist in controlling project vehicle traffic along the Bish Creek Forest Service Road and enable safe vehicle access to the Cedar site. The measures will limit the demand for additional local transportation safety infrastructure along the Bish Creek Forest Service Road. • Cedar will implement traffic management mitigation measures and, if required, a traffic management plan will be developed in accordance with Ministry of Transportation and Infrastructure's Traffic Management Manual for Work on Roadways and in consultation with the District of Kitimat. Implementation of traffic management mitigation measures (and a plan) will assist in improving safety and managing the increase in vehicle traffic volume during construction, limiting the demand on local traffic infrastructure. Non-resident construction workers accommodated at local work lodges will be transported by bus or van to the Cedar site each day. Cedar will also explore transportation services (bussing) from Kitamaat Village to the Cedar site, as well as scheduling rotations to reduce effects on traffic during peak traffic hours. Worker transportation via busses, will reduce the potential number of vehicles traveling to and from the Site each day limiting the demand on local traffic infrastructure.	by the increased competition for such services resulting from a project-related temporary increase in the population. With measures to transport all project workers to the Cedar site, including from Indigenous communities, effects on change in transportation infrastructure are likely to be evenly distributed among the population. Substantial adverse residual effects on infrastructure and services are not predicted to result in an exceedance of available capacity, or a decrease in the quality of a service provided, on a persistent and ongoing basis, which cannot be mitigated with current or anticipated programs, policies, or mitigation measures. Based on existing conditions and level of use of infrastructure and services within the LAA, and/or the available mitigation and management options, adverse interactions between the Project and infrastructure and services can largely be avoided, and there is a low likelihood of residual adverse effects and medium likelihood of residual positive effects. Cedar anticipates project construction to start in the second half of 2023 and will have the highest level of activity from spring 2024 through 2025. This is anticipated to coincide with completion of the Coastal GasLink Pipeline construction in 2023 and ramping down of the main construction phase for the LNG Canada Export Terminal in 2024. Consequently, demand for infrastructure and services created by the large labour forces associated with those projects will have lessened and there will likely be spare capacity in the infrastructure and services LAA to accommodate the project workforce. The presence of industrial projects and project workers may also have positive effects through the production of revenue for some municipal services, such as recreation, which can increase the capacity for investment in local infrastructure and services, which will benefit residents within the infrastructure and services LAA. An increase in the population of the infrastructure and services LAA can lead to improvements in utilities by the municipalities to serve more people, as well as an increase in housing developments and transportation infrastructure. During project construction and operation, adverse interactions between the direct project workforce and accommodations can largely be avoided, due to the relatively small non-resident workforce and the use of existing worker accommodation centers. Due to uncertainties associated with estimates of direct, indirect, and induced in-migration to the LAA, the Project could result in population-related changes in the LAA. However, in consideration of the application of mitigation and enhancement measures, there is a low likelihood of adverse interactions between the Project and housing availability and a low likelihood of positive effects. As was described in Section 7.11.7.2, the infrastructure and services LAA has experience with managing the demand for infrastructure and services created by industrial development projects. With respect to housing, the District of Kitimat conducted a Housing Action Plan and Needs Assessment to help plan for current and future housing requirements. In addition, several initiatives, including a collaboration between BC Housing and the City of Terrace to create an Affordable Housing Fund that seeks to build 52 supportive housing units and 45 low-income housing units in Terrace and the District of Kitimat, have been established to respond to the region's evolving housing needs. As previously mentioned, the scheduling of project activities to coincide with the ramping down of the Coastal GasLink Pipeline construction and the main construction phase for the LNG Canada Export Terminal will free up some capacity for infrastructure and services in the LAA to accommodate the project workforce and activities.

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			As was described in Section 7.11.7.2, the LAA has experience with managing the demand for infrastructure and services created by industrial development projects. Recent and planned improvements to road infrastructure, including the planned Haisla Bridge replacement and highway resurfacing projects in British Columbia's northern region, indicate efforts to increase the capacity and improve the condition of transportation infrastructure in preparation for increased demand from current and planned industrial projects in the region.
Haisla Nation identify economic development as one of nine interconnected community goals; the Nation seeks and promotes projects that respect community values and create job opportunities for Nation members (Haisla Nation 2020). Haisla Nation members therefore seek employment opportunities both on- and off-reserve, including employment with various industries in the region. Haisla Nation may therefore experience **changes in regional employment, business, and economy.**	**Employment and Economy (Section 7.8)** Project demand for labour has the potential to result in positive and adverse effects on regional employment. Positive effects stem from increased local employment and income during construction and operation while adverse effects arise from the inability for certain sub-populations to participate equitably in employment. Adverse effects also result from wage inflation caused by increased demand competition for labour (Section 7.8) Increased project-related employment opportunities, including project contributions to labour drawdown and wage inflation may affect the well-being of Haisla Nation members through decreased social cohesion, decreased volunteerism and ability of employees to attend events and family functions (e.g., feasts). Increased employment and salaries could affect Haisla Nation owned agencies and businesses' operation (e.g., reduced ability to retain skilled workers). Project expenditures on materials, equipment and services have the potential to result in positive and adverse effects on regional business. Positive effects include increased business revenue, which can support capital investment and hiring, thereby increasing capabilities and capacity among local businesses. Spending of income by direct and indirect workers contributes to positive effects on local businesses, primarily within the service sector, resulting in induced employment effects. Adverse effects relate to project contributions to labour drawdown (i.e., workers leave current employers to secure employment with the Project due to wage differentials or a desire to work on the Project) and wage inflation (i.e., to attract and retain workers local employers may increase compensation paid to workers). (Section 7.8). No measurable change in living costs and cost of consumables (services and goods) is predicted for Terrace and Kitimat as a result of the Project. However, any increase in living costs and the cost of consumables within the LAA may affect Haisla Nation members that are unemployed, within income, or without a living-wage (Section 7.8).	**Employment and Economy (Section 7.8)** • Inform local residents and Indigenous Nations of job and procurement opportunities during all project phases. Develop work packages that consider the capacity and capabilities of local and regional businesses. Increase local content, assess the need to translate communications in local Indigenous languages, and enhance positive effects of the Project on local communities. • Identify potential shortages of workers with specific skill requirements and training, and work with the Haisla employment department, local and regional Indigenous employment centers, local and regional training and education facilities, and communities to increase opportunities for Indigenous and local community members to obtain training required for project participation. Enhance local benefits by working with stakeholders to understand and address gaps in skills and training needed to gain employment with the Project. • Provide information to local and Indigenous employment agencies and economic development organizations to help them plan for increased demand for labour. Provide employment agencies and economic development organizations with early information on project-influenced periods of increased labour demand. • Implement a Gender Equity and Diversity Policy that focuses on hiring Haisla Nation members local and Indigenous persons, and women to increase project employment among underrepresented populations. Enhance local benefits among underrepresented populations by specifically targeting select populations and working to reduce employment barriers. • On-the-job training programs and apprenticeship opportunities will be made available. Enhance local benefits by providing necessary occupational training to under-skilled and underexperienced workers. • Workers (not inclusive of summer students) 19 years and younger will be required to have completed grade 12 or have an appropriate equivalency to work on the Project. Remove incentive for young people to leave school prematurely. • Engage with the Haisla and local, regional and Indigenous economic development departments and organizations to discuss procurement opportunities during all project phases. Develop work packages that prioritize local and regional businesses. Increase local content and enhance positive effects of the Project on local communities.	**Employment and Economy (Section 7.8)** The Project is not expected to have a substantial residual adverse residual effect on regional employment, business or economy. In terms of cost of living (assessed under the effect "change in regional economy"), while notable differences between existing wages and that of the Project's direct workforce could lead to increased competition for labour and upward pressure on wages, the extent to which local businesses would likely need to increase prices to cover increased labour costs is expected to be minor and as such the Project's contribution to inflated prices of consumables across LAA is expected to be negligible. Implementing a hire local first policy, Cedar hopes to recruit most of its workforce (all phases) from LAA and RAA communities. Despite this, a non-local workforce will likely be required to fully satisfy the Project's demand for labour, especially for highly skilled positions. Given the relatively short duration of construction and turnarounds and the Project's relatively small operation workforce, incremental demand on housing and accommodations from non-local workers is not expected to measurably increase costs for housing and other forms of accommodation. As such, the Project is expected to have a negligible effect on the cost of housing and accommodations. No further characterizations are provided. With the implementation of mitigation and enhancement measures and in consideration of current and anticipated economic conditions, the Project is expected to result in positive effects with regional gains in employment and labour income that are moderate in magnitude given workforce estimates (construction, operation [including turnarounds] and decommissioning), existing regional conditions and the 10-year labour market outlook of the North Coast and Nechako Economic Region (9,900 jobs [not including the Project] are anticipated to be added to the region by 2029). Effects extend beyond the RAA (insufficient labour supply exists to fully satisfy the Project's demand for labour) and are short-term in duration during construction and decommissioning and medium-term during operation. Positive effects are reversible following the completion of each phase (construction, operation, and decommissioning). Effects occur continuously throughout each phase of the Project. Positive effects are disproportionately distributed with non-Indigenous males anticipated to realize a major proportion of project employment (based on existing labour force and educational conditions). Risk and uncertainty are overestimated. There is a medium likelihood of effects occurring as assessed is moderate as positive effects in the form of direct, indirect, and induced employment, will occur and can be enhanced through proposed management measures. With the implementation of mitigation and enhancement measures and in consideration of current and anticipated economic conditions, project residual effects on regional business are expected to be positive in direction and moderate in magnitude. Effects extend beyond the RAA and occur over the short-term during construction and decommissioning and medium-term during operation. Positive effects are partially reversible following the completion of each phase (construction, operation, and decommissioning). Effects occur continuously throughout each phase. Positive effects are disproportionately distributed with non-Indigenous businesses likely to realize a larger share of project contracting opportunities . Risk and uncertainty are overestimated. There is a medium likelihood of effects occurring as assessed, is moderate as project spending will result in indirect and induced business activity (positive effects), which can be enhanced through management measures.

TABLE 11.5.8 CHANGES THAT AFFECT ASPECTS OF HAISLA NATION GOVERNANCE

Description of Project Interaction(s) and Effect Pathway(s) Specific to Haisla Nation	Description of Project Interaction(s) and Effect Pathway(s) Related to Valued Components	Key Mitigation and Enhancement Measures for Related Valued Components[1]	Residual Effect(s) that Remain for Valued Components After Application of Mitigation
	Project expenditures during construction and operation will result in increased economic activity (e.g., GDP) in the LAA, RAA, British Columbia and beyond. During operation, the Project will also pay income and property taxes to various governments contributing to the local, regional and provincial tax base. Increased economic activity and increased demand for labour has the potential to drive up wages and increase business costs. Increased business costs could result in the need for businesses to increase prices resulting in increases in the cost of living. Increased business costs could result in the need for businesses to increase prices resulting in increases in the cost of consumables (Section 7.8). Large differentials between existing employment income and estimated project workforce wages could result in upward pressure on wages in the LAA, increasing labour costs and potentially driving up prices of local goods and services. Should the Project rely heavily on a non-local workforce, in-migrating workers could increase demand for housing and accommodations contributing to upward pressure on the price of housing and accommodations (Section 7.8).	• Cedar will include Haisla businesses, and local, regional and Indigenous businesses and contractors in its corporate database. Enhance local benefits by increasing visibility to, and access to information on, local businesses and contractors. • Cedar will, and will require its contractor(s) to, disclose policies and practices for providing opportunities to local businesses and contractors (or to provide a CLIP—contractor's local involvement plan). Enhance local benefits by making selection criteria of contracts transparent and accessible to local businesses. • Cedar will look for opportunities over the life of the Project to enable Haisla and Indigenous, local and regional businesses and contractors to have repeated or ongoing contracts. Enhance long-term benefits of project spending by actively planning for the participation of local businesses and contractors in repeat and ongoing contracts. • Workers will be paid wages consistent with the western Canadian labour market. Reduces the possibility that the Project will contribute to wage inflation within the RAA.	With the implementation of mitigation and enhancement measures and in consideration of current and anticipated economic conditions, project residual effects on regional economy are expected to be positive in direction and moderate in magnitude. Effects extend beyond the RAA and occur over the short-term during construction and decommissioning and medium-term during operation. Positive effects are reversible following the completion of each phase (construction, operation, and decommissioning). Effects occur continuously throughout each phase. Positive effects are evenly distributed, and risk and uncertainty are overestimated. There is a medium likelihood of effects occurring as assessed as economic activity (e.g., employment and business activity) related to project construction and operation will contribute to provincial and federal GDP and municipal, provincial, and federal government revenues. Imperfect information, including gaps in existing data (namely the timeliness of data), uncertainty related to the extent to which local residents businesses and contractors will seek and secure employment and contracts with the Project, and known limitations in the effectiveness of mitigation and enhancement measures limit a potential high likelihood characterization. Economic impacts modeled through Statistics Canada's IPIOM are based on Pre-FEED estimates, which are subject to change and methodological limitations of the IPIOM (see Section 7.8.7.1), which further limit a potential high likelihood characterization. A conservative approach that overestimates the magnitude of adverse effects and underestimates the magnitude of positive effects has been applied to the assessment. Residual effects occur within a socio-economic context shaped through the cumulative effects of century long ties to industrial development and "boom-and-bust" cycles that accompany resource development (see Section 23 Summary of Effects to Current and Future Generations). With Cedar planning to start construction in late 2023 with clearing work (see Section 1.7), coinciding with the completion of construction activities on Costal GasLink and ramping down of the main construction phase of the LNG Canada Export Terminal, the Project is well positioned to leverage local labour. The timing of project construction activities means that labour demand from the Project will partially offset employment losses associated with completion/ramping down of the aforementioned construction phases mitigating the potential of a regional economic 'bust'. Given the timing of construction activities (beginning in late 2023 with clearing work) the Project is well positioned to: • leverage businesses that will likely have extra capacity (project construction coincides with the completion of construction activities on Costal GasLink and the ramping down of the main construction phase of LNG Canada Export Terminal) to meet project demand for materials, goods, and services. • partially offset declines in regional economic activity and losses in GDP and government revenue contributions associated with decreased spend on labour, goods and services from Coast GasLink and LNG Canada Export Terminal (project construction coincides with the completion of construction activities on Costal GasLink and the ramping down of the main construction phase of LNG Canada Export Terminal).

NOTE:

[1] Additional information regarding the rationale for selection, the expected success, risks and uncertainty, and timing of proposed mitigation and enhancement measures specific to the valued components discussed can be found at the referenced Application chapters noted throughout this table.

Characterization of Project Residual Effect

The application of the mitigation measures, including communication with MCTS, guidelines on reducing wake and wash, and the Marine Transportation Management Plan developed through Cedar's engagement with Haisla Nation will reduce the potential effects on Haisla shoreline harvesters and marine fishers, therefore also reducing potential residual effects on Haisla Nation governance. However, adverse residual effects are anticipated on Haisla Nation governance and, as identified in Table 11.5.8, on valued components related to Haisla Nation governance within the marine shipping LAA, the marine terminal LAA, and the infrastructure and services LAA.

Adverse residual effects on Haisla Nation governance are not expected within the employment and economy LAA (e.g., the extent to which local businesses would likely need to increase prices to cover increased labour costs is expected to be minor and as such the Project's contribution to inflated prices of consumables across LAA is expected to be negligible). Residual effects from a change in regional employment, business, and economy within the employment and economy LAA and RAA are expected to result in potential decreased social cohesion for Haisla Nation, decreased volunteerism, ability of employees to attend events and family functions (e.g., feasts), and ability to retain skilled workers for Haisla Nation owned agencies and businesses' operation.

The additional increase in large vessel movements along the marine shipping route attributable to the Project may prevent or reduce Haisla Nation access to fishing or shoreline harvesting sites. The increase in project workers within the land and resource use LAA and RAA may prevent or reduce Haisla Nation access to terrestrial hunting, trapping, harvesting or other culturally important sites. Residual effects may be disproportionally distributed, as Haisla Nation members who heavily rely on the marine environment and its resources for FSC purposes and for other purposes (e.g., cultural, economic, spiritual, trade), or who hold inherited rights over *wa'wais*, may be directly affected, whereas other Nation members may not. If access to harvesting sites or the quality and quantity of resources available is diminished, Haisla Nation's culture, identity, mental health and physical health, and well-being may be impacted.

Residual effects from increased demand on utilities, including water, sewer, and waste infrastructure within the infrastructure and services LAA are anticipated to result in changes to Haisla Nation ability to access infrastructure, services, accommodation, and transportation. Residual effects from changes in housing availability within the infrastructure and services LAA are expected to result in changes to Haisla Nations ability to access affordable and suitable housing and temporary accommodations off reserve. Residual effects from increased demand on transportation infrastructure within the infrastructure and services LAA are expected to result in changes to Haisla Nations ability to access local land-based transportation infrastructure to access harvesting sites, sacred and cultural sites, as well for work, education, and other purposes. However, adverse residual effects on infrastructure and services are not predicted to result in an exceedance of available capacity, or a substantial decrease in the quality of a service provided, on a persistent and ongoing basis, which cannot be mitigated with current or anticipated programs, policies, or mitigation measures.

Residual effects within the infrastructure and services LAA may be disproportionately experienced by Haisla Nation subgroups (e.g., Indigenous women requiring specific health services, low-income families requiring housing) that already experience challenges in accessing infrastructure and services and housing in larger centers in Terrace and Kitimat; these subgroups may be more adversely affected than other groups by the increased competition for such services resulting from a project-related temporary increase in the population. Risks may disproportionately affect vulnerable subgroups (e.g., women, children, families).

Residual effects on Haisla Nation governance have been conservatively overestimated with consideration for the interconnectedness of the effect pathways that inform Haisla Nation governance. As a result, the characterizations of residual effects on Haisla Nation governance are ranked higher than the residual effects characterized for related valued components, specifically, duration, magnitude, and likelihood.

With the implementation of mitigation measures outlined in Table 11.5.5 and Table 11.5.8, residual effects on Haisla Nation governance are anticipated to be long-term within the marine shipping LAA due to increased marine vessel traffic and associated sensory disturbances that will occur through the operation and decommissioning phases. However, residual effects are largely considered reversible as they are primarily tied to project marine shipping traffic and associated effects. For example, temporary displacement of Haisla Nation vessels travelling to places to engage in cultural or governance activities, and sensory disturbances associated with vessels which may be experienced are reversible following the project-vessel's transit through the marine shipping LAA (i.e., after the vessel passes by the sensory disturbance will cease to occur, and Haisla Nation travel can continue).

The frequency of the residual effects is intermittent and will vary according to project phase. Residual effects will occur as multiple irregular events during the construction and decommissions phase due to marine transport of construction materials, and residual effects will occur as multiple regular events during the operation phase because one LNG vessel is predicted to visit the Project every 7 to 10 days (up to approximately 50 vessels annually). The likelihood of residual effects occurring is characterized as high due to Haisla Nation existing travel, access, harvesting, and other governance activities within the marine shipping LAA and in the vicinity of the marine terminal LAA. Overall, residual effects on Haisla Nation governance are anticipated to be moderate in magnitude. Sensory disturbances, both real and perceived, may further deter Haisla members from accessing culturally important sites or engaging in governance activities within the marine shipping LAA or in the vicinity of the marine terminal LAA. However, the Project Area is located on fee simple land owned by Haisla Nation and being developed for the purpose for which it was acquired, and project activities will occur within an established shipping route where marine activities will be able to safely continue in a manner that is generally consistent with existing conditions.

11.5.6.4 CHANGES TO ABORIGINAL TITLE AND RIGHTS

Cedar is aware that Haisla Nation is currently in Stage 4 of the treaty negotiation process with British Columbia and anticipates that Haisla Nation's Aboriginal title claims will be addressed through that process. As the area of the treaty and title claim is unknown and the land and resource use LAA overlaps with Haisla Nation's traditional territory and four reserves (Kitamaat 1 and Kitamaat 2, Walth 3, and Henderson's Ranch 11), changes to non-tenured land use within the LAA are conservatively included in this assessment with consideration for future land use and planning. As noted in Section 7.11, the Project is located primarily on previously disturbed land and will result in land tenure change of 41.1 ha of unsurveyed provincial Crown land within the project footprint, representing less than 0.1% of the land base within the land and resource use RAA.

Changes to Haisla Nation interests, including rights, are anticipated through the identified changes in consumption and harvest, changes in the use and integrity of sacred and culturally important sites and landscapes features, and changes that affect aspect of Haisla Nation governance, as outlined in Table 11.5.5, Table 11.5.6 and Table 11.5.8 and as characterized in Sections 11.5.6.1 to 11.5.6.3. The range and extent to which each potential and residual effect on Haisla Nation Aboriginal title and rights are also summarized in Section 11.5.7 Characterization of Residual Effects.

11.5.7 Characterization of Residual Effects

Consistent with the AIR, residual project effects on Haisla Nation interests are summarized in Table 11.5.10. Sections 11.5.6.1 to 11.5.6.4 detail the anticipated residual effects on Haisla Nation interests which were characterized according to the socio-cultural context of the Nation's interests and the potential for effects on the broader social, economic, and health status of the Nation. Overall, there is a high likelihood that the Project will result in measurable residual effects on Haisla Nation interests. Based on the existing conditions within the marine shipping LAA and marine terminal LAA, the scope and scale of project activities and physical works, and the effectiveness of project-specific mitigation and enhancement measures, including the Marine Transportation Management Plan developed through Cedar's ongoing engagement with Haisla Nation, the Project is expected to result in moderate magnitude residual effects on Haisla Nation interests within the marine shipping LAA and marine terminal LAA. Residual effects are long-term in duration. Residual effects are largely considered to be reversible following the project-vessel's transit through the marine shipping LAA, and the decommissioning of the Project within the marine terminal LAA.

No mitigation or enhancement measures, review processes or monitoring initiatives specific to Haisla Nation interests additional to those described in Section 11.5.5 are proposed. Cedar will continue to work with Haisla Nation to develop a shared understanding of how the Project may affect their Indigenous interests. Cedar will continue engaging with Haisla Nation to discuss the Project and its effects, understand concerns that may arise and respond to those concerns. Through ongoing engagement (i.e., throughout the life of the Project) and in development of the Marine Transportation Management Plan, Cedar aims to maintain a positive long-term relationship with Haisla Nation.

TABLE 11.5.9 PROJECT RESIDUAL EFFECTS ON HAISLA NATION INTERESTS

Residual Effect	Residual Effects Characterization Criteria								
	Direction	Magnitude	Extent	Duration	Reversibility	Frequency	Affected Populations	Risk and Uncertainty	Likelihood
Changes that affect Haisla Nation consumption and harvest	A	M	Marine shipping LAA Marine terminal LAA	LT	R	IR; R	DD	O	H
Changes that affect Haisla Nation use and integrity of sacred and culturally important sites and landscape features	A	M	Marine shipping LAA Marine terminal LAA	LT	R	IR; R	DD	O	H
Changes that affect Haisla Nation governance	A	M	Marine shipping LAA Marine terminal LAA Infrastructure and services LAA Land and resource use LAA Employment and economy LAA	LT	R	IR; R	DD	O	H
Changes to Haisla Nation l title and rights[10]	A	M	Marine shipping LAA Marine terminal LAA Infrastructure and services LAA Land and resource use LAA Employment and economy LAA	LT	R	IR; R	DD	O	H

[10] Cedar is aware that Haisla Nation is currently in Stage 4 of the treaty negotiation process with British Columbia and anticipates that Haisla Nation's Aboriginal title claims will be addressed through that process. As the extent of the treaty and title claim is unknown and the land and resource use RAA overlaps with Haisla Nation's traditional territory, changes to non-tenured land use within the RAA are conservatively included in this assessment with consideration for future land use and planning.

TABLE 11.5.9 PROJECT RESIDUAL EFFECTS ON HAISLA NATION INTERESTS

Residual Effect	Residual Effects Characterization Criteria								
	Direction	Magnitude	Extent	Duration	Reversibility	Frequency	Affected Populations	Risk and Uncertainty	Likelihood
KEY See Table 11.5.4 for detailed definitions **Direction:** P: Positive A: Adverse N: Neutral **Magnitude:** NMC: No measurable change L: Low M: Moderate H: High			**Geographic Extent:** PA: Project Area PF: Project footprint LAA: Local assessment area RAA: Regional assessment area **Duration:** ST: Short-term MT: Medium-term LT: Long-term **Reversibility:** R: Reversible I: Irreversible			**Frequency:** S: Single event IR: Irregular event R: Regular event C: Continuous **Affected Populations:** ED: Evenly distributed DD: Disproportionally distributed **Risk and Uncertainty** U: Underestimated O: Overestimated **Likelihood** L: Low M: Medium H: High			

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11.5.8 Cumulative Effects

The project residual effects on Haisla Nation's interests that are likely to interact cumulatively with residual effects of past, present, or reasonably foreseeable projects and physical activities are identified in this section.

Cedar has characterized the Project's contributions to cumulative effects and has proposed mitigation measures to address potential cumulative effects. Cedar anticipates that mitigations and enhancement measures implemented for the Project will lessen cumulative effects on Haisla Nation's interests, however, cumulative effects from past, present/in progress, and reasonably foreseeable projects and activities in the vicinity of the project assessment areas, in combination with the Project, may affect Haisla Nation's experiential, behavioural, and social context in which their interests are exercised or practiced. Cumulative effects are anticipated at the regional level (within the RAAs) and can be addressed through regional initiatives, management plans, and programs.

11.5.8.1 PROJECT RESIDUAL EFFECTS LIKELY TO INTERACT CUMULATIVELY

Project residual effects identified in Section 11.5.6 likely to act cumulatively with those projects and physical activities identified in Table 6.9.1 of Section 6.9.1 (Project and Physical Activities Inclusion List) are listed in Table 11.5.10.

Where residual effects from the Project act cumulatively with residual effects from other projects and physical activities, a cumulative effects assessment is carried out. Based on feedback from Haisla Nation, anticipated cumulative effects for selected valued components are included in this analysis, even if potential effects of the Project on Haisla Nation (i.e., within the LAAs) are not anticipated. Effects identified in Table 11.5.10 as not likely to interact cumulatively with residual effects of other projects and physical activities (no check mark) are not discussed further.

Based on input provided by Indigenous Nations, regulators, and community members, as well as current understanding of the conceptual project design, Cedar identified past, in progress, and reasonably foreseeable future projects and physical works that could have potential cumulative effects on Haisla Nation interests.

As not all reasonably foreseeable projects and physical activities may proceed, the cumulative effects assessment should be considered conservative. Note that only projects located within the applicable LAAs and RAAs of relevant valued components are assumed to be likely to interact with the Project on Haisla Nation interests.

TABLE 11.5.10 INTERACTIONS WITH THE POTENTIAL TO CONTRIBUTE TO CUMULATIVE EFFECTS

Project or Physical Activity	Potential Cumulative Effects			
	Changes to Haisla Nation consumption and harvest	Changes to Haisla Nation use and integrity of sacred and culturally important sites and landscape features	Changes that affect aspects of Haisla Nation governance	Changes to Haisla Nation title and rights
Past				
Former Eurocan Pulp and Paper Mill	✓	✓	✓	✓
Former Moon Bay Marina	✓	✓	✓	✓
Present or In Progress				
Coastal GasLink Pipeline (TransCanada Corp)	✓	✓	✓	✓
Fairview Container Terminal Phase 1 and 2A (DP World/Prince Rupert Port Authority)	✓	✓	✓	✓
LNG Canada Export Terminal	✓	✓	✓	✓
LNG Canada Load Interconnection Project (BC Hydro)	✓	✓	✓	✓
MK Bay Marina	✓	✓	✓	✓
Northland Cruise Terminal (Prince Rupert Port Authority)	✓	✓	✓	✓
Northwest Transmission line	✓	✓	✓	✓
Pacific Northern Gas Pipeline	✓	✓	✓	✓
Prince Rupert Ferry Terminal	✓	✓	✓	✓
Prince Rupert Grain Terminal (Prince Rupert Grain Ltd.)	✓	✓	✓	✓
Prince Rupert LGP Export Terminal (Pembina Pipeline Corp.)	✓	✓	✓	✓
Prince Rupert Marine Fuels Project (Wolverine Terminals ULC)	✓	✓	✓	✓
Rail activities	✓	✓	✓	✓

TABLE 11.5.10 INTERACTIONS WITH THE POTENTIAL TO CONTRIBUTE TO CUMULATIVE EFFECTS

Project or Physical Activity	Potential Cumulative Effects			
	Changes to Haisla Nation consumption and harvest	Changes to Haisla Nation use and integrity of sacred and culturally important sites and landscape features	Changes that affect aspects of Haisla Nation governance	Changes to Haisla Nation title and rights
Ridley Terminals (Ridley Terminals Inc.)	✓	✓	✓	✓
Ridley Island Propane Export Terminal (AltaGas Ltd.)	✓	✓	✓	✓
Rio Tinto Aluminum Smelter	✓	✓	✓	✓
Rio Tinto Terminal A Extension	✓	✓	✓	✓
Various forestry activities	✓	✓	✓	✓
Various fishing and aquaculture activities	✓	✓	✓	✓
Westview Wood Pellet Terminal (Pinnacle Renewable Energy Inc.)	✓	✓	✓	✓
Reasonably Foreseeable				
Cedar Feed Gas Connector Pipeline	✓	✓	✓	✓
Fairview Container Terminal Expansion—Phase 2 B (DP World/Prince Rupert Port Authority)	✓	✓	✓	✓
Kinskuch Lake Hydro (WindRiver Power Corporation)	-	-	✓	✓
Kitimat LNG Project (Chevron Canada Limited/Woodside Energy Ltd.)	✓	✓	✓	✓
Kitimat LPG Export Project (Pacific Traverse Energy)	✓	✓	✓	✓
Ksi Lisims LNG Project	✓	✓	✓	✓
Pacific Northern Gas Pipeline Looping Project (Pacific Northern Gas Ltd.)	✓	✓	✓	✓

TABLE 11.5.10 INTERACTIONS WITH THE POTENTIAL TO CONTRIBUTE TO CUMULATIVE EFFECTS

Project or Physical Activity	Potential Cumulative Effects			
	Changes to Haisla Nation consumption and harvest	Changes to Haisla Nation use and integrity of sacred and culturally important sites and landscape features	Changes that affect aspects of Haisla Nation governance	Changes to Haisla Nation title and rights
Port Edward Small Scale LNG (Port Edward LNG)	✓	✓	✓	✓
Prince Rupert Gas Transmission Project (TransCanada Corp.)	✓	-	✓	✓
Pacific Trail Pipelines (Chevron Canada Limited/Woodside Energy Ltd.)	✓	✓	✓	✓
Ridley Island Export Logistics Platform Project (Prince Rupert Port Authority)	✓	✓	✓	✓
Ridley Terminals Berth Expansion Project (Ridley Terminals Inc.)	✓	✓	✓	✓
Skeena LNG (Top Speed Energy)	-	-	✓	✓
Terrace to Kitimat Transmission Project (BC Hydro)	✓	✓	✓	✓
Vopak Pacific Canada Storage and Export Facility (Vopak Development Canada Inc.)	✓	✓	✓	✓
Westcoast Connector Gas Transmission Project (Enbridge Inc.)	-	-	✓	✓

NOTES:

✓ = Those “other projects and physical activities” whose effects are likely to interact cumulatively with the Project’s residual effects.

– = Interactions between the residual effects of other projects and residual effects of the Project are not expected.

11.5.8.2 CUMULATIVE EFFECTS PATHWAYS

As summarized in Table 11.5.10, past and present/in-progress projects and physical activities that have been or are being carried out have contributed to the existing conditions for the shipping RAA and the infrastructure and services RAA and the exercise of Haisla Nation rights and title. Reasonably foreseeable projects are also anticipated to contribute to the existing conditions in the RAAs. Overall, an increase in marine vessel traffic within the shipping RAA, industrial project activities within the marine terminal RAA, increased recreation within the land and resource use RAA, and an increase in population within the infrastructure and services RAA have altered the current regional landscape and marine areas and have contributed to existing cumulative effects on Haisla Nation interests.

Haisla Nation interact with their history (e.g., heritage sites, spiritual sites, oral history, laws), grow their Nation, exercise self-determination, govern, and enrich the future of their members through ongoing connection, use, and access to the waters and lands of their traditional territory (see Section 11.2.2). Changes in Haisla Nation territory brought about after contact with European settlers resulted in changes to Haisla land use and lifestyle, beginning with the fur trade in the 19th century. Between 1890 and 1950, the increase in farming and cannery operation affected the lifeways of Haisla Nation members (Hamori-Torok 1996; Powell 2013:26), and industrial developments around the town of Kitimat resulted in the restriction of use of areas along Kitimat Arm (Powell 2011). Prior to the early-1970s, the Kitimat River was a primary source of oolichan for Haisla Nation, yielding 27,000 to 81,000 kg per year from 1969 to 1971 (Gordon et al. n.d.). By 1972, Haisla reported that the oolichan harvested from the Kitimat River was “foul-tasting and inedible”, and this was attributed to pollution from industrial and municipal effluent discharges (Tirrul-Jones 1985).

Regional industrial developments such as commercial fishing, logging, and large industrial facilities are perceived by some Haisla members to be a major factor influencing the decline in oolichan abundance in their territory (Gauvreau 2021; see Section 11.2.2). Daily operation and maintenance of specific facilities have been observed to impact oolichan spawning substrate and water quality over time (e.g., pollution, destruction of habitat); employee travel to and from facilities has also been observed to impact oolichan harvesting sites (e.g., wave action, erosion, noise) (Gauvreau 2021). Participants reported that industrial developments have influenced the lack of consistent annual return to the spawning areas in their territory (Gauvreau 2021). Some Haisla members have reported that Haisla Nation’s ability to harvest oolichan has been negatively impacted by industrial expansion within their territory (Gauvreau 2021). Oolichan conservation and recovery planning is ongoing in Haisla Nation territory; Haisla Nation members are working with industry and scientists to develop enhancement studies to actualize oolichan recovery in formerly active harvesting sites (Gauvreau 2021).

Table 11.5.11 identifies the cumulative effects anticipated for each valued component related to Haisla Nation interests. Cumulative effects on Haisla Nation interests are discussed relative to each valued component following Table 11.5.11. Based on feedback received from Haisla Nation, anticipated cumulative effects for select valued components are included in this analysis, even if potential effects of the Project on Haisla Nation (i.e., within the LAAs) are not anticipated.

TABLE 11.5.11 CUMULATIVE EFFECTS ON HAISLA NATION INTERESTS

Valued Component	Anticipated Cumulative Effects on Haisla Nation Interests within the RAAs		
	Changes that affect Haisla Nation consumption and harvest	Changes that affect Haisla Nation use and integrity of sacred and culturally important sites and landscape features	Changes that affect aspects of Haisla Nation governance
Air quality	-	-	-
Acoustic	-	-	-
Vegetation resources	✓	✓	-
Wildlife	✓	✓	✓
Marine resources	✓	✓	✓
Employment and economy	-	-	-
Land and resource use	✓	✓	✓
Marine use	✓	✓	✓
Infrastructure and services	-	-	✓
Human health	-	-	-
Heritage	-	-	-

Air Quality

Results of the application case show a small increase to maximum predicted concentrations compared to the base case where predicted concentrations add 0%, 0.09%, 0.7% and 0% 11 of nitrogen dioxide, sulphur dioxide, $PM_{2.5}$, and carbon monoxide, respectively. The extent of residual effects is limited to within the air quality LAA and RAA and to the vicinity of the Project (less than 1 km) and is negligible to very small at increasing distance from the Project. The results show negligible to very small cumulative effects. There are no new future foreseeable projects in the air quality LAA and RAA that act cumulatively with the Project.

Results of the shipping air quality assessment shows a small increase to existing air quality conditions. The extent of residual effects from shipping is limited to within the air quality LAA and RAA and to the vicinity of the shipping route. Residual effects do not persist in any location due the motion of the LNG carriers and tugboats and are negligible to very small at increasing distance from the shipping route. The results show negligible to very small cumulative effects.

Residual cumulative effects are therefore not anticipated on Haisla Nation interests within the air quality RAAs.

Acoustic

Present projects and physical activities within the acoustic LAA and RAA that are likely to interact on acoustic with the Project are characterized by a combination of residential, industrial and commercial activities as well as the natural environment (e.g., MK Bay Marina, Rio Tinto Aluminum Smelter). Section 7.3.5 provides information on the existing acoustic environment in the acoustic LAA and RAA. The existing baseline sound levels already include and account for existing noise emission activities in the acoustic LAA and RAA (e.g., Rio Tinto Aluminum Smelter, local marine shipping activities). Predicted noise levels from the LNG Canada Export Terminal have been included within the baseline noise levels of all the noise sensitive receptors; however, cumulative effects within the RAA will not overlap with the predicted project noise in such way as to exceed the OGC's PSL.

A maximum of 50 LNG carriers are expected for the Project. This is equivalent to 100 vessels per year of marine traffic. Project related marine traffic is approximately 8% of the future non-project related marine activities along the Douglas Channel portion of the Cedar shipping route. This percentage is less along the other portions of the shipping route (e.g., 6 % for Principe Channel and 2% for Triple Islands). Project-related marine traffic residual effect is based on a "worst-case" 24-hour scenario, conservatively assuming that LNG carriers and assistance/harbor tugboats activities will occur on a daily basis. With the conservative assumptions, project-related marine traffic residual effect along the shipping route is well below the baseline sound level; cumulative noise effect with respect to the present and future commercial vessels and ferries is predicted to be negligible.

Residual cumulative effects are therefore not anticipated on Haisla Nation's interests within the acoustic RAAs.

Vegetation Resources

The Project's contribution to cumulative effects on vegetation resources is relatively small in comparison to the changes from past and present projects and activities.

The marine terminal RAA has been subject to disturbances associated with harvesting and industrial buildup due to past and present (existing) projects and activities, totaling 884.5 ha (44% of the marine terminal RAA including historical cutblocks greater than 20 years old. The Project will contribute an additional area of disturbance of 40.6 ha (3%) of vegetated ecological communities of the marine terminal RAA. Of this contribution, 32 ha (79% of the vegetated component of the project footprint) is associated with the transmission line (most of the area will be maintained at shrub height), while 8.6 ha are associated with the vegetation clearing associated with the facility (some of which will also be kept vegetated at shrub height).

The air emissions RAA has been subject to industrial emissions (demonstrated by base case modelling and documented for other projects). Cumulatively, project modelling estimates that sulphur dioxide will affect 5,249.5 ha of vegetated area above the critical level protective of lichens and mosses, 5,176.9 ha of vegetated area above calculated critical loads of acidity, and 567.2 ha of vegetated area above eutrophication calculated critical loads. Included in these totals, the Project would contribute to an increase of 73.6 ha (1% increase from existing conditions) of vegetated area above the critical level of sulphur dioxide, and an increase of 76.2 ha (2% increase from existing conditions) of vegetated area above calculated critical loads of acidity. Though no additional vegetated ecological communities will be affected by eutrophication exceedances due to project emissions, the Project will bring soils in the RAA closer to the eutrophication critical load.

Overall cumulative effects are characterized as moderate magnitude for all potential effects except change in abundance of plant species of interest which is characterized as low magnitude. With the Project's proposed mitigation in place and the expected similar mitigation in place for other projects and activities in the marine terminal RAA through legislative requirements, standard operating procedures, and industry standard best management practices, no substantial adverse residual cumulative effect for vegetation resources is predicted. The long-term viability of plants and ecological communities of interest, including those of cultural or traditional importance, will persist in the marine terminal RAA and there will be no cumulative loss of wetland functions of ecologically important wetland because none occur in the project footprint. Cumulative effects of air emissions effects are not expected to affect the long-term viability of native plants (including lichens and mosses) which will persist in the air emissions RAA.

Residual cumulative effects on change in vegetation resources is expected to result in residual cumulative effects on Haisla Nation interests within the vegetation resources RAA.

Wildlife

Residual cumulative effects on wildlife are predicted to range from low to moderate, based knowledge of threats to key species and species groups and past, current, and reasonably foreseeable projects and physical activities. These cumulative effects are due to changes in vegetative cover (e.g., removal) and vegetative type (e.g., conversion of old forest to second-growth forest) and increasing levels of indirect effects (e.g., noise, lighting, human presence, presence of LNG shipping carriers) within the marine terminal RAA and shipping RAA which are expected to disturb wildlife, resulting in changes to habitat, movement, and mortality risk.

Construction, operation, and decommissioning of the Project will contribute to these residual cumulative effects by removing some vegetative cover to accommodate project infrastructure, changing forest cover (primarily along the transmission line corridor) to shrub cover for approximately 40 years, and adding to the effects already present around the Kitimat area and along the shipping route.

Overall, residual cumulative effects on wildlife are not anticipated to result in a substantive adverse residual effect for wildlife because cumulative effects are not predicted to cause or further contribute to the exceedance of a conservation-based threshold or threaten the long-term persistence or viability of species of management concern, or species of cultural or traditional importance.

There is a high likelihood that past, present, and reasonably foreseeable future projects and physical activities will interact cumulatively with residual effects from the Project within the marine terminal RAA and shipping RAA. This is because future projects and physical activities assessed in the cumulative case are likely to overlap with the Project spatially (e.g., vessels from other projects using the same shipping route as the Project's shipping route) and/or temporally (e.g., indirect effects during construction of other projects in the Kitimat area would add to indirect effects from the operation phase of the Project). Therefore, adverse interactions between the Project and wildlife are difficult to avoid and adverse cumulative effects are likely. The likelihood of the Project's contribution to a cumulative residual effect is considered high.

The likelihood of a residual cumulative effect on mortality risk and movement is high for terrestrial wildlife and marine birds[11].

[11] Effects of past marine shipping are considered reversed with respect to temporary disruption of marine bird movement and mortality risk.

Residual cumulative effects on change in marine bird habitat, movement and mortality risk are expected to result in residual cumulative effects on Haisla Nation interests within the wildlife (shipping) and (marine terminal) RAAs.

Freshwater Fish

Project construction is expected to result in the temporary alteration of up to 0.4 ha of riparian habitat in RRZ of fish-bearing watercourses. This riparian habitat represents a relatively small percentage of the riparian habitat (approximately 0.3% of RRZ for Beaver, Anderson and Moore creeks) in the freshwater fish RAA and the clearing will primarily affect trees; shrubs will continue to provide riparian functions in this area. As a result, the reduction of riparian functions is anticipated to be small. Some past development projects within the freshwater fish RAA that have resulted in adverse effects to fish habitat (e.g., LNG Canada Export Terminal) have been required by DFO to implement offsetting (or compensation) programs and it is assumed that these programs have been (or will be) effective. It is also expected that any future developments within the freshwater fish RAA will be similarly required to implement habitat offsetting programs for any residual HADD resulting from the permanent alteration or destruction of fish habitats and that these programs will also be effective. For these reasons, potential cumulative effects on fish habitat within the freshwater fish RAA due to riparian vegetation losses are predicted to be low in magnitude (i.e., will not affect the long-term persistence of any fish population). Effects would occur multiple times (but only once at each location), and would be long-term and reversible.

Results from the acidification assessment identified that there was one critical load exceedance in the project-alone case, lake LAK28. However, this lake was predicted to have high acid sensitivity and was found to also exceed critical loads under the base case scenario because of high base case emission levels from other projects in the area. The project contribution to residual cumulative effects is considered low and this conclusion is predicted based on the area with predicted deposition level of 100 S+N eq ha-1 yr-1 in the project-alone modelling scenario. The modelled S+N deposition rate for the surface water receptors show an approximate 1% increase in the application case compared to the base-case.

The likelihood of residual cumulative effects on riparian habitat is considered high. This is because, despite habitat compensation/offsetting, some adverse changes in riparian habitat have occurred, and may continue to occur, as a consequence of riparian vegetation clearing due to past, present, and reasonably foreseeable future projects.

In addition, there is a high likelihood of residual cumulative effects on surface water quality through acidification. This effect is due to the influence of existing projects in the area as modeled by the deposition level of 100 S+N eq ha^{-1} yr^{-1} for the the base case modelling scenario.

Residual cumulative effects on change in freshwater fish are expected to result in residual cumulative effects on Haisla Nation interests within the freshwater fish RAA.

Marine Resources

Residual cumulative effects on marine resources are summarized for each residual effect related to Haisla Nation's interests. Residual cumulative effects on change in marine resources are expected to result in residual cumulative effects on Haisla Nation interests within the marine resources (shipping) and (marine terminal) RAAs.

Change in Habitat

Project construction is expected to result in the permanent alteration of 360 m of shoreline in Kitimat Arm due to erosion protection armouring and the loss of 47 m^2 of habitat below the higher high-water mean tide due to pile installation. These affected habitats represent a relatively small area of fish habitat in the marine resources (marine terminal) RAA and an even smaller proportion of the total fish habitat in the combined marine resources (marine terminal) and marine resources (shipping) RAAs. It is assumed that past marine development projects within the marine terminal RAA, most of which are located in or near Kitimat that have resulted in adverse effects to fish habitat (e.g., LNG Canada Export Terminal, Rio Tinto Aluminum Smelter) have been required by DFO to implement offsetting (or compensation) programs where a harmful alteration, disruption or destruction of fish habitat is predicted to occur and that these programs have been (or will be) effective. It is also expected that future developments within the marine terminal RAA (e.g., Kitimat LNG Project, Kitimat LPG harmful alteration, disruption or destruction of fish habitat project) will be similarly required to implement effective offsetting programs for any residual harmful alteration, disruption or destruction of marine fish habitats.

With the implementation of mitigation measures, cumulative effects on marine fish habitats within the marine resources (marine terminal) RAA are predicted to be low in magnitude. Effects will occur multiple times (but only once at each location), will be long-term or permanent in duration, and will occur in both disturbed and undisturbed habitats. Collectively, the permanent alteration and destruction of fish habitats from all past, present, and reasonably foreseeable projects is expected to be irreversible.

The likelihood of residual cumulative effects on marine fish habitat is considered high since, despite the widespread implementation of habitat compensation/offsetting, some adverse changes in habitat have occurred as a consequence of past and present projects and activities and are expected to occur during construction of reasonably foreseeable future projects. However, the incremental contribution of the Project to this cumulative effect is considered small and the health and overall viability of marine fish habitat in the marine resources (marine terminal) RAA is considered high.

Water Quality

Residual changes to water quality from project-related discharges into the marine environment (e.g., treated sanitary wastewater) are not expected to act cumulatively with those of other projects and activities. It is assumed that other projects will be required to meet similar effluent permit conditions and Water Quality Guidelines designed to protect aquatic life in marine waters, and that residual effects will be localized and limited to within or near the development footprint of each project. The likelihood of residual cumulative effects for change in water quality is considered is low. Mitigation measures implemented for the Project and other marine development projects in the marine terminal RAA will reduce the levels and spatial extent of TSS in the water column, and sediment plumes for the Project and other projects are expected to be small and irregularly and therefore are not expected to interact cumulatively (spatially or temporally).

Change in Behaviour

During project construction, some cumulative change in fish and marine mammal behaviour is expected following the implementation of project mitigation measures and the expected practicable mitigation of underwater noise for other present or reasonably foreseeable marine construction projects. Residual cumulative effects caused by concurrent marine construction projects and activities are characterized as low in magnitude, non-overlapping in extent, limited to the marine resources (marine terminal) RAA and will persist over the medium-term. These effects will occur in disturbed environments and are considered to be reversible following the completion of the activities that generate underwater noise.

Residual cumulative effects on marine fish and marine mammal behaviour resulting from marine construction vessel traffic and other existing vessel traffic in the marine resources (marine terminal) RAA are predicted to be low in magnitude. The spatial extent of changes in fish and marine mammal behaviour may be smaller for vessels travelling at low speeds, and in areas of higher traffic where fish and marine mammals may have become accustomed to underwater noise generated by vessel movements over the long-term. Residual cumulative effects are expected to persist over the medium-term, will occur in primarily disturbed areas that are currently subject to underwater noise from existing vessel traffic, and will be reversible following the cessation of the underwater noise.

During the Project's operation phase, residual cumulative changes in marine fish behaviour are predicted to be low in magnitude. Similar to construction vessel traffic, effects during operation are expected to be in the marine resources (shipping) RAA and to include multiple areas of marine fish avoidance or altered swimming direction and marine mammal behaviour (e.g., time underwater, time at surface, swim speed). The areas of changes in behaviour are expected to be of limited overlap along the shipping route to the Triple Islands pilot boarding station. In these areas, the spatial extent of changes in behaviour may be smaller due to habituation to underwater noises generated by frequent vessel movements over the long-term. Residual cumulative effects are expected to be short-term and reversible (animals will recover in minutes to hours) but effects will occur repeatedly over the operation life of the Project, will occur in disturbed areas.

Residual cumulative effects of change in behaviour of marine mammals are conservatively categorized as medium magnitude in the marine resources (shipping) RAA due to the presence of multiple marine mammals listed under the *Species at Risk Act*. However, the incremental contribution of behavioural effects from the Project acting cumulatively with past, present and future projects is not anticipated to result in adverse effects to the viability of marine populations, including species at risk. Given the anticipated operation life of most projects, residual cumulative effects of changes in behaviour are expected to be regular in nature, reversible, short-term, and occurring in a disturbed area. The likelihood of residual cumulative effects on marine fish and marine mammal behaviour is considered high. While mitigation measures implemented for the Project and other marine development projects in the marine resources (shipping) RAA will reduce the intensity and spatial extent of underwater noise, some cumulative changes in marine fish and marine mammal behaviour are expected in areas close to active construction sites and in the vicinity of transiting vessels. The likelihood of residual cumulative effects for change in behaviour on marine mammals is therefore considered high but is not anticipated to result in population-level effects.

Change in Injury or Mortality Risk

Future marine development projects within the marine resources (marine terminal) RAA are expected to result in the mortality of some marine fish and invertebrates, primarily sessile or slow-moving species that are unable to avoid areas of in-water construction. These effects are expected to be localized, occurring within or near the development footprint of each project, and limited to periods of active construction (i.e., during dredging, disposal at sea, infilling, impact pile driving and underwater blasting). Most species that could be injured or killed during marine construction activities are abundant in the marine resources (marine terminal) RAA, and the loss of a limited number of individuals will not affect the long-term persistence these populations. Following the completion of construction works, available habitats be colonized via recruitment and migration from nearby areas. Where projects result in unavoidable marine fish mortality or harmful alteration, disruption or destruction of fish habitat, offsetting measures will be implemented to counter-balance project impacts, and these will likely benefit those species affected by in-water construction activities.

With the implementation of mitigation measures, the cumulative effect of a change in mortality risk is predicted to be low. This effect is considered regular and long-term in a mostly disturbed environment, in consideration of the numerous commercial, recreational and Indigenous fisheries that operate throughout the marine resources (marine terminal) RAA on an ongoing basis. While mortality is, by definition, irreversible, most of the affected species have high intrinsic population growth rates and are expected to be replaced within one to two generations following the completion of in-water construction activities (or in the absence of fishing) and the population viability of fish populations will not be adversely affected.

The Project will act cumulatively with past, present and reasonably foreseeable projects and activities in the marine resources (shipping) RAA to increase the relative risk of a marine mammal vessel strike, and residual cumulative effects of change in injury or mortality risk from increased marine vessel traffic are expected to be of moderate magnitude. Marine mammal vessel strikes are expected to occur as multiple, irregular, albeit infrequent events. In the event of a vessel strike, consequences for the marine mammal involved are assumed to range from reversible (in the case of injury) to permanent and irreversible (in the case of mortality). Based on current marine mammal population sizes and trends for species known to occur in the marine resources (shipping) RAA, changes in mortality risk are considered unlikely to affect population viability, including species at risk. This effect will occur in a disturbed area of active human development where strike risk to marine mammals already exists and populations of the most commonly struck whale are stable or increasing (e.g., grey whales, humpback whales, fin whales).

The likelihood of residual cumulative effects for change in injury or mortality risk to marine resources is considered high. While mitigation measures implemented for the Project and other marine development projects in the marine resources (marine terminal) RAA will reduce the magnitude, extent, and duration of injury and mortality to marine fish and marine mammals, some mortality is likely unavoidable.

Employment and Economy

The Project is not expected to have a residual adverse effect on regional employment, business or economy therefore further assessment of cumulative effects is not warranted and residual cumulative effects on Haisla Nation interests are not predicted to occur within the employment and economy RAA.

Land and resource use residual cumulative effects on change in private property and tenured land use within the RAA are expected to be adverse and difficult to avoid, however, the project footprint represents less than 0.1% of the RAA (i.e., approximately 2,168,307 ha of land). Only four private property parcels are overlapped by the project transmission line corridor, two of which are owned by Haisla Enterprises

Ltd. and were acquired for the purpose of developing energy export projects. The Project will otherwise not affect use or access to other private property within the RAA. The Project will not affect TSA land and timber and will have no contribution to cumulative effects on forestry within the RAA. There is a high likelihood that the future projects, if built, will overlap with land use and resources within the RAA, including guiding/outfitting areas, and trapping areas, having cumulative effects. There is also a high likelihood that reasonably foreseeable future projects, should they be built, will overlap with private property and tenured land use and result in cumulative effects on visual quality/light within the RAA. These projects are anticipated to restrict the use and/or access of terrestrial or freshwater environments currently used for resources (e.g., hunting, trapping, etc.). Overall, the cumulative effects with the Project for change in property and tenured land use, including visual quality/light, is considered negligible to low magnitude (low to moderate for visual quality/light), extends to the RAA, medium term in duration, continuous in frequency, and reversible.

Project residual effects will contribute to cumulative changes in non-tenured land use within the LAA. The Project's contribution to cumulative effects within the RAA includes residual effects on recreational use, hunting, and fishing. The Project changes 48 ha of unsurveyed provincial Crown land within the RAA, representing less than 0.1% of the land base within the RAA. Other projects will affect the availability of lands for non-tenured land uses in a similar fashion, but only represent a small fraction of lands available for recreational use within the RAA. Cedar is aware that Haisla Nation is currently in Stage 4 of the treaty negotiation process with British Columbia (see Section 11.5.6.4). The area of Haisla Nation's treaty and title claim is unknown, however, the land and resource use RAA overlaps with Haisla Nation's traditional territory, including four reserves (Kitamaat 1 and Kitamaat 2, Walth 3, and Henderson's Ranch 11). There is a high likelihood that reasonably foreseeable future projects will overlap with non-tenured land use and result in cumulative effects on visual quality/light and are anticipated to restrict the use and/or access of terrestrial or freshwater environments currently used for recreation (e.g., hiking, hunting, fishing etc.) and the exercise or practice of Indigenous rights, and the exercise or practice of Indigenous rights, as well changes in the ability to make decisions regarding land use within the RAA. Haisla Nation may experience disproportionally distributed residual cumulative effects on their hunting, fishing, trapping, and other land-based activities within the RAA. Adverse interactions between the Project and land and resource use are difficult to avoid and adverse cumulative effects are likely. Overall, the cumulative effects with the Project for change in non-tenured land use (i.e., recreation, visual quality/light, exercise or practice of Indigenous rights) is considered low to moderate in magnitude, extend to the RAA, medium-term in duration, continuous in frequency, and reversible.

Residual cumulative effects on land and resource use are expected to result in residual cumulative effects on Haisla Nation's interests within the land and resource use RAA.

Marine Use

If all past, present, and future projects and physical activities listed in Table 7.10.19 proceed to construction and operation, approximately 2,351 vessels could visit the port of Kitimatport of Kitimat or intersect the marine shipping route annually, with 605 of those vessels, or 25.7%, visiting the port of Kitimat directly. This is a conservative estimate as it assumes that all of the proposed and or approved projects will be built.

Increases in ship volumes related to reasonably foreseeable future projects will occur gradually over time. It is anticipated that that marine shipping associated with other projects will also implement measures to limit their effects on marine use and navigation (see measures proposed or implemented by LNG Canada in 2014, as an example). Other large marine users will use systems including VHF broadcasts through

the MCTS and BC Coast Pilots, which will limit will reduce the likelihood of adverse residual cumulative effects on marine navigation, such as ship collisions, congested waterways, and other impediments to navigation. The port of Kitimat is a private port that has a long history of industrial development and has been managing large industrial vessel traffic since the 1950s. Kitimat is home to large industrial projects that use large commercial vessels and small recreational vessels that may launch from local marinas. The Project will be located approximately 2.5 km from the port of Kitimat. The proposed Kitimat LNG Project will be located in or adjacent to Bish Cove, located approximately 9 km south of the Project Area. Due to the location of the Kitimat LNG Project, it is unlikely that it will impede or interact with Cedar regarding a change in navigation due to physical structures. It is expected that other government agencies, such as Transport Canada and the Canadian Coast Guard, will continue to contribute to maintain the high safety standards in the port of Kitimat. Given the experience of the port of Kitimat and other government agencies involved in maintaining navigable waters, existing conditions, and the proposed mitigations listed in Table 7.10.17, there is low likelihood of cumulative effects on marine navigation from past, present, and future projects and physical activities as adverse interactions between the past, present, and future projects and marine navigation can largely be avoided or mitigated.

Large commercial vessels travelling to Prince Rupert will only pass through the northern portion of the RAA when travelling to and from the Triple Islands Pilot Boarding Station and would not travel the length of the marine shipping route. Potential interactions between project shipping activities and Prince Rupert bound vessels is expected to be limited to the area offshore of Triple Islands in the northern portion of the RAA. In this portion of the RAA, limited fishing activity has been identified. Recreational fishing occurs south of Triple Islands, which will not be transited by Prince Rupert bound shipping traffic as it passes north of Triple Islands through the RAA. Shoreline harvesting occurs in proximity to islands such as the Tree Nob Group, Dolphin Island, north of Porcher Island, and the areas between Mink and Pitt Islands, and do not overlap with the northern portion of the RAA.

Indigenous Nations whose territories are intersected by or in proximity to marine shipping routes or marine terminals may experience disproportionate effects on marine fisheries and other uses due to the locations of their commercial and FSC fisheries. Since contact, past and current colonial processes have displaced Indigenous communities from their traditional territory, which have had direct impacts to the health and wellness of individuals and communities. For example, to continue to harvest and fish the same quantities of marine resources as their ancestors, Indigenous communities have had to increase their efforts or move their harvesting areas. The emotional and spiritual attachment Indigenous Nations have to their traditional territories has been developed over time through individual and collective experiences on the land and water and is tied to histories, knowledge and stories, connections with ancestors, cultural practices, and geographical features and place names. The application of the mitigation measures, including communication with MCTS and other media outlets, the establishment of a LNG carrier shipping schedule notification processes for Indigenous Nations with traditional territories overlapping the marine shipping route, maintaining safe speeds and adhering to the prescribed shipping route, and following the guidelines on reducing wake and wash set out in the draft Waterways Management Guidelines for the North Coast (when implemented), will reduce or eliminate the potential residual effects on shoreline harvesters.

Assuming all present and future projects proceed to construction and operation, project-related vessel traffic will represent 2.13% of the increase. However, the fishing grounds and gear types and techniques do not overlap or prevent interactions with marine shipping traffic. In consideration of the mitigation measures listed in Table 7.10.17 that will apply to the Project, there is a medium likelihood, but low project contribution of cumulative effects on marine fisheries and other uses from present and future projects and physical activities as adverse interactions between the present and future projects and marine navigation can largely be avoided or mitigated.

Overall, with the implementation of appropriate mitigation measures present and future projects and physical activities will result in residual cumulative effects on marine navigation and marine fisheries and other uses that will have a measurable change on marine use as compared to current levels, but that will allow marine use to continue at current levels. Substantial adverse cumulative effects to marine use are not anticipated, as the Project is not expected to contravene established marine use plans or policies or create a change or disruption that widely restricts or degrades present marine uses to a point where activities cannot continue at current levels. The effect on marine use will be relatively low as small areas of navigable waters will be affected and the impact to marine fisheries and other uses will be minimal.

The effects on marine navigation and marine fisheries and other uses from the construction of all new marine infrastructure for the cumulative effects scenario, will persist for the long-term and will be reversible upon decommissioning. The effects of large vessel traffic are considered long-term and will occur continuously. The effects of large vessel traffic associated with projects will be reversible when projects' operation cease.

Residual cumulative effects on marine fisheries and marine navigation are expected to result in residual cumulative effects on Haisla Nation's interests within the marine use RAA.

Infrastructure and Services

Residual cumulative effects on change in infrastructure and services are expected to result in residual cumulative effects on Haisla Nation interests within the infrastructure and services RAA.

Change in Infrastructure and Services

Adverse residual effect on infrastructure and services are not expected to result in an exceedance of available capacity, or a substantial decrease in the quality of a service provided, on a persistent and ongoing basis, which cannot be mitigated with current or anticipated programs, policies, or mitigation measures. Project construction workers will be lodged at existing work lodges with services, including catering and opportunities for recreation, this will reduce the need for project workers to go into infrastructure and services RAA communities.

Cedar will provide site security and implement an emergency response plan to respond to emergency situations at the Cedar site. First-aid facilities and personnel will be available onsite during construction and operation to provide non-emergency health services to the workforce. Corporate policies will be implemented to prevent workplace incidents and limit adverse behaviours of the non-local workforce in the community. These measures will reduce the likelihood of cumulative effects on local health, safety, and emergency services and infrastructure. Several services in Kitimat and Terrace are currently proposing expansions (e.g., Mills Memorial Hospital), which will increase capacity in advance of the Project.

Cedar will continue to communicate with local communities and service providers with respect to scheduling so they may prepare for potential increased demands local services and infrastructure, such as the local landfill due to the addition of project-related domestic and construction waste. With application of mitigation and enhancement measures, cumulative effects on infrastructure and services are expected to be adverse, low to moderate in magnitude, short-term to long-term, continuous, and reversible.

Because the Project and project workers are likely to rely on infrastructure and services in the main service centres in the infrastructure and services RAA (Kitimat and Terrace), groups that already experience challenges in accessing infrastructure and services in these larger centres (e.g., Indigenous women requiring specific health services), may be more adversely affected than other groups by the increased competition for such services resulting from a project-related increase in the population.

The Project will act cumulatively with other projects to create positive effects on infrastructure and services because all project workforces will contribute economically to the infrastructure and services RAA (through property and income taxes) representing a potential expansion of municipal tax bases. This in turn will help pay for improvements in infrastructure and services as service providers to re-size appropriately for the increased population.

The likelihood of effects occurring as assessed is low to medium. The assessment is based on the capacity of infrastructure and services, Cedar's mitigation and enhancement measures, Cedar's efforts to hire locally, the likelihood that future projects and physical activities will be required to apply standard mitigation and other management measures, and cumulative demand for infrastructure and services during construction and operation. A conservative approach that overestimates the magnitude of adverse effects has been applied to the assessment.

Change in Accommodation Availability

As a result of the potential increase in the infrastructure and services RAA population associated with planned projects, adverse residual cumulative effects on housing availability may result in an exceedance of available capacity, or a substantial decrease in the quality of a service provided, on a persistent and ongoing basis, which cannot be mitigated with current or anticipated programs, policies, or mitigation measures.

Establishing hiring policies, which will prioritize hiring of project construction and operation workers from infrastructure and services RAA communities, and arranging for project construction workers to be lodged at existing work camps, will reduce the adverse residual cumulative effects of the Project on housing availability. Similar mitigation measures have been implemented in the RAA, including for LNG Canada, and have resulted in limited additional demand on market housing.

Cedar will continue to communicate with local communities, as well as worker accommodation center operators with respect to scheduling so they may prepare for potential increased demands local services and infrastructure.

With application of mitigation and enhancement measures, cumulative effects on change in housing availability are expected to be adverse and low to moderate in magnitude. As reported in the Terrace Housing Needs Assessment, in a medium to high economic scenario, demand will exceed supply for housing between 2020 and 2030. This has been determined using a conservative approach and considering that the Project could potentially overlap temporally with other large projects in Kitimat, which could lead to an increase in the RAA population of up to 2,500 people during the project construction phase. This would slightly exceed capacity of local open lodges, but project contribution to this effect

would be low, in consideration of the relatively small construction workforce (max 500). Also, while Terrace has experienced an increase in housing prices and an increase in rental rates (peak in 2019), increased demand for housing and other forms of accommodation from in-migrating construction and operation phase workers is not expected to measurably increase demand such that upward pressure on costs occur. This is further explained in Section 7.8.7.4 (Economy and Employment).

Adverse residual cumulative effects will be short-term, continuous, and reversible. Residual cumulative effects on housing during operation are low, long-term, continuous, and reversible. Because the Project and project workers are likely to rely on housing in the main service centres in the infrastructure and services LAA (Kitimat and Terrace), groups that already experience challenges in accessing housing in these larger centres may be more adversely affected than other groups by the increased competition for housing resulting from a project-related temporary increase in the population.

The likelihood of effects occurring as assessed is low during operation and decommissioning when labour forces are relatively small. The likelihood has been assessed as high during construction as adverse effects on housing availability are likely to occur during construction if the planned projects in the infrastructure and services RAA proceed as scheduled. The assessment is based on the capacity of housing in the infrastructure and services RAA, Cedar's mitigation and enhancement measures, Cedar's efforts to hire locally, and cumulative demand for housing during construction and operation. A conservative approach that considers the uncertainty associated with the proportion of the project workforce that my come from outside the infrastructure and services RAA and the schedule of other planned projects overestimates the magnitude of adverse effects.

Change in Transportation Infrastructure

Adverse residual cumulative effects on transportation infrastructure are not expected to result in an exceedance of available capacity, or a substantial decrease in the quality of a service provided, on a persistent and ongoing basis, which cannot be mitigated with current or anticipated programs, policies, or mitigation measures.

While the Northwest Regional Airport has received an increase in passenger movements since 2013 related to transiting project workers, it has undergone improvements in recent years to improve service and increase capacity. Cedar will establish hiring policies to prioritize hiring of project construction and operation workers from infrastructure and services RAA communities, which will reduce the Project's contribution to demands on the Northwest Regional Airport. This strategy will also reduce project-related demands on local roads and highways since a proportion of the workforce will already live in infrastructure and services RAA communities. The provision of catering, first aid, and recreation services at worker accommodation centers will also alleviate demands on transportation infrastructure since project workers will not need to travel into infrastructure and services RAA communities for these services. Transportation infrastructure in the RAA may see upgrades as a result of additional tax revenue, and increased demand from projects and where increased spending associated with project workforces leads to future improvements.

It is expected that other project proponents will implement similar mitigation and enhancement measures to reduce the adverse residual cumulative effects on transportation infrastructure. Measures implemented by LNG Canada, including chartered flights and shuttle transit for project workers, have limited direct effects of LNG Canada on transportation infrastructure.

Cedar will continue to communicate with local communities and transportation service providers with respect to scheduling so they may prepare for potential increased demands on transportation infrastructure. With the application of mitigation measures, cumulative effects on transportation infrastructure are expected to be adverse, low to moderate in magnitude, short-term to long-term, continuous, and reversible. Effects on change in transportation infrastructure are likely to be evenly distributed among the population.

The likelihood of effects occurring is assessed as low to medium. The assessment is based on the capacity of transportation infrastructure in the RAA, Cedar's mitigation and enhancement measures, and cumulative demand for transportation infrastructure during construction and operation. A conservative approach that overestimates the magnitude of adverse effects and underestimates the magnitude of positive effects has been applied to the assessment.

Human Health

There are no cumulative effects from past and present projects. Past projects have no lasting effect on noise levels or COPC concentrations in the air after the Project is completed. Present projects have already been integrated into the assessment under the Project's base case scenarios (i.e., existing conditions). While there are reasonably foreseeable future projects located within the human health LAA and RAA, these projects are not located within the spatial area for which the Project influences air quality and noise. Therefore, there are no cumulative effects to human health from reasonably foreseeable future projects, that are anticipated to interact with Haisla Nation interests within the human health (shipping) and (marine terminal) RAAs.

Heritage

After implementation of mitigation measures and engagement with Haisla Nation, no residual project effects on heritage resources are anticipated. Therefore, residual cumulative effects on Haisla Nation interests are not anticipated within the heritage RAA.

11.5.8.3 MITIGATION AND ENHANCEMENT MEASURES FOR CUMULATIVE EFFECTS

Mitigation measures to limit changes to Haisla Nation interests from project construction and operation are summarized in Table 11.5.4, Table 11.5.5, Table 11.5.6 and Table 11.5.8 and include legislation, best practices, and guidelines applicable to limiting cumulative effects within the shipping RAA, such as:

- Federal legislation related to marine shipping and navigation (e.g., Canada *Shipping Act*, *2001*, Canadian *Navigable Waters Act*)
- Marine use guidelines and frameworks that pertain to the north coast (e.g., draft North Coast Waterways Management Guidelines)
- Project-specific management plans developed in accordance with federal and provincial legislation, regulations and best practices (e.g., Marine Transportation Management Plan, CEMP)

Cedar has identified its willingness to collaborate in the following initiatives or programs regarding cumulative effects in the region:

- Management of effects of vessel strikes on marine mammals in the marine shipping route in conjunction with other proponents and Indigenous nations (Section 7.10 Marine Use)

- Programs planned and developed by government and in conjunction with other proponents, stakeholders, and Indigenous Nations regarding regional management of potential cumulative effects of underwater noise on marine mammals in the marine shipping route (e.g., Transport Canada Cumulative Effects of Marine Shipping [CEMS] initiative[12], see Section 7.7 Marine Resources)
- Government-led initiatives with respect to cumulative effects on marine navigation, marine fisheries, and other uses (Section 7.10 Marine Use).

For future projects that require regulatory approval, it is expected that proponents will be subject to mitigation measures like those that will be applied for this Project (e.g., cultural awareness training, emergency response plans, offsetting programs that balance or result in a net gain of fish habitat).

11.5.8.4 RESIDUAL CUMULATIVE EFFECTS ON HAISLA NATION INTERESTS

Cumulative effects from past, present/in-progress, and reasonably foreseeable future projects in combination with the Project are predicted to adversely affect Haisla Nation interests.

Changes in Haisla Nation territory brought about after contact with European settlers resulted in changes to Haisla land use and lifestyle, beginning with the fur trade in the 19th century. Between 1890 and 1950, the increase in farming and cannery operation affected the lifeways of Haisla Nation members (Hamori-Torok 1996; Powell 2013:26), and industrial developments around the town of Kitimat resulted in the restriction of use of areas along Kitimat Arm (Powell 2011). Prior to the early-1970s, the Kitimat River was a primary source of oolichan for Haisla Nation, yielding 27,000 to 81,000 kg per year from 1969 to 1971 (Gordon et al. n.d.). By 1972, Haisla reported that the oolichan harvested from the Kitimat River was “foul-tasting and inedible”, and this was attributed to pollution from industrial and municipal effluent discharges (Tirrul-Jones 1985).

Regional industrial developments such as commercial fishing, logging, and large industrial facilities are perceived by some Haisla members to be a major factor influencing the decline in oolichan abundance in their territory (Gauvreau 2021; see Section 11.2.2). Daily operation and maintenance of specific facilities have been observed to impact oolichan spawning substrate and water quality over time (e.g., pollution, destruction of habitat); employee travel to and from facilities has also been observed to impact oolichan harvesting sites (e.g., wave action, erosion, noise) (Gauvreau 2021). Participants reported that industrial developments have influenced the lack of consistent annual return to the spawning areas in their territory (Gauvreau 2021). Some Haisla members have reported that Haisla Nation’s ability to harvest oolichan has been negatively impacted by industrial expansion within their territory (Gauvreau 2021). Oolichan conservation and recovery planning is ongoing in Haisla Nation territory; Haisla Nation members are working with industry and scientists to develop enhancement studies to actualize oolichan recovery in formerly active harvesting sites (Gauvreau 2021).

With mitigation, contribution of the Project to residual cumulative effects on Haisla Nation interests is expected to be low because effects will be largely reversible and occur within the established shipping route. However, residual effects of past, present and reasonably foreseeable future projects and physical activities combined with the predicted residual effects of the Project are anticipated to be irreversible for Haisla Nation members who have already experienced alienation and dispossession from areas in throughout their territory as these experiences are likely to increase in the future rather than decrease

[12] https://tc.canada.ca/en/marine-transportation/marine-pollution-environmental-response/cumulative-effects-marine-shipping

and require regional initiatives and programs to be addressed. Cedar has identified its willingness to collaborate in government-led initiatives with respect to cumulative effects on marine navigation and marine fisheries which may assist with reducing further perceptions of barriers and alienation from territorial waters in the region. Ongoing engagement with Haisla Nation in development of the Marine Transportation Management Plan is expected to further reduce adverse residual project and cumulative effects on Haisla Nation interests.

No additional mitigation measures are proposed for incremental project contributions to the cumulative effects on the related valued components or on Haisla Nation interests. Cedar will remain available through Application review should Haisla Nation bring forward additional information regarding the assessment of cumulative effects on Haisla Nation interests.

11.5.8.5 LIKELIHOOD OF RESIDUAL CUMULATIVE EFFECTS

While mitigation measures implemented for the Project and other marine development projects in the Project Area and marine shipping route will reduce the magnitude, extent, and duration of residual cumulative effects, there is a high likelihood of project contributions to adverse residual cumulative effects on Haisla Nation interests.

11.6 Assessing Positive Effects

The Project is a key element of the Haisla Nation's economic and social development strategy and will further advance reconciliation by allowing the Haisla Nation to—for the first time ever—directly own and participate in a major industrial development in its territory. The Project is also anticipated to be the first Indigenous-majority owned export facility in Canada, which will create jobs, contracting and other economic opportunities for the Haisla Nation, the local community, neighbouring Indigenous Nations and northwest British Columbia. In addition, income generated by the Project will be invested in the Haisla community.

11.7 Haisla Nation Views[13]

Section 11.3 describes how Cedar engaged with Haisla Nation on the assessment of effects on the Nation's interests, including for both positive and adverse effects, in accordance with the Nation's preferences.

Cedar sought feedback from Haisla Nation through several means regarding the assessment of effects on the Nation's interests and the integration the Nation's perspectives into the assessment, including through provision of iterative drafts of Section 11.0, and sharing draft Application Information Requirements and Valued Component Selection Memo documents. Comments received from Haisla Nation on the Application Information Requirements and Valued Component Selection Memo identified Key Areas of Concern (Section 11.3.1) and the Scope of the Assessment (Section 11.5.1). Cedar will remain available through Application review should Haisla Nation bring forward additional information regarding the approach to effects management, residual effects, and conclusions described within the Application.

[13] This section was authored by Cedar and reflects the Project's understanding of Haisla Nation's views shared through engagement to date.

11.8 Summary

Table 11.5.9 of Section 11.5.7 provides a summary of the assessment for Haisla Nation outlining the residual effects on Haisla Nation's interests for the EAO to consider when determining the overall seriousness of impact to the Nation's interests.

To date, Cedar is of the view that the comments and concerns brought forward by Haisla Nation through pre-Application engagement have been addressed through changes to project design, changes to the scopes of the assessment for valued components of concern (e.g., marine shipping air quality and noise), and by the mitigation and management plans proposed, which include commitments for ongoing discussion regarding mitigation appropriateness.

No major points of agreement or disagreement with the Nation have been identified. However, Cedar will remain available through Application Review should Haisla Nation bring forward additional information related to this assessment.

11.8.1 Prediction Confidence

The predication confidence in the conclusions for project residual effects and residual cumulative effects on Haisla Nation's interests is moderate and is based on:

- Available information and feedback provided by Haisla Nation to Cedar
- Suite of mitigation measures and management plans proposed
- Assessment assumes Haisla Nation's interests occur on lands and waters within the LAAs and RAAs that overlap with the Nation's territory and harvesting areas

Conservative assumptions regarding the Project were also made for valued components related to Haisla Nation's interests, as described through this Application, in order to overestimate the effects assessed.

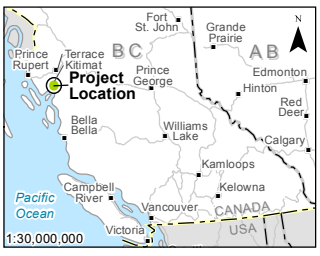
11.8.2 Follow-Up Strategy

Cedar will continue to work with Haisla Nation to develop a shared understanding of how the Project may affect their Indigenous interests. Cedar will continue engaging with Haisla Nation to discuss the Project and its effects, understand concerns that may arise and respond to those concerns.

To verify compliance of the Project with commitments in this Application, and conditions of an EAC, Cedar is committed to the development of a CEMP that will contain the mitigation measures presented in this assessment. This plan will be provided to the OGC, EAO, and Impact Assessment Agency of Canada to document compliance with this commitment.

Cedar will continue to work with Haisla Nation to communicate project information, including employment and contracting opportunities, with the aim of increasing local benefits of the Project.

11.9 Figures



- International Boundary
- Highway
- Road
- Ferry Route
- Railway
- Watercourse
- Waterbody
- Reserve Land
- Project Location
- Marine Shipping Route (Approximate Location)
- Haisla Nation Traditional Territory

0 15 30 45 60 km

1:1,500,000 (at original document size of 8.5x11)

Notes
1. Coordinate System: NAD 1983 UTM Zone 9N
2. Data Sources: DataBC, Government of British Columbia; Natural Resources Canada; Canadian Hydrographic Service

Stantec

CEDAR LNG

Project Location: Kitimat, British Columbia

Project Number 123221953
Prepared by KWONG on 20211126
Discipline Review by AGAUVREAU on 20211126
GIS Review by TDINNEEN on 20211126

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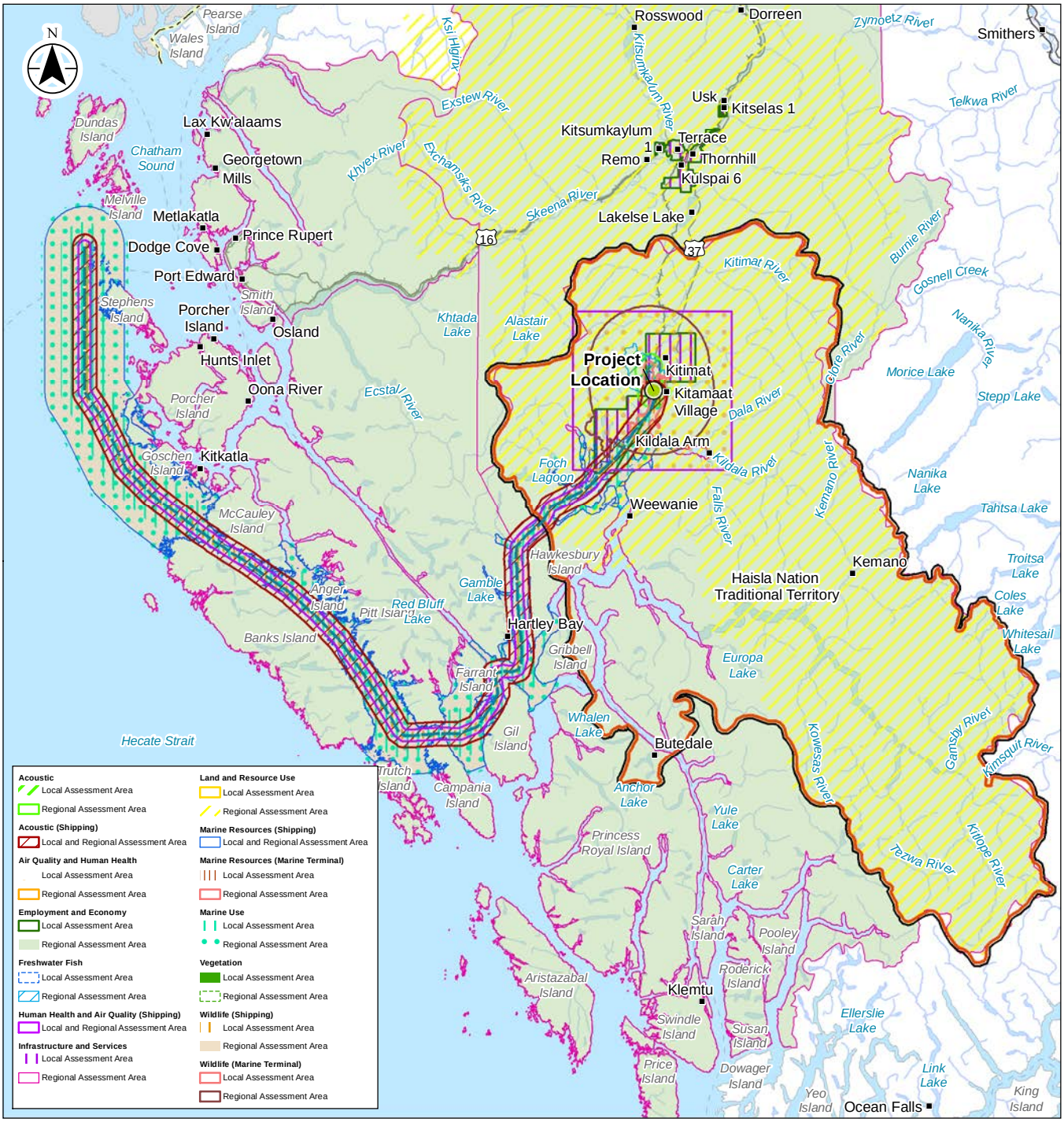
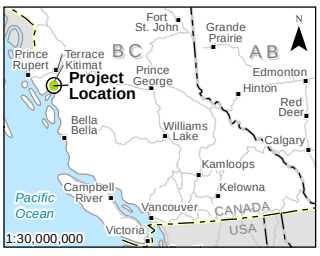
Cedar LNG Project
Environmental Assessment Certificate Application

Figure No.
11.9.1

Title
Haisla Nation Traditional Territory Overview Map





Notes
1. Coordinate System: NAD 1983 UTM Zone 9N
2. Data Sources: DataBC, Government of British Columbia; Natural Resources Canada; Canadian Hydrographic Service

- International Boundary
- Highway
- Road
- Ferry Route
- Railway
- Watercourse
- Waterbody
- Project Location
- Marine Shipping Route (Approximate Location)

Haisla Nation
- Traditional Territory

0 10 20 30 40 km
1:1,500,000 (at original document size of 8.5x11)

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CEDAR LNG

Project Location: Kitimat, British Columbia

Project Number 123221953
Prepared by KWONG on 20211126
Discipline Review by AGAUVREAU on 20211126
GIS Review by TDINNEEN on 20211126

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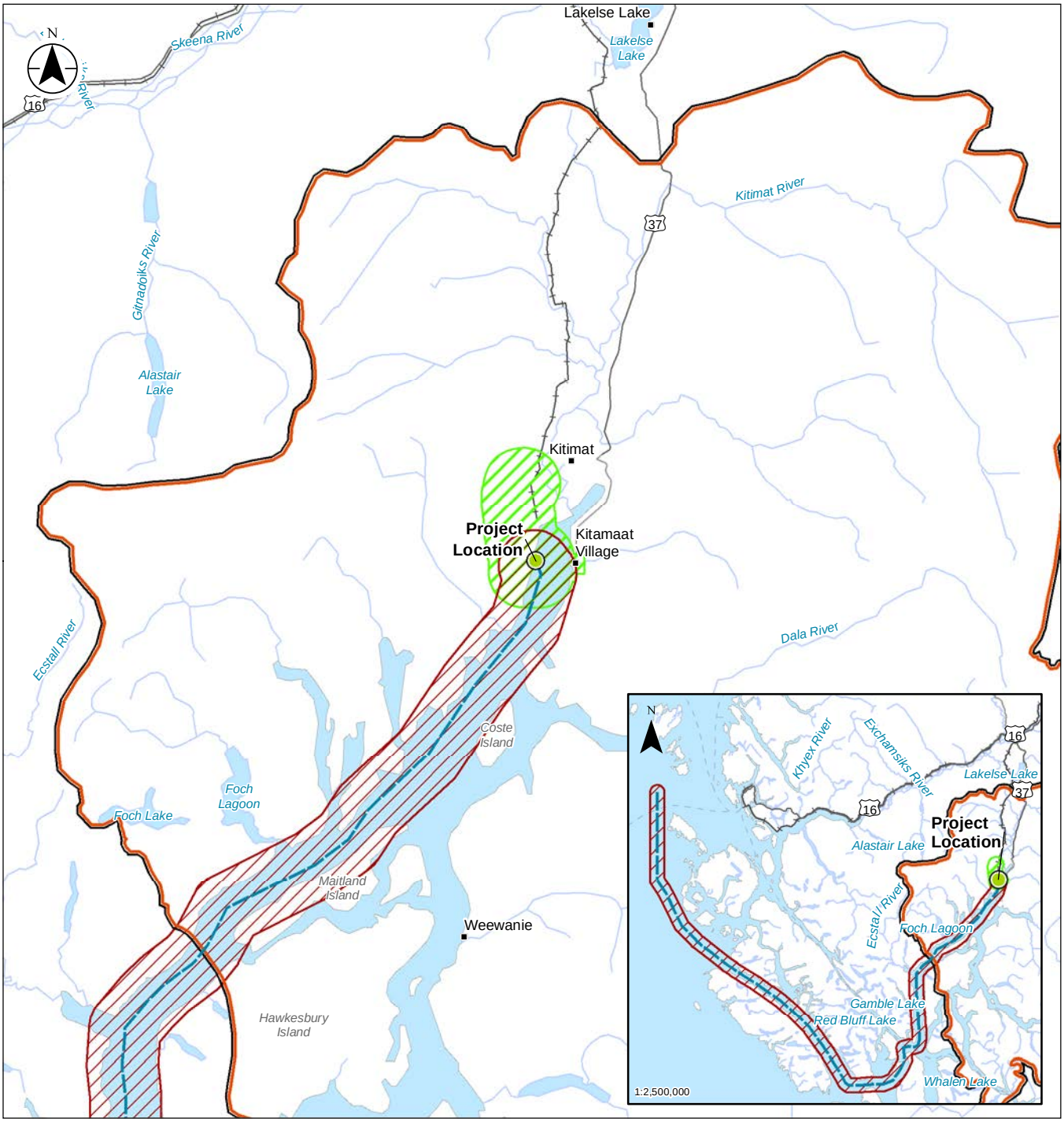
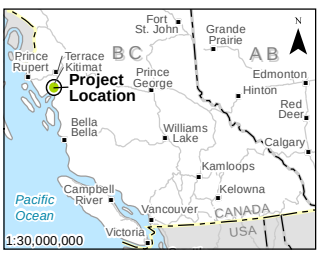
Cedar LNG Partners LP
Cedar LNG Project
Environmental Assessment Certificate Application

Figure No.
11.9.2

Title
Assessment Boundaries for Haisla Nation Traditional Territory Key Map





- Highway
- Road
- Railway
- Watercourse
- Waterbody
- Project Location
- Marine Shipping Route (Approximate Location)

Haisla Nation
- Traditional Territory

Acoustic
- Local Assessment Area
- Regional Assessment Area

Acoustic (Shipping)
- Local and Regional Assessment Area

0 5 10 15 20 km
1:500,000 (at original document size of 8.5x11)

Notes
1. Coordinate System: NAD 1983 UTM Zone 9N
2. Data Sources: DataBC, Government of British Columbia; Natural Resources Canada; Canadian Hydrographic Service

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Project Location: Kitimat, British Columbia

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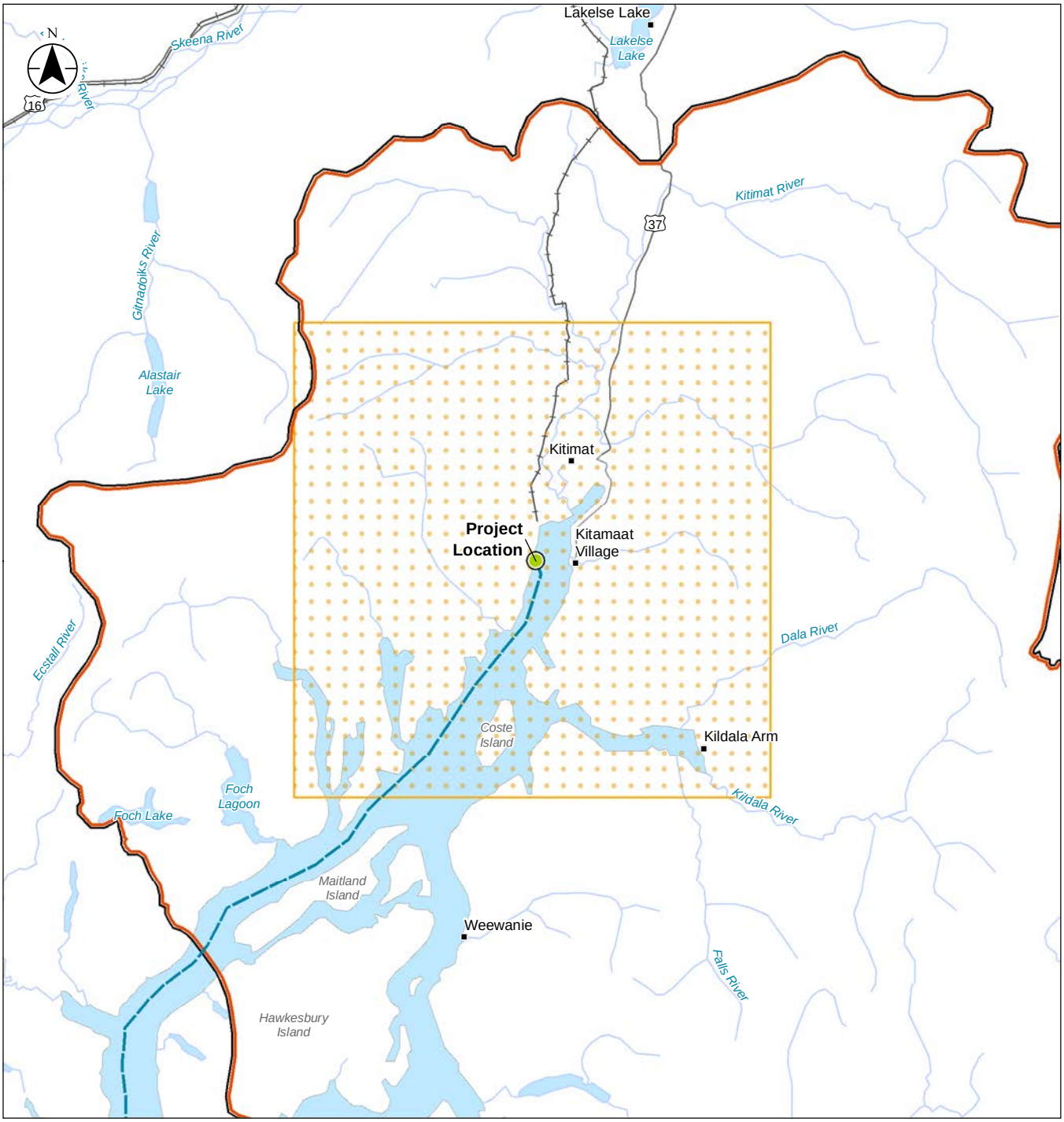
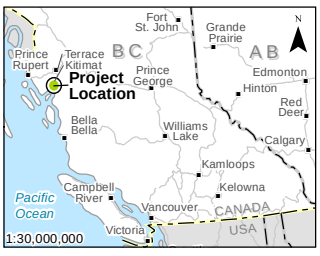
Figure No.
11.9.3

Title
Assessment Boundaries for Haisla Nation Traditional Territory Acoustic





Highway
Road
Railway
Watercourse
Waterbody
Project Location
Marine Shipping Route (Approximate Location)

Haisla Nation
Traditional Territory

Air Quality and Human Health
Local Assessment Area
Regional Assessment Area

0 5 10 15 20 km
1:500,000 (at original document size of 8.5x11)

Notes
1. Coordinate System: NAD 1983 UTM Zone 9N
2. Data Sources: DataBC, Government of British Columbia; Natural Resources Canada; Canadian Hydrographic Service

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CEDAR LNG

Project Location: Kitimat, British Columbia
Project Number 123221953
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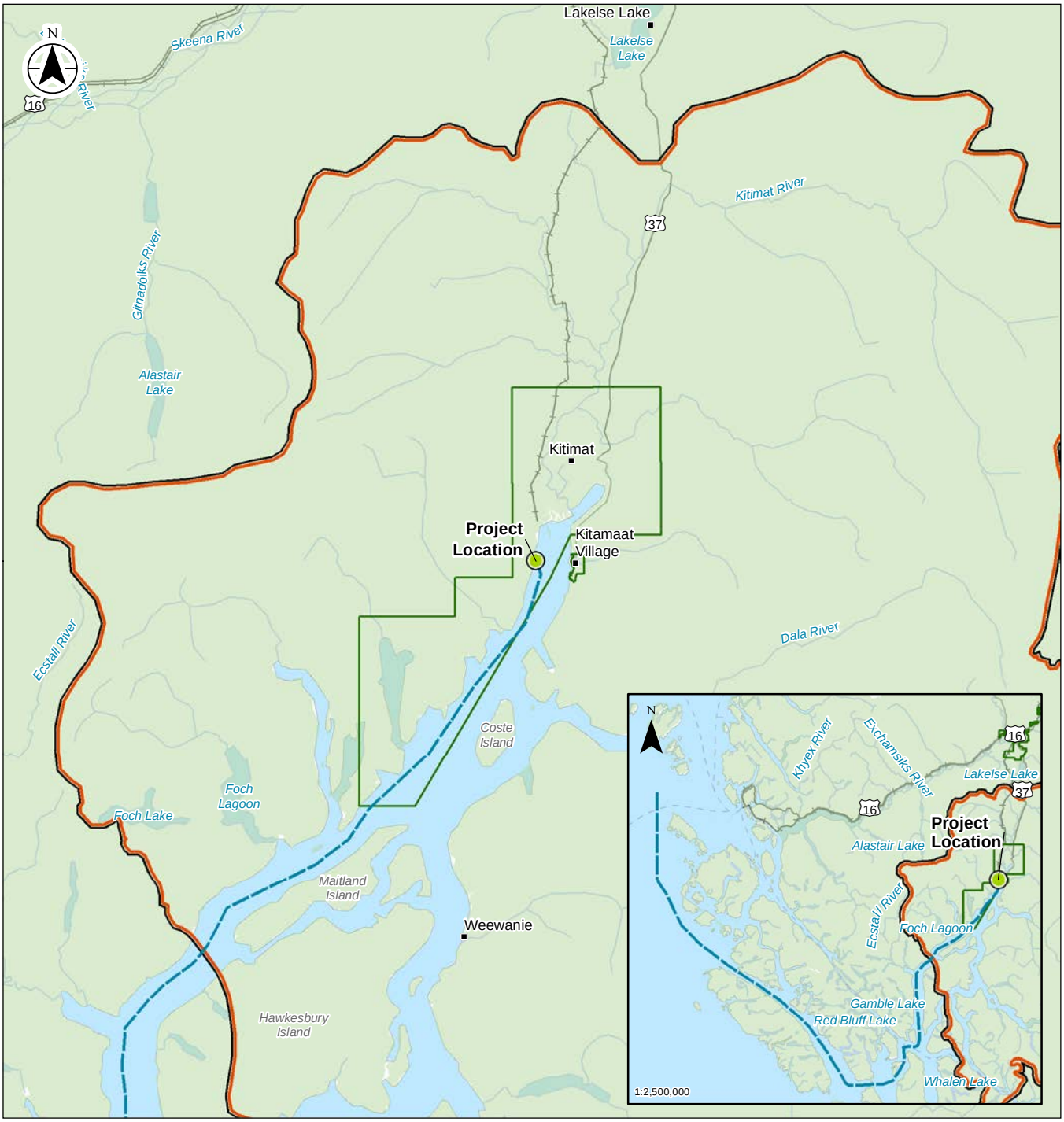
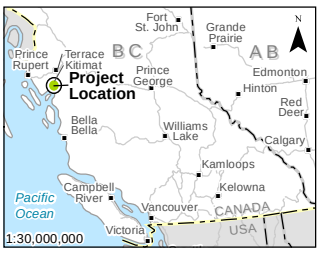
Cedar LNG Partners LP
Cedar LNG Project
Environmental Assessment Certificate Application

Figure No.
11.9.4

Title
Assessment Boundaries for Haisla Nation Traditional Territory Air Quality





Highway
Road
Railway
Watercourse
Waterbody
Project Location
Marine Shipping Route (Approximate Location)

Haisla Nation
Traditional Territory

Employment and Economy
Local Assessment Area
Regional Assessment Area

0 5 10 15 20 km
1:500,000 (at original document size of 8.5x11)

Notes
1. Coordinate System: NAD 1983 UTM Zone 9N
2. Data Sources: DataBC, Government of British Columbia; Natural Resources Canada; Canadian Hydrographic Service

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CEDAR LNG

Project Location: Kitimat, British Columbia

Project Number 123221953
Prepared by KWONG on 20211126
Discipline Review by AGAUVREAU on 20211126
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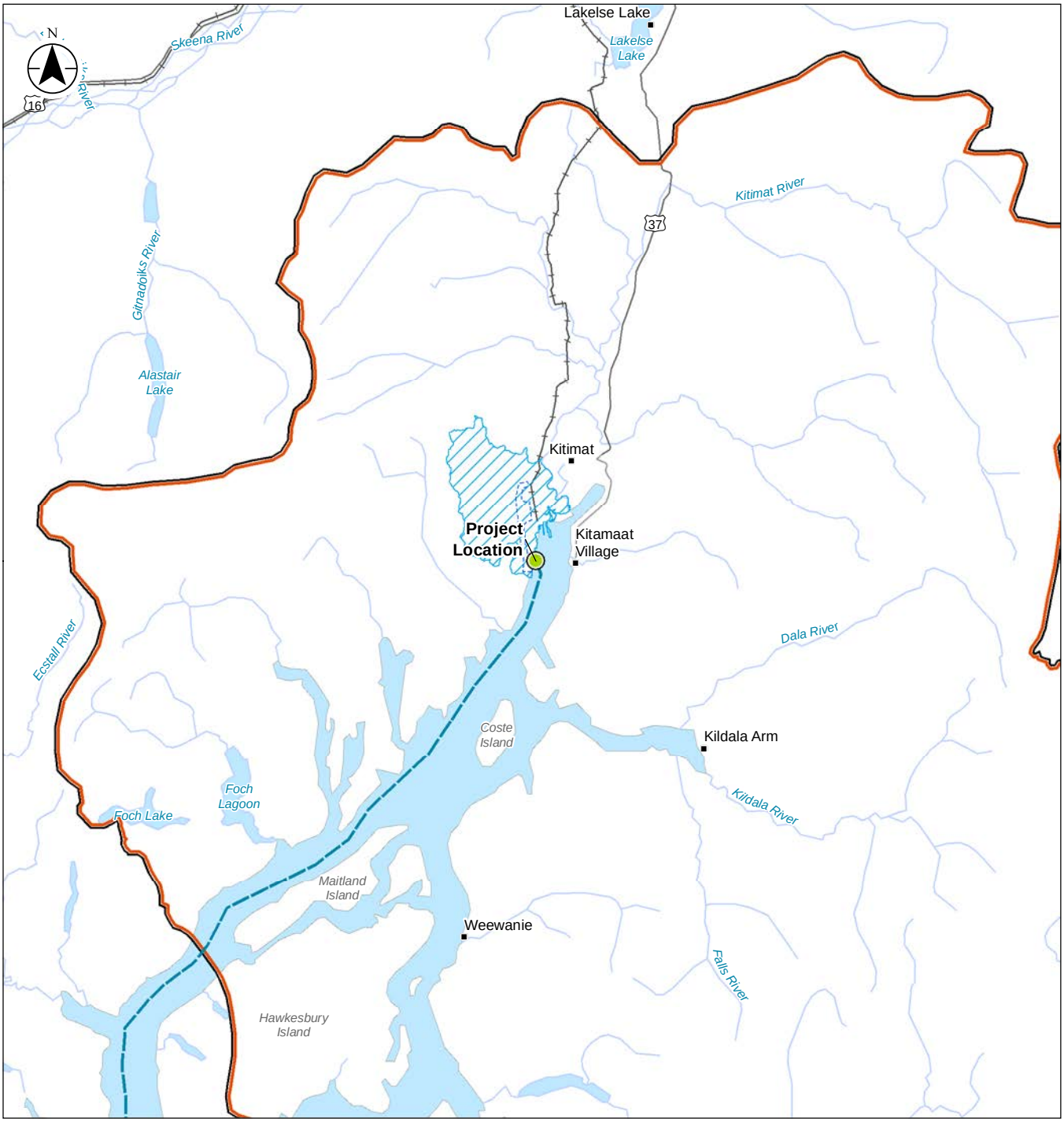
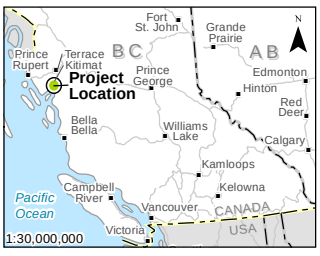
Cedar LNG Partners LP
Cedar LNG Project
Environmental Assessment Certificate Application

Figure No.
11.9.5

Title
Assessment Boundaries for Haisla Nation Traditional Territory Employment and Economy





Highway
Road
Railway
Watercourse
Waterbody
Project Location
Marine Shipping Route (Approximate Location)

Haisla Nation
Traditional Territory

freshwater_fish_LAA
Freshwater Fish LAA
Freshwater Fish RAA

0 5 10 15 20 km
1:500,000 (at original document size of 8.5x11)

Notes
1. Coordinate System: NAD 1983 UTM Zone 9N
2. Data Sources: DataBC, Government of British Columbia; Natural Resources Canada; Canadian Hydrographic Service

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Project Location:
Kitimat,
British Columbia

Project Number 123221953
Prepared by KWONG on 20211126
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Cedar LNG Partners LP
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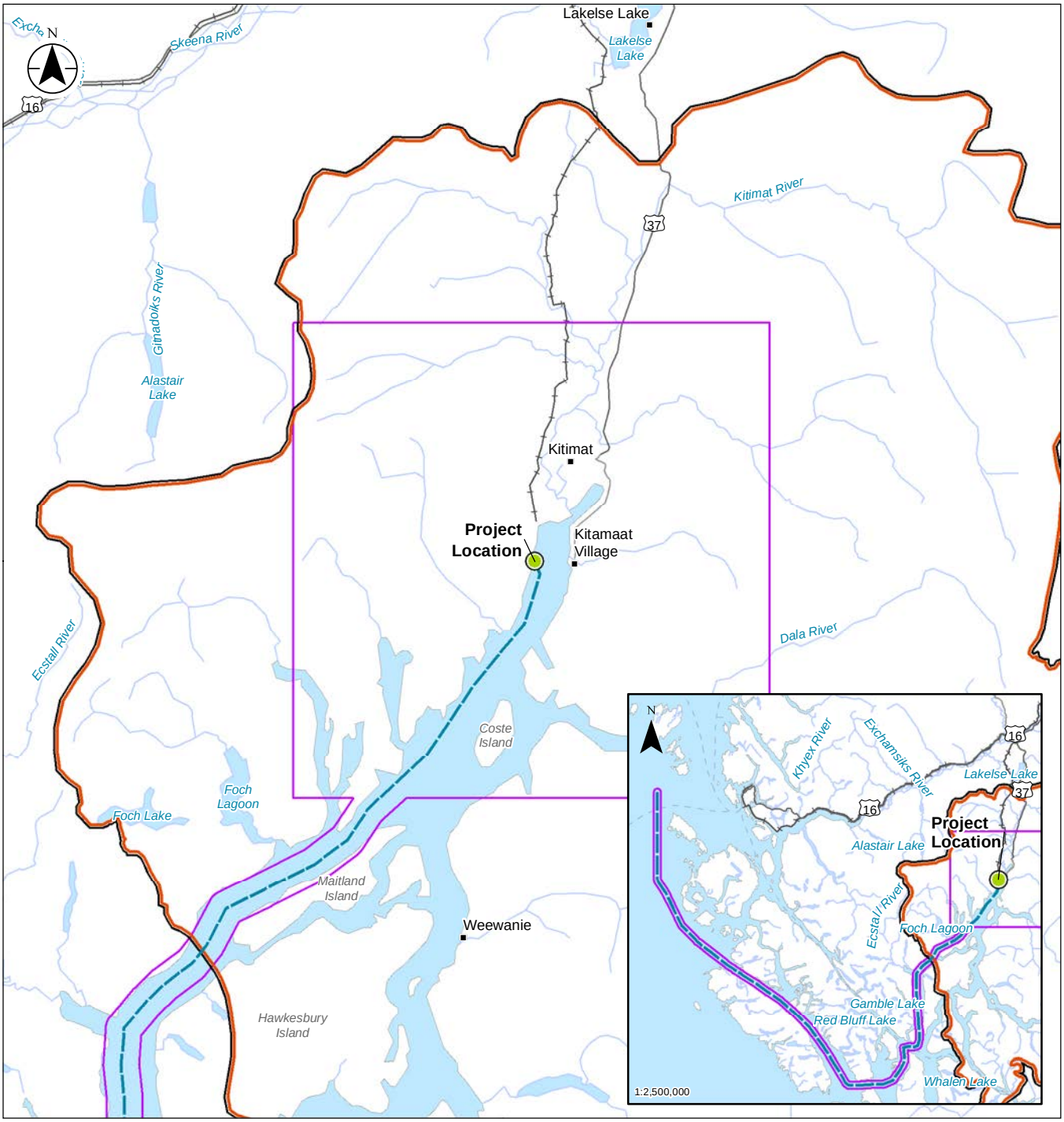
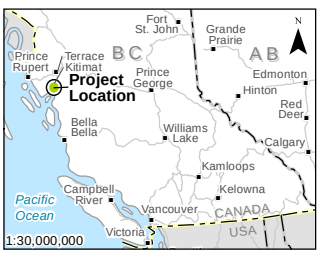
Figure No.
11.9.6

Title
Assessment Boundaries for Haisla Nation Traditional Territory Freshwater Fish





- Highway
- Road
- Railway
- Watercourse
- Waterbody
- Project Location
- Marine Shipping Route (Approximate Location)

Haisla Nation

- Traditional Territory

Valued_Component

- Human Health and Air Quality (Shipping) LAA and RAA

0 5 10 15 20 km

1:500,000 (at original document size of 8.5x11)

Notes
1. Coordinate System: NAD 1983 UTM Zone 9N
2. Data Sources: DataBC, Government of British Columbia; Natural Resources Canada; Canadian Hydrographic Service

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Project Location: Kitimat, British Columbia

Project Number 123221953
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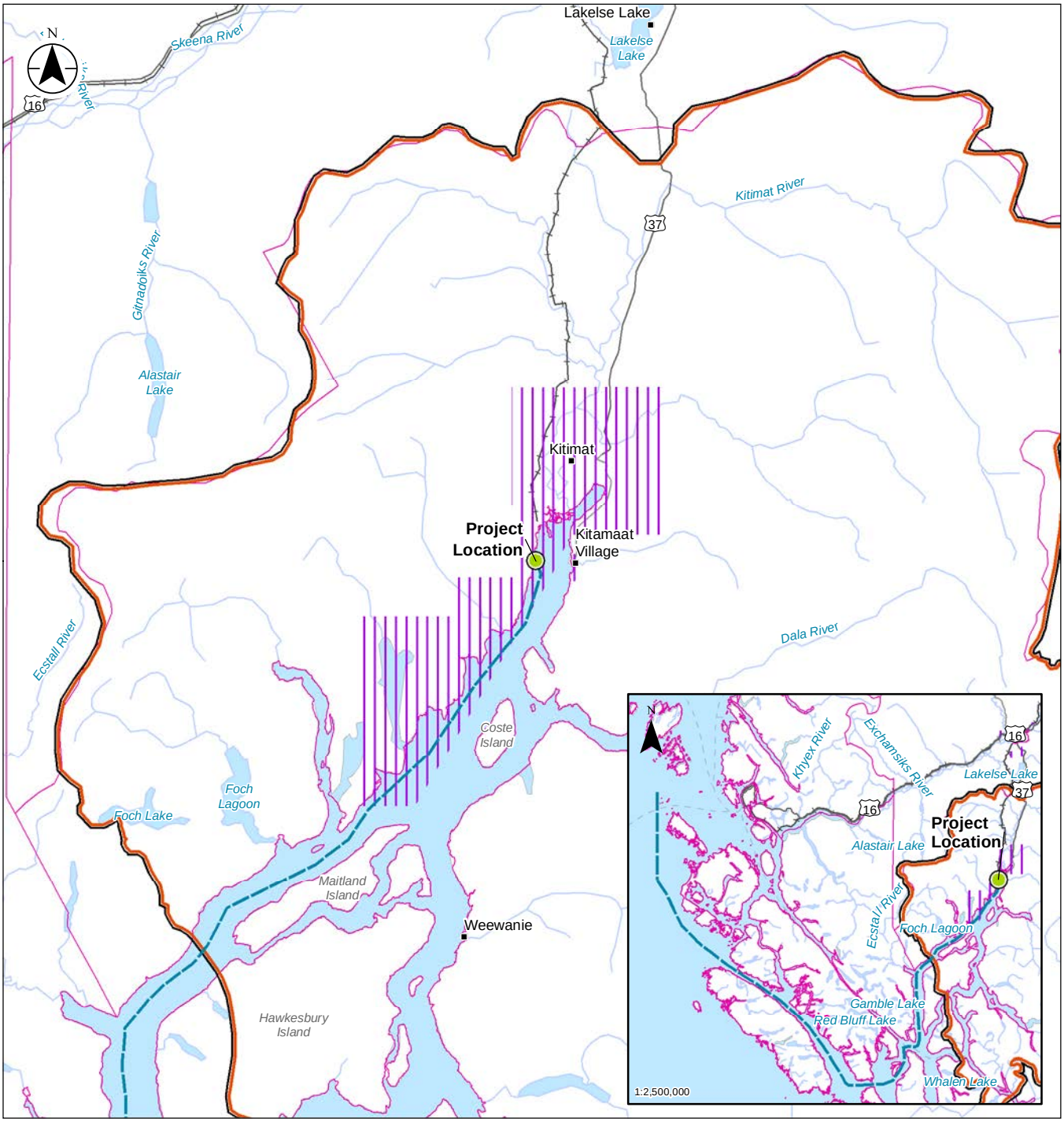
Cedar LNG Partners LP
Cedar LNG Project
Environmental Assessment Certificate Application

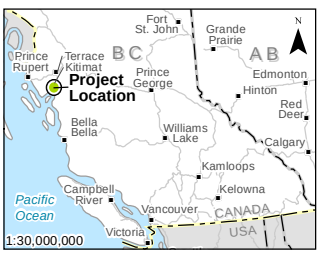
Figure No.

11.9.7

Title

Assessment Boundaries for Haisla Nation Traditional Territory Human Health





- Highway
- Road
- Railway
- Watercourse
- Waterbody
- Project Location
- Marine Shipping Route (Approximate Location)

Haisla Nation

- Traditional Territory

Infrastructure and Services

- Infrastructure and Services LAA
- Infrastructure and Services RAA

0 5 10 15 20 km

1:500,000 (at original document size of 8.5x11)

Notes
1. Coordinate System: NAD 1983 UTM Zone 9N
2. Data Sources: DataBC, Government of British Columbia; Natural Resources Canada; Canadian Hydrographic Service

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CEDAR LNG

Project Location: Kitimat, British Columbia

Project Number 123221953
Prepared by KWONG on 20211126
Discipline Review by AGAUVREAU on 20211126
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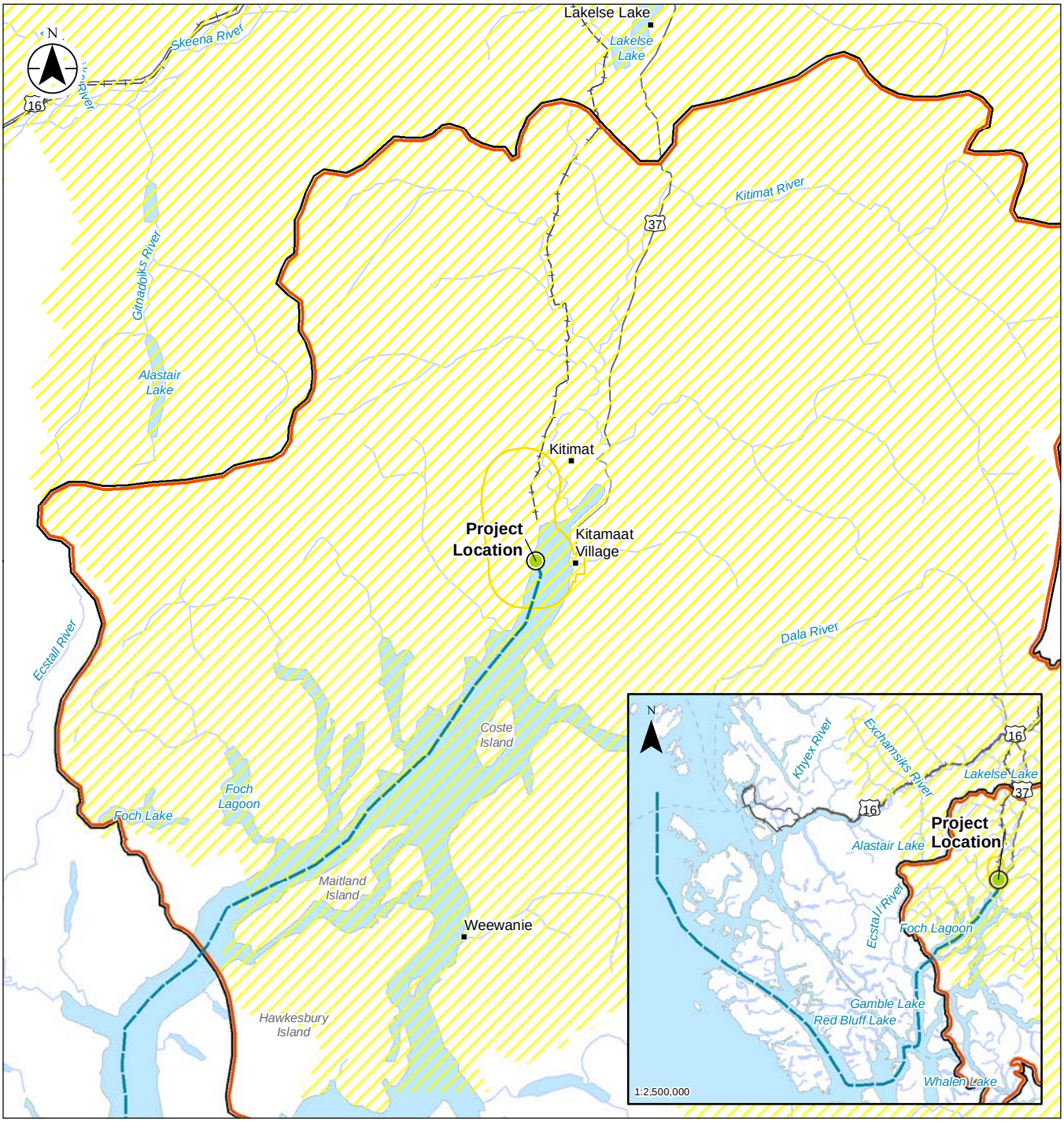
Cedar LNG Partners LP
Cedar LNG Project
Environmental Assessment Certificate Application

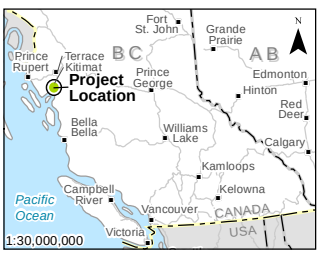
Figure No.

11.9.8

Title

Assessment Boundaries for Haisla Nation Traditional Territory Infrastructure and Services





Highway
Road
Railway
Watercourse
Waterbody
Project Location
Marine Shipping Route (Approximate Location)

Haisla Nation
Traditional Territory

land_and_resource_use_LAA
Land and Resource Use LAA
Land and Resource Use RAA

0 5 10 15 20 km
1:500,000 (at original document size of 8.5x11)

Notes
1. Coordinate System: NAD 1983 UTM Zone 9N
2. Data Sources: DataBC, Government of British Columbia; Natural Resources Canada; Canadian Hydrographic Service

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Project Location: Kitimat, British Columbia
Project Number 123221953
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Discipline Review by AGAUVREAU on 20211126
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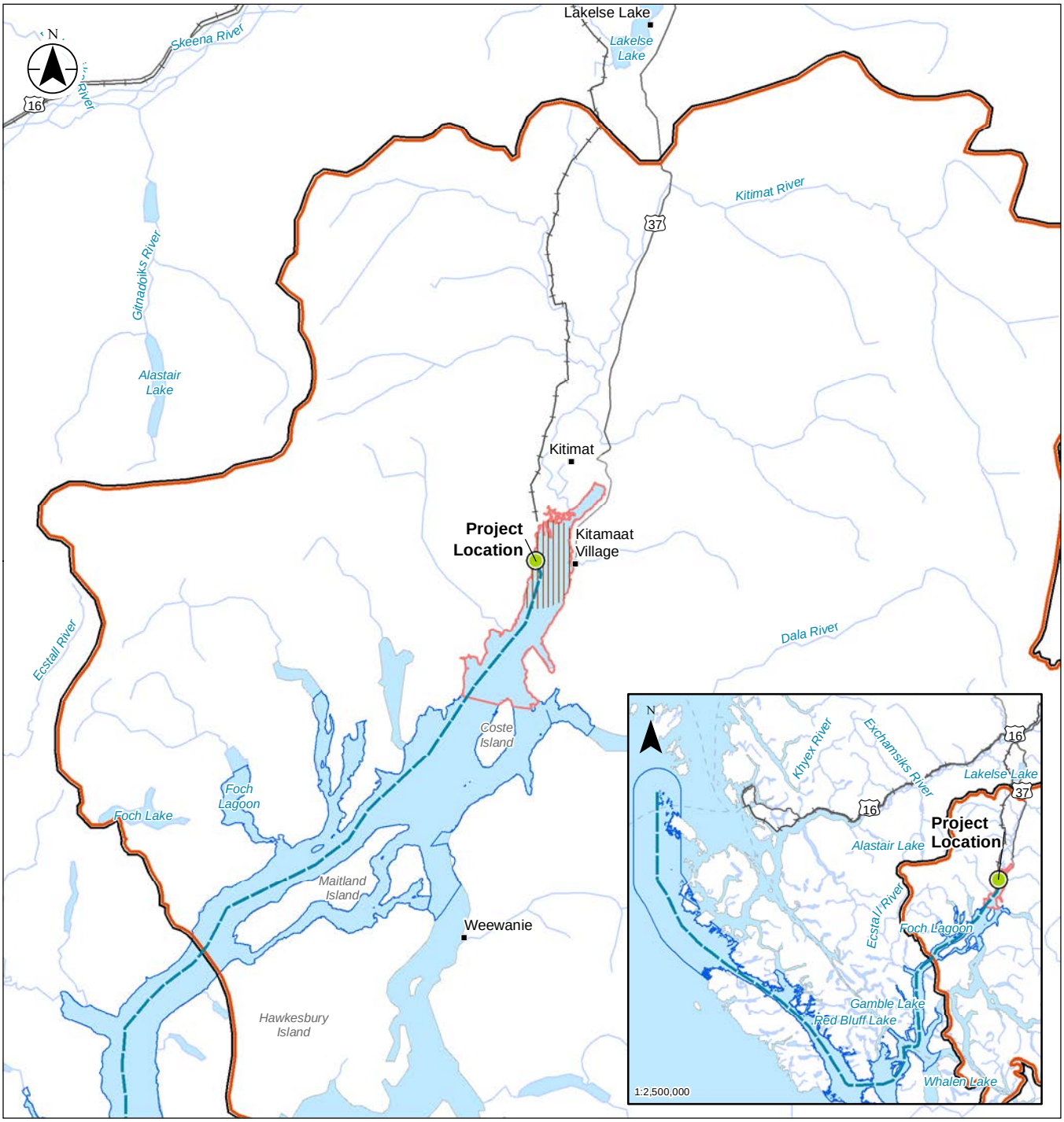
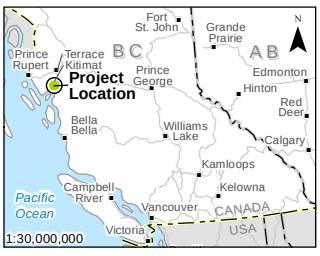
Cedar LNG Partners LP
Cedar LNG Project
Environmental Assessment Certificate Application

Figure No.
11.9.9

Title
Assessment Boundaries for Haisla Nation Traditional Territory Land and Resource Use





Highway
Road
Railway
Watercourse
Waterbody
Project Location
Marine Shipping Route (Approximate Location)

Haisla Nation
Traditional Territory

Marine Resources (Shipping)
Marine Resources (Shipping) LAA and RAA

marine_resources_facility_LAA
Marine Resources (Marine Terminal) LAA
Marine Resources (Marine Terminal) RAA

0 5 10 15 20 km
1:500,000 (at original document size of 8.5x11)

Notes
1. Coordinate System: NAD 1983 UTM Zone 9N
2. Data Sources: DataBC, Government of British Columbia; Natural Resources Canada; Canadian Hydrographic Service

Stantec
CEDAR LNG

Project Location: Kitimat, British Columbia
Project Number 123221953
Prepared by KWONG on 20211126
Discipline Review by AGAUVREAU on 20211126
GIS Review by TDINNEEN on 20211126

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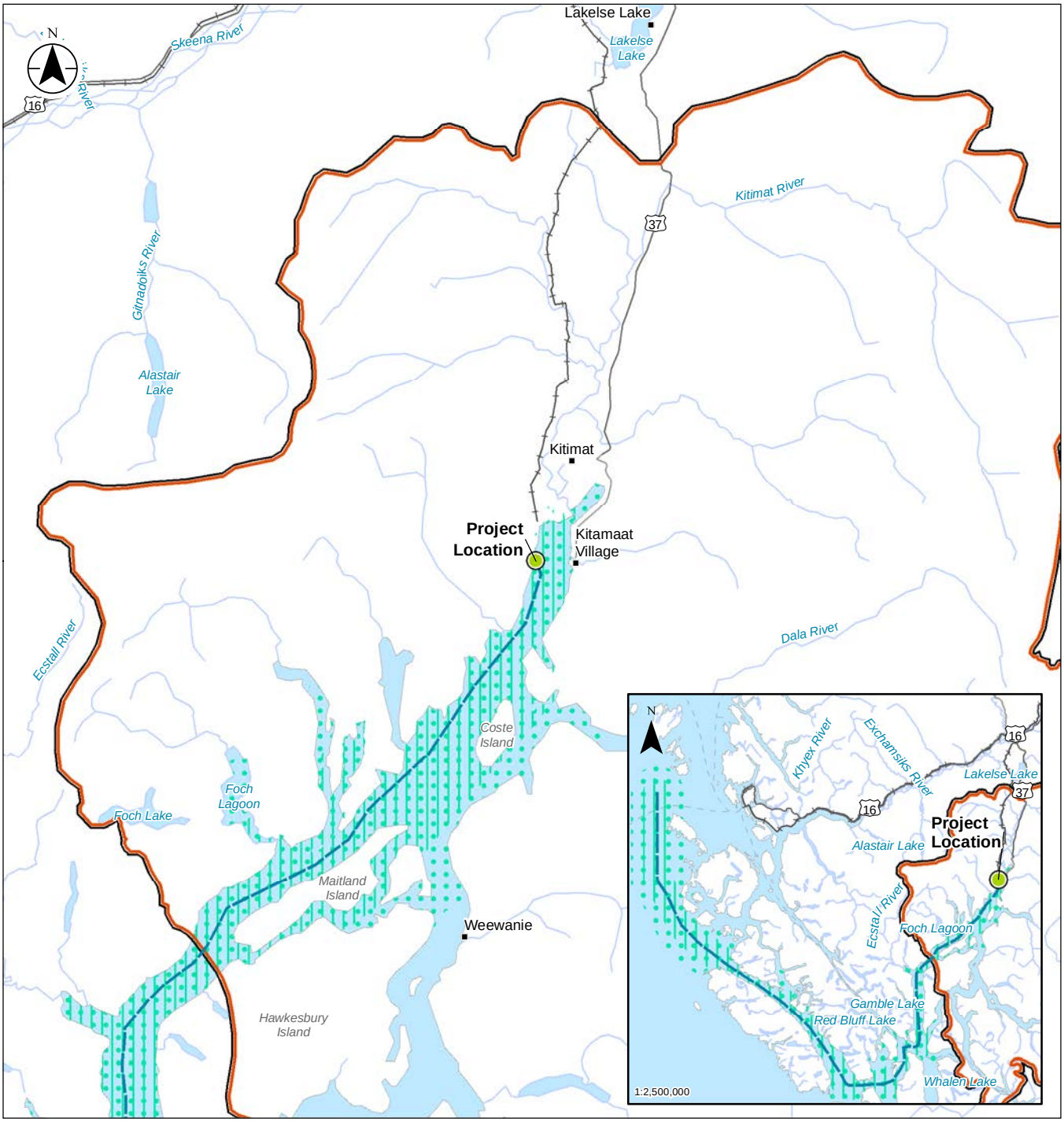
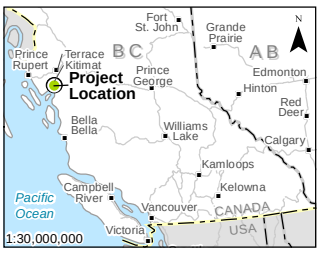
Cedar LNG Partners LP
Cedar LNG Project
Environmental Assessment Certificate Application

Figure No.
11.9.10

Title
Assessment Boundaries for Haisla Nation Traditional Territory Marine Resources





Highway
Road
Railway
Watercourse
Waterbody
Project Location
Marine Shipping Route (Approximate Location)

Haisla Nation
Traditional Territory

Marine Use
Marine Use LAA
Marine Use RAA

0 5 10 15 20 km
1:500,000 (at original document size of 8.5x11)

Notes
1. Coordinate System: NAD 1983 UTM Zone 9N
2. Data Sources: DataBC, Government of British Columbia; Natural Resources Canada; Canadian Hydrographic Service

Stantec
CEDAR LNG

Project Location:
Kitimat, British Columbia

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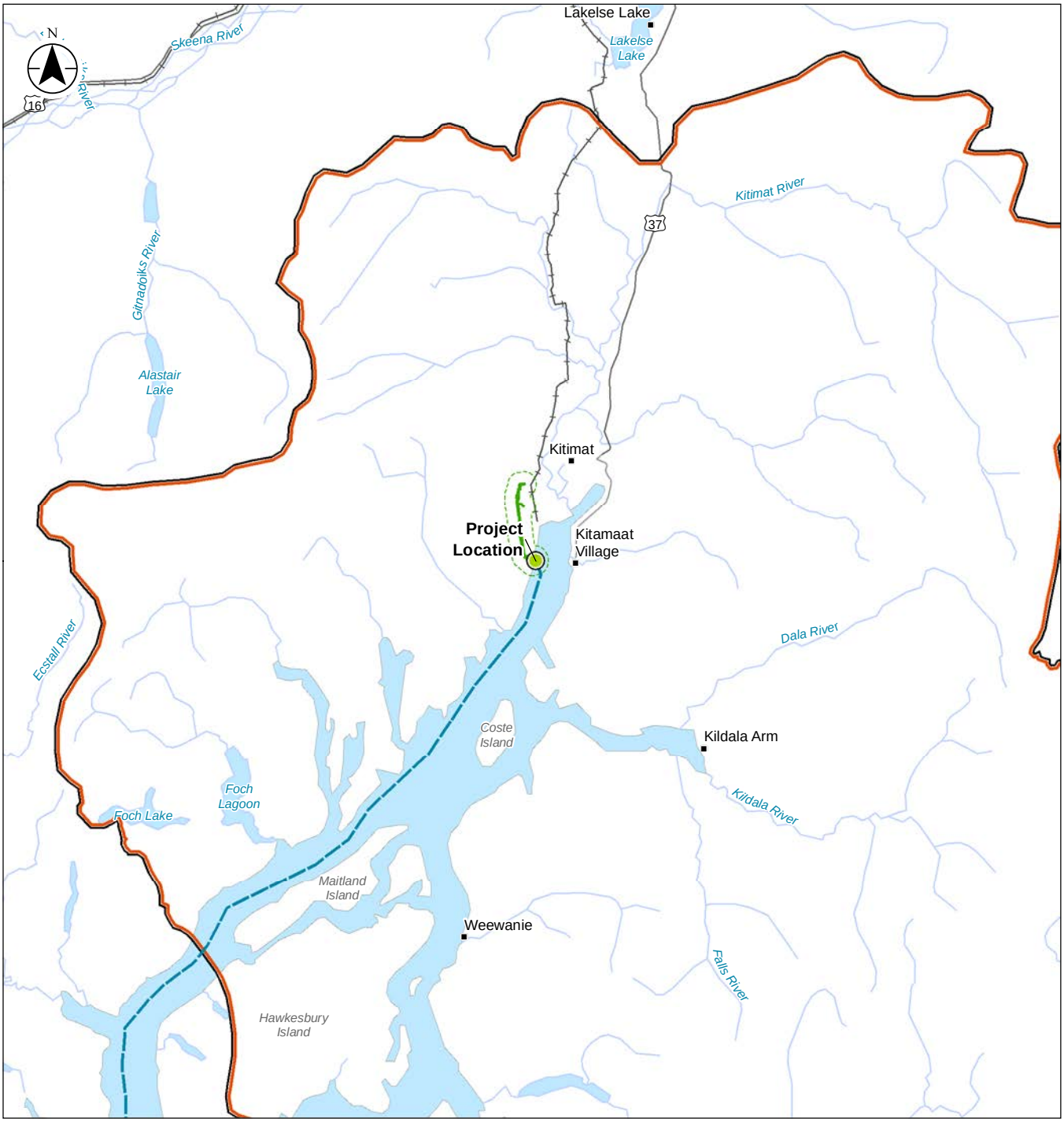
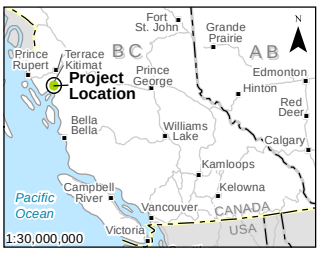
Cedar LNG Partners LP
Cedar LNG Project
Environmental Assessment Certificate Application

Figure No.
11.9.11

Title
Assessment Boundaries for Haisla Nation Traditional Territory Marine Use





Highway
Road
Railway
Watercourse
Waterbody
Project Location
Marine Shipping Route (Approximate Location)

Haisla Nation
Traditional Territory

vegetation_LAA
Vegetation LAA
Vegetation RAA

0 5 10 15 20 km
1:500,000 (at original document size of 8.5x11)

Notes
1. Coordinate System: NAD 1983 UTM Zone 9N
2. Data Sources: DataBC, Government of British Columbia; Natural Resources Canada; Canadian Hydrographic Service

Stantec
CEDAR LNG

Project Location:
Kitimat,
British Columbia

Project Number 123221953
Prepared by KWONG on 20211126
Discipline Review by AGAUVREAU on 20211126
GIS Review by TDINNEEN on 20211126

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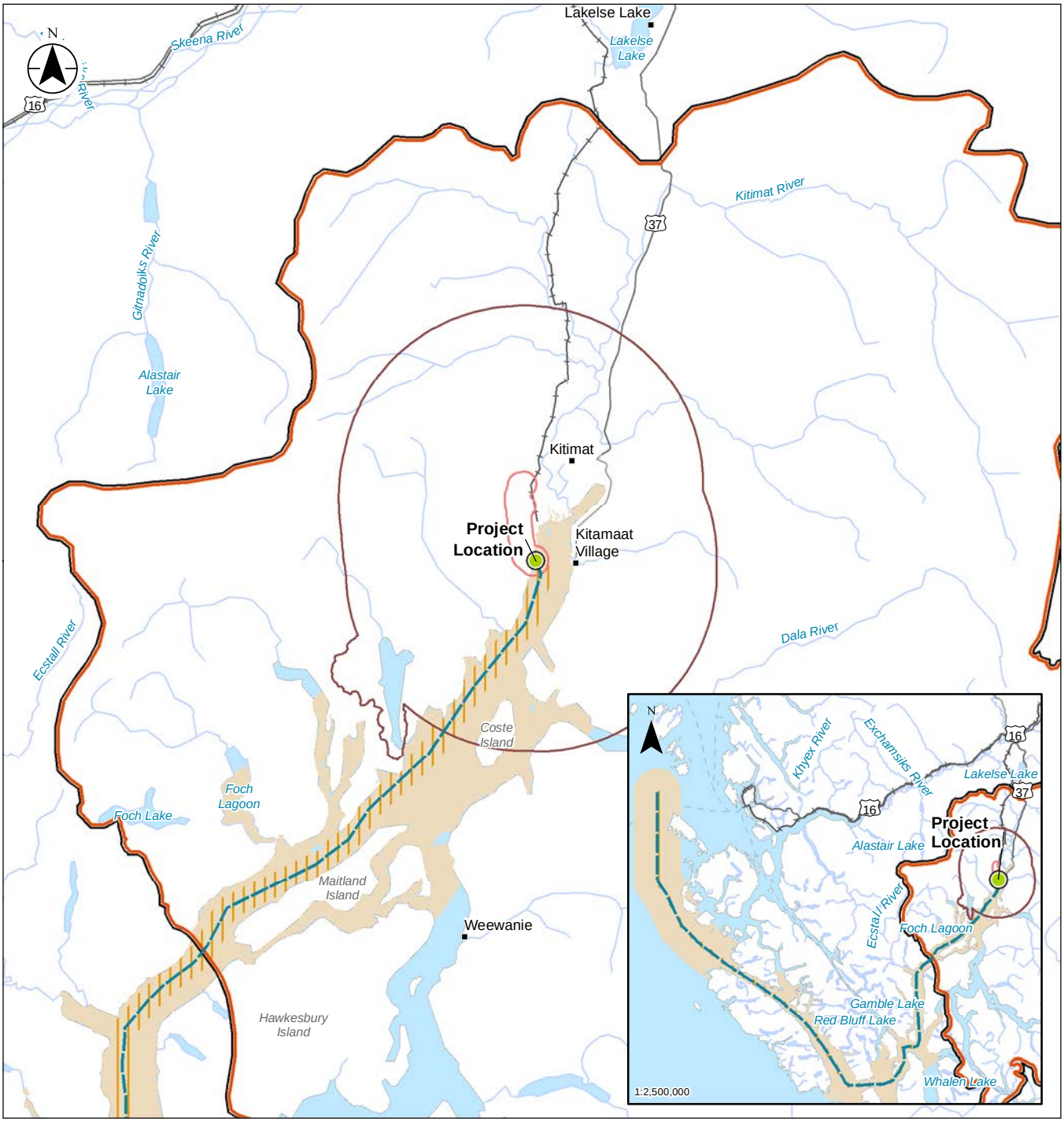
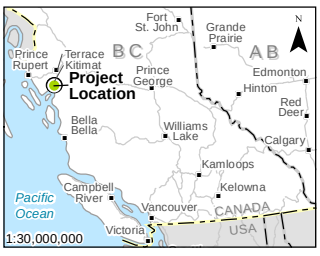
Cedar LNG Partners LP
Cedar LNG Project
Environmental Assessment Certificate Application

Figure No.
11.9.12

Title
Assessment Boundaries for Haisla Nation Traditional Territory Vegetation





- Highway
- Road
- Railway
- Watercourse
- Waterbody
- Project Location
- Marine Shipping Route (Approximate Location)

Haisla Nation
- Traditional Territory

Wildlife (Shipping)
- Local Assessment Area
- Regional Assessment Area

Wildlife (Marine Terminal)
- Local Assessment Area
- Regional Assessment Area

0 5 10 15 20 km

1:500,000 (at original document size of 8.5x11)

Notes
1. Coordinate System: NAD 1983 UTM Zone 9N
2. Data Sources: DataBC, Government of British Columbia; Natural Resources Canada; Canadian Hydrographic Service

Stantec

CEDAR LNG

Project Location: Kitimat, British Columbia

Project Number 123221953
Prepared by KWONG on 20211126
Discipline Review by AGAUVREAU on 20211126
GIS Review by TDINNEEN on 20211126

Client/Project/Report

Cedar LNG Partners LP
Cedar LNG Project
Environmental Assessment Certificate Application

Figure No.

11.9.13

Title

Assessment Boundaries for Haisla Nation Traditional Territory Wildlife