

## **28 SUMMARY OF THE ASSESSMENT**

This section provides a summary of the EIS/Application. The potential effects of the Project, mitigation measures, residual and cumulative effects and their significance, are summarized in this section. The specific mitigation and accommodation measures related to public concerns and potential effects on aboriginal rights and related interests are also summarized. A description of the outstanding public concerns and outstanding Aboriginal issues is provided.

### **28.1 Summary of Potential Effects, Adverse Residual Effects and their Significance**

Table 28-1 provides a summary of the potential effect of the Project on each valued component (VC), proposed mitigation measures for each effect, a summary of residual effects, and the significance determination for each project effect.

Table 28-2 lists all of the proposed mitigation measures for each VC.

**Table 28-1: Summary of Potential Effects, Proposed Mitigation Measures, Residual Adverse Effects, and their Significance**

Potential Effects	Project Phase / Contributing Project Activity or Physical Works	Proposed Mitigation/ Commitments	Residual Effects	Significance
<b>Air Quality</b>				
Increase in criteria air contaminant (CAC) concentrations	<p><b>Construction</b>                      Site preparation                      Onshore construction                      Vehicle traffic                      Dredging</p> <p><b>Operations</b>                      LNG facility                      Marine terminal use                      Shipping</p>	<ul style="list-style-type: none"> <li>▪ Best achievable technology</li> <li>▪ Best management practices.</li> <li>▪ Natural gas leak detection program.</li> <li>▪ Thermal oxidizer operation.</li> <li>▪ Dust suppression.</li> <li>▪ Equipment maintenance and low sulfur fuel.</li> <li>▪ Vehicle idling restrictions.</li> <li>▪ Adherence to the International Convention for the Prevention of Pollution from Ships (MARPOL).</li> </ul>	<ul style="list-style-type: none"> <li>▪ The ecological context is that the atmosphere is expected to demonstrate a <b>high degree of resilience</b> to change in air quality</li> <li>▪ <b>Low</b> in magnitude (effect is detectable but within normal variability of baseline conditions)</li> <li>▪ <b>Local</b> in geographic extent (restricted to the LAA)</li> <li>▪ <b>Medium-term</b> in duration (effect occurs for the life of the Project)</li> <li>▪ Reversible</li> <li>▪ Is <b>continuous</b> in frequency</li> <li>▪ The likelihood of a residual effect of an increase in criteria air contaminant concentrations is <b>high</b></li> </ul>	<b>Not significant</b> with a high level of confidence
<b>Greenhouse Gas Management</b>				
Emission of GHG gases (CO <sub>2</sub> , CH <sub>4</sub> , N <sub>2</sub> O) from LNG facility	<p><b>Construction</b>                      Site preparation                      Onshore construction                      Vehicle traffic                      Dredging                      Marine construction</p> <p><b>Operations</b>                      LNG facility                      Marine terminal use                      Shipping</p>	<ul style="list-style-type: none"> <li>▪ Develop and implement a GHG Management Plan.</li> </ul>	<ul style="list-style-type: none"> <li>▪ The contribution of GHG emissions from the Project would cause a small material change relative to the total global emissions.</li> </ul>	<b>Not significant</b>

Potential Effects	Project Phase / Contributing Project Activity or Physical Works	Proposed Mitigation/ Commitments	Residual Effects	Significance
<b>Acoustic Environment</b>				
Increase in noise levels	<p><b>Construction</b>                      Site preparation                      Onshore construction                      Dredging                      Marine construction</p> <p><b>Operations</b>                      LNG facility                      Marine terminal use                      Shipping</p> <p><b>Decommissioning</b>                      Dismantling project infrastructure</p>	<ul style="list-style-type: none"> <li>▪ Nighttime construction activity will be limited to low noise activities (no impact type pile driving or blasting).</li> <li>▪ Pile driving using vibro-hammer, where feasible.</li> <li>▪ Noise Management Plan.</li> <li>▪ Use of building enclosures and/or silencers on large machinery and equipment.</li> <li>▪ Closure of building windows. Closure of doors when not in use.</li> <li>▪ Implementation of a noise complaint mechanism.</li> <li>▪ Specification of acoustic performance of noise emission equipment (not exceeding 85 dBA at 1 m from equipment and 120 dBA for emergencies).</li> </ul>	<ul style="list-style-type: none"> <li>▪ The ecological context is of <b>moderate resilience</b> (the effect takes place in an area currently disturbed by human development)</li> <li>▪ <b>Moderate</b> in magnitude (effect is perceptible compared to baseline)</li> <li>▪ <b>Regional</b> in extent (effects extend into the RAA for three receptors)</li> <li>▪ <b>Medium-term</b> in duration (effect occurs for the life of the Project)</li> <li>▪ Reversible</li> <li>▪ Is <b>continuous</b> in frequency</li> <li>▪ The likelihood of a residual effect of an increase in noise levels is <b>high</b></li> </ul>	<p><b>Not significant</b>                      With a moderate level of confidence</p>
<b>Ambient Light</b>				
Increase in ambient lighting	<p><b>Construction</b>                      Site preparation                      Onshore construction                      Vehicle traffic                      Operational testing and commissioning</p> <p><b>Operations</b>                      LNG facility                      Marine terminal use</p>	<ul style="list-style-type: none"> <li>▪ Fixtures selected to reduce wasted or stray light.</li> <li>▪ Adherence to design specifications.</li> <li>▪ Use of a centralized lighting control system.</li> <li>▪ Maintain a 30 m vegetation buffer.</li> </ul>	<ul style="list-style-type: none"> <li>▪ The ecological context is of <b>moderate resilience</b> (the effect takes place in an area currently disturbed by human development)</li> <li>▪ <b>Low</b> in magnitude (effect is detectable but reduced through design mitigation)</li> <li>▪ <b>Local</b> in extent (effects are within the LAA)</li> <li>▪ <b>Medium-term</b> in duration (effect occurs for the life of the Project)</li> <li>▪ Reversible</li> <li>▪ Is <b>continuous</b> in frequency</li> <li>▪ The likelihood of a residual effect of an increase in ambient lighting is <b>high</b></li> </ul>	<p><b>Not significant</b>                      With a high level of confidence</p>

Potential Effects	Project Phase / Contributing Project Activity or Physical Works	Proposed Mitigation/ Commitments	Residual Effects	Significance
<b>Vegetation and Wetland Resources</b>				
Change in abundance of plant species of interest	<b>Construction</b> Site preparation	<ul style="list-style-type: none"> <li>▪ Incorporate traditional use plants into wetland compensation plans wherever possible and practical.</li> <li>▪ Incorporate weed and invasive plant control measures during construction and operations.</li> <li>▪ Implement a Species-at-Risk Discovery Contingency Plan.</li> </ul>	<ul style="list-style-type: none"> <li>▪ The ecological context is of <b>moderate resilience</b> (the effect takes place in an <b>undisturbed</b> area)</li> <li>▪ <b>Low</b> in magnitude</li> <li>▪ Occurs within the <b>PDA</b></li> <li>▪ Long term</li> <li>▪ Change in plant abundance is <b>reversible</b></li> <li>▪ Occurs <b>once</b></li> <li>▪ The likelihood of a residual effect of a change in abundance of plant species of interest is <b>high</b></li> </ul>	<b>Not Significant</b> With a moderate level of confidence
Change in abundance or condition of ecological communities	<b>Construction</b> Site Preparation <b>Operation</b> LNG facility	<ul style="list-style-type: none"> <li>▪ During construction, ecological communities of management concern located outside of the PDA will be marked and protected.</li> <li>▪ Design and implement drainage and erosion control techniques to maintain the local surface and groundwater hydrology.</li> <li>▪ Implement monitoring program to monitor effects of air emissions on ecological communities.</li> </ul>	<ul style="list-style-type: none"> <li>▪ The ecological context is of <b>moderate resilience</b> (the effect takes place in an <b>moderately disturbed</b> area)</li> <li>▪ <b>Low</b> in magnitude</li> <li>▪ <b>Regional</b> in extent (potential effects of emissions extend to the RAA)</li> <li>▪ Permanent</li> <li>▪ Loss of plant communities within the PDA are <b>irreversible</b></li> <li>▪ Is <b>continuous</b> in frequency (effects from facility emissions)</li> <li>▪ The likelihood of a residual effect of a change in abundance or condition of ecological communities is <b>high</b></li> </ul>	<b>Not significant</b> With a moderate level of confidence

Potential Effects	Project Phase / Contributing Project Activity or Physical Works	Proposed Mitigation/ Commitments	Residual Effects	Significance
Change in wetland functions	<b>Construction</b> Site Preparation	<ul style="list-style-type: none"> <li>▪ Delineate wetlands outside the PDA as environmentally sensitive areas, mark with fencing, and restrict construction access.</li> <li>▪ Develop and implement the wetland compensation plan.</li> <li>▪ Drainage and erosion control techniques designed to maintain the local surface and groundwater hydrology will be designed and implemented.</li> </ul>	<ul style="list-style-type: none"> <li>▪ With compensation there are <b>no residual effects</b> on loss of wetland function</li> <li>▪ The ecological context is of <b>low resilience</b> (the effect takes place in an <b>undisturbed</b> area)</li> <li>▪ <b>Medium-term</b> in duration (including time to restore wetland function through compensation)</li> <li>▪ <b>Reversible</b> (with compensation)</li> <li>▪ The likelihood of a residual effect of a change in wetland function is <b>low</b></li> </ul>	<b>Not significant</b> With a high level of confidence
<b>Terrestrial Wildlife and Marine Birds</b>				
Change in wildlife habitat availability	<b>Construction</b> Site preparation Onshore construction Dredging Marine construction Disposal at sea <b>Operations</b> LNG facility Marine terminal use Shipping <b>Decommissioning</b> Dismantling project infrastructure	<ul style="list-style-type: none"> <li>▪ Maintain a 30 m vegetation buffer.</li> <li>▪ Limit clearing limits of the PDA and temporary work space.</li> <li>▪ Apply mitigation measures for acoustic environment. Implement Wetland Habitat Compensation and Fish Habitat Offsetting Strategies.</li> <li>▪ Vessels will not exceed a speed of 16 knots within the LAA.</li> <li>▪ Implement a Blasting Management Plan.</li> </ul>	<ul style="list-style-type: none"> <li>▪ The ecological context is of <b>moderate</b> resilience (effect occurs in a stable ecosystem and/or moderately disturbed environment)</li> <li>▪ <b>Moderate</b> in magnitude (many individuals or hectares of habitat in a regional population are affected)</li> <li>▪ <b>Local</b> in extent (potential effects are within the LAA)</li> <li>▪ <b>Long-term</b> in duration (occurs across multiple breeding seasons/generations and project phases)</li> <li>▪ Reversible</li> <li>▪ Occurs <b>once</b> in frequency</li> <li>▪ The likelihood of a residual effect of a change in wildlife habitat availability is <b>high</b></li> </ul>	<b>Not significant</b> With a moderate level of confidence

Potential Effects	Project Phase / Contributing Project Activity or Physical Works	Proposed Mitigation/ Commitments	Residual Effects	Significance
Risk of mortality	<p><b>Construction</b> Site preparation Dredging Marine construction</p> <p><b>Operations</b> LNG facility Marine terminal use</p>	<ul style="list-style-type: none"> <li>▪ Maintain 30 m vegetation buffer.</li> <li>▪ Limit clearing to the PDA and temporary work space.</li> <li>▪ Clearing activities will occur outside of the breeding season for terrestrial birds, amphibians, and bats. If clearing is required during these breeding periods, bird surveys will be conducted in advance.</li> <li>▪ Removal of raptor nests within the clearing limits of the PDA will be subject to permit approval.</li> <li>▪ Erect permanent fencing around the Project.</li> <li>▪ Store waste and recycling materials on-site in wildlife-proof containers for permanent disposal at an approved facility.</li> <li>▪ Prohibit feeding and harassment of wildlife.</li> <li>▪ Provide wildlife education and awareness training. Reduce traffic between Prince Rupert, Port Edward, and the project site through the use of buses, crew cab trucks, water taxis, and other group transportation options when practical.</li> <li>▪ Adhere to posted speed limits on road and vessel transportation routes.</li> <li>▪ Apply lighting mitigations.</li> <li>▪ Implement Management Plans (e.g. Blasting Management Plan).</li> </ul>	<ul style="list-style-type: none"> <li>▪ The ecological context is of <b>moderate</b> resilience (effect occurs in a stable ecosystem and/or moderately disturbed environment)</li> <li>▪ <b>Moderate</b> in magnitude (many individuals or hectares of habitat in a regional population are affected)</li> <li>▪ <b>Local</b> in extent (potential effects are within the LAA)</li> <li>▪ <b>Long-term</b> in duration (occurs across multiple breeding seasons/generations and project phases)</li> <li>▪ Reversible</li> <li>▪ Occurs at <b>multiple</b> times at an <b>irregular</b> frequency</li> <li>▪ The likelihood of a residual effect of increased risk of mortality is <b>medium</b></li> </ul>	<p><b>Not significant</b> With a moderate level of confidence</p>

Potential Effects	Project Phase / Contributing Project Activity or Physical Works	Proposed Mitigation/ Commitments	Residual Effects	Significance
Alteration of movement or behaviour patterns	<b>Construction</b> Site preparation Onshore construction Dredging Marine construction <b>Operations</b> LNG facility Marine terminal use <b>Decommissioning</b> Dismantling project infrastructure	<ul style="list-style-type: none"> <li>▪ Limit clearing limits of the PDA and temporary work space.</li> <li>▪ Vessels will not exceed a speed of 16 knots within the LAA.</li> <li>▪ Apply mitigation measures for acoustic environment.</li> <li>▪ Equipment will be properly maintained.</li> <li>▪ Implement Management Plans (e.g. Blasting Management Plan).</li> </ul>	<ul style="list-style-type: none"> <li>▪ The ecological context is of <b>moderate</b> resilience (effect occurs in a stable ecosystem and/or moderately disturbed environment)</li> <li>▪ <b>Low</b> in magnitude (few individuals or hectares of habitat in a regional population are affected)</li> <li>▪ <b>Local</b> in extent (potential effects are within the LAA)</li> <li>▪ <b>Long-term</b> in duration (occurs across multiple breeding seasons/generations and project phases)</li> <li>▪ Reversible</li> <li>▪ Occurs at <b>multiple</b> times at an <b>regular</b> an <b>irregular</b> frequency</li> <li>▪ The likelihood of a residual effect of alteration of movement or behaviour pattern is <b>high</b></li> </ul>	<b>Not significant</b> With a high level of confidence
<b>Freshwater Aquatic Resources</b>				
Change in (permanent alteration or destruction of) fish habitat	<b>Construction</b> Site preparation Onshore construction <b>Operations</b> LNG facility	<ul style="list-style-type: none"> <li>▪ The extent of infilling of water courses will be reduced, where practical.</li> <li>▪ Infilling lower sections of watercourses (near the intertidal area) will be avoided, where practical.</li> <li>▪ Sedimentation and erosion control plan will be in place to avoid downstream effects.</li> <li>▪ Undertake fish habitat offsetting.</li> <li>▪ A 30 m vegetation buffer will be maintained around Lelu Island.</li> </ul>	<ul style="list-style-type: none"> <li>▪ The ecological context is of <b>high</b> resilience (effect occurs in an undisturbed environment)</li> <li>▪ <b>Low</b> in magnitude (effect is measurable, but on low quality, marginal or non-critical habitat)</li> <li>▪ Occurs within the <b>PDA</b></li> <li>▪ <b>Long-term</b> in duration (the effect extends from 1 to 5 years including time to restore habitat through compensation)</li> <li>▪ Irreversible</li> <li>▪ Occurs <b>once</b></li> <li>▪ The likelihood of a residual effect of a change in fish habitat is <b>low</b></li> </ul>	<b>Not significant</b> With a high level of confidence

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Potential Effects	Project Phase / Contributing Project Activity or Physical Works	Proposed Mitigation/ Commitments	Residual Effects	Significance
Change in food and nutrient content	<p><b>Construction</b> Site preparation Onshore construction</p> <p><b>Operations</b> LNG facility</p>	<ul style="list-style-type: none"> <li>▪ A 30 m vegetation buffer will be maintained around Lelu Island.</li> <li>▪ Undertake fish habitat offsetting.</li> </ul>	<ul style="list-style-type: none"> <li>▪ The ecological context is of <b>high</b> resilience (effect occurs in an undisturbed environment)</li> <li>▪ <b>Low</b> in magnitude (effect is measurable, but on low quality, marginal or non-critical habitat)</li> <li>▪ Occurs within the <b>PDA</b></li> <li>▪ <b>Long-term</b> in duration (the effect extends from 1 to 5 years including time to restore habitat through compensation)</li> <li>▪ Irreversible</li> <li>▪ Occurs <b>once</b></li> <li>▪ The likelihood of a residual effect of a change in food and nutrient content is <b>low</b></li> </ul>	<p><b>Not significant</b> With a high level of confidence</p>
Increased risk of fish mortality	<p><b>Construction</b> Site preparation Onshore construction</p> <p><b>Operations</b> LNG facility</p>	<ul style="list-style-type: none"> <li>▪ Fish salvage program during construction.</li> </ul>	<ul style="list-style-type: none"> <li>▪ The ecological context is of <b>high</b> resilience (effect occurs in an undisturbed environment)</li> <li>▪ <b>No effect</b> (No measurable adverse effect on the function or use of the habitat; no measurable reduction in size of the fish population)</li> <li>▪ Occurs within the <b>PDA</b></li> <li>▪ <b>Short-term</b> in duration (the effect is less than 1 week)</li> <li>▪ Irreversible</li> <li>▪ Occurs <b>once</b></li> <li>▪ The likelihood of a residual effect of an increased risk of fish mortality is <b>low</b></li> </ul>	<p><b>Not significant</b> With a high level of confidence</p>



Potential Effects	Project Phase / Contributing Project Activity or Physical Works	Proposed Mitigation/ Commitments	Residual Effects	Significance
<b>Marine Resources</b>				
Change in sediment or water quality	<b>Construction</b> Dredging Marine construction Disposal at sea  <b>Operations</b> Marine terminal use	<ul style="list-style-type: none"> <li>▪ A 30 m vegetation buffer around Lelu Island. Sediment and erosion control measures will be used.</li> <li>▪ TSS and turbidity will be monitored, the rate of the activity will be adjusted, or additional mitigation measures implemented as required.</li> <li>▪ Dredge operations will be conducted using methods that reduce sediment spill.</li> <li>▪ Sediment will be disposed in an area distant from the area used on the previous trip (within the disposal site).</li> <li>▪ A portion of the seabed will be armoured in marine terminal berth area.</li> <li>▪ Arrivals and departures of LNG carriers will be avoided at low water slack tide and as the tide rises from low water up to mean sea level.</li> <li>▪ Use of tugs with less sediment scour-inducing propulsion systems (such as the Voith-Schneider design), will be evaluated.</li> </ul>	<ul style="list-style-type: none"> <li>▪ The ecological context is of <b>moderate to high</b> resilience (under baseline conditions, the marine resources occasionally or often experience anthropogenic effects and are sensitive to them, with changes triggering small and short-term ecological effects, or are unaffected by them)</li> <li>▪ <b>Low to moderate</b> in magnitude (effects result in a measurable change outside the range of natural variability but not posing a risk to population viability)</li> <li>▪ Occurs within the <b>LAA</b></li> <li>▪ <b>Long-term</b> in duration (the effect continues for more than two years)</li> <li>▪ Reversible</li> <li>▪ Occurs either <b>continuously</b> or at <b>multiple</b> times at <b>regular</b> intervals</li> <li>▪ The likelihood of a residual effect of a change in sediment or water quality is <b>high</b></li> </ul>	<b>Not significant</b> With a moderate level of confidence

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Potential Effects	Project Phase / Contributing Project Activity or Physical Works	Proposed Mitigation/ Commitments	Residual Effects	Significance
Change in (permanent alteration or destruction of) fish habitat	<p><b>Construction</b> Dredging Marine construction Disposal at sea</p> <p><b>Operations</b> Marine terminal use</p> <p><b>Decommissioning</b> Dismantling project infrastructure</p>	<ul style="list-style-type: none"> <li>▪ Hard multi-facetted shoreline protection material will be used where needed (e.g., at the trestle abutment) to promote colonization by marine biota.</li> <li>▪ Habitat offsetting will be implemented to achieve no net loss of productivity.</li> <li>▪ The outer limits of foreshore construction areas will be demarcated.</li> </ul>	<ul style="list-style-type: none"> <li>▪ The ecological context is of moderate resilience (under baseline conditions, the marine resources are occasionally exposed to anthropogenic effects and are sensitive to them)</li> <li>▪ Moderate in magnitude (measurable change outside the range of natural variability but not posing a risk to population viability)</li> <li>▪ Occurs within the LAA</li> <li>▪ Permanent</li> <li>▪ Reversible</li> <li>▪ Occurs once</li> <li>▪ The likelihood of a residual effect of a change in fish habitat is <b>low</b></li> </ul>	<p><b>Not significant</b> With a high level of confidence</p>
Direct mortality or physical injury to fish or marine mammals	<p><b>Construction</b> Dredging Marine construction Disposal at sea</p> <p><b>Operations</b> Marine terminal use</p>	<ul style="list-style-type: none"> <li>▪ DFO's Blasting Guidelines will be implemented.</li> <li>▪ Blasting will be conducted within DFO least-risk timing windows.</li> <li>▪ Dungeness crabs will be relocated from construction zones.</li> <li>▪ Material from the dredge area that is suitable for construction or habitat compensation will be used, where possible.</li> <li>▪ Implement a Pile Driving Management plan to outline low noise techniques to be used to install piles. If an impact pile driver is used a marine mammal observation program will be implemented.</li> </ul>	<ul style="list-style-type: none"> <li>▪ The ecological context is of <b>moderate</b> resilience (under baseline conditions, the marine resources are occasionally exposed to anthropogenic effects and are sensitive to them)</li> <li>▪ <b>Moderate</b> in magnitude (measurable change outside the range of natural variability but not posing a risk to population viability)</li> <li>▪ Occurs within the <b>LAA</b></li> <li>▪ <b>Long-term</b> in duration (effect continues through all project phases)</li> <li>▪ Reversible</li> <li>▪ Occurs continuously</li> <li>▪ The likelihood of a residual effect of direct mortality or physical injury to fish or marine mammals is <b>high</b></li> </ul>	<p><b>Not significant</b> With a moderate level of confidence</p>

Potential Effects	Project Phase / Contributing Project Activity or Physical Works	Proposed Mitigation/ Commitments	Residual Effects	Significance
Change in behaviour of fish or marine mammals	<p><b>Construction</b>                      Dredging                      Marine construction                      Disposal at sea</p> <p><b>Operations</b>                      Marine terminal use                      Shipping</p> <p><b>Decommissioning</b>                      Dismantling project infrastructure</p>	<ul style="list-style-type: none"> <li>▪ Vessels will not exceed a speed of 16 knots within the LAA.</li> <li>▪ LNG carrier vessel speed will be reduced to 6 knots when approaching the Triple Island Pilot Boarding Station.</li> </ul>	<ul style="list-style-type: none"> <li>▪ The ecological context is of <b>low</b> to <b>moderate</b> resilience (under baseline conditions, the marine resources are either rarely or occasionally exposed to anthropogenic effects and are sensitive or highly sensitive to them)</li> <li>▪ <b>Moderate</b> in magnitude (measurable change outside the range of natural variability but not posing a risk to population viability)</li> <li>▪ Occurs within the <b>LAA</b></li> <li>▪ <b>Long-term</b> in duration (effect continues through all project phases )</li> <li>▪ Reversible</li> <li>▪ Occurs either <b>continuously</b> or at <b>multiple</b> times at <b>regular</b> intervals</li> <li>▪ The likelihood of a residual effect of a change in behaviour of fish or marine mammals is <b>high</b></li> </ul>	<p><b>Not significant</b>                      With a moderate level of confidence</p>

Potential Effects	Project Phase / Contributing Project Activity or Physical Works	Proposed Mitigation/ Commitments	Residual Effects	Significance
<b>Economic Environment</b>				
Changes in regional labour supply and demand	<b>Construction Operations Decommissioning</b>	<ul style="list-style-type: none"> <li>▪ Work with training and educational facilities so that programs necessary to prepare regional residents for work on the Project are available.</li> <li>▪ Require that all of workers complete grade 12 or have an appropriate equivalency.</li> <li>▪ Develop career pathways that would allow local construction workers to transition into operational employment.</li> <li>▪ Facilitate hiring and employment opportunities for RAA residents.</li> <li>▪ Work with EPCC contractors to remove barriers to employment for RAA residents.</li> <li>▪ Identify work packages that would be consistent with the capabilities of local and regional businesses to maximize local procurement opportunities.</li> <li>▪ Work with First Nations to identify partnership or other arrangements that would increase the opportunities for their participation.</li> </ul>	<ul style="list-style-type: none"> <li>▪ The context is within a <b>moderate</b> level of resilience</li> <li>▪ <b>Moderate</b> in magnitude</li> <li>▪ <b>Regional</b> in extent</li> <li>▪ <b>Long-term</b> in duration</li> <li>▪ Reversible</li> <li>▪ <b>Continuous</b> in frequency</li> <li>▪ The likelihood of a residual effect of changes in regional labour supply and demand is <b>low</b></li> </ul>	<b>Not significant</b> With a moderate level of confidence
Changes in cost of living and economic activity	<b>Construction Operations Decommissioning</b>	<ul style="list-style-type: none"> <li>▪ Develop a project closure strategy that would reduce the adverse effects that project closure would have upon regional workers</li> </ul>	<ul style="list-style-type: none"> <li>▪ The context is within a <b>moderate</b> level of resilience</li> <li>▪ <b>Moderate</b> in magnitude</li> <li>▪ <b>Regional</b> in extent</li> <li>▪ <b>Long-term</b> in duration</li> <li>▪ Reversible</li> <li>▪ <b>Continuous</b> in frequency</li> <li>▪ The likelihood of a residual effect is <b>low</b></li> </ul>	<b>Not significant</b> With a high level of confidence

Potential Effects	Project Phase / Contributing Project Activity or Physical Works	Proposed Mitigation/ Commitments	Residual Effects	Significance
Changes to municipal government finances	<b>Construction</b> <b>Operations</b> <b>Decommissioning</b>	<ul style="list-style-type: none"> <li>▪ Consultations with municipal governments will continue to monitor whether the Project is creating issues, in terms of effects on municipal finances or demands for infrastructure or services.</li> <li>▪ A community investment program will be developed.</li> </ul>	<ul style="list-style-type: none"> <li>▪ The context is within a <b>moderate</b> level of resilience</li> <li>▪ <b>Low</b> in magnitude</li> <li>▪ <b>Regional</b> in extent</li> <li>▪ <b>Long-term</b> in duration</li> <li>▪ Reversible</li> <li>▪ <b>Continuous</b> in frequency</li> <li>▪ The likelihood of a residual effect of changes to municipal government finances is <b>low</b></li> </ul>	<b>Not significant</b> With a high level of confidence
<b>Navigation and Marine Resource Use</b>				
Interference with marine navigation	<b>Construction</b> Dredging Marine construction <b>Operations</b> Marine terminal use <b>Decommissioning</b> Dismantling project infrastructure	<ul style="list-style-type: none"> <li>▪ Implement a Marine Communications Plan.</li> <li>▪ Establish safety zones during construction.</li> <li>▪ Lighting design to reduce stray lighting.</li> <li>▪ Installation of navigational aids.</li> <li>▪ Updated navigational charts.</li> <li>▪ Sufficient clearance (11m above HHW) for gillnetters will be provided beneath the Lelu Island bridge and the trestle spans that best supports navigation to and from Porpoise Channel over Flora Bank.</li> <li>▪ Use of escort vessels to confirm the route is clear and that other vessels do not intrude safety zones.</li> <li>▪ Tugs will be used for the safe transit and docking of LNG carriers.</li> <li>▪ Limits on environmental conditions under which operations can be conducted safely (visibility, day-time operations, wind) will be set.</li> <li>▪ Traffic management and routing options will be assessed to determine if de-confliction of LNG carrier routes is necessary for small craft.</li> </ul>	<ul style="list-style-type: none"> <li>▪ The context is within a <b>low</b> level of disturbance</li> <li>▪ <b>Moderate</b> in magnitude</li> <li>▪ <b>Local</b> in extent (effects are within the LAA)</li> <li>▪ <b>Long-term</b> in duration (effects last for the life of the Project)</li> <li>▪ Reversible</li> <li>▪ <b>Continuous</b> in frequency</li> <li>▪ The likelihood of a residual effect of interference with marine navigation is <b>moderate</b></li> </ul>	<b>Not significant</b> With a high level of confidence

Potential Effects	Project Phase / Contributing Project Activity or Physical Works	Proposed Mitigation/ Commitments	Residual Effects	Significance
Effects on fishing, recreation and marine use (including marine tourism)	<p><b>Construction</b> Dredging Marine construction</p> <p><b>Operations</b> Marine terminal use Shipping</p> <p><b>Decommissioning</b> Dismantling project infrastructure</p>	<ul style="list-style-type: none"> <li>A Marine Communications Plan will be implemented.</li> <li>Sufficient clearance (11m above HHW) for gillnetters will be provided beneath the Lelu Island bridge and the trestle spans that best supports navigation to and from Porpoise Channel over Flora Bank.</li> <li>Effects related to navigation (see Section 15.5.2.2) will be mitigated.</li> <li>Other effects related to marine resources will be mitigated (see Section 13 Marine Resources).</li> </ul>	<ul style="list-style-type: none"> <li>The context is within a <b>moderate</b> level of disturbance</li> <li><b>Moderate</b> in magnitude</li> <li><b>Local</b> in extent (effects are within the LAA)</li> <li><b>Long-term</b> in duration (effects last for the life of the Project)</li> <li>Reversible</li> <li><b>Continuous</b> in frequency</li> <li>The likelihood of a residual effect of effects on fishing and recreation and marine use is <b>moderate</b></li> </ul>	<p><b>Not significant</b></p> <p>With a moderate level of confidence</p>
<b>Infrastructure and Services</b>				
Change in traffic and pressure on transportation infrastructure	<p><b>Construction</b> Site preparation Onshore construction Vehicle traffic Waste management and disposal</p>	<ul style="list-style-type: none"> <li>A Transportation Management Plan will be implemented to outline preferred ground transportation corridors, provide policies for the movement of loads, outline policies and procedures for the use of the Prince Rupert Airport and the Northwest Regional Airport Terrace-Kitimat, provide policies for the movement of workers, and require PNW LNG to engage in frequent communication between MOTI, RCMP, PRPA and the council members of Port Edward and Prince Rupert.</li> </ul>	<ul style="list-style-type: none"> <li>The context is within a <b>moderate</b> level of resilience (infrastructure and services are able to accommodate changes with minor impacts to viability).</li> <li><b>Low</b> in magnitude (effects cannot be distinguished from baseline)</li> <li><b>Local</b> in extent (effects are within the LAA)</li> <li><b>Long-term</b> in duration (effects last for the life of the Project)</li> <li>Reversible</li> <li><b>Continuous</b> in frequency</li> <li>The likelihood of a residual effect of change in traffic and pressure on transportation infrastructure is <b>moderate</b></li> </ul>	<p><b>Not significant</b></p> <p>With a moderate level of confidence</p>

Potential Effects	Project Phase / Contributing Project Activity or Physical Works	Proposed Mitigation/ Commitments	Residual Effects	Significance
Change in housing availability and affordability	<b>Construction</b> Onshore construction	<ul style="list-style-type: none"> <li>▪ A camp will be used to house workers during construction.</li> <li>▪ An accommodation plan will be implemented to establish communication with city and district planners in Port Edward and Prince Rupert, provide housing policies for non-local temporary workers who are not housed in the construction camp on Lelu Island, and outline camp management policies and practices.</li> </ul>	<ul style="list-style-type: none"> <li>▪ The context is within a <b>moderate</b> level of resilience (infrastructure and services are able to accommodate changes with minor impacts to viability).</li> <li>▪ <b>Low</b> in magnitude (effects cannot be distinguished from baseline)</li> <li>▪ <b>Local</b> in extent (effects are within the LAA)</li> <li>▪ <b>Long-term</b> in duration (effects last for the life of the Project)</li> <li>▪ Reversible</li> <li>▪ <b>Continuous</b> in frequency</li> <li>▪ The likelihood of a residual effect of change in housing availability and affordability is <b>high</b></li> </ul>	<b>Not significant</b> With a moderate level of confidence
Change in infrastructure and community services	<b>Construction</b> Onshore construction Waste management and disposal	<ul style="list-style-type: none"> <li>▪ A First Nations and community training and employment strategy will be implemented that will ensure that local communities, including First Nations, have access to training and employment opportunities provided by the Project.</li> <li>▪ A community crime prevention initiative between RCMP and PNW LNG will be developed</li> <li>▪ A PNW LNG Project engagement plan will be implemented.</li> <li>▪ An emergency response plan will be established and implemented with BC OGC, PRFR, PEFD, PRPA, and the RCMP.</li> <li>▪ Mandatory awareness programs for employees will be implemented regarding fire suppression systems.</li> <li>▪ Recreational facilities will be provided on site at the construction camp.</li> <li>▪ Waste management, disposal, and recycling programs of construction and domestic waste will be implemented.</li> </ul>	<ul style="list-style-type: none"> <li>▪ The context is within a <b>high</b> level of resilience (infrastructure and services are well developed and able to accommodate change).</li> <li>▪ <b>Moderate</b> in magnitude (a measurable change that can be accommodated elsewhere in the RAA)</li> <li>▪ <b>Local</b> in extent (effects are within the LAA)</li> <li>▪ <b>Long-term</b> in duration (effects last for the life of the Project)</li> <li>▪ Reversible</li> <li>▪ <b>Continuous</b> in frequency</li> <li>▪ The likelihood of a residual effect of change in infrastructure and community services is <b>high</b></li> </ul>	<b>Not significant</b> With a moderate level of confidence

Potential Effects	Project Phase / Contributing Project Activity or Physical Works	Proposed Mitigation/ Commitments	Residual Effects	Significance
<b>Visual Quality</b>				
Reduction in visual quality	<p><b>Construction</b> Site preparation Onshore construction Dredging Marine construction</p> <p><b>Operations</b> LNG facility Marine terminal use Shipping</p>	<ul style="list-style-type: none"> <li>A 30 m mature vegetation buffer will be retained around Lelu Island, except at access points, and will reduce the visual impact of the Project.</li> </ul>	<ul style="list-style-type: none"> <li>The context is within a <b>moderate</b> level of resilience</li> <li><b>High</b> in magnitude (a measurable change exceeds visual quality objectives)</li> <li><b>Local</b> in extent (effects are within the LAA)</li> <li><b>Long-term</b> in duration (effects last for the life of the Project)</li> <li>Reversible</li> <li><b>Continuous</b> in frequency</li> <li>The likelihood of a residual effect of reduction in visual quality is <b>high</b></li> </ul>	<p><b>Not significant</b> With a moderate level of confidence</p>
<b>Community Health and Well-Being</b>				
Changes in social determinants of health	<p><b>Construction</b> Site preparation Onshore construction Dredging Marine construction</p> <p><b>Operations</b> LNG facility Marine terminal use Shipping</p>	<ul style="list-style-type: none"> <li>Provide training, employment and business opportunities.</li> <li>Provide an employee assistance program.</li> <li>Implement a vaccination policy.</li> <li>Enforce workplace hygiene policies.</li> <li>Provide contractor information sessions.</li> <li>Non-local construction workers will be housed in an accommodation camp.</li> </ul>	<ul style="list-style-type: none"> <li>The context is within a <b>resilient</b> community</li> <li><b>Moderate</b> in magnitude (effect is measurable and will not affect quality of life)</li> <li><b>Regional</b> in extent (effects extend to the RAA)</li> <li><b>Long-term</b> in duration (effects last for the life of the Project)</li> <li>Reversible</li> <li><b>Continuous</b> in frequency</li> <li>The likelihood of a residual effect of changes in social determinants of health is <b>high</b></li> </ul>	<p><b>Not significant</b> With a moderate level of confidence</p>



Potential Effects	Project Phase / Contributing Project Activity or Physical Works	Proposed Mitigation/ Commitments	Residual Effects	Significance
Change in diet and nutrition	<b>Construction</b> Site preparation Onshore construction Marine construction Operational testing and commissioning  <b>Operations</b> LNG facility Marine terminal use Shipping	<ul style="list-style-type: none"> <li>▪ Mitigation measures presented in biophysical, land and marine use and human health sections of the application serve as mitigation measures reducing residual effects on change in diet and nutrition.</li> <li>▪ Public awareness and informational sessions will be available.</li> </ul>	<ul style="list-style-type: none"> <li>▪ The context is within a <b>resilient</b> community</li> <li>▪ <b>Moderate</b> in magnitude (effect is measurable and will not affect quality of life)</li> <li>▪ <b>Local</b> in extent (effects are within the LAA)</li> <li>▪ <b>Long-term</b> in duration (effects last for the life of the Project)</li> <li>▪ Irreversible</li> <li>▪ <b>Continuous</b> in frequency</li> <li>▪ The likelihood of a residual effect of change in diet and nutrition is <b>high</b></li> </ul>	<b>Not significant</b>  With a moderate level of confidence
<b>Human and Ecological Health</b>				
Change in human health	<b>Construction</b> Dredging  <b>Operations</b> LNG facility Marine terminal use Shipping	See mitigations for Air Quality, Acoustic Environment, Ambient Light, and Marine Resources in Table 28-2.	<ul style="list-style-type: none"> <li>▪ The context is <b>low</b> resilience due to the potential effects on sensitive receptors</li> <li>▪ <b>Low</b> in magnitude (exposures are near health-based guidelines)</li> <li>▪ <b>Local</b> in extent (effects are within the LAA)</li> <li>▪ <b>Long-term</b> in duration (effects last for the life of the Project)</li> <li>▪ Reversible</li> <li>▪ <b>Continuous</b> in frequency</li> <li>▪ The likelihood of a residual effect of change in human health is <b>low</b></li> </ul>	<b>Not significant</b>  With a high level of confidence

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Potential Effects	Project Phase / Contributing Project Activity or Physical Works	Proposed Mitigation/ Commitments	Residual Effects	Significance
Changes in ecological health	<b>Construction</b> Dredging  <b>Operations</b> LNG facility Marine terminal use Shipping	See mitigations for Air Quality, Acoustic Environment, Ambient Light, and Marine Resources in Table 28-2.	<ul style="list-style-type: none"> <li>▪ The context is of <b>moderate</b> resilience (effect occurs in a stable ecosystem and is not likely to contribute to change ecological health)</li> <li>▪ <b>Low</b> in magnitude (exposures are near health-based guidelines)</li> <li>▪ <b>Local</b> in extent (effects are within the LAA)</li> <li>▪ <b>Long-term</b> in duration (effects last for the life of the Project)</li> <li>▪ Reversible</li> <li>▪ <b>Continuous</b> in frequency</li> <li>▪ The likelihood of a residual effect of change in ecological health is <b>low</b></li> </ul>	<b>Not significant</b>  With a high level of confidence
<b>Heritage and Archaeological Resources</b>				
Destruction or disturbance of culturally modified trees	<b>Construction</b> Site preparation Onshore construction	<ul style="list-style-type: none"> <li>▪ Systematic Data Recovery (SDR) studies for CMT sites will be conducted by systematically recording a representative sample of CMT features.</li> <li>▪ Use of a Chance Find Protocol during project construction.</li> </ul>	<ul style="list-style-type: none"> <li>▪ The Project is within a largely <b>undisturbed</b> context (there negligible disturbances within the PDA)</li> <li>▪ <b>Low/moderate</b> in magnitude (could be low or moderate in magnitude, depending on the archaeological context)</li> <li>▪ <b>Local</b> in extent (effects are within the PDA)</li> <li>▪ Effects are permanent and irreversible</li> <li>▪ Occurs <b>once</b></li> <li>▪ The likelihood of a residual effect of destruction or disturbance of CMTs is <b>low</b></li> </ul>	<b>Not significant</b>  With a high level of confidence

Potential Effects	Project Phase / Contributing Project Activity or Physical Works	Proposed Mitigation/ Commitments	Residual Effects	Significance
Destruction or disturbance of archaeological or heritage sites	<b>Construction</b> Site preparation Onshore construction Dredging Marine construction	<ul style="list-style-type: none"> <li>▪ Work affecting archaeological or heritage sites will cease until the site can be properly assessed by a professional archaeologist.</li> <li>▪ Systematic Data Recovery (SDR) studies on affected heritage sites (if found).</li> <li>▪ Archaeological or heritage resources of low significance may also be mitigated.</li> <li>▪ Use of a Chance Find Protocol during project construction.</li> </ul>	<ul style="list-style-type: none"> <li>▪ The Project is within a largely <b>undisturbed</b> context (there negligible disturbances within the PDA)</li> <li>▪ <b>Low/high</b> in magnitude (could be low or high in magnitude, depending on the archaeological context)</li> <li>▪ <b>Local</b> in extent (effects are within the PDA)</li> <li>▪ Effects are permanent and irreversible</li> <li>▪ Occurs <b>once</b></li> <li>▪ The likelihood of a residual effect of destruction or disturbance of archaeological or heritage sites is <b>low</b></li> </ul>	<b>Not significant</b> With a high level of confidence

Potential Effects	Project Phase / Contributing Project Activity or Physical Works	Proposed Mitigation/ Commitments	Residual Effects	Significance
<b>Current Use of Land and Resources for Traditional Purposes</b>				
Change in the use of land and resources for traditional purposes by Aboriginal people	<p><b>Construction</b>                      Site preparation                      Onshore construction                      Dredging                      Marine construction                      Disposal at sea                      Site clean-up and reclamation</p> <p><b>Operations</b>                      LNG facility and supporting infrastructure on Lelu Island                      Marine terminal use                      Shipping</p> <p><b>Decommissioning</b>                      Dismantling facility and infrastructure                      Dismantling of marine terminal and MOF                      Site clean-up and reclamation</p>	<ul style="list-style-type: none"> <li>PNW LNG will make good faith efforts to negotiate impact benefit agreements.</li> <li>Other mitigation measures for effects on the Current Use of Land and Resources for Traditional Purposes are found in the following valued components: Vegetation and Wetland Resources, Terrestrial Wildlife and Marine Birds, Marine Resources, Navigation and Marine Resource Use, Freshwater Aquatic Resource, Human and Ecological Health, Archaeological and Heritage Resources, Air Quality, Ambient Light, Acoustic Environment, and Visual Quality.</li> </ul>	<ul style="list-style-type: none"> <li>The Project is within a largely <b>moderately resilient</b> context (Aboriginal rights exercised by approximately 30-60% of community members and there is moderate interference with those rights; traditional community structures in place; some use of Aboriginal languages by community members)</li> <li><b>Moderate</b> in magnitude (varies from baseline and may result in noticeable changes to traditional practices, traditional knowledge or community perceptions of traditional territory, practices or knowledge [particularly on Lelu Island and immediately surrounding waters]; moderate exacerbation of existing conditions)</li> <li><b>Local</b> in extent (effects are within the LAA)</li> <li>Effects are <b>long term</b> (certain effects extend beyond project closure)</li> <li>Reversible</li> <li>Occurs <b>continuously</b> in frequency</li> <li>The likelihood of a residual effect of change in the use of lands and resources for traditional purposes by Aboriginal people is <b>high</b></li> </ul>	<p><b>Not significant</b>                      With a moderate level of confidence</p>

**Table 28-2: Summary of Mitigation Measures**

Potential Effect	Proposed Mitigation
<b>Air Quality</b>	
Increase in criteria air contaminant (CAC) concentrations	<ul style="list-style-type: none"> <li>▪ Best achievable technology will be incorporated into project design to reduce air emissions. Control technologies will focus on managing NO<sub>x</sub> emissions. PM<sub>2.5</sub> emissions will be managed through the use of smokeless flare technology. CO and hydrocarbon emissions (e.g., VOCs) will be reduced by optimizing combustion.</li> <li>▪ Thermal oxidizers will be used to oxidize H<sub>2</sub>S, to achieve negligible H<sub>2</sub>S emission effects, oxidize VOCs, and vaporize any hydrocarbon solids in the waste gas stream before venting.</li> <li>▪ Best management practices for the processing systems will be instituted and maintained (i.e., use of treated feed gas as fuel for power generation).</li> <li>▪ A natural gas leak detection program will be implemented.</li> <li>▪ LNG carriers and assist tugs will adhere to applicable marine emission standards (MARPOL).</li> <li>▪ Dust associated with the use of facility roads will be reduced by using dust suppressants, and surface paving.</li> <li>▪ Vehicle and off-road equipment will undergo regular tuning and maintenance.</li> <li>▪ Vehicle idling times during all project phases will be kept to a minimum.</li> </ul>
<b>Greenhouse Gas Management</b>	
Emission of GHG gases (CO <sub>2</sub> , CH <sub>4</sub> , N <sub>2</sub> O) from LNG facility	<ul style="list-style-type: none"> <li>▪ A GHG Management Plan will be developed and implemented.</li> </ul>

Potential Effect	Proposed Mitigation
<b>Acoustic Environment</b>	
Increase in noise levels	<ul style="list-style-type: none"> <li>▪ Nighttime construction activity will be limited to low noise activities (no impact type pile driving or blasting activities).</li> <li>▪ All construction equipment with gas or diesel engines will be fitted with a muffler system (alternatives such as hydraulic or electric controlled units will be considered where feasible).</li> <li>▪ If diesel power generators are required, enclosed units equipped with ventilation, combustion air inlet, and gas exhaust silencers will be considered. The provision of electrical power supplied by the BC Power and Hydro Authority to the construction site on Lelu Island is under consideration and may replace the need for on-site diesel power.</li> <li>▪ Vibro-hammer piling equipment will be used where conditions permit for piling operations.</li> <li>▪ Equipment enclosure doors will be kept closed when not in use.</li> <li>▪ Exhaust vents will be equipped with commercially available silencers.</li> <li>▪ Large machinery such as gas turbine generators and refrigerant compressors will be located in enclosure with minimum acoustic sound transmission loss rating.</li> <li>▪ Inlet and exhaust silencers will be installed on gas turbines if required to meet regulatory limits.</li> <li>▪ Acoustic performance of noise emission equipment will be specified to manufacturers or suppliers (not exceeding 85 dBA at 1 m from equipment and 120 dBA for emergencies).</li> <li>▪ A Noise Management Plan will be implemented.</li> <li>▪ A policy will be implemented to keep windows and doors closed when not in use.</li> <li>▪ A noise complaint mechanism will be implemented to address any noise complaints in a timely manner.</li> </ul>
<b>Ambient Light</b>	
Increase in ambient lighting	<ul style="list-style-type: none"> <li>▪ Retain a 30 m mature vegetation buffer around Lelu Island to reduce effects of increased light.</li> <li>▪ Construction lighting and operational lighting to be selected to reduce spill-over light and will include shielded fixtures, where appropriate.</li> <li>▪ Design principles (such as those within the Canada Green Building Council LEED guidelines (LEED 2004) and the International Commission on Illumination (CIE 2003)) will be used where applicable and consistent with overarching requirements of safety and security</li> <li>▪ A centralized lighting control system will be used to selectively turn off lights when not required.</li> </ul>
<b>Vegetation and Wetland Resources</b>	
Change in abundance of plant species of interest	<ul style="list-style-type: none"> <li>▪ In the development of the wetland compensation plan, traditional use species present in the PDA will be used for planting wherever possible and practical.</li> <li>▪ Standard mitigation to prevent any introduction and spread of noxious weeds and invasive plants.</li> <li>▪ A Species-at-Risk Discovery Contingency Plan will be developed and followed to address any chance-discoveries of plant species at risk during construction.</li> </ul>

Potential Effect	Proposed Mitigation
Change in abundance or condition of ecological communities	<ul style="list-style-type: none"> <li>▪ Ecological communities of management concern located adjacent to construction limits will be clearly marked to alert workers to these features and ensure they are protected, and the use of herbicides will be restricted near such communities.</li> <li>▪ Drainage and erosion control techniques designed to maintain the local surface and groundwater hydrology will be designed and implemented.</li> <li>▪ A monitoring program will be implemented to monitor effects of air emissions on ecological communities.</li> </ul>
Change in wetland functions	<ul style="list-style-type: none"> <li>▪ Wetlands outside the PDA will be delineated as environmentally sensitive areas during construction, marked with fencing, and construction access will be restricted within these areas.</li> <li>▪ Drainage and erosion control techniques designed to maintain the local surface and groundwater hydrology will be designed and implemented.</li> <li>▪ Implementation of a wetland habitat compensation plan consisting of:                             <ul style="list-style-type: none"> <li>• Securement, plus restoration or creation, of 120 ha of wetlands through a legally binding agreement between PNW LNG and Ducks Unlimited Canada.</li> <li>• A five-year effectiveness monitoring program for the restored or created wetlands by Ducks Unlimited Canada.</li> <li>• Bog restoration benefiting a minimum of 116 ha of coastal bog ecosystems through funding the immediate research and restoration priorities of the Burns Bog Management Plan and Burns Bog Ecological Conservancy Area Management Plan.</li> </ul> </li> </ul>
<b>Terrestrial Wildlife and Marine Birds</b>	
Change in wildlife habitat availability	<ul style="list-style-type: none"> <li>▪ Boundaries of the PDA will be clearly marked and clearing, grading or dredging, construction, and temporary storage of materials of terrestrial and marine habitat will be limited to within the PDA boundaries.</li> <li>▪ If temporary workspace or storage areas are required beyond the extent of the PDA, they will be located in existing cleared areas to the extent possible.</li> <li>▪ A 30 m vegetation buffer will be retained around the perimeter of Lelu Island, except at access points (e.g., at the bridge, pioneer dock, MOF, trestle, and pipeline interconnection).</li> <li>▪ Wetland habitat compensation will include restoration and compensatory activities to recover the loss of wetland habitat function to terrestrial mammals, amphibians, and birds.</li> <li>▪ Fish habitat offsetting will include restoration and compensatory activities to recover the net loss of marine fish habitat used for foraging by marine birds.</li> <li>▪ LNG carriers, tugs, and barges will not exceed a speed of 16 knots within the LAA.</li> <li>▪ Mitigations for the acoustic environment will reduce noise disturbance to adjacent terrestrial and marine habitats.</li> <li>▪ A Blasting Management Plan will be implemented</li> </ul>

Potential Effect	Proposed Mitigation
Risk of mortality	<ul style="list-style-type: none"> <li>▪ A 30 m vegetation buffer will be retained around the perimeter of Lelu Island, except at access points (e.g., at the bridge, pioneer dock, MOF, trestle, and pipeline interconnection).</li> <li>▪ Boundaries of the PDA will be clearly marked and clearing, grading or dredging, construction, and temporary storage of materials of terrestrial and marine habitat will be limited to within the PDA boundaries.</li> <li>▪ Guidelines for restricted activity periods to protect wildlife and marine birds will be followed. Clearing activities will occur outside of the breeding season for terrestrial birds, amphibians, and bats (April 15 through July 31), and will avoid the breeding period for raptors (January 5 through September 6).</li> <li>▪ If clearing is required during these breeding periods, bird surveys will be conducted in advance of vegetation clearing by a BC-certified Registered Professional Biologist to comply with the <i>Migratory Birds Regulations</i> of the <i>Migratory Birds Convention Act</i> and the BC <i>Wildlife Act</i>. Buffers will be established around active nests and clearly marked to show the extent of clearing (BC MOE 2013).</li> <li>▪ If raptor nests are identified within the clearing limits of the PDA and require removal, this would be subject to permit approval under Section 34 of the BC <i>Wildlife Act</i>, where the <i>Act</i> applies.</li> <li>▪ Permanent fencing will be erected around the Project.</li> <li>▪ Feeding and harassment of wildlife will be prohibited.</li> <li>▪ Wildlife education and awareness training will be provided.</li> <li>▪ Traffic between Prince Rupert, Port Edward, and the project site will be reduced through the use of buses, crew cab trucks, water taxis, and other group transportation options when practical. This will primarily apply to travel required for shift changes.</li> <li>▪ Operators of project-related ground and marine transportation will adhere to posted speed limits.</li> <li>▪ A Project Waste Management Plan will be implemented and ensure that wastes and recycling materials will be temporarily stored on site in wildlife-proof containers and regularly transferred to an approved disposal or sorting facility.</li> <li>▪ To mitigate potential light-induced mortality, lighting mitigations will follow objectives contained within the Canada Green Building Council LEED guidelines and the International Commission on Illumination (LEED 2004; CIE 2003; Section 9). The use of exterior lighting (including portable lighting structures) at the LNG facility, the MOF, marine terminal, trestle, berth, and on berthed vessels will be limited where practical and permissible under federal safety and navigation regulations.</li> <li>▪ A Blasting Management Plan will be implemented.</li> </ul>
Alteration of movement or behaviour patterns	<ul style="list-style-type: none"> <li>▪ Boundaries of the PDA will be clearly marked and clearing, grading or dredging, construction, and temporary storage of materials of terrestrial and marine habitat will be limited to within the PDA boundaries.</li> <li>▪ LNG carriers, tugs, and barges will not exceed a speed of 16 knots within the LAA.</li> <li>▪ Mitigation for the acoustic environment will reduce noise disturbance to adjacent terrestrial and marine habitats.</li> <li>▪ Equipment will be properly maintained.</li> </ul>



Potential Effect	Proposed Mitigation
<b>Freshwater Aquatic Resources</b>	
Change in (permanent alteration or destruction of) fish habitat	<ul style="list-style-type: none"> <li>▪ A 30 m vegetation buffer will be retained around the perimeter of Lelu Island, except at access points (e.g., at the bridge, pioneer dock, MOF, trestle, and pipeline interconnection).</li> <li>▪ The extent of infilling of water courses will be reduced, where practical</li> <li>▪ Infilling lower sections of watercourses (near the intertidal area) will be avoided, where practical</li> <li>▪ Erosion and sediment control measures will be implemented to protect downstream water quality, where required</li> <li>▪ Fish habitat offsetting will be undertaken to achieve no net loss of productive capacity.</li> </ul>
Change in food and nutrient content	<ul style="list-style-type: none"> <li>▪ A 30 m vegetation buffer will be retained around the perimeter of Lelu Island, except at access points (e.g., at the bridge, pioneer dock, MOF, trestle, and pipeline interconnection).</li> <li>▪ Fish habitat offsetting will be undertaken to achieve no net loss of productive capacity.</li> </ul>
Increased risk of fish mortality	<ul style="list-style-type: none"> <li>▪ Fish salvage will be conducted prior to infilling of fish streams WC 8/9 and WC 11.</li> </ul>

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Potential Effect	Proposed Mitigation
<b>Marine Resources</b>	
Change in sediment or water quality	<ul style="list-style-type: none"> <li>▪ A 30 m vegetation buffer will be retained around the perimeter of Lelu Island, except at access points (e.g., at the bridge, pioneer dock, MOF, trestle, and pipeline interconnection). Sediment and erosion control measures will be used (e.g., sediment fences) for land-based construction, particularly at the shoreline, to reduce TSS inputs into the water.</li> <li>▪ TSS and turbidity will be monitored during in-water construction activities (e.g., shoreline infilling, pile installation, blasting, dredging, and ocean disposal). In the event that TSS levels exceed applicable water quality guidelines outside of the immediate work area (defined in consultation with regulatory agencies), the rate of the activity will be adjusted (e.g., slowed), or additional mitigation measures implemented (e.g., silt curtains) to minimize the spatial extent of elevated TSS.</li> <li>▪ Dredging operations will be conducted using methods and/or equipment that reduces sediment spill.</li> <li>▪ At the disposal site, sediment will be disposed within the approved disposal area at a point distant from the area used on the previous trip.</li> <li>▪ Pacific NorthWest LNG Limited Partnership (PNW LNG) is committed to meeting the appropriate TSS WQG over the long-term during dredging at the marine berth area and disposal of that sediment. Various scenarios will be modelled to identify the best strategies and the following mitigation measures will be considered:               <ul style="list-style-type: none"> <li>• Extend disposal timelines beyond one year, resulting in fewer disposal events per day.</li> <li>• Beneficial re-use of sediment for construction or fish habitat enhancement. Habitat enhancement could result in the reduction of up to half of the dredged sediment to be disposed at sea from the marine berth area (see Appendix K).</li> <li>• Consider alternative disposal sites in addition to Brown Passage.</li> </ul> </li> <li>▪ The following measures will be used to reduce TSS from vessel maneuvering:               <ul style="list-style-type: none"> <li>• A portion of the seabed will be armoured in marine berth area.</li> <li>• Arrivals and departures of LNG carriers will be avoided at low water slack tide and as the tide rises from low water up to mean sea level.</li> <li>• Use of tugs with less sediment scour-inducing propulsion systems (such as the Voith-Schneider design), will be evaluated.</li> </ul> </li> </ul>
Change in (permanent alteration or destruction of) fish habitat	<ul style="list-style-type: none"> <li>▪ Hard multi-facetted shoreline protection material (e.g., rip-rap boulders) will be used where needed (e.g., trestle abutment) to promote colonization by marine biota.</li> <li>▪ Habitat offsetting will be implemented to achieve no net loss of productivity.</li> <li>▪ The outer limits of foreshore construction areas (the MOF, marine terminal, bridge and pioneer dock) will be demarcated to avoid habitat damage outside of these areas.</li> </ul>

Potential Effect	Proposed Mitigation
Direct mortality or physical injury to fish or marine mammals	<ul style="list-style-type: none"> <li>▪ DFO's Blasting Guidelines (Wright and Hopky 1998) will be implemented, including enforcing a safety radius of 500 m, and ensuring marine mammals are not present in the safety radius prior to blasting.</li> <li>▪ Blasting will be conducted within DFO least-risk timing windows (November 30 to February 15) to avoid key lifecycle stages of fish.</li> <li>▪ Dungeness crabs will be relocated from construction zones using proper handling techniques and strategies that limit stress.</li> <li>▪ Material from the dredge area that is suitable for construction or habitat compensation will be used, where possible.</li> <li>▪ A Pile Driving Management plan will be implemented to outline low noise techniques (such as vibratory hammer with bubble curtain) to be used to install piles, where technically feasible. If an impact pile driver is used (with bubble curtain) a marine mammal observation program will be implemented.</li> </ul>
Change in behaviour of fish or marine mammals	<ul style="list-style-type: none"> <li>▪ LNG carriers, tugs, and barges will not exceed a speed of 16 knots within the LAA.</li> <li>▪ LNG carrier vessel speed will be reduced to 6 knots when approaching the Triple Island Pilot Boarding Station.</li> </ul>
<b>Economic Environment</b>	
Change in regional labour supply and demand	<ul style="list-style-type: none"> <li>▪ Work with training and educational facilities so that programs necessary to prepare regional residents for work on the Project are available</li> <li>▪ Require that all of workers complete grade 12 or have an appropriate equivalency in order to prevent young people from leaving school prematurely.</li> <li>▪ Develop career pathways that would allow local construction workers with the skills necessary to transition into operational employment</li> <li>▪ Facilitate hiring and employment opportunities for RAA residents by posting qualifications and skill requirements in advance of construction and operation</li> <li>▪ Work with EPCC contractors to remove barriers to employment for RAA residents, including literacy and Grade 12 training, childcare, occupational training and support for Aboriginal workers from local First Nations</li> <li>▪ Identify work packages that would be consistent with the capabilities of local and regional businesses to maximize local procurement opportunities</li> <li>▪ Work with First Nations to identify partnership or other arrangements that would increase the opportunities for their participation.</li> </ul>
Change in cost of living and economic activity	<ul style="list-style-type: none"> <li>▪ Develop a project closure strategy that would reduce the adverse effects that project closure would have upon regional workers</li> </ul>
Change to municipal government finances	<ul style="list-style-type: none"> <li>▪ Consultations with municipal governments will continue to monitor whether the Project is creating issues, in terms of effects on municipal finances or demands for infrastructure or services.</li> <li>▪ A community investment program will be developed.</li> </ul>

Potential Effect	Proposed Mitigation
<b>Navigation and Marine Resource Use</b>	
Interference with marine navigation	<ul style="list-style-type: none"> <li>▪ A Marine Communications Plan will be implemented, which identifies measures so that all marine traffic is made aware of any project construction activities and that details the local marine communications and project-related safety procedures.</li> <li>▪ Safety zones will be established during construction that specify “no go” areas.</li> <li>▪ Lighting will be designed to reduce stray lighting.</li> <li>▪ Navigational aids will be installed on structures where required to enhance navigation safety.</li> <li>▪ Navigational charts will be updated to show the MOF and trestle and berth locations.</li> <li>▪ Sufficient clearance (11 m above HHW) for gillnetters will be provided beneath the Lelu Island bridge and the trestle spans that best supports navigation to and from Porpoise Channel over Flora Bank.</li> <li>▪ Escort vessels will be used to confirm the route is clear and safe and that other vessels do not intrude safety zones.</li> <li>▪ Tugs will be used for the safe transit and docking of LNG carriers.</li> <li>▪ Traffic management and routing options will be assessed to help small craft know which route a carrier will follow, if deemed necessary by the port and pilots based on analysis of TERMPOL studies.</li> <li>▪ Limits on environmental conditions under which operations can be conducted safely (visibility, day-time operations, wind) will be set consistent with results from the TERMPOL studies, consultation with pilots, and LNG terminal practices throughout the industry.</li> </ul>
Effects on fishing, recreation, and marine use (including marine tourism)	<ul style="list-style-type: none"> <li>▪ A Marine Communications Plan will be implemented, which identifies measures so that all marine traffic is made aware of any project construction activities and that details the local marine communications and project-related safety procedures.</li> <li>▪ Sufficient clearance (11 m above HHW) for gillnetters will be provided beneath the Lelu Island bridge and the trestle spans that best supports navigation to and from Porpoise Channel over Flora Bank.</li> <li>▪ Effects related to navigation (see Section 15.5.2.2) will be mitigated.</li> <li>▪ Other effects related to marine resources will be mitigated (see Section 13 Marine Resources).</li> </ul>

Potential Effect	Proposed Mitigation
<b>Infrastructure and Services</b>	
Change in traffic and pressure on transportation infrastructure	<p>A transportation management plan will be implemented to:</p> <ul style="list-style-type: none"> <li>▪ Outline preferred ground transportation corridors.</li> <li>▪ Provide policies for the movement of dangerous goods, heavy, oversized and regular loads; convoys will be prohibited.</li> <li>▪ Outline policies and procedures for the use of the Prince Rupert Airport and the Northwest Regional Airport Terrace-Kitimat for project-related activities.</li> <li>▪ Provide policies for the movement of workers to and from construction sites and airports; where possible workers will be transported by bus or crew-cab truck.</li> <li>▪ Require PNW LNG to engage in frequent communication between MOTI, RCMP, PRPA and the council members of Port Edward and Prince Rupert to address potential concerns and changes in demand of infrastructure and services.</li> </ul>
Change in housing availability and affordability	<ul style="list-style-type: none"> <li>▪ A camp will be used to house workers during construction</li> <li>▪ An accommodation plan will be implemented to:                             <ul style="list-style-type: none"> <li>• Establish communication with city and district planners in Port Edward and Prince Rupert as a means of responding to potential community grievances and changes in demand for housing infrastructure.</li> <li>• Provide housing policies for non-local temporary workers who are not housed in the construction camp on Lelu Island; policies will outline preferred accommodations and require workers be housed in both Port Edward and Prince Rupert when not in housed in the construction camp to lower the demand in a single community.</li> <li>• Outline camp management policies and practices.</li> </ul> </li> </ul>

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Potential Effect	Proposed Mitigation
Change in infrastructure and community services	<ul style="list-style-type: none"><li>▪ A First Nations and community training and employment strategy will be implemented that will ensure that local communities, including First Nations, have access to training and employment opportunities provided by the Project. The long-term objective of the strategy is to maximize access to long-term career opportunities during the operational phase of the Project by local populations through enhanced skills training programs and outreach efforts (used to identify local labour talent).</li><li>▪ A community crime prevention initiative between RCMP and PNW LNG will be implemented through the Transportation Management Plan and Accommodation Plan. The initiative will encourage PNW LNG and RCMP to collaborate and communicate project updates and activities that could influence community safety. The initiative will additionally help facilitate an understanding of project-related traffic concerns.</li><li>▪ A PNW LNG Project community engagement plan will assist communities in planning for an influx of workers. The plan will include initiatives to address potential effects and will facilitate communication with the community and provide a framework from which to respond to community grievances. The plan will also provide details on how best to maximize economic opportunities related to the Project.</li><li>▪ An emergency response plan will be established and implemented with BC OGC, PRFR, PEFD, PRPA, and the RCMP including mandatory LNG specific emergency response training (EMS and firefighting).</li><li>▪ Mandatory awareness programs for employees will be implemented regarding fire suppression systems installed onsite, with key employees trained in fire suppression according to legislation requirements.</li><li>▪ Recreational facilities will be provided on site at the construction camp to reduce potential demand on infrastructure and municipal services.</li><li>▪ Waste management, disposal, and recycling programs of construction and domestic waste targeted at reducing demand on municipal landfill facilities and operations will be implemented.</li></ul>
<b>Visual Quality</b>	
Reduction in visual quality	<ul style="list-style-type: none"><li>▪ A 30 m vegetation buffer will be retained around the perimeter of Lelu Island, except at access points (e.g., at the bridge, pioneer dock, MOF, trestle, and pipeline interconnection).</li></ul>
<b>Community Health and Well Being</b>	
Change in social determinants of health	<ul style="list-style-type: none"><li>▪ Provide training, employment and business opportunities.</li><li>▪ Provide an employee assistance program.</li><li>▪ Implement a vaccination policy.</li><li>▪ Enforce workplace hygiene policies.</li><li>▪ Provide contractor information sessions.</li><li>▪ Non-local construction workers will be housed in an accommodation camp.</li></ul>

Potential Effect	Proposed Mitigation
Change in diet and nutrition	<ul style="list-style-type: none"> <li>▪ Mitigation measures presented in biophysical, land and marine use and human health sections of the application serve as mitigation measures reducing residual effects on change in diet and nutrition.</li> </ul> <p>Specific to access country foods, availability and perceived contamination, public awareness and informational sessions will be made available. The goal of these programs will be to:</p> <ul style="list-style-type: none"> <li>▪ Inform the public of changes in access to the PDA potentially affecting access to country foods.</li> <li>▪ Inform the public of project activities that could potentially displace wildlife (providing locations, durations etc.).</li> <li>▪ Provide information and data on actual risks of contamination to soils, waterways, vegetation and wildlife and risks associated with the consumption of contaminated country foods.</li> </ul>
<b>Human and Ecological Health</b>	
Change in human health	<ul style="list-style-type: none"> <li>▪ Mitigation measures listed in the following sections of this table (Table 28-2) will mitigate effects on human health (see mitigations for Air Quality, Acoustic Environment, Ambient Light, and Marine Resources)</li> </ul>
Change in ecological health	<ul style="list-style-type: none"> <li>▪ Mitigation measures listed in the following sections of this table (Table 28-2) will mitigate effects on ecological health (see mitigations for Air Quality, Acoustic Environment, Ambient Light, and Marine Resources)</li> </ul>
<b>Archaeological and Heritage Resources</b>	
Destruction or disturbance of culturally modified trees	<ul style="list-style-type: none"> <li>▪ Systematic Data Recovery (SDR) studies for CMT sites will be conducted by systematically recording a representative sample of CMT features, consisting of:                             <ul style="list-style-type: none"> <li>• Detailed recording as outlined in the CMT Handbook (Archaeology Branch 2001)</li> <li>• Stem round collection</li> <li>• Monitoring of CMT removal by a crew comprised of a professional archaeologist and a local First Nations representative</li> <li>• Direct dating by stem-round sampling</li> <li>• Production of a comprehensive report</li> </ul> </li> <li>▪ A Chance Find Protocol document will be used during project construction in the event that unrecorded CMTs are encountered.</li> </ul>

Potential Effect	Proposed Mitigation
Destruction or disturbance of archaeological or heritage sites	<ul style="list-style-type: none"> <li>▪ Work affecting archaeological or heritage sites will cease until the site can be properly assessed by a professional archaeologist</li> <li>▪ SDR studies will be conducted on affected heritage sites (if found), consisting of:                             <ul style="list-style-type: none"> <li>• Scientific excavation and/or surface collection studies</li> <li>• Collection and analysis of artifacts, faunal remains, botanical remains, and other archaeological remains</li> <li>• Collection and processing of carbon samples for dating</li> <li>• Completion of other appropriate specialized analytical processes (e.g., geochemical analysis of stone tools, blood residue analysis)</li> <li>• Analysis and interpretation of all recovered data</li> <li>• Cataloguing of all collected artifacts and their subsequent curation in an approved facility</li> <li>• Production of a comprehensive report</li> </ul> </li> <li>▪ Archaeological or heritage resources of low significance may also be mitigated through a program of archaeological monitoring carried out during construction</li> <li>▪ A Chance Find Protocol document will be used during project construction and implemented in the event that unrecorded archaeological or heritage sites are encountered.</li> </ul>

**Current Use of Lands and Resources for Traditional Purposes**

Change in the use of land and resources for traditional purposes by Aboriginal people	<ul style="list-style-type: none"> <li>▪ PNW LNG will make good faith efforts to negotiate impact benefit agreements.</li> </ul> <p>Mitigation measures for the following valued components will mitigate effects on the Current Use of Land and Resources for Traditional Purposes:</p> <ul style="list-style-type: none"> <li>▪ Vegetation and Wetland Resources</li> <li>▪ Terrestrial Wildlife and Marine Birds</li> <li>▪ Marine Resources</li> <li>▪ Navigation and Marine Resource Use</li> <li>▪ Freshwater Aquatic Resources</li> <li>▪ Human and Ecological Health</li> <li>▪ Archaeological and Heritage Resources</li> <li>▪ Air Quality</li> <li>▪ Ambient Light</li> <li>▪ Acoustic Environment</li> <li>▪ Visual Quality</li> </ul>
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## 28.2 Summary of Cumulative Effects

The EIS/Application cumulative effects assessment focuses on the incremental effect on VCs that are directly attributable to the proposed Project. The cumulative contribution of other known and announced projects and activities identified in Table 28-3 was considered. Cumulative effects were considered for each VC that resulted in a residual effect. The residual cumulative effects were characterized and evaluated using the same criteria and significance thresholds established for the project-specific effects. Not all residual effects contributed to measurable cumulative effects.

The cumulative effects assessment was conducted on an effect by effect basis, with a two-step process to determine the potential for cumulative effects on each VC. The first step consists of two questions:

- Is there a project residual effect?
- Does the project residual effect overlap spatially and temporally with those of other past, present or reasonably foreseeable future projects?

Where the answers to both of these two questions were affirmative there is potential for the Project to contribute to cumulative effects on a VC and the potential contribution of these project effects to cumulative effects is assessed. The second step consists of one question:

- Is there a reasonable expectation that the contribution (i.e., addition) of the Project’s residual effects would cause a change in cumulative effects that could affect the quality or sustainability of the VC?

Where the answer to this question is affirmative, additional assessment of the potential cumulative effects is described.

A total of 24 past, current, and future projects were considered in the cumulative effects assessment. The projects and their residual effects are summarized in Table 28-3.

**Table 28-3: Residual Cumulative Effects from Past, Present, and Reasonably Foreseeable Future Projects**

Project	Description
District of Port Edward	<ul style="list-style-type: none"> <li>▪ Non point-source air emissions from motor vehicle traffic and heating homes/businesses</li> <li>▪ Loss of approximately 64 ha of terrestrial habitat from municipal developments on mainland</li> </ul>
Ridley Island Projects: <ul style="list-style-type: none"> <li>▪ Canpotex Potash Export Terminal</li> <li>▪ Prince Rupert Grain</li> <li>▪ Prince Rupert LNG Facility</li> <li>▪ Ridley Terminals Inc.</li> <li>▪ Ridley Island Log Sort</li> <li>▪ Westcoast Connector Gas Transmission Project</li> </ul>	<ul style="list-style-type: none"> <li>▪ Air and noise emissions due to shipping traffic and equipment use for loading/unloading vessels</li> <li>▪ Air, noise and light emissions from industrial facilities</li> <li>▪ Depending on the route selected - pipeline construction vessels could interfere with marine navigation (Westcoast Connector) and/or terrestrial habitat could be altered</li> <li>▪ LNG carriers and construction vessels will add to vessel traffic (Prince Rupert LNG)</li> <li>▪ Loss of approximately 48 ha of terrestrial habitat on Ridley Is.</li> <li>▪ Infill of an estimated 35 ha of marine intertidal habitat for “land-bridge” to Kaien Island and overburden disposal</li> <li>▪ Anticipated loss of approximately 175 ha of terrestrial habitat for future developments</li> <li>▪ Pressure on transportation, housing, health and community services infrastructure</li> <li>▪ Changes in visual quality from new developments</li> </ul>

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Project	Description
WatCo Pulp Mill	<ul style="list-style-type: none"> <li>▪ Loss of approximately 48 ha of terrestrial habitat on Watson Is.</li> <li>▪ Infill of an estimated 6 ha of marine and estuarine habitat for “land-bridge” to mainland and pipeline causeways</li> <li>▪ Pressure on transportation, housing, health and community services infrastructure</li> <li>▪ Changes in visual quality</li> </ul>
CN Rail Line	<ul style="list-style-type: none"> <li>▪ Approximately 40 ha of terrestrial habitat loss and an estimated 2 ha of marine infill associated with 25 km of rail in the Prince Rupert and Port Edward area</li> <li>▪ Up to 14 trains (inbound and outbound) per day currently and 34 train per day in the future</li> <li>▪ Air, noise and light emissions due to locomotive operation</li> </ul>
Mount McDonald Wind Power Project	<ul style="list-style-type: none"> <li>▪ Pressure on transportation, housing, health and community services infrastructure</li> <li>▪ Changes in visual quality</li> </ul>
NaiKun Wind Energy Project	<ul style="list-style-type: none"> <li>▪ Light sources at the Project</li> <li>▪ Pressure on transportation, housing, health and community services infrastructure</li> </ul>
Prince Rupert Gas Transmission Project	<ul style="list-style-type: none"> <li>▪ Pipeline construction vessels could interfere with marine navigation</li> <li>▪ Marine habitat could be altered</li> <li>▪ Pressure on transportation, housing, health and community services infrastructure</li> </ul>
City of Prince Rupert	<ul style="list-style-type: none"> <li>▪ Non point-source air emissions from motor vehicle traffic and heating homes/businesses</li> <li>▪ Loss of approximately 900 ha of terrestrial habitat on Kaien Is. from municipal developments (including land portions of marine terminals)</li> <li>▪ Sewage and storm water discharges to Prince Rupert harbour</li> </ul>
Projects in the Prince Rupert Area: <ul style="list-style-type: none"> <li>▪ Atlin Terminal</li> <li>▪ Fairview Container Terminal (Phase I and II)</li> <li>▪ Northland Cruise Terminal</li> <li>▪ Odin Seafood</li> <li>▪ Pinnacle Pellet Inc.</li> <li>▪ Prince Rupert Ferry Terminal</li> <li>▪ Prince Rupert Industrial Park</li> </ul>	<ul style="list-style-type: none"> <li>▪ Air and noise emissions due to shipping traffic and equipment use for loading/unloading vessels</li> <li>▪ Noise emissions from industrial equipment</li> <li>▪ Approximately 13 km of shoreline development including jetties and bank armouring (along Kaien Is. and in Porpoise Harbour)</li> <li>▪ Infill of an estimated 24 ha of marine habitat</li> <li>▪ Approximately 160 ha of terrestrial habitat loss associated with industrial development</li> <li>▪ 457 vessels per year in 2013 and estimates of 1,500 by 2017</li> <li>▪ Pressure on transportation, housing, health, and community services infrastructure</li> <li>▪ Changes in visual quality from new developments</li> </ul>

Project	Description
Kitimat Projects: <ul style="list-style-type: none"> <li>▪ Douglas Channel LNG</li> <li>▪ Enbridge Northern Gateway Project</li> <li>▪ Kitimat LNG Terminal Project</li> <li>▪ LNG Canada Project</li> <li>▪ Rio Tinto Alcan Aluminium Smelter and Modernization Project</li> </ul>	<ul style="list-style-type: none"> <li>▪ Approximately 1,000 vessels per year will call at Triple Island for piloting</li> <li>▪ Underwater noise emissions from vessels near Triple Island</li> <li>▪ Pressure on transportation infrastructure</li> <li>▪ Changes in visual quality</li> </ul>
Combined Residual Environmental Effects	<ul style="list-style-type: none"> <li>▪ Air, noise, and light emissions</li> <li>▪ 13 km of shoreline development</li> <li>▪ Sewer and storm water discharges</li> <li>▪ 1,450 ha of terrestrial habitat loss</li> <li>▪ 67 ha of marine infill</li> <li>▪ 2,000 vessels per year in Prince Rupert harbour</li> <li>▪ Approximately 3,000 vessels per year will call for piloting at Triple Island</li> <li>▪ Pressure on transportation, housing, health and community services infrastructure</li> <li>▪ Changes in visual quality</li> </ul>

A summary of the cumulative effects that are predicted to occur are provided below. A more detailed discussion of the cumulative effects is provided in each VC Section. In all cases, the cumulative effects are predicted to be not significant.

### Air Quality

Cumulative effects on air quality include emissions of criteria air contaminants (CACs) from existing and industrial sources and reasonably foreseeable future projects in combination with the project emissions. The application case (baseline case + Project case) dispersion modelling results indicate that project residual effects do not substantially overlap the regional source effects. The cumulative effects case dispersion modelling results indicate that the overlap of effects from reasonably foreseeable future projects in the assessment area do have an effect near the project site, but the cumulative effect is not significant.

Maximum predicted concentrations for SO<sub>2</sub>, NO<sub>2</sub>, CO, PM<sub>10</sub> and PM<sub>2.5</sub> generally increase, but only incrementally when compared to existing conditions. The objective for 1-hour NO<sub>2</sub> is exceeded at two locations in the modelling domain. These exceedances occur west of Prince Rupert on the east side of Digby Island and are about 2.3 km apart. A time series analysis shows that the exceedances only occur at different times during one hour of the three-year period. Further analysis shows that areal extent of the exceedance is localized.

Additionally, most of the contributions for those events originate from existing regional sources and are located far from the project site. Therefore, the cumulative effects on air quality are not significant.

### **Acoustic Environment**

Project activities will result in residual effects on noise. However, the noise effect from projects located outside the RAA is not expected to add cumulatively with residual effects from the Project because the geographical extent for project-related noise residual effects is mostly limited to the LAA. Noise is expected to attenuate to levels well below the background level within 5 km of their source.

The past, present, and reasonably foreseeable projects and activities in the RAA, in combination with the residual environmental effects of the Project on the acoustic environment will not overlap in such a way as to exceed regulatory thresholds on a persistent basis. The reasonably foreseeable projects and activities in the RAA, in combination with the project residual noise effects, are expected to meet the regulatory guidelines. Cumulative effects have therefore been rated as not significant.

### **Ambient Light**

There is potential for the Project to contribute to increased spillover light in the RAA cumulatively with other light sources. However, with the proposed mitigation and adherence to specific design standards, the cumulative effects of additional light from the Project are not expected to be substantial. Provided that other industries subscribe to the energy efficient and reduced lighting design guidelines, the effect of growing industrialization of Lelu and Ridley islands are anticipated to produce effects on ambient light that are not significant on a cumulative basis.

### **Vegetation and Wetland Resources**

Project effects on vegetation and wetland resources will result in residual effects due to the loss of traditional use plants within the PDA and the loss of ecological communities of management concern (ecological communities at risk and old forest). These residual effects have the potential to act cumulatively with other past, present, and reasonably foreseeable projects and activities in the region. However, these losses represent very small proportions of the ecological communities within the RAA.

Overall, the Project would affect less than 1% of the total area of ecological communities at risk and/or old forest within the RAA, while regional ecosystem based planning objectives have set management targets allowing for a loss of these community types at 30% and 40% respectively. Neither the project-specific residual effects, nor the Project's residual effects acting cumulatively with other projects would threaten the regional sustainability of the vegetation and wetland resources identified in this assessment.

Consequently, the cumulative effects on vegetation and wetland resources is considered to be not significant.

### **Terrestrial Wildlife and Marine Birds**

The Project will result in residual effects on terrestrial wildlife and marine birds. The Project's contribution to cumulative effects on habitat availability, mortality, and alteration of movement on terrestrial wildlife and marine birds will be local and affect a small portion of the regional population. Past, current and reasonably foreseeable future projects in the area have similar effects on wildlife and will act cumulatively with these residual project effects.

The current population status of species (Special Concern, Threatened, or Endangered) is a measure of the past cumulative effects of development on terrestrial wildlife and marine birds. The approach to the assessment of project effects on wildlife is inherently cumulative in nature because of its focus on the sustainability of populations of species at risk. Past and present projects and activities have contributed to the loss or alteration of 1,944 ha of habitat in the RAA, and have contributed to change in mortality and movement of terrestrial wildlife and marine birds. The Project will result in the removal of 261 ha of terrestrial and marine habitat, which will be offset through wetland habitat compensation and fish habitat offsetting. Through compliance with applicable federal and provincial regulations and through the implementation of mitigation measures, the residual effect of the Project on change in mortality and movement is expected to be low in magnitude. It is therefore not likely that cumulative effects on local or regional wildlife populations and marine bird populations in the RAA will influence the long-term sustainability of these populations. The cumulative effects are therefore determined to be not significant.

### **Freshwater Aquatic Resources**

The Project is not expected to result in a net loss of the productive capacity of freshwater fish habitat, a loss of nutrient contribution, or fish mortality. Therefore, the Project will not result in direct cumulative effects on freshwater aquatic resources. Only two watercourses on Lelu Island were identified as potential fish streams. Habitat quality in these watercourses is rated as marginal. It is highly unlikely that these watercourses support any resident or anadromous fish species. The cumulative effects on freshwater aquatic resources are predicted to be not significant.

### **Marine Resources**

Project activities will result in residual effects on the marine environment. In-water construction activities will result in the loss or alteration of marine fish habitats and the injury or mortality of sedentary marine organisms within the PDA. Underwater sounds produced during construction and operations may result in local avoidance of some areas by fish and marine mammals. These project-specific effects will act cumulatively with similar effects of other projects and activities in the Prince Rupert Harbour.

Within the Prince Rupert Harbour, the shorelines of Kaien and Ridley Islands have been affected by coastal development, including jetty construction and shoreline armouring. This development has led to the loss of marine habitat. These areas of habitat loss represent only a small fraction of the total available marine fish habitat within the Prince Rupert Harbour, and an even smaller fraction of available habitat in the RAA. Given the limited amount of regional development and the abundance of undisturbed marine fish habitats, cumulative effects of past, current and future projects on the marine environment are not expected to affect any population of fish, invertebrate or marine mammal at the regional level.

A substantial volume of marine sediment will be dredged for the Project and is proposed to be disposed of at the Brown Passage disposal site. Dredging and disposal of marine sediments will result in residual effects on sediment and water quality (e.g., increase total suspended solids in the water column) and can act cumulatively with other projects that undertake dredging and disposal at that site. Dredging activities will comply with water quality guidelines for the protection of marine life. Dredged materials must be tested for contamination and disposed at approved sites under

appropriate permits. Brown Passage is a designated disposal at sea site proposed for project use according to Environment Canada requirements for disposal at sea.

Under the *Fisheries Act*, marine fish habitats permanently affected by current and future developments will be offset with the creation new habitats so there is not net loss of the productive capacity of fish habitat supporting commercial, recreational or Aboriginal fisheries. Localized losses of sedentary marine organisms will be temporary, as most affected species are abundant in adjacent unaffected areas, and are expected to quickly recolonize the disturbed habitats. Sensory disturbance resulting from anthropogenic underwater sounds will also be site-specific and temporary, as marine animals are expected to return to ensonified areas following the cessation of acoustic disturbance. The Project will not compromise populations of marine species; therefore cumulative effects on marine resources are predicted to be not significant.

### **Economic Environment**

The construction and operation of the Project will provide benefits for the regional economy. It is anticipated that project construction will involve as many as 50 workers who have experience in the construction industry. With participation in appropriate training programs, another 150 regional residents who would be otherwise unemployed, or are entering the job market, could be directly employed on the Project. An additional 140 indirect and induced jobs are also expected to be created. During operation, about 260 of the 334 people directly employed to operate the Project are expected to be residents from the region, as will be 140 of the 186 workers working under contract. The other 74 workers and 46 contract workers are expected to relocate to the area and will contribute to regional economy. An additional 280 indirect and induced jobs are also expected to be created during operations. As a result, incomes and earnings are expected to rise, levels of educational attainment will increase, and there will be some growth and increased diversity of the regional economy.

Upon project decommissioning, the resulting loss of jobs will have adverse effects on employment income and economic diversity; however the improved educational attainment and employment experience created by the Project, in combination with the development of project closure strategy, is anticipated to result in residual effects that are not significant.

For municipal government finances, residual effects could be positive or neutral during construction and operation, depending on the demands that project workers may have on municipal infrastructure and services and the revenues received by municipal governments directly or indirectly from PNW LNG and/or its employees. By ongoing consultation with municipal governments PNW LNG will monitor potential adverse effects on municipal government finances until such time as the Project is decommissioned.

The cumulative adverse effects on the economic environment are predicted to be not significant.

### **Navigation and Marine Resource Use**

The PRPA plans to increase shipping to 2,000 ships (4,000 movements) by 2025. Given the current volume in the Port of Prince Rupert of well under a 1,000 ships annually, there is tremendous capacity to increase the volume of traffic within areas under the jurisdiction of the PRPA. All shipping traffic into both the Prince Rupert Harbour and Kitimat will follow shipping lanes around Triple Island

which has the potential to cause congestion. At the Triple Island boarding station, a licensed pilot will board each large commercial vessel desiring to enter the area. This is also where incoming and outgoing carriers on the proposed route will interact with Prince Rupert Marine Communications and Traffic Services (MCTS). The use of certified pilots and established communication and traffic procedures should reduce any potential impacts related to congestion.

All of the projects within the jurisdiction of PRPA will be subject to all operating procedures and practices that cover such topics as: control of movements, speed, entry into narrow channels, communication, pilotage, and berthing.

Overlap between the Project and other facilities generating vessel traffic within the RAA is expected to be manageable based on current and planned levels, and the separation distances between the Project and other local projects. The cumulative effects, will not affect the safety and efficiency of navigation and marine resource use within the RAA

The cumulative effects on navigation and marine resource use are predicted to be not significant.

### **Infrastructure and Services**

Cumulative effects currently influence access to, quality, and use of infrastructure and services in Port Edward and Prince Rupert. Baseline conditions identified highlight current levels of demand, illustrate the resiliency of numerous services and infrastructure to fluctuations in demand, and note needed areas of improvement and maintenance. The degree to which past and present effects have influenced the delivery and access to infrastructure and services has not exceeded a limit whereby added demand displaces public use or access. Considering project-related residual effects and reasonably foreseeable future project effects, cumulative effects on infrastructure and services are expected to be manageable and are therefore are predicted to be not significant.

### **Community Health and Well Being**

Cumulative effects currently influence quality of community health and well-being in Prince Rupert and Port Edward. Considering project-related residual effects and reasonably foreseeable future project effects, cumulative effects on health infrastructure and services are not expected to affect the sustainability of the VC. Overall, the degree to which past and present effects will influence employment and procurement opportunities will be positive. The degree to which past and present effects will effect peoples' recreational opportunities are unknown but with an expanded municipal tax base and with applied mitigation measures any effects are expected to be manageable.

Assuming that other projects in the RAA will have similar mitigation measures, the implementation of mitigations by PNW LNG in conjunction with other projects in the RAA will increase demand for health infrastructure and services. Demand for labour, health infrastructure and services and housing will be greatest during project construction phases. Demand will cumulatively increase if construction phases of spatially overlapping projects occur at the same time as that of the Project. The cumulative effects on community health and well-being are predicted to be not significant.

### **Human and Ecological Health**

The cumulative effects to air emissions are well below health-based ambient air quality objectives and subsequent potential for human and ecological health effects is not significant.

The cumulative effects to sediment and marine country foods from dredging could change the physical dynamics of sediment distribution but the concentration of dioxin and furans contained in the sediment would be similar or lower in concentration than baseline levels. Subsequent potential for human and ecological health effects is not significant.

### **Archaeological and Heritage Resources**

Over 430 CMTs have been identified on Lelu Island. Many are within the 30 m mature vegetation buffer that will be retained around the island; however, those within the PDA will be removed. Prior to the removal of any CMT, it will be systematically recorded. As a result of this mitigation measure, there will be no significant loss of archaeological or heritage resources and therefore no residual effects. Though other projects may have affected this resource in the past, the lack of residual effects associated with the current Project means there is no potential for cumulative effects.

### **Current Use of Lands and Resources for Traditional Purposes**

The Project will result in residual environmental effects on the Current Use of Land and Resources for Traditional Purposes VC. Cumulative effects for the VCs related to harvested species, traditional use locations, access routes, and marine harvesting areas, and the experience of using lands and resources for traditional purposes are not anticipated to be significant. This suggests that the contribution of the Project's residual effects are unlikely to cause a change in cumulative environmental effects that could affect the viability or sustainability of traditional use by Aboriginal people of lands and resources within the RAA. Cumulative effects are therefore expected to be not significant.

## **28.3 Summary of Comments from the Public**

Stakeholders and the public have identified general areas of concern and interest throughout the course of public engagement about the Project. Table 28-4 provides an overview of the issues identified through public engagement completed prior to submission of the EIS/Application and lists the measures proposed to address these concerns.

The key issues raised by key stakeholders and the public have been addressed through the proposed mitigation measures listed in Table 28-2 and Table 28-4. PNW LNG plans ongoing stakeholder and public consultation throughout project planning and development to continue to address concerns about the Project.

Outstanding issues from public consultation and additional information on consultation activities planned after submission of the EIS/Application is provided in Appendix B. This includes planned consultation with the public and government agencies. PNW LNG will continue to work with the public, stakeholders, and the government to resolve issues and ensure greater involvement from all members of the community. Outreach activities will focus on providing factual information about the Project, seeking feedback about potential concerns, and ensuring individuals and businesses are aware of employment and contracting opportunities associated with construction and operations of the Project and how to prepare for them.



**Table 28-4: Summary of Issues Identified through Public and Stakeholder Consultation**

Issue	Measures to Address Public Concerns
<b>Consultation</b>	
<ul style="list-style-type: none"> <li>▪ Access to project team</li> <li>▪ Need for ongoing communication with communities</li> <li>▪ Dedicated contacts for vendors/area small businesses</li> </ul>	<p><i>PNW LNG completed the following prior to submission of the EIS/Application:</i></p> <ul style="list-style-type: none"> <li>▪ PNW LNG provided project updates on a regular basis to stakeholders.</li> <li>▪ PNW LNG has established a storefront office in Prince Rupert with full-time staff and a working office in Port Edward. The purpose of the offices is to create local touch points for the community where they can discuss various aspects of the Project and have their questions answered, or for community outreach.</li> </ul> <p><i>The following measures listed below were developed as part of the EIS/Application:</i></p> <p>Economic Environment (Section 14)</p> <ul style="list-style-type: none"> <li>▪ Work with training and educational facilities so that programs necessary to prepare regional residents for work on the Project are available</li> <li>▪ Develop career pathways that would allow local construction workers with the skills necessary to transition into operational employment</li> <li>▪ Facilitate hiring and employment opportunities for RAA residents by posting qualifications and skill requirements in advance of construction and operation</li> <li>▪ Work with EPCC contractors to remove barriers to employment for RAA residents, including literacy and Grade 12 training, childcare, occupational training and support for Aboriginal workers from local First Nations</li> <li>▪ Identify work packages that would be consistent with the capabilities of local and regional businesses to maximize local procurement opportunities</li> <li>▪ Work with First Nations to identify partnership or other arrangements that would increase the opportunities for their participation.</li> </ul> <p>Community Health and Well Being (Section 18)</p> <ul style="list-style-type: none"> <li>▪ Training, employment and business opportunities will be provided to community members.</li> <li>▪ Contractor information sessions will be provided for local businesses on how to secure project work.</li> </ul>

Issue	Measures to Address Public Concerns
<b>Socio-economic Impacts</b>	
<ul style="list-style-type: none"> <li>▪ Impacts to community infrastructure</li> <li>▪ Potential increase in population</li> <li>▪ Inability of services to keep pace with rate of growth</li> <li>▪ Temporary construction camp</li> </ul>	<p><i>PNW LNG completed the following prior to submission of the EIS/Application:</i></p> <ul style="list-style-type: none"> <li>▪ Attention will be paid to communicating and being responsive to concerns about the construction camp including the appointment of a community camp liaison and ongoing information about procurement and job opportunities.</li> <li>▪ PNW LNG will continue to track and report on community interests and concerns.</li> </ul> <p><i>The following measures were developed as part of the EIS/Application:</i></p> <p>Economic Environment (Section 14)</p> <ul style="list-style-type: none"> <li>▪ Consultations with municipal governments will continue to monitor whether the Project is creating issues, in terms of effects on municipal finances or demands for infrastructure or services.</li> </ul> <p>Infrastructure and Services (Section 16)</p> <ul style="list-style-type: none"> <li>▪ An accommodation plan will be implemented to:</li> <li>▪ Establish communication with city and district planners in Port Edward and Prince Rupert as a means of responding to potential community grievances and changes in demand for housing infrastructure.</li> <li>▪ Provide housing policies for non-local temporary workers of whom are not housed in the construction camp on Lelu Island; policies will outline preferred accommodations and require workers be housed in both Port Edward and Prince Rupert when not in housed in the construction camp to lower the demand in a single community.</li> <li>▪ Outline camp management policies and practices.</li> <li>▪ A community crime prevention initiative between RCMP and PNW LNG will be implemented through the Transportation Management Plan and Accommodation Plan. The initiative will encourage PNW LNG and RCMP to collaborate and communicate project updates and activities that could influence community safety. The initiative will additionally help facilitate an understanding of project-related traffic concerns.</li> <li>▪ A PNW LNG Project community engagement plan that will assist communities in planning for an influx of workers. The plan will include initiatives to address potential effects and will facilitate communication with the community and provide a framework from which to respond to community grievances. The plan will also provide details on how best to maximize economic opportunities related to the Project.</li> <li>▪ An emergency response plan will be established and implemented with BC OGC, PRFR, PEFD, PRPA, and the RCMP including mandatory LNG specific emergency response training (EMS and firefighting).</li> <li>▪ Mandatory awareness programs for employees will be implemented regarding fire suppression systems installed onsite, with key employees trained in fire suppression according to legislation requirements.</li> <li>▪ Recreational facilities will be provided at the construction camp to reduce demand on infrastructure and services.</li> <li>▪ Waste management, disposal, and recycling programs will be implemented.</li> </ul>

Issue	Measures to Address Public Concerns
<b>Marine Navigation</b>	
<ul style="list-style-type: none"> <li>▪ Impact of jetty trestle/marine terminal</li> <li>▪ Location of jetty trestle/marine terminal</li> <li>▪ Height of Lelu Island bridge</li> <li>▪ Location of Lelu Island bridge</li> </ul>	<p><i>PNW LNG completed the following prior to submission of the EIS/Application:</i></p> <ul style="list-style-type: none"> <li>▪ Acknowledged concerns.</li> <li>▪ Marine Workshop was organized for November 18, 2013 where marine users were invited to a community roundtable discussion. The Project has initiated design changes originally submitted in the project description. Both the Lelu Slough Bridge and the jetty trestle will be engineered to permit boats as tall as a gillnetter to pass safely underneath, tides permitting.</li> <li>▪ An assessment of potential effects on navigation and marine resource use is included in the EIS/Application (Section 15).</li> </ul> <p><i>The following measures were developed as part of the EIS/Application:</i></p> <p>Navigation and Marine Resource Use (Section 15)</p> <ul style="list-style-type: none"> <li>▪ Sufficient clearance will be provided beneath the Lelu Island bridge and the trestle spans that best supports navigation to and from Porpoise Channel over Flora Bank.</li> </ul>
<b>Environmental Effects</b>	
<ul style="list-style-type: none"> <li>▪ Flora Bank</li> <li>▪ Impacts on marine life</li> <li>▪ Protection of the marine environment</li> <li>▪ Cumulative impacts</li> <li>▪ Air and any water emissions</li> <li>▪ Waste management</li> </ul>	<p><i>PNW LNG completed the following prior to submission of the EIS/Application:</i></p> <ul style="list-style-type: none"> <li>▪ PNW LNG provided a project update presentation and responded to questions about how much space will be used on Lelu Island.</li> <li>▪ Acknowledged concerns.</li> <li>▪ Discussed potential muskeg disposal site.</li> <li>▪ PNW LNG is committed to returning to discuss how the concerns will be dealt with.</li> </ul> <p><i>The following measures were developed as part of the EIS/Application:</i></p> <ul style="list-style-type: none"> <li>▪ See complete list of mitigation measures in Table 28-2.</li> </ul>

Issue	Measures to Address Public Concerns
<b>Economic Benefits</b>	
<ul style="list-style-type: none"> <li>▪ LNG tax</li> <li>▪ Property tax</li> <li>▪ Labour/jobs</li> <li>▪ Pipeline taxation</li> <li>▪ Job opportunities</li> <li>▪ Contracting opportunities</li> <li>▪ Information for service providers</li> </ul>	<p><i>PNW LNG completed the following prior to submission of the EIS/Application:</i></p> <ul style="list-style-type: none"> <li>▪ Acknowledged concerns.</li> <li>▪ Effects of the Project on the economy, labour and employment are assessed in this EIS/Application.</li> <li>▪ PNW LNG met with the District of Port Edward and City of Prince Rupert to discuss potential effect on infrastructure and services.</li> <li>▪ An assessment of potential effects on the economic environment is included in the EIS/Application (Section 14).</li> </ul> <p><i>The following measures were developed as part of the EIS/Application:</i></p> <p>Economic Environment (Section 14)</p> <ul style="list-style-type: none"> <li>▪ Enhance employment and procurement opportunities for regional residents, monitoring, and reporting on the success of these initiatives.</li> <li>▪ Work with training and educational facilities so that programs necessary to prepare regional residents for work on the Project are available</li> <li>▪ Develop career pathways that would allow local construction workers with the skills necessary to transition into operational employment</li> <li>▪ Facilitate hiring and employment opportunities for RAA residents by posting qualifications and skill requirements in advance of construction and operation</li> <li>▪ Work with EPCC contractors to remove barriers to employment for RAA residents, including literacy and Grade 12 training, childcare, occupational training and support for Aboriginal workers from local First Nations</li> <li>▪ Identify work packages that would be consistent with the capabilities of local and regional businesses to maximize local procurement opportunities</li> <li>▪ Work with First Nations to identify partnership or other arrangements that would increase the opportunities for their participation.</li> <li>▪ Develop a project closure strategy that would reduce the adverse effects that project closure would have upon regional workers</li> <li>▪ Consultations with municipal governments will continue to monitor whether the Project is creating issues, in terms of effects on municipal finances or demands for infrastructure or services.</li> <li>▪ Develop a community investment program</li> </ul>

Issue	Measures to Address Public Concerns
<b>Regulatory</b>	
<ul style="list-style-type: none"> <li>▪ Environmental assessment</li> <li>▪ Availability of scientific studies</li> <li>▪ Access to regulatory agency</li> <li>▪ Prince Rupert Port Authority</li> <li>▪ Cumulative effects</li> </ul>	<p><i>PNW LNG completed the following prior to submission of the EIS/Application:</i></p> <ul style="list-style-type: none"> <li>▪ Acknowledged concerns.</li> <li>▪ PNW LNG has conducted extensive scientific studies to support this EIS/Application.</li> <li>▪ Representative from regulatory agency will be available at open houses throughout the assessment process. Input to the regulatory agencies can also be made through the BC EAO website.</li> <li>▪ PNW LNG has worked closely with the PRPA throughout the assessment process.</li> <li>▪ Cumulative effects of the Project are assessed in EIS/Application</li> </ul>
<b>LNG Industry</b>	
<ul style="list-style-type: none"> <li>▪ The composition of LNG</li> <li>▪ LNG safety</li> <li>▪ Price of LNG</li> <li>▪ Domestic use of natural gas</li> </ul>	<p><i>PNW LNG completed the following prior to submission of the EIS/Application:</i></p> <ul style="list-style-type: none"> <li>▪ Acknowledged concerns.</li> <li>▪ The composition of feed gas and processed LNG is described in this EIS/Application.</li> <li>▪ Potential environmental effects from accidents and malfunctions are assessed in Section 22.</li> </ul> <p><i>The following measures were developed as part of the EIS/Application:</i></p> <p>Infrastructure and Services (Section 14)</p> <ul style="list-style-type: none"> <li>▪ An emergency response plan will be established and implemented with BC OGC, PRFR, PEFD, PRPA, and the RCMP including mandatory LNG specific emergency response training (EMS and firefighting).</li> <li>▪ Mandatory awareness programs for employees will be implemented regarding fire suppression systems installed onsite, with key employees trained in fire suppression according to legislation requirements.</li> </ul>

Issue	Measures to Address Public Concerns
<b>Facility Design and Operations</b>	
<ul style="list-style-type: none"> <li>▪ Power supply</li> <li>▪ Flaring</li> <li>▪ Facility safety</li> <li>▪ Odour</li> <li>▪ Noise</li> <li>▪ Decommissioning</li> <li>▪ Location</li> </ul>	<p><i>PNW LNG completed the following prior to submission of the EIS/Application:</i></p> <ul style="list-style-type: none"> <li>▪ Acknowledged concerns.</li> <li>▪ Clarified that the facility will only flare under upset conditions.</li> <li>▪ Clarified odour will not be an issue due to low sulfur concentrations in FEED gas.</li> <li>▪ Initiated design changes to reduce potential effects of flaring and noise.</li> <li>▪ Potential effects of decommissioning are assessed in this EIS/Application.</li> </ul> <p><i>The following measures were developed as part of the EIS/Application:</i></p> <p>Alternative Means of Carrying Out the Project (Section 2.4)</p> <ul style="list-style-type: none"> <li>▪ The EIS/Application includes an assessment of power supply alternatives</li> <li>▪ The EIS/Application includes an assessment of alternative project locations</li> </ul> <p>Accidents and Malfunction (Section 22)</p> <ul style="list-style-type: none"> <li>▪ The EIS/Application includes an assessment of facility safety</li> </ul>

Issue	Measures to Address Public Concerns
<b>LNG Carriers</b>	
<ul style="list-style-type: none"> <li>▪ Size of carriers</li> <li>▪ Number of ships per year</li> <li>▪ Shipping lanes</li> <li>▪ Exclusion zones around carriers</li> </ul>	<p><i>PNW LNG completed the following prior to submission of the EIS/Application:</i></p> <ul style="list-style-type: none"> <li>▪ Acknowledged concerns.</li> <li>▪ Potential effects of shipping on the navigation, access to marine areas, and the environment are assessed in this EIS/Application.</li> <li>▪ The trestle and bridge have been designed to reduce effects of possible exclusion zones, and on marine traffic.</li> <li>▪ Addressed in EIS/Application (Section 15).</li> </ul> <p><i>The following measures were developed as part of the EIS/Application:</i></p> <p>Navigation and Marine Resource Use (Section 15)</p> <ul style="list-style-type: none"> <li>▪ A Marine Communications Plan will be implemented, which identifies measures so that all marine traffic is made aware of any project construction activities and that details the local marine communications and project-related safety procedures.</li> <li>▪ Safety zones will be established during construction that specify “no go” areas.</li> <li>▪ Lighting will be designed to reduce stray lighting.</li> <li>▪ Navigational aids will be installed on structures where required to enhance navigation safety.</li> <li>▪ Navigational charts will be updated to show the MOF and trestle and berth locations.</li> <li>▪ Sufficient clearance (11m above HHW) for gillnetters will be provided beneath the Lelu Island bridge and the trestle spans that best supports navigation to and from Porpoise Channel over Flora Bank.</li> <li>▪ Escort vessels will be used to confirm the route is clear and safe and that other vessels do not intrude safety zones.</li> <li>▪ Tugs will be used for the safe transit and docking of LNG carriers.</li> <li>▪ Traffic management and routing options will be assessed to help small craft know which route a carrier will follow, if deemed necessary by the port and pilots based on analysis of TERMPOL studies.</li> <li>▪ Limits on environmental conditions under which operations can be conducted safely (visibility, day-time operations, wind) will be set consistent with results from the TERMPOL studies, consultation with pilots, and LNG terminal practices throughout the industry.</li> </ul>

## **28.4 Aboriginal Rights and Related Interests**

PNW LNG has engaged in consultation with the five Aboriginal groups listed in the CEA Agency's EIS Guidelines and in Schedule B of the BC EAO's Section 11 Order:

- Metlakatla First Nation
- Lax Kw'alaams Band
- Gitxaala Nation
- Kitselas First Nation
- Kitsumkalum First Nation

Key issues raised by Aboriginal groups during the consultation process, the responses of PNW LNG, and any outstanding issues are summarized in Section 3 (Summary of Engagement), Section 27.1.3 (Summary of Engagement Activities), and Table 28-5. Detailed information is provided in the Aboriginal Consultation Report (Appendix A).



**Table 28-5: Summary of First Nations Issues and Concerns and PNW LNG’s Response**

Issue	PNW LNG Response and Action Items
<b>Common Issues Raised by all First Nations</b>	
<p>The sufficiency of the environmental assessment process to discharge the duty to consult</p>	<ul style="list-style-type: none"> <li>▪ The environmental assessment process will address the concerns of potentially affected First Nations. First Nations have the ability to raise concerns through the Working Group. First Nations have also expressed concerns to PNW LNG and PNW LNG has incorporated those concerns into the EIS/Application.</li> <li>▪ If the Crown concludes that the environmental assessment process is unable to fully discharge the duty to consult, PNW LNG will continue consultation as directed through the permitting process.</li> <li>▪ PNW LNG is continuing its effort to negotiate Impact Benefit Agreements with Metlakatla, Lax Kw’alaams, Kitsumkalum, Kitselas and Gitxaala First Nation. PNW LNG believes that the process can address any potential residual impacts if such impacts are not addressed through the EA or permitting processes.</li> <li>▪ In response to criticisms of the timelines for the environmental assessment process, PNW LNG has noted that it is following timelines mandated by federal and provincial statutes. PNW LNG has also attempted to engage First Nations in longer-term monitoring studies regarding impacts to the marine environment and Skeena Estuary outside of the environmental assessment process including substantive, comprehensive and enduring fish habitat enhancement and restoration projects that will be monitored and adapted for efficacy.</li> <li>▪ PNW LNG is undertaking procedural aspects of the duty to consult as delegated by BC through the environmental assessment process and is consulting with First Nations under the direction of the CEA Agency and the PRPA.</li> </ul>
<p>The adequacy of the strength of claim assessments provided by Transport Canada and British Columbia and the Methods used to identify First Nations interests</p>	<ul style="list-style-type: none"> <li>▪ PNW LNG takes no position on the relative strength of claims to Aboriginal rights and title in the vicinity of the Project and will continue to be directed by the Crown in discharging the procedural aspects of the duty to consult that have been delegated to it.</li> <li>▪ In response to criticism that neither PNW LNG nor the Working Group is able to adequately identify potential impacts to First Nations’ interests, PNW LNG has made offers of funding to each First Nation to complete Traditional Use Studies.</li> <li>▪ PNW LNG, at its expense and independent of any regulatory requirement, has also engaged an expert to review publicly available information, and the information provided by First Nations, regarding First Nations interests in Lelu Island and its vicinity.</li> <li>▪ PNW LNG continues to welcome any information provided by First Nations regarding the Project’s potential impacts to their interests and will review and respond to all information provided by First Nations.</li> </ul>

Issue	PNW LNG Response and Action Items
<b>Common Issues Raised by all First Nations</b>	
<p>The adequacy of PNW LNG's consultation with First Nations</p>	<ul style="list-style-type: none"> <li>▪ PNW LNG has been attempting to consult with all five First Nations since the fall of 2012. Since that time, PNW LNG has invited First Nations to participate in studies and review the findings of these studies. PNW LNG has invited First Nations to open houses and offered to hold open houses in First Nations communities. PNW LNG has initiated correspondence with First Nations in hopes to engage them more fully in consultation. PNW LNG has diligently attempted to respond to every comment and issue raised by First Nations.</li> <li>▪ PNW LNG is committed to ensuring that the Project's potential impacts to the interests of all First Nations people living within their asserted territories are considered in the environmental assessment process. Wording in the draft Application Information Requirements has been revised to reflect this consideration.</li> <li>▪ PNW LNG has entered into an Environmental Assessment Agreement with Metlakatla that provides capacity funding for the environmental assessment process. Under this agreement a number of activities are currently being conducted. These include an alternate Disposal At Sea analyses, a Traditional Use Study, and a "community-specific" Socio-Economic Impact Assessment.</li> <li>▪ On January 24, 2013, PNW LNG sent letters to Lax Kw'alaams, Gitxaala, Kitselas and Kitsumkalum to engage those First Nations in the environmental assessment process. Those letters promised each First Nation \$40,000 in capacity funding and it has since been provided.</li> <li>▪ PNW LNG has agreed to provide capacity funding to First Nations under Environmental Assessment Agreements, or interim capacity funding in the absence of Environmental Assessment Agreements, in excess of the monies already provided for capacity funding under the letter of January 24, 2013.</li> <li>▪ On July 29, 2013, PNW LNG wrote to Lax Kw'alaams, Kitselas, Kitsumkalum and Gitxaala with separate proposals for those First Nations to conduct Traditional Use Studies.</li> </ul>

Issue	PNW LNG Response and Action Items
<b>Metlakatla First Nation</b>	
<p>Metlakatla has stated that only Lax Kw'alaams and Metlakatla have legitimate claims to Aboriginal rights and title on Lelu Island.</p>	<ul style="list-style-type: none"> <li>▪ PNW LNG takes no position on the strength of asserted claims and is undertaking procedural aspects of consultation as directed by the BC EAO.</li> </ul>
<p>Expressed doubts about the Working Group's ability to identify and assess impacts to First Nations' interests.</p>	<ul style="list-style-type: none"> <li>▪ PNW LNG believes that the Working Group provides a viable forum for First Nations to raise concerns. PNW LNG has agreed to fund a Traditional Use Study for Metlakatla so that it can better identify which of its Aboriginal interests may be potentially affected by the Project.</li> </ul>
<p>First Nations should be able to comment on all studies and work plans, for the environmental assessment process and should be able to vet PNW LNG's consultation record.</p>	<ul style="list-style-type: none"> <li>▪ PNW LNG believes that the requirement that First Nations be able to comment on all studies and work plans and vet the consultation record is in excess of legal requirements. However, PNW LNG is committed to sharing studies with First Nations wherever possible and as soon as possible. PNW LNG has entered into an Environmental Assessment Agreement with Metlakatla that provides a work plan for Metlakatla participation in the environmental assessment process and provided Metlakatla with a copy of its consultation record prior to submitting the EIS/Application. Metlakatla provided comments on that record and PNW LNG revised the record to reflect those comments.</li> </ul>
<p>The environmental assessment's timeline and the capacity funding provided are insufficient to adequately discharge the duty to consult.</p>	<ul style="list-style-type: none"> <li>▪ PNW LNG is following the timelines mandated by the respective federal and provincial statutes for the Environmental assessment process.</li> <li>▪ PNW LNG has entered into an Environmental Assessment Agreement with Metlakatla that provides capacity funding for the environmental assessment process. Under this agreement a number of activities are currently being conducted. These include an alternate Disposal At Sea analyses, a Traditional Use Study, and a "community-specific" Socio-Economic Impact Assessment.</li> </ul>
<b>Lax Kw'alaams First Nation</b>	
<p>Lax Kw'alaams has specifically noted that only Metlakatla and Lax Kw'alaams can claim Aboriginal rights and title to Lelu Island and that the range of rights identified by the Transport Canada assessment is incorrect.</p>	<ul style="list-style-type: none"> <li>▪ PNW LNG takes no position on the strength of asserted claims and is undertaking procedural aspects of consultation as directed by the BC EAO.</li> <li>▪ PNW LNG, at its expense and independent of any regulatory requirement, has also engaged an expert to review publicly available information, and the information provided by First Nations, regarding First Nations interests in Lelu Island and its vicinity.</li> <li>▪ PNW LNG continues to welcome any information provided by First Nations regarding the Project's potential impacts to their interests and will review and respond to all information provided by First Nations.</li> </ul>

Issue	PNW LNG Response and Action Items
<p><b>Lax Kw'alaams First Nation</b></p> <p>Lax Kw'alaams has also noted the need to address the economic component of Aboriginal title.</p>	<ul style="list-style-type: none"> <li>▪ PNW LNG continues to welcome any information provided by First Nations regarding the Project's potential impacts to their interests and will review and respond to all information provided by First Nations.</li> <li>▪ PNW LNG continues negotiations with Lax Kw'alaams and believes that an Impact Benefit Agreement can address any potential impacts on the economic component of Lax Kw'alaams' asserted Aboriginal title.</li> </ul>
<p>Concerns about the sufficiency of PNW LNG's consultation for the Project and specifically with respect to archaeological inventories, impact assessments and land and marine geotechnical investigations conducted in the spring, summer and fall of 2013</p>	<ul style="list-style-type: none"> <li>▪ PNW LNG been attempting to consult with all Lax Kw'alaams since the fall of 2012. Since that time, PNW LNG has invited First Nations to participate in studies and review the findings of these studies. PNW LNG has invited First Nations to open houses and offered to hold open houses in First Nations communities. PNW LNG has initiated correspondence with First Nations in hopes to engage them more fully in consultation. PNW LNG has diligently attempted to respond to every comment and issue raised by First Nations.</li> <li>▪ PNW LNG is committed to ensuring that the Project's potential impacts to the interests of all First Nations people living within their asserted territories are considered in the environmental assessment process. Wording in the draft Application Information Requirements has been revised to reflect this consideration.</li> <li>▪ PNW LNG believes that all of its archaeological studies have been carried out to the professional standards required of archaeologists practicing in BC. It also notes that extensive consultation was conducted regarding geotechnical investigations completed in 2013 and undertook additional studies and mitigations measures in response to Lax Kw'alaams' concerns. Both the PRPA and the DFO have concluded that those geotechnical investigations would not result in adverse impacts to Lax Kw'alaams' Aboriginal Interests.</li> </ul>
<p>Timelines for the environmental assessment and the capacity funding provided to date are insufficient to discharge the duty to consult and have requested a parallel process for consultation outside of the environmental assessment process.</p>	<ul style="list-style-type: none"> <li>▪ In response to criticisms of the timelines for the environmental assessment process, PNW LNG has noted that it is following timelines mandated by federal and provincial statutes.</li> <li>▪ PNW LNG has also attempted to engage First Nations in longer-term monitoring studies regarding impacts to the marine environment and Skeena Estuary outside of the environmental assessment process including substantive, comprehensive and enduring fish habitat enhancement and restoration projects that will be monitored and adapted for efficacy.</li> </ul>

Issue	PNW LNG Response and Action Items
<b>Lax Kw'alaams First Nation</b>	
Concerns about PNW LNG's provision of information and the scientific methods used for reports provided by PNW LNG	<ul style="list-style-type: none"> <li>▪ PNW LNG believes that all of its environmental studies have been, and will be, scientifically credible and consistent with the regulatory requirements. PNW LNG has explained this position to Lax Kw'alaams and shared numerous reports with Lax Kw'alaams as soon as it was able and will continue to do so.</li> <li>▪ PNW LNG has provided Lax Kw'alaams with capacity funding payments totalling \$40,000 and attempted to negotiate an Environmental Assessment Agreement that would provide an agreed-on plan for consultation and capacity funding. Lax Kw'alaams has not accepted the invitations to those negotiations. In the absence of an Environmental Assessment Agreement, PNW LNG has agreed to provide interim capacity funding.</li> </ul>
Need for an Aboriginal Interest and Use Study	<ul style="list-style-type: none"> <li>▪ PNW LNG offered to fund a Traditional Use Study for Lax Kw'alaams. This offer has not been accepted.</li> </ul>
<b>Gitxaala First Nation</b>	
Gitxaala has objected to Transport Canada's strength of claim assessment to the Prince Rupert Harbour area.	<ul style="list-style-type: none"> <li>▪ PNW LNG takes no position on the strength of asserted claims and is undertaking procedural aspects of consultation as directed by the BC EAO.</li> </ul>

Issue	PNW LNG Response and Action Items
<p><b>Gitxaala First Nation</b></p> <p>Gitxaala has expressed doubts about the adequacy of the environmental assessment process to discharge the duty to consult at law.</p>	<ul style="list-style-type: none"> <li>▪ PNW LNG has been attempting to consult with all five First Nations since the fall of 2012. Since that time, PNW LNG has invited First Nations to participate in studies and review the findings. PNW LNG has invited First Nations to open houses and offered to hold open houses in First Nations communities. PNW LNG has initiated correspondence with First Nations in hopes to engage them more fully in consultation. PNW LNG has diligently attempted to respond to every comment and issue raised by First Nations.</li> <li>▪ The environmental assessment process will address the concerns of potentially affected First Nations. First Nations will have the ability to raise concerns through the Working Group. First Nations have also expressed concerns to PNW LNG and PNW LNG has incorporated those concerns into the EIS/Application.</li> <li>▪ If the Crown concludes that the environmental assessment process is unable to fully discharge the duty to consult, PNW LNG will continue consultation as directed through the permitting process.</li> <li>▪ PNW LNG, at its expense and independent of any regulatory requirement, has engaged an expert to review publicly available information, and the information provided by First Nations, regarding First Nations interests in Lelu Island and its vicinity.</li> <li>▪ PNW LNG continues to welcome any information provided by First Nations regarding the Project's potential impacts to their interests and will review and respond to all information provided by First Nations.</li> <li>▪ PNW LNG is continuing its effort to negotiate an Impact Benefit Agreement with Gitxaala First Nation. PNW LNG believes that the process can address any potential residual impacts if such impacts are not addressed through the environmental assessment or permitting processes.</li> </ul>
<p>Gitxaala has requested greater input on the approval of the consultation process including requesting that it be able to approve the consultation plan.</p>	<ul style="list-style-type: none"> <li>▪ PNW LNG believes that Gitxaala approval of the consultation plan is in excess of statutory requirements, but notes that it shared the Consultation Plan with Gitxaala for comments before it submitted the Consultation Plan to BC EAO for approval.</li> </ul>

Issue	PNW LNG Response and Action Items
<b>Kitselas First Nation</b>	
<p>Kitselas has disputed Transport Canada's strength of claim assessment for its assertion of rights and title in the Prince Rupert Harbour area.</p>	<ul style="list-style-type: none"> <li>▪ PNW LNG takes no position on the strength of asserted claims and is undertaking procedural aspects of consultation as directed by the BC EAO.</li> <li>▪ PNW LNG, at its expense and independent of any regulatory requirement, has also engaged an expert to review publicly available information, and the information provided by First Nations, regarding First Nations interests in Lelu Island and its vicinity.</li> <li>▪ PNW LNG continues to welcome any information provided by First Nations regarding the Project's potential impacts to their interests and will review and respond to all information provided by First Nations.</li> <li>▪ PNW LNG been attempting to consult with all five First Nations since the fall of 2012. Since that time, PNW LNG has invited First Nations to participate in studies and review the findings of studies. PNW LNG has invited First Nations to open houses and offered to hold open houses in First Nations communities. PNW LNG has initiated correspondence with First Nations in hopes to engage them more fully in consultation. PNW LNG has diligently attempted to respond to every comment and issue raised by First Nations.</li> </ul>

Issue	PNW LNG Response and Action Items
<b>Kitselas First Nation</b>	
<p>Kitselas also expressed concerns about the sufficiency of the environmental assessment process to discharge the duty to consult and identified timelines and capacity funding as insufficient.</p>	<ul style="list-style-type: none"> <li>▪ The environmental assessment process will address the concerns of potentially affected First Nations. First Nations will have the ability to raise concerns through the Working Group. First Nations have also expressed concerns to PNW LNG and PNW LNG has incorporated those concerns into the EIS/Application.</li> <li>▪ If the Crown concludes that the environmental assessment process is unable to fully discharge the duty to consult, PNW LNG will continue consultation as directed through the permitting process.</li> <li>▪ PNW LNG, at its expense and independent of any regulatory requirement, has also engaged an expert to review publicly available information, and the information provided by First Nations, regarding First Nations interests in Lelu Island and its vicinity.</li> <li>▪ PNW LNG continues to welcome any information provided by First Nations regarding the Project’s potential impacts to their interests and will review and respond to all information provided by First Nations.</li> <li>▪ PNW LNG is continuing its effort to negotiate Impact Benefit Agreement with Kitselas. PNW LNG believes that the process can address any potential residual impacts if such impacts are not addressed through the environmental assessment or permitting processes.</li> <li>▪ PNW LNG, at its expense and independent of any regulatory requirement, has also engaged an expert to review publicly available information, and the information provided by First Nations, regarding First Nations interests in Lelu Island and its vicinity.</li> <li>▪ PNW LNG continues to welcome any information provided by First Nations regarding the Project’s potential impacts to their interests and will review and respond to all information provided by First Nations.</li> </ul>
<b>Kitsumkalum First Nation</b>	
<p>Kitsumkalum disagrees with Transport Canada’s assessment of its strength of claim to the Prince Rupert Harbour area. It asserts that it holds Aboriginal rights and title to all of Lelu Island and the surrounding marine area.</p>	<ul style="list-style-type: none"> <li>▪ PNW LNG takes no position on the strength of asserted claims and is undertaking procedural aspects of consultation as directed by the BC EAO.</li> <li>▪ PNW LNG, at its expense and independent of any regulatory requirement, has also engaged an expert to review publicly available information, and the information provided by First Nations, regarding First Nations interests in Lelu Island and its vicinity.</li> <li>▪ PNW LNG continues to welcome any information provided by First Nations regarding the Project’s potential impacts to their interests and will review and respond to all information provided by First Nations.</li> </ul>



Issue	PNW LNG Response and Action Items
<b>Kitsumkalum First Nation</b>	
<p>Kitsumkalum has identified the acknowledgement of harvesting rights in the marine environment around Lelu Island in its Agreement in Principle with British Columbia as evidence of its Aboriginal rights in the project area. Kitsumkalum notes that Aboriginal title will not be addressed by the environmental assessment process.</p>	<ul style="list-style-type: none"> <li>▪ The environmental assessment process will address the concerns of potentially affected First Nations. First Nations will have the ability to raise concerns through the Working Group. First Nations have also expressed concerns to PNW LNG and PNW LNG has incorporated those concerns into the EIS/Application.</li> <li>▪ If the Crown concludes that the environmental assessment process is unable to fully discharge the duty to consult, PNW LNG will continue consultation as directed through the permitting process.</li> <li>▪ PNW LNG is continuing its effort to negotiate Impact Benefit Agreement with Kitsumkalum. PNW LNG believes that the process can address any potential residual impacts if such impacts are not addressed through the environmental assessment or permitting processes.</li> </ul>
<p>Kitsumkalum has expressed concerns regarding the environmental assessment timelines and the capacity funding provided.</p>	<ul style="list-style-type: none"> <li>▪ In response to criticisms of the timelines for the environmental assessment process, PNW LNG has noted that it is following timelines mandated by federal and provincial statutes. PNW LNG has also attempted to engage First Nations in longer-term monitoring studies regarding impacts to the marine environment and Skeena Estuary outside of the environmental assessment process including substantive, comprehensive and enduring fish habitat enhancement and restoration projects that will be monitored and adapted for efficacy.</li> <li>▪ PNW LNG has provided Kitsumkalum with payments totalling \$40,000 in capacity funding and has attempted to negotiate an EA Agreement with Kitsumkalum that would outline a work plan for the environmental assessment process and provide capacity funding to undertake that work plan. PNW LNG hopes to still be able to complete such an agreement, but in its absence will provide reasonable interim capacity funding as required.</li> </ul>

Table 28-5 summarizes the potential effects on Aboriginal rights and related interests, the relationships of valued components to Aboriginal groups' rights and related interests, and the proposed accommodation measures.

**Table 28-6: Summary of Potential Effects on Aboriginal Rights and Related Interests and Accommodation Measures**

Related Valued Component	Accommodation Measures
<b>Potential Adverse Effects on Consumptive Harvesting Rights</b>	
Vegetation and Wetland Resources	<ul style="list-style-type: none"> <li>▪ Standard mitigation to prevent any introduction and spread of noxious weeds and invasive plants.</li> <li>▪ Implementation of a wetland habitat compensation plan consisting of:                             <ul style="list-style-type: none"> <li>• Securement, plus restoration or creation, of 120 ha of wetlands through a legally binding agreement between PNW LNG and Ducks Unlimited Canada.</li> <li>• A five-year effectiveness monitoring program for the restored or created wetlands by Ducks Unlimited Canada.</li> <li>• Bog restoration benefiting a minimum of 116 ha of coastal bog ecosystems through funding the immediate research and restoration priorities of the Burns Bog Management Plan and Burns Bog Ecological Conservancy Area Management Plan.</li> </ul> </li> <li>▪ In the development of the wetland compensation plan, traditional use species present in the PDA will be used for planting wherever possible and practical.</li> </ul>
Terrestrial Wildlife and Marine Birds	<ul style="list-style-type: none"> <li>▪ Wetland habitat compensation will include restoration and compensatory activities to recover the loss of wetland habitat function to terrestrial mammals, amphibians, and birds.</li> <li>▪ Fish habitat offsetting will include restoration and compensatory activities to recover the net loss of marine fish habitat used for foraging by marine birds.</li> </ul>

Related Valued Component	Accommodation Measures
Marine Resources	<p><i>Water Quality</i></p> <ul style="list-style-type: none"> <li>▪ A 30 m vegetation buffer will be retained around the perimeter of Lelu Island, except at access points (e.g., at the bridge, pioneer dock, MOF, trestle, and pipeline interconnection). Sediment and erosion control measures will be used (e.g., sediment fences) for land-based construction, particularly at the shoreline, to reduce TSS inputs into the water.</li> <li>▪ TSS and turbidity will be monitored during in-water construction activities (e.g., shoreline infilling, pile installation, blasting, dredging, and ocean disposal). In the event that TSS levels exceed applicable water quality guidelines outside of the immediate work area (defined in consultation with regulatory agencies), the rate of the activity will be adjusted (e.g., slowed), or additional mitigation measures implemented (e.g., silt curtains) to minimize the spatial extent of elevated TSS.</li> <li>▪ Dredging operations will be conducted using methods and/or equipment that reduce releases sediment spill.</li> <li>▪ At the disposal site, sediment will be disposed within the approved disposal area at a point distant from the area used on the previous trip.</li> <li>▪ The following measures will be used to reduce TSS from vessel maneuvering:                     <ul style="list-style-type: none"> <li>• A portion of the seabed will be armoured in marine berth area.</li> <li>• Arrivals and departures of LNG carriers will be avoided at low water slack tide and as the tide rises from low water up to mean sea level.</li> <li>• Use of tugs with less sediment scour-inducing propulsion systems (such as the Voith-Schneider design), will be evaluated.</li> </ul> </li> </ul> <p><i>Fish Habitat</i></p> <ul style="list-style-type: none"> <li>▪ Hard multi-facetted shoreline protection material (e.g. rip-rap boulders) will be used where needed (e.g., trestle abutment) to promote colonization by marine biota.</li> <li>▪ Habitat offsetting will be implemented to achieve no net loss of productivity.</li> </ul> <p><i>Mortality or Physical Injury</i></p> <ul style="list-style-type: none"> <li>▪ DFO's Blasting Guidelines (Wright and Hopky 1998) will be implemented, including enforcing a safety radius of 500 m, and ensuring marine mammals are not present in the safety radius prior to blasting.</li> <li>▪ Blasting will be conducted within DFO least-risk timing windows (November 30 to February 15) to avoid key lifecycle stages of fish.</li> <li>▪ Dungeness crabs will be relocated from construction zones using proper handling techniques and strategies that limit stress.</li> <li>▪ Material from the dredge area that is suitable for construction or habitat compensation will be used, where possible.</li> <li>▪ A Pile Driving Management plan will be implemented to outline low noise techniques (such as vibratory hammer with bubble curtain) to be used to install piles, where technically feasible. If an impact pile driver is used (with bubble curtain) a marine mammal observation program will be implemented.</li> </ul> <p><i>Change in Behaviour</i></p> <ul style="list-style-type: none"> <li>▪ LNG carriers, tugs, and barges will not exceed a speed of 16 knots within the LAA.</li> <li>▪ LNG carrier vessel speed will be reduced to 6 knots when approaching the Triple Island Pilot Boarding Station.</li> </ul>

Related Valued Component	Accommodation Measures
Navigation and Marine Resource Use	<ul style="list-style-type: none"> <li>▪ A Marine Communications Plan will be implemented, which identifies measures so that all marine traffic is made aware of any project construction activities and that details the local marine communications and project-related safety procedures.</li> <li>▪ Safety zones will be established during construction which specifies “no go” areas.</li> <li>▪ Lighting will be designed to reduce stray lighting.</li> <li>▪ Navigational aids will be installed on structures where required to enhance navigation safety.</li> <li>▪ Navigational charts will be updated to show the MOF and trestle and berth locations.</li> <li>▪ Sufficient clearance (11m above HHW) for gillnetters will be provided beneath the Lelu Island bridge and the trestle spans that best supports navigation to and from Porpoise Channel over Flora Bank.</li> <li>▪ Escort vessels will be used to confirm the route is clear and safe and that other vessels do not intrude safety zones.</li> <li>▪ Tugs will be used for the safe transit and docking of LNG carriers.</li> <li>▪ Traffic management and routing options will be assessed to help small craft know which route a carrier will follow, if deemed necessary by the port and pilots based on analysis of TERMPOL studies.</li> <li>▪ Limits on environmental conditions under which operations can be conducted safely (visibility, day-time operations, wind) will be set consistent with results from the TERMPOL studies, consultation with pilots, and LNG terminal practices throughout the industry.</li> </ul>

Related Valued Component	Accommodation Measures
Air Quality	<ul style="list-style-type: none"> <li>▪ Best achievable technology will be incorporated into project design to reduce air emissions. Control technologies will focus on managing NO<sub>x</sub> emissions. PM<sub>2.5</sub> emissions will be managed through the use of smokeless flare technology. CO and hydrocarbon emissions (e.g., VOCs) will be reduced by optimizing combustion.</li> <li>▪ Thermal oxidizers will be used to oxidize H<sub>2</sub>S, to achieve negligible H<sub>2</sub>S emission effects, oxidize VOCs, and vaporize any hydrocarbon solids in the waste gas stream before venting.</li> <li>▪ Best management practices for the processing systems will be instituted and maintained (i.e., use of treated feed gas as fuel for power generation).</li> <li>▪ A natural gas leak detection program will be implemented.</li> <li>▪ LNG carriers and assist tugs will adhere to applicable marine emission standards (MARPOL).</li> <li>▪ Dust associated with the use of facility roads will be reduced by using dust suppressants and surface paving.</li> <li>▪ Vehicle and off-road equipment will undergo regular tuning and maintenance.</li> <li>▪ Vehicle idling times during all project phases will be kept to a minimum.</li> </ul>
Acoustic Environment	<ul style="list-style-type: none"> <li>▪ Nighttime construction activity will be limited to low noise activities (no impact type pile driving or blasting activities).</li> <li>▪ All construction equipment with gas or diesel engines will be fitted with a muffler system (alternatives such as hydraulic or electric controlled units will be considered where feasible).</li> <li>▪ If diesel power generators are required, enclosed units equipped with ventilation, combustion air inlet, and gas exhaust silencers will be considered. The provision of electrical power supplied by the BC Power and Hydro Authority to the construction site on Lelu Island is under consideration and may replace the need for on-site diesel power.</li> <li>▪ Vibro-hammer piling equipment will be used where conditions permit for piling operations.</li> <li>▪ Equipment enclosure doors will be kept closed when not in use.</li> <li>▪ Exhaust vents will be equipped with commercially available silencers.</li> <li>▪ Large machinery such as gas turbine generators and refrigerant compressors will be located in enclosure with minimum acoustic sound transmission loss rating.</li> <li>▪ Inlet and exhaust silencers will be installed on gas turbines if required to meet regulatory limits.</li> <li>▪ Acoustic performance of noise emission equipment will be specified to manufacturers or suppliers (not exceeding 85 dBA at 1 m from equipment and 120 dBA for emergencies).</li> <li>▪ A Noise Management Plan will be implemented.</li> <li>▪ A policy will be implemented to keep windows and doors closed when not in use.</li> <li>▪ A noise complaint mechanism will be implemented to address any noise complaints in a timely manner.</li> </ul>

Related Valued Component	Accommodation Measures
Ambient Light	<ul style="list-style-type: none"> <li>▪ Retain a 30 m mature vegetation buffer around Lelu Island to reduce effects of increased light.</li> <li>▪ Construct lighting and operational lighting to be selected to reduce spill-over light and will include shielded fixtures, where appropriate.</li> <li>▪ Design principles (such as those within the Canada Green Building Council LEED guidelines (LEED 2004) and the International Commission on Illumination (CIE 2003)) will be used where applicable and consistent with overarching requirements of safety and security</li> <li>▪ A centralized lighting control system will be used to selectively turn off lights when not required.</li> </ul>
Visual Quality	<ul style="list-style-type: none"> <li>▪ A 30 m vegetation buffer will be retained around the perimeter of Lelu Island, except at access points (e.g., at the bridge, pioneer dock, MOF, trestle, and pipeline interconnection).</li> </ul>
<b>Potential Adverse Effects on Aboriginal Title</b>	
n/a	<ul style="list-style-type: none"> <li>▪ The existence, nature, extent, and exact location of Aboriginal title lands within the LAA is uncertain. PNW LNG will continue seek direction from both provincial and federal regulators with regard to asserted Aboriginal title claims within areas potentially affected by the Project.</li> </ul>

## 28.5 Summary of Commitments

**Table 28-7: Commitments Table**

No.	Proposed Mitigation/Compensation	Project Phase
1	<p>PNW LNG will ensure a construction and operational Environmental Management Plan (EMP) is prepared and adhered to and will be made up of the following component plans:</p> <ul style="list-style-type: none"> <li>▪ Air Quality and Greenhouse Gas Management Plan</li> <li>▪ Noise, Vibration, and Ambient Light Management Plan</li> <li>▪ Emergency Response Plan</li> <li>▪ Transportation Management Plan</li> <li>▪ Marine and Freshwater Resources Management Plan</li> <li>▪ Vegetation Management Plan</li> <li>▪ Waste Management Plan</li> <li>▪ Blasting Management Plan</li> <li>▪ Pile Driving Management Plan</li> <li>▪ Dredging Management Plan</li> <li>▪ Archaeological and Heritage Resources Management Plan</li> <li>▪ Environmental Monitoring Management Plan</li> <li>▪ Accomodation Plan.</li> </ul>	Construction Operations

No.	Proposed Mitigation/Compensation	Project Phase
2	Toward the end of the project life, PNW LNG must develop and implement as required a decommissioning plan in accordance with requirements of the PRPA and regulations in force at that time and in consultation with regulatory agencies to the satisfaction of relevant regulatory agencies. PRPA requirements related to decommissioning will be included within the lease to PNW LNG.	Decommissioning
3	A natural gas leak detection program must be implemented.	Operations
4	PNW LNG must reduce dust from use of facility roads by use of suppressants (e.g., water) and paving surfaces.	Construction Operations
5	PNW LNG will employ measures during construction to reduce air and sound emissions. Vehicles and construction equipment must be properly tuned and maintained. A Noise Management Plan will be implemented.	Construction
6	A GHG Management Plan must be developed and implemented.	Operations
7	Large machinery such as gas turbine generators and refrigerant compressors will be located in enclosures with minimum acoustic sound transmission loss rating.	Operations
8	A policy will be implemented to keep building windows closed and doors closed when not in use to reduce noise emissions.	Operations
9	PNW LNG must maintain a log of any noise complaints received during project construction and operation, investigate to assess whether they relate to project activities, and if so, identify and implement practical measures that will be taken to address them.	Construction Operations
10	Construction lighting and project streetlights must use shielded, cut-off design. All outdoor operational lighting must be equipped with “dark sky” shielded fixtures.	Construction Operations
11	A wetland compensation plan will be implemented.	Not Applicable
12	A 30 m vegetation buffer will be retained around the perimeter of Lelu Island, except at access points (e.g., at the bridge, pioneer dock, MOF, trestle, and pipeline interconnection).	Construction Operations
13	PNW LNG must attempt to complete vegetation clearing activities outside of the breeding season for terrestrial birds, amphibians, and bats (April 15 through July 31), and the breeding period for raptors (January 5 through September 6).	Construction
14	If clearing during breeding season is unavoidable, a nest survey will be conducted in advance of the clearing by a qualified professional to ensure compliance with applicable legislation (the <i>Migratory Birds Convention Act</i> and/or the <i>BC Wildlife Act</i> ).	Construction
15	PNW LNG must prohibit feeding and harassment of wildlife by project personnel.	Construction Operations
16	Operators of project-related ground and marine transportation will adhere to posted speed limits. Project personnel will slow or stop vehicles to allow wildlife to cross the line of traffic.	Construction Operations
17	A water quality monitoring program and sediment and erosion control program (see commitment 1) will be implemented to ensure all discharged water into the marine environment meets provincial and federal water quality guidelines.	Construction Operations
18	Fish salvages must be conducted prior to infilling fish streams on Lelu Island.	Construction

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<b>No.</b>	<b>Proposed Mitigation/Compensation</b>	<b>Project Phase</b>
19	PNW LNG must prepare a Fish Habitat Offsetting Plan to the satisfaction of DFO. The Plan must be developed prior to start of construction. The Habitat Offsetting Plan must include: <ul style="list-style-type: none"><li>▪ The final PDA loss from construction</li><li>▪ Like-for-like habitat criteria as per direction from DFO for off-site areas selected for offsetting, where possible</li><li>▪ A monitoring plan to measure and evaluate effectiveness of habitat offsetting.</li></ul>	Pre-construction
20	PNW LNG will ensure that in water blasting is completed in accordance with the Blasting Management Plan (see commitment 1). The Blasting Management Plan will implement DFO's Blasting Guidelines, including enforcing a safety radius of 500 m, and ensuring marine mammals are not present in the safety radius prior to blasting.	Construction
21	In water blasting will be conducted within the least-risk timing window (November 30 to February 15).	Construction
22	Low noise techniques (such as vibratory hammer with bubble curtain) will be used to install piles, where technically feasible. If an impact pile driver is used a marine mammal observation program will be implemented.	Construction
23	Sufficient clearance (11 m above HHW) will be provided beneath the Lelu Island bridge and the trestle spans that best supports navigation by small vessels (i.e., gill-netters) to and from Porpoise Channel over Flora Bank.	Operations
24	A transportation management plan will be implemented (see commitment 1) to manage onshore transportation of workers and equipment.	Construction
25	An accommodation plan will be implemented (see commitment 1) to provide housing policies for non-local temporary workers of whom are not housed in the construction camp on Lelu Island; policies will outline preferred accommodations and require workers be housed in both Prince Rupert and Port Edward when not in housed in the construction camp to lower the demand in a single community. The plan will also outline camp management policies and practices.	Construction
26	Systematic Data Recovery (SDR) studies for CMT sites will be conducted by systematically recording a representative sample of CMT features. A detailed final report will be completed to ensure that the data and results of analyses are available to other archaeologists and First Nations.	Construction
27	A marine communications plan will be developed to ensure that other vessels are aware of construction activities in the area and safety zones (no go areas) will be identified.	Construction
28	All shipping within the Port of Prince Rupert will be conducted following the requirements of safe shipping laid out in the Canada Shipping Act, PRPA Practices and Procedures and Canadian Coast Guard regulations..	All phases



No.	Proposed Mitigation/Compensation	Project Phase
<b>Follow-up and Monitoring</b>		
29	Acidification and Eutrophication: <ul style="list-style-type: none"> <li>▪ A follow-up program would be implemented to determine whether a measurable effect to vegetation communities and freshwater bodies occurs due to deposition of acidifying and eutrophying compounds.</li> </ul>	Operations
30	Sediment Quality: <ul style="list-style-type: none"> <li>▪ Physical and chemical characterization of marine sediment will be completed for the marine terminal dredge area. This will be completed as part of the disposal at sea permit application, and will include modelling of sediment plumes and sedimentation rates during dredging and disposal of sediment to confirm predictions of the assessment.</li> </ul>	Permitting
31	Fish and Fish Habitat: <ul style="list-style-type: none"> <li>▪ Monitoring as part of the Fish Habitat Offsetting Strategy.</li> <li>▪ Monitoring of the Flora Bank eelgrass bed for change in extent and density to confirm predictions of the assessment.</li> <li>▪ Monitor underwater noise during pile driving to confirm effectiveness of mitigation and effects on marine mammals.</li> </ul>	Construction Operations