Westcoast Connector
Gas Transmission

Westcoast Connector Gas Transmission Project

Wetlands Management Plan
Conditions 12 and 26

Detailed Outline – Revision 1

January 2022

Prepared for:

Westcoast Connector Gas Transmission Ltd.

Prepared by:

Jacobs Consultancy Canada Inc.

Jacobs

Westcoast Connector Gas Transmission Project

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Land Acknowledgement

We acknowledge that the Westcoast Connector Gas Transmission project (WCGT Project) area is in the Traditional and Ancestral Territory of many Indigenous Peoples, presently subject to the Nisga'a Treaty, Treaty 8, and vast areas of unceded Indigenous Traditional lands. These Indigenous groups include the Nisga'a Nation, Prophet River First Nation, Blueberry River First Nations, Doig River First Nation, Gitanyow Hereditary Chiefs, Gitxsan Hereditary Wilp, Halfway River First Nation, Kitselas First Nation, Kitsumkalum First Nation, Lake Babine Nation, Lax Kw'alaams First Nation, Wilp Luuxhon, Metlakatla First Nation, Saulteau First Nation, Takla Lake First Nation, Tsay Keh Dene First Nation, West Moberly First Nations, Nak'azdli First Nation, McLeod Lake Band, Gitxaala Nation, and the Métis Nation British Columbia

We acknowledge the many Indigenous Peoples who live on care for these lands and have for generations. We are grateful for the traditional Knowledge Keepers and Elders who are still with us today and those who have gone before us. We make this acknowledgement as an act of reconciliation and gratitude to those whose territory we reside on or are visiting.

Executive Summary

The British Columbia Environmental Assessment Office (BC EAO) issued an Environmental Assessment Certificate (Certificate) to Westcoast Connector Gas Transmission Ltd. (WCGT Ltd.) for the WCGT Project on November 25, 2014, and later granted a 5-year extension to the Certificate on April 25, 2019. The Certificate expires on November 25, 2024.

The WCGT Project approved in the Certificate includes the potential to build two 48-inch diameter natural gas pipelines within the same right-of-way along with accompanying compressor stations that could potentially service multiple liquefied natural gas (LNG) terminal sites starting at Cypress in northeast British Columbia (BC) and ending at Ridley Island on the north coast. The Certificate provided the flexibility to choose one of two routes to the Prince Rupert area—either through the Nass Valley (Nasoga Route) or north towards Kitsault (Kitsault Route).

WCGT Ltd. is actively developing the WCGT Project to build one express, single-purpose natural gas pipeline from a compressor station near Willow Flats in northeast BC to a delivery point at Wil Milit on the north coast to supply natural gas to potential LNG terminal sites (Project).

The Certificate granted for the WCGT Project is subject to 43 Conditions. The purpose of the Wetlands Management Plan (WMP or the Plan) is to address the requirements of Certificate Condition 12 and 26.

WCGT Ltd. is engaging with Indigenous groups and relevant regulatory authorities (RRAs) in the development of this detailed outline to support the full build-out of the Plan. Through engagement, WCGT Ltd. is seeking collaboration in the development of the Plan and any information that can be shared to strengthen the Plan and the commitment to fulfilling Conditions 12 and 26.

WCGT Ltd. acknowledges the inherent connection Indigenous Peoples have with wetlands and that while the Plan will satisfy the regulatory requirements, the Plan is intended to minimize impacts to wetlands by incorporating Indigenous Knowledge and ensuring concerns are addressed during mitigation development.

The scope of the Plan includes:

- Purpose and objectives of the Plan
- Linkages to other condition plans that relate to wetlands
- Roles and responsibilities related to wetlands
- Implementation schedule related to wetland management
- Future planned updates to the Plan

Table of Concordance

Table 0-1 describes how this Wetlands Management Plan addresses the applicable Certificate Conditions.

Table 0-1. Concordance with Certificate Condition 12 and 26: Wetlands Management Plan

Certificate Condition	Section
Condition 12 – Wetlands Function	
The Holder must develop, in consultation with EC, FLNR, PRPA and BC OGC, and implement a Wetlands Management Plan. The Wetlands Management Plan must meet the objective of no net loss in wetland area and function. The Plan must:	Subsections 2.1 and 3
Include the results of pre-Construction surveys for all wetlands within the Certified Project Corridor that includes site-specific information on wetland location, type, area, and function;	Subsection 6.3 and Appendix A
Commit the Holder to carry out post-Construction wetland monitoring over five-year periods that each begin upon the substantial completion of each pipeline, to confirm whether residual loss of wetland area and function occurs as a result of Construction and Operations; and	Section 6
Commit the Holder to implement mitigation and compensation measures to address any loss of wetland area and function identified in (i) and (ii), and a description of the manner and extent to which the measures are consistent with the Federal Policy on Wetland Conservation.	Subsections 5.1, 5.2, and 6.7
If, following five years of post-Construction monitoring for a pipeline, the Holder confirms that loss of wetland area and/or function has occurred, the Holder must compensate for all such loss in a manner consistent with the Federal Policy on Wetland Conservation. In order to allow for 60 days review and comment, the Holder must provide the Plan to BC EAO no less than 90 days prior to the Holder's planned date to commence Construction. Once the Plan is complete, the Holder must also provide the Plan to EC, FLNR, PRPA, Nisga'a Nation and OGC.	Subsections 5.2 and 6.7
Condition 26 – Mugaha Marsh	
The Holder must adhere to the objectives of the Sensitive Area Plan for Mugaha Marsh (2001), and if the Holder uses a construction technique other than underground trenchless construction, the Holder must construct in the winter months in the Mugaha Marsh unless otherwise authorized by OGC.	Subsections 2.1 and 5.1

Notes:

FLNR updated to BC MFLNRORD = British Columbia Ministry of Forests, Lands, Natural Resource Operations and Rural Development

BC OGC = British Columbia Oil and Gas Commission

PRPA =Prince Rupert Port Authority

EC updated to ECCC = Environment and Climate Change Canada

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Acronyms and Abbreviations

AMP	Access Management Plan
BC	British Columbia
BC EAO	British Columbia Environmental Assessment Office
BC MFLNRORD	British Columbia Ministry of Forests, Lands, Natural Resource Operations and Rural Development
BC *OGAA*	British Columbia *Oil and Gas Activities Act*
BC OGC	British Columbia Oil and Gas Commission
BC RISC	British Columbia Resources Information Standards Committee
BMP	Best Management Practice
Certificate	Environmental Assessment Certificate CPC Certified Pipeline Corridor
ECCC	Environment and Climate Change Canada
EI	Environmental Inspector
EPMR	*Environmental Protection and Management Regulation*
FPWC	Federal Policy on Wetland Conservation
FWQMP or Plan	Freshwater Water Quality Monitoring Plan
km	kilometre(s)
LNG	liquified natural gas
LRMP	Land and Resource Management Plan
NWRP	Nisga'a Watercourse Restoration Plan
PCM	post-construction monitoring
Project	one express, single-purpose natural gas pipeline from a compressor station near Willow Flats in northeast British Columbia to a delivery point at Wil Milit on the north coast to supply natural gas to potential liquified natural gas terminal sites
PRPA	Prince Rupert Port Authority
QP	Qualified Professional
RP	Restoration Plan
RRA	Relevant Regulatory Authority
SARA	*Species at Risk Act*
SRMP	Sustainable Resource Management Plan
TCEMP	Terrestrial Construction Environmental Management Plan
WCGT Ltd.	Westcoast Connector Gas Transmission Ltd.
WCGT Project	Westcoast Connector Gas Transmission Project
WMP or the Plan	Wetlands Management Plan
WSA	*Water Sustainability Act*
WWHMP	Wildlife and Wildlife Habitat Management Plan

1. Introduction

The British Columbia Environmental Assessment Office (BC EAO) issued an Environmental Assessment Certificate (Certificate) to Westcoast Connector Gas Transmission Ltd. (WCGT Ltd.) for the Westcoast Connector Gas Transmission Project (WCGT Project) on November 25, 2014, and later granted a 5-year extension to the Certificate on April 25, 2019. The Certificate expires on November 25, 2024. The Certificate granted for the WCGT Project is subject to 43 Conditions. The purpose of the Wetland Management Plan (WMP or Plan) is to address the requirements of Certificate Conditions 12 and 26.

WCGT Ltd. is engaging with Indigenous groups and Relevant Regulatory Authorities (RRAs) in the development of this detailed outline to support the full build-out of the Plan. Through engagement, WCGT Ltd. is seeking collaboration in the development of the Plan and any information that can be shared to strengthen the Plan and the commitment to fulfilling Conditions 12 and 26.

WCGT Ltd. acknowledges the inherent connection Indigenous Peoples have with wetlands and that while the Plan will satisfy the regulatory requirement, the Plan is intended to minimize impacts to wetlands by incorporating Indigenous Knowledge and ensuring concerns are addressed during mitigation development.

1.1 Project Description

The WCGT Project approved in the Certificate includes the potential to build two 48-inch diameter natural gas pipelines within the same right-of-way along with accompanying compressor stations that could potentially service multiple liquefied natural gas (LNG) terminal sites starting at Cypress in northeast British Columbia (BC) and ending at Ridley Island on the north coast. The Certificate provided the flexibility to choose one of two routes to the Prince Rupert area—either through the Nass Valley (Nasoga Route) or north towards Kitsault (Kitsault Route).

WCGT Ltd. is actively developing the WCGT Project to build one express, single-purpose natural gas pipeline from a compressor station near Willow Flats in northeast BC to a delivery point at Wil Milit on the north coast to supply natural gas to potential LNG terminal sites (the Project) (Figure 1).

The new compressor station at Willow Flats will have the potential to connect to Enbridge Inc.'s Westcoast Energy Inc. pipeline system near Compressor Station 2 or TC Energy's NGTL system, eliminating the need for the pipeline corridor from Cypress to Willow Flats and the compressor station at Cypress. WCGT Ltd. will apply to the BC EAO to amend its Certificate to:

1) remove approximately 100 kilometres of the Certified Pipeline Corridor from Cypress to Willow Flats; and
2) change the location of the compressor station from Cypress to Willow Flats.

If WCGT Ltd. proceeds with construction of a second pipeline, it would also start near Willow Flats and would not use the corridor from Cypress to Willow Flats.

The new delivery point for the pipeline will be near Wil Milit. WCGT Ltd. will apply to the BC EAO to amend its Certificate to make routing changes along its approved Nasoga Route to end the first pipeline at Wil Milit. WCGT Ltd. will retain the option to expand the WCGT Project to the currently approved delivery point at Ridley Island at a later date.

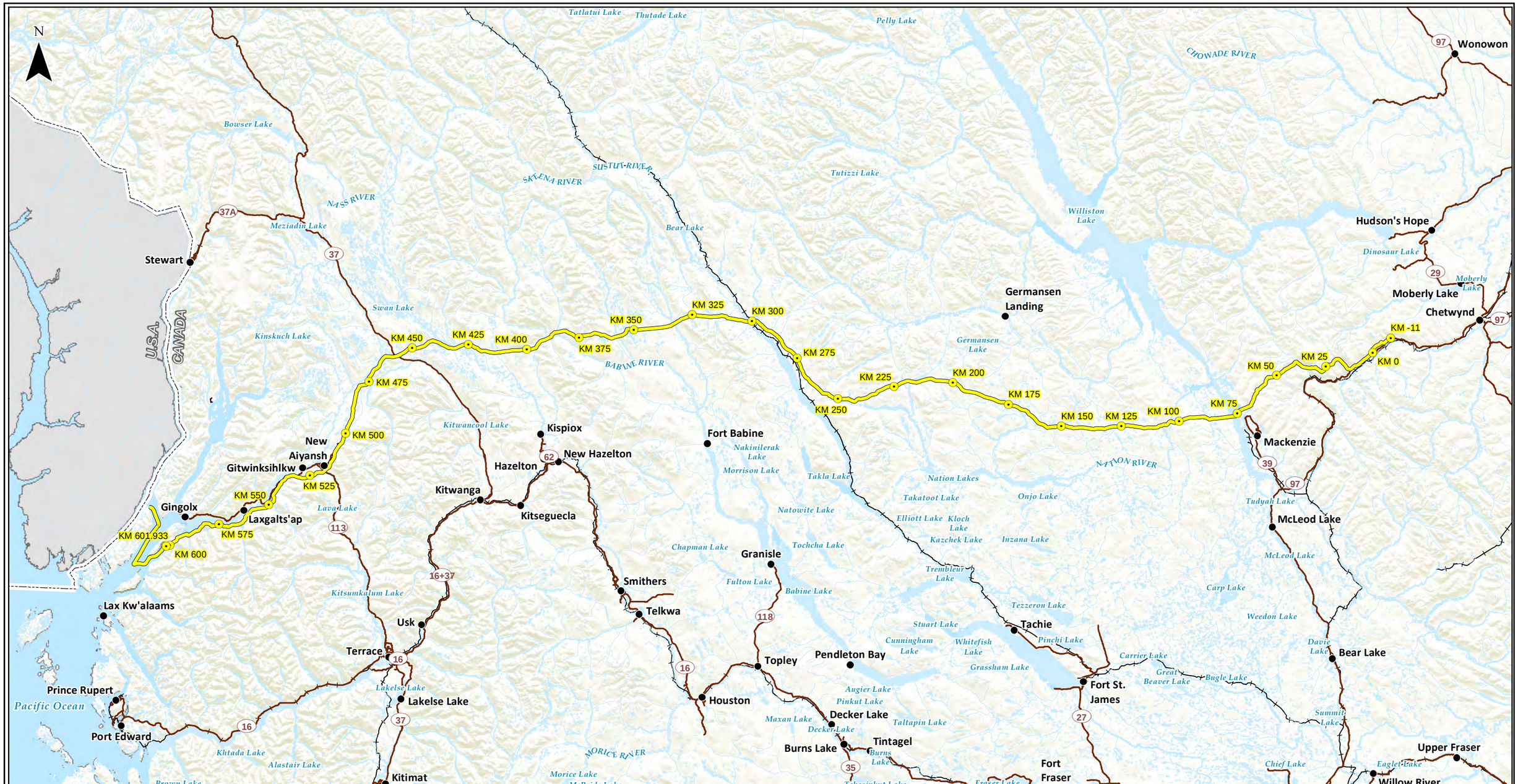
WCGT Ltd. is developing condition plans for the Project with Indigenous groups and stakeholders for submission to the BC EAO in accordance with its Certificate. The condition plans will address potential impacts from the Project, which includes the first pipeline from Willow Flats to Wil Milit, one compressor station at Willow Flats, and the necessary meter stations.

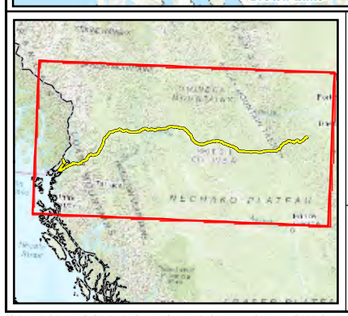
WCGT Ltd. does not have plans to build the second pipeline at this time; however, should it decide to construct a second pipeline, increase capacity by adding compressor stations or extend the first pipeline to Ridley Island, WCGT Ltd. will submit revised or new condition plans to the BC EAO in accordance with Condition 1 of its Certificate.

1.2 Project Interactions Impacts to Wetlands

The WMP is intended to include all Project direct impacts to wetlands. The biophysical features along the Project route have been extensively studied. WCGT Ltd. has commissioned the required biophysical studies along the pipeline route and at associated infrastructure sites. Information from these studies is used to further refine and optimize the Project footprint.

Following the hierarchy of avoid, minimize, and restore-on-site, Project planning considerations provided the opportunity to avoid Project impacts to wetlands. In general, the primary objective is to locate the proposed pipeline contiguous to the existing rights-of-way wherever practical. Where this is not practical, the hierarchy of routing criteria in descending order of preference included the following: parallel other linear corridors; identify new routing (greenfield) to balance several engineering, construction, environmental, cultural and socio-economic factors; and, in the case of new routing, minimize the length before returning to the existing rights-of-way or other linear corridors.





Town/Village/Service Area
Kilometre Marker
WCGT Pipeline Route
Railway
Highway
International Border
Watercourse
Water Body

ENBRIDGE
Westcoast Connector Gas Transmission

SCALE: 1:1,500,000
0 14,000 28,000 42,000 56,000 m
(All Locations Approximate)

FIGURE 1

REGIONAL OVERVIEW

WESTCOAST CONNECTOR GAS TRANSMISSION LTD.
WESTCOAST CONNECTOR GAS TRANSMISSION PROJECT

Jacobs

NAD 1983 BC Environment Albers
Hillshade Background: TERA Environmental 2008;
Highways/Roads: NRCan 2015; Railways: NRCan 2012; Hydrology: BC FLNRO 2008; Reserves: Government of Canada 2018; Legal Grid: TERA Environmental Consultants 2010; Watercourse Crossings: Jacobs 2021; Project Components: Enbridge 2021.

Although there is no reason to believe that there are any errors associated with the data used to generate this product or in the product itself, users of these data are advised that errors in the data may be present.

January 2022

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2. Wetlands Management Plan Overview

This WMP is being developed to meet the requirements of the Condition 12 in the Certificate. Condition 26 related to the Mugaha Marsh, will also be addressed in this WMP. The WMP will be developed in collaboration with the Indigenous groups, RRAs, and stakeholders.

The scope of the WMP includes:

- Linkages to other plans, purpose and objectives, roles and responsibilities, implementation schedule, and future updates (Section 2)
- Engagement methods that identify parties to be engaged and a plan for engaging Indigenous groups, RRAs and stakeholders, and a description of engagement outcomes help shape the Plan (Section 3)
- Regulatory requirements related to pre-construction, construction, and post-construction (Operation phase) activities of the Project that may impact wetlands (Section 4)
- A description of the wetland mitigation measures that may be implemented during pre-construction, construction, and post-construction (Operations phase) activities of the Project (Section 5)
- A description of the monitoring program (Section 6), pre-, during (Construction phase) and post-construction (Operations phase) monitoring methods, wetland survey locations, performance indicators and targets.
- A description of compensation measures to address any loss of wetland area and/or function.
- A description of the adaptive management program in relations to wetlands, including how the results of monitoring will inform adaptive management (Section 7)
- A plan for reporting on the implementation of the WMP including the schedule, content, and recipients of reports (Section 8)
- Professional Authentication of the WMP (Section 9)

2.1 Purpose and Objectives

The purpose of this WMP is to satisfy Conditions 12 and 26 in the Certificate. The overall desired outcome of the WMP is to avoid net loss of wetland function resulting from the Project (i.e., avoid permanent loss of wetland area and/or wetland function as a result of the Project).

Wetlands functions are defined by the Federal Policy on Wetland Conservation as “the natural processes and derivation of benefits and values associated with wetland ecosystems, including economic production (e.g. peat, agricultural crops, wild rice, peatland forest products), fish and wildlife habitat, organic carbon storage, water supply and purification (groundwater recharge, flood control, maintenance of flow regimes, shoreline erosion buffering), and soil and water conservation, as well as tourism, heritage, recreational, educational, scientific, and aesthetic opportunities.” (Government of Canada 1991).

To determine whether the WMP meets the objectives, the WMP identifies goals that can be measured using several performance indicators. The performance indicators and targets that will be monitored and measured to evaluate the effectiveness of wetlands mitigation measures in achieving the goals of the WMP will be described in Section 6.

The purpose and objectives noted above will be applied to the Mugaha Marsh where there is Project interaction. In addition to applying the regulatory framework, mitigation program, monitoring program, adaptive management approach and reporting requirements outlined in this WMP to Project impacts at

the Mugaha Marsh, the objectives for the Sensitive Area Plan for the Mugaha Marsh (MacKenzie Forest District 2001) will be adhered to and as stated in Condition 26.

If any construction technique other than underground trenchless crossing is used within the Mugaha Marsh, WCGT Ltd. will construct in the winter months for crossings of the marsh, unless otherwise authorized by the BC Oil and Gas Commission (BC OGC).

The following objectives will be adhered to for the Mugaha Marsh, as included under the Order to Establish a Sensitive Area and Objectives (MacKenzie Forest District 2001).

1) Maintain the current mix of forest and wetland habitat for resident wildlife species.
2) Allow for wildlife monitoring and research activities within the sensitive area that do not conflict with the other objectives.
3) Maintain the current range of recreational uses and opportunities.
4) Provide reasonable precautions for the safety of users of the area.

Wildlife habitat within the Project footprint will be addressed in the Wildlife and Wildlife Habitat Management Plan (WWHMP) as per Condition 19.

Plans to address occurrences of inadequate mitigation or unanticipated Project effects are discussed in Section 7.

2.2 Linkages to Other Condition Plans

Information on other condition plans prepared for the Project have been considered in this WMP. The links between this WMP and other Project condition plans are provided in Table 2-1.

Table 2-1. Linkages to Other Condition plans

Plan	Description of the Plan	Linkages to this Plan
Condition 10 - Freshwater Water Quality Monitoring Plan (FWQMP)	The FWQMP outlines onsite water quality monitoring and reporting requirements to be implemented during Construction.	
Condition 19 - Wildlife and Wildlife Habitat Management Plan (WWHMP)	The WWHMP includes survey results for *Species at Risk (SARA)* Schedule 1	The WWHMP contains mitigation applicable to wildlife and wildlife habitat affected by the Project, which can be associated with wetlands.
Condition 22 - Access Management Plan (AMP)	The AMP provides the means by which access will be controlled, the types and locations of access requirements, rationale to demonstrate the necessity of any new temporary or permanent access, access control management measures that will be implemented during Construction and Operations, and post-construction monitoring requirements.	Temporary and permanent access for the Project will interact with wetlands, requiring installation of crossings and establishment of an accessible corridor through wetland areas. The WMP provides a process and strategy that will be followed during access management for the protection of wetlands.

Table 2-1. Linkages to Other Condition plans

Plan	Description of the Plan	Linkages to this Plan
Condition 25 - Restoration Plan (RP)	The RP provides recommendations for soil handling, construction clean-up, erosion control measures, revegetation plans, and life of Project vegetation management.	The RP contains mitigation and restoration measures applicable to wetlands affected by the Project.
Condition 35 – Terrestrial Construction Environmental Management Plan (TCEMP)	The TCEMP describes WCGT Ltd.'s environmental procedures and mitigation measures to field and construction personnel. These environmental procedures and mitigation measures will be implemented during Construction of the Project to mitigate, avoid, or reduce potential adverse environmental effects. The TCEMP serves as reference information for construction and inspection personnel to support decision-making and to provide direction to more detailed information (i.e., resource-specific mitigation, management, and contingency plans). The TCEMP also includes mitigation measures to address additional Conditions: ▪ Condition 23 – integrated pest management for pests related to wetlands ▪ Condition 24 – Red- and Blue-listed plants and ecological communities ▪ Condition 27 – mitigation for Red- and Blue-listed or culturally important lichen and plant species within the Nisga'a Lava Bed Memorial Park ▪ Condition 34 – hunting, trapping, and fishing policy ▪ Condition 35 – Environmental Management Plan that includes details of the Post-construction Monitoring (PCM) Program	The TCEMP forms the basis of the WMP and contains general construction measures applicable to wetlands that are affected by the Project. These environmental protection commitments are adapted from and/or influenced by several sources including regulatory requirements, guidance documents, and Best Management Practices (BMPs), which are further discussed in Section 4.
Condition 43 – Nisga'a Watercourse Restoration Plan (NWRP)	The NWRP outlines the objectives for achieving "no net loss" of environmental function for areas where the pipeline route intersects existing aquatic or riparian habitat restoration or compensation sites within Nisga'a Lands.	

2.3 Implementation Schedule

This WMP will be submitted to the BC EAO at least 90 days before the commencement of Construction. The Plan will be implemented throughout Construction under the supervision of a Qualified Professional (QP), and as described throughout the TCEMP.

WCGT Ltd. will monitor mitigation effectiveness during the Construction period and in the first, third, and fifth years following the first full growing season after completion of final clean-up. Routine operational monitoring will occur over the life of the Project (Section 6).

2.4 Future Updates to the Wetlands Management Plan

Revisions to the WMP could occur as a result of:

- Engagement with Indigenous groups
- Additional information becoming available
- Changes to Project planning (e.g., engineering changes)
- Commitments made during the regulatory review process
- Regulatory permits and authorization Conditions
- Addressing unforeseen resource-specific conditions that may arise during construction

WCGT Ltd. will not inform Indigenous groups and RRAs when minor revisions are made to the WMP (i.e., small changes that would not affect the scope and objectives of the WMP). Examples of small changes include minor updates to text or references within the document such as to contingency plans.

Indigenous groups and RRAs will be provided an opportunity to review and provide comment on material revisions to the WMP (i.e., changes to the scope or mitigation and monitoring requirements). A Document History table listing version, date and distribution will be provided in this document.

3. Engagement

This WMP is being developed through engagement with Indigenous groups (including Nisga'a Nation), Environment and Climate Change Canada (ECCC), the BC Ministry of Forests, Lands, Natural Resource Operations and Rural Development (BC MFLNRORD), Prince Rupert Port Authority (PRPA), and the BC OGC. The WMP will be provided to the BC EAO for review at least 90 days prior to construction.

Throughout the development of the detailed outline, WCGT Ltd. is engaging to ensure the WMP is reflective of Indigenous interests and concerns, meets the intent of the Certificate Conditions, and aligns with regulatory requirements as informed by RRA reviewers.

WCGT Ltd. is engaging on the content and approach provided in this detailed outline. Through this review, WCGT Ltd. wants to ensure a collaborative approach at this early stage and that the outline captures on a high level, the intent and expectation of the Certificate Condition, as well as interests and concerns raised by Indigenous groups and RRAs. The information that WCGT Ltd receives will inform the drafting of the full WMP. WCGT Ltd. will document and track all comments and recommendations received and provide a description on how this information has been considered and incorporated into the WMP.

4. Regulatory Framework

The legislation, regulatory guidelines, BMPs, and policy documents used to develop mitigation measures in the WMP and the TCEMP will be summarized in this section.

Federal and provincial legislation, policy, and regulatory guidance is considered when developing a plan to avoid net loss of wetland area and/or function resulting from the Project, as per Condition 12. As described in the following sections, the Federal Policy on Wetland Conservation (FPWC) establishes the goal of "No Net Loss" of wetland function, and the BC *Environmental Protection and Management Regulation* (*EPMR*) of the BC *Oil and Gas Activities Act* (BC *OGAA*), and the *Water Sustainability Act* (*WSA*), provide regulatory guidance for avoiding, minimizing, mitigating, and restoring wetland and riparian values.

Regulatory guidance is implemented according to direction provided during engagement with Indigenous Groups, ECCC, BC MFLNRORD, PRPA, BC OGC, as described in Section 3.

4.1 Indigenous Land Use Planning Documents

Indigenous Land Use planning documents provide strategic direction for resource management activities. These plans provide direction for areas with general and specific resource values that are managed to sustain environmental, social, economic, or cultural values.

There are no known Indigenous Land Use planning documents applicable to the Plan.

4.2 Regional and Municipal Land Management Plans

Land and Resource Management Plans (LRMPs) and Sustainable Resource Management Plans (SRMPs) strategic direction for resource management activities. These documents provide guidance for areas with general and specific resource values that are managed to sustain environmental, social, or economic values.

Resource management planning documents applicable to the Plan include:

- Fort St. James LRMP
- Fort St. James LRMP
- MacKenzie LRMP
- Mugaha Marsh Order
- Prince George LRMP
- Vanderhoof LRMP
- Babine River Interim Local Resource Use Plan
- Bulkley LRMP
- Bulkley Landscape Unit Plans
- Central Coast LRMP
- Cranberry SRMP
- Kalum LRMP
- Kispiox LRMP
- Lakes District LRMP
- North Lakes LRMP
- Mill Creek Sensitive Area Plan
- Morice LRMP
- Nass South SRMP
- Standardized Industry Management Practices

4.3 Federal

4.3.1 Federal Policy on Wetland Conservation

The objective of the FPWC (Government of Canada 1991) is to promote conservation of Canada's wetlands to sustain their ecological and socio-economic functions. To support this objective, several goals have been established by the FPWC that identify the importance of wetland function. Goals of the FPWC include:

- "No Net Loss" of wetland function on federal lands and waters.
- Enhancement and rehabilitation of wetlands in areas where the continuing loss or degradation of wetlands or their functions have reached critical levels.
- Recognition of wetland functions in resource planning, management, and economic decision-making regarding applicable federal programs, policies, and activities.

The FPWC commits applicable federal departments and projects to the goal of "No Net Loss" of wetland function on federal lands and waters (Government of Canada 1991; Lynch-Stewart 1992; Lynch-Stewart et al. 1996). Guiding principles for use by the federal government in pursuing the objective of the FPWC also acknowledge that conservation of wetland function can only be achieved through the cooperation of the private sector.

For the Project, the goal of "No Net Loss" of wetland function will be applied to wetlands encountered by the Project. As noted in subsection 2.1, WCGT Ltd. intends to avoid net loss of wetland function resulting from the Project (i.e., avoid permanent loss of wetland area and/or function as a result of the Project). Avoidance, minimization, mitigation, and restoration measures will be implemented at these wetlands, and wetlands affected by Project activities, to prevent any net loss of wetland function and are addressed in subsections 5.1 and 5.2.

4.4 Provincial

4.4.1 *Water Sustainability Act*

The *WSA* is the principal law for managing the diversion and use of water resources in BC. Under the *WSA*, the *Water Sustainability Regulation* sets out the statutory requirements for the issuance of licences or approvals for the diversion, use, or storage of surface water or groundwater, and for making Changes In and About a Stream. The definition of stream under the *WSA* is broad, and includes watercourses, wetlands, lakes, and other aquatic features.

For the purposes of the Project, WCGT Ltd. considered the definition of a stream as provided in the *EPMR* under the BC *OGAA*, which defines a stream as "a watercourse, including a watercourse that is obscured by overhanging or bridging vegetation or soil mats, that contains water on perennial or seasonal basis, is scoured by water or contains observable deposits of mineral alluvium, and that (a) has continuous channel bed that is 100 m or more in length, or (b) flows directly into (i) a fish stream or a fish-bearing lake or wetland or (ii) a waterworks".

For oil and gas projects, the BC OGC has authority to an issue an approval for Changes In and About a Stream (including wetlands and lakes) in accordance with Section 11 of the *WSA*. Changes In and About a Stream refer to:

- Any modification to the nature of the stream, including any modification of the land, vegetation, and natural environment of a stream or the flow of water in a stream
- Any activity or construction within a stream channel that has or may have an impact on a stream or stream channel

The *WSA* applies to activities on both Crown and private lands. According to the *Water Sustainability Regulation*, Changes In and About a Stream occurring on BC *OGAA*-regulated projects (i.e., the Project) are considered to be authorized changes if they are conducted in accordance with BC *OGAA* regulations (e.g., the *EPMR*) and have been authorized by a permit issued under the BC *OGAA* process.

5. Mitigation Program

5.1 Mitigation Hierarchy

Project planning and mitigation development considered the mitigation hierarchy of avoid, minimize, and restore-on-site as described in the Policy and Procedures for Mitigating Impacts on Environmental Values (BC MOE 2014a,b). Following this hierarchy, WCGT Ltd. first considered measures to avoid Project effects on wetlands, appropriate measures to minimize and mitigate Project effects and, finally, implement onsite restoration measures to reduce the Project's residual effects on wetlands.

The goal of the mitigation program is to ensure that throughout the Project phases (i.e., pre-construction, construction, and operations), wetland function and area will be maintained or restored as appropriate and "no net loss" of function will occur as per the FPWC.

5.1.1 Project Routing and Siting

The strategies of avoidance through routing, siting, and scheduling have been, and will continue to be, considered in Project planning. The pipeline corridor and route selection process for the Project is described in the Application. In general, the primary objective is to locate the pipeline contiguous to existing linear corridors wherever practical. Where this is not practical, the hierarchy of routing criteria in descending order of preference, included the following: parallel other linear corridors; identify new routing (greenfield) to balance several engineering, construction, environmental, and socio-economic factors; and, in the case of new routing, minimize the length before returning to an existing linear corridor. Crossings at environmental features were avoided to the extent practical, and permanent facilities and infrastructure were sited to avoid wetlands.

The rationale for progressing from avoidance to mitigation includes wetland locations where avoidance is not technically or economically feasible. The pipeline construction activities will require wetland crossings; however, mitigation will be implemented to ensure that "No Net Loss" of wetland function and/or area is achieved. This approach aligns with the intent of the *EPMR*, to reduce impacts on wetlands and riparian areas through avoidance, minimization, mitigation, and restoration. It is not anticipated that wetland area will be lost due to Project activities. Impacts to wetland functions are anticipated to be mitigated for wetlands encountered by the Project footprint by the fifth year following final clean-up and restoration.

5.1.2 Project Design – Wetland Crossings

WCGT Ltd. determines the appropriate pipeline installation method for wetlands by considering and balancing a variety of technical, environmental, stakeholder and economic considerations, along with site -specific conditions.

Factors considered in the selection of wetland crossing methods include:

- terrain and geotechnical constraints;
- Indigenous cultural or environmental (e.g., fisheries) values;
- environmental sensitivities;
- timing and scheduling constraints; and
- cost.

With the exception of the Mugaha Marsh that will be crossed using a trenchless method or under winter conditions unless otherwise approved by the BC OGC, wetlands will be crossed using a trenched method and appropriate mitigation measures.

5.2 Compensation

Based on the findings during the PCM Program, potential corrective measures to mitigate loss of wetland function will be considered, if warranted, to promote the successful return of wetland function within the lifetime of the PCM Program.

If. at the end of the 5-year PCM Program, targets outlined in Table 6-1 are not achieved and corrective measures are not appropriate to return wetland function, next steps will be considered at that time in discussion with appropriate Indigenous groups and RRAs. These may involve either additional remedial measures or compensation (subsections 6.7 and 7.2).

6. Monitoring Program

To meet Condition 12 of the Certificate, WCGT Ltd. is designing and will implement a wetland monitoring program to test the effectiveness of mitigation implemented for the Project. Other monitoring plans pertaining to wetlands that will be implemented during the post-construction phase of the Project are the TCEMP, RP, AMP, WWHMP, and the PCM Program.

Reporting on mitigation effectiveness and compliance will be described in the TCEMP. Should monitoring programs indicate that the measures implemented were not adequate or were ineffective at avoiding or reducing potential residual effects on wetlands, follow-up measures will be implemented.

6.1 Mitigation Compliance Monitoring

Monitoring compliance will include construction monitoring inspections and periodic field visits by WCGT Ltd. personnel or their consultants. These activities are designed for proactive identification of non-compliance issues by verifying Project-specific compliance requirements have been fulfilled.

As described in subsection 2.3, the Environmental Inspector (EI) is responsible for monitoring and follow through on environmental and socio-economic commitments and compliance with applicable legal requirements, regulations, permits, and approval Conditions. This monitoring and follow through by the EI is the step between wetland pre-construction surveys and PCM to ensure mitigation measures are implemented to meet the goal of “no net loss” of wetland function.

6.2 Mitigation Effectiveness Monitoring

Monitoring will take place to measure the effectiveness of mitigation and corrective actions will be taken when necessary. Various performance indicators and measurable targets will be used. Different monitoring programs will occur in construction, post-construction, and operation phases. If a mitigation measure is found to be ineffective at preventing harm to the environment, corrective measures will be taken. These corrective measures are outlined in Section 7 as part of the adaptive management plan.

6.3 Monitoring Timeframe

This subsection outlines monitoring timeframes for the pre-construction period, construction period, post-construction period, and during operations.

6.3.1 Pre-Construction Surveys and Identification

Pre-construction wetland surveys are consistent with previous wetland surveys (Section 4.2 of the Wetland Technical Data Report [Appendix 2M of the Application]) (Spectra Energy 2014) and these data will be used to inform the PCM Program. The purpose of the pre-construction surveys is to collect data to facilitate PCM at wetlands crossed by the Project footprint, and collect site-specific information for wetlands within the Project route that includes:

- Wetland location
- Type
- Area
- Function

This site-specific wetland information is included as Appendix A of this WMP. The results of the pre-construction surveys will be provided to Indigenous groups, ECCC, PRPA, BC EAO, BC MFLNRORD and BC OGC for review a minimum of 90 days prior to planned commencement of construction.

6.3.2 Construction Monitoring

Environmental Monitoring and Inspection during Construction

Environmental inspection will be conducted on a full-time basis for all construction phases. The EI will oversee activities to confirm compliance with environmental regulations and report on issues of non-compliance and stop work if necessary. The EI can notify regulators of non-compliance, implement mitigation, and keep records of incidents. The EI will be supported, when needed, by QPs with expertise in a particular discipline or issue. The QP will be consulted by WCGT Ltd. or the EI when necessary. Environmental inspection is a key component of adaptive management, explained further in Section 7.

6.3.3 Post-Construction Monitoring

Monitoring will occur for the Project footprint in the first, third, and fifth growing seasons following completion of final clean-up as part of the Project PCM Program. PCM of wetlands outside of the Project footprint and within the Project route will not be required as no direct disturbance is anticipated to occur with the implementation of appropriate mitigation measures during construction. Wetland assessments will ideally take place at or near the height of the growing season during the first complete growing season following construction.

WCGT Ltd. will complete a final evaluation of the effectiveness of mitigation upon completion of the 5-year PCM period and will determine if targets have been met and whether additional monitoring may be warranted. For example, if corrective measures are needed at site-specific locations, additional monitoring will be completed following implementation.

6.3.4 Operations Monitoring

During operations, WCGT Ltd. will monitor the Project as part of its operations monitoring program, which includes regular aerial patrols of the right-of way. Additional periodic monitoring during operations may be warranted for concerns such as access management or natural hazards. Indicators of wetland function such as those listed in subsection 6.4.1.4 will be noted (e.g., poor vegetation health, erosion, ponded water etc.).

Outstanding restoration issues remaining after the fifth year following final clean-up and restoration will be identified and addressed by WCGT Ltd. representatives through ongoing routine monitoring of the permanent right-of-way, which will continue for the life of the Project as part of regular operations and maintenance activities. Additional periodic monitoring during operations may be warranted for concerns such as access management or natural hazards.

The WCGT Ltd. representatives will be supported, when needed, by QPs with expertise in a particular discipline or issue. The QP will be consulted by WCGT Ltd. when necessary. WCGT Ltd. will work with Indigenous groups, landowners, stakeholders, and RRAs to resolve any emerging or outstanding environmental issues. Further details will be provided the TCEMP.

6.4 Monitoring Strategy

As noted in the Wetland Technical Data Report (Section 4.2 of Appendix 2M of the Application) (Spectra Energy 2014), Hanson et. al (2008) is used to select wetland function as a Valued Component. Wetland function is determined using a reproducible wetland landscape functional assessment during ground surveys for the Project (Section 4.2 of the Wetland Technical Data Report [Appendix 2M of the Application]) (Spectra Energy 2014).

WCGT Ltd. will monitor the effectiveness of the measures implemented (Section 5 of this WMP and the TCEMP) in wetlands to determine if the goal of the mitigation program (subsection 5.1) is met and identify the need for corrective measures.

6.4.1 Monitoring Methods

6.4.1.1 Wetland Function Indicators

The following provides wetland function indicators used to determine wetland function pre- and post-construction. Monitoring methods include the assessment of performance indicators listed in Table 6-1. Through assessment of performance indicators, it will be determined whether a wetland is on the trajectory to reaching pre-construction conditions (i.e., goals and targets outlined in Table 6-1 and overall goal of “no net loss” of wetland function noted in subsection 5.1) throughout the PCM Program as appropriate.

Habitat Function

The habitat function of wetlands can be determined based on parameters related to the presence of vegetation indicator species and/or communities, wildlife observations, and habitat suitability.

Hydrological Function

The hydrological function of wetlands is dependent on several factors. The source and movement of water can indicate the class of wetland, as well as its importance to surrounding waterbodies and wetlands. Observations of water depth, extent, location, ponding, and channelization provide information on a wetland’s hydrological flow patterns.

Biogeochemical Function

Biogeochemical cycling includes the transport and transformation of carbon and other nutrients through physical, chemical, and biological processes. Wetland biogeochemical function can be defined as material inflows (sink), outflows (source), and intrasystem cycling. Observations on overall topography, substrate composition and condition, vegetation density and vigor, and water quality, provide insight on the capacity of a wetland to store and cycle nutrients.

6.4.1.2 Pre-Construction

Pre-construction wetland surveys will be carried out within the Project footprint, as well as the CPC. As noted in subsection 6.3.1, results of pre-construction surveys for some wetlands within the pipeline route will include results based on the extrapolation of data from comparable wetlands and desktop information such as remote sensing technologies. The Wetland Landscape Functional Assessment used during pre-construction ground surveys for the Project is described in Section 4.2 of the Wetland Technical Data Report [Appendix 2M of the Application]) (Spectra Energy 2014). The intent of the pre-construction

survey is to collect pre-construction data for wetlands to support PCM of wetland function and satisfy the requirements under Condition 12.

Detailed results of the pre-construction survey will be provided to Indigenous groups, BC EAO, ECCC, BC MFLNRORD, PRPA, and BC OGC and for review a minimum of 90 days prior to planned commencement of Construction (Condition 12).

6.4.1.3 Construction Period

A EI will review, collect, organize, and disseminate environmentally-related information and documentation that arises during construction, and will be responsible for the preparation of daily Environmental Inspection reports. Environmental information (e.g., erosion concerns or natural drainage patterns) will be collected throughout construction for documentation and the assessment of effectiveness of procedures/measures used to aid or inform the decision-making process during post-construction. Pertinent environmental information collected during pre-construction surveys may also be reviewed as part of the effectiveness assessment.

6.4.1.4 Post-Construction

Although data are being collected at wetlands within the Project route and CPC to satisfy Condition 12, PCM will occur at wetlands within the Project footprint to confirm whether residual loss of wetland area and/or function occurs as a result of construction and operations. Wetland ecologists view wetlands as dynamic landscape systems (i.e., variables are interrelated) and review wetland condition using professional judgement, available pre-construction data, off right-of-way comparison, and PCM assessments that are similar to those used prior to construction.

Wetland assessments focus on the ability of affected wetlands to provide habitat, hydrological, and biogeochemical functions (described as follows), which can be characterized based on several factors documented in the field (Table 6-1). Wetland surveys will be conducted as part of a PCM Program for wetlands.

6.4.2 Wetland Survey Locations

6.4.2.1 Pre-Construction

Pre-construction survey data will be collected for all wetlands within the CPC prior to construction to collect baseline data (e.g., boundary coordinates, photos, hydrological, habitat, and biogeochemical characteristics). The baseline data will be used during PCM to determine if wetlands are on the trajectory to returning to pre-construction function.

6.4.2.2 Post-Construction

The BC Resources Information Standards Committee (BC RISC) recommends a sample level intensity of 5 to 14 percent for projects between 10,000 to 1,000,000 hectares in size at a ratio of 1 full plot to 15 visual checks (BC RISC 1998). The wetland PCM surveys will exceed this sampling level. During the first year of the PCM Program, all wetlands will be monitored through a combination of field work, and desktop review as appropriate. In subsequent years of the PCM Program (third and fifth growing seasons following completion of final clean-up), wetlands where potential issues related to wetland function recovery are observed will be revisited (subsection 6.4.1.4).

WCGT Ltd. is using remote sensing technologies to aid in wetland data collection. Remote sensing techniques will be used to support field survey results and provide information on wetland conditions where appropriate. Where remote sensing methods are found to provide an equivalent or higher level of data in a cost-effective manner and provide opportunities to reduce field survey effort, WCGT Ltd. intends to implement these methods.

6.5 Performance Indicators and Targets

Monitoring will measure performance indicators to determine if the targets are met. The targets act as triggers for implementation of corrective measures if the mitigation measures are found to be underperforming.

A wetland will be considered to have met restoration success once habitat, hydrologic, and biogeochemical functions are on the trajectory to being restored to pre-construction condition without assistance through restoration or corrective measures.

6.6 Reporting on Mitigation Compliance

An EI will review, collect, organize, and disseminate environmentally-related information and documentation that arises during construction, and will be responsible for the preparation of daily Environmental Inspection reports. Environmental information (e.g., erosion concerns or natural drainage patterns) will be collected throughout construction for documentation and the assessment of effectiveness of procedures/measures used to aid or inform the decision-making process during post-construction.

The EI will document construction methods, decisions related to implementation and location of mitigation measures and final restoration measures and issues encountered, as well as communication records for discussion with RRAs.

7. Adaptive Management

This section outlines how mitigation measures will be re-evaluated should monitoring programs indicate that the measures implemented were not adequate/effective at avoiding or reducing potential residual effects on wildlife.

7.1 Adaptive Management Approach

The results of monitoring will inform the need for corrective measures.

Depending on the performance indicator, evaluation against the measurable target may be conducted during construction, or at each PCM year (i.e., years one, three, and five after restoration is completed). If, at any point during the 5-year PCM Program, performance indicators are found to be underperforming and are unlikely to meet the targets within the 5-year timeframe, corrective measures will be implemented as soon as feasible. Depending on the performance indicator, evaluation against the measurable target may be conducted during construction, or at each PCM year.

7.2 Potential Corrective Measures

Corrective measures will be implemented as soon as practical. Should it be determined during construction or PCM that corrective measures are needed to promote the successful return of wetland function to the preconstruction conditions, recommended measures will be identified on a case by case basis and will depend on the site specific conditions.

Corrective measures may involve implementing modified, alternate, or additional mitigation or remedial measures that may include, but are not limited to:

- recontouring to reestablish pre-construction drainage should an unanticipated impediment occur
- soil stabilization and sediment control

7.2.1 Contingency Plans

Contingency plans will be developed for activities that introduce known risks to wetlands, as follows:

- Contaminated Soil Discovery Contingency Plan (TCEMP)
- Directional Drilling Procedures and Drilling Mud Release Contingency Plan (TCEMP)
- Sedimentation of Watercourses and Non-Classified Drainages Contingency Plan (TCEMP)
- Spill, Fuel, and Hazardous Materials Contingency Plan (TCEMP)
- Construction Environmental Management Plan Contingency Plans

8. Compensation Measures

During the PCM Program, if areas are identified where wetland function is compromised due to the Project to the extent that it cannot be recovered through restoration efforts, WCGT Ltd. will mitigate and implement compensation measures for such loss to the satisfaction of BC EAO (as per Condition 12). In order to deliver this result, WCGT Ltd. will consult with Indigenous groups with an interest in the wetland, BC EAO, and ECCC to determine the appropriate measures to compensate for impacts in accordance with BC's Policy for Mitigating Impacts on Environmental Values (BC MOE 2014a) and achieve the FPWC goal of "No Net Loss" of wetland function. Situations where corrective measures may be appropriate are provided in subsection 7.2.

If after 5 years of PCM, it is confirmed that loss of wetland function and/or area has occurred, WCGT Ltd. will compensate for all such loss in a manner consistent with the FPWC. WCGT Ltd. will consult with RRAs regarding the requirements of a Wetland Compensation Plan following Year 5 PCM to address concerns of loss of wetland function in the Project footprint.

9. Reporting Requirements

During the PCM Program, WCGT Ltd. will prepare reports following completion of PCM during the growing season of each PCM year (i.e., first, third, and fifth growing season following final clean-up). Reporting will include detail on the implementation of site-specific mitigation and habitat restoration measures, information on the indicators measured and their performance in reaching the monitoring target, the monitoring methods used, details of corrective actions taken (if any), as well as an updated engagement record.

The environmental monitoring report filed after the fifth PCM year will include information on the effectiveness of mitigation and corrective actions and will identify any goals that have not been achieved and the need for any further corrective actions and monitoring. The need for additional reporting will be determined through engagement with the BC EAO.

10. Professional Authentication

This WMP is developed and signed by the QPs listed as follows. These individuals will be directly responsible for providing professional services and submitting accurate work as directed by WCGT Ltd. in support of the submission as required by the BC EAO.

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