Construction Environmental Management Plan

Site C Clean Energy Project

Revision 4: July 26, 2016
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Appendix G  Mitigation, Management and Monitoring Plans
Appendix H  Soil Management, Site Restoration and Revegetation Plan
Appendix I  Water Management, Erosion and Sediment Control Plan
## Revision History

<table>
<thead>
<tr>
<th>Version</th>
<th>Date</th>
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<td>10-17-2014</td>
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<td>02-26-2015</td>
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<tr>
<td>Rev 0</td>
<td>05-19-2015</td>
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<td>Rev 1</td>
<td>06-05-2015</td>
<td>Final Plan, Revision 1</td>
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</table>
| Rev 2   | 02-02-2016 | - Clarified requirements to identify applicable permits and authorizations (S. 2.4)  \
|         |            |   - Added requirement to include a table detailing revision history (S. 2.4)  \
|         |            |   - Clarified reporting requirements and timeframes for submitting reports (S. 2.4.2 and 2.4.3)  \
|         |            |   - Added requirement to include a rationale for edits to EPPs (S. 2.4.4)  \
|         |            |   - Clarified the requirements for incident reporting (S. 2.5)  \
|         |            |   - Added provision for BC Hydro to require additional mitigation measures if ambient air quality does not meet the provincial objectives (S. 4.1)  \
|         |            |   - Revised the restriction on blasting near bat hibernacula (S. 4.2)  \
|         |            |   - Deleted reference to obsolete MWLAP Field Guide (S. 4.6)  \
|         |            |   - Added requirement to include a noise management program (S. 4.11)  \
|         |            |   - Updated the language for 85th Avenue industrial lands noise (S. 4.11)  \
|         |            |   - Updated requirements for contents of spill kits and that “spills if any volume are an Environment Incident”. (S. 4.13)  \
|         |            |   - Added controls for application of road salt (S. 4.14)  \
|         |            |   - Buffer around nests if a bird builds or occupies a nest in an active construction zone changed to a minimum 5 m (S. 4.17)  \

These revisions are not material within the meaning of Section 2.6 because:
- the revisions will not result in a reduction of any monitoring or reporting requirements
- the revisions will not result in the deletion or reduction of an environmental specification
- the revisions will not otherwise make an adverse effect more likely, nor become more adverse and be significant.
<table>
<thead>
<tr>
<th>Rev 3</th>
<th>07-08-2016</th>
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<tbody>
<tr>
<td></td>
<td>Revised Table numbering and the Table of Contents</td>
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<tr>
<td></td>
<td>Clarified roles and responsibilities, IEM duties, lines of communication, reporting requirements, reformatted for greater clarity, and provided further definition of terms (Glossary, S. 2 and sub-sections, 2.4.3, 2.4.4, 2.5, 2.6, 4.5, 4.13 and 4.17)</td>
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<td></td>
<td>Added reference to the Environmental Assessment for the project and added background related to the Environmental Assessment findings, conclusions and requirements for greater clarity (S. 1.2, 1.4 and 1.5.)</td>
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<td></td>
<td>Added reference to and a summary of the BC Water License Process required for dam and reservoir construction to provide greater background and clarity (S. 1.2 and Appendix F).</td>
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<td>Added reference to the requirement for, and a summary of separate mitigation, management and monitoring plans required by the Environmental Assessment Certificate as applicable to construction (S. 1.5 and Appendix G).</td>
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<td></td>
<td>Clarified requirements for inclusion in EPPs (S. 2.4).</td>
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<td></td>
<td>Revised text for clarity related to environmental monitoring requirements, added “The QEP will define in each EPP the work activities that fall into the above risk categories.” (S. 2.4.1).</td>
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<td></td>
<td>Revised text associated with incident reporting timelines and what must be reported immediately (S. 2.5).</td>
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<td></td>
<td>Updated environmental orientation and tailboard sections to clarify project requirements (S. 3.1 and 3.2)</td>
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<td></td>
<td>Revised to provide clarity related to requirement for contingency sediment and erosion control supplies, required mitigation measures for water balance mitigation and added “unless otherwise authorized in a permit or approval” (S. 4.4).</td>
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<td></td>
<td>Added detail related to hydro acoustic monitoring and mitigation, readily biodegradable hydraulic fluid requirements, clarity that coffer dam work is included, improved clarity for fish salvage requirements, minimum flow requirements to better reflect project requirements and added greater clarity for guideline references, added “unless otherwise authorized in a permit or approval (S. 4.5).</td>
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<tr>
<td></td>
<td>Used wording from BMP to better describe desired equipment condition and added “unless otherwise authorized in a permit or approval (S. 4.6).</td>
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<td></td>
<td>Revised to better reflect requirements for EPPs related to use of groundwater and associated licensing requirements (S. 4.7).</td>
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</table>
• Revised and reformatted Soil Management, Site Restoration, and Revegetation requirements to provide greater clarity and better reflect project requirements (S. 4.12)

• Revised to provide greater clarity related to spill contingency supply, training, emergency response and external reporting requirements, added “spills of any volume are an Environmental Incident” (S. 4.13).

• Revised to provide clarity related to concrete and concrete product and water diversion mitigation and associated guidelines, required water management details to be provided for structures capable of retaining water, added that Technical Specifications for some contracts provide additional details for how to manage acid rock drainage and metal leachate, and added “unless otherwise authorized in a permit or approval” (S. 4.14).

• Relocated rare plant mitigation elements from S. 4.17 to S. 4.15 and adding clarity for work associated with invasive plant and pest management to be in accordance with applicable guidelines (S. 4.15).

• Revised to provide further clarity related to the requirement for animal proof containers (S. 4.16).

• Revised for greater clarity related to data reporting, buffer zones, mapping updates, speed limit sign posting, mitigation measure requirements to better reflect project requirements, added survey and monitoring requirement clarity for grouse leks, added clarity for education of workers related to identification of wildlife dens, provided clarity on what “adjacent to” means, and, added “after considering site-specific information” to QEP role in establishing buffers (S. 4.17).

• Added Appendix H – Soil Management, Site Restoration, and Revegetation Plan that augments and adds to previous measures for clarity (S.4.12)

• Added Appendix I – Water Management, Erosion and Sediment Control Plan, to augment measures prescribed in CEMP (S. 4.4). Compliance with the Erosion and Sediment Control Plan is required by a S34(1) Order from the BC Environmental Assessment Office.

These revisions are not material within the meaning of Section 2.6 because:

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• the revisions will not result in the deletion or reduction of an environmental specification

• the revisions will not otherwise make an adverse effect more likely, nor become more adverse and be significant.
## GLOSSARY

| Aboriginal Groups                       | • Blueberry River First Nations  
|                                        | • Dene Tha’ First Nation        
|                                        | • Doig River First Nation       
|                                        | • Duncan’s First Nation         
|                                        | • Fort Nelson First Nation      
|                                        | • Halfway River First Nation    
|                                        | • Horse Lake First Nation       
|                                        | • Kelly Lake Métis Settlement Society 
|                                        | • McLeod Lake Indian Band       
|                                        | • Métis Nation British Columbia  
|                                        | • Prophet River First Nation    
|                                        | • Saulteau First Nations        
|                                        | • West Moberly First Nations    |
| CEMP                                    | • Construction Environmental Management Plan |
| Construction                            | Any activity associated with building the Site C project, including but not limited to:  
|                                        | • clearing                      
|                                        | • site preparation              
|                                        | • quarrying                     
|                                        | • excavation                    
|                                        | • material handling and processing 
|                                        | • material placement            
|                                        | • concrete works                
|                                        | • road and bridge building      
|                                        | • site reclamation              |
| Dam Site Area                           | • The grey area shown in Figure 2 |
| Environmental Features Map             | • GIS spatial data that identifies known environmental, heritage and cultural features and environmentally sensitive areas.  
<p>|                                        | • This data will be updated as additional information is collected. |</p>
<table>
<thead>
<tr>
<th>Environmental Incident</th>
<th>An event, act or omission that is, or has the potential to cause, a violation of any of the Environmental Requirements. Examples of Environmental Incidents include, but are not limited to:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- Spills of oil, fuel, hazardous chemicals</td>
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<td></td>
<td>- Unauthorized discharges of deleterious substances into fish-bearing water bodies</td>
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<tr>
<td></td>
<td>- Unauthorized alteration, disruption, or destruction of aquatic or terrestrial habitat</td>
</tr>
<tr>
<td></td>
<td>- Alteration of, or damage to, heritage or archaeological resources</td>
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<tr>
<td></td>
<td>- Fires related to construction activities</td>
</tr>
<tr>
<td></td>
<td>- Unauthorized release of air pollutants</td>
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<tr>
<td>Environmental Monitor</td>
<td>A Qualified Environmental Professional who observes and reports on construction activities in relation to the requirements under the applicable EPP</td>
</tr>
<tr>
<td>Environmental Requirements</td>
<td>The Environmental Specifications</td>
</tr>
<tr>
<td></td>
<td>The conditions included in the Environmental Assessment Certificate for the Project (BC Environmental Assessment Office, 2014)</td>
</tr>
<tr>
<td></td>
<td>The conditions included in the decision statement issued by the Minister of Environment of Canada (CEAA, 2014)</td>
</tr>
<tr>
<td></td>
<td>The permits, authorizations and approvals for the Project issued by regulatory agencies</td>
</tr>
<tr>
<td></td>
<td>Statutory requirements</td>
</tr>
<tr>
<td>Environmental Specifications</td>
<td>The specifications set out in Section 4 of this CEMP</td>
</tr>
</tbody>
</table>
| Environmentally Sensitive Area | Location of an environmental feature of importance, including but not limited to:  
| | • Watercourse crossing  
| | • Location of rare or endangered plant  
| | • Sensitive ecosystem sites (wetlands, tufa seeps, marl fens, grasslands, and old-growth forests)  
| | • Raptor nest site  
| | • Nest or den site of rare or endangered wildlife  
| | • Culturally important feature  
| | • Rare plant sites  
| | • Active bear, wolf, fox or coyote den sites |
| EPP | • Environmental Protection Plan |
| Important Wildlife Areas | Wildlife habitat areas that many animals use around the same time each year, including, but not limited to:  
| | • wetlands  
| | • snake hibernacula  
| | • bat hibernacula  
| | • sharp-tailed grouse leks  
| | • beaver lodges, dams and food caches  
| | • active furbearer and large carnivore den sites  
| | • active bird nests  
| | • mineral licks  
| | • habitat used by ungulates for winter range  
<p>| | • amphibian breeding sites and migration routes |
| Independent Engineer | • A person, retained by BC Hydro, with professional qualifications and demonstrated experience and knowledge, who provides information regarding the design and construction of the Project under the direction of the Comptroller of Water Rights |
| Independent Environmental Monitor | • A person, retained by BC Hydro, with professional qualifications, demonstrated experience and knowledge of environmental monitoring for construction projects in BC, including experience working in a third party role, who will summarize the environmental reports prepared by BC Hydro and its contractors and report monthly to BC Hydro, the Independent Engineer, the BC Environmental Assessment Office, the Canadian Environmental Assessment Agency, the Comptroller of Water Rights, and any other regulatory agencies as directed from time to time by BC Hydro, on the compliance of the construction activities with the Environmental Requirements |</p>
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Invasive Plants</td>
<td>A noxious weed designated by weed control regulation in British Columbia to be a noxious weed, and includes the seeds of the noxious weed, as well as invasive species identified under the Peace River Regional District Invasive Plant Program</td>
</tr>
<tr>
<td>Ordinary High Water Mark</td>
<td>The visible high water mark of any river, stream, wetland or other body of water where the presence and action of the water are so common and usual and so long continued in all ordinary years as to mark upon the soil of the bed of the river, stream, wetland or other body of water a character distinct from that of the banks, both in vegetation and in the nature of the soil itself. (BC Ministry of Environment, 2014)</td>
</tr>
<tr>
<td>Project Activity Zone</td>
<td>Area within which the Project components will be found or will occur, but not including existing transportation infrastructure that will be used without modification to transport materials or personnel required for the Project. (BC Hydro 2013)</td>
</tr>
<tr>
<td>Qualified Environmental Professional (QEP)</td>
<td>An applied scientist or technologist who specializes in a relevant applied science or technology including, but not limited to: agrology, forestry, biology, engineering, geomorphology, geology, hydrology, hydrogeology or landscape architecture. A Qualified Environmental Professional must be a member in good standing registered with the appropriate professional organization in British Columbia, and acting under that association’s Code of Ethics and subject to disciplinary action by that association. He or she must also be someone who, through demonstrated suitable education, experience, accreditation and knowledge relevant to the particular matter, may be reasonably relied on to provide advice within his or her area of expertise. (BC Environmental Assessment Office, 2014)</td>
</tr>
<tr>
<td>The Project</td>
<td>Site C Clean Energy Project</td>
</tr>
<tr>
<td>Raptors</td>
<td>Birds of prey including eagles, hawks, owls and falcons</td>
</tr>
</tbody>
</table>
RISC

- BC Integrated Land management Bureau Resources Information Standards Committee

RSEM

- Relocated Surplus Excavated Material

Sensitive Wildlife

- Wildlife species that require specific habitats or habitat features which could be affected by Project activities within or adjacent to the habitat or feature
- Wildlife species that are known to be intolerant of human caused disturbance during critical times of the year (e.g. breeding season, winter season)

Stop Work Procedure

- A procedure to be provided in each EPP that is to be followed in the event that a construction activity must be stopped for non-compliance with an EPP. The procedure must be developed in accordance with Section 2.4.3 of this CEMP

Work Avoidance Zone

- Areas where construction activities are prohibited, or restricted to specified activities

References


1.0 Introduction

1.1 BC Hydro

BC Hydro is a Crown corporation owned by the Province of British Columbia. BC Hydro’s mandate is to generate, manufacture, conserve, purchase, and sell electricity to meet the needs of its customers. BC Hydro serves 95 per cent of B.C.’s population, delivering electricity safely and reliably to approximately 1.9 million customers.

As the largest electric utility in British Columbia, BC Hydro operates an integrated system with 31 hydroelectric facilities and three thermal generating plants, totaling approximately 12,000 MW of installed generating capacity. The hydroelectric facilities provide over 95 per cent of the total electricity generated and are located in the Peace, Columbia, and Coastal regions of B.C.

BC Hydro owns and operates two hydroelectric generation facilities on the Peace River that together account for greater than 30% of the capacity of the electrical power generation facilities in B.C. The existing facilities are operated as part of a coordinated system to allow BC Hydro to respond to seasonal and hourly changes in electricity demand.

W.A.C. Bennett Dam was completed in 1968 and is located 168 km upstream of the Alberta border. The Peace Canyon Dam was constructed in 1976 approximately 23 km downstream of the W.A.C. Bennett Dam near the town of Hudson's Hope. Water discharged from the G.M. Shrum Generating Station or released from discharge facilities (spillways, low level outlets) at W.A.C. Bennett Dam flows directly into the Dinosaur Reservoir. Water discharged from the Peace Canyon Dam and Generating Station enters the Peace River and flows downstream past the Site C dam site.

1.2 Project Overview and Description

The Site C Clean Energy Project (the Project) will be the third dam and generating station on the Peace River. The Project will provide up to 1,100 MW of capacity and about 5,100 GWh of energy each year to the province’s integrated electricity system.

The components of the Project are:

- Dam, generating station, and spillways
- Reservoir
- Hudson’s Hope shoreline protection berm
- Substation and transmission lines to Peace Canyon Dam
- Highway 29 realignment
- Quarried and excavated construction materials
- Worker accommodation
- Road and rail access.

This Construction Environmental Management Plan (CEMP) applies to all activities undertaken in construction of the Project. The Project is as described in Schedule A of the Environmental Assessment Certificate #14-02 issued in respect of the Project.

Specific Project components related to dam and reservoir construction are subject to BC Provincial Water Licensing that includes the requirement to obtain specific Leaves to Commence Construction (LCCs) from the Comptroller of Water Rights (CWR) as described in Appendix F.
1.3 BC Hydro Environmental Responsibility Policy

The Project will be constructed and operated to meet the objectives of BC Hydro’s Environmental Responsibility Policy which currently states:

“Consistent with our purpose to provide reliable power at low cost for generations, BC Hydro is committed to producing, acquiring, delivering and consuming electricity in an environmentally, socially and financially responsible manner.

We recognize that our energy system causes both positive and negative impacts on the environment and on those with whom we share public resources. Conservation is a key means to avoid negative environmental impacts. Where negative impacts cannot be avoided, we will work to minimize and offset them and sustain resources over the long term.

Specifically, BC Hydro will:

- Meet environmental requirements defined by legislation, regulation, government directives, and other environmental standards that apply to BC Hydro.
- Perform beyond environmental requirements where it makes sound business sense.
- Make decisions about environmental risk and opportunity in accordance with our values in a structured and systematic way to balance competing objectives.
- Continually improve our environmental performance and our environmental management systems exercising due diligence.
- Work to reduce historic environmental impacts.
- Develop and foster an electrical energy conservation culture in B.C. that leads to customers choosing to make a dramatic and permanent reduction in electricity consumption.
- Seek products, services and new supplies of energy that take into account environmental responsibility.
- Work cooperatively with stakeholders and First Nations on resource use, management, and conservation to increase public benefits from affected resources.
- Publicly report on our environmental performance.”
1.4 Environmental Assessment

The Site C Project underwent a cooperative Environmental Assessment in accordance with the BC Environmental Assessment Act (BCEAA) and the Canadian Environmental Assessment Act (CEAA). The environmental assessment of the Project focused on 22 valued components (VCs), or aspects of the biophysical and human setting that are considered important by Aboriginal groups, the public, the scientific community, and government agencies. In the Environmental Impact Statement (EIS), valued components were categorized under five pillars: environmental, economic, social, heritage and health. For each VC, the assessment of the potential effects of the Project components and activities during construction and operations was based on a comparison of the biophysical and human environments between the predicted future conditions with the Project, and the predicted future conditions without the Project.

Potential adverse effects on each VC are described in the EIS along with technically and economically feasible mitigation measures, their potential effectiveness, as well as specific follow-up and related commitments for implementation. If a residual effect was found on a VC, the effect was evaluated for significance. Residual effects were categorized using criteria related to direction, magnitude, geographic extent, context, level of confidence and probability, in accordance with the EIS Guidelines.

Existing baseline conditions, potential effects of the Project and proposed measures to mitigate potential effects on Fish and Fish Habitat, Vegetation and Ecological Communities, Wildlife Resources and Heritage Resources are described in the Project’s EIS, Volume 2, Sections 12, 13 and 14, and Volume 4 Section 32, respectively.

The assessment found that the effects of the Project will largely be mitigated through careful, comprehensive mitigation programs and ongoing monitoring during construction and operations. The EIS indicates that the Project is unlikely to result in a significant adverse effect for most of the valued components. However, a determination of a significant effect of the Project was found on four VCs: Fish and Fish Habitat, Wildlife Resources, Vegetation and Ecological Communities, and Current Use of Lands and Resources for Traditional Purposes.

1.5 Environmental Assessment Conclusion

On October 14, 2014, the Provincial Ministers of Environment and of Forests, Lands and Natural Resource Operation decided that the Project is in the public interest and that the benefits provided by the Project outweigh the likely risks of significant adverse environmental, social and heritage effects. The Ministers have issued an Environmental Assessment Certificate setting conditions under which the Project can proceed.

Further, on November 25, 2014, The Minister of Environment of Canada issued a Decision Statement confirming that, while the Project has the potential to result in some significant adverse effects, the Federal Cabinet has concluded that those effects are justified in the circumstances. The Decision Statement sets out the conditions under which the Project can proceed.

Condition 70 of the EAC Document requires that BC Hydro prepare specific mitigation, management and monitoring plans (“Plans”) to satisfy associated requirements. Appendix G provides an overview level description of the plans as they pertain to construction and associated links where the plans can be viewed. Additional and relevant information is found within these plans that may require referral in development of site specific Environmental Protection Plans in accordance with this CEMP.
2.0 Environmental Management Roles and Responsibilities

Environmental management is the responsibility of BC Hydro, the Independent Environmental Monitor (IEM), BC Hydro’s contractors and their qualified environmental professionals and environmental monitors. Compliance with environmental requirements will involve ongoing discussions with the regulatory agencies. The relationships and associated lines of communication between these various parties for the construction phase of the Project are shown in Figure 1. Specific roles and responsibilities are described in the section below.

Roles and responsibilities of BC hydro and contractors are summarized in Table 1. More detail is provided in the sub-sections of Section 2.
Table 1 Summary of Roles and Responsibilities

<table>
<thead>
<tr>
<th>Entity</th>
<th>Role and Responsibility</th>
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<tbody>
<tr>
<td>BC Hydro</td>
<td>Develop and maintain the CEMP</td>
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<tr>
<td></td>
<td>Lead communication with stakeholders and Aboriginal groups</td>
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<td></td>
<td>Review contractor’s EPP’s</td>
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<td>Audit compliance with the requirements of EPPs</td>
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<td></td>
<td>Report to regulators and the IEM</td>
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<td></td>
<td>Report environmental incidents internally and to Aboriginal Groups</td>
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<td></td>
<td>Monitor air quality, noise and vibration</td>
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<td></td>
<td>Communicate with the IEM on Project progress and compliance with Environmental Requirements</td>
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<td></td>
<td>Prepare monthly reports in accordance with EAC requirements, and provide these monthly reports to the IEM to communicate Project progress and compliance with Environmental Requirements, and provide these monthly reports to the IE during construction under the Water License.</td>
</tr>
<tr>
<td>Contractors</td>
<td>Appoint a QEP to prepare EPP(s) and manage and supervise Environmental Monitors</td>
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<tr>
<td></td>
<td>Appoint Environmental Monitor(s)</td>
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<td>Ensure that all construction activities are conducted in compliance with the applicable EPP</td>
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<td>Ensure that their workers and subcontractors are appropriately trained and supervised</td>
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<td>Ensure that their Supervisors and Environmental Monitors attend an environmental overview training workshop.</td>
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<td>Ensure that the tailboard meetings take place</td>
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<td>Inform BC Hydro should the conditions differ materially from those anticipated under the applicable EPP</td>
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<td>Undertake corrective and preventative measures in response to non-conformance with the EPP</td>
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<td></td>
<td>Ensure that all permits necessary to undertake the construction activities have been obtained</td>
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<td>Report environmental information to BC Hydro</td>
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<td></td>
<td>Immediately report every Environmental Incident as described in S. 2.5</td>
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<td></td>
<td>Investigate the cause of every Environmental Incident and implement preventive and corrective actions</td>
</tr>
<tr>
<td>Independent Environmental Monitor</td>
<td>Review and comment on the CEMP providing recommendations to the Comptroller of Water Rights for acceptance where required by the Comptroller of Water Rights (CWR) (see Appendix F).</td>
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<tr>
<td></td>
<td>Audit and review compliance of construction activities with the Environmental Requirements</td>
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<tr>
<td></td>
<td>Report directly to regulators on the compliance of the construction activities with the Environmental Requirements during construction. Where requested by the CWR, report to the CWR and the IE (See Appendix F).</td>
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<td></td>
<td>Review and comment on contractors’ EPPs. Where a specific condition of the CWL Process (See Appendix F), verify that EPP’s adequately address environmental mitigation requirements and provide comments to indicate acceptance or if revisions are warranted prior to construction proceeding.</td>
</tr>
</tbody>
</table>
2.1 BC Hydro

BC Hydro will:

- Develop and maintain the Construction Environmental Management Plan (CEMP) that specifies the requirements for Environmental Protection Plans (EPPs)
- Communicate with the Contractors’ personnel and the IEM related to compliance with the CEMP and related component plans
- Lead communication with regulatory agencies, local governments, interested and potentially affected Aboriginal Groups, and public stakeholders, including property owners and local residents
- Audit compliance with the requirements of the applicable EPP including, but not limited to:
  - Conformance of construction activities to the Environmental Requirements
  - The effectiveness of implemented mitigation measures
  - That implemented mitigation measures are maintained for as long as those mitigation measures are required
  - That applicable permits and approvals have been obtained
  - That spill response and emergency equipment and procedures are implemented and maintained
  - Worker training and supervision
  - Response to environmental incidents
  - Waste records
- Prepare and submit monthly reports to the Independent Environmental Monitor, EAO and CEAA within 45 days following the reporting period. Submit the monthly reports to the IE during construction under the Water License. Monthly reports are to summarize:
  - Project progress
  - EMP and EPP submissions
  - Permits issued by provincial and federal agencies
  - Reports submitted by contractor Environmental Monitors
  - Results of the BC Hydro field inspections
  - Environmental incidents and applicable corrective action
  - Compliance of construction activities with the Environmental Requirements
- Monitor air quality, noise and vibration
2.2 Independent Environmental Monitor

BC Hydro will retain an Independent Environmental Monitor (IEM). The IEM will have authority and responsibility to audit and review:

- compliance of construction activities with the Environmental Requirements
- BC Hydro’s auditing of contractor’s environmental monitoring as described in Section 2.1
- BC Hydro monthly environmental reports as described in Section 2.1
- contractor environmental monitoring as described in Sections 2.3.1
- contractor environmental monitoring reports as described in Sections 2.3.1
- environmental incident reports as described in Section 2.5
- the content and frequency of environmental overview training and pre-work orientation and tailboard meetings as described in Section 3.

The IEM will:

- develop, and submit to BC Hydro and the Comptroller of Water Rights, a work plan that describes the activities that the IEM will undertake, including but not limited to:
  - the frequency of on-site inspection of construction activities
  - the QEPs from the IEM’s staff, their positions and their responsibilities, to be involved in the on-site inspection activities
  - the QEPs from the IEM’s staff, their positions and their responsibilities, to be involved in the review of documents.

- communicate with BC Hydro, Contractors QEPs, and the Contractors EM during audit activities and in response to review of plans and reporting related to compliance.

- communicate with the Independent Engineer during construction to coordinate their activities to provide information to the Comptroller of Water Rights for proper regulation of the construction of the works; and

- report directly to the Independent Engineer, the executive director of the Environmental Assessment Office, the President of the Canadian Environmental Assessment Agency, the Comptroller of Water Rights, and any other regulatory agencies as directed from time to time by BC Hydro, on the compliance of the construction activities with the Environmental Requirements during construction.
2.3 Contractors

Contractors must:

- Appoint Qualified Environmental Professionals to develop EPPs in accordance with Section 2.4
- Ensure that all of the contractor’s construction activities are carried out in accordance with an EPP
- Appoint Qualified Environmental Professional(s) to:
  - manage and supervise the contractors’ Environmental Monitors
  - communicate with BC Hydro and the IEM regarding compliance with the CEMP and related component plans
  - communicate to external agencies where required by legislation or specific permit requirements (e.g. compliant with spill reporting regulation).
- Ensure that their workers and subcontractors are appropriately trained, supervised and have the necessary experience and competency to implement the requirements of the EPPs
- Ensure that their Supervisors and Environmental Monitors attend an environmental overview training workshop as described in Section 3.1 of this CEMP
- Ensure that the tailboard meetings described in Section 3.2 of this CEMP take place
- Inform BC Hydro should the conditions of the environment or construction practices change materially from that as anticipated under the applicable EPP.
- Undertake corrective and preventative measures in response to non-conformance with the EPP, and ensure that such measures have been implemented in a timely manner
- Ensure that all permits necessary to undertake the construction activities have been obtained, either by BC Hydro or by the contractor, prior to commencing such construction activities.
- By January 30 of each year report to BC Hydro the following information:
  - The quantity of each type of fuel consumed at the Project site during the preceding year
  - The production throughput for the preceding year of on-site processes that contribute to greenhouse gas emissions

2.3.1 Environmental Monitors

Contractors must appoint Environmental Monitors who will monitor construction activities with respect to compliance with the applicable EPPs, under the direction of a Qualified Environmental Professional.

The responsibilities of the Environmental Monitors are:

- Conducting monitoring of construction in accordance with the applicable EPP
- Communicate with BC Hydro and the IEM onsite representatives during auditing activities as it relates to compliance
- Providing technical assistance on environmental matters to construction personnel
• In consultation with the contractor’s Qualified Environmental Professional, providing recommendations for modifying and/or improving environmental mitigation measures, as necessary
• Documenting construction activities, mitigation measures, and environmental incidents by field notes and photographs
• Taking field measurements and conducting analyses in accordance with the EPP
• Completing inspection checklists for each monitoring site visit consistent with the monitoring requirements in the EPP
• In consultation with the Qualified Environmental Professional, identifying and providing recommendations for resolving potential problems to the contractor and BC Hydro
• Preparing and submitting to BC Hydro and the Independent Environmental Monitor weekly Environmental Monitoring Reports during construction periods in accordance with the relevant EPPs.
• Preparing and submitting to BC Hydro and the Independent Environmental Monitor an Environmental Completion Report at the end of construction activities that describes compliance with the applicable EPPs, and any reportable environmental incidents, including the responses to those incidents, that may have occurred in the course of work

2.4 Environmental Protection Plans
An EPP will be prepared by Qualified Environmental Professionals with the expertise relevant to the construction activities covered by the EPP.

In developing the EPP, the QEP will take into consideration:
• any guidance issued by regulatory authorities with respect to the Environmental Requirements or Environmental Specifications that may be applicable
• the Environmental Requirements and the Environmental Specifications
• contract requirements

The EPP will include:
• a clear statement of objectives
• a description of the particular construction activities and location to which the EPP applies
• mapping at a suitable scale, including identification of any environmentally sensitive areas
• a description of the potential environmental effects and safety hazards that relate to environmental management for the specific activities and locations of the work
• detailed site or activity-specific mitigation measures and how they will be implemented
• provisions for working in extreme cold temperatures where applicable
• identification of applicable permits and authorizations
• a description of worker qualifications and training requirements pertaining to implementation and monitoring of the requirements within the EPP
• description of how the contractor will comply with the conditions of those permits and authorizations
• a table detailing revision history.
For clarity, Component Management Plans may be prepared to address activity-specific rather than site-specific measures and shall be considered EPPs for the purposes of this CEMP.

2.4.1 Environmental Monitoring

Each EPP will provide for environmental monitoring of construction activities sufficient to reliably determine whether the construction activities are being conducted in compliance with the EPP. The minimum requirements for environmental monitoring are as follows; with percentages relating to time the EM is expected to be present during specific work components:

- Minor environmental risk activities – less than 10% of the activity must be monitored
- Low environmental risk activities –10% to 40% of the activity must be monitored
- Moderate environmental risk activities –40% to 90% of the activity must be monitored
- High environmental risk activities –100% of the activity must be monitored

The QEP will define in each EPP the work activities that fall into the above risk categories.

Each EPP must provide the following details with respect to monitoring:

- The type and frequency of observations and data collection, methodologies to be employed, and protocols to be followed, including, but not limited to:
  - Regular inspection of:
    - sediment and erosion control measures
    - RSEM areas and management measures required for Acid Rock Drainage/Metal Leaching
    - construction equipment on site for leaks or spills
    - bulk fuel storage facilities, including monitoring of fuel deliveries and transfers
    - adequacy of the emergency response and spill containment and recovery equipment, and spill response training programs
    - construction activities to evaluate appropriate implementation of mitigation measures
    - construction waste management programs
  - Water quality monitoring upstream and downstream of construction areas including RSEM, including measurement of common parameters (e.g., pH, temperature, turbidity, dissolved oxygen, conductivity, total suspended solids), especially during construction (e.g., concrete pours) in the vicinity of watercourses
  - Monitoring the quality of point discharges relative to the applicable requirements

2.4.2 Reporting

Each EPP will provide for weekly reporting of environmental information and provide for reporting whether construction activities are being conducted in accordance with the EPP including, but not limited to:

- For the reporting period, a description of:
  - construction activities
  - environmental monitoring activities
identified environmental issues and corresponding mitigation measures implemented

- Results of any testing of environmental attributes as they become available
- Photographs (accompanied by identifying information such as date, location) documenting construction activities, environmental issues, and corresponding mitigation measures.
- An Environmental Completion Report at the conclusion of the construction activities covered by the EPP, including, but not limited to:
  - a summary of construction activities
  - a summary of environmental monitoring activities during construction
  - a description of environmental incidents and issues encountered during construction, and the management and mitigation measures used to resolve the issues
  - representative site photographs

Weekly reports shall be submitted to BC Hydro within one week of the reporting period. Environmental Completion Reports shall be submitted within 30 days of the completion of the construction activities covered by the EPP.

Each EPP will provide that, for any monitoring data collected, sampling conducted, or analyses performed the following information shall be reported, in a format acceptable to BC Hydro:
- the place, date and time of sampling;
- the analyses that were performed and the dates they were performed;
- the analytical techniques, methods, or procedures used in the analyses;
- the names of the persons who collected and analyzed each sample; and
- the results of the analyses.

2.4.3 Stop Work

Every EPP must provide for a Stop Work Procedure. Every Stop Work Procedure must:
- Identify the person(s) employed by the contractor with the authority to direct that a construction activity that is being conducted in breach of the EPP must be immediately stopped (the contractor’s designated person)
- The direct contact information for that (those) person(s)
- Provide that the contractor’s designated person, the Independent Environmental Monitor, and BC Hydro each have the authority to stop a construction activity that is being conducted in breach of an EPP, in accordance with the Stop Work Procedure.

The EPP must provide that any order to stop work that is issued shall include a description of the nature of the non-compliance, including a description of the activity, the location, the time and the element of the EPP that is being breached. When an order to stop work is issued, the Environmental Monitor must also immediately notify BC Hydro and the Independent Environmental Monitor.

Once work has been stopped due to a stop work order, it must not re-start until the Contractor’s EM, Contractor’s QEP and BC Hydro are satisfied that the work will be compliant with the EPP.
Within five working days of any order to stop work being issued, the contractor must provide to BC Hydro and the Independent Environmental Monitor a written environmental incident investigation report that meets the requirements of Section 2.5 Environmental Incidents.

2.4.4 EPP Review and Revision

The Qualified Environmental Professional that prepares an EPP is responsible for ensuring that it meets the requirements of this CEMP. In addition, each EPP must be provided to BC Hydro at least 30 days prior to commencement of the construction activities covered by that EPP. BC Hydro and the IEM may review the EPP and may require the QEP, the contractor, or both, to demonstrate that the EPP complies with the requirements of this CEMP prior to commencement of the construction activities covered by that EPP.

Any revisions to an EPP must be provided to BC Hydro prior to construction activities covered by the revised EPP. BC Hydro and the IEM may review the revised EPP and may require the QEP, the contractor, or both, to provide a rationale for the revision, and to demonstrate that the revised EPP complies with the requirements of this CEMP prior to commencement of the construction activities covered by that revised EPP.

EPPs may require revisions as a result of amendments of the CEMP or in response to relevant changes, for example, changes in:

- Project design
- Construction procedures and methods
- Construction schedule
- Site conditions

2.5 Environmental Incidents

In the event of an Environmental Incident contractors must:

- Immediately report all available information regarding the Environmental Incident (e.g., Location, nature of incident, potentially affected environment, scale of incident (minor, moderate, severe), etc.) to:
  - the appropriate authority if required by statute to be reported;
  - BC Hydro; and
  - the Independent Environmental Monitor.

- Within five working days of an Environmental Incident reported to Regulators or an order to stop work, provide to BC Hydro and the Independent Environmental Monitor a written environmental incident investigation report that includes appropriate photo documentation and describes the:
  - Nature of the incident
  - Approximate magnitude and duration of the incident
  - Area or habitat affected
  - Environmental resources affected
  - Results of any sample analysis taken in conjunction with the incident (e.g., water samples)
  - Root cause(s) of the incident
Immediate actions taken
Preventive and corrective actions to control or limit the activity causing the incident, including a time frame for implementation
Communications held with the contractor’s employees and with BC Hydro
Communications with the Independent Environmental Monitor or regulatory agencies

- Reports will be available to regulators upon request
- Contractors must implement the identified preventive and corrective actions in the time frame specified
- The contractor’s QEP must confirm in a written report to BC Hydro that the identified preventive and corrective actions have been taken within five working days of implementation of each action

In the event of an Environmental Incident BC Hydro must:

- Report internally in accordance with corporate reporting policies and procedures
- Report externally where required by applicable legislation (e.g. Spill Reporting Regulation)
- Ensure the IEM is notified of the incident, in the event the Contractor failed to do so
- Notify Aboriginal Groups as required
2.6 CEMP Review and Revision

During construction of the Project, at least once every 12 months, and more often as may be required, BC Hydro will review this CEMP.

Further information may become available as detailed design progresses and as the results of pre-construction surveys are received. Information may also be received from contractors, Aboriginal Groups, the public and regulatory agencies. During construction, corrective or preventative actions may be taken in response to incidents. It may be beneficial to take this information into account in a revision of this CEMP.

A material revision of this CEMP is one which would be relevant to the question of whether an adverse effect is more likely to occur, or become more adverse, and be significant, and would include, in particular:

- A reduction of monitoring or reporting requirements
- Deletion of an environmental specification, or making a specification less stringent

If BC Hydro proposes to make a material revision of this CEMP, to the extent practical in the circumstances, BC Hydro will provide draft text of the proposed material revision for review and comment to i) the executive director of the Environmental Assessment Office (the “Executive Director”), ii) the President of the Canadian Environmental Assessment Agency (the “President of the Agency”), iii) BC Ministry of Environment, BC Ministry of Forests Lands and Natural Resource Operations, Environment Canada, Natural Resources Canada, and iv) Aboriginal Groups who would potentially be affected by the proposed revision.

The period of time provided for review and comment on a proposed material revision will depend on the nature or urgency of the revision and the relative interests or jurisdiction of government agencies and of the rights and relative interests of potentially affected Aboriginal group, and any legal requirement to consult. If BC Hydro proposes material revisions to the body of this CEMP, a copy of the CEMP showing the proposed revisions will be provided. If BC Hydro proposes to materially revise an appendix, a revised copy of the appendix only will be provided.

BC Hydro will also provide an opportunity to review and provide comments on proposed material revisions to those contractors who have been required to develop EPPs. The opportunity to review and provide comments will be given utilizing the communication protocols provided for in the contracts.

An opportunity to review and provide comments will not be provided for proposed revisions that would not be material, for example, revisions to:

- correct typographical or grammatical errors
- reflect changes that are necessary as a result of other amendments, for example, updating page numbers, updating the version number or date of the CEMP, updating the glossary, etc.
- revise or update citations to references, guidance documents or statutory documents
- add monitoring or reporting requirements
- add an environmental specification or make an existing specification more stringent

Each time the CEMP is revised, all EPPs must be reviewed by a QEP and revised, where necessary.
3.0 Orientation, Training and Tailboard Meetings

The activities identified in this section shall be conducted as part of the Project to provide a basis for informing contractors, BC Hydro, and their crews of environmental requirements specified in this CEMP.

3.1 Environmental Overview Training

Prior to the start of field activities, Field Crew Supervisors, Qualified Environmental Professionals and Environmental Monitors shall attend an environmental overview and training workshop. The workshop will include, but is not limited to, the following topics, as applicable to the construction activities to be undertaken:

- Briefings and copies of Schedule B (Table of Conditions) of the EAC and all Environmental and Safety Management Plans identified in Schedule B that are relevant to works
- The requirements of the EPPs
- Potential effects of the Project and proposed mitigation measures
- Environmental Requirements
- Requirements of the CEMP
- The roles and responsibilities of BC Hydro, the contractor, Environmental Monitors, and other members of the Project team
- The requirement for Environmental Monitors to immediately advise the contractor’s representative who has the authority to stop work, and BC Hydro, of construction activities that are not being conducted in accordance with the applicable EPP
- Environmental reporting and communication structures
- Environmental mapping of sensitive areas
- Procedures for reporting of environmental incidents and emergencies

3.2 Pre-work Orientation and Tailboard Meetings

Pre-Work Orientation training shall be provided for each worker prior to beginning construction activities at a site, so that workers are aware of the requirements set out in the EPP applicable to the construction activities to be conducted. Pre-Work Orientation training shall include Bear-Aware training or equivalent.

Field crew Tailboard Meetings shall be held prior to the commencement of construction activities and at regular intervals thereafter. The frequency of subsequent tailboard meetings will be dependent upon the nature of the construction activities and the environmental risks associated with that work. Specific information to be discussed in Tailboard meetings includes, but is not limited to:

- Environmentally Sensitive Areas, potential effects and mitigation
- Construction activities planned
- All applicable mitigation measures, including, for example, Work Avoidance Zones applicable to the planned construction activities, as described in the EPP
- All Pre-Work Orientation Meetings and Tailboards shall be documented by the contractor, and documentation provided to BC Hydro upon request.
4.0 Environmental Specifications

In this section, specifications are provided that must be implemented under EPPs, where applicable to the construction activities. These specifications are largely standard construction practices. In some places, specific commitments made by BC Hydro are specified.

4.1 Air Quality Management

Emissions of criteria air contaminants from Project activities have the potential to affect human health.

BC Hydro will implement an ambient air quality monitoring program in the vicinity of the project. Where measured ambient air quality does not meet the British Columbia Ambient Air Quality Objectives (BC Ministry of Environment, 2015), BC Hydro may require additional mitigation measures such as changes in construction methods or engineered controls to address the issue.

EPPs will address, at a minimum, the following requirements if applicable:

General

- Control of emissions of fine particulate matter (PM$_{2.5}$ and PM$_{10}$), dust and greenhouse gases
- Pollution prevention, keeping clean areas clean and continuous improvement, as described in A National Commitment to Pollution Prevention (CCME 1993) and Guidance Document on Continuous Improvement and Keeping Clean Areas Clean (CCME 2007)
- Retain vegetative barriers, or install temporary barriers, where practical
- Manage smoke from the burning of clearing debris in accordance with the Smoke Management Plan (Appendix A).

Drilling

- Equip on-site drills with dust suppression systems such as dust collectors or wet drilling systems
- Where wet drilling is prohibited by technical specifications, use another type of dust suppression system

Material Handling

- To reduce dust, when loading materials onto vehicles, stockpiles and conveyors adjust drop heights to less than two metres where feasible
- With materials that may emit dust, cover loads when hauling
- Load trucks so that loads do not spill during movement

Conveyors

- Enclose transfer points where feasible
- Ventilate transfer points through particulate matter control equipment (i.e., cyclone, baghouse or similar control device) at all times when the conveyors are in operation
For open transfer points, manage dust by water spray, fog nozzles or equivalent

Minimize the vertical distance between material transfer points to the extent feasible

When required, clean the ground under conveyors and transfer points to remove accumulations of particulate matter

Manage dust associated with the off-site portion of the 85th Avenue Industrial lands conveyor belt by enclosing it, or by providing an alternative that is as effective in managing dust associated with operation of the conveyor

Concrete Batch Plant Operations

Enclose cement and fly-ash storage bins, and associated transfer points

Operate particulate matter control equipment (i.e., cyclone, bag house or similar control device) during filling of silos

Regularly inspect and maintain emissions controls in accordance with supplier specification

Fully enclose the weigh hopper, and ventilate it through particulate matter control equipment (i.e., cyclone, baghouse or similar control device) at all times when it is being filled

At truck-mix plants, fit the truck loading bays with a telescopic chute, flexible sleeve, or equivalent, long enough to enter the hatches on the truck

Material Extraction and Processing

Use water sprays as required to suppress dust, except where this would result in not meeting technical specifications of the material being extracted or processed

Enclose all processing equipment to the fullest extent practical to contain fugitive emissions

Inspect enclosures regularly and repair as required to control potential emissions

Equip crushers and screens with particulate matter control equipment (i.e., cyclone, baghouse or similar control device) and water spray bars to knock down fugitive emissions

Minimize vertical drop distance of materials to transfer points to the extent feasible

Roads and Highways

Dust shall be controlled on unpaved roads using water or an alternate accepted dust suppressant (calcium chloride or magnesium chloride)

Dust suppressants shall be applied in accordance with Environmental Best Practices For Highway Maintenance Activities (BC MOTI 2010)

Oil shall not be used as a dust suppressant

Use of water for dust control will be in accordance with an authorization under the Water Act

Limit general site traffic to established haul routes
• Define a program for sweeping or cleaning off on-site paved roads based on weather conditions, traffic volumes and other factors

**Vehicles and Equipment**

- Inspect and maintain vehicles and equipment in accordance with manufacturers’ specifications
- Use modern machinery and commercially available low sulphur fuels
- Minimize engine idling to the extent feasible
- Optimize trucking loads to reduce the number of trips between the source and destination

**Asphalt Production**

- Inspect and maintain the burner and air systems in accordance with manufacturers’ specifications in order to ensure that fuel consumption is reduced and carbon monoxide and volatile organic carbon emissions are controlled
- Control the flow of aggregate to ensure that it remains clear of the combustion zone of the burner’s flame
- Install thermocouples and other sensors to monitor temperature and pressure change within the burner system
- Regularly calibrate these sensors in accordance with manufacturers’ specifications to ensure that they are functioning at their optimum levels

**Air Quality Monitoring and Reporting**

BC Hydro will monitor air quality in the vicinity of the project, and report the monitoring results, in accordance with the Air Quality Monitoring Program (Appendix B). Results will be provided to contractors.

**References**


4.2 Blasting Management

Dust, noise, and vibration from blasting have the potential to affect the health of humans, wildlife and fish. Potential adverse effects include noise, ground vibration, air blast overpressure, fly-rock, dust, and pollution.

All blasting must be conducted in accordance with Part 21 Blasting Operations of the Guidelines for Workers Compensation Act and OHS Regulation.

EPPs will address, at a minimum, the following requirements if applicable:

Timing Windows
- Blasting must be conducted in accordance with Guidelines for Raptor Conservation (BC MOE 2013);
- Blasting is prohibited:
  - within 1 km of an active raptor nest from April 1 to July 31; or
  - within 300 m of bat hibernacula from September 15 to May 15.
- Blasting is prohibited at the West Pine Quarry from January 1 to March 31.
- Blasting levels are limited at the West Pine Quarry to no greater than historical levels from May 15 to June 14.

Noise and Vibration
- Comply with applicable environmental guidelines and setbacks for use of explosives near watercourses, including Fisheries and Oceans Canada’s Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters (Wright and Hopky 1998), or an Authorization

Worker and Public Safety
- Implement mitigation measures to control fly rock
- Secure and limit access to blasting areas to qualified personnel involved in, and necessary for, blasting operations
- Prohibit smoking in and around explosives storage locations and blasting areas
- Maintain fire-fighting equipment in explosive storage facilities and at handling areas
- Design blasts (e.g., reducing maximum instantaneous charge, explosive type, blast pattern, size, etc.) to control blasting energy to only that required. Blast design and supervision shall be undertaken by qualified professionals holding appropriate and valid certification

Blasting in potentially acid generating rock must be done in accordance with Appendix E Acid Rock Drainage and Metal Leachate Management Plan.

Explosives Transportation and Storage
- Comply with all applicable legislation and regulations in connection with the use, storage, and transportation of explosives
• Transport explosives components separately and store them in separate and secure designated facilities, located safe distances from other facilities as recommended by qualified professionals

Control of Blast Debris and Dust
• Dust and overpressure shall be controlled by using appropriate blast hole patterns, detonation systems and stemming to prevent venting of blasts
• Safe overpressure limits shall be established by a qualified specialist

References

Wright, D.G. and G.E. Hopky, Department of Fisheries and Oceans. 1998. Guidelines for Use of Explosives in or Near Canadian Fisheries Waters. Access via:
4.3 Contaminated Sites Management

Potentially contaminated sites within the Project footprint have been identified and categorized based on the potential for contamination. Thirteen sites were classified as potentially contaminated, and 33 sites were classified as requiring further investigation. In addition, previously unidentified contaminated sites or materials (e.g., soil and groundwater) may be encountered during construction activities.

BC Hydro will:

- provide the locations of known contaminated or potentially contaminated sites to contractors;
- carry out further investigation on the remaining sites noted above
- conduct a risk assessment for each site based on the investigation results and the Project activities
- remediate the site if required by risk assessment

The objective of the general Contaminated Sites Environmental Management Plan is to outline the general procedures that would be followed if suspected contaminated materials are encountered during construction.

EPPs will address, at a minimum, the following requirements if applicable:

Discovery of Potentially Contaminated Soil

- Assess all excavated and imported soils for indicators of potential soil contamination. Indicators of potentially contaminated soils include, but are not limited to:
  - Unusual appearance or odour
  - Staining or sheens
  - Buried debris or trash (e.g., drums, automotive parts, cleaning rags, tanks) or
  - Suspect waste (e.g., batteries and metal parts)
- If potentially contaminated soils are encountered during excavation, segregate these soils from uncontaminated soil and stockpile them separately
- If potentially contaminated soils are encountered during the placement of imported soil, segregate the entire truckload of imported soil and stockpile it separately and immediately notify BC Hydro
- This soil shall be sampled and characterized by a contaminated sites approved professional, in accordance with *Technical Guidance on Contaminated Sites 1: Site Characterization and Confirmation Testing* (BCMOE 2009)
- If confirmed to be contaminated, secure contaminated soils and restrict access to authorized personnel and
- Only further handle potentially contaminated soils (e.g., placed or moved) after it has been sampled and confirmed to be non-contaminated by a contaminated sites approved professional
Handling, Storage and Movement of Contaminated Soil

- Take the following precautions when stockpiling potentially contaminated soils:
  - cover with plastic sheeting or tarps to prevent erosion
  - install a berm around the stockpile to prevent runoff from leaving the area
  - locate the stockpile at least 15 m from the Ordinary High Water Mark of any water course or wetland

- Handle and store contaminated or potentially contaminated soil under the direction of a contaminated sites approved professional, or by authorized personnel under the supervision of the contaminated sites approved professional

- Track and document the transport of all contaminated material in accordance with the Contaminated Sites Regulation

Removal of Wood Poles

Soil around wood poles may contain wood preservatives and be considered contaminated under the provincial Contaminated Sites Regulation.

Where a wood pole IS to be removed completely from the ground:

- All excess soil removed from within one meter of the pole site during wood pole renewal work must be disposed of at a facility authorized to accept this waste.

Where a wood pole IS NOT to be removed completely from the ground:

- Poles scheduled for replacement shall be cut about 0.5 m below the surrounding ground level and the hole backfilled with native material.

Wood poles may be stored for up to 90 days. Temporary wood poles storage areas must be located at least 10 m from water bodies and Environmentally Sensitive Areas. Storage areas must be less than 46.5 m².

Reference


4.4 Erosion Prevention and Sediment Control Management

Construction of the Site C dam may result in the generation of sediment. Other Project construction activities such as relocation of Highway 29, clearing, and transmission line construction may also generate sediment. Sediment has the potential to affect fish, fish habitat and riparian habitat, surface water quality and land use, such as agriculture.

Sediment control system including ditches, retention ponds and settling ponds shall be designed by a Qualified Environmental Professional. Design details, including calculations, shall be submitted to BC Hydro. BC Hydro will make available to contractors the work that it has done regarding construction sediment inputs. Sediment and erosion control structures (for example straw bales, vegetation matting) shall be certified weed free.

EPPs must identify areas of high erosion and sediment potential. EPPs must also follow the requirements for planning, implementing and maintaining water management, erosion and sediment control measures outlined in Appendix I: Water Management, Erosion and Sediment Control Plan.

While the Plan in Appendix I shall govern overall project water management, erosion and sediment control measures, the following are considered minimum requirements that shall be addressed in EPPs:

**Sediment Control**

- Effective sediment and erosion control measures shall be installed before starting construction to reduce the potential for introduction of sediment into watercourses
- Applying applicable aspects of Land Development Guidelines for the Protection of Aquatic Habitat (Fisheries and Oceans Canada 1993) and Standards and Best Practices for Instream Works (BC Ministry of Environment 2004), unless otherwise specified in the Environmental Requirements or authorized in a permit or approval
- Design and construction shall follow the Standards and Best Practices for Instream Works (BC Ministry of Environment 2004)
- Control runoff and manage stormwater (for example rainfall or snow melt) and direct it away from construction areas where excavation, spoil placement, and staging activities occur
- Prior to construction of the Jackfish Lake Road, or Project access roads, and of the transmission line, develop, with the assistance of a hydrologist, site-specific measures to reduce changes to the existing hydraulic balance and wetland function during construction, including installation of culverts installed under access roads to maintain hydrological balance and sedimentation barriers
- Isolate in-stream work areas from flowing water to prevent sediment from entering the downstream environment except as permitted by the environmental monitor
- The nature and location of silt fences, berms, swales, ditches, check dams, settling ponds, and other sediment and erosion control facilities, as required
- Contingency supplies of sediment and erosion control materials shall be maintained at each construction site and workers shall be sufficiently trained in their appropriate installation and maintenance
- Sediment and erosion control measures shall be:  
  - inspected regularly at a frequency commensurate with the risk, nature, location, and...
seasonality of the work
  o adapted or revised, as appropriate
  o repaired as necessary in a timely manner, commensurate with the risk, nature, location, and seasonality of the work
  o maintained until construction is completed and the affected areas are sufficiently stabilized and revegetated so there is minimal risk of erosion or sedimentation at the site as a result of construction activities
  o Sediment and erosion control contingency supplies must be onsite, readily accessible, clearly identifiable, and of sufficient quantity to respond to an event. EPPs must indicate and describe the minimum supply of contingency supplies to be kept onsite, relevant to the work.

- Storage and disposal of construction wastes, overburden, soil, or other substances in such a manner as to reduce the potential for entry into any streams or watercourses including:
  o Stockpiles of materials shall be located at least 15 m from the Ordinary High Water Mark of any watercourse or wetland, unless otherwise reviewed by the Environmental Monitor and deemed to pose a low risk of sediment entry into any waterbody.
  o Cover stockpiles of erodible materials such as soil with plastic sheeting or tarps, or establish vegetative cover, to prevent erosion

- Manage equipment production rates if required to reduce the amount of sediment generated

- Use clean rock materials for riprap construction to reduce the amount of sediment that is introduced into the aquatic environment

- When feasible, adjust the timing of construction activities to coincide with periods of high background sediment levels in consideration of the Peace Region aquatic wildlife least-risk windows identified in Terms and Conditions for Changes In and About a Stream Specified by Ministry of Environmental Habitat Officers, Peace Sub-Region (BC Ministry of Environment 2010).

### Erosion Control

- Control site runoff by ditching, grading, sedimentation ponds, check dams or effective alternatives
- Stabilize slopes by maintaining ground cover or using materials such as geotextiles/erosion control cloth
- Leave stumps in place to reduce soil disturbance, erosion and sediment transport in the headpond during reservoir clearing to reduce soil disturbance and potential sedimentation issues
- Manage vegetation and soil stripping, taking into consideration slope stability and the proximity to sensitive habitats such as wetlands
- Identify natural drainages that occur within cleared areas and incorporate appropriate sediment and erosion control measures into site planning
- Incorporate perimeter channels, as required, to catch and transport site runoff from new construction sites and equipment staging areas
- Install water bars to direct road surface runoff away from access roads in a safe manner
• Where required, install appropriately sized culverts to reduce road failure through erosion and to manage hydrological balance and wetland function
• Maintain ditches along access roads, as required, to control surface runoff and sediment transport
• Operate machinery on land above the high water mark in a manner that reduces disturbance to the banks of watercourses
• Remove sediment control measures, such as plastic sheeting and silt fencing, when no longer required, as determined by the Environmental Monitors
• Salvage and stockpile clean surface soils for site restoration
• Establish and maintain vegetative cover on the soils stockpiled for six months or longer to prevent erosion
• Restore disturbed areas to a stable vegetated condition as soon as possible in accordance with 4.12 Soil Management, Site Restoration and Revegetation
• Develop construction schedules such that reservoir clearing in the winter is maximized

References


4.5 Fisheries and Aquatic Habitat Management

Construction activities may affect aquatic habitat and riparian areas. Potential effects include alteration of aquatic habitat and reduction of fish health and survival. Clearing of all project construction sites, including but not limited to the reservoir, transmission corridor, Highway 29, dam site and quarries will be conducted in accordance with the Vegetation Clearing and Debris Management Plan.

EPPs will address, at a minimum, the following requirements if applicable:

**Protection of Aquatic and Riparian Habitat**

- Description of the areas and types of aquatic and riparian habitat with the potential to be adversely affected from construction activities, and mitigation measures and best management practices proposed to reduce, avoid, or offset potential adverse effects
- Unless otherwise authorized in a permit or approval, construction activities will be conducted in accordance with:
- Except at the Dam Site Area (see Figure 2) during clearing, prohibit construction within 15 m of the Ordinary High Water Mark, unless the activity was described in the EIS
- Avoid construction and installation of transmission structures and associated infrastructure (i.e. anchors, guy wires) below the high water mark of any watercourse
- Inform the EM prior to working within 30 meters of a watercourse or wetland
- Use existing roads, trails, or cut lines, wherever possible
- Retain a 15 m machine-free riparian buffer from the Ordinary High Water Mark of watercourses and waterbodies during clearing
- Locate lay-down and material storage areas at least 15 m from the Ordinary High Water Mark
- Clearly flag or otherwise delineate riparian areas throughout all phases of construction
- Prevent debris and deleterious substances from entering watercourses
- Screen the intakes of any pumps in accordance with Fisheries and Oceans *Canada’s Freshwater Intake End-of-Pipe Fish Screen Guidelines* (Fisheries and Oceans Canada 1995)
- Conduct visual and/or hydrophone monitoring of underwater sound pressure levels and fish during pile driving, as per BC Marine and Pile Driving Contractors Association’s Best Management Practices for Pile Driving and Related Operations (BC Marine and Pile Driving Contractors Association 2003). Implement mitigation measures if the threshold of 30 kPa is exceeded.
- During Reservoir Filling and Operations (see Appendix F), maintain in the Peace River, as measured immediately downstream of the Site C dam:
  - *a minimum flow of 390 cms*
  - *a minimum flow of as ordered by an Engineer under the Water Act*
- Use readily biodegradable hydraulic fluids in equipment working within or above water.
Sediment Controls

Install effective sediment and erosion control measures and conduct construction activities in a manner which reduces the potential for siltation into watercourses in accordance with Section 4.4 of this CEMP.

Work Timing Windows

Unless otherwise specified in the Environmental Requirements, conduct construction activities within watercourses only during the Peace Region aquatic wildlife least-risk windows identified in Terms and Conditions for Changes In and About a Stream Specified by Ministry of Environmental Habitat Officers, Peace Sub-Region (BC Ministry of Environment 2010).

The least-risk window does not apply if:

- The stream channel is naturally dry (no flow) or frozen to the bottom at the worksite and the instream activity will not adversely impact fish habitat (e.g., result in the introduction of sediment into fish habitat), or
- Construction of a winter crossing is proposed and such work does not adversely impact the stream channel (including stream banks), fish habitat or fish passage.
Fish Salvage and Relocation

Unless otherwise specified in the Environmental Requirements, fish salvage shall be conducted prior to the start of construction activities to capture and relocate any fish present within the work area. Fish salvage and relocation plans will be developed that take into account the following considerations:

- Fish salvage activities will be conducted in accordance with fish collection permits issued by MFLNRO and/or DFO
- Where feasible, prior to instream construction work, exclude fish from a section of the watercourse using stop-nets or other suitable measures
- Stop-nets should remain in place for the duration of the instream work, and should be monitored to ensure that they remain free of debris and continue to prevent fish access to the work area
- Fish should be captured by electrofishing, seining, trapping or a combination of these methods
- Alternative fish salvage approaches will be implemented in advance of those works where work area isolation or fish exclusion is not expected to be technically feasible or effective, such as certain instream work components in the mainstem of the Peace River. The intent is to capture those species and life stages that are expected to remain in the work area given the nature of the works being undertaken (i.e., less mobile fish such as species with small adult body size, and juvenile life stages of large fish species). Fish will be captured in advance of the works using methods suited to the habitat where work is planned. Backpack and/or boat electrofishing are potential capture techniques that are suited to these habitats, though other techniques may also be suited. Fish will be relocated well downstream of the work area.
- Transport and release salvaged fish into suitable habitat (e.g., habitat in which they are likely to survive), and within the same reach either above or below the construction area, and in a location that would not require re-salvaging. Planning for release locations should also take into account the number of fish expected to be released and the capacity of the habitat. Multiple release locations may be required when large numbers of fish are released.
- Fish holding times should be as short as feasible to reduce stress on salvaged fish. Maximum holding times should be specified for each fish species requiring salvaging
- Fish salvage plans in the construction headpond or in the Peace River downstream of Site C should be developed in coordination with the effectiveness monitoring program titled: Fish and Fish Habitat Productivity - Stranding monitoring program
- The potential for fluctuating water levels to re-water salvaged areas, the requirement to monitor for this, and the requirement to conduct additional fish salvage as required.
Water Crossings and Instream Works

- Apply these requirements to all manner of in-stream work including but not limited to road crossings, rip rap placement, coffer dam installation and maintenance, in-river excavations, structure placement below top-of-bank, etc.
- Avoid instream construction activities on fish-bearing watercourses during construction of access road crossings where feasible,
- Unless otherwise authorized in a permit or approval, the design and construction of water crossings shall follow applicable aspects of:
  - *Measures to Avoid Causing Harm to Fish and Fish Habitat* (Fisheries and Oceans Canada 2013)
- Design and construct clear-span structures to avoid placement of materials such as abutments and rip rap below the high water mark of any watercourse where feasible
- Isolate instream construction areas in accordance with Appendix 14.2 Work Area Isolation of Standards and Best Practices for Instream Works (BC Ministry of Environment, 2004) and/or as authorized in an applicable permit or approval
- Design and construct approaches so that they are perpendicular to watercourses to reduce disturbance to or loss of riparian vegetation where feasible
- Design and construct bridges so that stormwater runoff from bridge decks, side slopes, and approaches is directed into a retention pond or vegetated area to remove suspended solids, dissipate velocity and prevent sediment and other deleterious substances from entering watercourses
- If replacement rock reinforcement/ armouring is required to stabilize eroding inlets and outlets of a culvert, the following measures shall be incorporated:
  - Place appropriately-sized, clean rocks into the eroding areas associated directly with the inlet or outlet
  - Obtain rocks from above the high water mark of any watercourse
  - Avoid the use of rock that is acid-generating
  - Install rock at a similar slope to maintain a uniform stream bank and natural stream alignment
  - Do not place rock where it interferes with fish passage or constricts the channel width

Water Isolation and Diversion

If it is necessary to complete work within the stream channel, dewatering the site will proceed after effective fish salvage has been completed. The following guidelines shall be implemented during isolation and dewatering:

- The isolation of the work area must not cut off flow to downstream portions of the stream (below the isolation area) at any time during construction. The point of discharge to the stream should be located immediately downstream of the work area and upstream of the fish stop fence
• If surface flow is present, water from upstream should be diverted with a suitable method, such as through a diversion channel, gravity bypass pipe, or by pumping around the site. The point of discharge to the stream should not result in sedimentation, scour, or erosion

• If flow is redirected through a temporary diversion channel, the channel should be lined with an appropriate material (e.g., filter cloth, clean gravel) to prevent erosion of the exposed channel bed

• Following isolation of the work area, sediment laden water that accumulates within the site due to groundwater flow or seepage should be pumped to a suitable sedimentation pond or vegetated area, far enough from the watercourse to prevent direct re-entry into the channel. Excavation of a small sump upstream and downstream of the work area will assist in collecting seepage, which can then be pumped away from the watercourse

• The isolation and diversion structures and equipment shall be monitored and regularly maintained until the works are sufficiently completed and until the Environmental Monitor determines that there is no longer a risk of adverse effects to aquatic resources or water quality as a result of flowing water through the work areas

**Decommissioning and Site Restoration**

• Decommission and remove temporary structures used during construction within the construction season that they are deemed to be no longer required

• Upon completion of construction activities, remove surplus materials and wastes from the work sites, and dispose at appropriate facilities

• Install and maintain appropriate sediment control measures until such time that natural vegetation becomes established

• To the extent possible, restore surface soil adjacent to the stream channel using low impact equipment under dry soil conditions

• Restore riparian management areas disturbed during work to a stable vegetated condition as soon as possible in accordance with 4.12 Soil Management, Site Restoration and Revegetation

• Where possible, re-establish ground cover to allow adequate vegetative growth prior to the onset of rainfall and snowfall events. If this is not possible, alternate erosion measures must be provided

• Upon completion of restoration activities, remove all remaining sediment and erosion control measures, unless necessary to protect areas where vegetation is naturally establishing.

• Remove all equipment, supplies and materials associated with the work

**Aquatic Invasive Species**

Equipment arriving at the Project area could contain aquatic invasive species. To avoid the introduction aquatic invasive species, EPPs must address, at a minimum, the following:

• Demonstrate compliance with the BC Wildlife Act’s Controlled Alien Species Regulations

• Measures to avoid the introduction of aquatic invasive species into the Project area, including procedures for equipment inspection, cleaning and treatment of wash water
References


4.6 Fuel Handling and Storage Management

During construction, fuels will be delivered to and stored on the site for refuelling of service vehicles, equipment and machinery. Mishandling of fuels could affect groundwater and surface water quality, and fish and wildlife habitat. Spilled fuels would create a fire hazard.

EPPs will address, at a minimum, the following requirements if applicable:

- Unless otherwise authorized in a permit or approval, plan, design, and construct fuel storage and handling facilities following applicable aspects of the Standards and Best Practices for Instream Works (BC Ministry of Environment 2004). Locate storage, handling and equipment and vehicle maintenance and repair sites on flat, stable ground, at least 30 m from the Ordinary High Water Mark of watercourses and wetlands.

- Store all tanks, barrels, and containers greater than 23 litres containing hydrocarbon products within impermeable containment designed to contain 110% of the volume of the largest container. Containers must be transported upright and secured to prevent shifting and toppling. Impermeable containment is required for stationary fuel storage as well as mobile fuel storage (i.e., fuel trucks) when remaining on site overnight.

- Store and transport containers that are 23 litres or less in an equipment box of a vehicle that is capable of containing the total quantity of fuel in the container(s) should it leak or spill.

- Operate storage area(s) so that containment systems remain effective during wet weather, and provide protection against theft and vandalism.

- Sites shall have a written Spill Contingency Plan with required actions specified and will include the names of those to be contacted.

- Plastic containers used to carry petroleum products shall be designed for that purpose.

- Verify that containers do not leak and are sealed with a proper fitting cap or lid.

- Label containers according to the Transportation of Dangerous Goods Act Regulations.

- Transport hydrocarbons to and within construction areas, in conformance with the requirements of the Transportation of Dangerous Goods Act.

- Refuel equipment at least 30 m from the Ordinary High Water Mark of watercourses and wetlands. In locations where this is not practical, describe and implement protective measures to ensure that all spilled fuel is contained and recovered. This includes measures to prevent spills during fueling of boats.

- Ensure all sites where fuel handling and storage is happening are equipped with appropriate spill kits.

- Inspect vehicles and equipment, including their hydraulic fittings, daily to verify that they are in good condition and free of leaks, and excess oil or grease.

- Compressors/generators required at helicopter fly-in sites shall be placed in an impermeable containment area designed and constructed to contain 110% of the volume of any potential fuel spill. Absorbent pads shall be included in the “fly box” tool kits for sites requiring fuel containing equipment.

- Store fuels separately from corrosive materials.

- Prohibit smoking in the vicinity of fuel storage and dispensing facilities in accordance with the Occupational Health and Safety Regulations.
An inspection program for fuel storage (i.e., tanks and transfer systems) and dispensing
locations and equipment shall be developed by a qualified professional, and
implemented by the contractor. This program shall be submitted to and accepted by BC
Hydro prior to construction of fuel storage and dispensing facilities

Reference

4.7 Groundwater Protection

Project construction activities that have the potential to affect groundwater quality include, but are not limited to:

- Storage, use, and potential spills of fuels, chemicals and hazardous materials;
- Reservoir filling;
- Excavation, drilling, and construction around springs and groundwater seeps as well as other activities that can expose groundwater to surface contamination;
- Activities that produce waste fluid and water which could infiltrate into the ground (e.g., washing of cement and concrete, camp septic systems, equipment maintenance).

EPPs will address, at a minimum, the following requirements if applicable:

Use of Groundwater

- Non-domestic groundwater diversion or use is regulated under the Water Sustainability Act and the Groundwater Protection Regulation (2016)
  - Identification of licensing requirements for groundwater use

Managing Infrastructure Prior to Inundation

- Inspect all properties with infrastructure within the proposed reservoir footprint for potential sources of groundwater contamination prior to reservoir inundation. Potential sources of contamination include:
  - Building infrastructure
  - Septic tanks and fields
  - Underground storage tanks
  - Debris and waste, within buildings and on the property
- Decommission identified potential sources of contamination associated with properties and infrastructure within the reservoir footprint, prior to reservoir inundation
- Decommission water wells that will potentially be directly inundated by reservoir filling prior to reservoir filling
- Identify, characterize and remediate contaminated sites in accordance with the Contaminated Sites Management Plan

Groundwater Protection Measures

- Drilling will be conducted in accordance with the *Groundwater Protection Regulation*
- Waste liquid shall only be discharged to ground:
  - If it has been sampled and meets applicable standards
  - In accordance with a permit or other provincial authorization, or an applicable regulation or code of practice
4.8 Hazardous Waste Management

Hazardous wastes include, but are not limited to, asbestos, fuels, used fuels, oils, oil filters, greases, bitumen's, lubricants, solvents, cement, paints, solvents, batteries, cleaners, dust suppressants, PCBs, and used spill cleanup materials. Hazardous waste that is spilled could affect surface water quality, air quality, fish habitat, or wildlife habitat.

EPPs will be developed in accordance with Hazardous Waste Legislation Guide (BCMOE 2005). EPPs will address, at a minimum, the following requirements if applicable:

- Store, handle and transport hazardous materials to avoid loss and to allow containment and recovery in the event of a spill in accordance with all applicable legislation, including, but not limited to, the BC Fire Code, the National Fire Code of Canada, and the Transportation of Dangerous Goods Act

- Designate onsite areas for the transfer and limited temporary storage of hazardous materials and wastes. The area(s) shall be located at least 30 m from the Ordinary High Water Mark of any waterbody, clearly labelled and appropriately controlled. BC Hydro may inspect designated area(s) at any time and may require the prompt removal of any hazardous materials which are not in active use

- Adequately train site personnel in the handling and transportation of hazardous materials

- Dispose of hazardous wastes generated during construction in compliance with the BC Hazardous Waste Regulation under the Environmental Management Act

- Where construction activities involve the handling, storage, and removal of hazardous wastes, contractors shall maintain the following records:
  - Inventories of types and quantities of wastes generated, stored, or removed
  - Manifests identifying licensed waste haulers and disposal destinations
  - Disposal certification documents

Reference

http://www2.gov.bc.ca/gov/DownloadAsset?assetId=51C5BF7BBBC8140FA93CE2C9AEABBC042
4.9 Heritage Resources Management

Heritage resources include archaeological, historical, and paleontological sites, objects and features. Construction activities that disturb land could affect heritage resources. In addition to heritage sites, there may be locations of cultural importance (e.g., areas of current traditional use) identified by Aboriginal Groups in the area.

All construction sites require completion of a heritage assessment, in the snow-free season, prior to the start of construction activities. These assessments were completed during the environmental assessment phase prior to construction in most areas. Any areas still requiring a heritage assessment prior to commencement of Work shall be identified in an EPP as indicated below.

BC Hydro will:

- Retain a Heritage Specialist to coordinate BC Hydro’s heritage obligations with the Contractors working on the Project.
- With the assistance of the heritage specialist, develop a Project-wide construction Heritage Resource Management plan (HRMP) that describes the measures that will be used to mitigate the adverse effects of the Project on heritage resources.
- Through its Heritage Specialist obtain permits under the BC Heritage Conservation Act that are required for the construction of the Project, which are anticipated to include requirements with respect to the assessment, mitigation and management of heritage resources and requirements to undertake construction activities within protected heritage sites.
- Invite Aboriginal Groups to identify to BC Hydro any locations of cultural importance within planned construction areas; lead discussion with Aboriginal Groups, the Heritage Specialist and applicable contractors to identify feasible avoidance or mitigation measures for locations of cultural importance made known to BC Hydro; direct its contractors with respect to avoidance or mitigation measures for such locations.

Contractors will be responsible to include heritage requirements as part of an EPP as applicable to the scope of work covered by the EPP. Contractors will be required to cooperate with BC Hydro’s Heritage Specialist to develop the heritage requirements of an EPP, and to provide the Heritage Specialist with information in a timely manner about the scheduling of planned work. The Heritage Specialist will support the Contractor in developing the EPP by providing the following as applicable:

- Maps and digital data identifying:
  - areas within planned construction locations where heritage assessments are not completed and still required;
  - recorded heritage sites;
  - required heritage mitigation and protection measures.
- Review of maps of contractors planned construction locations and activities prior to construction commencing to identify heritage management requirements.
- Completion of required heritage assessments in accordance with applicable legislation and conditions of permits issued under the BC Heritage Conservation Act, where heritage assessments have not been completed in any construction locations.
• Confirmation of the status and timing of planned mitigation for known heritage resources in accordance with permit conditions issued under the BC Heritage Conservation Act.

• Confirmation of the status of Heritage Conservation Act permits prior to disturbance of known heritage resources.

• Implementation of required heritage surface inspections or monitoring after initial ground disturbance associated with stripping, grubbing or excavating within known archaeological sites, in accordance with the conditions of permits issued under the BC Heritage Conservation Act.

• Qualified Environmental Professionals as required if the contractor discovers a chance find of any previously unrecorded heritage resources and any human remains found during construction activities in accordance with the HRMP, applicable legislation and conditions of permits issued under the BC Heritage Conservation Act.

EPPs will address, at a minimum, the following heritage requirements if applicable, in accordance with the HRMP:

• Heritage site management requirements, including conditions of permits issued under the BC Heritage Conservation Act;

• Procedures for the delineation, on maps and on the ground, of known heritage sites within Work Areas to support implementation of site specific heritage site management requirements.

• Prohibitions on workers, during the course of their work, from destroying, excavating, altering or collecting any heritage resource without authorization under a BC Heritage Conservation Act permit.

• Prohibitions on workers from disturbing, destroying or collecting heritage resources for personal purposes.

• Implementation of monitoring procedures as specified in the HRMP and as specified in permits issued under the BC Heritage Conservation Act.

• Chance find procedures with respect to heritage resources, including definition of heritage resources subject to chance find reporting, initial response procedures, and guidelines for determining further action and management of newly found heritage resources.

References


4.10 Ice Management

BC Hydro operates its existing Peace River facilities under a joint agreement between the provinces of BC and Alberta (Alberta - British Columbia Joint Task Force on Peace River Ice). The Project will be operated in accordance with the agreement. One of the management objectives of the joint agreement is to control flows from BC Hydro’s facilities in a way that avoids downstream flooding during ice formation and breakup. Existing ice management practices will continue during the construction phase of the Project.

Construction of the Site C dam will occur in two stages. Stage 1 (channelization) consists of restricting the channel and is expected to last through two or three winters. Stage 2 (diversion) consists of diverting the flow through tunnels in order to isolate the area where the earthfill dam will be constructed across the Peace River and is expected to last through three winters.

BC Hydro will retain a qualified professional to develop and implement a Head Pond Ice Monitoring Plan for the Stage 2 diversion phase of construction. The objectives of the Head Pond Ice Monitoring Plan are to:

- Ensure that ice hazards such as ice jams, and ice accumulation on the construction headpond and downstream of the Project are managed during construction in consideration of worker and public safety

- Establish protocols for managing ice on the construction headpond so that water levels are maintained at a safe level below the top of the temporary cofferdams

Results of this Plan will be reported to BC Hydro and upstream operations will be adjusted accordingly to maintain free flow of water through the diversion tunnels, and sufficient freeboard at the temporary cofferdams.

Monitoring of the downstream ice front will continue as per the operating procedures of the Joint Task Force on Peace River Ice.
4.11 Noise and Vibration Management

The potential to affect noise sensitive receptors (e.g., residences, campgrounds, schools, hospitals, sensitive wildlife) depends on the type of activity and the proximity of that activity to the receptor. The following activities will take place close to residences or campgrounds and therefore the control of noise and vibration is particularly important at the following locations:

- 85th Avenue Industrial Lands: excavating, loading, conveyor operation
- Reservoir clearing
- Construction of Hudson’s Hope berm
- Relocation of Highway 29 segments

BC Hydro will notify residents in the vicinity of the project of construction activities in accordance with the Construction Communications Plan (Appendix C) and the Aboriginal Group Communication Plan (Appendix D).

BC Hydro will implement a noise monitoring program to measure noise levels at sensitive locations near the 85th Avenue Industrial Lands, Highway 29 re-alignment and Hudson’s Hope berm. Where measured noise exceeds the *British Columbia Noise Control Best Practices Guidelines* (BC Oil and Gas Commission, 2009) BC Hydro will require additional mitigation measures such as changes in construction schedule, changes in construction methods or engineered controls to address the issue. If necessary, BC Hydro will temporarily relocate residents, as deemed appropriate in consultation with affected homeowners.

EPPs must include a noise management program that describes:

- any construction activities that create noise that could reasonably be expected to disturb residents in close proximity to the Site; and
- the mitigation measures the Contractor will undertake to lessen the impact of the noise created by such construction activities.

EPPs will address, at a minimum, the following requirements if applicable:

- Retain or erect acoustic barriers, fencing, and vegetative screens as appropriate
- Maintain equipment in good working order
- Outfit equipment with the appropriate silencers and mufflers, as designed
- Use electric motors, pumps and auxiliary equipment that meet current acoustic industrial and regulatory standards
- Locate stationary equipment away from noise receptors
- Restrict helicopter use to defined flight paths to and from construction sites in order to reduce noise effects on local residents
- Schedule construction activity near homes to reduce the period of disturbance
- Control construction traffic and deliveries on local roads during night-time hours (22:00-07:00)
- Implement drive-through pathways for material drop off or pick-up to reduce use of back-up alarms
- Prohibit free swinging tailgates
- Minimize vehicle idling to the extent feasible
- Minimize the length and duration of helicopter flights to the extent feasible

### 85th Avenue Industrial Lands

The area surrounding 85th Avenue Industrial Lands includes residences and is sensitive to disturbances. The noise management program for 85th Avenue Industrial Lands shall include:

- Install perimeter fencing around the construction site to restrict access
- Direct site lighting into the site
- Install a 3 m high berm along all boundaries of the site at the start of site development
- Consider the use of secondary berms or portable enclosures or barriers closer to construction activities as a measure to reduce visual or noise impacts
- Retain existing vegetation where feasible to maintain a natural visual and noise buffer, and consider planting vegetation as a measure to reduce visual or noise impacts
- Install portable acoustic barriers near the conveyor belt hopper and an enclosure for the on-site portion of the conveyor belt
- Manage noise associated with the off-site portion of the conveyor belt by enclosing it, or by providing an alternative that is as effective in managing noise associated with operation of the conveyor
- If feasible, use silent back-up alarms during night-time operations
- Design a work and noise management schedule that allows an uninterrupted eight hour sleep schedule for Project workers

### Reference

4.12 Soil Management, Site Restoration and Revegetation

Soil management, site restoration, and revegetation activities are intended to restore and revegetate areas disturbed during Project construction to a safe and environmentally acceptable condition that minimizes or prevents soil erosion and the colonization of invasive plants.

Soil management entails activities intended to temporarily store organic soils and coarse woody debris so that these materials can be used to support site restoration objectives. Site restoration activities are designed to recreate the conditions that support the re-establishment of a natural ecosystem state on disturbed sites, or the re-establishment of agricultural landscapes. Revegetation activities support the natural re-establishment of suitable plant cover on disturbed sites.

BC Hydro has developed a Soil Management, Site Restoration and Revegetation Plan (Appendix H) that provides specific objectives to be incorporated into contractor-prepared EPPs. The following sections provide a summary of the related environmental management specifications in Appendix H to be implemented during and after Project construction.

4.12.2 Soil Management

- Identify and appropriately store soil, overburden material and coarse woody debris that could be used to create habitat features during site restoration.
- Design, construct and protect soil stockpiles to reduce soil erosion.
- Restore soils within agricultural areas, including replacement of topsoil to maintain agricultural productivity in consultation with a Professional Agrologist.
- Minimize compaction of undisturbed soils to the extent feasible.
- Restore site drainage patterns to natural flow conditions upon completion of soil movement activities, where feasible.

4.12.3 Site Restoration

- Provide a schedule of site restoration activities that outlines the progressive reclamation of any temporary disturbance within one year of completion of activities.
- Apply certified weed free native seed mixtures as specified in Appendix H
- Restore borrow and quarry areas developed for the Project in accordance with Part 10 of the Health, Safety and Reclamation Code for Mines in British Columbia (BC Ministry of Energy, Mines and Petroleum Resources, 2008), relevant permit conditions, and the site development plan before the end of the construction season that construction ceases at the site.
- Comply with applicable MOTI standards during revegetation of road rights-of-way along Highway 29.
- Contour disturbed slopes to landforms which are safe and stable and compatible with adjacent landforms and proposed future use / restoration objectives.
- Create swales and knolls on slopes while maintaining the overall specified slope angles.
- Scarify soil surfaces so there are rough and loose, unless the nature of the materials render them susceptible to erosion.
  - Return water drainage patterns to pre-disturbance conditions
Revegetation

- Prepare a revegetation plan that is appropriate to the following four landscape categories.

<table>
<thead>
<tr>
<th>Landscape Category</th>
<th>Defining Features</th>
<th>Planting Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>South aspect slopes</td>
<td>Slopes with grades &gt;10%</td>
<td>Native grass seed, Woody debris, Aspen seedlings</td>
</tr>
<tr>
<td>North aspect slopes</td>
<td>Slopes with grades &gt;10%</td>
<td>Alder seed, White spruce seedlings, Woody debris</td>
</tr>
<tr>
<td>Riparian Areas</td>
<td>Within 15 m of the ordinary high water mark</td>
<td>Woody debris, Leaf litter, Live stakes of balsam poplar, willow and red-osier dogwood</td>
</tr>
<tr>
<td>Plateau Areas</td>
<td>Slopes with grades &lt;10% that are south aspect, north aspect or riparian</td>
<td>Woody debris, Alder seeds</td>
</tr>
</tbody>
</table>

- Implement the revegetation plan within one year after completion of construction activities at a site.

- Assess the effectiveness of restoration and revegetation works through monitoring and implement corrective actions as necessary to achieve Project objectives.

References


Northeast Invasive Plant Committee, 2015

4.13 Spill Prevention and Response

Spills of chemical or fuels spills, of any volume, are considered an Environmental Incident and may cause environmental damage and pose a risk to human health.

Activities that involve potentially harmful or toxic substances such as oil, fuel, antifreeze, and concrete will follow approved practices and consider Develop with Care 2014: Environmental Guidelines for Urban and Rural Land Development in British Columbia (BC MOE 2014). Equipment will be maintained according to manufacturers’ specifications to reduce the likelihood of spills.


EPPs will address, at a minimum, the following requirements if applicable:

Spill Prevention

- Specific instructions on how to reduce the risk of spills
- Storage, handling and labelling of fuels and other hazardous materials. Fuel storage and handling procedures shall be consistent with A Field Guide to Fuel Handling, Transportation and Storage (BC MWLAP 2002)
- Implementation of a risk assessment process for recognizing potential hazards and minimizing fuel spills consistent with Section 7 of A Field Guide to Fuel Handling, Transportation and Storage (BC MWLAP 2002)
- Equipment refueling and servicing procedures. Machinery shall only be serviced, refueled and washed in designated areas, located at least 30 metres from the Ordinary High Water Mark of any watercourse or wetland
- Incorporation of drip containment measures for fuel dispensing equipment to maximize fuel containment
- Monitoring of vehicles and equipment for leaks on a daily basis. If the operation of construction vehicles is necessary within riparian areas, vehicles and equipment shall arrive on site in a clean condition and be maintained free of fluid leaks

Spill Response Equipment

- The minimum required content of vehicle spill kits is:
  1. For all pickup trucks, transport vehicles and equipment with on-board fuel capacity of 500L or less:
     Goggles, PVC gloves, 10 absorbent pads, 2 absorbent booms (3m), 1 container of emergency sealant, 3 heavy duty plastic bags
2. For all pickup trucks, transport vehicles and equipment with a portable fuel tank with capacity of 500L or less:
   Goggles, PVC gloves, 10 absorbent pads, 2 absorbent booms (3m), 1 container of emergency sealant, 3 heavy duty plastic bags

3. For all pickup trucks, transport vehicles and equipment with on-board fuel capacity of greater than 500L:
   Goggles, PVC gloves, 20 absorbent pads, 6 absorbent booms (each 3m), 1 container of emergency sealant, 5 heavy duty plastic bags

4. For all pickup trucks, transport vehicles and equipment with a portable fuel tank with capacity of greater than 500L:
   Goggles, PVC gloves, 20 absorbent pads, 6 absorbent booms (each 3m), 1 container of emergency sealant, 5 heavy duty plastic bags

5. When working within, above, or within 15 metres of a watercourse or wetland with equipment that may result in a spill of a hazardous substance that suitable absorbent and containment booms be onsite and available for deployment in the event of a spill

The required contents are to be carried in each vehicle inside a container marked “Spill Kit”.

- Spill kit contents for fuel dispensing stations shall be consistent with requirements outlined in Table 9.3 (a) of A Field Guide to Fuel Handling, Transportation and Storage (MWLAP 2002). Equipment containing ethylene glycol (antifreeze) or other water soluble chemical shall carry an appropriate number of water soluble chemical absorbent pads in addition to absorbent pads used for petroleum products
- Inspections to compare current contents of spill kits with required contents at Project start-up and whenever a new piece of equipment comes onto site
- Locations and nature of clean-up materials and equipment
- Appropriate training of workers in the use of spill response equipment, including the location, type, and correct deployment of spill response equipment relating to the nature and location of work and potential onsite spills.

**Spill Response Procedures**

- Spill reporting and notification procedures, in accordance with Section 2.5 and as described below
- Containment, recovery and clean-up procedures and training
- Contact information for persons and organizations to be notified in the event of spills or other environmental emergencies (including contact information for the Provincial Emergency Program [PEP] and Environment Canada Emergencies)
If a spill of fuels, oils, lubricants or other harmful substances occurs, the following procedures shall be implemented:

1) Make the area safe
2) Stop the flow (when possible)
3) Secure the area
4) Contain the spill
5) Notify/Report (EMBC 1-800-663-3456 when necessary – see Table 3)
6) Clean-up

Site and activity specific EPPs must include procedures to address spill response related to identified environmental hazards. Generally these procedures would include:

1) MAKE THE AREA SAFE
   • Evaluate risk to personal/public, electrical and environmental safety;
   • Wear appropriate Personal Protective Equipment (PPE);
   • Never rush in, always determine the product spilled before taking action;
   • Warn people in the immediate vicinity; and
   • Verify that no ignition sources are present if the spill is a flammable material.

2) STOP THE FLOW (when possible and safe to do so)
   • Act quickly to reduce the risk of environmental impacts;
   • Close valves, shut off pumps or plug holes/leaks; and
   • Stop the flow or the spill at its source.

3) SECURE THE AREA
   • Limit access to the spill area; and
   • Prevent unauthorized entry onto the site.

4) CONTAIN THE SPILL
   ■ Block off and protect drains and culverts
   ■ Prevent spilled material from entering drainage structures (ditches, culverts, drains)
   ■ Use spill containment and sorbent material to contain the spill appropriate to site location and spilled materials
5) **Notification/ Reporting** – as per Table 2 below and Table 1 in Section 4.3

- Determine appropriate Contractor, BC Hydro and regulatory notification obligations and notify appropriate personnel
- When necessary, the first external call shall be made to **Emergency Management BC (EMBC)**, formerly known as the Provincial Emergency Program (PEP), at **1-800-663-3456 (24 Hour)**. Spills would then be reported to the appropriate ministries/agencies according to Table 2 below to allow for immediate response (as required) by appropriate staff. For spills to aquatic habitat, collection of water samples shall be undertaken to characterize the nature and extent of the release.
- Provide the required information for input into BC Hydro’s EIR system

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**Table 2: Spill Reporting Matrix from Spill Reporting Regulation Schedule of Reportable Levels for Certain Substances**

<table>
<thead>
<tr>
<th>Item</th>
<th>Substance</th>
<th>Quantity</th>
<th>External Reporting Requirements</th>
<th>Internal Reporting Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>Any Spill</td>
<td>Any amount in aquatic habitat</td>
<td>EMBC, DFO and MFLNRO</td>
<td>Environmental Incident Report (EIR)</td>
</tr>
<tr>
<td>-</td>
<td>Oil and Waste Oil</td>
<td>Any amount ≥1L</td>
<td>N/A</td>
<td>EIR</td>
</tr>
<tr>
<td>1</td>
<td>Class 1, Explosives as defined in section 2.9 of the Federal Regulations</td>
<td>Any quantity that could pose a danger to public safety or 50 kg</td>
<td>EMBC</td>
<td>EIR</td>
</tr>
<tr>
<td>2</td>
<td>Class 2.1, Flammable Gases, other than natural gas, as defined in section 2.14 (a) of the Federal Regulations</td>
<td>≥10 kg</td>
<td>EMBC</td>
<td>EIR</td>
</tr>
<tr>
<td>3</td>
<td>Class 2.2 Non-Flammable and Non-Toxic Gases as defined in section 2.14 (b) of the Federal Regulations</td>
<td>≥10 kg</td>
<td>EMBC</td>
<td>EIR</td>
</tr>
<tr>
<td>4</td>
<td>Class 2.3, Toxic Gases as defined in section 2.14 (c) of the Federal Regulations</td>
<td>≥5 kg</td>
<td>EMBC</td>
<td>EIR</td>
</tr>
<tr>
<td>5</td>
<td>Class 3, Flammable Liquids as defined in section 2.18 of the Federal Regulations</td>
<td>≥100 L</td>
<td>EMBC</td>
<td>EIR</td>
</tr>
<tr>
<td>6</td>
<td>Class 4, Flammable Solids as defined in section 2.20 of the Federal Regulations</td>
<td>≥25 kg</td>
<td>EMBC</td>
<td>EIR</td>
</tr>
<tr>
<td>7</td>
<td>Class 5.1, Oxidizing Substances as defined in section 2.24 (a) of the Federal Regulations</td>
<td>≥50 kg or 50 L</td>
<td>EMBC</td>
<td>EIR</td>
</tr>
<tr>
<td>8</td>
<td>Class 5.2, Organic Peroxides as defined in section 2.24 (b) of the Federal Regulations</td>
<td>≥1 kg or 1 L</td>
<td>EMBC</td>
<td>EIR</td>
</tr>
<tr>
<td>Item</td>
<td>Substance</td>
<td>Quantity</td>
<td>External Reporting Requirements</td>
<td>Internal Reporting Requirements</td>
</tr>
<tr>
<td>------</td>
<td>---------------------------------------------------------------------------</td>
<td>-------------------------------</td>
<td>---------------------------------</td>
<td>---------------------------------</td>
</tr>
<tr>
<td></td>
<td>defined in section 2.24 (b) of the Federal Regulations</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Class 6.1, Toxic Substances as defined in section 2.27 (a) of the Federal Regulations</td>
<td>≥5 kg or 5 L</td>
<td>EMBC</td>
<td>EIR</td>
</tr>
<tr>
<td>10</td>
<td>Class 6.2, Infectious Substances as defined in section 2.27 (b) of the Federal Regulations</td>
<td>≥1 kg or 1 L, or less if the waste poses a danger to public safety or the environment</td>
<td>EMBC</td>
<td>EIR</td>
</tr>
<tr>
<td>11</td>
<td>Class 7, Radioactive Materials as defined in section 2.37 of the Federal Regulations</td>
<td>Any quantity that could pose a danger to public safety and an emission level greater than the emission level established in section 20 of the &quot;Packaging and Transport of Nuclear Substances Regulations&quot;</td>
<td>EMBC</td>
<td>EIR</td>
</tr>
<tr>
<td>12</td>
<td>Class 8, Corrosives as defined in section 2.40 of the Federal Regulations</td>
<td>≥5 kg or 5 L</td>
<td>EMBC</td>
<td>EIR</td>
</tr>
<tr>
<td>13</td>
<td>Class 9, Miscellaneous Products, Substances or Organisms as defined in section 2.43 of the Federal Regulations</td>
<td>≥25 kg or 25 L</td>
<td>EMBC</td>
<td>EIR</td>
</tr>
<tr>
<td>14</td>
<td>Waste containing dioxin as defined in section 1 of the Hazardous Waste Regulation</td>
<td>≥1 kg or 1 L, or less if the waste poses a danger to public safety or the environment</td>
<td>EMBC</td>
<td>EIR</td>
</tr>
<tr>
<td>15</td>
<td>Leachable toxic waste as defined in section 1 of the Hazardous Waste Regulation</td>
<td>≥25 kg or 25 L</td>
<td>EMBC</td>
<td>EIR</td>
</tr>
<tr>
<td>16</td>
<td>Waste containing polycyclic aromatic hydrocarbons as defined in section 1 of the hazardous Waste Regulation</td>
<td>≥5 kg or 5 L</td>
<td>EMBC</td>
<td>EIR</td>
</tr>
<tr>
<td>17</td>
<td>Waste asbestos as defined in section 1 of the Hazardous Waste Regulation</td>
<td>≥50 kg</td>
<td>EMBC</td>
<td>EIR</td>
</tr>
<tr>
<td>Item</td>
<td>Substance</td>
<td>Quantity</td>
<td>External Reporting Requirements</td>
<td>Internal Reporting Requirements</td>
</tr>
<tr>
<td>------</td>
<td>---------------------------------------------------------------------------</td>
<td>---------------------------------------</td>
<td>---------------------------------</td>
<td>---------------------------------</td>
</tr>
<tr>
<td>18</td>
<td>Waste oil as defined in section 1 of the Hazardous Waste Regulation</td>
<td>≥100 L</td>
<td>EMBC</td>
<td>EIR</td>
</tr>
<tr>
<td>19</td>
<td>Waste containing a pest control product as defined in section 1 of the Hazardous Waste Regulation</td>
<td>≥5 kg or 5 L</td>
<td>EMBC</td>
<td>EIR</td>
</tr>
<tr>
<td>20</td>
<td>PCB Wastes as defined in section 1 of the Hazardous Waste Regulation</td>
<td>≥25 kg or 25 L</td>
<td>EMBC</td>
<td>EIR</td>
</tr>
<tr>
<td>21</td>
<td>Waste containing tetrachloroethylene as defined in section 1 of the Hazardous Waste Regulation</td>
<td>≥50 kg or 50 L</td>
<td>EMBC</td>
<td>EIR</td>
</tr>
<tr>
<td>22</td>
<td>Biomedical waste as defined in section 1 of the Hazardous Waste Regulation</td>
<td>≥1 kg or 1 L, or less if the waste poses a danger to public safety or the environment</td>
<td>EMBC</td>
<td>EIR</td>
</tr>
<tr>
<td>23</td>
<td>A hazardous waste as defined in section 1 of the Hazardous Waste Regulation and not covered under items 1 – 22</td>
<td>≥25 kg or 25 L</td>
<td>EMBC</td>
<td>EIR</td>
</tr>
<tr>
<td>24</td>
<td>A substance, not covered by items 1 to 23, that can cause pollution</td>
<td>≥200 kg or 200 L</td>
<td>EMBC</td>
<td>EIR</td>
</tr>
<tr>
<td>25</td>
<td>Natural gas</td>
<td>≥10 kg, if there is a breakage in a pipeline or fitting operated above 100 psi that results in a sudden and uncontrolled release of natural gas</td>
<td>EMBC</td>
<td>EIR</td>
</tr>
</tbody>
</table>


**CLEAN-UP**
- Determine cleanup options and requirements with appropriately qualified professionals
Mobilize recovery equipment and cleanup crew and conduct cleanup activities

Dispose of all equipment and/or material used in cleanup (e.g., used sorbent, oil containment materials, etc.) in accordance with MFLNRO requirements. Disposal of special wastes (e.g., material with >3% oil by mass) and contaminated soil must comply with the Environmental Management Act and Regulations.

Replenish spill response kits and equipment.

References


4.14 Surface Water Quality Management

Project construction activities in or near streams and water bodies, including clearing, blasting, dam construction, and road construction, have the potential to alter water quality.

EPPs will address, at a minimum, the following requirements if applicable including providing details on surface water management and associated programs within constructed structures capable of retaining water (e.g. Cofer dams, sediment ponds):

**Water Quality Monitoring**

EPPs will include a water quality monitoring program that will specify water sampling locations, parameters and frequencies. Water quality will be monitored both upstream and downstream of construction areas. Unless otherwise specified in the Environmental Requirements, water quality shall be maintained within the limits shown in Table 3. Water Quality Guidelines.

Contractor Environmental Monitor(s) shall conduct water quality monitoring for turbidity plumes (visual and with a turbidity meter), hydrocarbon sheens from oil and grease (visual), and iron bacteria/ochre (visual) during all construction activities in the vicinity of any watercourse or wetland and monitor pH during concrete works within 30 m of the Ordinary High Water Mark of any watercourse or wetland.

**Concrete and Concrete Products**

EPPs will identify if concrete products will be used, and what type (e.g., grout, wet curing, etc.).

EPPs will also identify if concrete products are going to be used within 30 m of the Ordinary High Water Mark of any watercourse or wetland.

Unless otherwise authorized in a permit or approval, concrete works shall be designed and undertaken in and about a water body must be carried out following applicable aspects of Appendix 14.6 of Standards and Best Practices for Instream Works (BC Ministry of Environment 2004), which states:

- Use pre-cast concrete structures whenever possible
- As concrete leachate is alkaline and highly toxic to fish and other aquatic life, ensure that all works involving the use of concrete, cement, mortars, and other Portland cement or lime-containing construction materials (concrete) will not deposit, directly or indirectly, sediments, debris, concrete, concrete fines, wash or contact water into or about any watercourse. Concrete materials cast in place must remain inside formed structures
- Keep a carbon dioxide (CO2) tank with regulator, hose and gas diffuser readily available during concrete work. Use it to release carbon dioxide gas into the affected area to neutralize pH levels should a spill occur. Train workers to use the tank
- Provide containment facilities for the wash-down water from concrete delivery trucks, concrete pumping equipment, and other tools and equipment
- Report immediately any spills of sediments, debris, concrete fines, wash or contact water to 1-800-663-3456. If possible, immediately remove the materials from the water and implement emergency mitigation and clean-up measures
- Completely isolate all concrete work from any water within or entering into any watercourse or stormwater system
- Monitor the pH frequently in the watercourse immediately downstream of the isolated
worksite until completion of the works. Emergency measures will be implemented if downstream pH has changed more than 1.0 pH unit, measured to an accuracy of ± 0.2 pH units from the background level, or is recorded to be below 6.0 or above 9.0 pH units.

- Prevent any water that contacts uncured or partly cured concrete during activities like exposed aggregate wash-off, wet curing, or equipment washing from directly or indirectly entering any watercourse or stormwater system.
- Maintain complete isolation of all cast-in-place concrete and grouting from fish-bearing waters for a minimum of 48 hours if ambient air temperature is above 0°C and for a minimum of 72 hours if ambient air temperature is below 0°C.
- Isolate and hold any water that contacts uncured or partly cured concrete until the pH is between 6.5 and 8.0 pH units, and the turbidity is less than 25 nephelometric turbidity units (NTU), measured to an accuracy of ± 2 NTU.

**Water Diversions**

Unless otherwise authorized in a permit or approval, temporary water diversions must be designed and constructed following applicable aspects of Appendix 14.2 of Standards and Best Practices for Instream Works (BC Ministry of Environment 2004), which states:

- Isolate your work area from all flowing water, but do not cut off flow to downstream portions of the stream at any time during construction.
- Temporarily divert, enclose or pump the water around the worksite. Ensure the point of discharge to the creek is located immediately downstream of the worksite to minimize disturbance to downstream populations and habitats.
- For works near or in lakes or larger water bodies, if it is not possible to fully isolate and divert flowing water from your work area due to water depth and volume, isolate your works with a silt curtain to keep silty water from entering clean water.

It is expected that it will not be technically feasible or effective to fully isolate or employ silt curtains for many works in the Peace River and large tributaries. In these situations, appropriate Erosion Prevention and Sediment Control will be employed to protect Surface Water Quality.

**Acid Rock Drainage and Metal Leachate**

Monitoring and reporting requirements as well as measures that will be undertaken to mitigate potential adverse effects resulting from potential sources of acid rock drainage or metal leaching material associated with construction of the Project are described in the Acid Rock Drainage and Metal Leachate Management Plan (Appendix E) and in Technical Specifications applicable to each contract.

The EPP must include the following:

- Water management in and around excavations and RSEMs;
- Potentially Acid Generating (PAG) material placement location and schedule;
- Definition of Contractor and BC Hydro’s responsibilities;
- List of qualified personnel undertaking the work;
- Sampling locations and frequency;
- Performance criteria and sampling methodology; and
- Water management in the event of non-compliance.
Application of Roadsalt

If roadsalt is used for de-icing roads, it shall be applied in accordance with Table 4 of BC Ministry of Environment's Roadsalt and Winter Maintenance for British Columbia Municipalities Best Management Practices to Protect Water Quality (BC Ministry of Environment. 1998).
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Maximum Allowable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suspended Solids &lt;sup&gt;1&lt;/sup&gt;</td>
<td>• Change from background of 25 mg/L at any one time for a duration of 24 hours in all waters during clear flows or in clear waters  &lt;br&gt; • Change from background of 5 mg/L at any one time for a duration of 30 days in all waters during clear flows or in clear waters  &lt;br&gt; • Change from background of 10 mg/L at any time when background is 25 – 100 mg/L during high flows or in turbid waters  &lt;br&gt; • Change from background of 10% when background is &gt;100 mg/L at any time during high flows or in turbid waters</td>
</tr>
<tr>
<td>Turbidity &lt;sup&gt;1&lt;/sup&gt;</td>
<td>• Change from background of 8 NTU at any one time for a duration of 24 hours in all waters during clear flows or in clear waters  &lt;br&gt; • Change from background of 2 NTU at any one time for a duration of 30 days in all water during clear flows or in clear waters  &lt;br&gt; • Change from background of 5 NTU at any time when background is 8 – 50 NTU during high flows or in turbid waters  &lt;br&gt; • Change from background of 10% when background is &gt;50 NTU at any time during high flows or in turbid waters</td>
</tr>
<tr>
<td>Streambed Substrate Composition &lt;sup&gt;1&lt;/sup&gt;</td>
<td>• % fines not to exceed: 10% &lt;2 mm, 19% &lt;3 mm, 28% &lt;6.35 mm at salmonid spawning sites  &lt;br&gt; • Geometric mean diameter not less than 12 mm (minimum 30-day intragravel dissolved oxygen of 6 mg/L)  &lt;br&gt; • Fredle number not less than 5 mm (minimum 30-day intragravel dissolved oxygen of 8 mg/L)</td>
</tr>
<tr>
<td>pH &lt;sup&gt;2&lt;/sup&gt;</td>
<td>• 6.5 – 9.0</td>
</tr>
<tr>
<td>Oil and Grease &lt;sup&gt;3&lt;/sup&gt;</td>
<td>• the surface water should be virtually free of petroleum, animal or vegetable oils</td>
</tr>
</tbody>
</table>

<sup>1</sup> From *Ambient Water Quality Guidelines (Criteria) for Turbidity, Suspended and Benthic Sediments* (BC MOE, 2001)  
<sup>2</sup> From *Water Quality Guidelines for the Protection of Aquatic Life* (CCME 2012)  
<sup>3</sup> From *A Compendium of Working Water Quality Guidelines for British Columbia* (BC Ministry of Environment 2006)
Table 4. Roadsalt Application Rates

<table>
<thead>
<tr>
<th>Application</th>
<th>Description</th>
<th>Application Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>light application</td>
<td>to prevent black ice when the surface temperature is near freezing with light snow or sleet</td>
<td>60 kilograms per two-lane kilometre (about 1/20 cubic metre)</td>
</tr>
<tr>
<td>average application</td>
<td>early in the day when the surface temperature is -4° Celsius and rising under snow, sleet or freezing rain conditions</td>
<td>85 kilograms per two-lane kilometre (about 1/14 cubic metre)</td>
</tr>
<tr>
<td>heavy application</td>
<td>early in the day when the surface temperature is -4° Celsius and stable or when the surface temperature is -6° Celsius and rising or late in the day when the surface temperature is -4° Celsius and rising, under conditions of packed snow or ice on the highway surfaces</td>
<td>130 kilograms per two-lane kilometre (about 1/9 cubic metre)</td>
</tr>
</tbody>
</table>

From (BC Ministry of Environment. 1998)

References


4.15 Vegetation and Invasive Plant Management

Construction activities may affect the dispersal of invasive plant species which can out-compete native vegetation, and cause damage to natural environments and agricultural production.

BC Hydro will undertake invasive plant control on work sites, in accordance with BC Hydro’s applicable Pest Management Plan, prior to construction, and coordinate control activities, and schedules with Contractors.

EPPs must address, at a minimum, the following requirements if applicable:

- Surveys of existing invasive species populations and mapping provided by BC Hydro
- Limit the stripping of vegetation and soils to the areas required for Project activities
- Ensure that weed material is not brought onto Project work sites from non-Project work sites, and that weed material from Project work sites is not transported to non-Project work sites
- Manage vehicle movement in a manner that reduces seed dispersal both within and beyond construction sites
- Locate vehicle wash areas at least 30 m from the Ordinary High Water Mark of any water body
- Treat used wash water to prevent seed dispersal and release of contaminants
- Keep machinery on designated routes to reduce damage to surrounding vegetation
- Measures to control invasive plants, manage established invasive species populations and prevent invasive species establishment
- Avoidance/minimization of use of herbicides or pesticides in areas that could impact species at risk, at-risk and sensitive ecological communities and rare plants. Any application will be in accordance with BC Hydro’s applicable Pest Management Plan.
- In temporary construction areas, plan construction methods that take into account the location of known rare plant occurrences. Where complete avoidance is not feasible, employ measures to reduce adverse effects such as timing construction activities to winter months, placing ramps or mats over occurrences to reduce soil compaction, use of rubber-tired equipment, implementing designated travel routes to and from work sites. See also Section 4.17 Wildlife Management.

Reference
4.16 Waste Management

Construction materials and other wastes can cause adverse effects on groundwater and surface water quality, fish and wildlife habitat, and human health and safety.

EPPs will be developed in accordance with *A Best Practices Guide to Solid Waste Reduction* (Canadian Construction Association 2001). EPPs will develop methods for disposal of project-related waste and identify waste management strategies to manage effects on landfills in the region. EPPs will address, at a minimum, the following requirements if applicable:

**General Construction Wastes**

- Contractor(s) shall make every reasonable effort to control the amount of material disposed of, using regionally available facilities
- Each contractor shall develop and implement a waste management program that integrates waste reduction, reuse and recycling considering the Peace River Regional District’s Solid Waste Management Plan
- Contractors may dispose of tires which are not recycled as part of BC’s tire recycling program in the Relocation Areas for Surplus Excavated Material
- If wastes are generated by contractor(s) in the course of construction, the wastes shall be disposed of in compliance with appropriate environmental waste management procedures and legislation such as the *Environmental Management Act* which are intended to reduce waste and potential for creating health risks and problems for wildlife
- Each contractor shall arrange for disposal of construction-related wastes in a manner acceptable to local governments having jurisdiction, including verification that local landfills have capacity to meet the contractor’s disposal requirements
- Establish regular clean up and disposal programs to prevent the unnecessary accumulation of construction wastes
- Provide sanitary facilities for the use of workers. Sanitary facilities shall be secured so they do not fall over, and shall be located at least 30 m from the Ordinary High Water Mark of any waterbody. Sanitary facilities shall be secured and emptied at a frequency sufficient to prevent potential overflow and spills
- The contractor shall keep records of the types and quantities of waste generated, their handling, transport, disposal date and disposal facility. The contractor shall make the records available to BC Hydro for inspection whenever required

**Food Waste**

- Collect and store food waste and domestic garbage in animal-proof containers and remove regularly for proper disposal. Animal proof containers are those that are considered resistant to entry by bears, birds, rodents and other scavenging wildlife species. An example is the bearicuda trash can ([http://www.bearicuda.com/enclosures/bear-resistant-containers.php](http://www.bearicuda.com/enclosures/bear-resistant-containers.php)). The contractor is to provide a schedule for waste removal in their EPP.
Waste Forecasting

Each contractor shall provide to BC Hydro an annual forecast of its expected waste types and quantities by January 31 of each year of construction.

BC Hydro will compile the annual contractor waste forecasts and provide the compilation to the Peace River Regional District by March 31 of each year of construction. BC Hydro will consult with the Peace River Regional District annually to identify waste management options and establish resources and funding arrangements to address any potential shortfall in existing landfill capacity caused by construction of the Project.

References


4.17 Wildlife Management

Construction activities may affect wildlife and wildlife habitat through:

- Disturbance and displacement;
- Permanent or temporary habitat loss, alteration or fragmentation;
- Direct and indirect mortality; and,
- Increased wildlife-human contact.

EPPs will address, at a minimum, the following requirements if applicable:

**Wildlife Protection Measures**

- Least-risk timing windows:
  - Where feasible, vegetation clearing will take place during the Peace Region terrestrial wildlife least-risk windows as shown in Table 5.
  - If clearing is to take place outside of the least-risk windows or inside the General Nesting Period, the contractor shall inform BC Hydro and retain a Qualified Environmental Professional to develop a nest and lek search protocol. The protocol will be developed in consultation with the Canadian Wildlife Service (Environment Canada), and the BC Ministry of Forests, Lands and Natural Resource Operations. The protocol will outline survey procedures that will be used to determine the presence of active nests and buffers required around active nest sites. Trees would be removed once nests are confirmed unoccupied. Contractors will identify nest surveys completed in weekly monitoring reports, and will provide BC Hydro with information on any new leks located. BC Hydro will provide MOE and FLNR with information on lek locations identified during nest surveys.

- Raptor nests:
  - Bald Eagle Nests
    - Obtain a BC Wildlife Act permit prior to removal of any Bald Eagle nest. Nests will be removed in compliance with permit conditions
    - Nests in construction area will be removed prior to construction activities in the direct vicinity of the nest.
    - Nests within the diversion headpond area, that could be lost during seasonal headponding, will be removed to reduce the risk of displacement or possible mortality during active nesting
    - Nests that become active for breeding within or adjacent to areas already disturbed by or under active construction, will, during active breeding use, be monitored by a QEP in a timely manner for signs of disturbance due to construction activities, and the QEP will identify and implement mitigation measures to address observed disturbance to breeding activity in accordance with the Guidelines for Raptor Conservation 2013.
    - Nests within areas not yet disturbed by Site C Project construction, will, during active breeding use, have an initial buffer applied of 300 m and
where active nests are located less than 300 m from existing human disturbance; a QEP will determine an appropriate buffer. During active breeding use, a QEP will monitor nests in a timely manner for signs of disturbance due to construction activities, and the QEP may identify and implement changes to the initial buffer based on the results of monitoring in accordance with the Guidelines for Raptor Conservation 2013.

- Any established buffers around nests active for breeding use will be clearly marked using flagging tape, fencing, spray paint or a combination of these or similar marking methods. Specific construction activities not allowed within buffer areas will be defined by the QEP on a nest by nest basis.
  - Other raptor nests
    - Existing raptor nests within construction areas will have a no activity buffer applied during active breeding use, with buffer size 100 m or as determined by a QEP. Buffers will be indicated using flagging tape, fencing, spray paint or a combination of these marking methods.
    - Newly occupied or newly constructed raptor nests, within or adjacent (i.e., within the prescribed buffer distance away) to already disturbed or active construction areas, will not have buffers applied.
  - No buffer will be implemented around raptor nests adjacent (i.e., within the prescribed buffer distance away) to a road being used for site access
  - Sharp-tailed grouse leks (communcal areas where males perform courtship displays before or during the breeding season):
    - Conduct lek surveys between approximately April 15 and mid-May (end date to be determined by a QEP) in suitable lek habitat prior to initiation of construction activities.
    - Determine the need for, scope and duration of lek monitoring during and after construction (any required post construction monitoring will be delivered by BC Hydro) in accordance with the following figure:
Figure 2. Sharp-tailed Grouse monitoring decision tree

1. Determine distance between lek and Site C active construction area
   - >2km from lek: No monitoring required
   - >800m and ≤2km of lek:
     - Construction planned 15 April-30 June:
       - No monitoring required
       - Yes:
         - Pre-construction monitoring required to determine if lek is active
         - Birds observed at lek during the three (3) lek monitoring visits:
           - No birds observed at lek: No monitoring required after the end of construction
           - Birds observed at lek: Daily monitoring of lek for duration of construction activities occurring >800m and ≤2km of lek 15 April-30 June
             - Disturbance documented:
               - Use of lek confirmed >1 year:
                 - Construction disturbance was temporary:
                   - No offsetting required
                 - Lek not used:
                   - Construction disturbance is permanent:
                     - Offset by retaining and managing lands with habitat features that could support leks and have suitable nesting and brood rearing habitat
               - Annual follow-up monitoring of lek use for 5 years after construction required
             - Disturbance documented:
               - Construction activities modified as feasible to stop disturbance
               - No disturbance documented:
                 - No monitoring required after the end of construction

2. Monitor periodically until end of lekking season to ensure lek does not become active during construction (TBD by QEP)
   - Lek not used:
     - Construction disturbance is permanent:
       - Offset by retaining and managing lands with habitat features that could support leks and have suitable nesting and brood rearing habitat
   - Lek not used:
     - No disturbance documented:
       - No monitoring required after the end of construction
   - Lek not used:
     - Use of lek confirmed >1 year:
       - Construction disturbance was temporary:
         - No offsetting required
   - Lek used:
     - No disturbance documented:
       - No monitoring required after the end of construction
     - Disturbance documented:
       - Use of lek confirmed >1 year:
         - Construction disturbance was temporary:
           - No offsetting required
       - Lek not used:
         - Construction disturbance is permanent:
           - Offset by retaining and managing lands with habitat features that could support leks and have suitable nesting and brood rearing habitat
   - Disturbance documented:
     - Use of lek confirmed >1 year:
       - Construction disturbance was temporary:
         - No offsetting required
     - Lek not used:
       - Construction disturbance is permanent:
         - Offset by retaining and managing lands with habitat features that could support leks and have suitable nesting and brood rearing habitat
If construction is required adjacent to any leks, implement appropriate monitoring methods as outlined in the Resource Inventory Standard Committee Standards for Upland Game Birds (RISC 1997):

- Leks will be surveyed three times each season in the early morning, surveys will not be conducted during periods with heavy wind, rain or snow.
- Leks will be surveyed by two observers, at least one observer will have experience in conducting Sharp-tailed Grouse lek surveys.
- Surveys will last for 10 minutes or until an accurate count of birds is obtained (Goddard 2010).
- The total number of birds using the lek will be recorded as will the number of males.
- Data collected during monitoring will be submitted to the provincial database.

If construction occurs within 2 km of the lek between April 15 and June 30 and pre-construction monitoring confirmed the lek was active then:

- The lek will be monitored daily during the active lekking season, which is defined as April 15 to the date when a QEP determines the lek is no longer being used (normally mid-May), for the duration of the time construction activities occur within 2km of the lek.
- Monitoring will be conducted by a QEP.
- If monitoring determines construction is negatively affecting the use of the lek, the QEP will work with the construction manager to determine how work activities could be adjusted given the constraints of the Project. Additional mitigation measures may include the installation of noise barriers, installation of additional visual buffers, and adjustment of work times.
- If monitoring determined disturbance to the lek occurred due to construction activities, then after construction is complete the lek will be monitored for up to five years or until birds are observed using the lek for >1 breeding season. This monitoring will be managed by BC Hydro.

- Amphibian breeding and migration areas:
  - Limit vegetation clearing and avoid road construction in identified amphibian breeding and migration areas, where feasible.
  - If construction is required adjacent to any identified amphibian breeding and migration areas, implement appropriate barriers and set-back buffers around the sites in accordance with management of Important Wildlife Areas protection measures described below.
  - Install crossing structures for amphibians and snakes to avoid and reduce injury and mortality to amphibians on roads that cross or are immediately beside wetland or other areas where amphibians or snakes are known to migrate across roads in accordance with Section 8.8 of the Vegetation and Wildlife Mitigation and Monitoring Plan. Notify BC Hydro of such installations within 5 days of installation.
  - Implement amphibian salvage and relocation procedures as required. Amphibian salvages could be required when avoidance of areas containing metamorphosing tadpoles cannot be avoided, when mass migration events cross access roads, or prior to the destruction of wetlands supporting amphibians.
o BC Hydro will seek and maintain a salvage permit for the project. EPP’s will contain a detailed salvage plan that is developed in accordance with conditions of the salvage permit.

- Active bear, wolf, fox, fisher or coyote dens sites
  o A 200 m buffer is required for active bear, wolf, fox, fisher or coyote dens sites. The buffer is to be retained until the den site is no longer being used by adults or cubs/kits.
  o To identify potential den sites, contractors are required to prepare an information sheet that includes representative photos of dens for each wildlife species and describes the types of areas that dens can be expected to be found in and the months of the year each species use dens. This information sheet will be reviewed during orientations and tailboards as required and provided to machine operators and other workers who will be completing ground activities or pre-disturbance surveys.

- If a calf or fawn is observed hiding without its mother present, all workers and equipment are to withdraw from the location to a distance determined by the contractors EM. Workers and equipment can return to the site once an EM has determined the calf or fawn has been away from the area for at least 24 hours. Applicable guidance is available in the BC “Leave Newborn Wildlife in the Wild” available at https://news.gov.bc.ca/stories/leave-newborn-wildlife-in-the-wild-2
Table 5  Peace Region Terrestrial Wildlife Least-Risk Windows³

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<th>Jan</th>
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</tbody>
</table>

Low Risk
Restrictions would not normally apply. Where ground conditions permit, plan development activities within these timeframes.

Caution
Operators should avoid development activities during these timeframes.


Critical
Development activities are not appropriate during this timeframe. Aerial activities should adhere to guidelines ¹. In the event that working within a critical window is unavoidable, proponent should contact an appropriate qualified professional (e.g. Registered Professional Biologist with BC accreditation) to discuss alternatives, and potential mitigation and monitoring plans.


General Wildlife Habitat Protection Measures

- Wildfires create a risk of wildlife habitat loss or alteration and the potential for mortality to wildlife. These risks are addressed by following the provisions of the Fire Hazard and Abatement Plan outlined in the Site C Clean Energy Project Construction Safety Management Plan.
- Control permanent habitat loss by carefully flagging and restricting clearing to those areas required for construction and the safe and reliable operation of the Project.
- Outside the reservoir area, control riparian vegetation clearing including clearing around wetlands, and retain wildlife trees when possible, and safe to do so.
- Where live or dead large trees must be removed within the transmission line fall zone, leave tall stumps where feasible and safe to do so.
- Focus lighting on work sites and away from surrounding areas to minimize light.
pollution and disturbance to wildlife. If lighting cannot be directed away from surrounding areas, the Contractor must ensure additional mitigation measures are implemented to reduce light pollution, including light shielding.

- Take measures to mitigate against harming migratory birds, nests and eggs as described in *Incidental Take of Migratory Birds in Canada* (Environment Canada 2014b).

**Protection of Important Wildlife Areas**

The Environmental Features Map will show Important Wildlife Areas. Contractors will use this data when planning construction activities to identify potential interactions with Important Wildlife Areas and guide avoidance and mitigation planning associated with these areas. Contractors will provide updated data to BC Hydro. BC Hydro will provide the Environmental Features Map to applicable regulatory agencies prior to the start of construction and as it is updated BC Hydro will notify regulatory agencies, the IEM and affected Contractors.

- Except within the dam site area, on designated access roads and during clearing, construction activities shall be prohibited within 15 m of the Ordinary High Water Mark of streams or wetland, unless the activity was described in the EIS and is accepted by BC Hydro.
- Avoid construction activity within Important Wildlife Areas, including designated set-back buffers, where feasible.
- Designation of set-back buffers:
  - If construction activities must be undertaken within a setback buffer, develop and implement an appropriate mitigation and monitoring program in consultation with BC Hydro, Ministry of Forests Lands and Natural Resources and Canadian Wildlife Service.
  - If a bird builds or occupies a nest in an active construction zone a minimum 5 m buffer will be established around the nest to protect the nest and allow construction activities to proceed. The appropriate buffer should be determined by a QEP. The buffer will be maintained until the nest is no longer occupied, as determined by a QEP.
- See also Section 4.15 Vegetation and Invasive Plant Management.

**Human-Wildlife Conflict Management Plan:**

- Food scraps and garbage from construction sites and camps shall be stored in bear-proof containers and removed regularly for proper disposal.
- Project workers shall be prohibited from:
  - Feeding wildlife at construction sites.
  - Hunting while on construction sites, Project built roads or worker housing sites.
  - Cleaning game at construction sites, Project built roads or worker housing sites.
- Reduce risk of wildlife-vehicle collisions:
  - Encourage personnel to use as few vehicles as necessary, with multiple people per vehicle.
  - Instruct workers that wildlife has the right of way unless it is unsafe (for example if a collision is imminent).
- Adhere to safe speed limits and post them as required in the CSMP (Appendix G)
- Maintain a log of large wildlife sightings and road kill
- Promptly notify appropriate authorities of road kill
- Post warning signs at locations with frequent wildlife crossings
- Provide and maintain wildlife escape routes through snow banks on each side of ploughed roads. Escape routes will be about 500 m apart and one blade width wide and extend to the edge of the surrounding vegetation to enable individual animals to exit the roadway
- Report dangerous human-wildlife incidents to appropriate authorities
- Include wildlife vehicle collisions in tailboard meetings

EPPs will address, at a minimum, the following:

- Provision of no hunting or cleaning game on or in the vicinity of construction sites
- Bear, Cougar and Moose Interaction Management Considerations
- Relative Human Risk from Bears, Cougars and Moose
- General Bear, Cougar and Moose Interaction Management
- Waste Management
  - Solid Waste Management
  - Sewage and Grey Water
  - Petroleum-Based Products
- Bear and Cougar Awareness & Safety Training
- Bear and Cougar Detection
  - Reporting and Recording Bear and Cougar Activity
- Bear and Cougar Interaction Response
- Bear/Cougar-Related Emergency

**Wildlife Deterrents**

Wildlife deterrent activities and devices may be employed within the Project Activity Zone, and in areas adjacent to the Project Activity Zone where there is a risk of dangerous wildlife or nest occupation by breeding birds.

Deterrent systems may include a combination of animal detection systems, physical barriers, auditory deterrents, and visual deterrents (e.g. airborne devices, kites, balloons, lights, laser deterrents, trained animals (dogs or birds of prey such as hawks or falcons), and models (injured birds or predators). Deterrent type will vary depending on target species, habituation, site conditions and effectiveness of deterrent activities.

Materials that could act as wildlife attractants (e.g. oils, grease, garbage, food scraps) shall be placed, stored and stockpiled in either animal proof containers or a manner that limits their potential to attract wildlife and as described in Section 4.8 above.
References


4.18 Restricted Activity and Work Avoidance Zones

Within the Dam Site Area (see Figure 2), restricted activity zones will be established to reduce or avoid potential construction effects in those areas. Only specified construction activities will be conducted within the restricted activity zones.

Environmental, heritage and cultural features and environmentally sensitive areas may also be identified as work avoidance zones. No construction activities will be allowed in work avoidance zones. Examples are:

- except within the Dam Site Area, work avoidance zones will be established around known tufa seeps, wetlands and rare plant occurrences that are adjacent to construction areas;
- sensitive heritage sites as identified in Heritage EPPs.

These sites must be addressed, as applicable, in EPPs. Appropriate buffers and barriers will be established around these sites in consultation with BC Hydro.
5.0 Pre- and Post-Construction Surveys and Monitoring

5.1 Vegetation and Wildlife Surveys

BC Hydro will conduct the following surveys:

- Rare plant surveys (including vascular plants, mosses, and lichens) along the transmission line and temporary access roads
- Invasive plant inventories at work sites
- Bald Eagle nests along the Peace River between Hudson's Hope and the Alberta border, up major tributaries to the Peace River, around select large lakes on the plateau near the transmission line and along the proposed expanded transmission line Right of Way
- Beaver lodges along the Peace River and major tributaries between Hudson's Hope and the Alberta border

BC Hydro will provide the results of these surveys to contractors, including updates, as appropriate. All Contractors shall include the results of these surveys in their EPPs when considering restricted activity and work avoidance zones (S. 4.18).

Where available RISC standards will be used to conduct pre-construction surveys. There are currently no formal BC RISC standards for conducting rare plant surveys other than for the collection of voucher specimens. Methodologies for these surveys will be developed using guidelines in the following documents: *Guidelines for Rare Plant Surveys* (Bizecki-Robson, 1998); *Survey Protocols For Survey & Manage Strategy 2 Vascular Plants* (Whiteaker et al., 1998); *ANPC Guidelines for Rare Plant Surveys in Alberta* (Alberta Native Plant Council, 2012); *CNPS Botanical Survey Guidelines* (California Native Plant Society, 2001); *Occupancy Survey Guidelines for Prairie Plant Species at Risk* (Henderson 2009) and *Protocols for Rare Plant Surveys* (Penny and Klinkenberg, 2012).

5.2 Post-Construction Monitoring

BC Hydro will undertake a post-construction site restoration monitoring program at each site, including evaluation of the effectiveness of site reclamation activities by a Qualified Environmental Professional to confirm that the required commitments have been met.

References


6.0 Qualified Environmental Professionals

The CEMP was prepared by the following Qualified Environmental Professional:

Al Strang, P. Eng., BC Hydro

Edits for Revisions 2 and 3 were prepared by a team of appropriately Qualified Environmental Professionals with review by:

Greg Scarborough, R.P. Bio., BC Hydro
7.0 Appendices