

<b>Project Name</b>	Revelstoke Generating Station Unit 5	<b>Inspection Status</b>	Final
<b>EA Certificate #</b>	E07-02	<b>Inspection No.</b>	20240011_IR001
<b>Project Status</b>	Certified - operations	<b>Inspection Start</b>	2024-05-02
<b>Inspection Type</b>	Field and Administrative	<b>Trigger</b>	Planned Inspection
<b>UTM</b>	11N 416231E, 5655983N		
<b>Project Description</b>	The Revelstoke Generating Station Unit 5 Project (Project) involved the installation of a fifth 500-megawatt hydroelectric turbine in the existing Revelstoke Dam. The fifth turbine became operational in December 2010.		
<b>Location Description</b>	The Revelstoke Dam is located on the Columbia River approximately five kilometres (km) north of Revelstoke, B.C.		
<b>Inspection Summary</b>	<p>During the field component of the inspection, the Officer inspected the warehouse and Areas A, B and C, as identified on the October 13, 2010 letter from BC Hydro to Brian Murphy at the Environmental Assessment Office (EAO) (Appendix 1). The inspection included a debrief of observations with Project staff on May 2, 2024.</p> <p>The following requirements were inspected against:</p> <ol style="list-style-type: none"> <li>1. Commitment 48 with respect to hazardous waste packaging and storage;</li> <li>2. Commitment 48 with respect to spill kits;</li> <li>3. Commitment 48 with respect to spill response;</li> <li>4. Commitment 53 (EAC Amendment 1) with respect to restoring and revegetating disturbed sites;</li> <li>5. Commitment 57 with respect to a mid-Columbia burbot winter spawning program;</li> <li>6. Commitment 58 with respect to developing and implementing a Fish Entrainment Strategy; and</li> <li>7. Commitment 77 with respect to weed control.</li> </ol> <p>Additional detail regarding these findings may be found in the sections below.</p> <p>The compliance determinations in this report reflect the findings from the inspection dates noted above. These determinations can change at any time upon information gathered through future inspections or if new information is obtained by the EAO Compliance and Enforcement Branch (CEB).</p>		
<b>In Attendance</b>	Fish Biologist, BC Hydro		
<b>Certificate Holder</b>	BC Hydro and Power Authority		
<b>Mailing Address</b>	BC Hydro and Power Authority, Project Delivery 6911 Southpoint Drive, B02 Burnaby, BC V3N 4X8		
<b>Inspecting Officer(s)</b>	Alex McLean Compliance & Enforcement Officer		
<b>Record Prepared By:</b>	Alex McLean Compliance & Enforcement Officer		

<b>Record Approved By</b>	Clayton Smith Deputy Director, Compliance & Enforcement Branch
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**INSPECTION DETAILS****Requirement 1: Commitment 48:**

BC Hydro will continue to implement existing Environmental Best Management Practices and procedures in place for the Revelstoke Dam...

*\*See Appendix 1 for the full wording of Commitment 48.*

*On April 15, 2024 the EAO asked BC Hydro for their current Environmental Best Management Practices and Procedures for the Revelstoke Dam. In response, they provided many documents, one of which was the Revelstoke Generating Station Hazardous Waste Checklist in Appendix 2.*

**Revelstoke Generating Station Hazardous Waste Checklist (Appendix 2)**

- Package the waste so that it will not leak and is suitable for storage and transport
- Package must be:
  - Labelled (CAT ID222-0357)
  - In good condition
  - Closed
  - Compatible with the waste
  - Secure
- For wastes that are in the process of being transported, hazardous wastes must be:
  - Protected from the weather
  - Stored in a secure area
  - Contained if liquid waste
  - Transported as soon as possible

**Inspection Details:**

Hazardous wastes are stored in a secure, weatherproof area in the warehouse. All observed hazardous wastes were in barrels or other containments. All containers were clearly labelled and in good condition. No leaks were observed.



Photo 1: Clearly labelled barrels of hazardous waste



Photo 2: Hazardous waste on secondary containment.

The above documents compliance with the requirement to store hazardous wastes in accordance with the Environmental Best Management Practices and procedures in place for the Revelstoke Dam.

<b>Compliance Finding</b>	In
<b>Enforcement Action</b>	Not Applicable

**Requirement 2: Commitment 48:**

BC Hydro will continue to implement existing Environmental Best Management Practices and procedures in place for the Revelstoke Dam...

**\*See Appendix 1 for the full wording of Commitment 48.**

*On April 15, 2024 the EAO asked BC Hydro for their current Environmental Best Management Practices and Procedures for the Revelstoke Dam. In response, they provided many documents, one of which was the Revelstoke Generating Station Spill Contingency Plan in Appendix 3.*

**Revelstoke Generating Station Spill Contingency Plan, Oct 2020 (Appendix 3)**

Section 4.2.10 - Warehouse and Storage Yard

There is a large oil response spill kit and an aggressive liquids spill kit located by the door in the warehouse.

**Inspection Details:**

There are multiple, sealed spill kits of various types by the door in the warehouse.



Photo 3: Sealed aggressive liquids spill kits in the warehouse.



Photo 4: Sealed spill kits in the warehouse. At least one of them is "oil only". The large, yellow plastic tote is a spill kit as well.

The above documents compliance with the requirement to maintain spill kits in accordance with the Environmental Best Management Practices and procedures in place for the Revelstoke Dam.

<b>Compliance Finding</b>	In
<b>Enforcement Action</b>	Not Applicable

**Requirement 3: Commitment 48:**

BC Hydro will continue to implement existing Environmental Best Management Practices and procedures in place for the Revelstoke Dam...

**\*See Appendix 1 for the full wording of Commitment 48.**

*On April 15, 2024 the EAO asked BC Hydro for their current Environmental Best Management Practices and Procedures for the Revelstoke Dam. In response, they provided many documents, two of which were the Revelstoke Generating Station Spill Contingency Plan and the Spill Card in Appendix 3.*

**Revelstoke Generating Station Spill Contingency Plan, Oct 2020 (Appendix 3)**

Section 4.2.10 - Warehouse and Storage Yard

Follow the six steps of spill response as outlined on the Spill Card...

**Spill Card, Dec 2020 (Appendix 3)**

The Six Steps of Spill Response:

1. Ensure safety
2. Stop the flow
3. Secure the area

- 4. Contain the spill
- 5. Notify/Report
- 6. Clean up

**Inspection Details:**

The large hydraulic ram in the storage yard has a dilapidated wooden shed around it. The shed was built around the ram and does not have a floor. The ram is leaking oil and the bucket placed underneath one end of it is not containing all the oil. As a result, oil is entering the environment below.

The ram appears to have been on site for a very long time and during inspection, BC Hydro informed the EAO that they have classed the ram’s location as a “contaminated site”.

Allowing a site to remain contaminated is contrary to the EAC.



Photo 5: Large hydraulic ram leaking oil to ground. The shed that it’s in has no floor.



Photo 6: The shed that contains the hydraulic ram.

Plastic bags full of primarily empty oil containers were also observed in the storage yard. While the bags had been placed in containment, one of the bags was overhanging and leaking oil to ground.



Photo 7: Bags of old oil containers leaking oil to ground.

The above documents non-compliance with the requirement to stop the flow, contain the spill, and clean up the spill in accordance with the Environmental Best Management Practices and procedures in place for the Revelstoke Dam.

<b>Compliance Finding</b>	Out
<b>Enforcement Action</b>	Notice of Non-compliance

**Requirement 4: Commitment 53 (EAC Amendment #1):**

BC Hydro will restore and re-vegetate disturbed sites as soon as possible after completion of construction of the proposed Revelstoke Unit 6 Project. If the proposed Revelstoke Unit 6 Project does not proceed or is significantly delayed, BC Hydro will restore and re-vegetate disturbed sites by 2016.

**Inspection Details:**

The October 13, 2010 letter from BC Hydro to Brian Murphy at the EAO (the Letter – Appendix 1), which forms part of EAC Amendment 1, identifies the sites subject to the above commitment. They are the Area B and C laydown and parking areas.

The Letter states *“The Revelstoke Unit 6 project would use essentially the same lay down and parking areas as are currently being used for construction of Revelstoke Unit 5 (see attached site plan). Therefore, rather than re-vegetate those areas upon completion of construction on Revelstoke Unit 5, with your consent, we would propose to delay our compliance with Commitments 51 and 53 until after the completion of Revelstoke Unit 6. BC Hydro would also commit to:*

- 1. ongoing weed control at the Area B and C laydown and parking areas, and*
- 2. completing these commitments by 2016 in the event the Revelstoke Unit 6 project does not proceed or is significantly delayed.*

*Please note that successful re-vegetation works by hydro-seeding occurred in 2008 along the eastern drainage line in Area C (see attached plan). Further, clean-up of the Area A hardstand (asphalt) area is planned for this fall and will include removal of Revelstoke Unit 5 project related scrap metal, wood and other scrap materials. Area A will continue to be used by Revelstoke Generating Station operations as a laydown and working area.”*

Areas B and C have not been restored and re-vegetated. While ongoing landslide remediation works have recently disturbed most of Area B, the south end of Area B is unaffected by these works and it has not been restored. While some vegetation is growing upon it, the substrate remains primarily placed rock.



Photo 8: Area B. While the north end has recently been disturbed to remediate a landslide, the south end remains undisturbed and has not been restored and re-vegetated.



Photo 9: Rock substrate at south end of Area B.

Area C contains two disturbed areas. One area is currently being used as a parking lot, while the other appears to be an abandoned laydown that has not been restored and re-vegetated.



Photo 10: East side of Area C currently being used as a parking lot.



Photo 11: West side of Area C. No current use and not restored and re-vegetated.

While the EAO acknowledges that BC Hydro is still planning on proceeding with Revelstoke Unit 6, they haven't commenced construction on it and the above commitment required BC Hydro to restore and re-vegetate Areas B and C by 2016 if the Revelstoke Unit 6 project was significantly delayed.

The Letter states *"The current schedule for Revelstoke Unit 6 would have construction begin in 2015 to meet an in service date of October 2018."* As such, the Revelstoke Unit 6 project has been significantly delayed.

The above documents non-compliance with the requirement to restore and re-vegetate disturbed sites by 2016 if the proposed Revelstoke Unit 6 Project does not proceed or is significantly delayed.

<b>Compliance Finding</b>	Out
<b>Enforcement Action</b>	Warning Letter

**Requirement 5: Commitment 57:**

BC Hydro will commit to a mid-Columbia burbot winter spawning program to examine burbot spawning movements, both pre and post Revelstoke Generating Station Unit 5.

**Inspection Details:**

Revelstoke Generating Station Unit 5 became operational in December 2010. As such, the mid-Columbia burbot winter spawning program should have occurred both before and after this date.

On May 22, 2024, in response to a May 14, 2024 information request from the EAO, BC Hydro stated that they fulfilled this commitment by completing a five-year monitoring study called CLBMON-31. A January 22, 2014 report (Appendix 4) summarizing the 5<sup>th</sup> year of this study states:

*“In 2008, LGL Limited in partnership with the Canadian Columbia River Intertribal Fisheries Commission (CCRIFC) was commissioned by BC Hydro to conduct a five-year study on Burbot life history and habitat use in the Arrow Lakes Reservoir system. The aim of the five-year program is to provide an improved understanding of the potential effects of hydro operations at Revelstoke Dam on Burbot downstream in the reservoir. The results of the work completed during the first (2008-2009), second (2009-2010), third (2010-2011) and fourth (2011-2012) years of study are in Glova et al. (2009, 2010) and Robichaud et al. (2011, 2012), respectively. This report is for the findings of the fifth year of study (2012-2013).”*

The above referenced reports are all in Appendix 4.

The above shows that BC Hydro committed to a mid-Columbia burbot winter spawning program to examine burbot spawning movements, both pre and post Revelstoke Generating Station Unit 5, and as such they are compliant with Commitment 57.

<b>Compliance Finding</b>	In
<b>Enforcement Action</b>	Not Applicable

**Requirement 6: Commitment 58:**

BC Hydro commits to developing and implementing the BC Hydro Fish Entrainment Strategy to assess the risks, magnitude of impact and develop and implement appropriate management actions to mitigate entrainment impacts associated with the Revelstoke operation including the addition of a 5th unit.

BC Hydro commits to working collaboratively with Department of Fisheries and Oceans and Ministry of Environment to develop and implement the BC Hydro Fish Entrainment Strategy at the Revelstoke Dam. This strategy will be developed in a timely manner and will include:

- A risk screening assessment for Revelstoke, completed prior to implementation of the Rev 5 project;
- Detailed assessment to quantify the level and species entrained and the population effects across the entire system from Kinbasket Reservoir to Arrow Lakes Reservoir;
- The risk screening to look at overall ecosystem effects;
- Local involvement in future mitigation/compensation discussions;
- A feasibility assessment for developing alternative mitigation and compensation options with a business case advancement; and
- Action plans involving implementation and monitoring for the Revelstoke and Mica dams.

This commitment will be included in the *Fisheries Act* authorization for the Project.

**Inspection Details:**

This inspection focused on whether BC Hydro developed and implemented an action plan to mitigate the impact of fish entrainment at the Revelstoke Dam.

The Mica-Revelstoke Fish Entrainment Strategy Technical Committee Recommendations Report in Appendix 5 (the Report), dated December 2022, details BC Hydro’s Fish Entrainment Strategy. It states that fish entrainment through Mica (MCA) and Revelstoke (REV) Dams has been evaluated since 2007. After detailed assessment, none of the mitigation alternatives proved fully acceptable to all Technical Committee (TC) members. Because of this, the TC examined offset/compensation options and made recommendations. The Report states the next steps to launch the Implementation Phase of the Mica-Revelstoke Fish Entrainment Strategy will be:

- Each TC member will review the outcomes and recommendations of this Technical Committee Recommendations Report with their constituency.
- The TC will re-convene to review feedback, make any necessary adjustments, and discuss detailed implementation plans.
- BC Hydro will work internally to establish details of the appropriate budgets and funding approach.

On April 15, 2024, the EAO asked BC Hydro for a status update. On April 29, 2024, they responded with an email (Appendix 5) that states:

*“The Fish Entrainment Strategy Technical Committee (FESTC), which included representatives of the Nations, endorsed the attached Technical Committee Recommendations Report (Dec 2022). Next steps were for each committee member to share the recommendations with their respective organizations.*

*The following outlines progress on this step:*

- *Secwepemc (SNTC): in February 2023, the Splotsin FN representative (our original SNTC lead) confirmed that council endorsement is not feasible given individual band interests to be represented separately. As this was not the original representation structure at the FESTC, BC Hydro is working directly with Splotsin, Shuswap and Little Shuswap Nations to review the work completed by the technical committee. Adams Lake and Neskonlith Nations have not yet responded to our requests for participation in the review.*
- *Okanagan Nation Alliance (ONA): incomplete*
- *Ktunaxa Nation Council (KNC): incomplete*
- *DFO: complete – endorsed*

- *BC Hydro: initiated – waiting on Secwepemc review and changes prior to completing internal business case approval.*

*Next steps for this process are to complete Secwepemc Nations review of the FESTC recommendations and “re”-endorsement by the FESTC by end of Summer 2024. We expect this step will lead to completion of ONA and KNC reviews. BC Hydro’s internal approvals can also proceed once we confirm the scope of recommendations proposed. We are working towards finalizing the Technical Committee Recommendations Report by March 2025, updating our Columbia operations Fisheries Act Authorization (CLB FAA) conditions and initiating implementation by June 2025.”*

The above confirms that BC Hydro has been implementing a Fish Entrainment Strategy since 2007. The Strategy has evolved over time and is still being implemented. As such, BC Hydro is compliant with the requirement to develop and implement appropriate management actions to mitigate entrainment impacts associated with the Revelstoke operation including the addition of a 5th unit.

<b>Compliance Finding</b>	In
<b>Enforcement Action</b>	Not Applicable

**Requirement 7: Commitment 77 (EAC Amendment #1):**

BC Hydro commits to ongoing weed control at the Area B and C lay down and parking areas as described in the letter of October 13, 2010 in Schedule A.

**Revelstoke Generating Station Vegetation Management Plan, version 2.1 (Appendix 6)**

Section 6.0 Site Monitoring

Monitoring and assessing sites is an integral component of integrated vegetation management. Vegetation communities will be assessed continually.

Section 6.1 - Assessment

Sites will be assessed before each treatment to determine the appropriate timing and requirements of treatment. Timing is especially important for site-specific herbicide applications, as their effectiveness is dependent on the target plants’ stage of growth. While all sites will undergo an annual assessment, some sites may be assessed more frequently due to environmental sensitivity or structural integrity concerns. Information gathered will be used in conjunction with established thresholds to develop treatment prescriptions and site management objectives.

Weed control crews will be provided with facility maps. They will use these maps to sketch weed coverage and herbicide application locations, and to record their visual estimations of coverage percentage and prevalence (few, common, or abundant) of target weed species. A single map will be used per year, with each visit’s information recorded in a different color.

Section 6.2 - Evaluation

Site evaluations will be conducted after each treatment to determine the effectiveness of the treatment prescription and to assess contractor performance. Evaluations can be visual or plot-based, and will measure the mortality of target and non-target vegetation.

Information collected from the evaluation will be measured against site management objectives. Field notes from the yearly evaluation will be included in the Vegetation Management Plan and the evaluation results will be used to improve future vegetation management programs through an adaptive management process.

**Inspection Details:**

The Area B and C lay down and parking areas referenced in the commitment above are portrayed in the October 13, 2010 letter in Appendix 1.

The EAO used the procedures outlined in Revelstoke Generating Station Vegetation Management Plan version 2.1 (the Plan) to define what “ongoing weed control” means. Excerpts from the Plan are above.

On May 14, 2024, the EAO asked BC Hydro for evidence of compliance with Plan sections 6.1 and 6.2, specifically the facility maps used by the weed control crews to document their 2022 and 2023 assessments and any post treatment site evaluations conducted in 2022 and 2023.

On May 22, 2024, BC Hydro emailed the EAO and stated “No weed control assessments or treatments were conducted in 2022 or 2023 at the Revelstoke Generating Station. BC Hydro’s Vegetation Management specialists will be assessing the Revelstoke Generating Station site this spring to prepare a treatment plan. Once this is developed the site will be treated in summer 2024 prior to seed set with a follow up assessment planned for the fall and subsequent planning for 2025. This work will be planned annually going forward.” This email is in Appendix 6.

During inspection, the EAO noted low levels of weeds around the perimeter of Area C.



Photo 12: Live knapweed on east side of Area C.

The above shows that BC Hydro is non-compliant with the requirement to annually assess and potentially treat weeds at the Area B and C lay down and parking areas as described in the letter of October 13, 2010 in Schedule A.	
<b>Compliance Finding</b>	Out
<b>Enforcement Action</b>	Notice of Non-compliance

<b>Additional Comments</b>	
None	
<b>Enforcement Summary</b>	
<p><b>BC HYDRO AND POWER AUTHORITY IS NOT COMPLIANT WITH COMMITMENTS 48, 53 AND 77 OF EAC E07-02. SEE APPENDIX 7 FOR A LETTER OF WARNING FOR THE NON-COMPLIANCE WITH COMMITMENT 53.</b></p> <p><b>THE EAO CEB MAY INSPECT TO DETERMINE IF THE REVELSTOKE GENERATING STATION UNIT 5 PROJECT HAS BEEN BROUGHT BACK INTO COMPLIANCE WITH THESE REQUIREMENTS. CONTINUED NON-COMPLIANCE WITH THESE REQUIREMENTS MAY RESULT IN ADDITIONAL ENFORCEMENT UNDER THE <i>ENVIRONMENTAL ASSESSMENT ACT</i>.</b></p>	
<b>Regulatory Considerations</b>	
N/A	
<b>Inspection Record Version Dates</b>	
<b>Date Preliminary</b>	
N/A	
<b>Date Finalized</b>	
<b>2024-06-17</b>	
<b>Appendices:</b>	
<p>Appendix 1: Environmental Assessment Certificate # E07-02  Appendix 2: Hazardous Waste Checklist  Appendix 3: Spill Response  Appendix 4: Burbot spawning program  Appendix 5: Fish Entrainment Strategy  Appendix 6: Vegetation management  Appendix 7: Letter of Warning</p>	
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