



Province of British Columbia

***WATER SUSTAINABILITY ACT***

**ORDER**

**Section 93**

Site C Clean Energy Project File Number: 7001837

**WHEREAS:**

1. On February 26, 2016 the Deputy Comptroller of Water Rights (the “DCWR”) issued to British Columbia Hydro and Power Authority (BC Hydro) Conditional Water Licences C132990 (the “Power Licence”) and C132991 (the Storage Licence”) for the construction of the dam and reservoir that are components of the Site C Clean Energy Project (the “Project”);
  2. Clause h) of the Power Licence authorizes the construction of works that include an approach channel, an intake, a dam, spillways, a powerhouse and tailrace, and an access road;
  3. Clause j) 5) of the Power Licence requires BC Hydro to obtain a leave to commence construction (LCC) in writing from the Engineer under the *Water Sustainability Act* (the “WSA Engineer”) before commencing the construction of the works authorized by clause h);
  4. Clause j) 3) e. of the Power Licence requires BC Hydro to submit a construction environmental management plan (CEMP) for the management and mitigation of construction impacts that is to the satisfaction of the Comptroller of Water Rights (the “CWR”);
  5. On June 29, 2016 the WSA Engineer granted LCC No. 2 to BC Hydro for the construction of five Relocated Surplus Excavation Material (RSEM) areas, RSEM R5a, R5b, R6, L5 and L6, including the construction and operation of associated sediment ponds;
  6. Appendix E – **Acid Rock Drainage and Metal Leachate Management Plan**, revised on July 26, 2016 and added to the CEMP, specifies the construction procedures that will be followed to minimize the amount of acid rock drainage (ARD) and metal leachate (ML) produced by the Project, the water quality objectives that are to be met, the monitoring that is to occur to verify that the objectives are being met, and the documentation required for any non-compliance with those objectives;
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7. Appendix E of the CEMP also specifies sediment pond and respective Peace River initial dilution zone (IDZ) compliance points, as well as water quality threshold concentrations for Relocated Surplus Excavation Material (RSEM) sediment pond end-of-pipe discharges of potentially acid generating (PAG) bedrock contact water. Appendix E further specifies that the effluent must be not acutely lethal to aquatic life at the point of discharge into the environment, to be confirmed through 96-hr Rainbow Trout acute toxicity testing;
  8. On September 8, 2018 heavy precipitation washed exposed PAG shale bedrock in the Approach Channel of soluble ARD/ML products, including Cadmium, Copper, Zinc, Aluminum and acidic (low pH) water;
  9. From September 9-20, 2018 over 22,000 cubic metres of PAG contact water was discharged from RSEM sediment pond R5b into the Peace River, which daily exceeded either pH or metal CEMP Appendix E concentration thresholds at the point of discharge. This exceedance included over 4,000 cubic metres of PAG contact water below pH 6.0 (down to pH 4.7) from September 9-10, 2018, as well as a failed acute toxicity test;
  10. During the exceedance event, mitigation measures included:
    - actively pumping contact runoff from the Approach Channel to the pre-treatment collection pond, as capacity allowed,
    - shutting off the CO<sub>2</sub> bubbler at the water treatment facility, allowing high pH water to reach RSEM R5b sediment pond,
    - trucking, and releasing to RSEM R5b sediment pond, comparably cleaner water from RSEM R5a sediment pond to further dilute the acidic water inflowing from the Approach Channel;
  11. While mitigation measures were undertaken onsite in response to the event where feasible, they were ultimately unsuccessful in preventing the release of a significant amount of potentially environmentally harmful effluent into the aquatic environment;
  12. During a September 25, 2018 site inspection conducted by the CWR, the exceedance event, including potential causes and preventative actions, was discussed with representatives of BC Hydro and their construction and environmental management contractors;
  13. On October 2, 2018 BC Hydro sent Peace River Hydro Partners (PRHP), the Project's main civil works contractor, a directive letter regarding the operation of the pre-treatment collection pond and water treatment facility, suggesting many of the options discussed on September 25, 2018.
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## **I HEREBY DIRECT BC HYDRO AS FOLLOWS:**

1. Submit to this office, within 14 days of receipt of this order, an independent assessment, to be conducted by appropriately Qualified Environmental Professionals, to determine the adequacy of the water treatment facility and pre-treatment collection pond to ensure water quality compliance at the Project, including assessment of:
    - the capacity of the existing water treatment facility and pre-treatment collection pond works, including local catchment area and volumes of water imported from other Project sources;
    - the return period of the designed inflow volume that the works were built for;
    - the suitability of continuing to use Fort St John airport climate data to establish return event inflow volume for water management infrastructure designs, including consideration of climate data collected at the dam site since 2015;
    - the suitability of the water treatment facility, including the generation, collection and disposal of resulting sludge material, given the typical influent water chemistry since commissioning of the plant and the water chemistry used in the facility design; and
    - environmental consequences, including an assessment of serious harm (as defined under the federal *Fisheries Act*), of discharged exceedances correlated to the 1:5, 1:10 and 1:20 return event rain volume using both the worst case modeled RSEM R5b water quality data and the September 9-20, 2018 RSEM R5b sampled water quality data.
  2. Submit to this office a plan and schedule to install and commission, within 14 days of receipt of this order, to the satisfaction of the Comptroller of Water Rights, to be developed by the appropriate Qualified Environmental Professional, to assess the Peace River IDZ sampling and sediment pond acute toxicity testing program and provide recommendations for the program moving forward.
  3. Further to Section 7.3.2 of the CEMP Appendix E, install, maintain and operate data loggers to collect measurements every 15 minutes of pH, turbidity and specific conductivity in each sediment pond containing PAG contact water. This data will be downloaded, disseminated and reviewed in real time, and will include alarms set at early and actual exceedance levels to support proactive and timely response. The real time dissemination recipients must include BC Hydro and their sediment pond and Peace River water management contractors, and the IEM team.
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4. Submit to this office a plan, within 14 days of receipt of this order, to the satisfaction of the Comptroller of Water Rights, in consultation with the responsible Qualified Environmental Professional (ARD), specifying measures to be taken by BC Hydro and their contractors to minimize the reoccurrence of a discharged water quality exceedance, including but not limited to consideration of the following:

- re-excavation of the benches in the Approach Channel to remove the weathered shale faces and expose new un-weathered shale,
- lining of the upper Approach Channel ditch to minimize contact with PAG material and PAG contact runoff,
- installation of a pipe to convey the non PAG-contact groundwater seep through the upper Approach Channel ditch;
- addition of pre-treatment collection storage by adding additional lined ponds and/or additional mobile baker tanks, and
- additional water treatment capacity by expanding the capacity of the water treatment facility.

Dated at Victoria, B.C., this 2 day of November, 2018.

  
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Comptroller of Water Rights