



## MEMORANDUM

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DATE: September 26, 2019  
TO: Joe Van Humbeck – CP Rail  
FROM: Alex Sartori, Sartori Environmental Inc.  
RE: **Environmental Monitoring Plan – CP Cascade M118.0 Expansion Works**

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### ENVIRONMENTAL MONITORING - AN OVERVIEW

Environmental monitoring is a process that provides an independent assessment of a project's compliance with practice to protect the environment that is outlined in a contractual agreement between Contractors, the Owner (CP Rail), and Consultants. The EM is the person who assesses performance by inspecting project compliance with applicable environmental best practices, regulations, and conditions of project approval. Findings are recorded and reported to the Owner, regulators, and/or other designates through which the EM is contractually bound. The EM is familiar with the regulatory and contractual requirements of the project, and has the responsibility to report all non-compliant activities and authority that may result in a stop work order. Penalties may be levied for non-compliance with municipal, provincial, and/or federal regulations.

EMs supervise construction activities to check that the work proceeds in compliance with regulatory requirements and commitments. Further, by being on the Site and in close communication with the construction team, the EM can detect problems early. This translates to better control of potential environmental effects and reduced costs associated with resolving potential problems early.

### Communications

The general standards and protocols for communication are as follows:

1. Clear communication channels will be determined for the Contractor at the start of the project and communication channels will be discussed with all parties before the work begins. Appendix 1 contains a list of key project contacts needed to implement the CEMP. This list is to be updated on an as needed basis;
2. CP Rail should notify VFPA Environmental Programs and DFO Habitat Protection of the intention to commence physical works 48 hours prior to commencement;
3. The EM will deliver an environmental awareness program to construction staff through an initial pre-construction meeting and regular briefings, as needed;
4. The EM is a key member of the inspection team and will simultaneously report the findings of inspections to the Contractor, Owner, and appropriate regulatory agencies, as deemed necessary through project approval;
5. The Owner or the Project Engineer will communicate any major changes to the design or contract specifications to the appropriate parties promptly. Minor day-to-day modifications or variances will be reported through the EM's weekly reports;

6. The EM will be responsible for communications with regulatory agencies regarding construction progress, environmental concerns, design or mitigation modifications, environmental damage and/or onsite meetings, as appropriate. Environmental concerns are to be communicated to the EM for resolution;
7. In the event of an environmental emergency, the Owner and/or Contractor(s) will notify the EM immediately. The EM, Contractor, or Owner will notify the appropriate regulatory agencies listed in the Emergency Response Plan within Appendix 1 of the Project CEMP; and
8. Communication with the public is the responsibility of the Owner, unless otherwise authorized.

### **Pre-Construction Inspection**

1. Prior to any works occurring at the Site, the EM, together with the Project Team (the Owner or their representative, the Project Engineer, and the Contractor), will meet onsite and review Site-specific environmental requirements and areas of potential concern;
2. The EM will review and/or mark-off any sensitive areas in the proximity of construction activities in advance of construction starting;
3. The EM will inspect the work for compliance with the construction specifications for:
  - All proposed mitigation measures;
  - All relevant federal, provincial, and municipal environmental regulations; and
  - Any other aspects of the work that have the potential to adversely affect the environment.
4. Inspection/supervision will include all waste areas, fill areas, access roads, ramps, and other project structures at the Site. The inspection will include, but will not be limited to:
  - Inspection of past work carried out for compliance with the construction specifications;
  - Inspection of construction areas for signs of environmental spills or emergencies;
  - Inspection of sensitive and “no construction” areas for disturbance;
  - Inspection for potential problems such as storage of material (i.e., excavated soil piles) that may permit the escape of material into streams, or the storm drainage system;
  - Inspection of the markers used to fence off sensitive and no disturbance areas;
  - Conducting or confirming that all pre-construction surveys are conducted as appropriate (i.e., pre-clearing invasive plant survey);
  - Permitted hours of work;
  - Inspection of onsite spill response equipment to confirm sufficient supply and appropriate type of supplies; and
  - Inspection of the fuel handling/storage practices for compliance with Spill Contingency and Response Plan.
5. The EM will be required to collect water quality samples during Site inspections. A sampling protocol set out by the environmental consultant and/or regulatory agencies should be adhered to.

### **Roles of Environmental Monitor**

The Environmental Monitor is responsible for ensuring the environmental protection objectives established by CP, DFO, and VFPA are met by ensuring compliance with the CEMP and applicable environmental legislation. The Environmental Monitor is responsible for ensuring that all staff and subcontractors working on-site are familiar with and comply with the contents of the CEMP and Environmental BMPs.

Primary responsibilities of the Environmental Monitor are outlined below; however, they are subject to change according to the methods, needs and scope of the Project. For the duration of construction activities and following Project completion, the Environmental Monitor will:

- Review and understand the CEMP;
- Communicate the requirements of the CEMP to CP and its contractors and their subcontractors and assists with implementation of mitigation and BMPs;
- Ensures compliance with the CEMP through regular and appropriate monitoring according to conditions and planned activities at the site;
- Advise on issues of non-conformity to the CEMP;
- Be present during key monitoring stages such as during activities conducted below the high water mark, installation of erosion and sediment control measures and during Project start-up;
- Adjust monitoring frequency according to weather conditions, planned site activities and in consultation with permit holders and regulatory agencies;
- Conduct routine and random inspections of construction activities and practices at an appropriate frequency based on the work planned;
- Be available on-call in case of emergency environmental concerns during low risk work activities;
- Attend environmental pre-job meetings with CP staff as required;
- Stop work if environmental damage is imminent or occurring;
- Maintain appropriate records including photos and documentation of site visits, activities, compliance with the CEMP and risks to the environment;
- Complete environmental monitoring reports at an agreed frequency to the permit holder, VFPA and other regulatory bodies as required for permit conditions, and;
- Ensure appropriate regulatory bodies (i.e., VFPA, DFO) are notified in the event of an environmental incident (e.g. discharge of deleterious substances into a waterbody; work and/or removal of vegetation in or near waterbodies without regulatory approval; death of fish or wildlife, etc.).

### **Non-compliance with Specifications**

1. The EM will, as the first step after identifying non-compliance, notify the Contractor and the Owner. **The EM has the authority to report work to the appropriate regulator if:**
  - Construction activities significantly affect environmentally sensitive areas or features at the Site and work is continuing unmodified; and/or
  - Water quality results exceed specified federal, provincial, regional, or municipal standards and guidelines and work is continuing unmodified.
2. If work is halted, the EM shall submit a report to the Owner, and regulatory agencies (if required) and notify them via phone, as required. The report will include:
  - Details of the events leading to the halting of work including date, time, location, staff involved, and construction activities undertaken;
  - Reference to the specific section of construction specifications, required mitigation measure or environmental regulations that prompted the work to be halted;
  - Features of the environment that were adversely affected or at risk;

- Extent of environmental effect or damage incurred, if any;
- Details and analysis, if available, of any samples taken in conjunction with the halted work;
- Remedial and due diligence actions undertaken by the Owner, the Contractor, the EM, other inspectors, and/or agencies, including steps to prevent recurrence of the problem or similar problems; and
- A detailed colour photographic record of the subject area before, during and after the emergency.

### Reporting Requirements

1. The EM will be responsible for documenting and maintaining a detailed record of all communication and correspondence with the Contractor, Owner, regulators and/or inspectors.
2. The EM will be responsible for developing and maintaining a detailed record of Site visits, including photograph records. For each Site inspection, the EM will detail: date, time, location, weather conditions, inspection activities, construction activities observed, contacts made, recommendations, and required follow-up.
3. The EM will be responsible for developing and maintaining a colour photographic record of construction activities, mitigation measures, environmental emergencies and halted work (if applicable).
4. The frequency of reporting will reflect contractual obligations and the types of activities underway at the Site, coincident with the site monitoring schedule, as follows:
  - Weekly during work in the intertidal or subtidal zones.
  - Within seven days of a significant rainfall event.
  - Bi-weekly during wet season (October 15 to May 15); and
  - Monthly during dry season (May 16 to October 14) or working above HWM.
5. Regular inspection summary reports will be submitted to the Contractor and Owner. The reports will be copied to regulatory agencies as required. The regular inspection summary reports will include:
  - General progress of the project with emphasis on work in environmentally sensitive areas;
  - Routine mitigation measures used and assessment of mitigation effectiveness;
  - Environmental concerns encountered, recommendations, and new mitigative measures taken, if any, including a list and record of all parties notified of any changes; and
  - Relevant conversations regarding work completed or planned.
6. The EM shall submit a separate report if work is halted.
7. A final report will be prepared by the EM, and will be submitted to the Contractor, Owner, Project Engineer, and regulatory agencies, as required upon completion of the project. The report may include:
  - A summary of all work in environmentally sensitive areas, including procedures used, and success of the procedures;
  - Routine mitigation measures used and mitigation effectiveness;
  - An explanation of all design changes implemented and/or recommended for environmental reasons;
  - A summary of environmental concerns encountered, new mitigative measures taken, and comments for avoiding these concerns in the future (if applicable);
  - A copy of the regular inspection summary reports for the entire project;

- A copy of all reports for halted work or for environmental emergencies; and
- A colour photographic history of work in environmentally sensitive areas, with emphasis on mitigation measures, environmental concerns encountered, and design changes.

### **Indigenous Group Monitoring Plan**

The project will offer opportunities for members or representatives of Indigenous Groups to participate in monitoring activities during Construction, including, but not limited to, monitoring of Construction activities that may affect traditional use and related environmental values.

The roles and responsibilities of Indigenous monitors will include construction, water quality and archeological monitoring on a daily basis, and will assist the EM with routine daily monitoring. If more than one Indigenous group is interested, a schedule will be created to provide a rotating monitoring schedule.

Training, equipment and support will be provided to the indigenous monitors to support the monitoring activities.

Archaeological chance find procedures area outline in the CEMP, and will be utilized in the event that a cultural find takes place during excavation works.

### **Turbidity & Water Quality Monitoring**

- Turbidity monitoring will be conducted during in-water construction activities at active rock placement or excavation activities;
- Works are anticipated to be conducted from both the existing upland, as well as from barge from Burrard Inlet. It is anticipated that water quality will be collected from outside of silt curtains to ensure turbidity is being contained, and adjacent to work areas where no silt curtain is being utilized (if rip rap is being placed on top of a solid substrate);
- If turbidity levels outside of the silt curtain are elevated (Change from background of 5 NTU at any time when background is 8 - 50 NTU in turbid waters, or Change from background of 10% when background is >50 NTU at any in turbid waters), works will cease until levels return to background levels. Samples will be taken just below surface; and
- Prior to work activities commencing, a marine salvage for high value intertidal biota will be conducted under the direction of a QEP (is the responsibility of the contractor), and collected specimens will be moved to adjacent suitable habitat; and,
- A site sweep will be conducted following high tide events and salvage visually observable biota, and moved to adjacent habitats.
- In the drainage pathways of the Project Area upslope of Burrard Inlet, fish habitat is limited to the contribution of food and nutrients to downstream habitat (*i.e.*, Burrard Inlet). Existing culverts are perched above the high water mark and habitat conditions and value of upslope pathways are limited by the absence of defined pathways, flow and other factors. Where appropriate, construction activities in and around freshwater will follow standard BMPs (*e.g.*, erosion and sediment control, water management, hydraulic connections). The exact isolation and bypass methods will be reviewed with the contractor prior to installation. Water quality will be

monitored during culvert extension works, and silt laden water will be pumped into infiltration areas to ensure it does not enter the marine environment.

If you have questions regarding the above monitoring plan, please contact me at (604) 987-5588.

**Sartori Environmental Inc.**



Alex Sartori, R.P.Bio

