



# Upper Lillooet Hydro Project

## Weekly Environmental Monitoring Report #54

Reporting Period: March 15 – March 28, 2015

Upper Lillooet River Hydroelectric Facility (Water File No. 2002561, Water licence No. C130613), Boulder Creek Hydroelectric Facility (Water File No. 2003049, Water licence No. C129969) & Transmission Line

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## Owner Construction Permits and Approvals

*Environmental Assessment Certificate No. E13-01 (Amendment 1, 2, 3, 4, 5, 6)*

*Fisheries Act Subsection 35(2)(b) Authorization No. 09-HPAC-PA2-000303 (Amendment 1, 2)*

*Letter of Advice for the Transmission Line No. 09-HPAC0-PA2-000303*

*Leave To Commence Construction (ULRHEF) File No. 2002561*

*Leave To Commence Construction (BDRHEF) File No. 2002453*

*Leave To Commence Construction (TX Line) File No. 2002561/2002453*

*Conditional Water Licence (ULRHEF C130613) File No. 2002561*

*Conditional Water Licence (BDRHEF C129969) File No. 2002453*

*Conditional Water Licence (BDRHEF C131153) File No. 2003601*

*Licence of Occupation (ULRHEF #232384) File No. 2409871*

*Licence of Occupation (BDRHEF #232386) File No. 2409998*

*Licence of Occupation (TX Line #2423386) File No. 2410654*

*Occupant Licence to Cut (ULRHEF Amendments 1, 2, 3, 4, 5, 6) No. L49717*

*Occupant Licence to Cut (BDRHEF – KM 38 laydown) No. L49698*

*Occupant Licence to Cut (BDRHEF Amendments 1, 2, 3) No. L49816*

*Occupant Licence to Cut (TX Line Amendment 1, 2, 3, 4, 5, 6, 7, 8) No. L49697*

*General Wildlife Measure Exemption Approval Letter (Amendment 1, 2) File No. 78700-35/06 UWR and 39585-20 WHA*

*Heritage Conservation Act – Alteration Permit (ULRHEF) File No. 11200-03/2014-0033*

*Road Use Permit No. 6123-13-02 (Lillooet River FSR); 5673-13-01 (Rutherford Creek FSR); 7977-13-01 (Lillooet South FSR); 8015-13-01 (Ryan River); 8188-13-01 (Pemberton Creek FSR); and 9717-13-01 (Miller Bench FSR)*

*Junction Permit (ULRHEF & BDRHEF) File No. 11250-32/6123 (Amendment 1)*

*Aeronautical Obstruction Approval (Tx Line - Lillooet River Crossing) File No. 2013-004*

*Aeronautical Obstruction Approval (Tx Line - Ryan River) File No. 2013-005*

*Aeronautical Obstruction Approval (Tx Line - North Miller) File No. 2013-006*

*Aeronautical Obstruction Approval (Tx Line - South Miller) File No. 2013-007*

*Aeronautical Obstruction Approval (Tx Line - Pemberton Creek) File No. 2013-008*

*Aeronautical Obstruction Approval (Tx Line - Lillooet River near Pemberton) File No. 2013-009*

*Aeronautical Obstruction Approval (Tx Line - Lillooet River near Meager Creek) File No. 2013-010*

*Navigable Water Protection Act (ULRHEF) File No. 8200-2009-500434-001*

*Navigable Water Protection Act (BDRHEF) File No. 8200-2012-501-032-001*

*Navigable Water Protection Act (Tx Line – North Creek) File No. 8200-2013-500103-001*

*Navigable Water Protection Act (Tx Line – Lillooet River) File No. 8200-2013-500101-001*

*Navigable Water Protection Act (Tx Line – Lillooet River) File No. 8200-2013-500102-01*

*Navigable Water Protection Act (Tx Line – Ryan River) File No. 8200-2013-500104-001*

*Navigable Water Protection Act (Tx Line – South Miller River) File No. 8200-2013-500100-001*

*Navigable Water Protection Act (Tx Line – Boulder Creek) File No. 8200-2013-500099-001*

*Navigable Water Protection Act – Extension Approval (ULRHEF, BDRHEF, Tx Line)*

*Navigable Water Protection Act (Bridge – Ryan River) File No. 8200-2013-500381*

*Navigable Water Protection Act (Bridge – Upper Lillooet Side Channel; Extension Approval) File No. 8200-2013-500383*

*Section 57 Authorization (ULRHEF) File No. 16660-20/REC202717*

*SLRD Temporary Use Permit No. 34 – Boulder Creek HEF*

*SLRD Temporary Use Permit No. 35 – Upper Lillooet River HEF*

*SLRD Building Permit (10864) – Upper Lillooet River HEF Powerhouse*

*SLRD Building Permit (10865) – Boulder Creek HEF Powerhouse*

*Works Permit for Construction within FSR Right-of-Way No. 6123-14-01*

*Section 52(1)(b) FRPA Authorization for Ryan River Wet Crossing File No. FOR-19400-01/2014*

*MOTI Permit to Construct, Use and Maintain Works Upon the Right-Of-Way of a Provincial Public Highway No. 2014-06099*

## *Contractor Construction Permits and Approvals*

*Magazine Licence File No. UL76018*

*Section 8 Approval – Short Term Use of Water File (Lillooet River and Tributaries) No. A2006123 (Amendment 1)  
Waste Discharge under the Code of Practice for the Concrete and Concrete Products Industry under the Environmental  
Management Act (Authorization No. 107204) Tracking No. 326969*

*Wildlife Act Permits – Pacific Tailed Frog Salvage Permit # SU14-95304 & SU13-90538, Fish Salvage Permit #SU14-95329*

*Section 52 of the Fisheries (General) Regulations – Fish Salvage Licence # XR 139 2014*

*BC Safety Authority – Temporary Construction Electrical Service Permit EL-140698-2014*

*Municipal Wastewater Regulation - Authorization # 107032*

*Water Supply System Construction Permits – VCH-14-613 for Main Camp*

*Water Supply System Permit to Operate Issued July 30th, 2014 for Main Camp*

*Section 6(3) and Schedule 3 Wildfire Regulations Fire Exemption for Ryan River Bridge File No. 14350-07*

*SLRD Building Inspection Report dated August 13, 2014 - Construction Camp Building Permit No. 10830*

*SLRD – Mechanic Shop Building Permit No. 10862*

*SLRD – Carpentry Shop Building Permit No. 10863*

*Lillooet River FSR Temporary Road Closures Approval File No. 11250-32/6123 (Amendment 1, 2)*

*Lillooet South FSR Temporary Road Closures Approval File No. 11250-32/7977*

### **ACRONYMS:**

<b>AMBNS</b>	Active Migratory Bird Nesting Survey	<b>INX</b>	Innergex Renewable Energy Inc.
<b>ASMP</b>	Archaeological Sites Management Plan	<b>ISW</b>	Instream Works
<b>ARD M/L</b>	Acid Rock Drainage and Metal Leaching	<b>ITM</b>	Environmental Issue Tracking Matrix
<b>BCEAO</b>	British Columbia Environmental Assessment Office	<b>JEM</b>	JEM Energy Ltd. (Delegate IE)
<b>BCWQG</b>	British Columbia Water Quality Guidelines	<b>LTC</b>	Leave to Construct
<b>BDRHEF</b>	Boulder Creek Hydroelectric Facility	<b>MFLNRO</b>	Ministry of Forests, Lands and Natural Resource Operations
<b>BG</b>	Background	<b>MOE</b>	Ministry of Environment
<b>BKL</b>	BKL Consultants Ltd.	<b>MOTI</b>	Ministry of Transportation and Infrastructure
<b>CE</b>	CRT-ebc Construction Inc.	<b>NCD</b>	Non Classified Drainage
<b>DFO</b>	Fisheries and Oceans Canada	<b>OLTC</b>	Occupational License to Cut
<b>CTF</b>	Coastal Tailed Frog	<b>PAG</b>	Potentially Acid Generating
<b>DS</b>	Downstream	<b>ROW</b>	Right of Way
<b>EAC</b>	Environmental Assessment Certificate	<b>RVMA</b>	Riparian Vegetation Management Area
<b>EAO</b>	Environmental Assessment Office	<b>SES</b>	Sartori Environmental Services
<b>Ecofish</b>	Ecofish Research Ltd.	<b>Stringer Line</b>	Temporary Backfeed Transmission Line
<b>Ecologic</b>	Ecologic Consulting	<b>TX Line</b>	Transmission Line
<b>EIR</b>	Environmental Incident Report	<b>ULRHEF</b>	Upper Lillooet Hydroelectric Facility
<b>ESC</b>	Erosion and Sediment Control	<b>UWR</b>	Ungulate Winter Range
<b>FAM</b>	Field Advice Memorandum	<b>VC</b>	Valued Component
<b>FSR</b>	Forest Service Road	<b>WEL</b>	Westpark Electric Ltd.
<b>GWR</b>	Mountain Goat Winter Range	<b>WEMR</b>	Weekly Environmental Monitoring Report
<b>Hedberg</b>	Hedberg and Associates Ltd.	<b>WHA</b>	Wildlife Habitat Area
<b>IE</b>	Independent Engineer (True North Energy)	<b>WQ</b>	Water Quality
<b>IEM</b>	Independent Environmental Monitor		

## 1.0 Summary of Site Inspections for Reporting Period

The table presented below summarizes the IEM team site presence, weather and monitoring locations by component:

Dates	IEM Team Personnel	Weather Conditions	Key Monitoring Locations & Activities
March 15 – March 21	TH, BA, KC	Variable conditions with minor rain events	<p><b>ULRHEF &amp; BDRHEF Winter Operations</b></p> <ul style="list-style-type: none"> <li>• Routine equipment maintenance and repairs completed at the 38km laydown shop location</li> <li>• Maintaining electric fence, gates, and electrified mats</li> </ul> <p><b>TX Line</b></p> <ul style="list-style-type: none"> <li>• Segment 8               <ul style="list-style-type: none"> <li>➢ ROW access works continued with road widening, hand falling, skidding and log decking</li> </ul> </li> <li>• Segment 12               <ul style="list-style-type: none"> <li>➢ Miller Bench FSR road upgrades continued - The IEM was onsite to monitor a culvert installation at MB47 on March 17</li> </ul> </li> </ul>
March 22 – March 28	TH, BA	Variable conditions with minor rain events	<p><b>ULRHEF &amp; BDRHEF Operations</b></p> <ul style="list-style-type: none"> <li>• Routine equipment maintenance and repairs completed at the 38km laydown shop location</li> <li>• Maintaining electric fence, gates, and electrified mats</li> <li>• Snow plowing from 38km to 41.5km of the Lillooet River FSR and within the ULRHEF powerhouse was completed on March 23</li> <li>• Dewatering at ULRHEF powerhouse and BDRHEF powerhouse began on March 25</li> <li>• The IEM conducted site inspections on March 23 and 25</li> </ul> <p><b>TX Line</b></p> <ul style="list-style-type: none"> <li>• Segment 8               <ul style="list-style-type: none"> <li>➢ ROW access works continued with road widening, hand falling, skidding and log decking</li> </ul> </li> <li>• Segment 9               <ul style="list-style-type: none"> <li>➢ Helicopter access RVMA clearing</li> </ul> </li> <li>• Segment 12               <ul style="list-style-type: none"> <li>➢ Miller Bench FSR road upgrades continued - The IEM was onsite to monitor a culvert installation at MB37 on March 23</li> </ul> </li> </ul>

**IEM Team Personnel:** TH – Tom Hicks, BA – Blake Aleksich, KC – Kirsten Cornwall

## 2.0 Administrative Summary

Key communications and meetings the IEM team had with the licensees, contractors and/or environmental authorities:

Date	Communication Type	Participants	Issues Discussed	ITM ID No.
March 16, 2015	<i>Work planning meeting</i>	INX, CE, SES	A meeting was held to discuss preliminary work planning for the BDRHEF intake construction activities scheduled to occur in 2015. Discussions focused on water quality management, river diversion/cofferdam construction methodologies, and environmental mitigation measures including timing restrictions and noise monitoring requirements.	-
March 17, 2015	<i>Field inspection of Lillooet River FSR</i>	INX, CE, WEL, Mumleqs, Squamish Mills, SES	The Lillooet River FSR was inspected from 17-38km to assess damages caused by snow melt and early spring rain events. 0-17km had been previously repaired and graded by Squamish Mills to support their logging activities. Damages were determined to be related to a number of significant weather events, and the required repairs will be completed as part of the spring road maintenance program by the primary road user. Two areas were identified by the IEM that required immediate attention, namely culvert repairs and ditch maintenance to prevent water flowing over the road surface at 23km, and ditch repairs and/or road grading to prevent runoff from eroding the road surface prior to entering the top end of Alena Creek (36km). The IEM informed the project team that hauling equipment and materials as part of CE spring mobilization would not be permitted until the repairs were complete. During a follow-up inspection on March 19, 2015 these repairs were completed and works on ditch maintenance and road grading were being completed by Squamish Mills between 17 – 20km.	-
March 23, 2015	<i>Pre-work meeting</i>	INX, SES, CE	Reviewed the snow clearing work plan for the Lillooet River FSR prior to commencement of snow clearing activities between 38km and 41.5km. Discussion focused on plowing a parking/turn around at 41.5km beyond access to the ULRHEF powerhouse as a means to manage public vehicle safety. The wolverine critical den emergence period was reviewed and discussed. No construction activity will occur beyond 41.5 km until after April 30 according to EAC condition #13.	-
March 25, 2015	<i>Email</i>	INX, SES, WEL	WEL requested IEM approval to operate equipment within the 15m RVMA buffer to complete pole foundation installation at structure 193 in Segment 8. The IEM reviewed the request and provided a list of additional mitigation measures and monitoring requirements to allow the works to proceed. Further details are provided in Section 5.1.	-
March 26, 2015	<i>Email</i>	INX, CE, SES	SES enacted the two-week spring shutdown based on snow conditions measured at identified road sites within the Mountain Goat Migration Corridor	-

Date	Communication Type	Participants	Issues Discussed	ITM ID No.
			according to conditions of the Mountain Goat Management Plan. Construction activities within the Mountain Goat Migration Corridor and at the ULRHEF Intake area are not currently active and are not planned to occur during the 2-week shutdown period (March 25 - April 8, 2015).	
March 27, 2015	Site inspection and tour	SES, INX, Coast to Cascades Grizzly Bear Initiative	A tour of the Construction camp, BDRHEF and ULRHEF powerhouse sites was performed with Coast to Cascades Grizzly Bear Initiative members to review mitigation measures in place according to the Human-Bear Conflict Management Plan and to discuss their concerns regarding spring Grizzly Bear presence and potential for human-bear interactions within the project area.	-

### 3.0 Current Work Restrictions and Timing Windows

The table presented below outlines work restrictions applicable during the reporting period for each active Project component location:

Component	Location	Wildlife/Archeology Concern	Construction/Timing Restrictions & Mitigations
TX Line	Segments 8 – 12	Within 150m of wetlands or 100m of Coastal Tailed Frog Streams	IEM presence is required when clearing within 150m of wetlands or 100m of CTF Streams, to ensure clearing area is minimized.
		Riparian Vegetation Management Areas (RVMA)	IEM monitoring is required during clearing within RVMAs.
		Surface Water Quality	IEM monitoring is required during culvert installation activities in non-fish bearing waters to document adherence to the Surface Water Quality Protection Plan objectives.
		Suitable Raptor Nesting Habitat	IEM presence is required when clearing within suitable Northern Goshawk (NOGO) and SPOW (Spotted Owl) nesting habitat during the breeding period.
		Suitable Class 1 & 2 Grizzly Bear forage habitat	IEM monitoring is required when clearing within identified Class 1 & 2 Grizzly Bear forage habitat, to ensure clearing area is minimized.
		Wildlife Habitat Area (WHA) 2-399	Construction of the transmission line within the Grizzly Bear WHA 2-399 must be construction outside of April 1 to June 1 and October 15 to December 31 to minimize disturbance to Grizzly Bears expected to use the WHA during spring and fall.

Component	Location	Wildlife/Archeology Concern	Construction/Timing Restrictions & Mitigations
		Ryan River Drainage	Construction of the TX Line into and across the Ryan River drainage will occur during the less critical Grizzly Bear summer foraging period (June 1 – September 1)
		Moose, Deer, & Mountain Goat UWRs	Helicopter flight paths will avoid UWRs and landing locations will be located further than 500m away from the UWRs during the sensitive late winter period (March 1 – May 15).
Lillooet River FSR & ULRHEF	Access roads above the lower limit of the 200m buffer Truckwash Creek Migration Corridor to the ULRHEF intake	Mountain Goat UWR	Snow depths measured on May 3, 2014 resulted in the implementation of the 2 week spring shutdown as detailed in the Mountain Goat Management Plan. The spring shutdown was lifted on May 18 <sup>th</sup> , additional information is provided in Section 8.0.  If a goat is observed within 500 m of construction operations, construction must cease for at least 48 hours. The IEM must record and submit all goat observations to FLNR within 48 hours.
ULRHEF & BDRHEF	ULRHEF work areas above the powerhouse (beyond 41.5km of the Lillooet River FSR) & BDRHEF intake	Wolverine den emergence	Construction will not occur beyond 41.5km of the Lillooet River FSR or above the BDRHEF intake access road gate from March 1 – April 30 during the critical den emergence period.
	BDRHEF intake	Mountain Goat UWR habitat (u-2-002 UL 12)	During winter construction and operations, access to Boulder Creek HEF intake must be gated at least 500 m from the original UWR u-2-002 UL 12 to restrict motorized use within the UWR, unless otherwise directed by FLNR.

## 4.0 Upper Lillooet River Hydroelectric Facility & Boulder Creek Hydroelectric Facility – Monitoring Results

### 4.1 Construction Camp & 38 km Laydown & Lillooet River FSR

#### Operations:

- The electric fence was fully operational and clear of snow throughout the reporting period as identified in CE weekly reports provided to the IEM.
- Maintenance works included re-installation of the electrified mats at the construction camp pad entrances, and routine maintenance of construction equipment within the mechanic shop at the 38 km laydown.
- Snow plowing from 38km to 41.5km of the Lillooet River FSR was completed on March 23, signalling the start of the 2015 construction season at the hydroelectric facilities. Following snow plowing, the BDRHEF and ULRHEF powerhouse sites were accessed and works

began to prepare the sites for the upcoming powerhouse and tunneling works (See Sections 4.2 & 4.3).

*Environmental Summary:*

- CE performed daily inspections of the electric fence and fuel storage areas and recorded results in a daily inspection log. Weekly reports were prepared by CE to report activities and conditions onsite. These reports were provided to the IEM for review. No concerns were noted in the reports.
- During the March 17, 2015 road users field visit two areas were identified by the IEM that required immediate attention, namely culvert repairs and ditch maintenance to prevent water flowing over the road surface at 23km, and ditch repairs and/or road grading to prevent runoff from eroding the road surface prior to entering the top end of Alena Creek (36km). The IEM informed the project team that hauling equipment and materials as part of CE spring mobilization would not be permitted until the repairs were complete. During a follow-up inspection on March 19, 2015 these repairs were found to be completed and works on ditch maintenance and road grading were being completed by Squamish Mills from 17 – 20km of the Lillooet River FSR.
- Mobilization of materials and personnel to the hydroelectric facilities began once the required repairs at 23km and 36km of the Lillooet River FSR were completed. Squamish Mills will continue with spring road maintenance works including ditching and culvert maintenance from 17 – 38km.
- Following snow plowing of the Lillooet River FSR from 38 – 41.5km, CE began road maintenance and silt fence installation at 37.9km (to protect Stream 7 from road runoff) and from 40.5 – 41.2km (to protect the Lillooet River from road runoff).

## **4.2 Upper Lillooet River HEF Powerhouse**

*Construction Activities:*

- Dewatering of the powerhouse excavation and foundations began on March 26, 2015.

*Environmental Summary:*

- Dewatering of the ULRHEF powerhouse commenced with a 10” pump conveying water to the Upper Lillooet River (Photo 1 and Photo 2). The hose was positioned and secured at a location that would minimize riverbank erosion. The IEM was onsite to inspect dewatering methods and to conduct water quality sampling. Prior to pumping, turbidity of the water in the flooded powerhouse excavation was measured at 1.81NTU and during pumping at the outlet of the hose it was 2.63NTU. No water quality concerns are expected during dewatering of the powerhouse. Once backfilling of the powerhouse foundations begin all water from the work area will be directed through the sediment ponds for treatment prior to discharging to vegetation.



Photos:



Photo 1 – 10” hose leading out of ULRHEF powerhouse for dewatering (March 27, 2015).



Photo 2 – Outlet of 10” hose used for dewatering ULRHEF powerhouse (March 26, 2015).

### 4.3 *Boulder Creek HEF Powerhouse*

Construction Activities:

- Dewatering of the powerhouse foundations began on March 26, 2015 (Photo 3 & Photo 4).
- Settling pond reconstruction began on March 25, 2015 (Photo 5).

Environmental Summary:

- Dewatering of the BDRHEF powerhouse commenced with the pumping of the tunnel discharge to vegetation and with three 3” pumps conveying the water from the flooded powerhouse excavation to a container for sediment detention prior to being discharged to Boulder Creek (Photo 3 and Photo 4). The IEM was onsite to inspect dewatering methods and to conduct water quality sampling. Prior to pumping the water at the powerhouse was measured to be 0.95NTU and during pumping at the outlet of the settlement container it was 9.11NTU prior to infiltration. No direct surface connection to Boulder Creek was observed. Background turbidity in Boulder Creek was 2.39NTU. The tunnel seepage water that was pumped to vegetation via a 3” hose was 0.76NTU with a pH of 7.99.

Photos:



**Photo 3 – Three pumps used to dewater BDRHEF powerhouse (March 26, 2015).**



**Photo 4 – BDRHEF powerhouse water conveyed to container for sediment detention (March 26, 2015).**



**Photo 5 – Reconstruction of BDRHEF powerhouse settling ponds (March 26, 2015).**

#### **4.4 *Water Quality Results***

Weekly water quality monitoring will resume the week of May 1, 2015 once access to the ULRHEF and BDRHEF intake sites is open. Water quality will continue to be monitored at the ULRHEF and BDRHEF powerhouse sites to ensure site discharge meets surface water quality objectives.

#### **4.5 *Recommendations***

IEM recommendations for the hydroelectric facilities are as follows:

- The IEM recommends that once the BDRHEF and ULRHEF sediment ponds are put to use that their effectiveness be closely monitored to ensure that they are effectively promoting infiltration and treating water quality prior to discharging water offsite.

- Once the ULRHEF and BDRHEF intake sites can be accessed the IEM recommends that the effectiveness of installed winterization and ESC measures be assessed to ensure that regular maintenance is performed as needed.

#### **4.6 Upcoming Works**

Backfilling of the ULRHEF and BDRHEF powerhouse foundations, rebar and form works, and concrete pours are scheduled to occur in the upcoming reporting period.

Also, a hydrojacking test of the BDRHEF tunnel walls, to test their strength, is scheduled to proceed in the upcoming reporting period. The sediment ponds will be completed prior to initiating the tests.

### **5.0 Transmission Line – Monitoring Results**

#### **5.1 Transmission Line Construction Activities**

##### Existing Road Upgrades and Access Road Construction:

- Road upgrades continued in Segment 12 on Miller Bench FSR (Photo 6 and Photo 7).
- RVMA clearing was completed by hand falling crews accessing the sites by helicopter in Segment 9 (Photo 10 and Photo 11).
- Road upgrades and works along the ROW (including spur road construction, culvert installations, road widening, skidding and log decking) continued in Segment 8 (Photo 12 and Photo 13).

##### Transmission Line Pole Installation, Line Stringing and Clipping:

- Ground works for pole foundations (including blasting) were completed in Segment 8 and 9.

##### Environmental Summary:

- On March 17 and March 23, the IEM was present for culvert installations at MB37 and MB47 on the Miller Bench FSR (Photo 6 and Photo 7). The culvert installation at MB37 was at an identified CTF stream. An Ecofish crew conducted a CTF salvage prior to works and during dewatering (Photo 8 and Photo 9). For both culvert installations worksite isolation was achieved with dam/sump and pump methods and works were completed in the absence of flowing water. Crews took care to minimize downstream sedimentation by minimizing disturbance to surrounding soil. During both culvert installations, a temporary pulse (< 10 minutes) of suspended sediment was experienced when water was released to the new culvert. The IEM conducted water sampling during both culvert installations. See Section 5.2 Water Quality Results.
- On March 25, WEL requested IEM approval to operate equipment within the 15m RVMA buffer to complete pole foundation installation at structure 193 in Segment 8. The IEM reviewed the request and provided a list of additional mitigation measures and monitoring requirements to allow the works to proceed. The following mitigations will be in place during these works, which are scheduled to occur in the next reporting period:

- Site conditions will be reviewed with the IEM to ensure the ground conditions are suitable to allow the operation of machinery within the RVMA. If the ground is saturated and operating equipment is likely to result in heavy rutting, measures to protect against rutting (eg. operating machinery on swamp mats) will be required.
  - The IEM will be onsite to document placing of the puncheon (on stream banks outside of the wetted channel) and crossing of stream 192B with a machine equipped with synthetic biodegradable or vegetable oil based hydraulic fluid.
  - The area must be fully stabilized from an ESC perspective once the ground works are complete to prevent impacts to nearby streams and allow the riparian area to recover as quickly as possible. This may require the use of silt fence (or alternative perimeter control, mulch, seeding, etc.), therefore adequate materials must be on hand.
  - Spill kits and materials will be onsite and readily available to respond in the event of a spill to prevent any introduction to nearby watercourses.
- On March 26, The IEM was present for two non-fish bearing culvert installations on ROW access spur roads (184.1 and 185.1) off of road 197.2 (Photo 12). Pumping for isolation was not possible due to low flows at both crossings. A small dam was built using sandbags to temporarily impede flows and allow the culvert to be installed. Crews took care to minimize downstream sedimentation by minimizing disturbance to surrounding soil. During both culvert installations, a temporary pulse of suspended sediment was experienced when water was released to the new culvert. The IEM conducted water sampling during both culvert installations. See Section 5.2 Water Quality Results.

Photos:



**Photo 6 – Pump used to complete worksite isolation for culvert installation at MB47 on the Miller Bench FSR (March 17, 2015).**



**Photo 7 – Culvert installation works at MB47 on the Miller Bench FSR (March 17, 2015).**



**Photo 8 – Ecofish crew conduct Coastal Tailed Frog salvage prior to works at MB37 (March 23, 2015).**



**Photo 9 – Coastal Tailed Frog tadpole captured and relocated prior to works at MB37 (March 23, 2015).**



**Photo 10 – Segment 9 staging area at end of Salmon Main (March 25, 2015).**



**Photo 11 – ROW clearing completed in Segment 9 (March 25, 2015).**



**Photo 12 – Culvert installed at spur 184.1 off of road 197.2 (March 26, 2015).**



**Photo 13 – Logs decked at 1+890 on road 197.2 (March 26, 2015).**

## 5.2 Water Quality Results

The following table presents the results of water quality sampling collected during TX - Line water management activities according to the conditions outlined in the Surface Water Quality Protection Plan. Exceedances of in-situ water quality (turbidity) deemed to be caused by project-related activities are highlighted in bold font and are discussed above in Section 5.1.

Date	Time	Sample Location Description	pH	Turbidity (NTU)	Cond (uS)	Temp (°C)
<b>Segment 12 – Miller Bench FSR culvert installation at MB47</b>						
March 17, 2015	7:38	Background above works	-	3.21	-	-
	8:07	20m downstream of works	-	2.85	-	-
	8:28	20m downstream of works	-	8.80	-	-
	8:55	20m downstream of works	-	<b>52.6</b>	-	-
	9:02	20m downstream of works	-	6.95	-	-
<b>Segment 12 – Miller Bench FSR culvert installation at MB37</b>						
March 23, 2015	8:30	Background above works	-	0.42	-	-
	8:42	1m downstream of works	-	2.41	-	-
	8:48	1m downstream of works	-	1.43	-	-
	10:10	100m downstream of works during excavation	-	<b>13.9</b>	-	-
	10:25	100m downstream of works	-	<b>44.2</b>	-	-
	10:37	100m downstream of works	-	4.52	-	-
	11:02	100m downstream of works	-	1.83	-	-
	12:18	100m downstream of works during release of water to culvert	-	<b>41</b>	-	-
	12:24	100m downstream of works	-	6.83	-	-
<b>Segment 8 – 184.1 spur road culvert installation</b>						
March 26, 2015	8:15	Background above works	-	2.77	-	-
	8:19	10m downstream of works	-	<b>82.9</b>	-	-
	8:25	10m downstream of works	-	<b>19.5</b>	-	-
	8:35	10m downstream of works	-	2.08	-	-
<b>Segment 8 – 185.1 spur road culvert installation</b>						
March 26, 2015	8:40	Background above works	-	1.74	-	-
	8:45	10m downstream of works	-	<b>83.4</b>	-	-
	8:55	100m downstream of works	-	<b>35.8</b>	-	-
	9:10	100m downstream of works	-	15.1	-	-
	9:20	100m downstream of works	-	6.99	-	-

### 5.3 Recommendations

- The IEM recommends all access roads be inspected to assess any slope failures or drainage/erosion concerns that have resulted from recent heavy rains and rain on snow events.

### 5.4 Upcoming Works

The following new and/or environmentally sensitive construction activities are scheduled to occur along the TX Line in the upcoming reporting period(s):

- Clearing of the Segment 8 ROW and road construction will continue.
- Road upgrades and repairs to the Miller Bench FSR are scheduled to continue.
- Clearing of the Segment 13 ROW will begin once the clearing plan is finalized.

## 6.0 Wildlife Sightings

As per the CEMP, a wildlife sightings record has been implemented and will be updated regularly by Project Personnel. It is mandatory for all personnel to report wildlife sightings including, but not limited to bears, cougars, mountain goats and deer. Wildlife sighting will be reported and recorded by the contractor(s) and submitted to the IEM on a weekly basis. Observation or detection of the following species will trigger notification to identified parties according to the following table.

Species Observed or Detected	Notification Period	Agencies to be Notified
Northern Rubber Boa	Immediately	IEM, Owner
Grizzly Bear	24hrs	IEM, Safety Officer, Conservation Officer, Owner
Wolverine Den	24hrs	IEM, MFLNRO, Owner
Spotted Owls	24hrs	IEM, MOE, Owner
Mountain Goats	48hrs	IEM, MFLNRO, Owner

## 7.0 Mountain Goat Monitoring Program

Mountain Goat monitoring will resume in the spring of 2015, once construction activities resume.

## 8.0 Environmental Issues Tracking Matrix (ITM)

### 8.1 Hydroelectric Facilities (ULRHEF & BDRHEF)

ITM Tracking Legend:		Work Item Open					
		Work Item Complete					
		Issue Closed					
Issue Tracking		Environmental Issue		Mitigation Measures			
ID No.	Status	Location	Issue Description	Action Taken/Recommended	Date of Identification	Targeted Date for Completion	Date Completed
<i>next ITM – ULR#23</i>							

### 8.2 Transmission Line

ITM Tracking Legend:		Work Item Open					
		Work Item Complete					
		Issue Closed					
Issue Tracking		Environmental Issue		Mitigation Measures			
ID No.	Status	Location	Issue Description	Action Taken/Recommended	Date of Identification	Targeted Date for Completion	Date Completed
<i>next ITM – Tx#3</i>							