



# Upper Lillooet Hydro Project

## Weekly Environmental Monitoring Report #46

Reporting Period: November 2 – November 8, 2014

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 (TX Line)

| Distribution List   |  | Prepared By   |
|---------------------|--|---|
| Name                | Organization                             |   |
| Murray Manson       | Fisheries and Oceans Canada              | <br><b>J. Alex Sartori, RPBio</b><br><i>Independent Environmental Monitor (IEM)</i><br><br><br><b>J. Stephen Sims, RPBio</b><br><i>Delegated IEM</i> |
| James Davies        | MFLNRO – Water Allocation                |   |
| Danielle Cunningham | MFLNRO – Land and Resources              |   |
| Frank DeGagne       | MFLNRO – Land and Resources              |   |
| Nathan Braun        | BC Environmental Assessment Office       |   |
| George Steeves      | True North Energy – Independent Engineer |   |
| Jennifer McCash     | JEM Energy Ltd. – Independent Engineer   |   |
| Thomas Hicks        | Sartori Environmental Services           |   |
| Peter Ramsden       | Innergex Renewable Energy Inc.           |   |
| Oliver Robson       | Innergex Renewable Energy Inc.           |   |
| Greg Davis          | Innergex Renewable Energy Inc.           |   |
| Julia Mancinelli    | Innergex Renewable Energy Inc.           |   |
| Liz Scroggins       | Innergex Renewable Energy Inc.           |   |
| Bas Brusche         | Innergex Renewable Energy Inc.           |   |
| Matt Kennedy        | Innergex Renewable Energy Inc.           |   |
| Renaud DeBatz       | Innergex Renewable Energy Inc.           |   |
| Richard Blanchet    | Innergex Renewable Energy Inc.           |   |
| Dara McDermott      | Innergex Renewable Energy Inc.           |   |
| Claude Denault      | CRT-ebc Construction Inc.                |   |
| Jonathan Drapeau    | CRT-ebc Construction Inc.                |   |
| Éric Ayotte         | CRT-ebc Construction Inc.                |   |
| Jordan Gagne        | CRT-ebc Construction Inc.                |   |
| Ian McKeachie       | CRT-ebc Construction Inc.                |   |
| D’Arcy Soutar       | Westpark Electric Ltd.                   | <b>Date Prepared:</b> January 13, 2015<br><b>Date Submitted:</b> January 14, 2015   |
| Pontus Lindgren     | Westpark Electric Ltd.                   |   |
| Harriet VanWart     | Lil’wat Nation                           |   |

## Owner Construction Permits and Approvals

*Environmental Assessment Certificate No. E13-01 (Amendment 1, 2, 3, 4 & 5)*  
*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) 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) No. L49697*  
*General Wildlife Measure Exemption Approval Letter (TX Line & BDRHEF) 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*  
*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*

## *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*

*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/ML</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 Independent Engineer)            |
| <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>NCD</b>     | Non Classified Drainage                                    |
| <b>CE</b>       | CRT-ebc Construction Inc.                        | <b>OLTC</b>    | Occupational License to Cut                                |
| <b>DFO</b>      | Fisheries and Oceans Canada                      | <b>PAG</b>     | Potentially Acid Generating                                |
| <b>DS</b>       | Downstream                                       | <b>RoW</b>     | Right of Way   |
| <b>Ecofish</b>  | Ecofish Research Ltd.                            | <b>RVMA</b>    | Riparian Vegetation Management Area                        |
| <b>Ecologic</b> | Ecologic Consulting                              | <b>SES</b>     | Sartori Environmental Services                             |
| <b>EDI</b>      | Environmental Dynamics Inc.                      | <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:

| Date                   | IEM Team Personnel | Weather Conditions | Key Monitoring Locations & Activities  |
|------------------------|--------------------|--------------------|--|
| Sunday,<br>November 2  | KM, AS             | Rain               | <p><b>ULRHEF Intake Diversion Channel – South Side</b></p> <ul style="list-style-type: none"> <li>Continued rebar and formwork for Obermeyer weir</li> </ul> <p><b>ULRHEF Intake Open Cut – North Side</b></p> <ul style="list-style-type: none"> <li>No activity in upstream portal excavation</li> <li>Re-contouring of north side spoil pile</li> </ul> <p><b>ULRHEF Downstream Tunnel Portal</b></p> <ul style="list-style-type: none"> <li>Demobilization and winterization</li> </ul> <p><b>ULRHEF Penstock</b></p> <ul style="list-style-type: none"> <li>Re-contouring and benching of fill slope at 2+800</li> <li>Grubbing and excavation between station 3+090 – 4+095</li> </ul> <p><b>ULRHEF Powerhouse</b></p> <ul style="list-style-type: none"> <li>Continued rebar installation and formwork</li> </ul> <p><b>BDRHEF Intake, Crane Pad and Access Road</b></p> <ul style="list-style-type: none"> <li>Continued rock bolt stabilization and scaling works</li> <li>Log choking and removal with crane</li> </ul> <p><b>BDRHEF Downstream Tunnel Portal</b></p> <p><b>Drilling, blasting and tunnel stabilization</b></p> <ul style="list-style-type: none"> <li>BDRHEF Powerhouse</li> <li>Continued rebar installation and formwork</li> </ul> <p><b>TX-Line</b></p> <ul style="list-style-type: none"> <li>No activity</li> </ul>   |
| Monday,<br>November 3  | TH, KM, BA,<br>AS  | Periods of rain    | <p><b>ULRHEF Intake Diversion Channel – South Side</b></p> <ul style="list-style-type: none"> <li>Continued rebar and formwork for Obermeyer weir</li> </ul> <p><b>ULRHEF Intake Open Cut – North Side</b></p> <ul style="list-style-type: none"> <li>No activity in upstream portal excavation</li> <li>Re-contouring of north side spoil pile</li> </ul> <p><b>ULRHEF Downstream Tunnel Portal</b></p> <ul style="list-style-type: none"> <li>Demobilization and winterization</li> </ul> <p><b>ULRHEF Penstock</b></p> <ul style="list-style-type: none"> <li>Re-contouring and benching of fill slope at 2+800</li> <li>Grubbing and excavation between station 3+090 – 4+095</li> <li>Hydroseeding slopes</li> </ul> <p><b>ULRHEF Powerhouse</b></p> <ul style="list-style-type: none"> <li>Continued rebar installation and formwork</li> </ul> <p><b>BDRHEF Intake, Crane Pad and Access Road</b></p> <ul style="list-style-type: none"> <li>Continued rock bolt stabilization and scaling works</li> <li>Log choking and removal with crane</li> </ul> <p><b>BDRHEF Downstream Tunnel Portal</b></p> <ul style="list-style-type: none"> <li>Drilling, blasting and tunnel stabilization</li> </ul> <p><b>BDRHEF Powerhouse</b></p> <ul style="list-style-type: none"> <li>Continued rebar installation and formwork</li> </ul> <p><b>TX-Line</b></p> <ul style="list-style-type: none"> <li>No activity</li> </ul> |
| Tuesday,<br>November 4 | TH, BA, AS, TJ     | Sun and cloud      | <p><b>ULRHEF Intake Diversion Channel – South Side</b></p> <ul style="list-style-type: none"> <li>Continued rebar and formwork for Obermeyer weir</li> </ul> <p><b>ULRHEF Intake Open Cut – North Side</b></p> <ul style="list-style-type: none"> <li>No activity in upstream portal excavation</li> <li>Re-contouring of north side spoil pile</li> </ul>   |

|                                  |                                   |             |  |
|----------------------------------|-----------------------------------|-------------|--|
|                                  |                                   |             | <p><b>ULRHEF Downstream Tunnel Portal</b></p> <ul style="list-style-type: none"> <li>• Demobilization and winterization</li> </ul> <p><b>ULRHEF Penstock</b></p> <ul style="list-style-type: none"> <li>• Re-contouring and benching of fill slope at 2+800</li> <li>• Grubbing and excavation between station 3+090 – 4+095</li> </ul> <p><b>ULRHEF Powerhouse</b></p> <ul style="list-style-type: none"> <li>• Continued rebar installation and formwork</li> </ul> <p><b>BDRHEF Intake, Crane Pad and Access Road</b></p> <ul style="list-style-type: none"> <li>• Crane transported CAT 320 excavator to the left bank of the river</li> <li>• Log jam dismantling with excavator</li> </ul> <p><b>BDRHEF Downstream Tunnel Portal</b></p> <ul style="list-style-type: none"> <li>• Drilling, blasting and tunnel stabilization</li> </ul> <p><b>BDRHEF Powerhouse</b></p> <ul style="list-style-type: none"> <li>• Continued rebar installation and formwork</li> </ul> <p><b>TX-Line</b></p> <ul style="list-style-type: none"> <li>• Segment 5 <ul style="list-style-type: none"> <li>➢ Dressing and stringing structures 105 to 123</li> </ul> </li> <li>• Segment 7 <ul style="list-style-type: none"> <li>➢ Ground works at structure 168</li> </ul> </li> <li>• Segment 8 <ul style="list-style-type: none"> <li>➢ Hand falling near structure 185</li> </ul> </li> <li>• Segment 9 <ul style="list-style-type: none"> <li>➢ Clearing near structure 207</li> <li>➢ RVMA falling at end of Salmon Main</li> </ul> </li> <li>• Segment 14 <ul style="list-style-type: none"> <li>➢ Road upgrades along road 371.1</li> </ul> </li> </ul>   |
| <p>Wednesday,<br/>November 5</p> | <p>TH, SS, BA,<br/>AS, DA, TJ</p> | <p>Rain</p> | <p><b>ULRHEF Intake Diversion Channel – South Side</b></p> <ul style="list-style-type: none"> <li>• Continued rebar and formwork for Obermeyer weir</li> </ul> <p><b>ULRHEF Intake Open Cut – North Side</b></p> <ul style="list-style-type: none"> <li>• No activity in upstream portal excavation</li> <li>• Re-contouring of north side spoil pile</li> </ul> <p><b>ULRHEF Downstream Tunnel Portal</b></p> <ul style="list-style-type: none"> <li>• Demobilization and winterization</li> </ul> <p><b>ULRHEF Penstock</b></p> <ul style="list-style-type: none"> <li>• Re-contouring and benching of fill slope at 2+800</li> <li>• Grubbing and excavation between station 3+090 – 4+095</li> </ul> <p><b>ULRHEF Powerhouse</b></p> <ul style="list-style-type: none"> <li>• Continued rebar installation and formwork</li> </ul> <p><b>BDRHEF Intake, Crane Pad and Access Road</b></p> <ul style="list-style-type: none"> <li>• Blasting to prepare site for diversion tunnel platform</li> <li>• Installation of steel diversion tunnel platform</li> </ul> <p><b>BDRHEF Downstream Tunnel Portal</b></p> <ul style="list-style-type: none"> <li>• Drilling, blasting and tunnel stabilization</li> </ul> <p><b>BDRHEF Powerhouse</b></p> <ul style="list-style-type: none"> <li>• Continued rebar installation and formwork</li> </ul> <p><b>TX-Line</b></p> <ul style="list-style-type: none"> <li>• Segment 5 <ul style="list-style-type: none"> <li>➢ Framing structures 108 to 118</li> </ul> </li> <li>• Segment 8 <ul style="list-style-type: none"> <li>➢ Hand falling near structure 185</li> </ul> </li> <li>• Segment 9 <ul style="list-style-type: none"> <li>➢ Slashing within RVMA at stream 206A</li> </ul> </li> <li>• Segment 14 <ul style="list-style-type: none"> <li>➢ Road upgrades along road 371.1</li> </ul> </li> </ul> |

|                                 |                           |                      |   |
|---------------------------------|---------------------------|----------------------|---|
| <p>Thursday,<br/>November 6</p> | <p>DA, BA, AS,<br/>TJ</p> | <p>Rain</p>          | <p><b>ULRHEF Intake Diversion Channel – South Side</b></p> <ul style="list-style-type: none"> <li>Continued rebar and formwork for Obermeyer weir</li> <li>Cleaning of downstream end of diversion channel</li> </ul> <p><b>ULRHEF Intake Open Cut – North Side</b></p> <ul style="list-style-type: none"> <li>No activity in upstream portal excavation</li> <li>Re-contouring of north side spoil pile</li> </ul> <p><b>ULRHEF Downstream Tunnel Portal</b></p> <ul style="list-style-type: none"> <li>Demobilization and winterization</li> </ul> <p><b>ULRHEF Penstock</b></p> <ul style="list-style-type: none"> <li>Re-contouring and benching of fill slope at 2+800</li> <li>Grubbing and excavation between station 3+090 – 4+095</li> </ul> <p><b>ULRHEF Powerhouse</b></p> <ul style="list-style-type: none"> <li>Continued rebar installation and formwork</li> </ul> <p><b>BDRHEF Intake, Crane Pad and Access Road</b></p> <ul style="list-style-type: none"> <li>Continued rock bolt stabilization and scaling works</li> <li>Rock imported to left bank to build rock pad below diversion tunnel</li> </ul> <p><b>BDRHEF Downstream Tunnel Portal</b></p> <ul style="list-style-type: none"> <li>Drilling, blasting and tunnel stabilization</li> </ul> <p><b>BDRHEF Powerhouse</b></p> <ul style="list-style-type: none"> <li>Concrete works</li> </ul> <p><b>TX-Line</b></p> <ul style="list-style-type: none"> <li>Segment 5 <ul style="list-style-type: none"> <li>Dressing structures 105 – 123</li> </ul> </li> <li>Segment 8 <ul style="list-style-type: none"> <li>Hand falling near structure 185</li> <li>Road works on road 197.2</li> </ul> </li> <li>Segment 9 <ul style="list-style-type: none"> <li>Slashing within RVMA at stream 206A</li> </ul> </li> <li>Segment 14 <ul style="list-style-type: none"> <li>Road upgrades along road 371.1</li> </ul> </li> </ul> |
| <p>Friday,<br/>November 7</p>   | <p>BA, VD, AS,<br/>AA</p> | <p>Sun and cloud</p> | <p><b>ULRHEF Intake Diversion Channel – South Side</b></p> <ul style="list-style-type: none"> <li>Continued rebar and formwork for Obermeyer weir</li> <li>Cleaning of downstream end of diversion channel</li> <li>Re-contouring of south side spoil pile</li> </ul> <p><b>ULRHEF Intake Open Cut – North Side</b></p> <ul style="list-style-type: none"> <li>No activity</li> </ul> <p><b>ULRHEF Downstream Tunnel Portal</b></p> <ul style="list-style-type: none"> <li>Demobilization and winterization</li> </ul> <p><b>ULRHEF Penstock</b></p> <ul style="list-style-type: none"> <li>Re-contouring and benching of fill slope at 2+800</li> <li>Grubbing and excavation between station 3+090 – 4+095</li> </ul> <p><b>ULRHEF Powerhouse</b></p> <ul style="list-style-type: none"> <li>Continued rebar installation and formwork</li> </ul> <p><b>BDRHEF Intake, Crane Pad and Access Road</b></p> <ul style="list-style-type: none"> <li>Rock imported to left bank to build rock pad below diversion tunnel</li> <li>Continued rock bolt stabilization and scaling works</li> <li>Commencement of diversion tunneling works (drilling and blasting)</li> </ul> <p><b>BDRHEF Downstream Tunnel Portal</b></p> <ul style="list-style-type: none"> <li>Drilling, blasting and tunnel stabilization</li> <li>Active water treatment system installed</li> </ul> <p><b>BDRHEF Powerhouse</b></p> <ul style="list-style-type: none"> <li>Continued rebar installation and formwork</li> </ul> <p><b>TX-Line</b></p> <ul style="list-style-type: none"> <li>Segment 5 <ul style="list-style-type: none"> <li>Framing structures 105 – 123</li> </ul> </li> <li>Segment 9</li> </ul>  |

|                         |                   |          |   |
|-------------------------|-------------------|----------|---|
|                         |                   |          | <ul style="list-style-type: none"> <li>➤ Road upgrades on Zorro Road</li> <li>• Segment 14</li> <li>➤ Road upgrades along road 371.1</li> </ul>   |
| Saturday,<br>November 8 | BA, VD, AS,<br>AA | Overcast | <p><b>ULRHEF Intake Diversion Channel – South Side</b></p> <ul style="list-style-type: none"> <li>• Continued rebar and formwork for Obermeyer weir</li> </ul> <p><b>ULRHEF Intake Open Cut – North Side</b></p> <ul style="list-style-type: none"> <li>• No activity in upstream portal excavation</li> <li>• Re-contouring of north side spoil pile</li> </ul> <p><b>ULRHEF Downstream Tunnel Portal</b></p> <ul style="list-style-type: none"> <li>• Demobilization and winterization</li> </ul> <p><b>ULRHEF Penstock</b></p> <ul style="list-style-type: none"> <li>• Re-contouring and benching of fill slope at 2+800</li> <li>• Grubbing and excavation between station 3+090 – 4+095</li> <li>• Hydroseeding slopes</li> </ul> <p><b>ULRHEF Powerhouse</b></p> <ul style="list-style-type: none"> <li>• Concrete works</li> </ul> <p><b>BDRHEF Intake, Crane Pad and Access Road</b></p> <ul style="list-style-type: none"> <li>• Continued rock bolt stabilization and scaling works</li> <li>• Diversion tunneling works (drilling and blasting)</li> </ul> <p><b>BDRHEF Downstream Tunnel Portal</b></p> <ul style="list-style-type: none"> <li>• Drilling, blasting and tunnel stabilization</li> <li>• Active water treatment system activated</li> </ul> <p><b>BDRHEF Powerhouse</b></p> <ul style="list-style-type: none"> <li>• Continued rebar installation and formwork</li> </ul> <p><b>TX-Line</b></p> <ul style="list-style-type: none"> <li>• Segment 5 <ul style="list-style-type: none"> <li>➤ Framing structures 105–123</li> </ul> </li> <li>• Segment 9 <ul style="list-style-type: none"> <li>➤ Road upgrades on Zorro Road</li> </ul> </li> <li>• Segment 14 <ul style="list-style-type: none"> <li>➤ Road upgrades along road 371.1</li> </ul> </li> </ul> |

**IEM Team Personnel:** TH – Tom Hicks; KM – Kathy Mai; SS – Stephen Sims; BA – Blake Aleksich; VD – Vanessa Dan; AA – Anthony Andrews; AS—Anne Sutherland; DA – Danita Abraham; TJ – Tammie Jenkins

## 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. |
|----------------------|--|--------------|---|------------|
| November 3, 2014     | Field observation, phone communication | SES, INX     | Squamish Mills was completing instream works to repair a failing bank along the Lillooet River FSR at 22km. The IEM contacted INX to discuss the activities and was informed that Squamish Mills Ltd. was completing the repairs independently of the project as the prime road user.   | -          |
| November 3 - 5, 2014 | Site inspection, emails, phone calls   | SES, INX, CE | On November 3 the IEM completed a site wide inspection and observed multiple areas where erosion and sediment transport demonstrated a lack of adequate ESC measures. The IEM expressed the need for CE to immediately address new and outstanding ESC concerns during follow-up discussions with CE environmental coordinators and with INX on November 3 and formalized the | -          |

|                      |  |   |  |   |
|----------------------|--|---|--|---|
|                      |  |   | ESC concerns in a letter to INX on November 4. INX and CE were both responsive to IEM concerns. INX advised CE that ESC issues needed to become the top priority onsite and CE followed through by suspending construction activities along the ULRHEF penstock alignment to focus on all areas of ESC concern.  |   |
| November 5, 2014     | <i>Site inspection &amp; follow-up email</i> | CE, SES, INX  | A site tour was completed to review CE progress on ESC remediation measures. The IEM was satisfied with the level of effort demonstrated and expects CE to continue to address all areas requiring ESC stabilization. CE committed to preparing a plan outlining how each area of ESC concern will be remediated with a timeline for completion for each area. | - |
| November 6, 2014     | <i>Report Submission</i>                     | WEL, INX, SES                                       | WEL submitted a report summarizing all Tx-line song bird nesting survey results for 2014.  | - |
| November 6 & 7, 2014 | <i>ESC plan</i>                              | CE, INX, SES, JEM                                   | CE submitted a plan as promised outlining areas requiring ESC remediation and providing a timeline for completion. INX and SES provided comment on November 7 prior to finalization of the plan.   | - |
| November 7, 2014     | <i>ULRHEF intake flow graph</i>              | INX, MFLNRO, DFO, EAO, Lil'wat Nation, SES, JEM, CE | INX submitted a graph of intake flow 1-week prior to commencing the Upper Lillooet River Diversion works according to conditions of the ULRHEF instream works window extension.  | - |

### 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 1 –11, & 14 | Within 150m of wetlands or 100m of Coastal Tailed-Frog Streams | IEM presence is required when clearing within 150m of wetlands or 100m of Coastal Tailed-Frog Streams, to ensure clearing area is minimized.   |
|           |                      | Riparian Vegetation Management Areas (RVMA)                    | IEM monitoring is required during clearing within RVMA's.  |
|           |                      | Old Growth Management Areas (OGMA's)                           | IEM monitoring is required when clearing within legally designated OGMA's, to ensure clearing area is minimized.   |
|           |                      | Ungulate Winter Range (UWR)                                    | IEM monitoring is required when clearing within identified deer and moose UWR, to ensure clearing area is minimized.   |
|           |                      | 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.<br>Blasting mats (or other noise reduction methods) are to be employed within 500m of Class 1 and Class 2 grizzly bear forage habitat during critical seasonal foraging periods (fall, September – October). |



|   |   |   |  |
|---|---|---|--|
|   |   | Salmon Migration Period and Bald Eagle Roosts | Construction of the transmission line within 500m of Alena Creek, 29.2 km Tributary, South Creek, Rohb Creek must be conducted outside of October 15 – December 31 and Sampson Creek and Railroad Creek must be conducted outside of August 15 to December 31.   |
|   |   | 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.   |
|   | Segment 5 & 7   | Ungulate Winter Range (UWR)                   | <p>According to EAC #E13-01 Amendment 5 and the General Wildlife Exemption Measures Approval dated October 28, 2014, the following mitigation measures must be enacted to extend Tx-line construction activities beyond November 1 and up to December 15 within Moose Winter Range Forest Management Zone u-5-002 J55/54-204-RE in Segment 5 &amp; up to December 31 within MWRFMZ u-5-002 J55/54-204-RO in Segment 7:</p> <ul style="list-style-type: none"> <li>• The IEM must oversee all construction activities in Segment 5 &amp; 7.</li> <li>• Helicopter flight paths must be determined by a QP in order to avoid, as much as possible, wildlife and wildlife habitat within the vicinity of proposed works.</li> <li>• Snow fall accumulation within the Moose Winter Range Forest Management Zone (u-5-002 J55/54-204-RO; Segment 7) must be monitored daily along the Lillooet South FSR. If snow depth exceeds 30 cm and remains at that depth for 8 hours, construction must be suspended immediately and may not resume in 2014.</li> </ul> |
| ULRHEF powerhouse, and Intake diversion channel | Within 50m of identified archeologically significant area | Archaeologically significant site EdRu-3      | The ASMP recommends that an archaeological technician from the Lil'wat Nation be present to monitor initial ground-disturbance activities within 50m of the EdRu-3 site boundaries.  |
|   | Within 30m of the Upper Lillooet River                    | Riparian area and fish bearing streams        | IEM presence is required when working within 30m of the Upper Lillooet River. Instream acoustic pressure monitoring required when blasting within 30m of the Upper Lillooet River.   |

|   |  |   |  |
|---|--|---|--|
| <p>Lillooet River FSR; ULRHEF downstream tunnel portal and penstock alignment</p> | <p>Access roads above the lower limit of the 200m buffer Truckwash Creek Migration Corridor to the ULRHEF intake; including FSR realignment at Truckwash Creek</p> | <p>Mountain Goat UWR and Migration Corridor</p> | <p>IEM was onsite to oversee daily construction equipment shutdowns (November 1 - 30) beginning one hour before and two hours after sunrise as well as two hours before and one hour after sunset.</p> <p>Noise monitoring equipment was installed to monitor background noise levels and exceedances of the 75dbA noise level maximum resulting from blasting activities. Initial data will be analyzed during the following reporting period and, if required, adaptive drilling/blasting noise mitigation strategies will be implemented.</p> <p>Daily snow depth monitoring will commence within the Truckwash Creek Migration Corridor once snow fall accumulations persist according to the Project's Mountain Goat Management Plan. A two week shutdown of work activities will occur once a significant snowfall is recorded (average snow depth of 10cm in forested habitat or 30cm in open terrain).</p> <p>Mountain Goat monitoring activities commenced on October 31, at three established observation stations (MG-OBS01, MG-OBS02 &amp; MG-OBS03). Stations are established to monitor three Mountain Goat critical winter habitats (UL 11, UL 19, and Migration Corridor), and each station was visited for a minimum of two hours daily on a rotating schedule.</p> <p>If a goat is observed within 500m line of sight 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.</p> |
| <p>BDRHEF intake</p>  | <p>Portion of intake access road and crane pad within UWR</p>  | <p>Mountain Goat UWR</p>                        | <p>IEM monitoring is required when clearing within UWR to ensure that clearing areas are minimized.</p> <p>During winter months (November 1 – April 30), access to BDRHEF intake must be gated at least 500 m from UWR to restrict motorized use within the UWR, unless otherwise directed by MFLNRO.</p> <p>On November 13, 2014 MFLNRO granted approval to delay the timing restrictions associated with construction activities, including blasting, in Mountain Goat UWR u-2-002 UL12 from November 15 to up to November 30 according to the following restrictions:</p> <ul style="list-style-type: none"> <li>• The Contractor must cease construction works and demobilize if snow fall accumulation exceeds 10 cm depth within the forested portion of UWR u-2-002 UL12, and may not recommence in 2014. Snow depth within the UWR will be evaluated as an average depth from</li> </ul>   |

|  |  |  |   |
|--|--|--|---|
|  |  |  | <p>five sample sites selected by a QP that will be monitored daily by the IEM.</p> <ul style="list-style-type: none"> <li>• No helicopter flights will be permitted in or within 1,500 m of UWR u-2-002 UL12</li> </ul> <p>If a goat is observed within 500m line-of-sight of construction operations, construction must cease for at least 48 hours. The IEM must record and submit all goat observations to MFLNRO within 48 hours.</p> |
|--|--|--|---|

## 4.0 Upper Lillooet River HEF – Monitoring Results

### 4.1 Intake (North & South Sides), Access Roads and Upstream Tunnel Portal

#### Construction Activities:

- Continued rebar and formworks at the Obermeyer Weir (south side diversion channel) (Photo 1 and Photo 2).
- Installation of final Obermeyer Weir components (Photo 2).
- Cleaning of downstream end of diversion channel (Photo 3).
- Demobilization and winterization at the upstream portal excavation. Excavation works did not continue during this reporting period (Photo 4).

#### Environmental Summary:

- Cleaning occurred in the downstream end of the diversion channel in preparation for upcoming diversion works (Photo 3). A mini-excavator was used to load material into crane baskets and out of the diversion channel excavation.
- Outstanding issues from *FAM04* (issued September 29, 2014) remain in the Project’s ITM under *ULR#20 – open*. Two action items were completed at the ULRHEF intake during this reporting period. Outstanding and completed ESC issues include:
  - ULRHEF spoil areas – A winterization plan for the ULRHEF spoil areas was submitted to the IEM on October 17. Re-contouring of the north and south side spoil areas began in this reporting period (Photo 5 and Photo 6). Woody debris and organic material was applied to the upper portion of the north side spoil pile slopes and sediment fencing was installed around the perimeter of the pile (Photo 7). This action item will remain open until works are complete and slopes are stabilized.
  - ULRHEF intake access road drainage – Ditching, re-grading and silt fence installation was completed on north and south side intake access roads (Photo 8 and Photo 9). This action item has been completed to the satisfaction of the IEM and marked accordingly in the Project’s ITM.
  - Lillooet River FSR KM 48 box culvert – Silt fence installation and road grading was completed (Photo 10). This action item has been completed to the satisfaction of the IEM and marked accordingly in the Project’s ITM.

- The IEM was onsite for works within 30m of the Lillooet River.

Photos:



**Photo 1 – Current conditions at ULRHEF intake (November 8, 2014).**



**Photo 2 – Current conditions in the ULRHEF intake diversion channel (November 8, 2014).**



**Photo 3 – ULRHEF intake diversion channel cleaning (November 6, 2014).**



**Photo 4 – Demobilization works at the ULRHEF upstream portal excavation (November 4, 2014).**



**Photo 5 – Re-contouring of south side spoil piles (November 7, 2014).**



**Photo 6 – Bulldozer re-contouring north side spoil pile (November 7, 2014).**



**Photo 7 – Silt fence installed at toe of slope and organic material placed on north side spoil pile (November 8, 2014).**



**Photo 8 – Silt fencing installed around tributary and ditching completed on ULRHEF intake south side access road (November 7, 2014).**



**Photo 9 – Re-grading and ditching completed on north side of Keyhole Falls bridge (November 7, 2014).**



**Photo 10 – Silt fencing installed and road grading completed at the KM 48 box culvert (November 7, 2014).**

## 4.2 *Downstream Tunnel Portal*

### Construction Activities:

- Demobilization of tunnelling equipment and winterization of portal area (Photo 11 and Photo 12).

### Environmental Summary:

- The downstream tunnel portal water treatment system was dismantled as part of winterization works (Photo 13). The IEM was onsite to monitor works within 30m of Truckwash Creek and works were completed without incident.
- During a significant rain event on November 3, the IEM observed turbid road runoff entering Truckwash Creek and runoff and deposited sediment in the forested area below the bottom of the downstream tunnel portal access road (Photo 14). The IEM conducted water quality sampling at the Truckwash Creek road crossing and measured it to be within BCWQG (see WQ results below). Truckwash Creek was not safely accessible downstream of all turbid inputs. The IEM contacted CE to discuss the ESC measures necessary to prepare the site for winter shutdown. Following discussion, ditching was completed, the access road and pad were re-graded and a berm was built at the bottom of the access road (Photo 15).
- Re-contouring works were completed to stabilize failing material at KM 43.5 on the Lillooet River FSR (Photo 16). This action item has been completed to the satisfaction of the IEM and marked accordingly in the Project's ITM.
- No surface discharge from the sediment ponds was observed this week; therefore no WQ measurements were taken by the IEM.

### Photos:



Photo 11 – Conditions at ULRHEF downstream tunnel portal (November 3, 2014)



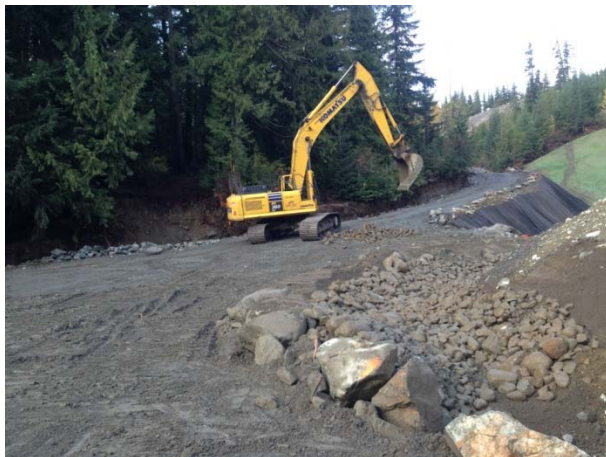
Photo 12 – Crews demobilizing tunnelling equipment (November 3, 2014)



**Photo 13 – Dismantling of downstream portal dewatering system (November 3, 2014).**



**Photo 14 – Mobilizing and deposited sediment observed below downstream portal access road (November 3, 2014).**



**Photo 15 – Works to improve drainage at bottom of ULRHEF downstream portal access road (November 7, 2014).**



**Photo 16 – Re-contouring of failing material at KM 43.5 on the Lillooet River FSR (November 3, 2014).**

### 4.3 *Penstock*

#### Construction Activities:

- Bulk excavation and fill works were suspended at station 2+800 to allow for slope stabilization works (see environmental summary below).
- Grubbing and bulk excavation/fill continued from 3+090 to 4+095m (Photo 17).

#### Environmental Summary:

- On November 3 the IEM observed slope failures and mobilization of sediment outside of Project boundaries at the 2+800 fill slope following a significant rain event (Photo 18 and Photo 19). The IEM contacted CE and initiated a site tour to assess the situation and plan remediation works to prevent further ESC issues. Excavation and fill activities were suspended and slope stabilization works began on November 5. Works included re-grading, benching, rock armouring and installation of Curlex wattles at toe of slope (Photo 20 and Photo 21).

- Hydroseeding occurred on slopes near station 3+100 (Photo 22).

Photos:



**Photo 17 – ULRHEF penstock bulk excavation from station 3+090m – 4+095 (November 3, 2014).**



**Photo 18 – Sloughing and failures observed at station 2+800 fill slope (November 3, 2014).**



**Photo 19 – Material mobilizing beyond project boundaries below toe of 2+800 fill slope (November 3, 2014).**



**Photo 20 – Stabilization works at 2+800 fill slope (November 7, 2014).**





Photo 21 – Stabilization works and erosion and sediment control measures at 2+800 fill slope (November 8, 2014).



Photo 22 – Hydroseeding slopes near station 3+100 (November 3, 2014).

#### 4.4 ***Powerhouse & Access Road***

##### Construction Activities:

- Continued rebar installation and formworks for the powerhouse structure (Photo 23 and Photo 24). A structure pour was completed on November 8 (Photo 25).
- Two pumps (6" and 10") previously installed in the sump draining seepage waters in the powerhouse excavation continued to convey water to the existing settling ponds (Photo 26). No flowing surface water was observed within the excavation and pump capacity appears to be adequate to maintain isolation from active work areas.

##### Environmental Summary:

- Dewatering of the ULRHEF powerhouse continued without environmental concerns. The IEM will continue to monitor the works area to confirm that future concrete pours are adequately isolated from flowing waters and protected from precipitation during curing.

Photos:



**Photo 23 – Current conditions at ULRHEF powerhouse (November 7, 2014).**



**Photo 24 – Current conditions at ULRHEF powerhouse (November 7, 2014).**



**Photo 25 – Continued concrete works at ULRHEF powerhouse (November 8, 2014).**



**Photo 26 – Current conditions at ULRHEF powerhouse settling ponds (November 7, 2014).**

### 4.5 *Water Quality Results*

The following table presents the results of the routine water quality sampling program for the ULRHEF. The IEM is undertaking a weekly monitoring program according to the conditions outlined in the Surface Water Quality Protection Plan. The regular monitoring sites have been selected to quantify WQ conditions within the Lillooet River upstream and downstream of active construction areas. The IEM acknowledges the natural variability of instream WQ conditions in the Lillooet River due to seasonal melt fluctuations and large tributary inputs. In the event that an exceedance of *in-situ* water quality (turbidity or pH) is deemed to be caused by project-related activities, the IEM will highlight the exceedance, discuss the cause, and outline measures undertaken by the Contractor to correct the issue. When an exceedance cannot be attributed to project related activities, the exceedance will be marked by an asterisk (\*).

| Date                                    | Time  | Sample Location Description   | pH  | Turbidity (NTU) | Cond (µS) | Temp (°C) |
|---|-------|---|-----|-----------------|-----------|-----------|
| <b>Routine Water Quality</b>            |       |   |     |                 |           |           |
| November 6,<br>2014                     | 14:30 | ULR Background – ULRHEF Intake  | 7.3 | 161.0           | 81        | 9.0       |
|   | 14:45 | ULR #0.5 – Downstream of ULRHEF intake at Keyhole Bridge                  | 7.4 | 130.0           | 75        | 9.0       |
|   | 15:15 | ULR # 1 – Upstream of ULRHEF Powerhouse                                   | 7.3 | 120.0           | 69        | 9.0       |
|   | 15:35 | ULR #2 – Downstream of ULRHEF Powerhouse between 40.5k and 41k            | 7.3 | 114.0           | 80        | 9.0       |
|   | 16:20 | ULR #3 – Lillooet River FSR KM 38 Laydown – D/S of Boulder confluence     | 7.4 | 141.0           | 84        | 9.0       |
|   | 16:45 | ULR #4 – Lillooet River FSR 24km – D/S of all works and Meager confluence | 8.3 | 1028 AU*        | 99        | 9.0       |
| <b>Water Quality for Specific Works</b> |       |   |     |                 |           |           |
| November 3,<br>2014                     | 11:40 | Truckwash Creek background  | -   | 2.83            | -         | -         |
|   | 11:45 | Truckwash creek at mixing zone with portal access road runoff             | -   | 10.34           | -         | -         |

*\*Increased turbidity due to the influence of Meager Creek confluence*

## 4.6 Recommendations

IEM recommendations for the ULRHEF are as follows:

- As a follow up to *FAM04* (issued September 29, 2014) and additional ESC issues identified in this reporting period, the IEM continues to recommend that all necessary measures be implemented to mitigate sediment mobilization and provide for adequate treatment capacity and efficiency prior to conveyance towards the Upper Lillooet River.
- The IEM recommends that works continue to stabilize the slope at 2+800 on the penstock alignment in order to prevent further sloughing and mobilization of sediment outside project boundaries.

## 4.7 Upcoming Works

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

- Installation of final Obermeyer weir components will continue at the ULRHEF intake diversion channel.
- Continued cut/fill along the ULRHEF penstock alignment.
- Completion of outstanding ESC items outlined in *FAM04* will continue.

## 5.0 Boulder Creek Hydroelectric Facility – Monitoring Results

### 5.1 Intake Access Road & Crane Pad

#### Construction Activities:

- Rope access technicians conducted scaling and stabilization works below the crane pad and above the diversion tunnel site.
- Log removal with 300 tonne crane near diversion tunnel site (Photo 27).
- Hoisting and transporting CAT 320 excavator to diversion tunnel site (Photo 28).
- Log jam dismantling with excavator near diversion tunnel site (Photo 29 and Photo 30).
- Blasting to prepare diversion tunnel platform area (Photo 31).
- BDRHEF intake diversion tunnel platform installation (Photo 32) and rock pad construction (Photo 33).
- BDRHEF diversion tunnelling works (drilling, blasting and mucking) (Photo 34).

#### Environmental Summary:

- On November 4, the dismantling of a log jam located in front of the diversion tunnel location resulted in sediments being introduced to Boulder Creek. A plume of sediment was visible for approximately 20 minutes and was observed to be diluted 15m downstream of works. The IEM was on site to monitor works and conduct water quality sampling (see WQ results below).
- Prior to installation, the metal and wood platforms used for the diversion tunnel pad were washed on the crane pad (Photo 32).
- A water containment system was installed at the diversion tunnel to capture and contain all tunnelling construction wastewater. A half-culvert is being utilized to convey wastewater to a barrel where it is then pumped to a containment tote. When full, the tote is transported to the BDRHEF downstream portal sediment ponds (Photo 34 and Photo 35).
- Ecofish salvage crew conducted Coastal Tailed Frog salvage (Photo 36 and Photo 37) prior to log jam dismantling and diversion tunnel platform installation.

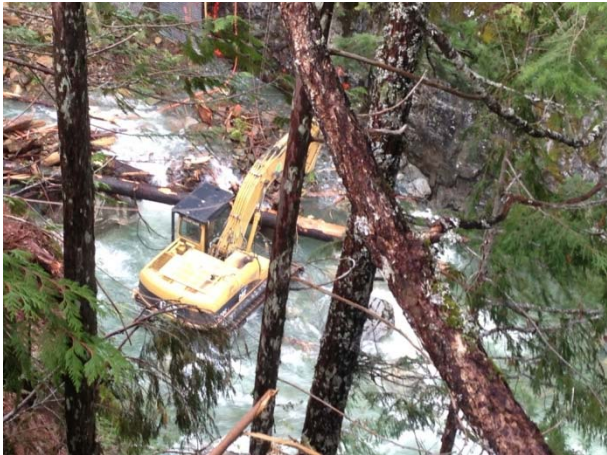
Photos:



**Photo 27 – Rope access crews choke log for crane removal (November 3, 2014).**



**Photo 28 – CAT 320 excavator lifted with crane and mobilized to left bank for diversion tunnel works (November 4, 2014).**



**Photo 29 – Excavator used to dislodge log for removal (November 4, 2014).**



**Photo 30 – Excavator used for log jam removal; sediment plume visible downstream of works (November 4, 2014).**



**Photo 31 – Blast mat hung during diversion tunnel platform preparation blast (November 5, 2014).**



**Photo 32 – Platforms cleaned on crane pad prior to being installed at diversion tunnel site (November 5, 2014).**



**Photo 33 – Clean rock for pad construction at diversion tunnel (November 6, 2014).**



**Photo 34 – Conditions at BDRHEF intake diversion tunnel following first blast (November 8, 2014).**



**Photo 35 – Half-culvert utilized to convey tunnelling wastewater for containment and disposal (November 6, 2014).**



**Photo 36 – Ecofish salvage crew being transported in man-basket to left bank for Coastal Tailed Frog salvage (November 4, 2014).**



**Photo 37 – Ecofish crew conducts Coastal Tailed Frog salvage downstream of BDRHEF intake diversion tunnel site (November 4, 2014).**

## 5.2 *Downstream Tunnel Portal and Powerhouse*

### Construction Activities:

- Rebar installation, formworks and concrete works continued at the powerhouse throughout the reporting period (Photo 38).
- Drilling, blasting, mucking and stabilization (anchoring and shotcrete application) continued within the tunnel.

### Environmental Summary:

- The active water treatment system previously used at the ULRHEF intake was transported to the BDRHEF downstream portal sediment ponds (Photo 39 and Photo 40). The system began treating tunnel wastewater on November 8 (Photo 41).
- The silt fence was repaired on either side of the box culvert at KM 39.7 on the Lillooet River FSR. This action item has been completed to the satisfaction of the IEM and marked accordingly in the Project's ITM.
- No environmental issues were observed during this reporting period at the BDRHEF powerhouse or downstream tunnel portal.

### Photos:



Photo 38 – Concrete works at BDRHEF powerhouse (November 6, 2014).



Photo 39 – Active water treatment transported to BDRHEF portal settling ponds (November 7, 2014).



**Photo 40 – Active water treatment system installed at BDRHEF portal settling ponds (November 8, 2014).**



**Photo 41 – Active water treatment system activated at BDRHEF portal settling ponds (November 8, 2014).**

### 5.3 Water Quality Results

The following table presents the results of the routine water quality sampling program for the BDRHEF. The IEM is undertaking a weekly monitoring program according to the conditions outlined in the Surface Water Quality Protection Plan. The regular monitoring sites have been selected to quantify WQ conditions within the Lillooet River upstream and downstream of active construction areas. The IEM acknowledges the natural variability of instream WQ conditions in Boulder Creek due to seasonal fluctuations in snowmelt. In the event that an exceedance of *in-situ* water quality (turbidity or pH) is deemed to be caused by project-related activities, the IEM will highlight the exceedance, discuss the cause, and outline measures undertaken by the Contractor to correct the issue. When an exceedance cannot be attributed to project related activities, the exceedance will be marked by an asterisk (\*).

| Date   | Time  | Sample Location Description   | pH  | Turbidity (NTU) | Cond (uS) | Temp (°C) |
|--|-------|---|-----|-----------------|-----------|-----------|
| <b>Routine Water Quality</b>   |       |   |     |                 |           |           |
| November 6, 2014   | 9:05  | <b>BDR BG</b> – Upstream of BDRHEF intake                                 | 7.5 | 39.9            | 52        | -         |
|  | -     | <b>BDR #1</b> – Downstream of BDRHEF intake<br>*not currently accessible* | -   | -               | -         | -         |
|  | 10:40 | <b>BDR #2</b> – Upstream of BDRHEF Powerhouse                             | 7.5 | 33.9            | 48        | -         |
|  | 10:30 | <b>BDR #3</b> – Downstream of BDRHEF Powerhouse at Pebble Creek Bridge    | 7.6 | 35.3            | 55        | -         |
| <b>Water Quality for Specific Works (BDRHEF log jam dismantling)</b> |       |   |     |                 |           |           |
| November 4, 2014   | 11:30 | <b>BDR BG</b> – Upstream of BDRHEF intake                                 | -   | 6.44            | -         | -         |
|  | 14:50 | Downstream of BDRHEF Powerhouse at Pebble Creek Bridge                    | -   | 6.77            | -         | -         |
|  | 16:40 | Downstream of BDRHEF Powerhouse at Pebble Creek Bridge                    | -   | 6.67            | -         | -         |



## 5.4 **Recommendations**

IEM recommendations for the BDRHEF are as follows:

- The IEM recommends that all wastewater related to the BDRHEF intake diversion tunnel works continues to be contained and transported to the BDRHEF downstream portal sediment ponds for treatment.

## 5.5 **Upcoming Works**

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

- BDRHEF intake diversion tunnelling works will continue.

# 6.0 **Transmission Line – Monitoring Results**

## 6.1 **Transmission Line Construction Activities**

### Right-of-Way Clearing:

- Hand falling occurred in Segment 8. RVMA hand falling occurred in Segment 9.
- ROW falling occurred in Segment 9.

### Existing Road Upgrades and Access Road Construction

- Transmission line access road upgrades/construction (including brushing, ballasting and drilling/blasting where necessary) were conducted in Segment 8 (road 197.2), Segment 9 (Salmon Main and Zorro Rd.) and Segment 14 (road 371.1).

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

- Foundation construction (ground works including blasting and use of heavy machinery) was conducted in Segment 7.

Structure framing, steel hanging and stringing occurred in Segment 5 (Photo 42 and Photo 43).

### Environmental Summary:

- The IEM was present as required when clearing activities occurred within 150m of wetlands, 15m RVMAs (30m for CTF streams), 100m of Coastal Tailed Frog Streams, Class 1 & 2 suitable Grizzly Bear WHA and/or suitable forage habitat, moose and deer UWR, and within legally designated Old Growth Management Areas (OGMAs). All flagged boundaries were respected during clearing activities. No environmental issues were observed.

Photos:



Photo 42 – Segment 5 pole stringing (November 7, 2014)



Photo 43 – Segment 5 structure framing (November 8, 2014).

## 6.2 Water Quality Results

| Date   | Time | Sample Location Description | pH | Turbidity (NTU) | Cond (uS) | Temp (°C) |
|--|------|-----------------------------|----|-----------------|-----------|-----------|
| <b>Routine Water Quality</b>   |      |                             |    |                 |           |           |
| No WQ measurements were recorded at active Tx-line work areas during this reporting period. Construction and clearing activities had no visual effect on WQ. |      |                             |    |                 |           |           |

## 6.3 Recommendations

- The IEM has no recommendations at this time.

## 6.4 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):

- Road upgrades on road 197.2 (Segment 8) and Zorro Rd. (Segment 9).
- Culvert installations on Zorro Rd. (Segment 9).

## 7.0 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). Wildlife Observation forms will be included in first reporting period following month end. 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                               |

## 8.0 Mountain Goat Monitoring Program

The following mitigation measures were implemented for work activity within the Migration Corridor during this monitoring period:

- Daily dawn and dusk shutdowns as outlined in the Mountain Goat Management Plan were followed.
- Noise level monitoring to ensure that the 75db noise level threshold is not exceeded as outlined in the Mountain Goat Management Plan.
- As of October 31st, the IEM or designate was on site to monitor Mountain Goat activity within 500m of construction activities at the ULRHEF intake and the ULRHEF downstream tunnel portal. Mountain Goats were monitored from three sites:
  - Truckwash Creek viewing river right of the Migration Corridor– MG-OBS01 (10U 467955 5612773):
  - Keyhole Falls viewing the south side u-2-002 UL11 – MG-OBS02 (10U 466593 5613988); and,
  - Garibaldi Pumice mine site viewing u-2-002 UL 19 – MG-OBS03 (10U 467388 561408).

Monitoring effort was split between all three sites between sunrise and sunset, unless safety concerns or weather conditions precluded monitors from doing so. The order of site visits rotated daily. Construction activities need to cease if a goat(s) are observed moving towards the ULRHEF intake and/or if a goat(s) are observed within a 500m line of site of a construction activity. No goats were observed within 500m line of sight of construction activities and no work stoppages were required.

*Please refer to the attached Mountain Goat Monitoring Daily Observation Forms for a summary of observations from this reporting period.*

## 9.0 Environmental Issues Tracking Matrix (ITM)

### 9.1 Hydroelectric Facilities (ULRHEF & BDRHEF)

| Issue Tracking |        | Environmental Issue   |  | Mitigation Measures   |                        |                              |                |  |
|----------------|--------|---|--|---|------------------------|------------------------------|----------------|--|
| ID No.         | Status | Location  | Issue Description  | Action Taken/Recommended  | Date of Identification | Targeted Date for Completion | Date Completed |  |
| ULR#20         | Open   | Various location at ULRHEF, BDRHEF and along the Lillooet FSR | FAM04 was issued to the contractor to address ESC concerns at HEF component sites. Since the issuing of FAM04 additional ESC concerns have been identified and added by the IEM. | 1. ULRHEF Intake (north and south sides)                          | September 29, 2014     | October 17, 2014             | -              |  |
|                |        |   |  | a. Ditch installation/maintenance                                 |                        |                              |                |  |
|                |        |   |  | b. Slope protection   |                        |                              |                |  |
|                |        |   |  | c. Spoil area winterization (plan submitted October 17, 2014)     |                        |                              |                |  |
|                |        |   |  | 2. ULRHEF Powerhouse  |                        |                              |                |  |
|                |        |   |  | a. Slope protection   |                        |                              |                |  |
|                |        |   |  | 3. BDRHEF Intake Access Road                                      |                        |                              |                |  |
|                |        |   |  | a. Slope protection   |                        |                              |                |  |
|                |        |   |  | 4. Upper Lillooet FSR   |                        |                              |                |  |
|                |        |   |  | a. KM 48 box culvert - reinstallation of silt fence and grading   |                        |                              |                |  |
|                |        |   |  | b. KM 43.5 - stabilization of failing material                    |                        |                              |                |  |
|                |        |   |  | c. KM 39.7 box culvert – reinstallation of silt fence and grading |                        |                              |                |  |

*next ITM – ULR#23*

### 9.2 Transmission Line

| 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>No outstanding environmental issues (next ITM – Tx#2)</i> |        |                     |                   |                          |                        |                              |                |  |

# MOUNTAIN GOAT DAILY OBSERVATION FORM

UPPER LILLOOET HYDRO PROJECT

Goat Monitor's Name(s):

Date (YYYY-MM-DD):

Weather (cloud cover, precipitation and temperature):



106-185 forester street, north vancouver, bc v7h 2m9  
office tel 987.5588 fax 987.7740

Please submit **Mountain Goat Daily Observation Form** in person to a representative of Sartori Environmental Services (**Tom Hicks** or **Stephen Sims**) or by email to [steve@sartorienv.com](mailto:steve@sartorienv.com) following each day of monitoring.

| Mountain Goat Observation Site | UWR/Migration Corridor - Location                 | UTM Coordinates<br><i>(approximate center of observation area)</i> | Daily Start Time<br><i>(24hr clock)</i> | Daily End Time<br><i>(24hr clock)</i> | Daily form #   | 1 | of | 1 |
|--------------------------------|---|--|---|---------------------------------------|--|---|----|---|
| MG - OBS01                     | Migration Corridor - East side of Truckwash Creek | 10U 467898 5612845   | 10:40                                   | 12:30                                 | If more space is needed in the below table, please fill out additional daily forms and indicate total number of forms above. |   |    |   |
| MG - OBS02                     | UWR u-2-002 UL 11 - Keyhole Falls                 | 10U 466760 5613967   | 14:10                                   | 16:00                                 |  |   |    |   |
| MG - OBS03                     | UWR u-2-002 UL 19 - Garibaldi Pumice              | 10U 469155 5614960   | 08:30                                   | 10:20                                 |  |   |    |   |

| Observation Site<br><i>(indicate if location other than OBS site)</i> | Time<br><i>(use 24hr clock)</i> | UTM Coordinates or Waypoint<br><i>(10U)</i> | Species Observed<br><i>(indicate Mountain Goat or other species)</i> | Observations<br><i>(be specific - visual sign, track, other sign)</i> | # of Animals | Age<br><i>(if known - refer to attached info sheet)</i> | Sex<br><i>(if known - refer to attached info sheet)</i> | Description of Activities<br><i>(feeding, moving, etc.)</i> | Comments<br><i>(habitat, snow conditions, etc.)</i> | Photo #s |
|---|---------------------------------|---|--|---|--------------|---|---|---|---|----------|
| MG - OBS03  | 09:00                           | 10U 469155 5614960                          | None   | No goats or tracks observed   |              |   |   |   |   |          |
| MG - OBS01  | 12:00                           | 10U 467898 5612845                          | None   | No goats or tracks observed   |              |   |   |   |   |          |
| MG - OBS02  | 16:00                           | 10U 466760 5613967                          | None   | No goats or tracks observed   |              |   |   |   |   |          |

# MOUNTAIN GOAT DAILY OBSERVATION FORM

UPPER LILLOOET HYDRO PROJECT

Goat Monitor's Name(s):

Date (YYYY-MM-DD):

Weather (cloud cover, precipitation and temperature):



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| Mountain Goat Observation Site | UWR/Migration Corridor - Location                 | UTM Coordinates<br><i>(approximate center of observation area)</i> | Daily Start Time<br><i>(24hr clock)</i> | Daily End Time<br><i>(24hr clock)</i> | Daily form #   | 1 | of | 1 |
|--------------------------------|---|--|---|---------------------------------------|--|---|----|---|
| MG - OBS01                     | Migration Corridor - East side of Truckwash Creek | 10U 467898 5612845   | 11:15                                   | 12:30                                 | If more space is needed in the below table, please fill out additional daily forms and indicate total number of forms above. |   |    |   |
| MG - OBS02                     | UWR u-2-002 UL 11 - Keyhole Falls                 | 10U 466760 5613967   | 08:30                                   | 11:00                                 |  |   |    |   |
| MG - OBS03                     | UWR u-2-002 UL 19 - Garibaldi Pumice              | 10U 469155 5614960   | 12:50                                   | 14:15                                 |  |   |    |   |

| Observation Site<br><i>(indicate if location other than OBS site)</i> | Time<br><i>(use 24hr clock)</i> | UTM Coordinates or Waypoint<br><i>(10U)</i> | Species Observed<br><i>(indicate Mountain Goat or other species)</i> | Observations<br><i>(be specific - visual sign, track, other sign)</i> | # of Animals | Age<br><i>(if known - refer to attached info sheet)</i> | Sex<br><i>(if known - refer to attached info sheet)</i> | Description of Activities<br><i>(feeding, moving, etc.)</i> | Comments<br><i>(habitat, snow conditions, etc.)</i> | Photo #s |
|---|---------------------------------|---|--|---|--------------|---|---|---|---|----------|
| MG - OBS02  | 11:00                           | 10U 466760 5613967                          | None   | No Goats observed at any of the stations                              |              |   |   |   |   |          |
| MG - OBS01  | 12:30                           | 10U 467898 5612845                          | None   | No Goats observed at any of the stations                              |              |   |   |   |   |          |
| MG - OBS03  | 14:15                           | 10U 469155 5614960                          | None   | No Goats observed at any of the stations                              |              |   |   |   |   |          |









# MOUNTAIN GOAT DAILY OBSERVATION FORM

UPPER LILLOOET HYDRO PROJECT

Goat Monitor's Name(s):

Date (YYYY-MM-DD):

Weather (cloud cover, precipitation and temperature):



106-185 forester street, north vancouver, bc v7h 2m9  
office tel 987.5588 fax 987.7740

Please submit **Mountain Goat Daily Observation Form** in person to a representative of Sartori Environmental Services (**Tom Hicks** or **Stephen Sims**) or by email to [steve@sartorienv.com](mailto:steve@sartorienv.com) following each day of monitoring.

| Mountain Goat Observation Site | UWR/Migration Corridor - Location                 | UTM Coordinates<br>(approximate center of observation area) | Daily Start Time<br>(24hr clock) | Daily End Time<br>(24hr clock) |
|--------------------------------|---|---|----------------------------------|--------------------------------|
| MG - OBS01                     | Migration Corridor - East side of Truckwash Creek | 10U 467898 5612845  | 10:00                            | 11:00                          |
| MG - OBS02                     | UWR u-2-002 UL 11 - Keyhole Falls                 | 10U 466760 5613967  | 11:15                            | 11:25                          |
| MG - OBS03                     | UWR u-2-002 UL 19 - Garibaldi Pumice              | 10U 469155 5614960  | 8:30                             | 10:30                          |

|              |   |    |   |
|--------------|---|----|---|
| Daily form # | 1 | of | 1 |
|--------------|---|----|---|

If more space is needed in the below table, please fill out additional daily forms and indicate total number of forms above.

| Observation Site<br><i>(indicate if location other than OBS site)</i> | Time<br><i>(use 24hr clock)</i> | UTM Coordinates or Waypoint<br><i>(10U)</i> | Species Observed<br><i>(indicate Mountain Goat or other species)</i> | Observations<br><i>(be specific - visual sign, track, other sign)</i> | # of Animals | Age<br><i>(if known - refer to attached info sheet)</i> | Sex<br><i>(if known - refer to attached info sheet)</i> | Description of Activities<br><i>(feeding, moving, etc.)</i> | Comments<br><i>(habitat, snow conditions, etc.)</i> | Photo #s |
|---|---------------------------------|---|--|---|--------------|---|---|---|---|----------|
| MGOBS-03  | 8:30                            | 10u4691555614960                            | Mg   | Vis   | 5            | Kid to Adult  | ?   | Moving down since yesterday                                 | Rain and snow patches                               | 1 tablet |
| MGOBS-03  | 9:30                            | 10u4691555614960                            | Mg   | Vis   | 2            | Kid and nanny   | ?   | Eatting   | Foggy   |          |
| MGOBS-01  | 10:00                           | 10u4678985612844                            | o  | o   | 0            | 0   | 0   | o   | Cool damp   | 4tablet  |
| MGOBS-02  | 11:20                           | 10u4667605613967                            | Bear tracks<br>At the beginning of trail                             | Tracks  | ?            | Adult   |   |   |   |          |

