



Upper Lillooet Hydro Project

Weekly Environmental Monitoring Report #114

Reporting Period: May 1 – 31, 2017

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)

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| | | Date Prepared: October 21, 2017 Date Submitted: October 27, 2017 |

Owner Construction Permits and Approvals

Environmental Assessment Certificate No. E13-01 (Amendment 1, 2, 3, 4, 5, 6, 7)
 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
 Leave to Commence Diversion (ULRHEF) File No. 2002561
 Leave to Commence Diversion (BDRHEF) File No. 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 & Modification Agreement (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) No. L49717 (Amendments 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11)
 Occupant Licence to Cut (BDRHEF – KM38 laydown) No. L49698
 Occupant Licence to Cut (BDRHEF) No. L49816 (Amendments 1, 2, 3, 4)
 Occupant Licence to Cut (TX Line) No. L49697 (Amendments 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11)
 General Wildlife Measure Exemption Approval Letter (TX Line & BDRHEF) File No. 78700-35/06 UWR and 39585-20 WHA
 Ground Water Licence (ULRHEF C50114) File No. 20003228
 Ground Water Licence (BDRHEF C500112) File No. 20003239
 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
 Works Permit for Construction within FSR Right-of-Way No. 7977-15-01
 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
 Section 8 - Special Use Permit issued for the operation of an avalanche weather station on Crown land (File No. S25988)
 Special Use Permit issued for construction of the Lillooet River FSR KM48 bypass road on Crown land (File No. S26115)
 Vancouver Coastal Health Letter of Certification (23966) Boulder Creek Powerhouse Sewerage System
 Vancouver Coastal Health Letter of Certification (23966) Upper Lillooet Powerhouse Sewerage System

Contractor Construction Permits and Approvals

Waste Discharge under the Code of Practice for the Concrete and Concrete Products Industry under the Environmental Management Act (Authorization No. 107204) Tracking No. 349424 (Renewal 2)
Wildlife Act Permits – Pacific Tailed Frog Salvage Permit # SU15-164805; SU17-262991; Fish Salvage Permit # SU15-174722
Fisheries and Oceans Canada – Anadromous Fish Salvage Permit #XR 178 2015
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
SLRD Building Permits for Mechanic Shop (10862) and Carpentry Shop (10836) March 18, 2015
Water Sustainability Act Section 10(1) Use Approval dated March 24, 2016
Section 7 Explosives Act – Magazine Licence (U76018) Renewal April 30, 2016
Magazine Licence File No. UL76018 (Renewal 1, 2)
Section 8 Approval – Short Term Use of Water File (Lillooet River and Tributaries) No. A2006123 (Amendment 1)

ACRONYMS:

| | | | |
|-----------------|--|----------------|--|
| AMBNS | Active Migratory Bird Nesting Survey | HWM | High water mark |
| Andritz | Andritz Hydro Canada Inc. | IE | Independent Engineer (True North Energy) |
| ANFO | Ammonia nitrate fuel oil (industrial explosive) | IEM | Independent Environmental Monitor |
| ARD M/L | Acid Rock Drainage and Metal Leaching | INX | Innergex Renewable Energy Inc. |
| BCEAO | British Columbia Environmental Assessment Office | ISW | Instream Works |
| BCCOS | British Columbia Conservation Officer Service | ITM | Environmental Issue Tracking Matrix |
| BCWQG | British Columbia Water Quality Guidelines | JEM | JEM Energy Ltd. (Delegate Independent Engineer) |
| BDRHEF | Boulder Creek Hydroelectric Facility | LTC | Leave to Construct |
| BEBO | ULRHEF Intake Concrete Arch & Foundation Wall | MFLNRO | Ministry of Forests, Lands and Natural Resource Operations |
| BG | Background | MOE | Ministry of Environment |
| BKL | BKL Consultants Ltd. | MOTI | Ministry of Transportation and Infrastructure |
| CE | CRT-ebc Construction Inc. | OGMA | Old Growth Management Area |
| CEMP | Construction Environmental Management Plan | OLTC | Occupational License to Cut |
| CTF | Coastal Tailed Frog | PAG | Potentially Acid Generating |
| DFO | Fisheries and Oceans Canada | QP | Qualified Professional |
| DS | Downstream | ROW | Right of Way |
| EPP | Environmental Protection Plan | RVMA | Riparian Vegetation Management Area |
| EAC | Environmental Assessment Certificate | SES | Sartori Environmental Services |
| EAO | Environmental Assessment Office | SLRD | Squamish-Lillooet Regional District |
| Ecofish | Ecofish Research Ltd. | TX Line | Transmission Line |
| Ecologic | Ecologic Consulting | ULRHEF | Upper Lillooet Hydroelectric Facility |
| EIR | Environmental Incident Report | UWR | Ungulate Winter Range |
| ESC | Erosion and Sediment Control | VC | Valued Component |
| FAM | Field Advice Memorandum | WEL | Westpark Electric Ltd. |
| FSR | Forest Service Road | WEMR | Weekly Environmental Monitoring Report |
| Golder | Golder Associates | WHA | Wildlife Habitat Area |
| GWR | Mountain Goat Winter Range | | |
| Hedberg | Hedberg and Associates Ltd. | | |

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 | Key Monitoring Locations & Activities |
|------------------|--------------------|--|
| May 1 – 31, 2017 | MC, SE, TH, SS | <p>Construction Camp, Laydown Areas and the Lillooet River FSR</p> <ul style="list-style-type: none"> • Road maintenance on the Lillooet River FSR. • Raising the elevation of the Lillooet River FSR and ditch armoring from KM41.5 – 42.75. • Electric fence repair surrounding the construction camp. <p>ULRHEF Intake & Upstream Tunnel Portal</p> <ul style="list-style-type: none"> • Restoration and planting at KM48.5 • Underwater concrete works and installation of protective rubber matting on the upstream sluice way slab. • Obermeyer repairs <p>Lower portal and Truckwash Creek 2 access road</p> <ul style="list-style-type: none"> • Placement of topsoil. • Deactivation of Truckwash 2 access road and KM44.7 access road. <p>BDRHEF Intake</p> <ul style="list-style-type: none"> • Ploughing intake access road. • Carbonneau stop log repair • Ditch clean out on intake access road |

IEM Team Personnel: SE – Stephanie Ellis; MC – Mike Champion; TH – Tom Hicks; SS – Stephen Sims

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. |
|-------|--------------------|--------------|--|------------|
| May 1 | <i>Email</i> | INX, SES, CE | <p>CE and INX requested that passenger vehicles associated with the underwater repairs on the ULRHEF sluice way be allowed to pass through the Truckwash Creek mountain goat migration corridor during the standard operational shutdown. All other traffic and movement of heavy machinery would follow the sunrise and sunset closures as outlined in the mountain goat management plan.</p> <p>The IEM agreed with this approach, but stressed that travel during the sunrise and sunset periods should be minimized and limited to pick-up trucks only. Additionally, the IEM advised CE and INX that the two-week operational shutdown within the Truckwash Creek migration corridor would likely start the week of May 8th, as snow levels were quickly receding. During this period, heavy construction within the corridor will be prohibited and travel to the ULRHEF intake should be minimized to the extent possible.</p> | - |
| | <i>Email</i> | CE, SES, INX | <p>CE informed SES and INX that a CE crew member observed a grizzly bear at KM42 of the Lillooet River FSR. The bear was traveling through the area and did not appear to be disturbed by construction activities.</p> | - |

| Date | Communication Type | Participants | Issues Discussed | ITM ID No. |
|-------------|-------------------------------|---------------------------|---|-------------------|
| | <i>Email</i> | SES, INX, MFLNRO, WEL, CE | The IEM submitted the grizzly bear observation form to all project members and applicable government agencies. | |
| May 3 | <i>Email</i> | SES, INX, WEL, McElhanney | The IEM conducted a pre-assessment helicopter flight of UWR SO-04 and SO-08 to determine if mountain goats were present/kidding at these sensitive sites. Three passes (one high elevation, and two low elevation) were completed to assess mountain goat presence. Visibility was excellent during the flight and the IEM determined that both UWRs were unoccupied, at the time of the flight. Based on these observations and the date, the IEM felt that there is a low likelihood that mountain goats would move into either of these UWRs to kid or for foraging purposes. Therefore, the IEM granted WEL and McElhanney permission to access segment 15 of the transmission line via helicopter to complete as-built activities, provided that the pilot follows pre-approved flight paths, the total number of flights are kept to a minimum, and that works are suspended if a mountain goat is observed in either UWR. | - |
| | <i>Email</i> | CE, SES, INX | CE notified the IEM and INX that instream works to repair the ULRHEF sluice way slab would begin on May 4, 2017. | |
| May 7 | <i>Email</i> | SES, INX | The IEM notified INX that pH levels temporarily exceeded BCWQG (9.06 – 9.16pH, for four minutes) while divers were conducting underwater grouting operation to repair the ULRHEF sluice way. CE and the IEM quickly deployed the CO ₂ diffuser, and pH levels returned to within background levels. Elevated pH levels were limited to the areas directly surrounding the work area and the IEM did not observe any impacts to water quality at the downstream sampling location (Keyhole bridge). | - |
| May 8 | <i>Email</i> | INX, SES | INX provided the IEM with QP prepared documentation confirming that BDRHEF Spoil piles are geo-technically stable and can be reclaimed according to approved reclamation prescriptions. | - |
| May 9 | <i>Email</i> | SES, CE, INX | On May 5, the IEM notified CE and INX that snow levels dropped below threshold levels triggering the spring two-week shutdown of “All drilling and construction associated activities ... at the Upper Lillooet River HEF downstream portal near Truckwash Creek and at the Intake”, until May 19, 2017. All loud construction activities at the ULRHEF intake are complete and therefore the shutdown no longer applies to this area. Restoration activities at the downstream portal near Truckwash Creek are scheduled to occur after May 19, 2017 and therefore should not be impacted by the operational closure. Lastly, all traffic restrictions as previously outlined and agreed to will continue to be followed during the spring two-week shutdown period. | - |
| May 17 | <i>Email and Site meeting</i> | CE, SES, INX | CE informed the IEM and INX that drainage works along the cable conduit alignment between the BDRHEF powerhouse and the intake access road would begin on May 18, 2017. CE and the IEM also met on site to discuss the work plan and updated design, water management, and other environmental concerns. | ULR#63 |
| May 22 | <i>Email</i> | IE, SES, MFLNRO, INX | The IE provided INX with the leave to construct for the ULRHEF and BDRHEF operator’s residence on Pad 1 and 2 of the existing construction camp site. | - |

| Date | Communication Type | Participants | Issues Discussed | ITM ID No. |
|--------|--------------------|--------------------------------------|--|------------|
| May 24 | Email | CE, SES, INX, WEL | CE informed all parties that the Upper Lillooet River construction camp would be decommissioned starting on June 5 and that no on-site accommodations would be available after June 14. | - |
| May 26 | Email | INX, CE, SES | INX circulated a Project Update Notice for the BDRHEF confirming that Commercial Operation has been reached. | - |
| May 29 | Site Meeting | WEL, SES, INX, local trapline holder | A site meeting was held with the local trapline holder to discuss and review TX Line road deactivation prescriptions. Specific areas of concern were highlighted by the local trapline holder. The concerns included: ensuring water bars on seasonally deactivated roads are passable by 4x4 vehicle and trailer, ensuring turn around area at the end of seasonally decommissioned road 139.1, placement of woody debris along road 53.1 and 56.1 to maintain ATV or snowmobile access, and ensuring 4x4 access is maintained on roads 5.1 & 5.2. Road deactivation activities will begin in June. | - |
| May 30 | Email | CE, SES, INX | CE notified the IEM and INX that maintenance activities on the KM41.2 would begin on June 7, 2017. | - |

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 |
|---|--|---|---|
| Lillooet River FSR, ULRHEF, & BDRHEF intake | Access roads above the lower limit of the 200m buffer to the Truckwash Creek Migration Corridor to the ULRHEF intake | Mountain Goat UWRs & Migration Corridor | <p>The spring two week shutdown to permit mountain goat migration was triggered on May 5, according to conditions of the Mountain Goat Management Plan. The shutdown period will extend until May 19 at the lower tunnel portal. The shutdown is not applicable to the ULRHEF intake as no loud construction activities are occurring within 500m of the UWR. Final reclamation activities at the ULRHEF lower tunnel portal may proceed post May 19</p> <p>If a mountain goat is observed within 500m line of sight of construction operations, construction must cease for at least 48 hours. Approval from the IEM must be obtained prior to recommencing construction activities, and the IEM must record and submit all goat observations to MFLNRO within 48 hours.</p> |
| TX Line | All Segments | Mountain Goat UWRs SO-04 & SO-08 | <p>IEM granted permission to survey crews to conduct as built surveys in the vicinity of UWRs SO-04 and SO-08, following a pre-works overflight assessment of the area that determined the UWRs were unoccupied.</p> <p>If a mountain goat is observed within 500m line of sight of construction operations, construction must cease for at least 48 hours. Approval from the IEM must be obtained prior to recommencing construction activities, and the IEM must record and submit all goat observations to MFLNRO within 48 hours.</p> |

| Component | Location | Wildlife/Archeology Concern | Construction/Timing Restrictions & Mitigations |
|-----------|----------|--|---|
| | | 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 areas are minimized. |
| | | Riparian Vegetation Management Areas (RVMA) | IEM monitoring is required during clearing within RVMAs. |
| | | 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 areas are minimized. |

4.0 Upper Lillooet River HEF – Monitoring Results

4.1 Construction Camp, KM38 Laydown, Access Roads & Lillooet River FSR

Construction Activities:

- CE continued routine fuel management at the KM38 laydown (Photo 1 - Photo 2). CE temporarily stored all hazardous substance materials (waste oil, contaminated soil, used oil/hydraulic fluid containers, etc.) in a designated area at the laydown prior to off-site disposal. The materials were all well contained and protected from the weather. CE also continued to demobilize equipment from various locations around site in preparation for project completion.
- CE began raising the elevation of the Lillooet River FSR and armoring the ditch line from KM41.5 – 42.75 (Photo 3 - Photo 6).
- After the end of the mountain goat operational shutdown, CE continued with restoration works and deactivation of the Truckwash 2 and KM44.7 access roads (Photo 7).

Environmental Summary:

- On the morning of May 1, CE fallers cleared 3 meters of forest on the south side of the Lillooet River FSR from KM42 – 42.5 to widen and raise the elevation of the FSR (Photo 3). All necessary song bird and raptor surveys were completed by Ecofish prior to the commencement of clearing activities. Lil'wat Nation archeologists were on site during all clearing and grubbing operations to monitor a known archeological area and to monitor for potential cultural artifacts that could have been encountered during the grubbing process, no artifacts were found. After clearing and grubbing operations were completed CE began raising the elevation of the FSR 1.5 meters from KM41.5 – 42.75 (Photo 4). The IEM monitored all construction activities and did not observe any environmental issues associated with these works.
- On May 12, CE began armoring the ditch line between KM41.5 – 42.75. Armouring was completed by isolating 100 foot sections of the ditch with large sandbags and earthen berms. A 6-inch pump was installed to pump water around the work area (Photo 5). Ecofish completed a CTF salvage in each section of the ditch prior to the placement of rip rap (Photo 6). In total, 100 CTF were captured within the ditch line and relocated upstream

of the work area. The IEM monitored water quality during all isolation/re-watering and pump movement activities and did not observe any increases in downstream turbidity at KM41.2.

- From May 19 – 22, CE placed top soil and decommissioned the Truckwash 2 and KM44.7 access roads (Photo 7).
- On May 5, snow depths dropped below threshold levels triggering the two-week spring mountain goat migration corridor shutdown of “All drilling and construction associated activities ... at the Upper Lillooet River HEF downstream portal near Truckwash Creek and at the Intake”. All loud construction activities at the ULRHEF intake are complete and therefore the shutdown no longer applies to this area.

Photos



Photo 1 – Mechanics shop and KM38 laydown (May 8, 2017).



Photo 2 – Decompaction of the concrete batch plant site at the KM38 laydown (May 5, 2017).



Photo 3 – Tree clearing at KM42 for road widening and raising (May 1, 2017).



Photo 4 – Grubbing for road widening at KM42 (May 3, 2017).



Photo 5 – Ditch isolation and pump around at KM42 (May 12, 2017).



Photo 6 – Ecofish staff conducting a CTF salvage in the ditch line at KM42 (May 12, 2017).



Photo 7 – Deactivated Truckwash 2 access road (May 29, 2017).

4.2 *Intake Commissioning and Sluiceway Armouring*

Construction Activities:

- Restoration planting at KM48.5 of the Lillooet River FSR (Photo 8).
- Commercial divers examined, cleaned, and installed protective rubber matting on the upstream portion of the ULRHEF sluiceway (Photo 9 - **Error! Reference source not found.**).
- Obermeyer repairs.

Environmental Summary:

- On May 3, commercial divers began installing the final piece of rubber protective matting over the damaged section of the ULRHEF sluiceway foundations (Photo 9). Once the matting was anchored in place divers began grouting the 2.8 x 0.4 x 0.3-meter void in the sluiceway slab. Crews used a pressurized hose to inject grout into ports welded to the

angle piece of the protective matting (Photo 9). Each port had a corresponding relief valve, which allowed water out from under the matting. Each relief valve was covered by a bucket and a 2" pump. The bucket and pump created a negative pressure differential between the interior and exterior of the bucket, forcing displaced water to the 2" pump which discharged into 1,000-liter totes and was neutralized with CO₂ near the intake structure (**Error! Reference source not found.**). To deter fish from entering the work area, CE installed a bubble curtain 5 meters away from the work area. Crews also installed a CO₂ diffuser to mitigate elevated pH water if the negative pressure gradient failed to remove contaminated water. On May 6, the IEM observed pH readings exceeding BCWQG (pH = 9.04 – 9.16, for four minutes) associated with the underwater grouting activities. The IEM immediately turned on the CO₂ diffuser and pH values returned to allowable levels quickly. The cause of the elevated pH is unknown, but underwater visibility was very poor and the divers were likely unaware that grout was temporally seeping out of a void between the protective matting and concrete slab.

Photos:



Photo 8 – Crews planting trees at KM48.5 of the Lillooet River FSR (May 15, 2017).



Photo 9 – Rubber Protective matting with angle iron and grouting ports to be installed on the ULRHEF sluiceway slab (May 5, 2017).

4.3 **Water Quality Results**

The IEM has suspended the routine water quality monitoring program as current activities pose low risk of negativity impacting water quality in the Lillooet River. Instead water quality monitoring was performed during all construction and commissioning activities that had the potential to affect downstream water quality including; repairs to the ULRHEF sluiceway. Water quality sampling results are discussed in Section 4.2 and detailed results are available upon request. Any instream works or works with the potential to affect downstream water quality will continue to be monitored by the IEM during the commissioning period.

4.4 *Recommendations*

IEM recommendations for the ULRHEF are as follows:

- CE should continue to maintain the Lillooet River FSR and maintain ditching during the spring freshet.
- CE should continue to remove construction waste as areas are reclaimed and equipment is demobilized.

4.5 *Upcoming Works*

The following new and/or environmentally sensitive construction activities are scheduled to occur at the ULRHEF in June 2017:

- Site demobilization and restoration works.
- Clearing of the KM41.2 culvert.

5.0 **Boulder Creek Hydroelectric Facility – Monitoring Results**

5.1 *Access Road & Intake*

Construction Activities:

- Ploughing of the BDRHEF intake access road (**Error! Reference source not found.**).
- Intake access road ditch maintenance (**Error! Reference source not found.**).
- Stop log repair works by Carbonneau.

Environmental Summary:

- On May 1, CE plowed the BDRHEF intake access road (**Error! Reference source not found.**). The IEM inspected these works and did not observe any environment issues. The IEM also reminded all construction staff that the mountain goat gate at KM3 must remain closed until June 15 to prevent public access within the UWR.

Photos:



Photo 10 – BDRHEF road ploughing and closed mountain goat gate (May 2, 2017)



Photo 11 – Ditch maintenance on the BDRHEF intake access road (May 9, 2017)

5.2 *Powerhouse*

Construction Activities:

- CE completed drainage works and restoration under the powerlines from the BDRHEF powerhouse to the intake access road (Photo 12). CE provided an update to the design of the drainage ditch that was installed that bisects six identified ephemeral drainage paths along the conduit alignment between the BRDHEF intake access road and the BDRHEF powerhouse. CE completed all repairs to the drainage system including: armoring the ditch and the 6 ephemeral channels the empty to the newly constructed ditch, and installed an upgraded culvert on the Lillooet River FSR. These works were completed on May 18 and ITM ULR#63 is therefore considered closed.

Environmental Summary:

- The IEM monitored construction activities along the transmission line alignment and verified that the ephemeral drainages were dry prior to beginning the works. No environmental concerns were noted.

Photos:



Photo 12 – Completed drainage and restoration under the transmission lines from BDRHEF powerhouse to the intake access road (May 22, 2017)

5.3 *Water Quality Results*

The IEM has suspended the routine water quality monitoring program as current activities pose low risk of negativity impacting water quality in Boulder Creek. Any instream works or works with the potential to affect downstream water quality will continue to be monitored by the IEM during the commissioning period.

5.4 *Recommendations*

IEM recommendations for the BDRHEF are as follows:

- CE should continue to remove garbage from both the BDRHEF powerhouse and intake as they demobilize equipment.

5.5 *Upcoming Works*

New and/or environmentally sensitive construction activities scheduled to occur at the BDRHEF in June 2017:

- CE should continue to remove garbage from both the BDRHEF powerhouse and intake as they demobilize equipment.
- Reclamation of the BDRHEF spoil areas and temporary work areas according to the master site reclamation plan revision 4.

6.0 Transmission Line – Monitoring Results

6.1 Transmission Line Construction Activities

Construction Activities:

- No construction activities occurred during the reporting period. Road deactivation works will begin in June.

Environmental Summary:

- There were no works along the Transmission Line that required IEM environmental monitoring during this reporting period.

6.2 Recommendations

IEM recommendations for the Transmission Line are as follows:

- WEL’s Environmental Manager continues to provide regular scheduling updates that permits the IEM to assess environmental risks and coordinate monitoring requirements. WEL should continue to provide the IEM with a minimum of 48 hours’ notice if IEM presence is required or expected for construction activities.

6.3 Upcoming Works

New and/or environmentally sensitive construction activities scheduled to occur along the Transmission Line alignment in 2017:

All Segments

- Seasonal and permanent road de-activation works.
- Reclamation and planting within sensitive wildlife areas.

7.0 Wildlife Sightings

As per the CEMP, the IEM implemented a wildlife sightings record. Project Personal are required to regularly update the record and it is mandatory for all personnel to report wildlife sightings including, but not limited to bears, cougars, mountain goats and deer. 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 |

The Owner, Contractors, and IEM team reported the following wildlife sightings in May 2017:

| Upper Lillooet Hydro Project - Wildlife Observation Form | | | | | |
|--|----------|--------------------------|------------------------|----------|---------------------------------------|
| Date | Time | Observer (Company) | Species or Description | Location | Comments |
| 05/01/2017 | 10:45:00 | Scott Thomson (Sibola) | Grizzly Bear | KM 42 | Reported to MFLNRO |
| 05/02/2017 | 10:45:00 | Tammie Jenkins (Lil'wat) | Black Bear | KM 42 | Sow and two cubs were seen in a tree. |
| 05/03/2017 | 15:45:00 | Ian McKeachie (CRT-EBC) | Black Bear | KM 43.5 | - |
| 05/04/2017 | 13:00:00 | Fanny Seminaro (CRT-EBC) | Black Bear | KM 42.5 | - |
| 05/04/2017 | 14:00:00 | Fanny Seminaro (CRT-EBC) | Black Bear | KM 42 | - |
| 05/06/2017 | 13:00:00 | Fanny Seminaro (CRT-EBC) | Black Bear | KM 43 | - |
| 05/16/2017 | 9:30:00 | Angel Orejas (CRT-EBC) | Black Bear | KM 44 | Sow and two cubs. |
| 05/19/2017 | 9:45:00 | Ian McKeachie (CRT-EBC) | Black Bear | KM 45 | - |
| 05/19/2017 | 9:50:00 | Ian McKeachie (CRT-EBC) | Black Bear | KM 44 | - |
| 05/24/2017 | 9:00:00 | Fanny Seminaro (CRT-EBC) | Black Bear | KM 39 | - |
| 05/24/2017 | 14:30:00 | Ian McKeachie (CRT-EBC) | Black Bear | KM 38.5 | - |
| 05/31/2017 | 14:45:00 | Angel Orejas (CRT-EBC) | Black Bear | KM 39 | - |

8.0 Mountain Goat Monitoring Program

The following mitigation measures related to mountain goats were implemented during this monitoring period:

- The BDRHEF intake access road is gated to restrict motorized public access to the UWR (UL-12). Construction activities at the BDRHEF intake are now complete. Commissioning activities will not involve loud construction activities.
- On May 5, the IEM notified CE and INX that snow levels dropped below threshold levels triggering the spring two-week shutdown of “All drilling and construction associated activities ... at the Upper Lillooet River HEF downstream portal near Truckwash Creek and at the Intake”, until May 19, 2017. All loud construction activities at the ULRHEF intake are complete and therefore the shutdown no longer applies to this area. Site restoration activities at the downstream portal near Truckwash Creek occurred after the end of the shutdown period from May 19 - 22, 2017.
- To mitigate potential impacts to mountain goats during the sensitive winter period, construction activities will cease if a mountain goat(s) is (are) observed moving towards the ULRHEF intake and/or if a mountain goat(s) is (are) observed within a 500m line of sight of a construction activity. No mountain goats were observed within 500m line of sight of construction activities and no work stoppages were required during this monitoring period.

9.0 Environmental Issues Tracking Matrix (ITM)

9.1 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 |
| ULR#58 | OPEN | All work areas | Conservation Officer and BCEAO Compliance and Enforcement Officer Inspection noted non-compliance with regard to wildlife attractant management. | 1. Develop, implement and document internal waste and attractant management auditing tool. Tool will be available for use by the IEM and CE's EM Team. Records of inspections and noted non-compliances should be tracked internally with clean-up documented in each report. This tracking tool will be available to agencies upon request. This tool should be used similarly to the Spill Reporting tool currently being employed onsite. | July 6, 2016 | July 9, 2016 | July 8, 2016 |
| | | | | 2. Repair and adjust the electric fences and charged entrance mats at the construction camp (perimeter fence, camp kitchen fence, and waste compactor fence) and surrounding the septic field. | | | July 21, 2016 |
| | | | | 3. Install self-closing door hinges in all site lunchrooms and anywhere food is being stored temporarily (lunch rooms, kitchen storage area) OR adjust how food is transported, stored and consumed onsite to eliminate the possibility of food and food waste attractants onsite. | | | July 21, 2016 |
| | | | | 4. Perform maintenance to clean-up grease and liquid waste around and underneath the garbage compactor | | | July 21, 2016 |
| | | | | 5. Install berms surrounding parking areas that are lined with impermeable fabric in areas where tunneling equipment is parked. All leaks could be considered wildlife attractants; therefore all leaky equipment should be repaired and leaks or spills to ground in parking areas must be cleaned up daily and be disposed of in appropriate contaminated soil bins. Update December 8: CE continues to demobilize tunneling equipment, much of which remains parked within the lined parking area near the BDRHEF powerhouse. Steel tunnel liner has been stored over the area where leaks on the pad remain to be cleaned up. As the steel liners are moved, observed hydrocarbon contaminated soils should be cleaned up and removed as required to prevent attracting wildlife. This | | | |

| | | | | | | | |
|------------------------------|--------|--|---|--|-------------------|---|--------------------|
| | | | | <i>item remains open as hydrocarbon staining in the parking area near the BDRHEF powerhouses continue to be observed.</i> | | | |
| ULR#60 | CLOSED | Lillooet River FSR from 46 – 48 Km | The road fill slope of the Lillooet River FSR between KM46 – KM48 requires ESC measures to ensure slope stability and prevent rill erosion from transporting material into the forested area below. | 1. <i>Assess the road fill slope conditions following conduit installation in the Lillooet River FSR in this section. Update September 30, 2016: CE and the IEM have assessed areas of concern and have discussed ESC stabilization/reclamation of the slopes by hydro-seeding with alder and hydro-mulch of appropriate strength (BFM) and at sufficient application rate.</i> | August 8, 2016 | August 16, 2016 | September 30, 2016 |
| | | | | 2. <i>Provide and implement an agreed upon plan to protect the slope from an erosion and sediment transport perspective and/or a plan to initiate reclamation of the impacted area. Update May 25, 2017 – CE removed material from the road edge and hydro-seeded the road slopes with alder seed and bonded fiber matrix.</i> | | | May 25, 2017 |
| ULR #63 | CLOSED | Conduit alignment between the BDRHEF intake access road and BDRHEF powerhouse along TX Line ROW. | Drainage paths interrupted by conduit installation have resulted in significant erosion and does not conform to the work plan or design. | 1. <i>The work plan and design of the power and tech cable conduit between the BDRHEF intake access road and the BDRHEF powerhouse called for the installation of swales at all ephemeral drainage paths. The work plan and design were not implemented resulting in substantial erosion along the conduit alignment and along two of the TX Line temporary access roads. An updated drainage plan should be prepared and installed to prevent further erosion. Update May 18, 2017 – Rock armoured over-drains were installed at six identified ephemeral drainage paths. All over-drains empty to an engineered drainage ditch that convey water across the Lillooet River FSR through an upgraded culvert. This work was completed under IEM supervision.</i> | November 10, 2016 | November 17, 2016 | May 18, 2017 |
| ULR #64 | OPEN | Penstock access road and riparian area on the left bank of Truckwash Creek | Organics, mineral soils, and snow were mixed during construction of an access path on the left bank of Truckwash Creek | 1. <i>Soils (organics and mineral soil) were mixed with snow and placed on an access path constructed to perform Truckwash Creek over-drain repairs. This material is placed on the permanent penstock access road and in the riparian area of Truckwash creek, which will need to be reclaimed in 2017. The mixed material (organics, soils, and snow) are to be removed upon completion of the penstock over-drain repair works, to eliminate the ESC risk.</i> | December 1, 2016 | Upon completion of Truckwash Creek over-drain repairs | |
| (next ITM – BDR#28 & ULR#66) | | | | | | | |

9.2 Transmission Line

| ITM Tracking Legend: | | <i>Work Item Open</i> | | Mitigation Measures | | | |
|--|--------|----------------------------|-------------------|----------------------------|------------------------|------------------------------|----------------|
| | | <i>Work Item Complete</i> | | | | | |
| | | <i>Issue Closed</i> | | | | | |
| 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#3)</i> | | | | | | | |