

# Upper Lillooet Hydro Project

## Weekly Environmental Monitoring Report #6

Reporting Period: October 20<sup>th</sup> – October 26<sup>th</sup>, 2013

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)

*Environmental Assessment Certificate No. E13-01 (Amendment 1)*

*Licence of Occupation (Upper Lillooet River HEF (or ULR HEF) #232384) File No. 2409871*

*Licence of Occupation (Boulder Creek HEF (or BDR HEF) #232386) File No. 2409998*

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

*Occupant Licence to Cut (FSR realignment) No. L49717*



*DFO Letter of Advice File No. 09-HPAC-PA2-00303*

*Occupant Licence to Cut (TX Line S.1-S5, Heli Pads) No. L49697 (Amendment 1)*

*General Wildlife Measure Exemption Approval Letter (Tx Line) File No. 78700-35/06 UWR and 39585-20 WHA*

*Section 57 Authorization (hiking trail construction) File No. 16660-20*

*Road Use Permit No. 6123-13-02*

Distribution List		Prepared By
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**ACRONYMS:**

BCWQG	British Columbia Water Quality Guidelines
BDRHEF	Boulder Creek Hydroelectric Facility
BG	Background
CRT-EBC	CRT-EBC Construction Inc.
DFO	Fisheries and Oceans Canada
DS	Downstream
Ecofish	Ecofish Research Ltd.
ESC	Erosion and Sediment Control
FSR	Forest Service Road
Hedberg	Hedberg and Associates Ltd.
IEM	Independent Environmental Monitor
Innergex	Innergex Renewable Energy Inc.
ITM	Issue Tracking Matrix
LTC	Leave to Construct
MFLNRO	Ministry of Forests, Lands and Natural Resource Operations
MOE	Ministry of Environment
RVMA	Riparian Vegetation Management Area
SES	Sartori Environmental Services
TX Line	Transmission Line
ULRHEF	Upper Lillooet River Hydroelectric Facility
UWR	Ungulate Winter Range
WQ	Water Quality
WEL	Westpark Electric Ltd.
WEMR	Weekly Environmental Monitoring Report

## 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:

Day	Date	IEM Team Personnel	Weather Conditions	Monitoring Locations & Key Environmental Information
Sunday	Oct 20	-	-	-
Monday	Oct 21	TH,ML	Sun	<p><b>Lillooet River FSR Realignment at Truckwash Creek</b></p> <ul style="list-style-type: none"> <li>• Drilling and blasting at the west heading excavation.</li> <li>• Clearing brush along east heading.</li> </ul> <p><b>TX Line – Segment 1,2,&amp; 4</b></p> <ul style="list-style-type: none"> <li>• Clean-up within Stream 30A RVMA.</li> <li>• Buncher clearing (Poles 48-49.5).</li> <li>• Hand falling (Poles 4-5).</li> </ul> <p><b>Truckwash Creek Trail</b></p> <ul style="list-style-type: none"> <li>• Trail construction continues.</li> </ul>
Tuesday	Oct 22	ML	Sun and cloud	<p><b>Lillooet River FSR Realignment at Truckwash Creek</b></p> <ul style="list-style-type: none"> <li>• Drilling and blasting at the west heading excavation.</li> <li>• Clearing brush along east heading.</li> </ul> <p><b>TX Line – Segment 1,2 &amp; 4</b></p> <ul style="list-style-type: none"> <li>• Clean-up within Stream 27A, 33A, &amp; 34A RVMAs.</li> <li>• Buncher clearing (Poles 53-56).</li> <li>• Hand falling (Poles 4-5).</li> </ul> <p><b>Truckwash Creek Trail</b></p> <ul style="list-style-type: none"> <li>• Trail construction continues.</li> </ul>
Wednesday	Oct 23	TH	Sun and cloud	<p><b>Lillooet River FSR Realignment at Truckwash Creek</b></p> <ul style="list-style-type: none"> <li>• Drilling and blasting at the west heading excavation.</li> <li>• Bulk excavation along east heading.</li> </ul> <p><b>TX Line – Segment 1&amp;4</b></p> <ul style="list-style-type: none"> <li>• Buncher clearing (Poles 56-59).</li> <li>• Hand falling (Poles 50-52).</li> <li>• Hand falling complete between Poles 4-5.</li> </ul> <p><b>Truckwash Creek Trail</b></p> <ul style="list-style-type: none"> <li>• Trail construction continues.</li> </ul>
Thursday	Oct 24	TH	Sun and cloud	<p><b>Lillooet River FSR Realignment at Truckwash Creek</b></p> <ul style="list-style-type: none"> <li>• Drilling and blasting at the west heading excavation.</li> <li>• Bulk excavation along east heading.</li> </ul> <p><b>TX Line – Segment 1&amp;4</b></p> <ul style="list-style-type: none"> <li>• Clean-up within Boulder Creek RVMA, and from Poles 5-7.</li> <li>• Buncher clearing (Poles 60-63).</li> </ul> <p><b>Truckwash Creek Trail</b></p> <ul style="list-style-type: none"> <li>• Trail construction continues.</li> </ul>

Day	Date	IEM Team Personnel	Weather Conditions	Monitoring Locations & Key Environmental Information
Friday	Oct 25	TH	Sun and cloud	<b>Lillooet River FSR Realignment at Truckwash Creek</b> <ul style="list-style-type: none"> <li>• Drilling and blasting at the west heading excavation.</li> <li>• Bulk excavation along east heading.</li> </ul> <b>TX Line – Segment 1&amp;2</b> <ul style="list-style-type: none"> <li>• Buncher clearing (Poles 65-70).</li> </ul> <b>Truckwash Creek Trail</b> <ul style="list-style-type: none"> <li>• Trail construction is 95% complete.</li> </ul>
Saturday	Oct 26	-	-	-

*IEM Team Personnel: ML – Mackenzie Lee; TH – Tom Hicks*

## 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.
Oct. 21	Segment 4 & 5 Clearing Kick-off meeting	Mumleqs, Hedberg, WEL, Innergex, SES	<ul style="list-style-type: none"> <li>• Clearing prescriptions.</li> <li>• Some sections on hold due to incomplete pole design/spacing</li> <li>• Timing restrictions.</li> </ul>	N/A
Oct. 22	Email	Ecofish, Innergex, WEL, SES	<ul style="list-style-type: none"> <li>• Clarified adaptive management approach to clearing within 500m of km 29.2 Tributary an identified salmon spawning stream. Clearing in the area was permitted as km 29.2 Tributary was found to be dry, and therefore did not represent suitable Grizzly Bear or Bald Eagle salmon foraging habitat at the time of clearing.</li> </ul>	N/A
Oct. 20-26	Email updates	WEL, SES	<ul style="list-style-type: none"> <li>• Daily communication of upcoming clearing activities.</li> </ul>	N/A
Oct. 25	Segment 5 Tailboard for North Creek area	Mumleqs, Hedberg, Innergex, SES	<ul style="list-style-type: none"> <li>• Clearing prescriptions.</li> <li>• Timing restrictions.</li> </ul>	N/A

### 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 Concern	Construction/Timing Restrictions & Mitigations
ULRHEF	Lillooet River FSR realignment at Truckwash Creek	Grizzly Bear Class 1 suitable fall forage habitat – ULL-GB05 (Class 1 Summer & Fall)	IEM was onsite to oversee clearing and blasting activities within 500m of verified Class 1 Grizzly Bear forage habitat to ensure clearing boundaries were minimized and appropriate noise mitigation measures were implemented.
TX Line	Segment 2 Clean-up within RVMAs	Reaching within 15m of Streams 27A,30A, 33A, 34A, and Boulder Creek	IEM was onsite for clean-up activities within the RVMA buffers. Equipment operated outside of the 15m buffer and reached in to remove debris.
	Segment 4	Grizzly Bear Class 1 and/or Class 2 suitable forage habitat. Specifically: <ul style="list-style-type: none"> <li>• ULH-GB11(Class 1 Early &amp; Late Spring, Class 2 Summer &amp; Fall)</li> <li>• ULH-GB12 (Class 2 Late Spring, Summer &amp; Fall)</li> <li>• ULH-GB14 (Class 1 Summer &amp; Fall, Class 2 Late Spring)</li> <li>• ULH-GB15 (Class 2 Late Spring)</li> </ul>	IEM was onsite to oversee clearing activities within 500m of verified Class 1 and Class 2 Grizzly Bear forage habitat to ensure clearing boundaries were minimized.
	Segment 4	150m Wetland Buffer	IEM was onsite to oversee clearing activities within 150m of wetland habitats and ensure clearing boundaries were minimized.
	Segment 4	Bald Eagle and Grizzly Bear fall feeding streams (Km 29.2 Tributary - salmon spawning stream)	IEM was onsite to oversee clearing activities within 500m of km 29.2 Tributary and ensure clearing boundaries were minimized. Clearing was permitted in this habitat during the Oct. 15 – Dec 31 no construction window as km 29.2 Tributary was dry at the time of clearing activities.

## 4.0 Upper Lillooet River Hydroelectric Facility

### 4.1 Monitoring Results

#### 4.1.1 Lillooet River FSR Realignment at Truckwash Creek

##### Construction Activities

- Continued drilling, blasting, clearing, bulk excavation and road base construction on west side of Truckwash Creek from FSR realignment Stn 2+200m – 1+950m.
- Construction at the east heading included clearing and grubbing, bulk excavation and road base construction over the 1600mm culvert installed during the last reporting period (Photo 1).
- Clearing and grubbing occurred at the east heading of Truckwash Creek FSR realignment (within 500m of ULL-GB05) on October 21<sup>st</sup>, 22<sup>nd</sup> and 23<sup>rd</sup>, 2013.

##### Environmental Summary:

- IEM was onsite periodically throughout this reporting period to oversee general construction activities (including grubbing) and full-time during clearing (Photo 2) in Grizzly Bear Class 1 suitable summer and fall forage habitat (ULL-GB05). Clearing limits were minimized.
- CRT-EBC provided the IEM and Innergex with adaptive noise reduction mitigations on October 16<sup>th</sup> to address ongoing blasting activities occurring up until October 31 as part of the FSR realignment works within ULL-GB05 (Grizzly Bear Class 1 summer and fall forage habitat). Approved blasting mitigations remained effective during monitoring of blasting activities throughout this reporting period.

Photos:



**Photo 1. Road base backfill placed over 1600mm culvert at Stn. 1+430 (Oct. 25, 2013).**



**Photo 2. Clearing and grubbing within 500m of Grizzly Bear Class 1 habitat (suitable summer and fall forage; ULL-GB05) at the east heading of the Truckwash Creek FSR realignment (Oct. 23, 2013).**

Water Quality Results

Date	Time	Sample Location Description	pH	Turbidity (NTU)	Temperature (°C)
No WQ measurements were recorded during this reporting period. Construction activities had no visual effect on WQ.					

**4.1.2 Truckwash Creek Trail Construction**

Construction Activities

- Crews achieved 95% completion of the trail construction to the left bank abutment of the footbridge to be installed over Truckwash Creek. Hand tools were used to grub and clear a footpath along a surveyed/flagged centerline. Upgrades to rocky sections and steeper sections (Photo 3) of the trail also occurred during this reporting period.

Environmental Summary:

- The construction of wooden plank footbridges over flowing sections of small watercourses and wet areas occurred during this reporting period (Photo 4). All crossing structures are wooden and were installed on existing ground surface, outside of the wetted channel.

Photos:



**Photo 3. Construction of stairs required for a steep section of the trail. (Oct. 25, 2013).**



**Photo 4. Boardwalk constructed over sections of flowing water (Oct. 25, 2013).**

Water Quality Results

Date	Time	Sample Location Description	pH	Turbidity (NTU)	Temperature (°C)
No WQ measurements were recorded during this reporting period. Trail construction activities had no visual effect on WQ.					

**4.2 Recommendations**

The following recommendations are provided for this reporting period:

- Based on recent monitoring results, the IEM recommends continued implementation of current blast mitigation measures (maximum 10-hole sets and use of minimum required charges) within 500m of ULL-GB05 until October 31, 2013.
- If blasting activities are to occur within 500m of Mountain Goat UWR (specifically UL-11) or within the migration corridor after November 1, the IEM recommends that blasting mats be brought to site and be used as the primary mitigation to reduce noise levels. Acoustic monitoring of blasting activities will occur beginning November 1<sup>st</sup> to document adherence to blasting noise level restrictions within 500m of the Mountain Goat UWR.
- Reinforce the inlet armouring of the 1600mm CSP culvert installed last reporting period to the height of the road base fill material. The recommend works can be completed above the current waterline elevation.

**4.3 Upcoming Works**

The realignment of the Lillooet River FSR and Truckwash Creek Bridge Crossing work is scheduled to continue for the next 2- 3 weeks. Work will continue on both the east and west headings of the alignment during the next reporting period. Blasting at the



west heading and continued bulk excavation of the switchbacks at the east heading are expected to occur next week.

Truckwash Creek Trail construction will be completed to the left bank abutment of the footbridge to be installed over Truckwash Creek next week. Crews will finalize the reinforcement of steep areas and construction of elevated footpaths through wet sections of the trail next week.

## 5.0 Transmission Line

### 5.1 Monitoring Results

#### 5.1.1 Segment 1,2 and 4 Clearing (poles 0 – 40, 48-81)

##### Clearing Activities

- Feller buncher clearing activities began in segment 4 during this reporting period (poles 48-81).
- Clean-up within the RVMA areas associated with Boulder Creek and Streams 27A, 30A, 33A, and 34A occurred this week. All equipment operated outside of the 15m RVMA buffer and reached into the area to remove debris (Photo 5).
- Hand falling was completed on the steep slope above the Lillooet River FSR near 41km for the clear span section between Poles 4 & 5. This work required fallers to be harnessed and secured with ropes and temporary road closures in this section of the FSR. No logs or debris entered the Lillooet River which is located adjacent to the FSR in this section.

##### Environmental Summary:

- IEM was onsite to ensure clearing boundaries were minimized for all clearing works within wildlife timing restriction areas as identified in **Section 3.0**. No environmental concerns were noted.
- An adaptive management strategy was developed to permit clearing within 500m of km 29.2 Tributary, a previously identified salmon spawning stream, during the no construction timing restriction (October 15<sup>th</sup> –December 31<sup>st</sup>). Clearing in the area was permitted as km 29.2 Tributary was found to be dry, and therefore did not represent suitable Grizzly Bear or Bald Eagle salmon foraging habitat at the time of clearing. As part of the adaptive management strategy the IEM and clearing crew were required to inspect km 29.2 Tributary each morning prior to starting works to verify that the stream remained dry.

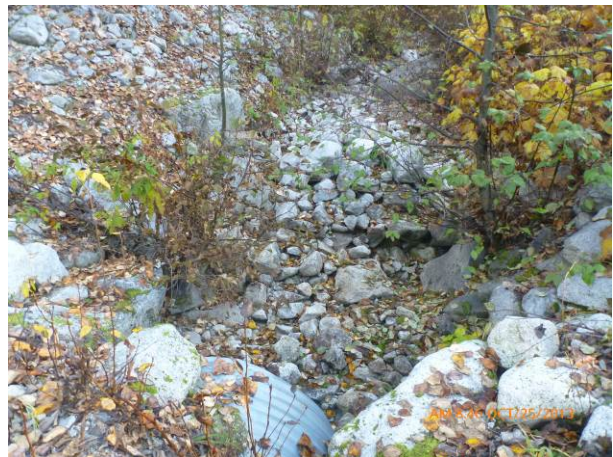
The IEM was onsite to verify the dry condition of km 29.2 Tributary (Photo 6), oversee clearing activities within 500m of km 29.2 Tributary, and ensure clearing boundaries were minimized, and works were conducted according to the agreed upon adaptive management strategy. Clearing occurred from Poles 60-63 and 65-70 on October 24<sup>th</sup> and 25<sup>th</sup>, respectively.

- The IEM was onsite and reviewed the clean-up prescriptions in each 15m RVMA boundary prior to beginning activities. All equipment remained outside the 15m buffer and reached in to remove debris. A spotter was onsite equipped with an extra spill kit to quickly identify and respond to spills throughout works within 30m of a watercourse; however, no spills occurred within these areas during this reporting period. No environmental concerns were noted.
- No ESC or WQ issues were observed throughout the active works areas.

Photos:



**Photo 5.** Clean-up activities within 15m of Boulder Creek. Notice the pink and blue flagging that delineates the 15m RVMA area. Equipment did not pass this line during clean-up works (Oct. 24, 2013).



**Photo 6.** Dry conditions of Stream 29.2 on October 25th (Oct. 25, 2013).

Water Quality Results

Date	Time	Sample Location Description	pH	Turbidity (NTU)	Temperature (°C)
No WQ measurements were recorded during this reporting period. Clearing activities had no visual effect on WQ.					

**5.2 Recommendations**

The IEM recommends making gaps in the visual barrier fencing installed to protect the adjacent wetland areas along the Lillooet River FSR. Gaps in the fencing should be installed to provide escape routes for wildlife traveling on or across the FSR. The IEM has verified that all currently required 30m wetland barrier fencing is installed according to the CEMP commitments.

**5.3 Upcoming Works**

Transmission line clearing work is expected to continue in Segments 4 and begin in Segment 5 next week. No temporary or permanent access road construction or

transmission line infrastructure construction will occur as part of the currently scheduled clearing activities.

## 6.0 Wildlife Sightings Report, Period

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

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

## 7.0 Environmental Issues Tracking Matrix (ITM)

### 7.1 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 Completion Date	Date Completed
<i>No outstanding environmental issues.</i>							

### 7.2 Transmission Line

ITM Tracking Legend:

Work Item Open
Work Item Complete
Issue Closed

Issue Tracking		Environmental Issue		Mitigation Measures			
ID No.	Status	Location	Issue Description	Action Taken/Recommended	Date of Identification	Targeted Completion Date	Date Completed
<i>No outstanding environmental issues.</i>							