



Upper Lillooet Hydro Project

Weekly Environmental Monitoring Report #83

Reporting Period: December 6 – 12, 2015

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

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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
 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) No. L49717 (Amendments 1, 2, 3, 4, 5, 6, 7)
 Occupant Licence to Cut (BDRHEF – KM 38 laydown) No. L49698
 Occupant Licence to Cut (BDRHEF) No. L49816 (Amendments 1, 2, 3)
 Occupant Licence to Cut (TX Line) No. L49697 (Amendments 1, 2, 3, 4, 5, 6, 7, 8, 9)
 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
 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
 Magazine Licence File No. UL76018 (Renewal 1)
 Section 8 Approval – Short Term Use of Water File (Lillooet River and Tributaries) No. A2006123 (Amendment 1)
 Section 8 - Special Use Permit issued for the operation of an avalanche weather station on Crown land (File No. S25988)

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. 326969 (Renewal 1)
Wildlife Act Permits – Pacific Tailed Frog Salvage Permit # SU15-164805; 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
SLRD Building Permit Stages 1 - 4 – Boulder Powerhouse Architectural, Electrical and Mechanical (10865) October 8, 2015
SLRD Building Permit Stages 1 - 4 – Upper Lillooet Powerhouse Architectural and Mechanical (10864) October 6, 2015

ACRONYMS:

AMBNS	Active Migratory Bird Nesting Survey	INX	Innergex Renewable Energy Inc.
Andritz	Andritz Hydro Canada Inc.	ISW	Instream Works
ANFO	Ammonia nitrate fuel oil (industrial explosive)	ITM	Environmental Issue Tracking Matrix
ASMP	Archaeological Sites Management Plan	JEM	JEM Energy Ltd. (Delegate Independent Engineer)
ARD M/L	Acid Rock Drainage and Metal Leaching	LTC	Leave to Construct
BCEAO	British Columbia Environmental Assessment Office	MFLNRO	Ministry of Forests, Lands and Natural Resource Operations
BCWQG	British Columbia Water Quality Guidelines	MOE	Ministry of Environment
BDRHEF	Boulder Creek Hydroelectric Facility	MOTI	Ministry of Transportation and Infrastructure
BG	Background	NCD	Non Classified Drainage
BKL	BKL Consultants Ltd.	OLTC	Occupational License to Cut
CE	CRT-ebc Construction Inc.	PAG	Potentially Acid Generating
DFO	Fisheries and Oceans Canada	ROW	Right of Way
DS	Downstream	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.	Stringer Line	Temporary Backfeed Transmission Line
Ecologic	Ecologic Consulting	TX Line	Transmission Line
EIR	Environmental Incident Report	ULRHEF	Upper Lillooet Hydroelectric Facility
ESC	Erosion and Sediment Control	UWR	Ungulate Winter Range
FAM	Field Advice Memorandum	VC	Valued Component
FSR	Forest Service Road	WEL	Westpark Electric Ltd.
Golder	Golder Associates	WEMR	Weekly Environmental Monitoring Report
GWR	Mountain Goat Winter Range	WHA	Wildlife Habitat Area
Hedberg	Hedberg and Associates Ltd.	WQ	Water Quality
HWM	High water mark		
IE	Independent Engineer (True North Energy)		
IEM	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, December 6	SE, AS	Snowing 0°C	<p>Construction Camp, Laydown Areas and the Lillooet River FSR</p> <ul style="list-style-type: none"> • Snow clearing and road maintenance on the Lillooet River FSR <p>ULRHEF Intake & Upstream Tunnel</p> <ul style="list-style-type: none"> • Grout injection in tunnel • Sediment basin water treatment system upgrades <p>ULRHEF Downstream Tunnel Portal</p> <ul style="list-style-type: none"> • Drilling, blasting and tunnel stabilization <p>ULRHEF Penstock</p> <ul style="list-style-type: none"> • No activity due to winter shutdown period. <p>ULRHEF Powerhouse</p> <ul style="list-style-type: none"> • Superstructure construction • Manifold installation <p>BDRHEF Intake Access Ramp and Diversion Tunnel</p> <ul style="list-style-type: none"> • No activity due to winter shutdown period (April 30, 2016). <p>BDRHEF Downstream Tunnel Portal</p> <ul style="list-style-type: none"> • Drilling, blasting and tunnel stabilization <p>BDRHEF Powerhouse</p> <ul style="list-style-type: none"> • Component installation <p>TX-Line</p> <ul style="list-style-type: none"> • No activity
Monday, December 7	SE, AS	Rain/snow 1°C	<p>Construction Camp, Laydown Areas and the Lillooet River FSR</p> <ul style="list-style-type: none"> • Snow clearing and road maintenance on the Lillooet River FSR <p>ULRHEF Intake & Upstream Tunnel</p> <ul style="list-style-type: none"> • Grout injection in tunnel • Sediment basin water treatment system upgrades <p>ULRHEF Downstream Tunnel Portal</p> <ul style="list-style-type: none"> • Drilling, blasting and tunnel stabilization <p>ULRHEF Penstock</p> <ul style="list-style-type: none"> • No activity due to winter shutdown period. <p>ULRHEF Powerhouse</p> <ul style="list-style-type: none"> • Superstructure construction • Manifold installation <p>BDRHEF Intake Access Ramp and Diversion Tunnel</p> <ul style="list-style-type: none"> • No activity due to winter shutdown period (April 30, 2016). <p>BDRHEF Downstream Tunnel Portal</p> <ul style="list-style-type: none"> • Drilling, blasting and tunnel stabilization <p>BDRHEF Powerhouse</p> <ul style="list-style-type: none"> • Component installation <p>TX-Line</p> <ul style="list-style-type: none"> • No activity
Tuesday, December 8	SE, AS	Rain/snow 5°C	<p>Construction Camp, Laydown Areas and the Lillooet River FSR</p> <ul style="list-style-type: none"> • Snow clearing and road maintenance on the Lillooet River FSR <p>ULRHEF Intake & Upstream Tunnel</p> <ul style="list-style-type: none"> • Closed due to heavy snowfall <p>ULRHEF Downstream Tunnel Portal</p> <ul style="list-style-type: none"> • Drilling, blasting and tunnel stabilization

Date	IEM Team Personnel	Weather Conditions	Key Monitoring Locations & Activities
			<p>ULRHEF Penstock</p> <ul style="list-style-type: none"> No activity due to winter shutdown period. <p>ULRHEF Powerhouse</p> <ul style="list-style-type: none"> Superstructure construction Manifold installation <p>BDRHEF Intake Access Ramp and Diversion Tunnel</p> <ul style="list-style-type: none"> No activity due to winter shutdown period (April 30, 2016). <p>BDRHEF Downstream Tunnel Portal</p> <ul style="list-style-type: none"> Drilling, blasting and tunnel stabilization <p>BDRHEF Powerhouse</p> <ul style="list-style-type: none"> Component installation <p>TX-Line</p> <ul style="list-style-type: none"> Segment 16 <ul style="list-style-type: none"> Groundworks for pole foundations
Wednesday, December 9	TH, DA	Rain/snow 5°C	<p>Construction Camp, Laydown Areas and the Lillooet River FSR</p> <ul style="list-style-type: none"> Snow clearing and road maintenance on the Lillooet River FSR <p>ULRHEF Intake & Upstream Tunnel</p> <ul style="list-style-type: none"> Grout injection in tunnel <p>ULRHEF Downstream Tunnel Portal</p> <ul style="list-style-type: none"> Drilling, blasting and tunnel stabilization <p>ULRHEF Penstock</p> <ul style="list-style-type: none"> No activity due to winter shutdown period. <p>ULRHEF Powerhouse</p> <ul style="list-style-type: none"> Superstructure construction Manifold installation <p>BDRHEF Intake Access Ramp and Diversion Tunnel</p> <ul style="list-style-type: none"> No activity due to winter shutdown period (April 30, 2016). <p>BDRHEF Downstream Tunnel Portal</p> <ul style="list-style-type: none"> Drilling, blasting and tunnel stabilization <p>BDRHEF Powerhouse</p> <ul style="list-style-type: none"> Component installation <p>TX-Line</p> <ul style="list-style-type: none"> Segment 16 <ul style="list-style-type: none"> Groundworks for pole foundations
Thursday, December 10	TH, DA	Cloudy 2°C	<p>Construction Camp, Laydown Areas and the Lillooet River FSR</p> <ul style="list-style-type: none"> Snow clearing and road maintenance on the Lillooet River FSR <p>ULRHEF Intake & Upstream Tunnel</p> <ul style="list-style-type: none"> Grout injection in tunnel <p>ULRHEF Downstream Tunnel Portal</p> <ul style="list-style-type: none"> Drilling, blasting and tunnel stabilization <p>ULRHEF Penstock</p> <ul style="list-style-type: none"> No activity due to winter shutdown period. <p>ULRHEF Powerhouse</p> <ul style="list-style-type: none"> Superstructure construction Manifold installation <p>BDRHEF Intake Access Ramp and Diversion Tunnel</p> <ul style="list-style-type: none"> No activity due to winter shutdown period (April 30, 2016). <p>BDRHEF Downstream Tunnel Portal</p> <ul style="list-style-type: none"> Drilling, blasting and tunnel stabilization <p>BDRHEF Powerhouse</p> <ul style="list-style-type: none"> Component installation

Date	IEM Team Personnel	Weather Conditions	Key Monitoring Locations & Activities
			TX-Line <ul style="list-style-type: none"> • No activity
Friday, December 11	SE, DA, AS	Cloudy with sunny periods 1°C	Construction Camp, Laydown Areas and the Lillooet River FSR <ul style="list-style-type: none"> • Snow clearing and road maintenance on the Lillooet River FSR ULRHEF Intake & Upstream Tunnel <ul style="list-style-type: none"> • Grout injection in tunnel ULRHEF Downstream Tunnel Portal <ul style="list-style-type: none"> • Drilling, blasting and tunnel stabilization ULRHEF Penstock <ul style="list-style-type: none"> • No activity due to winter shutdown period. ULRHEF Powerhouse <ul style="list-style-type: none"> • Superstructure construction • Manifold installation BDRHEF Intake Access Ramp and Diversion Tunnel <ul style="list-style-type: none"> • No activity due to winter shutdown period (April 30, 2016). BDRHEF Downstream Tunnel Portal <ul style="list-style-type: none"> • Drilling, blasting and tunnel stabilization BDRHEF Powerhouse <ul style="list-style-type: none"> • Component installation TX-Line <ul style="list-style-type: none"> • No activity
Saturday, December 12	SE, AS	Snow 0°C	Construction Camp, Laydown Areas and the Lillooet River FSR <ul style="list-style-type: none"> • Snow clearing and road maintenance on the Lillooet River FSR ULRHEF Intake & Upstream Tunnel <ul style="list-style-type: none"> • Grout injection in tunnel ULRHEF Downstream Tunnel Portal <ul style="list-style-type: none"> • Drilling, blasting and tunnel stabilization ULRHEF Penstock <ul style="list-style-type: none"> • No activity due to winter shutdown period. ULRHEF Powerhouse <ul style="list-style-type: none"> • Superstructure construction • Manifold installation BDRHEF Intake Access Ramp and Diversion Tunnel <ul style="list-style-type: none"> • No activity due to winter shutdown period (April 30, 2016). BDRHEF Downstream Tunnel Portal <ul style="list-style-type: none"> • Drilling, blasting and tunnel stabilization BDRHEF Powerhouse <ul style="list-style-type: none"> • Component installation TX-Line <ul style="list-style-type: none"> • No activity

IEM Team Personnel: TH – Tom Hicks; SS – Stephen Sims; BA – Blake Aleksich; DA – Danita Abraham; SE – Stephanie Ellis; AS – Anne Sutherland

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.
December 6	<i>Email</i>	SES, INX CE	SES provided an update on the progress of grout injection works and water treatment activities at the ULRHEF intake.	-
December 8	<i>Pre-work meeting</i>	SES, CE, INX	A meeting was held to discuss snow removal works on the Lillooet River FSR during the winter season. Operational, safety and environmental concerns were discussed.	-
	<i>Email</i>	INX, SES, CE	INX informed CE that SES would be conducting weekly site visits during the Christmas break. INX provided a list of key items SES would be concentrating on during the Christmas break inspections.	-
December 9	<i>Email</i>	SES, INX, CE	INX provided CE with the criteria and environmental constraints for the KM 36 Sand Pit for winter road surfacing works.	-
December 10	<i>Site Inspection</i>	JEM, SES, INX	The IE completed the monthly site inspection of all open and active project areas.	-
December 11	<i>Email</i>	INX, SES, JEM	INX distributed CE's revised ULHP Procedures when using Explosives.	-

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 7 – 16	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.
		Riparian Vegetation Management Areas (RVMA)	IEM monitoring is required during clearing within RVMAs.
		Surface Water Quality	IEM monitoring is required during culvert installation activities in non-fish bearing waters to document adherence to the Surface Water Quality Protection Plan objectives.
		Suitable 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.

Component	Location	Wildlife/Archeology Concern	Construction/Timing Restrictions & Mitigations
Lillooet River FSR & ULRHEF	Access roads above the lower limit of the 200m buffer Truckwash Creek Migration Corridor to the ULRHEF intake	Mountain Goat UWR & Migration Corridor	<p>Noise monitoring equipment is in place to monitor background noise levels and exceedances of the 75dbA noise level maximum resulting from blasting activities. Adaptive drilling/blasting noise mitigation strategies will be developed and implemented should activities show persistent exceedances of the noise level threshold.</p> <p>Mountain Goat monitoring activities will occur daily throughout the winter and spring (November 1 – June 15) when construction activities are occurring at the ULRHEF lower tunnel portal and/or the ULRHEF intake.</p> <p>If a mountain 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>
BDRHEF intake	Portion of intake access road and crane pad within UWR	Mountain Goat UWR	<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>An Exemption to the General Wildlife Measures for UWR u-2-002 UL 12 permits the following works to occur at the BDRHEF intake works beyond November 15, 2015.</p> <ul style="list-style-type: none"> • Helicopter activity can occur up until December 15. • Blasting activity, including avalanche control, can occur up until December 15. • All other construction related activities can occur up until December 21. <p>If a mountain goat is observed within a 500 m line of site of a construction activity within UWR u-2-002 UL 12, construction activities will cease for at least 48 hours. Approval from the IEM must be obtained prior to recommencing construction activities.</p>

4.0 Upper Lillooet River HEF – Monitoring Results

4.1 Construction Camp, KM 38 Laydown, Access Roads & Lillooet River FSR

Activities:

- Routine maintenance of construction equipment within the mechanic shop and fuel management continued at the KM 38 laydown. All hazardous substance materials (waste oil, contaminated soil, used oil/hydraulic fluid containers, etc.) were stored temporarily for off-site disposal in a designated area at the laydown. The materials were all well contained and protected from the weather.

- The electric fences surrounding the construction camp were maintained and operational throughout this reporting period.
- Snow removal on the Lillooet River FSR and site access roads continued.

Environmental Summary:

- No environmental issues were observed or reported at the construction camp, KM 38 laydown area, access roads or the Lillooet River FSR.

4.2 Intake (North & South Sides), and Upstream Tunnel Portal

Construction Activities:

- Standpipe installation and grout injection at the ULRHEF upstream tunnel portal.
- Dewatering to ULRHEF intake sediment basins (Photo 1).

Environmental Summary:

- All turbid or alkaline water resulting from activities at the ULRHEF upstream tunnel portal is pumped to the ULRHEF intake sediment basins (Photo 1).
- During grout injection works in the tunnel all seepage water was directed to the ULRHEF intake sediment basins for treatment. Prior to works, CE's environmental management team activated the CO₂ injection components of the water treatment system and prepared the flocculant injection system to be used if necessary (Photo 2).
- On December 6, 7, 9 and 12, the IEM was at the ULRHEF intake to conduct water quality monitoring during grout injection in the upstream tunnel. During works, the IEM conducted sampling in the first cell of the basins (Photo 3), in the cells downstream of the treatment system (Photo 4) and at the outlet to the Lillooet River (compliance point). The water treatment was successful and water quality remained within Project guidelines (pH 6.5 – 9) during grouting works. Please see Section 4.6 Water Quality Results.

Photos:



Photo 1 – Seepage water pumped to ULRHEF intake sediment basins during grout injection (December 9, 2015).



Photo 2 – Active water treatment system with CO₂ tanks at ULRHEF intake sediment basins (December 9, 2015).



Photo 3 – The IEM conducting sampling for pH in the first sediment basin pond during grout injection works (December 9, 2015).



Photo 4 – Water sampling location at outlet of pond #7 (December 9, 2015)

4.3 *Downstream Tunnel Portal*

Construction Activities:

- Drilling, blasting, mucking and stabilization works within the tunnel.

Environmental Summary:

- All tunnel seepage water was pumped to the downstream tunnel portal infiltration ponds.

4.4 *Penstock*

Construction Activities:

- No activity due to winter shutdown period.

Environmental Summary:

- No environmental issues were observed or reported at the ULRHEF penstock during this reporting period.

4.5 *Powerhouse & Access Road*

Construction Activities:

- Superstructure construction (Photo 5 and Photo 6).
- Dewatering to the Lillooet River.

Environmental Summary:

- No environmental issues were observed or reported at the ULRHEF powerhouse during this reporting period.



Photo 5 – Current conditions at the ULRHEF powerhouse (November 26, 2015).



Photo 6 – Current conditions at the ULRHEF powerhouse (November 27, 2015).

4.6 Water Quality Results

The following table presents the results of the routine WQ 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 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* WQ (turbidity and/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)
Routine Water Quality						
December 12, 2015	14:04	ULR Background – ULRHEF Intake	7.6	10.8	129	0.9
	16:10	ULR #0.5 – Downstream of ULRHEF intake at Keyhole Bridge	7.7	8.7	128	0.9
	14:45	ULR # 1 – Upstream of ULRHEF Powerhouse	7.7	8.9	130	2.2
	15:13	ULR #2 – Downstream of ULRHEF Powerhouse between KM 40.5 and KM 41	7.7	7.2	129	2.3
	15:35	ULR #3 – Lillooet River FSR KM 38 Laydown – D/S of Boulder confluence	7.8	4.5	124	1.3
	10:50	ULR #4 – Lillooet River FSR KM 24 – D/S of all works and Meager confluence	6.9	0.5	63	4.4
ULRHEF Intake sediment basins following grout injection at upstream tunnel						
December 6,	13:20	Pond 1 (prior to CO2 treatment)	9.44	-	-	-

Date	Time	Sample Location Description	pH	Turbidity (NTU)	Cond (µS)	Temp (°C)
2015	13:21	Pond 7 (downstream of CO2 treatment)	7.22	-	-	-
	15:00	Pond 1 (prior to CO2 treatment)	9.0	-	-	-
	15:01	Pond 7 (downstream of CO2 treatment)	7.4	-	-	-
	17:05	Pond 1 (prior to CO2 treatment)	8.79	-	-	-
	17:06	Pond 7 (downstream of CO2 treatment)	7.5	-	-	-
December 7, 2015	8:30	Pond 1 (prior to CO2 treatment)	8.4	-	-	-
	8:31	Pond 7 (downstream of CO2 treatment)	7.7	-	-	-
December 9, 2015	14:35	Pond 1 (prior to CO2 treatment)	11.5	62.0	-	-
	14:39	Pond 5 (downstream of CO2 treatment)	9.1	12.0	-	-
	14:44	Pond 7 (downstream of CO2 treatment)	6.9	11.8	-	-
	15:05	Sediment basin discharge to Lillooet River	6.9	2.47	-	-
December 12, 2015	13:00	Sediment basin discharge to Lillooet River	7.1	-	-	-
	16:20	Pond 7 (downstream of CO2 treatment)	7.5	-	-	-

4.7 Recommendations

IEM recommendations for the ULRHEF are as follows:

- All seepage water in the intake excavation and portal should be conveyed to the sediment basins unless approved for discharge directly to the Lillooet River by the IEM or CE environmental manager.
- The ULRHEF powerhouse sump water should be monitored regularly. Alkaline or turbid water should be pumped to the settling ponds for treatment.

4.8 Upcoming Works

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

- Grout injection will continue at the ULRHEF upstream tunnel portal.
- Dewatering to the ULRHEF intake sediment basins will continue.
- Superstructure construction will continue at the ULRHEF powerhouse.

5.0 Boulder Creek Hydroelectric Facility – Monitoring Results

5.1 Intake & Diversion Tunnel

Construction Activities:

- No activity due to winter shutdown period.

Environmental Summary:

- No environmental issues were observed or reported at the BDRHEF intake during this reporting period.

5.2 Downstream Tunnel Portal and Powerhouse

Construction Activities:

- Drilling, blasting and tunnel stabilization in the downstream tunnel portal.
- BDRHEF powerhouse component installation. Delivery of the BDRHEF generators occurred during this reporting period (Photo 7).
- Dewatering of the tunnel and powerhouse to the oil water separator and settling ponds continued (Photo 8).

Environmental Summary:

- All wastewater related to the BDRHEF tunnelling works continued to be contained and conveyed to the downstream portal settling ponds (Photo 8). All process and seepage water infiltrated to ground within the project area throughout the reporting period.

Photos:



Photo 7 – Delivery of a generator to BDRHEF powerhouse (December 9, 2015).



Photo 8 – BDRHEF downstream portal settling ponds (December 9, 2015).

5.3 Water Quality Results

The following table presents the results of the routine WQ 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* WQ (turbidity and/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)
Routine Water Quality						
December 12, 2015	-	BDR BG – Upstream of BDRHEF intake *not accessible*	-	-	-	-
	-	BDR #1 – Downstream of BDRHEF intake *not accessible*	-	-	-	-
	15:50	BDR #2 – Upstream of BDRHEF Powerhouse	8.0	1.1	97	1.0
	13:05	BDR #3 – Downstream of BDRHEF Powerhouse at Pebble Creek Bridge	7.7	0.7	114	2.7

5.4 Recommendations

IEM recommendations for the BDRHEF are as follows:

- All wastewater related to the BDRHEF tunnelling works should continue to be contained and conveyed to the downstream portal settling ponds for treatment. Regular inspections of the treatment ponds should be performed to ensure the necessary maintenance activities outlined in the work plan are performed.

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 downstream portal tunnelling works will continue.
- Superstructure component installation will continue at the BDRHEF powerhouse.

6.0 Transmission Line – Monitoring Results

6.1 Transmission Line Construction Activities

Right-of-Way Clearing:

- No activity.

Existing Road Upgrades and Access Road Construction

- No activity.

Transmission Line Pole Installation, Line Stringing and Clipping

- Groundworks for pole foundations in Segment 16.

Environmental Summary:

- No environmental issues were observed or reported during work in Segment 16.

6.2 Water Quality Results

Date	Time	Sample Location Description	pH	Turbidity (NTU)	Cond (uS)	Temp (°C)
No construction activities involving water management were conducted during this reporting period.						

6.3 Recommendations

- The IEM has no recommendations at this time.

6.4 Upcoming Works

- No scheduled activities.

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 related to mountain goats were implemented during this monitoring period:

- Access to the BDRHEF intake is gated and will now be locked fulltime to restrict motorized use within the UWR until April 30, 2016.
- Noise level monitoring data continued to be collected and used to adaptively manage construction noise and ensure that the 75db noise level threshold is not exceeded as outlined in the Mountain Goat Management Plan.
- 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 four 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); and,
 - Salal Creek monitoring site viewing u-2-002 UL 8 – MG-OBS04 (10U 466133 5613991).

Monitoring effort was split between all sites during daylight hours, unless safety concerns or weather conditions interfered. The order of site visits rotated daily. Construction activities must 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.

9.0 Environmental Issues Tracking Matrix (ITM)

9.1 Hydroelectric Facilities (ULRHEF & BDRHEF)

ITM Tracking Legend:		<i>Work Item Open</i>					
		<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 – BDR#28 & ULR#41)</i>							

9.2 Transmission Line

ITM Tracking Legend:		<i>Work Item Open</i>					
		<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>							