Upper Lillooet Hydro Project

Weekly Environmental Monitoring Report #105

Reporting Period: October 9 – 22, 2016

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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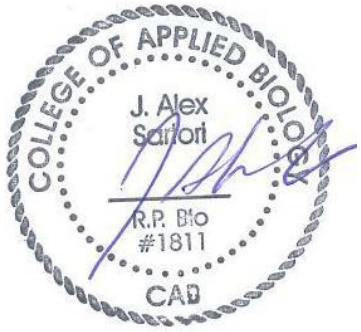
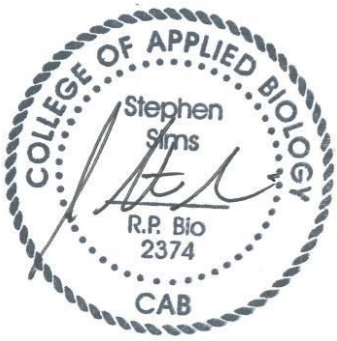
Brian Naito	Fisheries and Oceans Canada	 **J. Alex Sartori, RPBio** *Independent Environmental Monitor (IEM)*  **J. Stephen Sims, RPBio** *Delegate IEM*
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Owner Construction Permits and Approvals

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 & 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)
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. 349424 (Renewal 2)
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
Water Sustainability Act Section 10(1) Use Approval dated March 24, 2016
Section 7 Explosives Act – Magazine Licence (U76018) Renewal April 30, 2016

ACRONYMS:

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

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
October 9 – 15, 2016	SE, MC, DA	***Construction Camp, Laydown Areas and the Lillooet River FSR*** • Road maintenance on the Lillooet River FSR • Ditch maintenance for KM43.5 – KM 47 of the Lillooet River FSR • Demobilization of camp trailers from Pad 2 • Spoil pile reclamation at KM42.5 • Planting of KM36 spoil pile ***ULRHEF Intake & Upstream Tunnel Portal*** • Buried conduit installation & pulling cable through conduit • Intake sediment cleaning (between the stop logs and course and fine trash racks). • BEBO tunnel rebar, formwork and concrete works • BEBO tunnel installation and grouting • BEBO tunnel slab excavation and anchor drilling • Excavation of slope above right bank of diversion channel at KM49.5 ***ULRHEF Downstream Tunnel Portal*** • Plug – installing concrete delivery pipes • Tunnel plug rebar, formwork and concrete works ***ULRHEF Penstock*** • Reclamation and landscape restoration work and top soil placement on the creek side. • Widening of Truckwash creek (upstream right bank, all works conducted in the dry) • Pipe installation and backfill • Welding and coating works ***ULRHEF Powerhouse*** • Andritz mechanical and electrical works • ULR powerhouse water well drilling ***BDRHEF Intake & Upstream Tunnel Portal*** • Concrete pour to plug 600mm drainage pipe in intake wall (to prevent sediment laden water from entering Boulder Creek). • Concrete pours for diversion tunnel plug wall. • Ditching and road grading from KM3.5 - 4.5 on Boulder intake access road. • Rock consolidation and retaining wall rebar and formwork • Buried conduit installation from KM3 - 4.5 on Boulder intake access road. • Removal of upstream cofferdam (river right) and removal of both bridges. • Coanda walkway installation ***BDRHEF Downstream Tunnel Portal*** • Mesh and invert cleaning • Final lining and rock support (including shotcrete) ***BDRHEF Powerhouse*** • Westpark switchyard works • Bifurcation and manifold installation • Andritz mechanical and electrical works • BDR powerhouse water well setup ***TX-Line*** Segment 2 • Vegetation clearing to address clearing deficiencies Segment 4 • Brush clearing around structures and addressing clearing deficiencies

		Segment 5 – 8 • Pulling fiber optic cable and clearing brush around structures where required Segment 11 • Ground preparation by hand Segment 12 • Clipping structures • Ground preparation by hand Segment 13 • Ground preparation by hand • Straightening and backfilling and framing structures • Pulling conductor • Brush piling and ditching Segment 14 • Backfill, straightening, and framing pole structures Segment 16 • Ground preparation by hand • Decking timber from recently cleared areas
October 16 – 22, 2016	SE, TH, SS	***Construction Camp, Laydown Areas and the Lillooet River FSR*** • Road maintenance on the Lillooet River FSR • Planting of KM45 spoil pile • Removal of trailers from Pad 2 • Water well drilling on pad 2 for operator residence ***ULRHEF Intake & Upstream Tunnel Portal*** • Pulling cable through conduit • KM49 laydown; Cascade Environmental – testing soil for contamination • BEBO tunnel rebar, formwork and concrete works • Excavation of slope at KM49.5 • Reclamation of road at KM49.5 (river right) ***ULRHEF Downstream Tunnel Portal*** • Stormtec surge tank overflowing (Oct. 16th) • Tunnel plug rebar, formwork and concrete works • Placement and backfill of flushing pipe • KM44.7 laydown; Cascade Environmental – testing soil for contamination • Reclamation and landscape restoration of the Truckwash Creek Mountain Goat corridor (Nightshift) ***ULRHEF Penstock*** • Reclamation and landscape restoration of Truckwash Creek Mountain Goat corridor and top soil placement on the creek side. • Widening of Truckwash creek (upstream right bank, all works conducted in the dry) • Pipe installation and backfill • Welding and coating works ***ULRHEF Powerhouse*** • Andritz mechanical and electrical works • Superstructure deficiency corrections • Switchyard concrete works ***BDRHEF Intake & Upstream Tunnel Portal*** • Retaining wall rebar, formwork and concrete works • Bury conduit and ditching from KM3.5 - 4.5 on Boulder intake access road (nightshift). • Rock hammering and excavation of road for conduit and pull box installation ***BDRHEF Downstream Tunnel Portal*** • Cleaning out of BDR Powerhouse oil/water separator • Final lining and rock support (including shotcrete)

		BDRHEF Powerhouse • Westpark switchyard works • Bifurcation and manifold installation • Andritz mechanical and electrical works • Water well setup (Finished Oct. 18th) ***TX-Line*** Segment 1 & 2 • Falling hazard trees from the Boulder Creek wildfire Segments 5, 6, 7, & 8 • Pulling fiber optic cable • Falling hazard trees and slashing re-sprouting vegetation where required Segment 11 • Ground preparation by hand Segment 13 • Straightening/backfill pole structures Segment 14 • Stringing conductor Segment 15 • Tensioning and clipping • Hanging travelers • Stringing conductors • Addressing clearing deficiencies Segment 16 • Stringing conductors

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

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.
October 9	*Email*	CE, SES, INX	RE: Notification of high pH water discharged to Lillooet River – CE's environmental staff provided official notification of the discharge of high pH water to the Lillooet River on October 8. CE also informed the IEM and INX that all foremen were given additional training on proper pumping procedures. Specifically, that CE environmental staff or onsite IEM approval was needed prior to discharging water off site.	-
	Email	CE, SES, INX	CE informed the IEM that the 600 mm drain pipe, in the BDRHEF intake structure, would be filled with concrete to prevent road runoff from entering the Coanda spill way.	-
October 10	*Email*	CE, SES, INX	RE: Boulder Cofferdam Removal – Diversion tunnel side – CE requested to begin removing cofferdam on the left bank upstream of the BDRHEF intake on October 11. CE acknowledged that they were requesting instream works without 48-hour notification, but forecast weather required an expedited schedule. The IEM was available to monitor the works and therefore instream works proceeded.	-

Date	Communication Type	Participants	Issues Discussed	ITM ID No.
October 12	*Email*	SES, CE	RE: ULRHEF Truckwash Creek Mountain Goat corridor – The IEM requested clarification on the planting design and construction staging of the Mountain Goat corridor along the right bank of Truckwash Creek. CE informed the IEM that there was no change to the BPR/Ecofish design, but that the berm would be constructed in two phases to facilitate the installation of the ULRHEF penstock, and to ensure that planting requirements were met. Additionally, CE confirmed that all planting operations were carried out under the supervision of their QP.	-
	Email	SES, CE, INX	The IEM provided CE and INX with the updated environmental issue tracking matrix.	-
	Pre-work meeting	SES, CE, INX	A pre-work meeting was held for the drilling of the ULRHEF powerhouse water well. All attending reviewed the work plan and discussed safety, environmental, and construction concerns.	-
October 13	*Email*	SES, CE, INX	RE: Water with elevated pH discharged from BDRHEF powerhouse – The IEM informed CE's environmental team that they observed elevated pH water discharging into the BDRHEF tailrace. The source was concrete curing water pumped into the powerhouse drainage system from the bifurcation slab. Once notified, crews moved the discharge to the BDRHEF setting ponds. CE assured the IEM that additional training was given to the foremen about proper pumping procedures. Specifically, that no water was to be discharged offsite without prior approval from CE environmental staff or the on-site IEM.	-
October 14	*Email*	SES, CE, INX	RE: Over-range turbidity water discharged to surface water as a result of inadequate ESC – The IEM informed CE of two areas where ESC measures were in non-compliance during a site tour on October 13. 1) KM49 bridge – The IEM observed road runoff discharging into the Lillooet River. Two pumps were in place to prevent sediment laden water from entering the river, but neither were turned on, leading to non-compliance with project ESC requirements. 2) ULRHEF lower portal – The IEM observed sediment laden road runoff entering Truckwash creek next to the oil-water separator. CE had not repaired the ditching and the road grade between the lunch trailers and the small laydown, which resulted in the discharge of sediment laden water to Truckwash Creek and non-compliance with project ESC requirements. The IEM had advised CE to complete the necessary repair works in these two areas for the past two months (documented in bi-weekly coordination meeting and FAM #13). However, CE has failed to respond or implement the necessary mitigation measures to prevent the reoccurrence of these ESC	*FAM # 13*

Date	Communication Type	Participants	Issues Discussed	ITM ID No.
			issues. The IEM requested that CE submit a temporary ESC plan for these two areas to address these concerns immediately. Additionally, the IEM reminded CE that it is their responsibility to adhere to the project CEMP and EPPs regarding sediment and erosion control. CE informed the IEM that they had begun implementing a combination of temporary and permanent measures to eliminate road runoff into both the Lillooet River and Truckwash Creek, and that they were working vigilantly on all ESC measures outlined in FAM#13. Specifically: 1) KM49 – CE cleaned out the sump at the bottom of the ditch line to improve infiltration, thereby reducing the probability that sediment laden water would flow into the Lillooet River. Additionally, CE has turned on the 2-inch pump and will monitor it to ensure turbid water is not pooling on the bridge deck or in the road side ditch. 2) ULRHEF lower portal – CE installed a pump in the sump at the bottom of the ditch to convey water into the oil-water separator, where it was treated by the lower portal active water treatment system. Additionally, CE will cleanout the sump to improve infiltration and its function.	
October 16-18	*Email*	CE, SES, INX	CE informed the IEM and INX that a large spill of diesel (estimated to be 300L) occurred on October 16 at KM48.5. Due to the size of the spill and heavy rain fall, the diesel migrated down the access road toward the Keyhole bridge. Crews deployed spill pads and booms to intercept the fuel before it reached the bridge. CE used a vacuum truck to remove contaminated water and soil. The contents of the truck were emptied into the oil-water separator at the KM38 laydown temporally, before it could be removed to a proper off-site disposal facility. No fuel left site or entered the Lillooet River. On October 17, CE provided the details of their internal investigation to the IEM and INX. The root cause of the incident was that the operator began filling the generator at KM48.5 and left the pump running unattended. The operator indicated that the generator was just under half full when he began filling it, and stated that it usually took about 30 minutes to fill half of the tank. Unfortunately, it is not possible to be precise as to the exact amount of fuel that spilled, but it is approximated to be 300-500L. The capacity of the pump use is 95L/minute, and the operator believed that it was pumping for approximately 30-minutes. CE estimates that the overflow did not occur for longer than 5 minutes.	*EIR # 31*

Date	Communication Type	Participants	Issues Discussed	ITM ID No.
			CE retained Cascade Environmental to conduct confirmatory soil sampling for areas impacted by the spill. CE will provide the result of these samples to the IEM and INX once complete.	
October 17 & 18	*Field verification, email*	SES, WEL, INX	On October 17, the IEM and WEL's Environmental Manager conducted an aerial survey of grizzly bear habitat polygon GB59 (Segment 15) in advance of stringing conductor. The IEM determined that the potential for displacing grizzly bears from GB59 as a result of the conductor stringing by helicopter was low, and authorized the work to proceed. The conductor stringing was completed on October 18 and no grizzly bears were observed during works. See Section 6.1 for further details.	-
October 18	*Email*	SES, CE, INX	RE: Obermeyer and Stormtec Water Management Issues – The IEM notified CE's environmental team of two non-compliances observed on October 18: 1) High pH water was observed migrating off-site through the Obermeyer diversion channel. The IEM requested that CE install pumps to capture the high pH water and convey it to the active water treatment system. 2) Failure of a pump in the surge tank of the lower-portal active water treatment system on October 15 and 16, caused the surge tank to overflow. The discharged water was mostly clean and was contained within the road side ditch. The water flowed downslope into vegetation before reaching ASTR-04.	-
October 21	*Email*	SES, CE, INX	RE: Site reclamation and IE inspection summary – The IEM provided CE and INX with their findings on the site wide reclamation tour and IE inspection: 1) Reclamation was underway and in general the intentions presented by CE were in line with the current version of the master reclamation work plan. The two areas of concern were: erosion along the old diversion channel/obermeyer access road on the river right of the ULRHEF intake; and that the cut through the pre-existing slope, to create the access road, needed to be filled in to mimic natural contours. CE had already begun to implement corrective measures to prevent further erosion. 2) Road drainage along the BDRHEF intake access road was identified as an area of concern. CE had begun working on regrading and ditching the road to improve drainage. 3) The active water treatment system continued to treat road run-off entering the BDRHEF intake works area. However, it was to be removed shortly. The IEM informed CE that all final drainage structures, road capping, etc. on the BDR intake access road needed to be installed prior to the removal of the active water treatment system, and that all road run-off leaving site needed to meet BCWQGs.	-

Date	Communication Type	Participants	Issues Discussed	ITM ID No.
	Email	SES, CE, INX	RE: Notification of elevated pH discharging from Boulder Intake Water Treatment System – On October 21, the IEM recorded water with pH of 10.96 being discharged from the BDRHEF active water treatment system. The IEM notified CE's environmental team that the discharge of the system was not within allowable BCWQG. The active water treatment system was out of CO_2, causing the elevated pH. The IEM reminded CE that it was their responsibility to ensure that all water leaving site was meeting BCWQGs.	-
October 22	*Email*	CE, SES, INX	RE: Dangerous tree assessment – CE informed the IEM and INX that their QP will be on site to assess danger trees near access roads, the construction camp, and work areas. Prior to the removing any tree deemed unsafe CE would ensure that they were within their OLTC and outside of sensitive wildlife areas.	-

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
All Project Areas	ULRHEF intake & tailrace, BDRHEF tailrace, and fish accessible tributaries of the Lillooet River	Reduced Risk Project Specific Instream work windows for the protection of Bull Trout, Cutthroat Trout and Pacific Salmon (Coho, Sockeye), during sensitive life stages	All instream work will be conducted within Project specific timing windows. They are as follows: ULRHEF intake: August 1 – October 31 ULRHEF and BDRHEF powerhouses: July 15 – September 15
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, as well as a portion of BDRHEF intake access road and intake structure within UWR u-2-002 UL 12	Mountain Goat UWRs & Migration Corridor	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.
TX Line	All Segments	Mountain Goat UWRs SO-04 & SO-08	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.

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. Clearing and construction should avoid the fall and spring season to avoid displacing bears at ULH-GB26 near WHA 2-399, ULH-GB33 near the northwest side of the Camel's Back, at ULH-GB53 south of South Miller Creek; and at ULH-GB59 north of Rutherford Creek
		Ryan River Drainage	Construction of the TX Line into and across the Ryan River drainage will occur during the less critical Grizzly Bear summer foraging period (June 1 – September 1).
		Riparian Vegetation Management Areas (RVMA)	IEM monitoring is required during clearing within RVMAs.
		Within 500 m of South Creek & Rohb Creek	Construction of the transmission line within 500 m of South Creek & Rohb Creek, must be conducted outside the salmon migration period (October 15 – December 31).
		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 and maintenance of construction equipment within the mechanic shop at the KM38 laydown. 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. These materials were all well contained and protected from the weather.

Environmental Summary:

- On October 13, the IEM identified sediment laden road run-off discharging to the Lillooet River at the KM49 bridge (Photo 1). CE had previously installed two 2-inch pumps to temporally divert sediment laden road run-off into nearby vegetation, but neither were turned on at the time of the inspection (Photo 2). The IEM reported this issue to CE's environmental staff, reminding them that it was their responsibility to manage road run-off and to implement temporary measures that prevent erosion, control sediment, and protect surface water quality as outlined in the project CEMP and EPPs. Additionally, the IEM had been advising CE to address ESC measures at this site for two months during site

visits, the bi-weekly environmental coordination meeting, and in FAM # 13. However, CE failed to implement the necessary ESC mitigation measures to prevent the issue from reoccurring. Once notified, CE crews turned on the two 2-inch pump and temporally discharged sediment laden road run-off to vegetation. On October 15, crews began cleaning out the road side ditch and infiltration ponds from KM48.5 to the KM49 bridge (Photo 3). CE also committed to ensuring that all sediment and erosion control measures would be maintained to prevent a reoccurrence of this issue.

- On October 16, a large spill occurred when a mechanic left a fuel pump running unattended while fueling a generator at KM48.5 of the Lillooet River FSR (Photo 4). The generator overflowed for approximately 5-minutes, spilling an estimated 300 – 500L of diesel to the road surface. Due to the volume of the spill, and heavy rainfall the fuel migrated down the FSR towards the KM49 bridge. Once identified, crews quickly deployed spill pads and booms to intercept the fuel before it reached the bridge. A vacuum truck was used to remove all contaminated water and soil (Photo 5). All contaminated soil was deposited and stored at the mechanic shop at KM38 prior to offsite disposal at an accredited facility. No fuel migrated offsite or entered the Lillooet River. On October 19, CE retained Cascade Environmental to collect soil samples from the site of the large spill to ensure that crews had removed all contaminated materials. Due to the size of the spill (>100L) the Provincial Environmental Emergency Program was notified of the spill.
- On October 18, Field Drilling Contractors Ltd. began drilling for the permanent water well on Pad 2 for the ULHP operators' residence (Photo 6). The IEM monitored drilling activities and did not observe any environmental issues.

Photos:

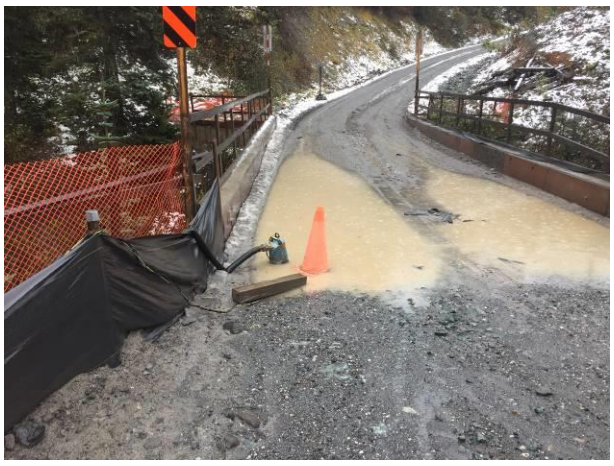

Photo 1 – Non-functioning pump installed on KM49 Bridge (October 13, 2016).

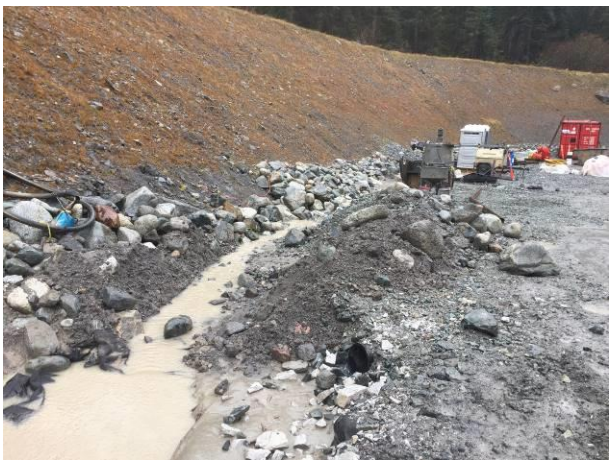

Photo 2 – Sediment laden water flowing towards KM49 bridge and pump sitting idle on slope (October 13, 2016).

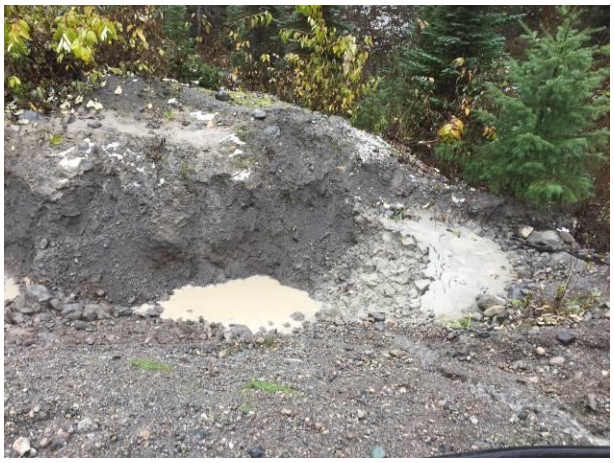

Photo 3 – Infiltration pond re-excavated on river left of KM49 bridge (October 15, 2016).

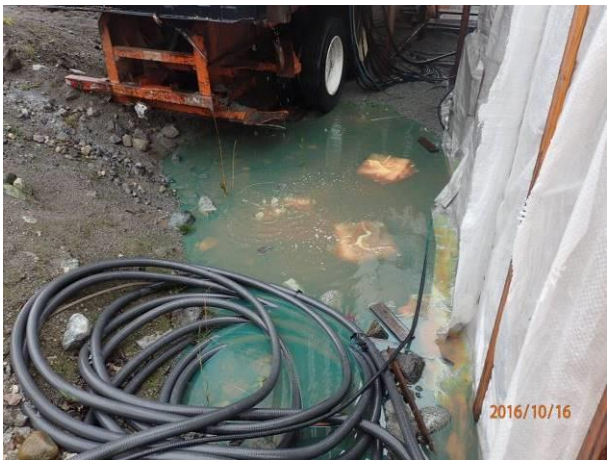

Photo 4 – Diesel spill from overfilling the generator at KM48.5 (October 16, 2016).

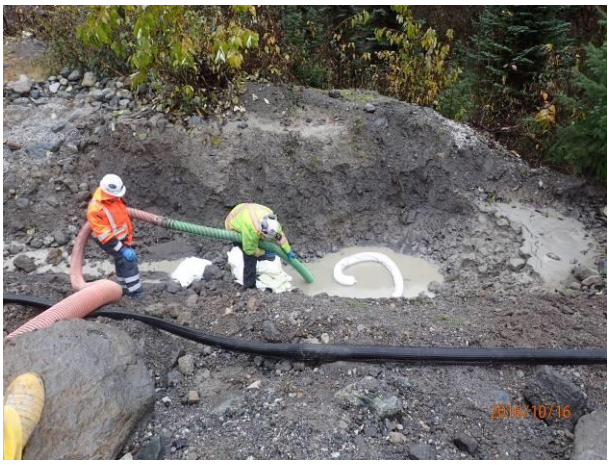

Photo 5 – Vacuum truck removing water and soil contaminated from diesel spill at KM48.5 (October 16, 2016).

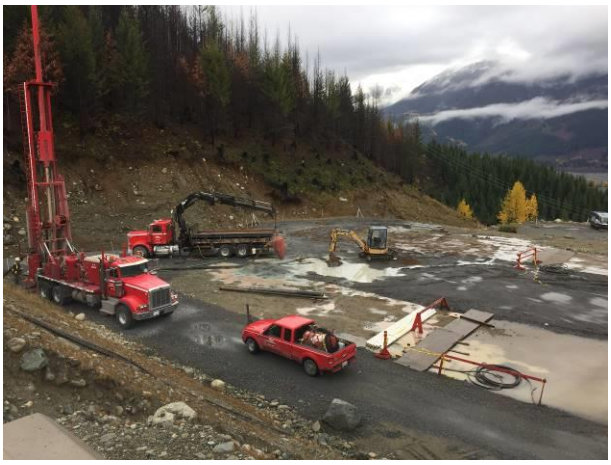

Photo 6 – Drilling for the permeant well on pad 2 of the construction camp (October 18, 2016).

4.2 *Intake, Concrete Arch Foundation Walls, and Upstream Tunnel*

Construction Activities:

- Buried conduit installation from the Lillooet River FSR at KM48 to the ULRHEF intake control room building.
- BEBO tunnel formwork, rebar, concrete for the connection to the ULRHEF intake, and arch installation (Photo 7).
- Grouting tunnel plug standpipes.
- Excavation and re-contouring of the slopes above the right bank of the diversion channel at KM49.5 (Photo 8).
- Obermeyer repairs.

Environmental Summary:

- CE directed all seepage water to the ULRHEF intake sediment basins for treatment during all concrete works associated with the final tunnel lining and BEBO tunnel works (Photo 9). CE's environmental management team ensured that the active water treatment system was functioning and well maintained. Additional water quality sampling results are available upon request.
- On October 18, the IEM documented high pH water discharging to the Lillooet River through the Obermeyer diversion channel. CE installed pumps to capture the high pH water and pump it to the active water treatment system. The IEM stressed to CE that all concrete curing/waste water must be pumped to the active water treatment system or treated with CO_2 on site before allowing treated water to discharge to the Lillooet River.
- CE continued to excavate and re-contour the slope on the right bank of the ULRHEF intake structure and to reclaim the old Obermeyer access road. On October 21, the IEM and IE observed erosion along a portion of the reclaimed old Obermeyer access road (Photo 10). CE had already begun implementing corrective measures to prevent further erosion to the slope at the time the issue was identified.

Photos:

Photo 7 – BEBO tunnel formwork, rebar, concrete works, and arch installation (October 18, 2016).

Photo 8 – Recontouring and reclamation of the slope on the right bank of the Lillooet River at the ULRHEF intake (October 22, 2016).

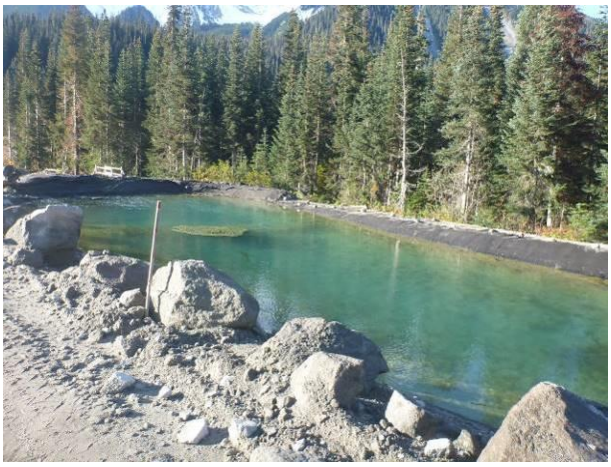

Photo 9 – ULRHEF upper tunnel water treatment system, pond No. 7 (October 10, 2016).

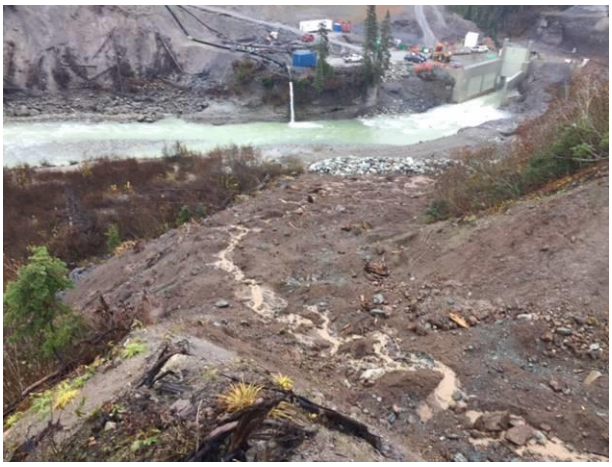

Photo 10 – Erosion on the old Obermeyer diversion channel access road (October 20, 2016).

4.3 *Downstream Tunnel Portal*

Construction Activities:

- Formwork, rebar, and concrete works for the ULRHEF lower-tunnel portal plug (Photo 11).
- Cascade Environmental collected soil samples at the KM44.7 laydown to confirm all remediation works had been completed (Photo 12).

Environmental Summary:

- On October 13, the IEM observed sediment laden road run-off entering Truckwash Creek from the access road to the lower tunnel portal. The IEM had been advising CE to implement ESC mitigation measures on the lower portal access road for two months, outlining the expected mitigation measures during site visits, the bi-weekly environmental coordination meeting, and in FAM # 13. On October 16, CE began repairing the ditch line, excavated an infiltration pond in the small laydown area, and installed a pump to convey water into the oil-water separator during heavy rainfall events (Photo 13).
- On October 18 and 19, the IEM observed the surge tank, on the lower tunnel portal active water treatment system, overflowing due to a pump failure. Water flowing out of the tank was clean and was contained in the access road ditch line. The water flowed along the penstock and into vegetation before reaching ASTR-04 (Photo 14). Stormtec technicians repaired the pump on October 19 and the IEM did not observe any additional environmental issues at this site during the monitoring period. Additional water quality sampling results are available upon request.

Photos:

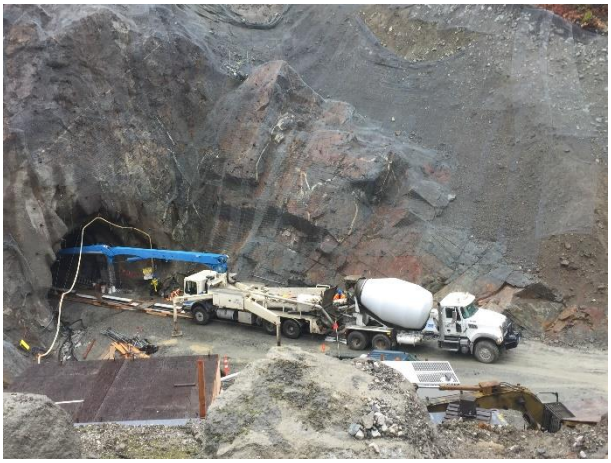

Photo 11 - Concrete pour for the lower-tunnel plug (October 18, 2016).

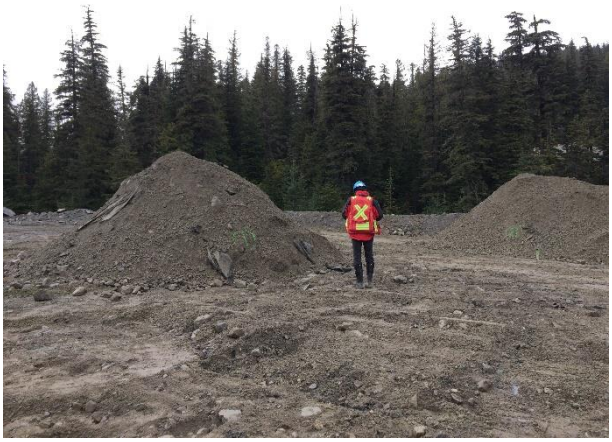

Photo 12 - Cascade Environmental conducting soil sampling at the KM45.5 mechanic laydown area (October 19, 2016).

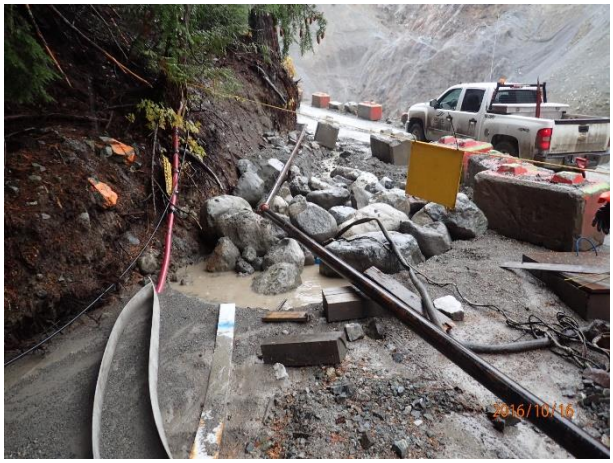

Photo 13 - Newly excavated infiltration pond and 2-inch pump at the small lower-tunnel portal lay down area (October 16, 2016).

Photo 14 - Overflow, from the lower portal active water treatment system, entering vegetation before ASTR-04 (October 18, 2016).

4.4 *Penstock and Truckwash Creek Penstock Crossing*

Construction Activities:

- Widening of Truckwash Creek on right bank of the upstream end of the diversion channel (Photo 15), all works were conducted above the HWM.
- Reclamation and landscape restoration of the Mountain goat corridor on the right bank of Truckwash Creek (Photo 16).

Environmental Summary:

- On October 9, CE widened the right bank of Truckwash Creek penstock over-drain to design specifications (Photo 16). Crews completed all excavation in the dry, above the HWM. The IEM monitored all construction activities and did not observe any environmental issues.

Photos:

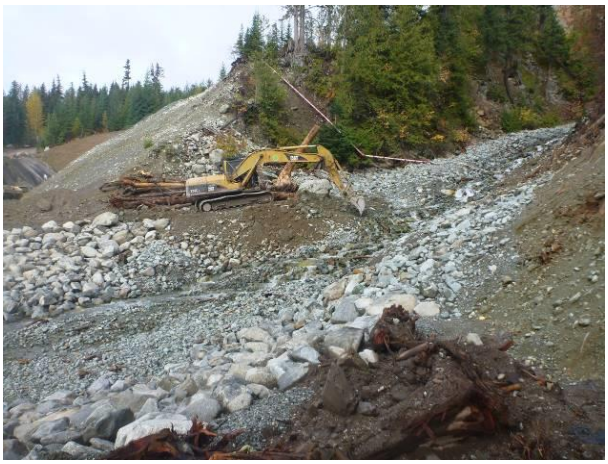

Photo 15 – Widening and armouring of the right bank of the Truckwash Creek over-drain (October 9, 2016).

Photo 16 – Reclamation and landscape restoration of the mountain goat corridor (October 10, 2016).

4.5 *Powerhouse, Tailrace & Access Road*

Construction Activities:

- Andritz mechanical and electrical works continue at the ULRHEF powerhouse (Photo 17).
- Excavation for the cable tray footings and grounding installation continue.
- Top soil placement and riparian planting occurred on north and south sides of the ULRHEF tailrace (Photo 18).

Environmental Summary:

- The IEM monitored construction activities throughout the monitoring period and observed no environmental issues.

Photos:

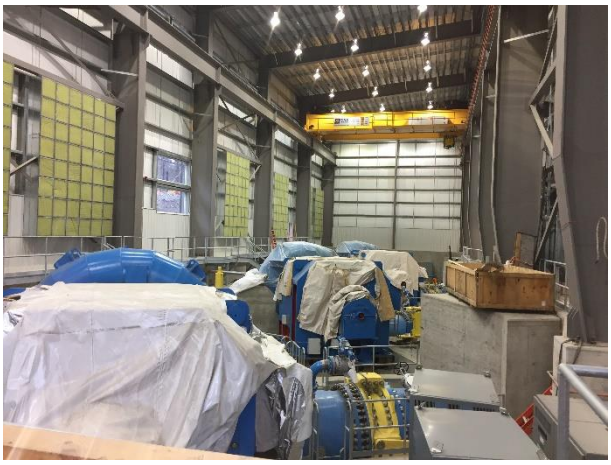

Photo 17 – Andritz mechanical and electrical works in the ULRHEF powerhouse (October 21, 2016).

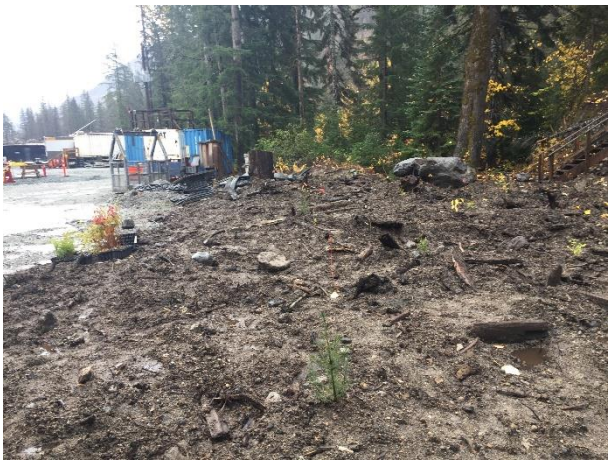

Photo 18 – Riparian planting on the South side of the ULRHEF tailrace (October 22, 2016).

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 IEM selected the regular monitoring to quantify WQ conditions within the Lillooet River upstream and downstream of active construction areas. The IEM acknowledges the natural variability of instream WQ conditions in the Lillooet River due to seasonal fluctuations in snowmelt. In the event of an exceedance of in-situ WQ (turbidity and/or pH) because of 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, an asterisk (*) will be used to denote it.

Date	Time	Sample Location Description	pH	Turbidity (NTU)	Cond (µS)	Temp (°C)
Routine Water Quality						
October 14, 2016	16:54	ULR Background – ULRHEF Intake	7.1	48.2	109	3.7
	17:09	ULR #0.5 – Downstream of ULRHEF intake at Keyhole Bridge	7.0	60.8*	114	3.6
	15:50	ULR # 1 – Upstream of ULRHEF Powerhouse	6.8	20.8	114	4.2
	15:37	ULR #2 – Downstream of ULRHEF Powerhouse between KM40.5 and KM41	6.7	17.4	114	4.3
	14:50	ULR #3 – Lillooet River FSR KM38 Laydown – D/S of Boulder confluence	7.5	22.0	111	4.6
	8:47	ULR #4 – Lillooet River FSR KM24 – D/S of all works and Meager confluence	7.2	39.9	109	4.3
October 21, 2016	11:30	ULR Background – ULRHEF Intake	7.9	9.4	107	3.4
	11:35	ULR #0.5 – Downstream of ULRHEF intake at Keyhole Bridge	7.6	14.0	117	3.6
	14:00	ULR # 1 – Upstream of ULRHEF Powerhouse	7.0	12.0	115	4.0

Date	Time	Sample Location Description	pH	Turbidity (NTU)	Cond (µS)	Temp (°C)
	14:15	ULR #2 – Downstream of ULRHEF Powerhouse between KM40.5 and KM41	6.9	12.4	115	4.1
	13:09	ULR #3 – Lillooet River FSR KM38 Laydown – D/S of Boulder confluence	7.6	11.4	112	4.3
	15:30	ULR #4 – Lillooet River FSR KM24 – D/S of all works and Meager confluence	7.2	12.3	125	5.1

4.7 *Recommendations*

IEM recommendations for the ULRHEF are as follows:

- CE should continue to convey all water from the ULRHEF upstream tunnel heading to the sediment basins for treatment. CE should perform regular monitoring to ensure that the water treatment system is functioning as intended and that discharge to the Lillooet River continues to meet BCWQGs.
- CE should continue to remind crews of proper food and wildlife attractant management, as per the Human – Bear and Human – Wildlife Interaction Management Plans.
- CE should continue to implement temporary and permanent sediment and erosion control issues along the access road leading to the ULRHEF intake and the lower-tunnel portal as outlined in the bi-weekly environmental coordination meeting and FAM # 13.
- CE should continue to remind crews of proper pumping procedures as outlined in the project CEMP and EPPs, to ensure that sediment laden and high pH water is not discharged off site prior to treatment.

4.8 *Upcoming Works*

New and/or environmentally sensitive construction activities scheduled to occur at the ULRHEF:

- BEBO tunnel arch installation at the ULRHEF upper tunnel portal.
- Excavation and re-contouring of the slope on the right bank above the ULRHEF Obermeyer/diversion channel.
- Reclamation and landscape restoration of the mountain goat corridor on the right bank of Truckwash Creek.
- Installation of the final lengths of penstock.
- Welding and coating ULRHEF penstock.
- Andritz to continue mechanical and electrical works in the ULRHEF powerhouse.
- Installation of the fence around the ULRHEF switchyard.

5.0 Boulder Creek Hydroelectric Facility – Monitoring Results

5.1 *Access Road & Intake*

Construction Activities:

- CE completed all concrete works associated with plugging the BDRHEF diversion tunnel (Photo 19).
- CE completed the removal of the BDRHEF upstream cofferdam (Photo 20 - Photo 23).
- Ditching along KM3.5 – 4.5 continued.

Environmental Summary:

- On October 9, CE filled a 600mm drain pipe in the BDRHEF intake structure to prevent road run-off from entering Boulder Creek.
- On October 10, CE completed the final concrete pour for the diversion tunnel plug (Photo 19). The IEM monitored the final pour and did not observe any environmental issues.
- On October 11, CE stripped the formwork from the diversion tunnel plug and resumed removing the BDRHEF upstream cofferdam. First, crews removed the left bank portion of the cofferdam, placing excavated material against the diversion tunnel and armoured it with rip rap (Photo 20). Crews then removed the two temporary bridges and the excavator completed a onetime wet crossing to the right bank of Boulder Creek (Photo 21 - Photo 22). On October 13, crews removed the remaining portion of the upstream cofferdam on the right bank of Boulder Creek, all instream construction activities were completed on October 13 (Photo 23). The IEM monitored all instream activities and collected water quality approximately 10 metres downstream of the BDRHEF intake structure and 300 metres upstream of the BDRHEF powerhouse. The IEM observed a slight increase in turbidity during instream activities, but water quality quickly returned to within BCWQG shortly after instream activities were completed. Additional water quality results are available upon request.

Photos:

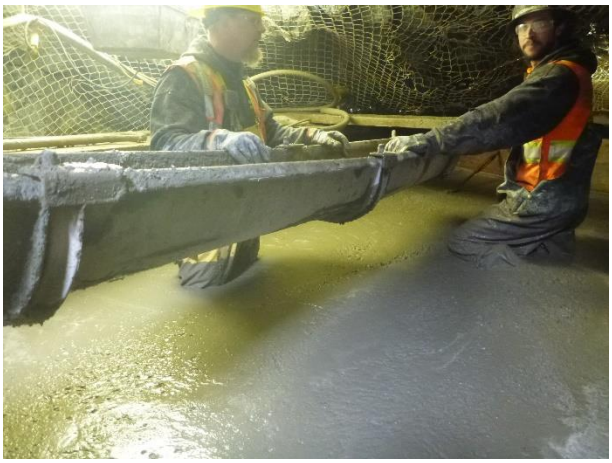

Photo 19 – Final concrete pour for the BDRHEF diversion tunnel plug (October 9, 2016).

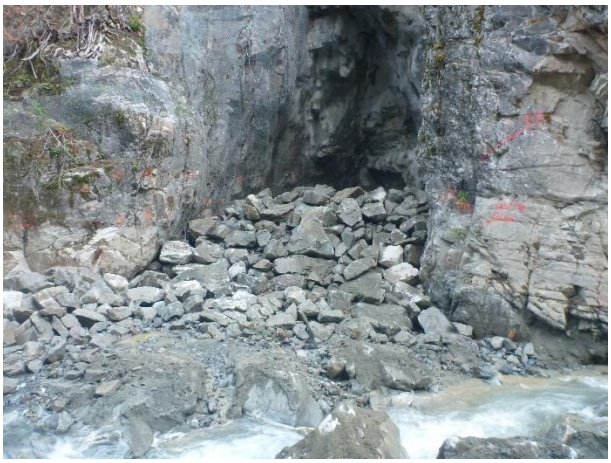

Photo 20 – Excavated material from the BDRHEF upstream cofferdam sealing the diversion tunnel (October 10, 2016).

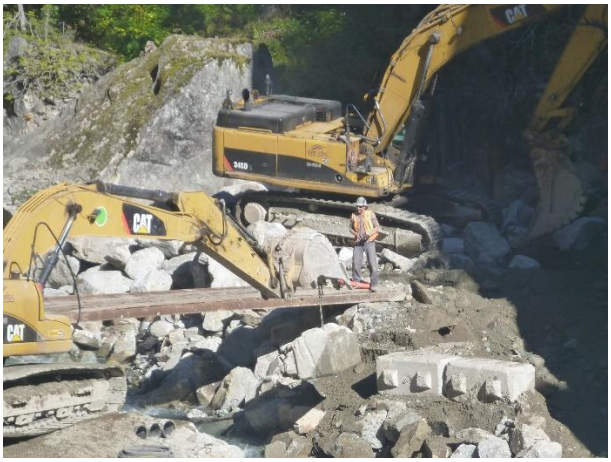

Photo 21 – Removal of the temporary bridges at the BDRHEF upstream cofferdam (October 10, 2016).

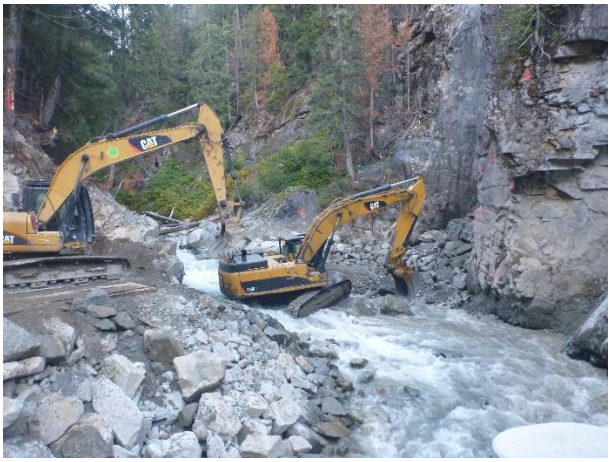

Photo 22 – One time wet crossing at the BDRHEF upstream cofferdam (October 10, 2016).

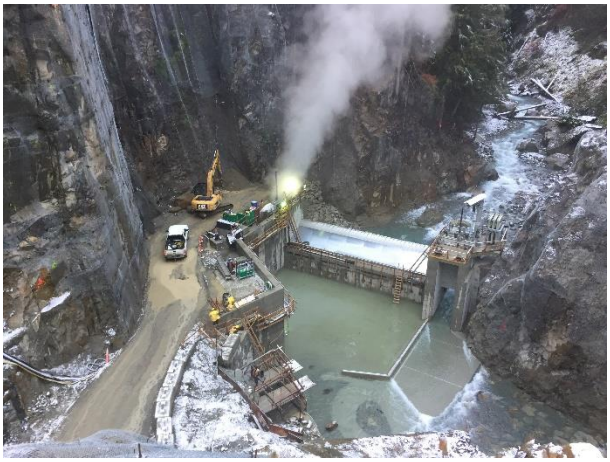

Photo 23 – View of Boulder Creek flowing through the BDRHEF sluice way (October 16, 2016).

5.2 *Downstream Tunnel Portal and Powerhouse*

Construction Activities:

- Final lining and rock support continued within the BDRHEF lower tunnel.
- Installation of the BDRHEF manifold continued throughout the monitoring period.
- Andritz continued mechanical and electrical works in the BDRHEF powerhouse (Photo 24).
- Westpark continued installing the BDRHEF switchyard (Photo 25).

Environmental Summary:

- CE conveyed all wastewater related to the BDRHEF tunnelling works to the downstream settling ponds for treatment throughout the monitoring period (Photo 26).
- On the evening of October 11, the IEM documented high pH water discharging to the BDRHEF tailrace through a drainage pipe from the BDRHEF powerhouse. Concrete cure water, from the bifurcation slab, was being pumped into the powerhouse drainage system, resulting in the discharge of high pH water to Boulder Creek. CE's environmental staff quickly relocated the discharge of the pump to the oil-water separator at the lower tunnel portal. CE committed to conducting additional training with their foremen on proper pumping procedures, to ensure that this or similar issues did not occur again.

Photos:

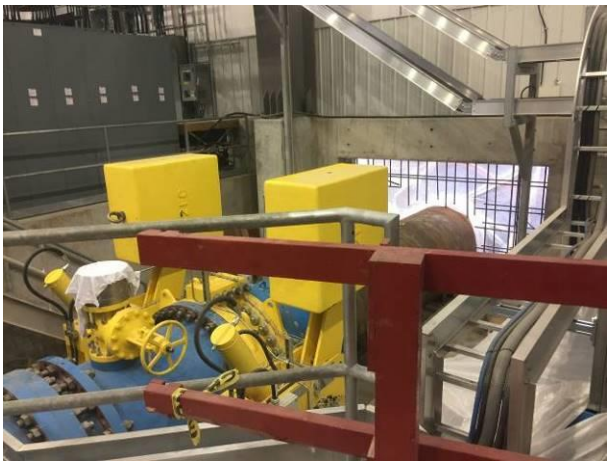

Photo 24 – Andritz mechanical works in the BDRHEF powerhouse (October 14, 2016).

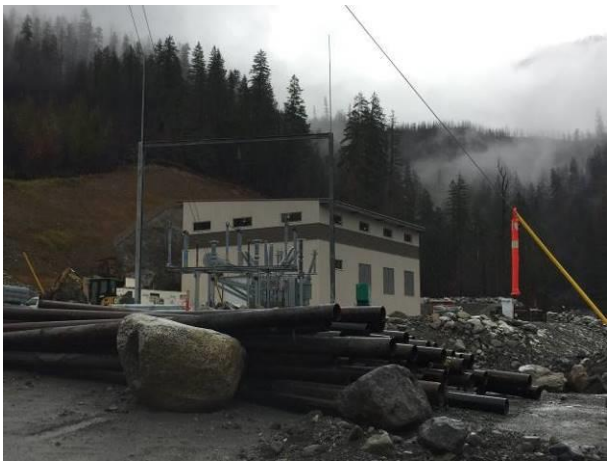

Photo 25 – BDRHEF switchyard (October 21, 2016).

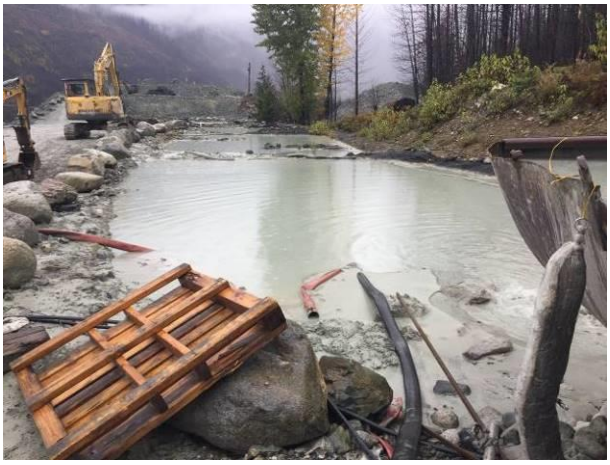

Photo 26 – BDRHEF lower-tunnel settling ponds (October 20, 2016).

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 IEM selected the regular monitoring to quantify WQ conditions within Boulder Creek 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 of an exceedance of in-situ WQ (turbidity and/or pH) because of 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, an asterisk (*) will be used to denote it.

Date	Time	Sample Location Description	pH	Turbidity (NTU)	Cond (µS)	Temp (°C)
Routine Water Quality						
October 14, 2016	10:35	BDR BG – Upstream of BDRHEF intake	7.4	1.4	99	3.1
		BDR #1 – Downstream of BDRHEF intake	Inaccessible			
	15:18	BDR #2 – Upstream of BDRHEF Powerhouse	6.8	7.1	96	4.1
	15:05	BDR #3 – Downstream of BDRHEF Powerhouse at Pebble Creek Bridge	7.1	11.9*	96	4.1
October 21, 2016	15:00	BDR BG – Upstream of BDRHEF intake	7.2	8.1	96	4.0
		BDR #1 – Downstream of BDRHEF intake	Inaccessible			
	13:38	BDR #2 – Upstream of BDRHEF Powerhouse	6.8	3.4	104	4.2
	13:31	BDR #3 – Downstream of BDRHEF Powerhouse at Pebble Creek Bridge	7.3	6.4	95	4.2

5.4 *Recommendations*

IEM recommendations for the BDRHEF are as follows:

- CE should continue to direct all construction related wastewater to the active water treatment systems/settling ponds. CE should continue to monitor the newly constructed settling/infiltration pond to ensure that it remains in good working condition, and perform all maintenance activities as outlined in the work plan. If water begins to discharge from the newly constructed channel, CE should conduct regular inspections to ensure that it meets BCWQG prior to infiltration near or connection with the Boulder Creek side channel.
- CE should regularly monitor the BDRHEF intake active water treatment system to ensure the system is functioning as intended and that discharge into Boulder Creek is within BCWQGs. The water treatment system capacity should be regularly assessed to ensure the system can handle the necessary volumes of water.
- CE should continue to maintain the BDRHEF intake access road, and continue excavation/maintenance of ditch lines as discussed after the BC EAO site tour on June 9, 2016 and subsequent environmental meetings.
- CE should continue to remind crews of proper pumping procedures as outlined in the project CEMP and EPPs, to ensure that sediment laden and high pH water is not discharged off site prior to treatment.

5.5 *Upcoming Works*

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

- BDRHEF tunnel final lining and rock stabilization.
- Manifold installation works at the BDRHEF powerhouse.
- Andritz electrical works at the BDRHEF intake and powerhouse.
- Pulling conduit on the BDRHEF access road.

6.0 Transmission Line – Monitoring Results

6.1 *Transmission Line Construction Activities*

Construction Activities:

Segment 1 – 5

- Stringing and pulling fiber optic cable
- Hand clearing and slashing (Photo 27)
- Falling hazard trees and slashing re-sprouting vegetation near towers 111-113 and 82-83 (Photo 28)

Segment 6

- Stringing and pulling fiber optic cable

Segment 11

- Ground preparation by hand for anchor installation

Segment 12

- Ground preparation by hand for anchor installation and clipping lines

Segment 13

- Ground preparation by hand for anchor installation
- Piling brush, ditching, and road works
- Framing poles

Segment 14

- Framing, backfilling and straightening tower poles
- Stringing conductors

Segment 15

- Backfill and straightening tower poles
- Stringing conductor, tensioning and clipping

Segment 16

- Ground preparation by hand for anchor installation
- Removal of timber from recently felled areas
- Stringing lines throughout the segment

Environmental Summary:

- On October 17, the IEM and WEL's Environmental Manager conducted an aerial survey of grizzly bear habitat polygon GB59 in advance of stringing conductor in the area to determine whether the habitat was currently occupied. No grizzly bears were observed during the aerial survey and it has been determined that GB59 was incorrectly mapped and actually lies to the northwest of structure 376, meaning the pole structure (installed prior to September 1) is outside of the high value fall forage habitat. The IEM determined that the potential for displacing grizzly bears from the area as a result of the minor works was minimal given the information presented above and therefore authorized the stringing of conductor by helicopter and pulling of the conductor by ground based equipment located well away from the sensitive grizzly bear habitat. The conductor stringing was completed on October 18 and no grizzly bears were observed during works.
- The IEM conducted spot checks on transmission line activities during the monitoring period and did not observe any environmental issues.

Photos:

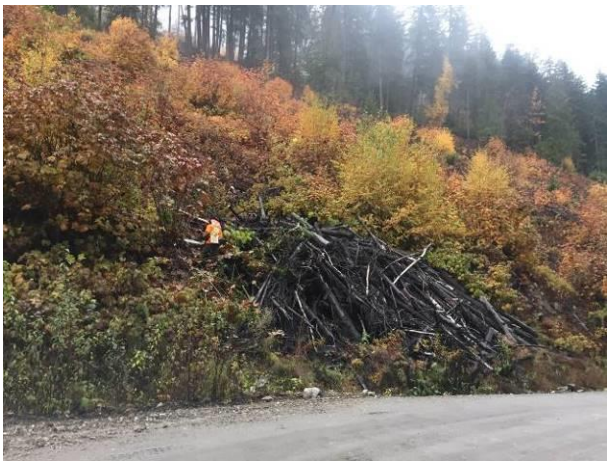

Photo 27 – Slashing re-sprouted vegetation in segment 5 (October 18, 2016).

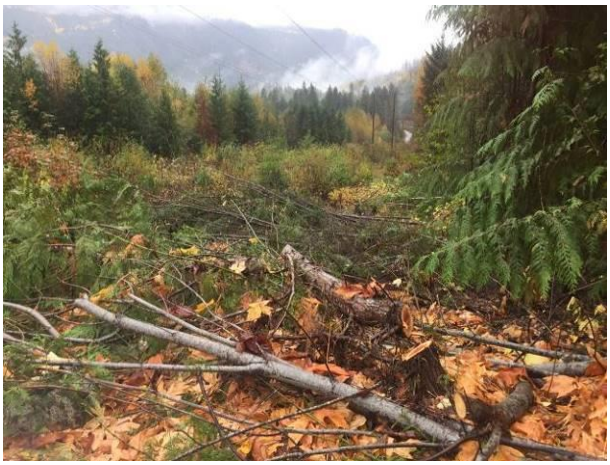

Photo 28 – RVMA clearing audit in Segment 4 (October 18, 2016).

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 IEMs 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:

Segment 8

- Slashing re-sprouted vegetation and burning slash piles

Segment 13

- Burning slash piles

Segment 14

- Stringing, tensioning, and clipping lines

Segment 15

- Slashing re-sprouted vegetation
- Stringing, tensioning, and clipping lines.
- Hazard tree falling

Segment 16

- Burning slash piles
- Stringing, tensioning, and clipping lines throughout the segment.

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 the 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 spring 2016 Mountain Goat Monitoring Program is complete as of June 15, 2016, according to conditions of the Mountain Goat Management Plan. The mountain goat monitoring program will resume in November 2016.

To mitigate potential impacts to mountain goats during the summer months, 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 site 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 October 12: CE continues to demobilize tunneling equipment, which remains parked within the lined parking areas. Leaks on the pad continue to be observed and should be removed on a regular basis as required to prevent attracting wildlife. This*			

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**
				item remains open as hydrocarbon staining in the parking areas continue to be observed.			
ULR#60	OPEN	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. 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.*	*August 8, 2016*	*August 16, 2016*	*September 30, 2016*
				2. 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 October 12, 2016: A plan has been agreed upon, however the implementation remains outstanding. This issue has now been open for more than 2 months, and the window to successfully hydro-seed is nearly closed.*			
ULR#61	OPEN	Access roads and general ESC measures	ESC improvements are required to ensure the site performs well during the imminent fall rain events, and to maintain adherence to conditions of the CEMP, Ditch Management Plan, Erosion Prevention and Sediment Control Plan, and Surface Water Quality Protection Plan	*1. The IEM has prepared FAM13 which describes ESC and ditch management improvements, some of which have been in discussion since August 18, 2016. Individual items are outlined in FAM13, which was provided to the contractor on September 30.*	*September 30, 2016*	*October 7, 2016*	
				a. Ditches and checks dams between KM48.5 and Keyhole Bridge are in need of maintenance. CE should ensure these ditches are continuous, armored against erosion (appropriately spaced check dams/armor), and able to receive and convey runoff. Update: CE has installed pumps to temporarily divert sediment laden water to a vegetated area for infiltration until final road capping and drainage structures can be installed.			
				b. The Lillooet River FSR drainage from KM47-48 must adequately convey runoff away from the stream at KM48. Update: CE has installed a pump to direct water away from the bridge deck and the fish bearing stream as a temporary measure to protect the watercourse. A temporary culvert has also been placed in the FSR to collect water flowing down			

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
				the road surface and direct it away from the fish bearing stream.			
				c. The temporary ULRHEF intake access road has no ditch installed and the upstream side of the laydown adjacent to the intake structure is likely to pool water or result in unmitigated runoff to the Lillooet River. Provide and implement a temporary drainage solution until this area is reclaimed. Cross ditches and berms have been installed to prevent turbid water from entering the Lillooet River,			October 21, 2016
				d. Ditching along the ULRHEF lower portal access road requires maintenance and the drainage pattern at the base of the road has changed since the installation of the Truckwash Creek penstock crossing. Provide temporary repairs to the ditch to ensure it can receive and convey road drainage and/or install final drainage (note: sediment laden water should not be directed to the UWR replacement area). Update: Water ponding in the work area has saturated the haul road; however sediment laden water is contained within the work area and is not flowing offsite. Final drainage solutions will be installed at a later date,			
				e. The access road at ASTR-04 crossing pools road runoff and discharges sediment laden water to ASTR-04 during rain events. CE has indicated that they are aware of this concern and are working on developing and implementing a final solution for road drainage.			October 21, 2016
				f. The steep penstock access road leading down towards the powerhouse from PI-12 (~3+950) requires measures to protect the running surface. The IEM suggest implementing seasonal deactivation measures or installing a combination of cross ditching and ditch line check dams to prevent transporting sediment laden water to the base of the slope.			October 21, 2016
				g. The ULRHEF powerhouse access road ditch is not continuous, specifically the section along the toe of the spoil area. Install the appropriate drainage solution. This ditch is not yet installed, however ESC has not yet been a concern in this area			

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**
				h. The BDRHEF intake access road requires ditch maintenance, especially where ditches have been impacted by conduit installation. The access road also requires repair/grading where wheel ruts have resulted in water channelizing along the road alignment. Update October 27: While some ditch line improvements and road grading has been completed, the stretch of road between KM3.5-KM5 of the intake access road remains a concerns as turbid road runoff continues to flow offsite during rain events. CE is in the process of installing conduit and finalizing the ditches and road grades in this area.			

9.2 *Transmission Line*

ITM Tracking Legend:	*Work Item Open*
	Work Item Complete
	Issue Closed

Issue Tracking		Environmental Issue		Mitigation Measures			
ID No.	**Status**	**Location**	**Issue Description**	**Action Taken/Recommended**	**Date of Identification**	**Targeted Date for Completion**	**Date Completed**
No outstanding environmental issues (next ITM – Tx#3)							

Environmental Incident Reporting Form

General Information

Project Name: Upper Lillooet Hydro Project	**Project Component**: Lillooet River Forest Service Road KM 48.5
Time/Date of Incident Start: 12:15/2016-10-16	**Time/Date Incident Stopped**: 12:20/2016-10-16
Date of Report: Draft Submitted: 2016-10-17 Final Submitted: 2016-10-18	**Project Incident Report Number**: 2016-10-16 CE-EIR-031 **Incident Description:** 300L-500L spill of Diesel Fuel at KM48.5 of the Lillooet River FSR
Report Prepared By: Ian McKeachie	
Contractors Environmental Manager: Ian McKeachie	
Independent Environmental Monitor (Sartori Environmental Services): Stephen Sims/ Tom Hicks	
Initial IEM Contact: 2016-10-16, the IEM was informed of the incident on site and attended the scene to monitor clean-up.	
Licensee's Environmental Manager: Julia Mancinelli	

Contact Information for Company Involved in Incident

Company: CRT-EBC	**Address**: 11-7339 Old Mill Road, PO Box 585, Pemberton, BC, V0N 2L0
Phone #: 604-894-5002	**Email**: imckeachie@crtconstruction.ca/jeanpelletier@crtconstruction.ca
Contact Person: Ian McKeachie/Jean Pelletier	**Position**: Environmental Manager

Incident Type *(check all that apply)*

Encroachment of an Environmentally Sensitive Area (*e.g.* Riparian/Wildlife Buffer) **Please provide details in "Description" section below.**	☐	**Potential Adverse Impacts to Fish/Wildlife (*e.g.* Mortality/Injury)** **Please provide details in "Description" section below.**	☐
Water Quality/Quantity **Please provide details in "Description" section below.** Note: Diesel fuel did not reach a waterbody or watercourse. It was contained at the spill site and in road side ditches.	☐	**Hazardous Material Spills (to ground or water)** **Please provide details in description section in regards to:** • Perceives extent of damage • Type, quantity and area of the spill • Containment Procedures • Environmental features in close proximity to the spill	☑
Disturbance of known or unknown archeological /heritage site **Please provide details in "Description" section below.**	☐	**Air Quality** **Please provide details in "Description" section below.**	☐

Spill reported to external agencies **If yes, describe the receiving environment and substance/quantity spilled.** Environmental Emergency Program (EEP) – 300L-500L of diesel fuel	☑	**Other** **Please provide details in "Description" section below.**	☐

Incident Profile

Weather at time of incident	 ☐ Clear	 ☐ Partly Cloudy/ Variable	 ☐ Cloudy	 ☐ Showers/ Periods of Rain	 ☐ Rain	 ☑ Heavy Rain *(>25mm in 24hr)*	 ☐ Storm *(Heavy rain and high winds)*	 ☐ Snow

Specific Location:
ULR FSR – KM48.5 Lillooet River Forest Service Road

Description and Cause of Incident:

Description:

- On October 16th, at approximately 12:15PM a worker started refuelling a generator located on the side of the Lillooet River Forest Service Road at approximately KM48.5 with diesel fuel from a fuel truck.
- He was called to another area of the site to attend to another matter.
- He left the fuel pump running while he went to the nearby area to attend to the other task, and subsequently forgot that it was on, leaving it running for approximately 30 minutes.
- When he arrived back at the generator he realized that the tank had begun to overflow, resulting in a spill of 300-500L of fuel to ground. No release to a waterbody or watercourse occurred as a result of the spilled fuel.
- He immediately turned off the pump and started the spill response procedure. The CE environment team and on-site IEM were notified, and the crew on site began spill clean-up immediately.

Cause:

- The fuel truck and pump left unattended

Incident Witness: Ryan Crossman, Sebastien Serrazin, Eric Coderre, Ian McKeachie and Stephanie Ellis.

Were there any Potential Environmental impacts as a result of the incident? (e.g., surface contamination, storm sewers, or fish/wildlife mortalities)	**Yes** ☑	**None Observed** ☐

If Yes, please describe: The spill exceeded the 100L reportable volume and had the potential to cause contamination of the soil around the source, as well as in the ditch-line, sump and laydown area at KM49. No spill to a watercourse, waterbody, or environmentally sensitive area occurred.

Has Wildlife Salvage Protocol been followed?	**Yes** ☐	**No** ☐	**N/A** ☑

If No, please explain:

Water Quality Samples Collected?	**Yes** ☐	**No** ☐	**N/A** ☑

If yes, attach results of water quality analysis to report in table format. Include Laboratory analysis if completed.
If No please explain:

Have applicable photos and/or drawings been attached to the incident report?	**Yes** ☑	**No** ☐	**N/A** ☐

Incident Response Measures

As soon as the spill occurred:

- Due to heavy rain some of the diesel fuel migrated to a nearby ditch-line and travelled approximately 400m toward the laydown area adjacent to Keyhole Bridge at KM49 where it terminated in a large sump, and did not reach the Lillooet River.
- Spill booms and absorbent pads were placed at several points in the ditch-line, and sump.
- Absorbent pads and spill booms were used to prevent the spill from migrating from the source to the ditch-line.
- A vacuum truck was used to collect all contaminated water and sediment from the sump, ditch-line and at the source of the spill under the generator.
- The clean-up efforts were finished at 5:30PM.
- CRT-EBC environment manager (Ian McKeachie) contacted the Provincial Emergency Program (PEP) to inform them of the incident. ***DGIR #161-975.*** Necessary steps (forms, notifications, confirmation that the cleanup was done) will be taken to follow-up with EEP within 60 days following the incident. The DFO Observe, Record, Report Line was also was also contacted; however no incident number was provided as there was no spill to water.
- Written notification was provided to the IEM (Tom Hicks) and Owner (Innergex) at 5:40PM on October 16th.
- The vacuum truck emptied its contaminated contents into a tank at the KM38 laydown yard, where it will be temporarily stored until it can be removed from site and taken to an acceptable disposal facility.
- Surface material suspected of contamination will be excavated and disposed of off-site in an approved facility.
- Remediation of the site will be in accordance with the guidelines contained in *Remediation of Sites Contaminated by a Spill* and the *Environmental Management Act - Contaminated Sites Regulation*.
- Soil samples will be taken after remediation efforts in the coming week.

Actions to Prevent Incident Recurrence

Before the incident the mitigation measures in place were:

- All CRT-ebc employees and sub-contractors are required to attend a site orientation and environmental awareness training. Fuelling procedures and spill response protocols are taught during this orientation, and reminders are provided at frequent safety meetings and Job Hazard Assessments.
- An impermeable membrane and additional surface material was in place under the generator.
- Each piece of equipment and vehicle is equipped with a spill kit, and larger spill kits are located on site next to the generator and at adjacent sites.

After the incident, additional mitigation measures were put in place:

- At the CRT-EBC morning meeting on October 17th, superintendents and foremen were reminded of not leaving equipment unattended while re-fuelling. Although the spill response procedure was well executed, and successful in preventing the spill from leaving site and entering sensitive areas or surface waters, foremen have been reminded of fuelling protocols and rules. Foreman will be reminding crews of these protocols, and at the next mass safety meeting, the spill will be discussed and used as an example and opportunity to remind all personnel of the need to follow all fuelling procedures and protocols to avoid recurrence.
- CRT-ebc superintendent and environmental manager met with the person involved in the spill, to discuss the mistake and enforce the message that this deviation from approved fuelling procedures cannot occur again.

Notification Record

Agency Reported to	Contact Information	Agency Contacted		Date and Time Reported	Reported By	Method of Reporting
		Yes	No			
External Notifications						
MFLNRO	James Davies	☑	☐	2016/10/18	Julia Mancinelli	Email
BC EAO	Monica Perry Sheldon Foote Justin Carlson	☑	☐	2016/10/18	Julia Mancinelli	Email
Lil'wat Nation	Harriet VanWart Carrie Lester	☑	☐	2016/10/18	Julia Mancinelli	Email
Environmental Emergency Program (EEP)	1-800-663-3456	☑	☐	2016-10-16 5:54PM	Ian McKeachie	Phone
RAPP Line	Conservation Officer Service 1-877-952-7277	☐	☑			
DFO Observe, Report, and Record Line	1-800-465-4336	☑	☐	2016-10-17 6:48AM	Ian McKeachie	Phone
DFO	Herb Klassen	☑	☐	2016/10/18	Julia Mancinelli	Email

Notification Record						
Agency Reported to	**Contact Information**	**Agency Contacted**		**Date and Time Reported**	**Reported By**	**Method of Reporting**
		Yes	**No**			
Environment Canada	604-666-6100	☐	☑			
Canadian Coast Guard	604-666-6011	☐	☑			
Local Fire Rescue	911	☐	☑			
Reported to	**Contact Information**	**Contacted**		**Date and Time Reported**	**Reported By**	**Method of Reporting**
		Yes	**No**			
Internal Notifications						
CRT-EBC	Ian McKeachie	☑	☐	2016-10-16 2:30PM	Roger Pelletier	In person
IEM	Tom Hicks	☑	☐	2016-10-16 5:40PM	Ian McKeachie	Email
	Stephanie Ellis	☑	☐	2016-10-16 2:30PM	Roger Pelletier	In person, IEM monitored clean-up effort
IE	Jennifer McCash	☑	☐	2016/10/18	Julia Mancinelli	Email
Owner Innergex	Julia Mancinelli	☑	☐	2016-10-16 5:40PM	Ian McKeachie	Email

Contractor's Environmental Manager:

Ian McKeachie	Environmental Manager, CRT-EBC		2016-10-18
Print Name	Position and Company	Signature	Date

Reviewed by:

Tom Hicks	Independent Environmental Monitor, Sartori Environmental Services		2016-10-18
Print Name	Position and Company	Signature	Date

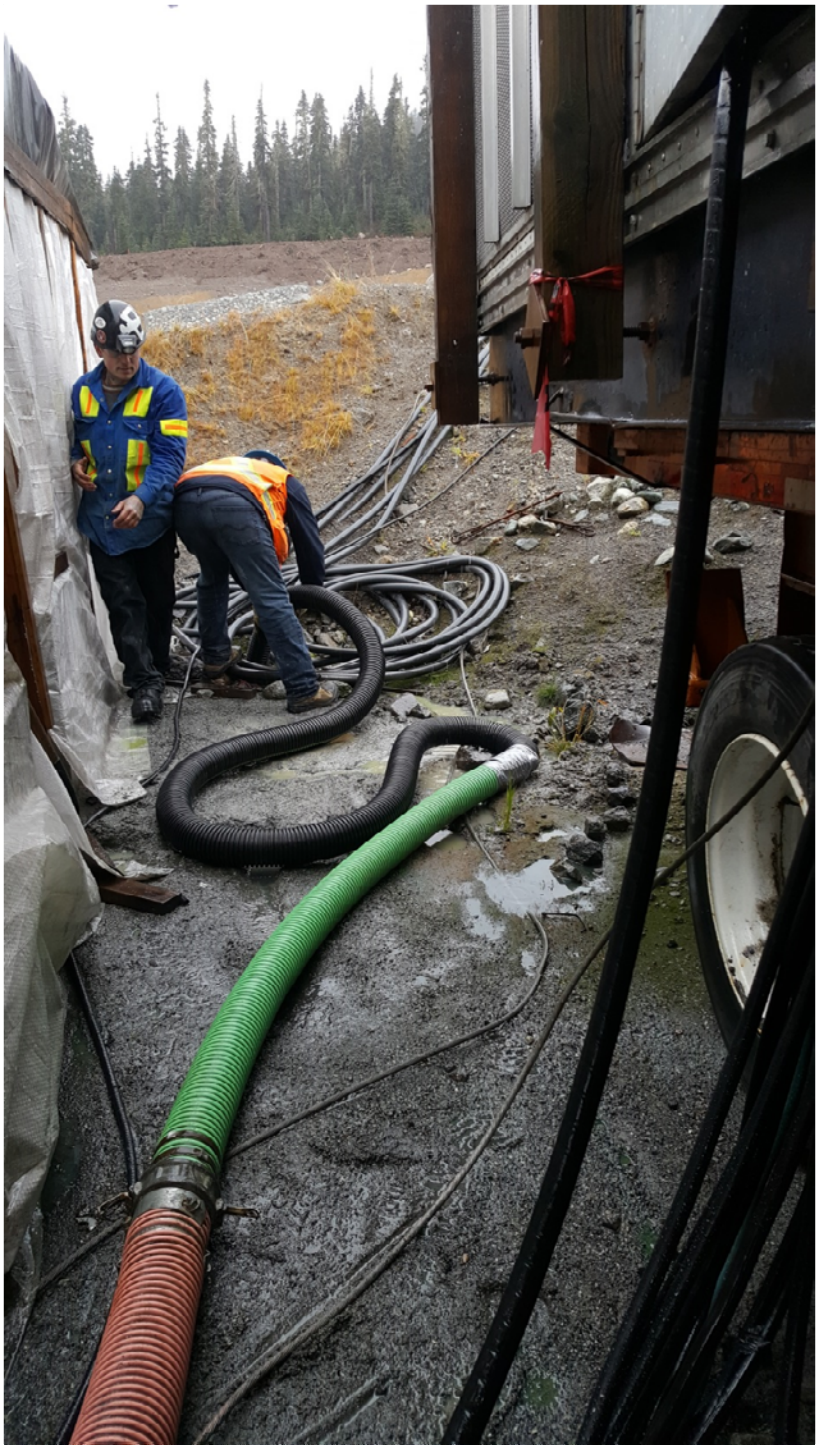

Figure 1: Vacuum truck removing contaminated water and sediment under generator tank

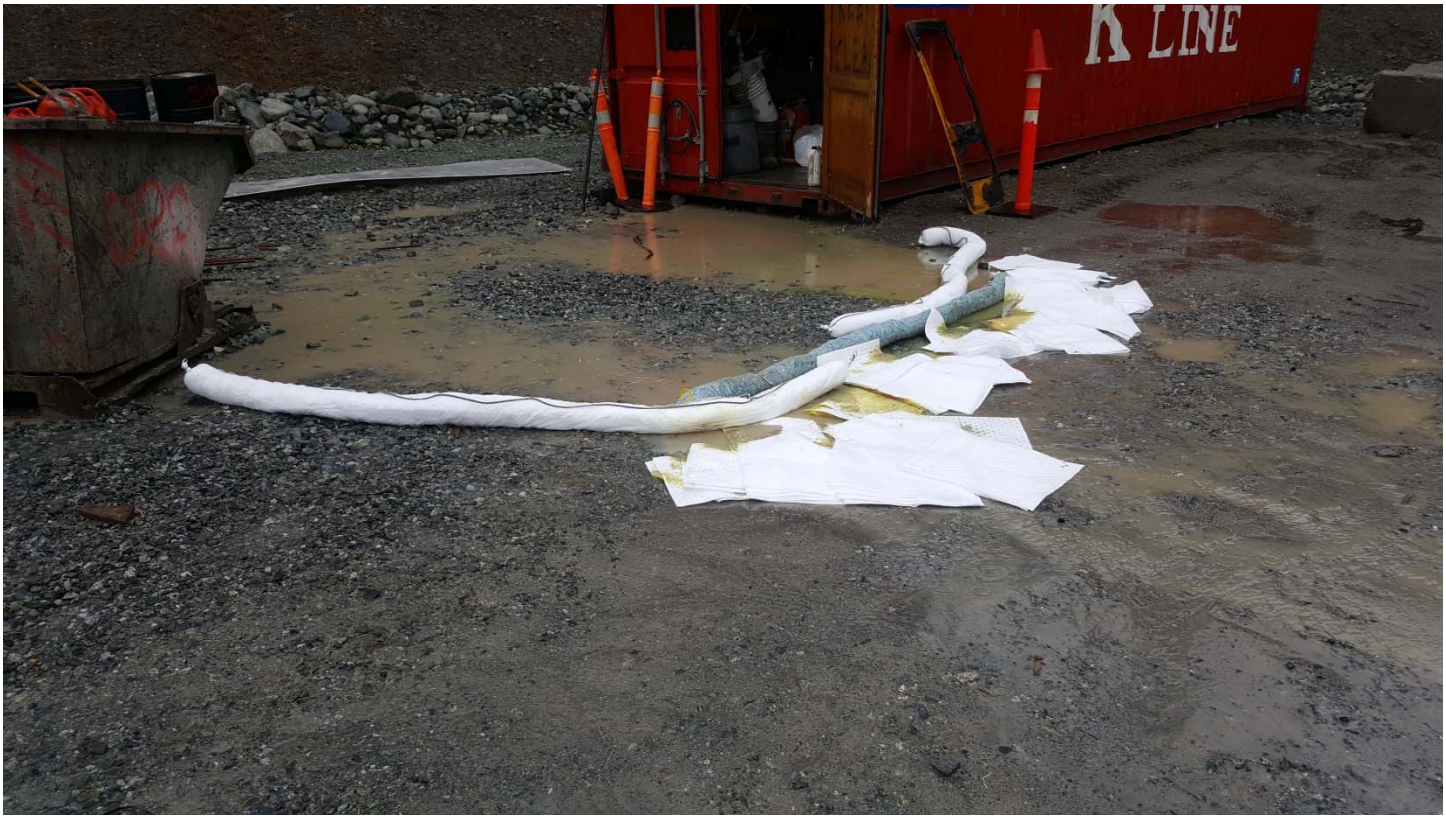

Figure 2: Spill booms and absorbent pads to stop migration of spill

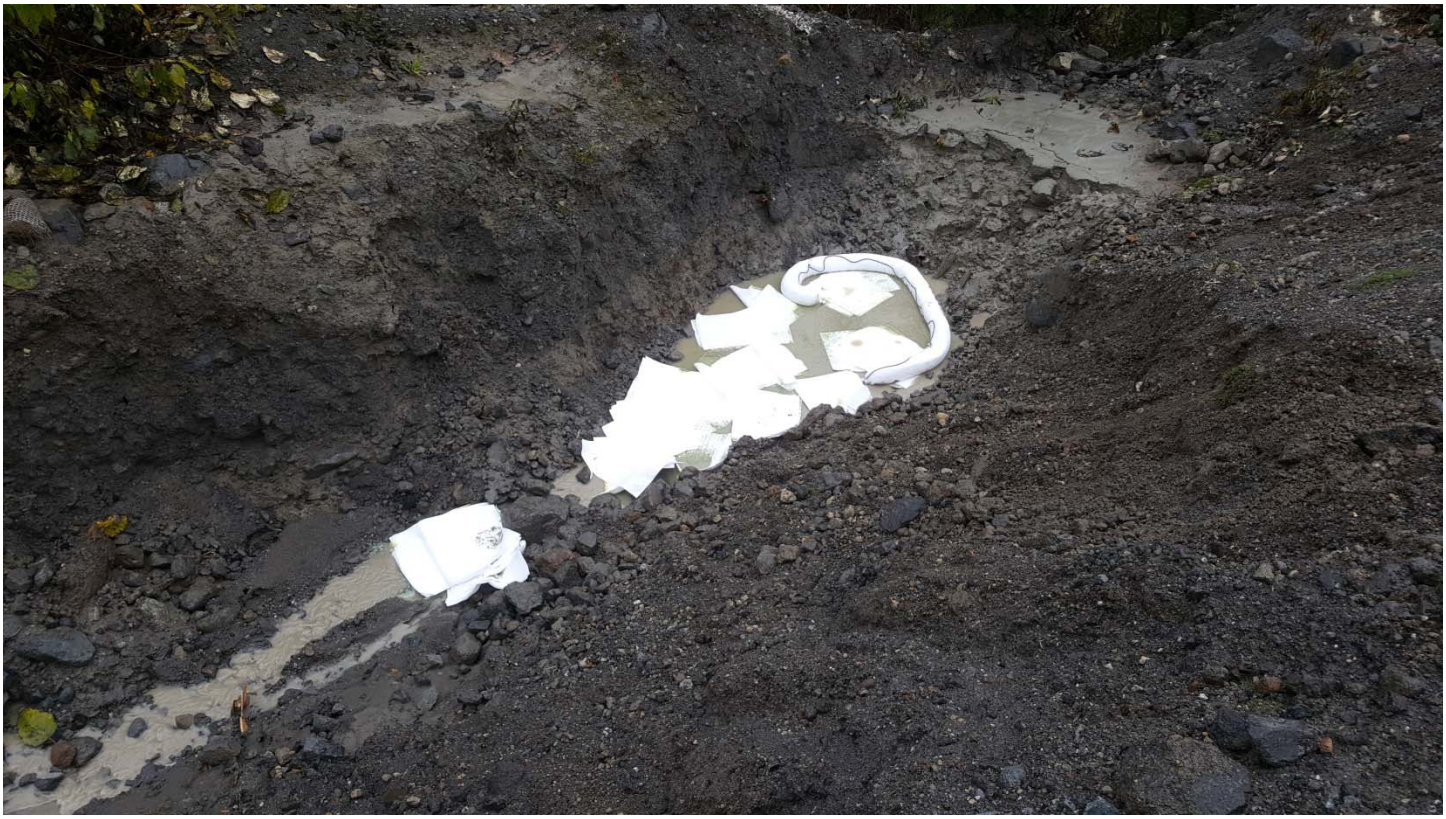

Figure 3: Spill booms and absorbent pads in sump

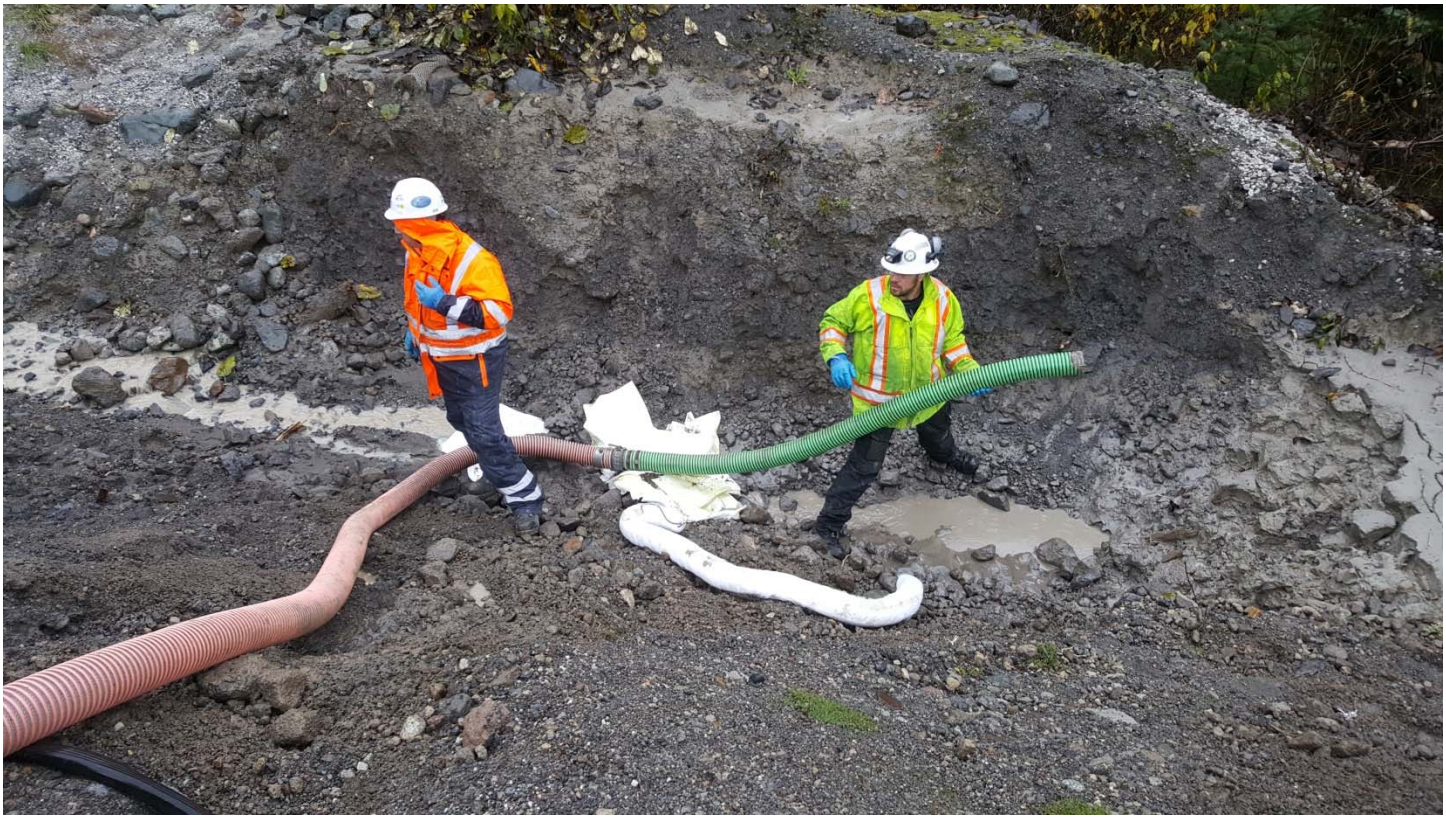

Figure 4: Vacuum truck removing contaminated water and sediment from sump

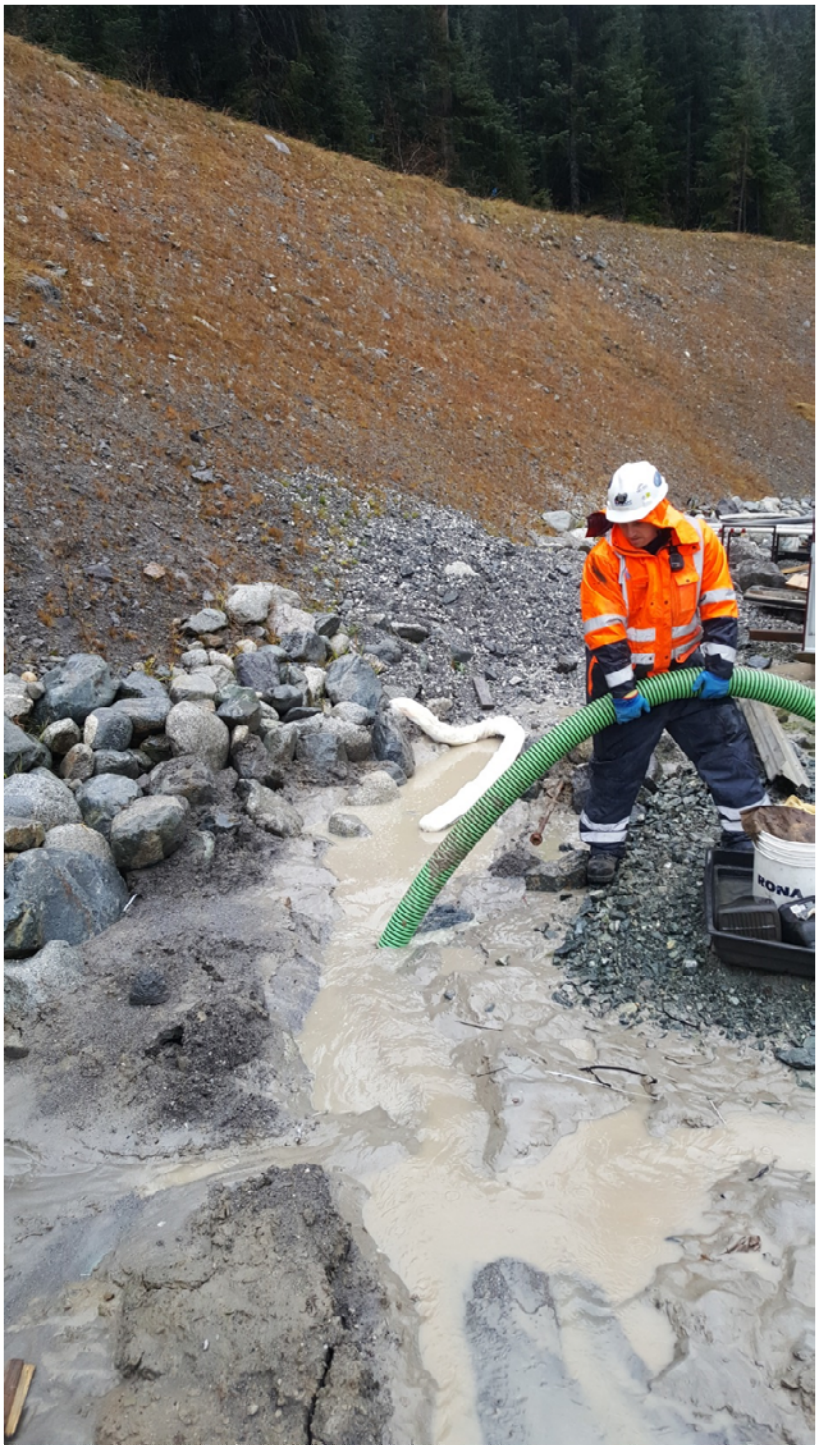

Figure 5: Vacuum truck removing contaminated water and sediment from ditch-line