

Shuswap River Water Use Plan

Monitoring Programs and Physical Works Annual Report: 2016

Implementation Period: April 2015 to March 2016

- **SHUMON-1 Sugar Lake Reservoir Inflow Monitoring**
- **SHUMON-2 Sugar Lake Reservoir Shoreline Erosion Monitoring**
- **SHUMON-3 Flooding Risks in Middle Shuswap River**
- **SHUMON-4 Sugar Lake Reservoir Archaeology Monitoring**
- **SHUWORKS-1 Flow Disruptions at Wilsey Dam Report on Findings**

For Water Licences 120948, 120949, 120950 and 120951

April 30, 2016

BC Hydro Shuswap River Water Use Plan Monitoring Programs and Physical Works Annual Report: 2016

1 Introduction

This document represents a summary of the status and the results of the Shuswap River Water Use Plan (WUP) monitoring programs and physical works to March 31, 2016, as per the Shuswap Order under the *Water Act*, dated October 12, 2005. There are four monitoring programs and one physical works.

2 Status

The following table outlines the dates that Terms of Reference (TOR) for the Shuswap River WUP monitoring programs and physical works were submitted to and approved by the CWR.

Table 2-1: Dates of Shuswap River WUP TOR Submissions and Approvals by the Comptroller of Water Rights

Monitoring Program & Physical Works TOR	Order Clause	Original ToR Submission		Most Recent ToR Resubmission	
		Date Submitted	Date Approved	Date Submitted	Date Approved
SHUMON-1 Sugar Lake Reservoir Inflow Monitoring	Clause 5 and 7 (c)	Mar 17, 2006	May 09, 2006		
SHUMON-2 Sugar Lake Reservoir Shoreline Erosion Monitoring	Clause 7(a)	Mar 17, 2006	May 09, 2006		
SHUMON-3 Flooding Risks in Middle Shuswap River	Clause 7(d)	Mar 17, 2006	May 09, 2006	Feb 15, 2010	Mar 18, 2010
SHUMON-4 Sugar Lake Reservoir Archaeology Monitoring	Clause 7(b)	Mar 17, 2011	Jun 03, 2011		
SHUWORKS-1 Flow Disruptions at Wilsey Dam Report on Findings	Clause 6	Apr 12, 2007	May 11, 2007		

3 Schedule

The following table outlines the current schedule for the monitoring programs and physical works being delivered for the Shuswap River WUP.

Table 3-1: Monitoring Programs and Physical Works Schedule as of March 31, 2015

Monitoring Programs	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
	WLR YR1	WLR YR2	WLR YR3	WLR YR4	WLR YR5	WLR YR6	WLR YR7	WLR YR8	WLR YR9	WLR YR10
SHUMON-1 Sugar Lake Reservoir Inflow Monitoring	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
SHUMON-2 Sugar Lake Reservoir Shoreline Erosion Monitoring		✓								
SHUMON-3 Flooding Risks in Middle Shuswap River						✓				
SHUMON-4 Sugar Lake Reservoir Archaeology Monitoring							✓	✓	✓	✓
Physical Works										
SHUWORKS-1 Flow Disruptions at Wilsey Dam		✓								
SHUWORKS-1 Bypass Valve			✓	✓	✓	✓				

Legend:

- = Program to be undertaken/initiated in identified year
- = Year work implemented dependent on flow conditions
- u/w = Program is underway
- ✓ = Program completed for the year

4 Monitoring Programs and Physical Works Terms of Reference

The monitoring programs and physical works being implemented under the Shuswap River WUP are described in Terms of Reference. These Terms of Reference and the reports for work completed to date can be found here:

http://www.bchydro.com/about/sustainability/conservation/water_use_planning/southern_interior/shuswap_sugar_lake.html

5 Status of Monitoring Programs

5.1 SHUMON-1 Sugar Lake Reservoir Inflow Monitoring

This monitoring program was initiated in May 2006 with the operation of the hydrometric gauging station, Eagle River near Malakwa (08LE024), by the Water Survey of Canada. Data from this gauging station has been used by BC Hydro as an index stream to support inflow forecasting and inflow data quality control for Sugar Lake Reservoir. Data collection was complete in 2015. BC Hydro will review the effectiveness of the stream gauge monitoring at Eagle River in improving inflow forecast for Sugar Lake Reservoir and to provide recommendations for ongoing monitoring. The final report will be included in the 2017 Annual Report.

5.2 SHUMON-2 Sugar Lake Reservoir Shoreline Erosion Monitoring

This monitoring program was initiated in September 2006 and completed in December 2007.

5.3 SHUMON-3 Flooding Risks in Middle Shuswap River

This monitoring program was conditional on the occurrence of a target discharge, which was met in 2011. Data collection as well as reporting was completed in 2011.

5.4 SHUMON-4 Sugar Lake Reservoir Archaeology Monitoring

This monitoring program was initiated in 2012 and will be ongoing through 2015 (Table 3-1). Due to safety constraints, the sampling window in 2014 was missed for one of the monitoring stations. The last visit to the missed station was completed in 2015. The final report is still being finalized and will be included in the 2017 Annual Report.

6 Status of Physical Works

6.1 SHUWORKS-1 Flow Disruptions at Wilsey Dam Report on Findings

This program is complete.

7 Monitoring Programs and Physical Works Costs

The following table summarizes the Shuswap River WUP monitoring programs and physical works costs approved by the Comptroller and the Actual Costs to March 31, 2016.

Table 7-1: Shuswap River WUP Monitoring Programs and Physical Works Costs

Monitoring Programs	Costs approved by CWR	Life to Date Actuals (LTD)	Estimated to Complete (Forecast)	Total Forecast (LTD and Forecast)	Variance Total to Approved	Explanation	Corrective Action
SHU Prepare Annual Report	\$9,674	\$7,348	\$1,091	\$8,438	\$1,236		
SHUM01A Sugar Lake Inflow Mon	\$80,142	\$49,744	\$4,627	\$54,371	\$25,771	Efficiencies found during implementation. Final reporting outstanding.	
SHUM01A Sugar Lake Inflow Mon - OR DM	\$10,142	\$3,698	\$2,421	\$6,119	\$4,023		
SHUM01A Sugar Lake Inflow Mon - OR Imp	\$70,000	\$46,046	\$2,206	\$48,252	\$21,748		
SHUM02A Sugar Lake Shoreline	\$37,520	\$32,659		\$32,659	\$4,861	Project Complete	
SHUM02A Sugar Lake Shoreline - OR DM	\$17,120	\$10,899		\$10,899	\$6,221		
SHUM02A Sugar Lake Shoreline - OR Imp	\$20,400	\$21,760		\$21,760	(\$1,360)		
SHUM03A Flood Risks Mid-SHU	\$71,174	\$45,148		\$45,148	\$26,026	Project Complete	
SHUM03A Flood Risks Mid-SHU - OR DM	\$17,517	\$11,964		\$11,964	\$5,553		
SHUM03A Flood Risks Mid-SHU - OR Imp	\$53,657	\$33,184		\$33,184	\$20,473		
SHUM04A Archaeology Mon Prgm	\$205,563	\$189,921	\$7,946	\$197,867	\$7,696	Final reporting outstanding.	
SHUM04A Archaeology Mon Prgm - OR DM	\$53,260	\$26,457	\$2,795	\$29,252	\$24,008		
SHUM04A Archaeology Mon Prgm - OR Imp	\$152,303	\$163,464	\$5,151	\$168,615	(\$16,312)		
SHUW01A Wilsey Dam Flow	\$245,524	\$195,293		\$195,293	\$50,231	Project Complete	
SHUW01A Wilsey Dam Flow - OR DM	\$48,802	\$26,933		\$26,933	\$21,869		
SHUW01A Wilsey Dam Flow - OR Imp	\$196,722	\$168,359		\$168,359	\$28,363		

OR - Ordered Remissible
 ONR - Ordered Non-Remissible

* Red values in parentheses denote overage.