

# **Wahleach Project Water Use Plan**

## **Monitoring Program and Physical Works**

**Annual Report: 2016**

**Implementation Period: February 2015 to January 2016**

- **WAHMON-1 Lower Jones Creek Fish Productivity Indices**
- **WAHMON-2 Channel Stability Assessment**
- **WAHMON-3 Herrling Island Sidechannel Chum Spawning Success Monitoring**
- **WAHWORKS-1 Boulder Creek Diversion Bypass**
- **WAHWORKS-2 Wahleach Reservoir Fertilization Program**
- **WAHWORKS-3 Lower Wahleach (Jones) Creek Channel Enhancement Project**

**For Water Licences 119711, 119709 and 119710**

**February 29, 2016**

## **BC Hydro Wahleach Project 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 Wahleach Project Water Use Plan (WUP) monitoring programs and physical works to January 31, 2016, as per the Wahleach Order under the *Water Act*, dated January 25, 2005. There are three monitoring programs and three physical works.

### **2 Status**

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

**Table: 2-1: Dates of Wahleach Project 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
WAHMON-1 Lower Jones Creek Fish Productivity Indices	Schedule B.1.a	Aug 24, 2005	Sep 27, 2005	Feb 24, 2011	Oct 01, 2012
WAHMON-2 Channel Stability Assessment	Schedule B.1.a	Aug 24, 2005	Sep 27, 2005	Feb 24, 2011	Oct 01, 2012
WAHMON-3 Herrling Island Sidechannel Chum Spawning Success Monitoring	Schedule B.1.b	Aug 24, 2005	Sep 27, 2005	Feb 24, 2011	Oct 01, 2012
WAHWORKS-1 Boulder Creek Diversion Bypass	Schedule A.2.a.ii	Aug 24, 2005	Oct 28, 2005	Feb 24, 2011	Oct 01, 2012
		Jul 16, 2007	Jul 26, 2007		
WAHWORKS-2 Wahleach Reservoir Fertilization Program	Schedule C	Aug 24, 2005	Oct 28, 2005	Mar 25, 2015	Apr 27, 2015
WAHWORKS-3 Lower Wahleach (Jones) Creek Channel Enhancement Project	Schedule D	Jun 15, 2006	Aug 02, 2006	Nov 03, 2014	Nov 26, 2014

### **3 Schedule**

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

**Table 3-1: Table of WUP Schedule**

Study/Physical Work	Component	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
		WLR YR1	WLR YR2	WLR YR3	WLR YR4	WLR YR5	WLR YR6 Interim Review	WLR YR7	WLR YR8	WLR YR9	WLR YR10			
WAHMON-1 Lower Jones Creek Fish Productivity Indices	Fry Outmigration Assessment	✓	✓	✓	✓	✓	X	✓	X	✓	X			
	Smolt Outmigration Assessment	✓	✓	✓	✓	✓	X	X	X	X	X			
	Adult Salmon Escapement	✓	✓	✓	✓	✓	X	✓	X	✓	X			
	Adult Steelhead Escapement	✓	✓	✓	✓	✓	X	X	X	X	X			
WAHMON-2 Channel Stability Assessment	✓		✓		✓			✓		✓				
WAHMON-3 Herring Island Sidechannel Chum Spawning Success Monitoring	Behaviour Assessments	✓	✓	✓	✓	✓	X	X	X	X	X			
	Stranding Assessments	✓	✓	✓	✓	✓	X	X	X	X	X			
	Water level fluctuation monitoring	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
WAHWORKS-1 Boulder Creek Diversion Upgrade	Temporary Upgrade	✓	✓	✓	□	□	X	X	X	X	X			
	Final Upgrade						X							
WAHWORKS-2 Wahleach Reservoir Fertilization	Fertilization and Basic Monitoring	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	■	■
	Hydroacoustic Monitoring		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	■	■
WAHWORKS-3 Lower Wahleach Creek Channel Enhancement Project		DEL	✓	✓	✓	□	□	□	□	□	✓			

**Legend:**

- = Project timing subject to change according to maintenance schedule
- = Project to be undertaken/initiated in identified year
- ✓ = Project field work/data collection is complete for the year
- X = Project field work/data collection discontinued based on outcome of interim review

## 4 Monitoring Programs and Physical Works Terms of Reference

The monitoring programs and physical works being implemented under the Wahleach Project WUP are described in TOR. These TOR and the reports for work completed to date can be found here:

[http://www.bchydro.com/about/sustainability/conservation/water\\_use\\_planning/lower\\_mainland/wahleach.html](http://www.bchydro.com/about/sustainability/conservation/water_use_planning/lower_mainland/wahleach.html)

## 5 Status of Monitoring Programs

### 5.1 WAHMON-1 Lower Jones Creek Fish Productivity Indices

This monitoring program was initiated in 2005 and all field work is complete. Additional incubation data collection identified during 2014 is also complete, and the project report for the 2013/14 season, including the incubation data, is complete and under review, and will be submitted with the next annual report. A final report of the

project will also be submitted to your office upon completion to conclude this monitoring program.

## **5.2 WAHMON-2 Channel Stability Assessment**

This monitoring program was initiated in 2005 and field work was completed in spring 2014. The final project report for the 2013-2014 year is attached. A final report of the project will be submitted to your office upon completion to conclude this monitoring program.

## **5.3 WAHMON-3 Herrling Island Sidechannel Chum Spawning Success Monitoring**

This monitoring program was initiated in 2005 and was completed in 2010 based on the outcome of the interim review.

Annual Herrling Sidechannel hydrometric data collection continued through to 2015 to monitor the sidechannel water level fluctuation in response to both Wahleach Generating Station and Fraser River discharge. This water level monitoring program is now complete. Annual summary reports of this continued data collection have not been submitted with annual reports to date, but are available for review if requested. A final report of this project will be submitted to your office upon completion to conclude this monitoring program.

## **6 Status of Physical Works**

### **6.1 WAHWORKS-1 Boulder Creek Diversion Bypass**

This physical works was initiated in 2005 and was completed in 2010 based on the outcome of the interim review.

In preparation for the Order Review process we completed a site visit to assess the condition of the diversion bypass in October 2015. The diversion continues to function as designed and is in good repair. The diversion weir was constructed as a temporary test facility, and as such has not been tested with an inflow event greater than the design flow (30 cms or a 1 in 50-year inflow event). Long term responsibility or permanence for the diversion weir post-WUP will be resolved as part of the WUP Order Review process. A final report of the project will also be submitted to your office upon completion to conclude this program.

### **6.2 WAHWORKS-2 Wahleach Reservoir Fertilization Program**

This physical works was initiated in 2005 and is still underway.

BC Hydro, in consultation with MOE, determined that the fertilization program will need to continue until completion of the WUP Order Review when a long-term decision can be made on the reservoir fertilization. A TOR addendum was prepared to continue fertilization until the WUP Order Review is completed. This addendum was submitted to the CWR in the spring of 2015, and was approved on April 27, 2015.

The project report for the 2013 - 2014 field seasons has been received and is under review. It will be submitted with the next annual report.

### **6.3 WAHWORKS-3 Lower Wahleach Creek Enhancement Channel**

This physical works was initiated in 2006. In 2014, formal approval to discontinue monitoring of the enhancement channels was received from the CWR. A final report of the project will also be submitted to your office upon completion to conclude this program.

## **7 Monitoring Programs and Physical Works Costs**

The following table summarizes the Wahleach Project WUP monitoring programs and physical works costs approved by the Comptroller and the Actual Costs to January 31, 2016.

**Table 7-1: Wahleach Project 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
<b>Wahleach WUP Annual Report</b>	\$14,359	\$13,131	\$1,228	\$14,359	\$0		
<b>WAHM01A Fish Productivity Ind</b>	\$1,335,486	\$510,117	\$11,950	\$522,067	\$813,419	Efficiencies found as outcome of the interim review.	
WAHM01A Fish Productivity Ind - ONR DM	\$147,986	\$50,183	\$5,989	\$56,172	\$91,814		
WAHM01A Fish Productivity Ind - ONR Imp	\$1,187,500	\$459,934	\$5,961	\$465,895	\$721,605		
<b>WAHM02A Channel Stability Ass</b>	\$227,278	\$167,672	\$23,075	\$190,747	\$36,531	Efficiencies found as outcome of the interim review.	
WAHM02A Channel Stability Ass - ONR DM	\$74,678	\$25,172	\$4,568	\$29,741	\$44,937		
WAHM02A Channel Stability Ass - ONR Imp	\$152,600	\$142,500	\$18,507	\$161,006	(\$8,406)		
<b>WAHM03A Herring Island Side</b>	\$479,514	\$325,264	\$4,340	\$329,604	\$149,910	Efficiencies found as outcome of the interim review.	
WAHM03A Herring Island Side - ONR DM	\$141,814	\$42,162	\$4,340	\$46,502	\$95,312		
WAHM03A Herring Island Side - ONR Imp	\$337,700	\$283,102		\$283,102	\$54,598		
<b>WAHW01A Boulder Cr Flow Byp</b>	\$1,330,034	\$291,945	\$4,416	\$296,361	\$1,033,673	Efficiencies found as outcome of the interim review.	
WAHW01A Boulder Cr Flow Byp - ONR DM	\$265,918	\$43,525	\$4,416	\$47,941	\$217,977		
WAHW01A Boulder Cr Flow Byp - ONR Imp	\$283,116	\$179,728	\$0	\$179,728	\$103,388		
WAHW01A Boulder Cr Flow Byp - CAP Imp	\$781,000	\$68,692		\$68,692	\$712,308		
<b>WAHW02A Fertilization Progr</b>	\$1,489,562	\$1,193,317	\$276,862	\$1,470,179	\$19,383	Efficiencies found during project implementation	
WAHW02A Fertilization Progr - ONR DM	\$54,058	\$41,012	\$16,287	\$57,300	(\$3,242)		
WAHW02A Fertilization Progr - ONR Imp	\$1,435,504	\$1,152,304	\$260,575	\$1,412,879	\$22,625		
<b>WAHW03A Lower WAH Channel</b>	\$241,609	\$108,033	\$5,023	\$113,056	\$128,553	Efficiencies found as outcome of the interim review.	
WAHW03A Lower WAH Channel - ONR DM	\$67,659	\$28,005	\$5,023	\$33,029	\$34,630		
WAHW03A Lower WAH Channel - ONR Imp	\$173,950	\$80,028	\$0	\$80,028	\$93,922		

OR - Ordered Remissible  
ONR - Ordered Non-Remissible

\* Red values in parentheses denote overage.