

Columbia River Water Use Plan

Arrow Lakes Reservoir Wildlife Management Plan Physical Works

Annual Report: 2015

Implementation Period: March 2014 to February 2015

- **CLBWORKS-29A Arrow Lakes Reservoir: Wildlife Physical Works Feasibility Study**
- **CLBWORKS-29B Arrow Lakes Reservoir: Study of High-Value Wildlife Habitat for Potential Enhancement and Protection**
- **CLBWORKS-30 Arrow Lakes Reservoir: Implementation of Wildlife Physical Works**

Conditional Water Licences for Kinbasket storage (27068 and 39432), Mica diversion (39431), Revelstoke diversion and storage (47215), and Arrow storage (27066)

March 31, 2015

BC Hydro Columbia River Project Water Use Plan Arrow Lakes Reservoir Wildlife Management Plan Physical Works Annual Report: 2015

1 Introduction

This document represents a summary of the status and the results of the Arrow Lakes Reservoir Wildlife Management Plan Water Use Plan (WUP) physical works to February 2015, as per the Columbia River WUP Order under the *Water Act*, dated January 26, 2007 and the Amended Order dated August 23, 2007. There are two studies and one physical works.

2 Status

The following table outlines the dates that TOR for the Arrow Lakes Reservoir Wildlife Management Plan WUP studies and physical works were submitted to and approved by the CWR.

Table: 2-1: Dates of Arrow Lakes Reservoir Wildlife Management Plan 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
CLBWORKS-29A Arrow Lakes Reservoir Wildlife Physical Works Feasibility Study	Schedule C, Clause 6.a Schedule D, Clause 6.a	Jan 24, 2008	Feb 20, 2008	Apr 30, 2009	Aug 05, 2009
CLBWORKS-29B Arrow Lakes Reservoir Study of High-Value Wildlife Habitat for Potential Enhancement and Protection	Schedule C, Clause 5.h Schedule D, Clause 5.c	Jan 24, 2008	Feb 20, 2008	Apr 15, 2009	May 11, 2009
CLBWORKS-30 Arrow Lakes Reservoir Wildlife Physical Works	Schedule C, Clause 5.h Schedule D, Clauses 5.c and 6	Jun 27, 2011	Aug 02, 2011	Jul 23, 2014	Aug 20, 2014

3 Schedule

The following table (Table 3-1) outlines the current schedule for the WUP studies and physical works being delivered for the Arrow Lakes Reservoir Wildlife Management Plan WUP.

Table 3-1: Table of WUP Schedule

Physical Works	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
	WLR YR1	WLR YR2	WLR YR3	WLR YR4	WLR YR5	WLR YR6 Interim Review	WLR YR7	WLR YR8	WLR YR9	WLR YR10	WLR YR11	WLR YR12	WLR YR13
CLBWORKS - 29A Arrow Lakes Reservoir Wildlife Physical Works Feasibility Study	✓	✓											
CLBWORKS - 29B Arrow Lakes Reservoir Study of High-Value Wildlife Habitat for Potential Enhancement and Protection				✓									
CLBWORKS - 30 Arrow Lakes Reservoir Wildlife Physical Works						✓	✓	■					
Legend: <ul style="list-style-type: none"> ■ = Program to be undertaken/initiated in identified year u/w = Project is underway ✓ = Program completed for the year x = Program started, but encountered operational or hydrological delays 													

4 Physical Works Terms of Reference

The Physical Works being implemented under the Arrow Lakes Reservoir Wildlife Management Plan 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/columbia_river/arrow-wildlife.html

5 Summary of Physical Works

5.1 CLBWORKS-29A Arrow Lakes Reservoir: Wildlife Physical Works Feasibility Study

5.1.1 Status

This feasibility study was initiated in 2008 and completed in 2009.

5.2 CLBWORKS-29B Arrow Lakes Reservoir: Study of High-Value Wildlife Habitat for Potential Enhancement and Protection

5.2.1 Status

This study was initiated and completed in 2011.

5.3 CLBWORKS-30 Arrow Lakes Reservoir: Implementation of Wildlife Physical Works

5.3.1 Status

This physical works project was initiated in 2013. The project identified physical works at three sites: Site 6A at Airport Marsh and Site 14 and Site 15A at Cartier Bay in Revelstoke Reach. The project at Site 6A included construction of a riprap mattress to halt the erosion of the east arm of the outflow channel located near Airport Marsh and Machete Island. The work also included the installation of nest boxes in the Revelstoke Reach area. The proposed project at Site 14 includes filling in the breach in the old CP railway grade to retain water behind the grade and create seasonal shallow open water habitat. The project at Site 15A includes removal of an old collapsed wooden box culvert and reconstruction of the dike to be one metre higher than the present elevation. All projects were identified in the CLBWORKS-29A Arrow Lakes Reservoir Wildlife Physical Works Feasibility Study Phase II report (December 2009).

In the fall of 2013, the project at Site 6A was completed. The final Site 6A –Airport Outflow –As Built Report (February, 12, 2014) is attached. Also attached is the Technical Memorandum for Site 6A—Airport Outflow (February 12, 2015) that describes the consultant’s recommended monitoring and maintenance plan for the completed project.

In the spring of 2014, the initiation of the projects at Sites 14 and 15A in Cartier Bay was delayed pending an Ecological Impact Assessment (EIA) to investigate concerns raised by stakeholders about the risks of the proposed projects. The Ecological Impact Assessment – Wildlife Physical Works Projects 14 and 5A (March 26, 2015) is attached, in addition to a peer review entitled the Cartier Bay Wildlife Enhancements Review – CLBWORKS-30 Sites 14 and 15A (November, 2014).

The EIA concluded that it is very uncertain whether the proposed projects would create net ecological benefits. Additionally, as the habitat in the existing wetland already has high ecological values, particularly at Site 15A, the proposed works could put those values at risk.

BC Hydro is reviewing the implications of the EIA and will submit a Terms of Reference addendum by May 29, 2015.

6 Studies and Physical Works Costs

The following table summarizes the Arrow Lakes Reservoir Wildlife Management Plan WUP studies and physical works costs approved by the Comptroller and the Actual Costs to February 28, 2015.

Table 6-1: Arrow Lakes Reservoir Wildlife Management Plan WUP 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
C07 Prepare Annual Report	\$4,889	\$2,321	\$884	\$3,205	\$1,684	Efficiencies found during project implementation	No corrective action.
C07W29A Arrow Feas - OR	\$243,085	\$243,085	\$0	\$243,085	(\$1,031)	Project complete	No corrective action.
C07W29A Arrow Feas - OR DM	\$34,038	\$35,586	\$0	\$35,586	(\$1,548)		
C07W29A Arrow Feas - OR Imp	\$208,016	\$206,468	\$0	\$206,468	\$1,548		
C07W29A Arrow Feas - ONR DM Overspend	\$1,031	\$1,031		\$1,031	(\$1,031)		
C07W29B ARR High Value	\$81,045	\$61,078	\$0	\$61,078	\$19,967	Project complete	No corrective action.
C07W29B ARR High Value - OR DM	\$15,387	\$1,078	\$0	\$1,078	\$14,309		
C07W29B ARR High Value - OR Imp	\$65,658	\$60,000	\$0	\$60,000	\$5,658		
C07W30A ARR Wildlife Pw	\$1,185,571	\$949,072	\$96,393	\$1,045,466	\$140,105	Reported costs include completion of Site 6A, Ecological Impact Assessment and other completed detailed design and project management costs for Sites 14 and 15A.	Terms of Reference following the EIA will be submitted by May 2015 and the Estimate to Complete (Forecast) will be revised accordingly.
C07W30A ARR Wildlife Pw - OR DM	\$192,110	\$90,849	\$21,393	\$112,242	\$79,868		
C07W30A ARR Wildlife Pw - OR Imp	\$993,461	\$858,223	\$75,000	\$933,223	\$60,238		

OR - Ordered Remissible
 ONR - Ordered Non-Remissible

* Red values in parentheses denote overage.