

# **Columbia River Project Water Use Plan**

## **Kinbasket and Arrow Recreational Management Plan**

### **Monitoring Program and Physical Works**

#### **Annual Report: 2017**

#### **Implementation Period: January 2016 to December 2016**

- **CLBMON-14 Boat Ramp Use Study**
- **CLBWORKS-4 Kinbasket: Bulldog Creek New Ramp**
- **CLBWORKS-5A Kinbasket: Valemount Marina Ramp Extension**
- **CLBWORKS-5B Kinbasket: Valemount Ramp Maintenance**
- **CLBWORKS-6A Kinbasket: Nixon Creek Ramp**
- **CLBWORKS-6B Kinbasket: Nixon Creek Ramp Maintenance**
- **CLBWORKS-7A Kinbasket: Bush Harbour Ramp Extension**
- **CLBWORKS-7B Kinbasket: Bush Harbour Ramp Maintenance**
- **CLBWORKS-9 Revelstoke Ramp Extend or Build**
- **CLBWORKS-11A Arrow: Burton New Ramp**
- **CLBWORKS-11B Arrow: Burton New Ramp Maintenance**
- **CLBWORKS-12A Arrow: Edgewood Ramp Extension**
- **CLBWORKS-12B Arrow: Edgewood Ramp Maintenance**
- **CLBWORKS-13A Arrow: Fauquier Ramp Extension**
- **CLBWORKS-13B Arrow: Fauquier Ramp Maintenance**
- **CLBWORKS-14A Arrow: McDonald Creek Park Ramp Extension**
- **CLBWORKS-14B Arrow: McDonald Creek Park Ramp Maintenance**
- **CLBWORKS-16 Kinbasket: Debris Inventory, Management Strategy and Removal**
- **CLBWORKS-17 Arrow: Debris Inventory, Management Strategy and Removal**
- **CLBWORKS-18 Kinbasket & Arrow: Feasibility of Boat Ramps**
- **CLBWORKS-19 Lower Columbia: Indian Eddy Dredging Environmental and Engineering Assessment**
- **CLBWORKS-20 Lower Columbia: Indian Eddy Dredging**
- **CLBWORKS-21 Lower Columbia: Indian Eddy Debris Removal Environmental Review**
- **CLBWORKS-22 Lower Columbia: Indian Eddy Debris Removal**
- **CLBWORKS-23 Kinbasket & Arrow: Debris Removal Environmental Review**
- **CLBWORKS-32 Anderson New Ramp (Renata)**
- **CLBWORKS-33A Arrow: Syringa Ramp**
- **CLBWORKS-33B Arrow: Syringa Ramp Maintenance**
- **CLBWORKS-35 Mid-Columbia: Bank Erosion Protection and Monitoring Program**
- **CLBWORKS-36 Mid-Columbia: Long-term Erosion Monitoring Program**
- **CLBWORKS-40 Kinbasket: Site Preparation and Debris Work**
- **CLBWORKS-41 Kinbasket: Floating Debris Removal**

**January 31, 2017**

- **CLBWORKS-43A Nakusp Boat Ramp**
- **CLBWORKS-43B Nakusp Boat Ramp Maintenance**
- **CLBWORKS -45 Anderson Maintenance**
- **CLBWORKS-50A Shelter Bay Boat Ramp**
- **CLBWORKS-50B Shelter Bay Boat Ramp Maintenance**

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

## **BC Hydro Columbia River Project Water Use Plan Kinbasket and Arrow Reservoir Recreational Management Plan Annual Report: 2017**

### **1 Introduction**

This document represents a summary of the status and the results of the Kinbasket and Arrow Reservoir Recreational Management Plan Water Use Plan (WUP) monitoring programs and physical works to December 31, 2016, as per the Columbia River Order under the *Water Act*, dated January 26, 2007. There is one monitoring program and 25 physical works.

### **2 Status**

The following table outlines the dates that Terms of Reference (TOR) for the Kinbasket and Arrow Reservoir Recreational Management Plan WUP monitoring program and physical works were submitted to and approved by the Comptroller of Water Rights (CWR).

**Table: 2-1: Dates of Kinbasket and Arrow Reservoir Recreational 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
CLBMON-14 Boat Ramp Use Study	Conditional, 2(b), 6(b)	Nov 13, 2009	Dec 17, 2009	Mar 31, 2016	Apr 08, 2016
CLBWORKS-4 Kinbasket: Bulldog Creek New Ramp	Conditional, 2(a)	Oct 24, 2007	Not Ordered Mar 03, 2008		
CLBWORKS-5A Kinbasket: Valemount Marina Ramp Extension	Conditional, 2(a)	Oct 24, 2007	Mar 03, 2008	May 28, 2015	Jun 09, 2015
CLBWORKS-5B Kinbasket: Valemount Marina Ramp Maintenance	Conditional, 2(a)	Oct 24, 2007	Mar 03, 2008	May 28, 2015	Jun 09, 2015
CLBWORKS-6A Kinbasket: Nixon Creek Ramp	Conditional, 2(a)	Oct 24, 2007	Mar 03, 2008	Jun 22, 2009	Sep 18, 2009
CLBWORKS-6B Kinbasket: Nixon Creek Ramp Maintenance	Conditional, 2(a)	Oct 24, 2007	Mar 03, 2008	Jun 22, 2009	Sep 18, 2009
CLBWORKS-7A Kinbasket: Bush Harbour Ramp Extension	Conditional, 2(a)	Oct 24, 2007	Mar 03, 2008	Jun 24, 2013	Jul 16, 2013
CLBWORKS-7B Kinbasket: Bush Harbour Ramp Extension	Conditional, 2(a)	Oct 24, 2007	Mar 03, 2008	Jun 24, 2013	Jul 16, 2013
CLBWORKS-9 Revelstoke Ramp Extend or Build	Conditional, 3(a)	Oct 24, 2007	Mar 03, 2008	Cancelled	Mar 14, 2011
CLBWORKS-11A Arrow: Burton New Ramp	Clause M (ONR)	Jul 25, 2007	Aug 29, 2007	Jan 07, 2015	Feb 05, 2015
	Schedule D.4	Jul 25, 2007	Aug 29, 2007	Jan 07, 2015	Feb 05, 2015
CLBWORKS-11B Arrow: Burton Ramp Maintenance	Clause M (ONR)	Jul 25, 2007	Aug 29, 2007	Jun 24, 2013	Jul 16, 2013
	Schedule D.4	Jul 25, 2007	Aug 29, 2007	Jun 24, 2013	Jul 16, 2013
CLBWORKS-12A Arrow: Edgewood Ramp	Clause M (ONR)	Apr 02, 2013	Apr 24, 2013	Aug 24, 2015	Aug 28, 2015
	Schedule D.4	Mar 02, 2012	Jul 26, 2012	Jan 20, 2015	Feb 05, 2015
CLBWORKS-12B Arrow: Edgewood Ramp Maintenance	Clause M (ONR)	Apr 02, 2013	Apr 24, 2013	Aug 24, 2015	Aug 28, 2015

**Table 2 cont'd**

Monitoring Program & Physical Works TOR	Order Clause	Original ToR Submission		Most Recent ToR Resubmission	
		Date Submitted	Date Approved	Date Submitted	Date Approved
CLBWORKS-13A Arrow: Fauquier Ramp Extension	Clause M (ONR)	Jul 25, 2007	Aug 29, 2007	Jan 07, 2015	Feb 04, 2015
	Schedule D.4	Jul 25, 2007	Aug 29, 2007	Mar 02, 2012	Jul 26, 2012
CLBWORKS-13B Arrow: Fauquier Ramp Maintenance	Clause M (ONR)	Jun 22, 2009	Sep 18, 2009	Jan 07, 2015	Feb 04, 2015
CLBWORKS-14A Arrow: McDonald Creek Park Ramp Extension	Clause M (ONR)	Jul 25, 2007	Aug 29, 2007	Jan 07, 2015	Feb 04, 2015
	Schedule D.4	Jul 25, 2007	Aug 29, 2007	Feb 19, 2014	May 08, 2014
CLBWORKS-14B Arrow: McDonald Creek Park Ramp Extension	Clause M (ONR)	Jul 25, 2007	Aug 29, 2007	Jan 07, 2015	Feb 04, 2015
CLBWORKS-16 Kinbasket: Debris Inventory, Management Strategy and Removal	(ONR) Conditional, 1(a)(b)	Nov 20, 2008	Nov 28, 2008	Sep 04, 2015	Dec 23, 2015
	Conditional, 1(a)(b)	Oct 26, 2007	Mar 05, 2008	Sep 04, 2015	Dec 23, 2015
CLBWORKS-17 Arrow: Debris Inventory, management Strategy and Removal	(ONR) Conditional, 5(a)(b)	Oct 26, 2007	Mar 05, 2008	Sep 04, 2015	Dec 23, 2015
	Conditional, 5(a)(b)	Oct 26, 2007	Mar 05, 2008	Sep 04, 2015	Dec 23, 2015
CLBWORKS-18 Kinbasket & Arrow: Feasibility of Boat Ramps	Schedule A, 4(a) Schedule C, 3(a) Schedule D, 4(a)	Apr 20, 2007	May 03, 2007	Mar 19, 2012	Not approved per letter of Jul 30, 2012
CLBWORKS-19 Lower Columbia: Indian Eddy Dredging Environmental and Engineering Assessment	Schedule E, 4(a)	Jul 24, 2007	Aug 29, 2007	Feb 02, 2009	Mar 26, 2009
CLBWORKS-20 Lower Columbia: Indian Eddy Dredging	Conditional, 8(a)	Sep 13, 2010	Nov 10, 2010 approval to develop TOR	Nov 14, 2016	Jan 27, 2017
CLBWORKS-21 Lower Columbia: Indian Eddy Debris Removal Environmental Review	Schedule E, 1(a)	Jul 24, 2007	Aug 29, 2007		
CLBWORKS-22 Lower Columbia: Indian Eddy Debris Removal	Conditional, 8(b)	Jun 25, 2009	Jul 13, 2009	-	-
CLBWORKS-23 Kinbasket & Arrow: Debris Removal Environmental Review	Schedule E, 1(b)	Apr 27, 2007	May 03, 2007	-	-
CLBWORKS-32 Arrow: Renata New Ramp (Anderson)	Schedule D.4	Nov 13, 2009	Mar 15, 2010	Nov 17, 2015	Dec 03, 2015
CLBWORKS-33A Arrow: Syringa Ramp (New)	Clause M (ONR)	Jan 22, 2015	Feb 04, 2015	Feb 25, 2015	Feb 27, 2015
	Schedule D.4	Nov 13, 2009	Not Approved per letter of Mar 15, 2010		
CLBWORKS-33B Arrow: Syringa Maintenance	Clause M (ONR)	not submitted yet			
CLBWORKS-35 Mid-Columbia: Bank Erosion Protection and Monitoring Program	Amended Order, 2(a)	Jul 31, 2008	Sep 11, 2008	Mar 23, 2011	May 16 2011
CLBWORKS-36 Mid-Columbia: Long-term erosion monitoring program	Amended Order, 2(d)	Jul 31, 2008	Sep 11, 2008		
CLBWORKS-40 Kinbasket: Site Preparation and Debris Work	(ONR)	Mar 12, 2008	Mar 28, 2008	Dec 12, 2008	Dec 16, 2008
		Mar 12, 2008	Mar 28, 2008	Dec 12, 2008	Dec 16, 2008

**Table 2 cont'd**

Monitoring Program & Physical Works TOR	Order Clause	Original ToR Submission		Most Recent ToR Resubmission	
		Date Submitted	Date Approved	Date Submitted	Date Approved
CLBWORKS-41 Kinbasket: Floating Debris Removal	Conditional, 1(c)	Mar 12, 2008	Mar 28, 2008	Dec 12, 2008	Dec 16, 2008
CLBWORKS-43A Nakusp Boat Ramp	Clause M (ONR)	Apr 02, 2013	Apr 16, 2013	Jan 12, 2015	Feb 04, 2015
CLBWORKS-43B Nakusp Boat Ramp Maintenance	Clause M (ONR)	Apr 02, 2013	Apr 16, 2013	Jan 12, 2015	Feb 04, 2015
CLBWORKS-45 Renata (Anderson) Boat Ramp Maintenance	Schedule D.4	Nov 13, 2009	Mar 15, 2010	Nov 17, 2015	Dec 03, 2015
CLBWORKS-50A Shelter Bay	Clause M (ONR)	Jan 22, 2015	Feb 04, 2015	Sep 24, 2015	Oct 01, 2015
CLBWORKS-50B Shelter Bay Maintenance	Clause M (ONR)	not submitted yet			

### 3 Schedule

The following table outlines the current schedule for the monitoring programs and physical works being delivered for the Kinbasket and Arrow Reservoir Recreational Management Plan WUP.

**Table 3-1: Monitoring Programs and Physical Works Schedule as of December 31, 2016.**

Monitoring Programs	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
	WLR YR1	WLR YR2	WLR YR3	WLR YR4	WLR YR5	WLR YR6	WLR YR7	WLR YR8	WLR YR9	WLR YR10	WLR YR11	WLR YR12	WLR YR13
CLBMON-14 Boat Ramp Use Study				✓	✓	✓	✓			✓	■	■	■
<b>Physical Works</b>													
CLBWORKS-5A Kinbasket: Valemout Marina Extend Ramp					✓	✓	✓			✓			
CLBWORKS-5B Kinbasket: Valemout Marina Maintenance						✓	✓	✓	✓	✓	■	■	■
CLBWORKS-6A Kinbasket: Nixon Creek Ramp <b>Ramp not Ordered</b>													
CLBWORKS-6B Kinbasket: Nixon Creek Ramp Maintenance					✓	✓	✓	✓	✓	✓	■	■	■
CLBWORKS-7A Kinbasket: Bush Harbour Ramp				✓	✓	✓	✓						
CLBWORKS-7B Kinbasket: Bush Harbour Maintenance					✓	✓	✓	✓	✓	✓	■	■	■
CLBWORKS-9 Revelstoke Ramp Upgrade <b>Ramp not Ordered</b>				✓									
CLBWORKS-11A Arrow: Burton New Ramp				✓	✓	✓	✓	✓	✓				
CLBWORKS-11B Arrow: Burton New Ramp Maintenance					✓	✓	✓	✓	✓	✓	■	■	■
CLBWORKS-12A Arrow: Edgewood Ramp Extension - Clause M							✓		✓				
CLBWORKS-12B Arrow: Edgewood Ramp Extension Maintenance								✓	✓	✓	■	■	■

Table 3-2: cont'd

Monitoring Programs	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
	WLR YR1	WLR YR2	WLR YR3	WLR YR4	WLR YR5	WLR YR6	WLR YR7	WLR YR8	WLR YR9	WLR YR10	WLR YR11	WLR YR12	WLR YR13
CLBWORKS-13A Arrow: Fauquier Ramp Extension - Clause M				✓	✓				✓				
CLBWORKS-13B Arrow: Fauquier Ramp Maintenance						✓	✓	✓	✓	✓	■	■	■
CLBWORKS-14A Arrow: McDonald Ramp Extension - Clause M				✓	✓			✓	✓				
CLBWORKS-14B Arrow: McDonald Ramp Extension Maintenance						✓	✓	✓	✓	✓	■	■	■
CLBWORKS-16 Kinbasket: Debris Inventory, Management Strategy and Removal		✓	✓	✓	✓	✓	✓	✓	✓	✓	■	■	
CLBWORKS-17 Arrow: Debris Inventory, Management Strategy and Removal		✓	✓	✓	✓	✓	✓	✓	✓	✓	■	■	
CLBWORKS-18 Feasibility of Boat Ramps	✓	✓	✓F										
CLBWORKS-19 Lower Columbia: Indian Eddy Dredging Environmental and Engineering Assessment	✓	✓	✓F										
CLBWORKS-20 Lower Columbia: Indian Eddy Dredging								x	✓	✓			
CLBWORKS-21 Lower Columbia: Indian Eddy Debris Removal Environmental Review		✓	✓F										
CLBWORKS-22 Lower Columbia: Debris Removal at Indian Eddy			x	✓	✓	✓	✓	✓	✓	✓	■	■	■
CLBWORKS-23 Kin and Arrow: Debris Removal Environmental Review	✓	✓F											
CLBWORKS-32 Arrow: Renata New Ramp						✓	✓	✓	✓				
CLBWORKS-33A Arrow: Syringa New Ramp <sup>1</sup>									✓				
CLBWORKS-33B Arrow: Syringa New Ramp Maintenance											■	■	■
CLBWORKS-35 Mid Columbia Bank Erosion Protection and Monitoring				✓	✓	✓	✓		✓				
CLBWORKS-36 Mid Columbia Long Term Erosion Monitoring			✓	✓	✓	✓		✓		✓			
CLBWORKS-40 Site Prep and Debris Work		✓	✓	✓	✓F								
CLBWORKS-41 Kinbasket: Floating Debris Removal													
CLBWORKS-43A Nakusp Boat Ramp							✓	✓	✓	✓			
CLBWORKS-43B Nakusp Boat Ramp									✓	✓	■	■	■
CLBWORKS-45 Anderson Maintenance									✓	✓	■	■	■
CLBWORKS-50A Shelter Bay Boat Ramp									✓	✓			
CLBWORKS-50B Shelter Bay Boat Ramp Maintenance											■	■	■

<sup>1</sup> Project formerly labelled as CLBWORKS-33 Syringa referred to a WUP project that was never ordered. The name and number was reused for the clause (m) required project at Syringa Park.

Legend:	■	=	Program to be undertaken/initiated in identified year
	✓	=	Program completed for the year
	x	=	Program started, but encountered operational or hydrological delays
	✓F	=	All field work for this project is complete. No further field work is planned.
	PCR	=	Project Completion Report submitted

## **4 Monitoring Programs and Physical Works Terms of Reference**

The monitoring programs and physical works being implemented under the Kinbasket and Arrow Reservoir Recreational 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/kinbasket-recreation.html](http://www.bchydro.com/about/sustainability/conservation/water_use_planning/southern_interior/columbia_river/kinbasket-recreation.html)

## **5 Status of Monitoring Programs**

### **5.1 CLBMON-14 Boat Ramp Use Study**

The objective of CLBMON-14 is to monitor boat launch traffic and use in-person surveys to measure the general public's satisfaction and use of upgraded boat launches on both Kinbasket and Arrow Reservoirs.

This monitoring program was initiated in 2010. The Mid-term report which covers study Years 1 through 4 was submitted with the 2015 Annual Report. The results from the Mid-term report suggest that visitors are very satisfied with the boat launch upgrades. However, the upgrades have had a mixed effect on visitor use (i.e., some launches show an increase in use, while others saw no change and one ramp showing a decline in use). These results are based on limited post-construction data and were confounded with the construction activity.

Both traffic monitoring and survey work were stopped after the 2013 recreation season. Traffic monitoring resumed in 2016 after all the boat launch upgrades were completed. The in-person survey monitoring will resume in 2017. The summary report of the 2016 traffic monitoring will be submitted with the next Annual Report.

## **6 Status of Physical Works**

### **6.1 CLBWORKS-5A Kinbasket: Valemount Marina Ramp Extension**

Under Clause (m) of Conditional Water Licence 27068, BC Hydro is required to provide reservoir access at Valemount. The Valemount Marina site is located on the eastern shore of the northern-most end of the Kinbasket Reservoir. It is located approximately 24 km off Highway 5.

Following the feasibility study dated October 5, 2007 (CLBWORKS-18)<sup>1</sup>, the CWR approved the initial design at Valemount to extend the ramp from the existing toe at El. 732.7 m (2403.9 ft.) to El. 730.0 m (2395 ft.) which would require dredging. On September 18, 2009, following further community input, the CWR approved an alternative two-stage ramp with no dredging to provide access to El. 727 m (2385 ft. lower ramp) and El. 734 m (2408 ft. upper ramp) with a concrete turnaround.

The majority of the construction was completed in 2011 following delays due to high water. The CWR approved cost increases on February 25, 2013, and further ramp construction was completed in 2013 and the CWR was advised the ramp was constructed to El. 727.6 m (2387.1 ft.). The ramp elevation will be confirmed by survey when water levels permit.

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<sup>1</sup> Submitted to the CWR January, 2008.

On June 9, 2015, the CWR approved the replacement of the boarding floats (walkway). The work was completed prior to the 2016 recreation season.

## **6.2 CLBWORKS-5B Kinbasket: Valemount Marina Maintenance**

BC Hydro will continue to provide maintenance on access-related facilities at the Valemount boat launch as per the Kinbasket and Arrow Recreation Management Plan Maintenance Plan 2017 submitted January 30, 2017. The maintenance budget for Valemount was approved by the CWR on March 3, 2008. An updated maintenance TOR is currently being developed.

## **6.3 CLBWORKS-6A Kinbasket: Nixon Creek Ramp**

Under Clause (m) of Conditional Water Licence 27068, BC Hydro is required to provide reservoir access at Nixon Creek.

The Nixon Creek boat launch is located approximately 93 km from the turn-off to Donald which is a westbound exit off Highway 1 when headed towards Revelstoke from Golden. It is a gravel ramp. The upper ramp has a natural slope of 7% that provides water level access to the reservoir from El. 764 m (2506.6 ft.) to El. 733.0 m (2404.9 ft.) and has a natural slope of approximately 15% from 733.0 m (2404.9 ft.), to El. 713.5 m (2340.9ft.).

The feasibility evaluation for a concrete ramp to El. 712.1 m was included in the October 5, 2007 report (CLBWORKS-18)<sup>2</sup>. The Nixon Creek ramp upgrades were considered not feasible due to long term site access concerns. The current Forest Service Road was not being maintained by the tenure holder, and there was a concern for public safety access to the boat launch via this road in the future.

In the letter dated March 3, 2008, the CWR did not approve the significant upgrades at this location, but approved regrading of the existing gravel ramp. The re-grading work was completed in 2011.

## **6.4 CLBWORKS-6B Kinbasket: Nixon Creek Ramp Maintenance.**

BC Hydro will continue to provide maintenance on access-related facilities at the Nixon Creek boat launch as per the Kinbasket and Arrow Recreation Management Plan Maintenance Plan 2017 submitted January 30, 2017. BC Hydro will continue to provide annual cleanup of the gravel ramp at Nixon Creek. The maintenance budget was approved by the CWR on March 3, 2008. An updated maintenance TOR is currently being developed.

## **6.5 CLBWORKS-7A Kinbasket: Bush Harbour Ramp Extension**

Under Clause (m) of Conditional Water Licence 27068, BC Hydro is required to provide reservoir access at Bush Harbour. The Bush Harbour site is located approximately 42 km from the exit to Donald – a westbound exit off Highway 1 when headed towards Revelstoke from Golden. In 2007, the elevation of the boat ramp was El. 734.6 m (2410.1 ft.).

The feasibility design was included in the October 5, 2007, report (CLBWORKS-18)<sup>3</sup> and design phase work was approved March 3, 2008. On September 18, 2009, the

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<sup>2</sup> Submitted to the CWR January, 2008.

<sup>3</sup> Submitted to the CWR January, 2008.



CWR approved construction on the Bush Harbour launch which included extension of the concrete ramp to El. 724.6 m (2377.3 ft.), concrete turnaround, floating walkway, breakwaters, parking lot, and toilet.

Construction for these works occurred between 2011 and May 2013. The ramp elevation will be confirmed by survey in 2017, water levels permitting.

#### **6.6 CLBWORKS-7B Kinbasket: Bush Harbour Ramp Maintenance**

BC Hydro will continue to provide maintenance on access-related facilities at the Bush Harbour boat launch as per the Kinbasket and Arrow Recreation Management Plan Maintenance Plan 2017 submitted January 30, 2017. Maintenance responsibilities for non-access facilities are currently being reviewed. The maintenance budget was approved by the CWR on July 16, 2013. An updated maintenance TOR is currently being developed.

#### **6.7 CLBWORKS-9 Revelstoke Ramp Extend or Build (Not Ordered)**

The Revelstoke boat launch is also known as Centennial Park boat launch. The Centennial Park boat launch is located in the City of Revelstoke near the ball park fields of Centennial Park and is located on property owned by the City. The launch is approximately 8 km downstream of the Revelstoke Dam.

The feasibility study for the Centennial Park launch upgrade was included in the October 5, 2007, feasibility report (CLBWORKS-18)<sup>3</sup>. The preliminary designs explored the possibility of extending the ramp, and improving safety by realigning the ramp to reduce its exposure to river currents. In a letter dated September 18, 2009, the CWR approved the preliminary designs.

However, BC Hydro was unable to enter into an agreement with the landowner for the upgrades. The City of Revelstoke, as the landowner, continued to have concerns about safety of the ramp usage even with the revised design. By letter dated January 21, 2011, the City of Revelstoke requested the CWR re-evaluate its decision regarding improvements at Centennial Boat Ramp due to ongoing safety concerns.

Subsequently, by letter dated March 14, 2011, the CWR relieved BC Hydro of the obligation to refurbish the Centennial Park ramp. No further work is required.

#### **6.8 CLBWORKS-11A Arrow: Burton New Ramp**

Under Clause (m) of Conditional Water Licence 27066, BC Hydro is required to provide reservoir access at Burton. The original Burton launch was located within the Burton Historical Park (formerly a Provincial Park) near the community of Burton, 32 km south of Nakusp. This original ramp, with a toe elevation of El. 431 m (1414 ft.), is located on the northern end of the park, with a turnaround and parking.

The feasibility report report dated July 13, 2007, (CLBWORKS-18)<sup>4</sup> explored two alternative sites in addition to the extension and upgrade of existing ramp within Burton Historic Park, and recommended a greenfield site located approximately 5 km south of Burton. The alternative site was suitable due to the natural slope of the foreshore, access to deeper lake bed elevations, and minimal environmental

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<sup>4</sup> Submitted to the CWR January, 2008.

impacts. On September 18, 2009, the CWR approved the design and implementation phase for the Burton (South) alternative.

The CWR confirmed the budget and final design requirements on February 5, 2015. The site design includes a ramp of El. 425.5 m (1396 ft.), with an access road from the highway, parking lot, turnaround, walkway and breakwater.

Construction took place between 2010 and 2015 and was completed in April 2015 with the ramp toe elevation of El. 425.4 m (1395.7 ft.).

#### **6.9 CLBWORKS-11B Arrow: Burton Maintenance**

BC Hydro will continue to provide maintenance on access- and non-access related facilities at the Burton boat launch as per the Kinbasket and Arrow Recreation Management Plan Maintenance Plan 2017 submitted January 30, 2017, as BC Hydro holds the Licence of Occupation. The maintenance budget for Burton was approved by the CWR office on July 16, 2013. An updated maintenance TOR is currently being developed.

#### **6.10 CLBWORKS-12A Arrow: Edgewood Ramp Extension**

Under Clause (m) of Conditional Water Licence 27066, BC Hydro is required to provide reservoir access at Edgewood. The boat launch at Edgewood is located in the Provincial Park near the community of Edgewood. The concrete ramp is constructed to El. 425.76 m (1396.7 ft.)

The feasibility designs for the Edgewood boat launch improvements are included in the report dated July 13, 2007 (CLBWORKS-18)<sup>4</sup>. The report included evaluation of options to extend the ramp to the Consultative Committee (CC) recommended level of 423.7 m, including an evaluation of alternative locations. Due to the contours of the reservoir floor at the reviewed locations, it was determined infeasible to extend the concrete ramp further without the need for regular ongoing and expensive dredging. Consequently, the design incorporated a gravel transition at the end of the existing concrete ramp to facilitate low water launching.

On April 23, 2013, the CWR approved the agreed conceptual design and cost estimates for erosion reinforcement of the existing concrete ramp with a gravel transition to the floor of the reservoir, the addition of breakwaters and, replacement of the floating walkway.

In 2013, Columbia Power Corporation completed the installation of the walkway, floating breakwaters and upper ramp reinforcements. Work was postponed in 2014 due to high water.

Discussions with the community were undertaken related to concerns about any possible impacts of Eagle Creek on the ramp. No impacts were identified.

In late 2014, the community expressed a safety concern regarding the anchor blocks for the southern floating breakwater becoming a hazard when exposed at low water. Following community meetings and redesign work in late 2014 and early 2015, BC Hydro received approval from the CWR on August 28, 2015, for an agreed design to relocate the southern breakwater.

The ramp reinforcement and walkway work was completed in spring 2015 to an elevation of El. 425.76 m (1396.9 ft.), with gravel transition. The southern breakwater was moved to a new location between the ramp and the spit in October 2015.

### **6.11 CLBWORKS-12B Arrow: Edgewood Ramp Maintenance**

BC Hydro will continue to provide access-related maintenance at this location as per the Kinbasket and Arrow Recreation Management Plan Maintenance Plan 2017 submitted January 30, 2017. The maintenance budget for Edgewood was approved by the CWR office on February 5, 2015. An updated maintenance TOR is currently being developed.

### **6.12 CLBWORKS-13A Arrow: Fauquier Ramp Extension**

Under Clause (m) of Conditional Water Licence 27066, BC Hydro is required to provide reservoir access at Fauquier. The Fauquier boat launch is located in Fauquier Provincial Park, off Highway 6 just north of Fauquier Creek and a 45-minute drive to Nakusp. The ramp toe reaches elevation El. 424.7 m (1393.4 ft.).

The feasibility report for Fauquier dated July 13, 2007, under CLBWORKS-18<sup>5</sup> identified a low water option to elevation El 419.7 m (1376.9 ft) as recommended by the CC. This option required the creation and maintenance of a dredged channel to access the concrete ramp due to the reservoir contours at the location.

On September 8, 2009, the CWR approved the installation of floating walkways, breakwaters and access ramp, as well as the extension, based on preliminary cost estimates. In 2010 and 2011, BC Hydro installed a floating walkway, two breakwaters and an access ramp for the floating walkway.

On February 4, 2015, following BC Hydro's resubmissions on the feasibility of dredging a channel for a low water ramp access, the CWR confirmed the existing elevation of 424.7 m (1393.4 ft.) meets the water licence requirement.

Some adjustments to the breakwater placement were completed by BC Hydro in 2015.

### **6.13 CLBWORKS-13B Arrow: Fauquier Ramp Maintenance**

BC Hydro will continue to provide maintenance on access-related facilities at this location as per the Kinbasket and Arrow Recreation Management Plan Maintenance Plan 2017 submitted January 30, 2017. The maintenance budget for Fauquier was approved by the CWR on February 5, 2015. An updated maintenance TOR is currently being developed.

### **6.14 CLBWORKS-14A Arrow: McDonald Creek Park Ramp Extension**

Under Clause (m) of Conditional Water Licence 27066, BC Hydro is required to provide reservoir access at McDonald Creek. McDonald Creek boat launch is located in McDonald Creek Provincial Park, located approximately 12 km south of Nakusp. The end of the ramp at McDonald Creek was at El. 429.2 m (1408.1 ft.) at the time of the July 13, 2007, feasibility report (CLBWORKS-18)<sup>6</sup>.

On September 18, 2009, (and February 4, 2015) BC Hydro received approval on the design and installation of the floating walkway and breakwaters, as well as approval for ramp extension and turnaround.

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<sup>5</sup> Submitted to the CWR January, 2008.

<sup>6</sup> Submitted to the CWR January, 2008. The level was surveyed in February 2014.

In 2010, BC Hydro installed the piles for the floating walkway. In spring 2014, the scour protection on the existing ramp and floating walkway were installed as well as the turnaround.

With low water in 2015, the extension of the ramp to El. 426 m (1397.6 ft.) was completed, with the installation of a creek diversion on the north side of the ramp, and two floating breakwaters.

#### **6.15 CLBWORKS-14B Arrow: McDonald Creek Park Ramp Maintenance**

BC Hydro will continue to provide maintenance on access-related facilities at this location as per the Kinbasket and Arrow Recreation Management Plan Maintenance Plan 2017 submitted January 30, 2017. The maintenance budget for McDonald Creek Park was approved by the CWR on September 18, 2009. An updated maintenance TOR is currently being developed.

#### **6.16 CLBWORKS-16 Kinbasket: Debris Inventory, Management Strategy and Removal**

Debris removal estimates for the Kinbasket Reservoir over the past few years include:

- 2013 – 50,000 m<sup>3</sup>
- 2014 – 35,000 m<sup>3</sup>
- 2015 – 38,540 m<sup>3</sup>
- 2016 – 25,240 m<sup>3</sup>

Following completion of the debris removal session for 2016, an estimated 421,886 m<sup>3</sup> of woody debris remains in the Kinbasket system. In 2016, we also collected an additional 24,000 m<sup>3</sup> of woody debris which is being stored in the reservoir for burning in 2017. We will also be building additional boom sticks in 2017. There is no need to update the debris inventory at this time.

BC Hydro's Reservoir Archaeology Program (RAP) has identified a number of new sites in the upper reservoir that may affect how we remove woody debris from these sites in the future.

An updated debris removal strategy was developed in 2015 in consultation with the Golden and Valemount Debris Committees, and submitted to the CWR in September 2015. The third phase of the debris program was approved in December 2015 for implementation in 2016, 2017 and 2018.

#### **6.17 CLBWORKS-17 Arrow: Debris Inventory, Management Strategy and Removal**

Debris removal estimates for the Arrow Reservoir over the past few years include:

- 2013 – 23,319 m<sup>3</sup>
- 2014 – 9,900 m<sup>3</sup>
- 2015 – 4,100 m<sup>3</sup>
- 2016 – 4,200 m<sup>3</sup>

Following completion of the debris removal session for 2016, an estimated 130,502 m<sup>3</sup> of woody debris remains in the Arrow Lakes system.

An updated debris removal strategy was developed in 2015 in consultation with the Arrow Lakes Debris Committees, and submitted to the CWR in September 2015. The

second phase of the debris program was approved in December 2015 for implementation in 2016, 2017 and 2018.

**6.18 CLBWORKS-18 Kinbasket and Arrow: Feasibility of Boat Ramps**

This project was completed in December 2009.

**6.19 CLBWORKS-19 Lower Columbia: Indian Eddy Dredging Environmental and Engineering Assessment**

This project was completed in September 2009.

**6.20 CLBWORKS-20 Lower Columbia: Indian Eddy Dredging**

In 2010, the CWR approved the development of a Terms of Reference for a two-phased approach, in which the first phase was to develop a detailed dredging and material disposal plan including more extensive sampling of the sediment and an assessment of risk. If the risks were deemed acceptable, BC Hydro would submit a second phase Terms of Reference for approval for the actual dredging works. BC Hydro began drafting the Terms of Reference in 2011/2012 and was not completed due to a reorganization and resource constraints.

When BC Hydro restarted the work on the TOR submission in 2014, BC Hydro became aware of groundwater contamination emptying into the site and temporary physical works put in place by Teck Resources Ltd. that will remain until a permanent solution is in place.

The Definition Phase Terms of Reference for the Lower Columbia Indian Eddy Dredging was approved on September 8, 2015. Task One (the bathymetric survey) and Task Two (stakeholder engagement) has been completed.

Based on the findings of the Year 1 report it was determined that dredging at the Indian Eddy would not be required as it does not pose a risk to public safety related to boat access at this time. A letter requesting relief of the WUP obligation to implement a dredging program to maintain safe boat access to the Columbia River at Indian Eddy Boat Launch locate in Trail, BC was sent to CWR in November, 2016. The CWR granted relief on January 27, 2017.

Attached is the Year 1 (2015) report dated February 29, 2016.

**6.21 CLBWORKS-21 Lower Columbia: Indian Eddy Debris Removal Environmental Review**

Project was completed in 2008.

**6.22 CLBWORKS-22 Lower Columbia: Indian Eddy Debris Removal**

Debris removal started in 2010 will continue annually until 2019.

**6.23 CLBWORKS-23 Kinbasket and Arrow: Debris Removal Environmental Review**

Project was completed in 2007.

**6.24 CLBWORKS-32 Arrow: Anderson New Ramp (Renata)**

Under the Columbia WUP Order, Schedule D, Clause 4.v, BC Hydro was required to recommend an option for up to two boat launch sites between Renata and Syringa

Creek Park. The feasibility report dated October 23, 2009<sup>7</sup> for two ramps between Renata and Syringa on the lower Arrow Reservoir was undertaken as part of CLBWORKS-18. During public meetings in 2009 and 2010, BC Hydro received a consensus recommendation for only one site at Anderson Point (Renata).

On October 12, 2012, the CWR approved the final design and budget for a new ramp at Anderson Point new ramp.

Access roads were completed in 2012. In 2013, Columbia Power Corporation (CPC) constructed the ramp to El. 431.6 m (1414 ft.) with turnarounds, walkway and parking lot. In June 2014, the breakwater was installed. After navigational issues arose with the location of the breakwater, the breakwater was relocated in early 2015. In 2015, CPC completed the ramp to El. 425.0 m (1394.4 ft.).

Maintenance for this boat launch is completed under CLBWORKS-45.

## **6.25 CLBWORKS-33A Arrow: Syringa Ramp**

Under Clause (m) of Conditional Water Licence 27066, BC Hydro is required to provide reservoir access at Syringa Provincial Park, located 19 km northwest of Castlegar on Highway 3A.

A survey in 2015 confirmed that the current ramp at Syringa reached El. 421.87 m (1384.1 ft.). The Syringa boat launch was the second of two projects identified in the October 23, 2009, feasibility study (CLBWORKS-18)<sup>8</sup> for reservoir access between Syringa Creek Park and Renata, as ordered under the Water Use Plan.

During public meetings in 2009 and 2010, BC Hydro received a consensus recommendation for only one site at Anderson Point (Renata), and did not proceed with an alternative ramp at Syringa.

In 2014, BC Hydro assessed the condition of the Syringa boat launch. The ramp was in generally good condition but repairs to the concrete ribs, and upland improvements were recommended. On February 25, 2015, the CWR approved these improvements.

In spring 2015, taking advantage of low water, BC Hydro undertook repairs to the ramp and walkway. BC Hydro repaired damaged concrete ribs, and added infill between the ribs, and between the ramp and floating walkway.

In 2015, following an engineering assessment of the wind, wave, and vessel wake conditions, it was determined that breakwaters were not required to ensure safe boat launching. In October 2015, BC Hydro expanded the upland turnaround area to provide for safer and quicker access to the ramp.

## **6.26 CLBWORKS-33B Arrow: Syringa Ramp Maintenance**

There is currently no approved maintenance budget for Syringa. An updated maintenance TOR is currently being developed prior to expenditures on maintenance. The TOR will outline maintenance on access-related facilities as per the Kinbasket and Arrow Recreation Management Plan Maintenance Plan 2017 submitted January 30, 2017.

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<sup>7</sup> Submitted to the CWR January, 2010.

<sup>8</sup> Submitted to the CWR November 2009.

**6.27 CLBWORKS-35 Mid-Columbia: Bank Erosion Protection and Monitoring Program**

This physical works was initiated in 2010, with monitoring implemented in 2011, 2012, 2013 and 2015.

Attached is the Year 5 (2015) report dated April 2016. This project is complete.

**6.28 CLBWORKS-36 Mid-Columbia: Long-term Erosion Monitoring Program**

Site selection occurred in 2009, and monitoring has occurred in 2010, 2011, 2012, 2014, and 2016. The 2015 (Year 5) report is in draft format and will be submitted with the next Annual Report.

**6.29 CLBWORKS-40 Kinbasket: Site Preparation and Debris Work**

Project was completed in 2011.

**6.30 CLBWORKS-41 Kinbasket: Floating Debris Removal**

In a letter to the CWR (dated December 12, 2008), BC Hydro requested reallocation of funds for boomstick fabrication and mobilization/demobilization of tugboats to barged-based debris removal activities under CLBWORKS-40. This request was made to seek significant efficiencies that could be realized by barging equipment directly to the work area and by reducing the need for remediation of access roads and ground disturbance.

In response, the CWR approved the reallocation of these funds as well as the funds from the Floating Debris Program to land-based removal activities under CLBWORKS-40, which was completed in 2011.

**6.31 CLBWORKS-43A Nakusp Boat Ramp**

Under Clause (m) of Conditional Water Licence 27066, BC Hydro is required to provide reservoir access in the Village of Nakusp.

The feasibility study dated August 8, 2008, for Nakusp identified options for reservoir access to address safety concerns and high maintenance costs associated with the wooden trestle ramp that existed at the location. In the summer of 2008, BC Hydro agreed with the community on the option to dismantle the wood trestle ramp and replace it with a concrete ramp, with turnaround and walkway.

The detailed design was completed in 2011. The CWR approved the budget and design and implementation for the first phase on April 16, 2013. By fall 2013, Columbia Power Corporation (CPC) had demolished the timber trestle, constructed the concrete ramp at grade to El. 430.1 m (1411.2 ft.), upgraded the parking lot, and installed the walkway. On August 8, 2014, the CWR approved additional budget and confirmed the requirement to the elevation of El. 420.5 m (1379.6 ft.), and approved a budget that including construction using under-water methods.

In spring 2015, with low water CPC constructed the ramp to El. 423.6 m (1390.8 ft.). In December 2015, work resumed in Nakusp to complete to the final elevation using under-water construction methods and the ramp was constructed to El. 420.5 m (1379.6 ft.) in February 2016.

### **6.32 CLBWORKS-43B Nakusp Boat Ramp Maintenance**

The maintenance budget was approved by the CWR on August 14, 2014. BC Hydro will continue to provide maintenance on access-related facilities at Nakusp as per the Kinbasket and Arrow Recreation Management Plan Maintenance Plan 2017 submitted January 30, 2017. An updated maintenance TOR is currently being developed.

### **6.33 CLBWORKS-45 Anderson Maintenance**

The construction of the Anderson ramp was undertaken as part of CLBWORKS-32. The maintenance budget for Anderson was approved by the CWR on October 30, 2012. BC Hydro will continue to provide maintenance on both access and non-access related facilities at this location as per the Kinbasket and Arrow Recreation Management Plan Maintenance Plan 2017 submitted January 30, 2017. An updated maintenance TOR is currently being developed.

### **6.34 CLBWORKS-50A Shelter Bay Boat Ramp**

Under Clause (m) of Conditional Water Licence 27066, BC Hydro is required to provide reservoir access at Shelter Bay Provincial Park to an elevation of 423.7 m (1390.1 ft.). Shelter Bay Provincial Park is located approximately 55 km south of Revelstoke on the eastern side of Highway 23. A survey of the ramp in 2015 concluded that the ramp reaches El. 422.9 m (1387.5 ft.).

The feasibility assessment for Shelter Bay was completed December 24, 2009, (CLBWORKS-18)<sup>9</sup> and concluded the concrete ramp was in reasonable condition requiring minor repairs with erosion protection and recommended upgrades to the upland parking area, turnaround, and replacement of the gabion walkway.

On February 4, 2015, the CWR approved design development and implementation for these changes and for a feasibility assessment of breakwaters. Following public feedback in 2015, the CWR approved a revised design including the breakwaters on October 1, 2015.

Work commenced in the fall of 2015 and was completed on in April 2016.

### **6.35 CLBWORKS-50B Shelter Bay Boat Ramp Maintenance**

There is currently no approved maintenance budget for Shelter Bay. An updated maintenance TOR is currently being developed and will be submitted prior to maintenance expenditures. The TOR will outline maintenance on access-related facilities as per the Kinbasket and Arrow Recreation Management Plan Maintenance Plan 2017 submitted January 30, 2017.

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

The following table summarizes the Kinbasket and Arrow Recreational Management Plan WUP monitoring programs and physical works costs approved by the Comptroller and the Actual Costs to December 31, 2016.

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<sup>9</sup> Submitted to the CWR January, 2010.



**Table 7-1: Kinbasket and Arrow Recreational Management Plan 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>CLB MP3 Kin &amp; Arrow Rec Annual Report</b>	\$47,328	\$10,847	\$17,426	\$28,274	\$19,054	Efficiencies found during project implementation.	
<b>C03M14A Boat Ramp Use Study</b>	\$825,868	\$433,417	\$230,526	\$663,943	\$161,925	Efficiencies found during project implementation.	
C03M14A Boat Ramp Use Study - OR DM	\$90,000	\$49,488	\$16,254	\$65,742	\$24,258		
C03M14A Boat Ramp Use Study - OR Imp	\$735,868	\$383,929	\$214,272	\$598,201	\$137,667		
<b>C03W05A KIN Valemount Ramp</b>	\$1,006,882	\$1,014,051	\$1,554	\$1,015,605	(\$8,723)	Variance is a result of splitting maintenance project (W05B). Total of W05A and W05B within total approved C03W05 ToR budget.	Request for re-allocation of funds from approved maintenance budget (W05B) prior to spending on completion reporting.
C03W05A KIN Valemount Ramp - ONR DM	\$31,595	\$36,055	\$1,554	\$37,609	(\$6,014)		
C03W05A KIN Valemount Ramp - ONR Imp	\$975,287	\$977,996		\$977,996	(\$2,709)		
<b>C03W05B KIN Valemount Maintenance</b>	\$119,000	\$13,508	\$50,623	\$64,131	\$54,869	Forecast will be adjusted according to revised maintenance approach.	Maintenance TOR with updated budget to be submitted.
C03W05B KIN Valemount Maint - ONR DM		\$1,725	\$10,623	\$12,348	(\$12,348)		
C03W05B KIN Valemount Maint - ONR Imp	\$119,000	\$11,783	\$40,000	\$51,783	\$67,217		
<b>C03W06A KIN Nixon Ramp</b>	\$18,036	\$5,273		\$5,273	\$12,763	Project is complete. Ongoing maintenance under CLBWORKS 06B.	
C03W06A KIN Nixon Ramp - ONR DM	\$18,036	\$3,234		\$3,234	\$14,802		
C03W06A KIN Nixon Ramp - ONR Imp		\$2,040		\$2,040	(\$2,040)		
<b>C03W06B KIN Nixon Maint</b>	\$60,844	\$774	\$44,254	\$45,027	\$15,817	Forecast will be adjusted according to revised maintenance approach.	Maintenance TOR with updated budget to be submitted.
C03W06B KIN Nixon Maint - ONR DM		\$774	\$9,254	\$10,027	(\$10,027)		
C03W06B KIN Nixon Maint - ONR Imp	\$60,844		\$35,000	\$35,000	\$25,844		
<b>C03W07A KIN Bush Harbr Ramp</b>	\$1,906,480	\$1,795,704	\$15,710	\$1,811,414	\$95,066	Completion reporting required.	
C03W07A KIN Bush Harbr Ramp - ONR DM	\$49,993	\$38,253	\$7,923	\$46,176	\$3,817		
C03W07A KIN Bush Harbr Ramp - ONR Imp	\$1,856,487	\$1,757,451	\$7,787	\$1,765,238	\$91,249		
<b>C03W07B KIN Bush Harbr Maint</b>	\$77,000	\$21,799	\$85,900	\$107,699	(\$30,699)	Forecast includes more years that previously approved in TOR.	Request for re-allocation of funds from approved CLBWORKS-07A budget prior to spending on future maintenance.
C03W07B KIN Bush Harbr Maint - ONR DM		\$2,796	\$9,902	\$12,699	(\$12,699)		
C03W07B KIN Bush Harbr Maint - ONR Imp	\$77,000	\$19,003	\$75,998	\$95,000	(\$18,000)		
<b>C03W09A REV Extend Or Build</b>	\$28,791	\$28,791		\$28,791	\$0	Project cancelled.	
C03W09A REV Extend Or Build - OR DM	\$10,108	\$10,108		\$10,108	\$0		
C03W09A REV Extend Or Build - OR Imp	\$18,683	\$18,683		\$18,683	(\$0)		
<b>C03W11A ARR Burton Newramp - OR</b>	\$3,518,210	\$785,105	\$3,477	\$788,582	\$2,729,628	Construction complete. Favourable water levels reduced construction cost compared to forecast. Completion reporting outstanding.	
C03W11A ARR Burton Newramp - OR DM	\$76,517	\$23,814	\$3,477	\$27,291	\$49,226		
C03W11A ARR Burton Newramp - OR Imp	\$3,441,693	\$761,291		\$761,291	\$2,680,402		
<b>C03W11A ARR Burton Newramp - ONR</b>	\$1,681,909	\$1,699,766	\$3,477	\$1,703,243	(\$21,334)	Construction costs overspent once maintenance budget was split (W11B). Completion reporting outstanding.	
C03W11A ARR Burton Newramp - ONR DM	\$68,262	\$44,168	\$3,477	\$47,645	\$20,617		
C03W11A ARR Burton Newramp - ONR Imp OS	\$1,613,647	\$1,655,598		\$1,655,598	(\$41,951)		
<b>C03W11B ARR Burton Maint</b>	\$87,500	\$22,580	\$67,847	\$90,427	(\$2,927)	Forecast includes more years that previously approved in TOR.	Maintenance TOR with updated budget to be submitted prior to undertaking maintenance.
C03W11B ARR Burton Maint - ONR DM		\$2,819	\$6,447	\$9,266	(\$9,266)		
C03W11B ARR Burton Maint - ONR Imp	\$87,500	\$19,761	\$61,400	\$81,161	\$6,339		
<b>C03W12A ARR Edgewood Ramp - ONR</b>	\$2,755,035	\$2,611,391	\$1,653	\$2,613,043	\$141,992	Completion reporting required	
C03W12A ARR Edgewood Ramp - ONR DM	\$91,604	\$76,067	\$1,649	\$77,716	\$13,888		
C03W12A ARR Edgewood Ramp - ONR Imp	\$2,663,431	\$2,535,323	\$4	\$2,535,327	\$128,104		
<b>C03W12B ARR Edgewood Maint</b>	\$40,000	\$5,590	\$45,513	\$51,103	(\$11,103)	Forecast is higher than previously approved in TOR.	Request for re-allocation of funds from approved CLBWORKS-12A budget prior to spending on future maintenance.
C03W12B ARR Edgewood Maint - ONR DM		\$1,337	\$10,513	\$11,850	(\$11,850)		
C03W12B ARR Edgewood Maint - ONR Imp	\$40,000	\$4,253	\$35,000	\$39,253	\$747		
<b>C03W13A ARR Fauquier Ramp - ONR</b>	\$744,659	\$628,949	\$1,871	\$630,821	\$113,838	Completion reporting required	
C03W13A ARR Fauquier Ramp - ONR DM	\$31,352	\$22,674	\$1,871	\$24,545	\$6,807		
C03W13A ARR Fauquier Ramp - ONR Imp	\$713,307	\$606,275		\$606,275	\$107,032		
<b>C03W13A ARR Fauquier Ramp - OR</b>	\$452,081	\$80,300		\$80,300	\$371,781	Completion reporting required and will be completed under ONR.	
C03W13A ARR Fauquier Ramp - OR DM	\$17,310	\$10,255		\$10,255	\$7,055		
C03W13A ARR Fauquier Ramp - OR Imp	\$434,771	\$70,045		\$70,045	\$364,726		
<b>C03W13B ARR Fauquier Maint</b>	\$36,250	\$3,203	\$59,263	\$62,466	(\$26,216)	Forecast is higher than previously approved in TOR.	Request for re-allocation of funds from approved CLBWORKS-13A budget prior to spending on future maintenance.
C03W13B ARR Fauquier Maint - ONR DM		\$1,602	\$10,513	\$12,115	(\$12,115)		
C03W13B ARR Fauquier Maint - ONR Imp	\$36,250	\$1,601	\$48,750	\$50,351	(\$14,101)		
<b>C03W14A ARR McDonald Ramp - ONR</b>	\$3,796,186	\$1,098,991	\$1,660	\$1,100,651	\$2,695,535	Completion reporting required	
C03W14A ARR McDonald Ramp - ONR DM	\$147,035	\$49,068	\$1,660	\$50,728	\$96,307		
C03W14A ARR McDonald Ramp - ONR Imp	\$3,649,151	\$1,049,923		\$1,049,923	\$2,599,228		
<b>C03W14A ARR McDonald Ramp - OR</b>	\$261,344	\$21,671		\$21,671	\$239,673	Completion reporting required and will be completed under ONR.	
C03W14A ARR McDonald Ramp - OR DM	\$16,065	\$10,065		\$10,065	\$6,000		
C03W14A ARR McDonald Ramp - OR Imp	\$245,279	\$11,606		\$11,606	\$233,673		
<b>C03W14B ARR McDonald Maint</b>	\$138,609	\$2,173	\$93,316	\$95,489	\$43,120	Maintenance TOR with updated approach to be submitted including details on ONR and OR split.	Maintenance TOR with updated budget to be submitted prior to undertaking maintenance.
C03W14B ARR McDonald Maint - ONR DM		\$1,184	\$9,966	\$11,150	(\$11,150)		
C03W14B ARR McDonald Maint - ONR Imp		\$989	\$83,350	\$84,339	(\$84,339)		
<b>C03W16A KIN Debris Mgmt</b>	\$2,070,756	\$1,274,306	\$746,158	\$2,020,464	\$50,292	Efficiencies found during project implementation.	
C03W16A KIN Debris Mgmt - OR DM	\$253,542	\$173,522	\$84,369	\$257,891	(\$4,349)		
C03W16A KIN Debris Mgmt - OR Imp	\$1,817,214	\$1,100,784	\$661,789	\$1,762,573	\$54,641		
<b>C03W16B KIN Debris</b>	\$1,648,074	\$982,188	\$423,497	\$1,405,685	\$242,389	Approved amount includes \$240,000 for high water contingency, which is not included in our forecast as it is conditional.	
C03W16B KIN Debris - ONR Imp	\$1,648,074	\$982,188	\$423,497	\$1,405,685	\$242,389		
<b>C03W17A ARROW Debris Mgmt</b>	\$800,444	\$485,790	\$314,654	\$800,444	\$0		
C03W17A ARROW Debris Mgmt - OR DM	\$107,220	\$69,022	\$38,199	\$107,220	(\$0)		
C03W17A ARROW Debris Mgmt - OR Imp	\$693,224	\$416,769	\$276,455	\$693,224	\$0		
<b>C03W17B ARR Debris</b>	\$784,739	\$399,239	\$150,000	\$549,239	\$235,500	Approved amount includes \$222,000 for high water contingency, which is not included in our forecast as it is conditional.	
C03W17B ARR Debris - ONR Imp	\$784,739	\$399,239	\$150,000	\$549,239	\$235,500		

Table 7 cont'd

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>C03W18A Feasblty Boat Ramp - OR</b>	\$238,120	\$238,120		\$238,120	(\$0)	Project complete	
C03W18A Feasblty Boat Ramp - OR DM	\$53,942	\$53,942		\$53,942	(\$0)		
C03W18A Feasblty Boat Ramp - OR Imp	\$184,178	\$184,178		\$184,178	\$0		
<b>C03W19A LC Indian Env</b>	\$181,019	\$157,488	\$1,814	\$159,302	\$21,717	Project complete. Final reporting outstanding.	
C03W19A LC Indian Env - OR DM	\$53,892	\$31,564	\$1,814	\$33,379	\$20,513		
C03W19A LC Indian Env - OR Imp	\$127,127	\$125,924		\$125,924	\$1,203		
<b>C03W20A LC Indian Dred</b>	\$114,002	\$53,238	\$2,346	\$55,584	\$58,418	Project complete. Final reporting outstanding.	
C03W20A LC Indian Dred - OR DM	\$45,722	\$28,814	\$2,346	\$31,159	\$14,563		
C03W20A LC Indian Dred - OR Imp	\$68,280	\$24,424		\$24,424	\$43,856		
<b>C03W21A LC Debris Env</b>	\$53,601	\$45,886	\$1,206	\$47,092	\$6,509	Project complete. Final reporting outstanding.	
C03W21A LC Debris Env - OR DM	\$15,367	\$15,259	\$1,206	\$16,466	(\$1,099)		
C03W21A LC Debris Env - OR Imp	\$38,234	\$30,627		\$30,627	\$7,607		
<b>C03W22A LC In Ed Debre</b>	\$44,726	\$20,174	\$13,191	\$33,365	\$11,361	Efficiencies found during project implementation.	
C03W22A LC In Ed Debre - OR DM	\$16,512	\$6,428	\$1,191	\$7,619	\$8,893		
C03W22A LC In Ed Debre - OR Imp	\$28,214	\$13,746	\$12,000	\$25,746	\$2,468		
<b>C03W23A KIN &amp; ARR Debris Env</b>	\$126,716	\$68,960	\$1,339	\$70,299	\$56,417	Project complete. Final reporting outstanding.	
C03W23A KIN & ARR Debris Env - OR DM	\$34,233	\$15,326	\$1,339	\$16,666	\$17,567		
C03W23A KIN & ARR Debris Env - OR Imp	\$92,483	\$53,633		\$53,633	\$38,850		
<b>C03W32A ARR Anderson Newramp - OR</b>	\$6,181,717	\$3,668,233	\$1,761	\$3,669,994	\$2,511,723	Construction complete. Favourable water levels reduced construction forecast significantly. Final completion report outstanding.	
C03W32A ARR Anderson Newramp - OR DM	\$64,653	\$83,622	\$1,761	\$85,383	(\$20,730)		
C03W32A ARR Anderson Newramp - OR Imp	\$6,117,064	\$3,584,611		\$3,584,611	\$2,532,453		
<b>C03W32A ARR Anderson Newramp- ONR</b>	\$91,500	\$42,817		\$42,817	\$48,683	Maintenance TOR with updated approach to be submitted.	Maintenance TOR with updated budget to be submitted prior to undertaking maintenance.
C03W32A ARR Anderson Newramp - ONR DM		\$720		\$720	(\$720)		
C03W32A ARR Anderson New ramp - ONR	\$91,500	\$42,097		\$42,097	\$49,403		
<b>C03W33A ARR Syringa Ramp ONR</b>	\$2,527,085	\$369,016	\$3,423	\$372,439	\$2,154,646	Construction complete. Favourable water levels reduced construction forecast significantly. Final completion report outstanding.	
C03W33A ARR Syringa Ramp - ONR DM	\$189,085	\$57,387	\$3,423	\$60,809	\$128,276		
C03W33A ARR Syringa Ramp - ONR Imp	\$2,338,000	\$311,630		\$311,630	\$2,026,370		
<b>C03W33B ARR Syringa Maint</b>		\$1,512	\$24,876	\$26,388	(\$26,388)	TOR not yet submitted.	Request for re-allocation of funds from approved CLBWORKS-33A budget prior to spending on future maintenance.
C03W33B ARR Syringa Maint - ONR DM		\$1,512	\$10,876	\$12,388	(\$12,388)		
C03W33B ARR Syringa Maint - ONR Imp			\$14,000	\$14,000	(\$14,000)		
<b>C03W35A MCR Bank Erosion</b>	\$712,739	\$708,285	\$2,085	\$710,370	\$2,369	Project complete. Final reporting outstanding.	
C03W35A MCR Bank Erosion - ONR DM	\$72,964	\$57,201	\$1,161	\$58,361	\$14,603		
C03W35A MCR Bank Erosion - ONR Imp	\$639,775	\$651,085	\$924	\$652,008	(\$12,233)		
<b>C03W36A MCR Erosion Mon</b>	\$311,993	\$293,477	\$16,736	\$310,213	\$1,780	Project complete. Final reporting outstanding.	
C03W36A MCR Erosion Mon - ONR DM	\$70,240	\$46,907	\$736	\$47,643	\$22,597		
C03W36A MCR Erosion Mon - ONR Imp	\$241,753	\$246,570	\$16,000	\$262,570	(\$20,817)		
<b>C03W40A KIN Dbrs Site Prep</b>	\$785,000	\$783,522	\$1,586	\$785,108	(\$108)	Project complete. Final reporting outstanding.	
C03W40A KIN Dbrs Site Prep - OR DM	\$78,000	\$52,470	\$1,586	\$54,057	\$23,943		
C03W40A KIN Dbrs Site Prep - OR Imp	\$707,000	\$731,051		\$731,051	(\$24,051)		
<b>C03W40B KIN Debris Rmvl</b>	\$1,800,000	\$1,995,488		\$1,995,488	(\$195,488)	Project complete.	
C03W40B KIN Debris Rmvl - ONR Imp	\$1,800,000	\$1,995,488		\$1,995,488	(\$195,488)		
<b>C03W41A KIN Flt Dbrs Rmvl</b>	\$42,026	\$1,498	\$1,586	\$3,084	\$38,942	Project complete. Final reporting outstanding.	
C03W41A KIN Flt Dbrs Rmvl - ONR DM	\$29,784	\$1,455	\$1,586	\$3,042	\$26,742		
C03W41A KIN Flt Dbrs Rmvl - ONR Imp	\$12,242	\$43		\$43	\$12,199		
<b>C03W43A Nakusp Boat Launch</b>	\$9,457,731	\$5,405,765	\$774	\$5,406,539	\$4,051,192	Construction complete. Favourable water levels reduced construction forecast significantly. Final completion report outstanding.	
C03W43A Nakusp Boat Launch - ONR DM	\$69,038	\$98,112	\$734	\$98,847	(\$29,809)		
C03W43A Nakusp Boat Launch - ONR Imp	\$9,388,693	\$5,307,652	\$40	\$5,307,692	\$4,081,001		
<b>C03W43B Nakusp Maintenance</b>	\$40,000	\$15,082	\$93,947	\$109,029	(\$69,029)	Maintenance TOR with updated approach to be submitted.	Request for re-allocation of funds from approved CLBWORKS-43A budget prior to spending on future maintenance.
C03W43B Nakusp Maint - ONR DM		\$2,401	\$13,941	\$16,341	(\$16,341)		
C03W43B Nakusp Maint - ONR Imp	\$40,000	\$12,681	\$80,006	\$92,688	(\$52,688)		
<b>C03W45A Anderson Maintenance</b>	\$120,065	\$39,017	\$69,807	\$108,824	\$11,241	Forecast adjusted according to revised maintenance approach.	
C03W45A Anderson Maintenance - OR DM	\$0	\$15,792	\$6,557	\$22,349	(\$22,349)		
C03W45A Anderson Maintenance - OR Imp	\$120,065	\$23,225	\$63,250	\$86,475	\$33,590		
<b>C03W50A Shelter Bay</b>	\$3,065,308	\$1,399,545	\$2,198	\$1,401,742	\$1,663,566	Construction complete. Favourable water levels reduced construction forecast significantly. Final completion report outstanding.	
C03W50A Shelter Bay - ONR DM	\$209,308	\$106,283	\$853	\$107,136	\$102,172		
C03W50A Shelter Bay - ONR Imp	\$2,856,000	\$1,293,261	\$1,345	\$1,294,606	\$1,561,394		
<b>C03W50B Shelter Bay Maint</b>		\$10,476	\$49,454	\$59,930	(\$59,930)	TOR not yet submitted.	Request for re-allocation of funds from approved CLBWORKS-50A budget prior to spending on future maintenance.
C03W50B Shelter Bay Maint - ONR DM		\$1,921	\$11,361	\$13,282	(\$13,282)		
C03W50B Shelter Bay Maint - ONR Imp		\$8,555	\$38,093	\$46,648	(\$46,648)		

OR - Ordered Remissible  
ONR - Ordered Non-Remissible

\* Red values in parentheses denote overage.