

**Peace Water Use Plan
Dinosaur Reservoir Management Plan**

**Monitoring Programs and Physical Works
Annual Report 2018**

Implementation Period: June 2017 to May 2018

- **GMSMON-14 DNR Tributary Habitat Review**
- **GMSWORKS-8 DNR Demonstration Tributary**
- **GMSWORKS-9 DNR Tributary Inventory & Feasibility**
- **GMSWORKS-12 PCR & WLL Recreation Access**
- **GMSWORKS-51 Hudson's Hope Boat Launch Construction**
- **GMSWORKS-53 Hudson's Hope Boat Launch Design**
- **GMSWORKS-56 Hudson's Hope Boat Launch Maintenance**

For Water Licences 123018, 123019, 123020, 123021, 123025

June 29, 2018

BC Hydro Peace Water Use Plan Dinosaur Reservoir Management Plan Annual Report: 2018

1 Introduction

This document represents a summary of the status and the results of the Peace Project Dinosaur Reservoir Management Plan Water Use Plan (WUP) monitoring program and physical works projects to May 31, 2018, as per the Peace Order under the *Water Act*, dated August 9, 2007. This annual report includes those projects in Schedule B of the Order. There is one monitoring program and six physical works.

2 Status

The following table outlines the dates that Terms of Reference (TOR) for the Dinosaur Reservoir 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 Dinosaur Reservoir 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 |
| GMSMON-14 DNR TRIBUTARY HABITAT | Schedule B.e.a | Aug 08, 2008 | Sep 15, 2008 | Jul 29, 2015 | Aug 12, 2015 |
| GMSWORKS-8 DNR DEMONSTRATION TRIBUTARY | Schedule B.1.b | May 09, 2008 | Jun 02, 2008 | Jul 29, 2015 | Aug 12, 2015 |
| GMSWORKS-9 DNR TRIBUTARY INVENTORY & FEASIBILITY | Schedule B.1.a | May 09, 2008 | Jun 02, 2008 | | |
| GMSWORKS-12 DNR RECREATION ACCESS | Schedule B.2.a | May 09, 2008 | Jun 02, 2008 | Aug 07, 2009 | Jan 20, 2010 |
| GMSWORKS-51 BOAT RAMP HUDSONS HOPE (Dinosaur) | Schedule B.2 | Apr 18, 2011 | Apr 03, 2012 | Oct 17, 2013 | Jan 14, 2014 |
| GMSWORKS-53 BOAT RAMP DESIGN HUDSONS HOPE (Dinosaur) | Schedule B.2 | Apr 15, 2010 | May 07, 2010 | Oct 17, 2013 | Jan 14, 2014 |
| GMSWORKS-56 HUDSONS HOPE MAINTENANCE (Dinosaur) | Schedule B.2 | Apr 18, 2011 | Apr 03, 2012 | Oct 26, 2017 | Nov 08, 2017 |

3 Schedule

The following table outlines the current schedule for the monitoring program and physical works being delivered for the Dinosaur Reservoir Management Plan WUP.

Table 3-1: Monitoring Program and Physical Works Schedule as of May 31, 2018

| Monitoring Programs | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|---|---|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|
| | 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 | WLR YR14 | WLR YR15 |
| GMSMON-14: DNR Tributary Habitat | | | ✓F | | | | | ● | | | | | | | |
| GMSWORKS-8: DNR Demonstration Tributary | | | ✓F | | | | | ● | | | | | | | |
| GMSWORKS-9: DNR Tributary Inventory & Feasibility | | ✓F | | | | | | | | | | | | | |
| GMSWORKS-12: DNR Recreation Access | ✓ | ✓ | ✓F | | | | | | | | | | | | |
| GMSWORKS-51 Hudson's Hope Boat Ramp Construction (Dinosaur) | | | | | ✓ | ✓F | | | | | | | | | |
| GMSWORKS-53 Boat Ramp Design Hudson's Hope | | | ✓ | ✓ | ✓F | | | | | | | | | | |
| GMSWORKS-56 Hudson's Hope Maintenance | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | u/w* | ■* | ■* | ■* | ■* |
| Legend | <p>■ = Project to be undertaken/initiated in identified year</p> <p>✓ = Project is completed for the year</p> <p>u/w = Project is under way</p> <p>* = Maintenance only in identified year</p> <p>● = Relief granted; Project cancelled</p> <p>✓F = All field work for this project is complete. No further field work is planned.</p> <p>PCR = Project Completion Report submitted</p> | | | | | | | | | | | | | | |

4 Monitoring Program and Physical Works Terms of Reference

The monitoring program and physical works being implemented under the Dinosaur Reservoir 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:

https://www.bchydro.com/about/sustainability/conservation/water_use_planning/northern_interior/peace_river/dinosaur_reservoir.html

5 Status of Monitoring Program

5.1 GSMON-14 Dinosaur Reservoir Tributary Habitat

GSMON-14 was intended to monitor the effectiveness of physical works to be constructed under GMSWORKS-8 (Dinosaur Reservoir Demonstration Tributary), which was conditional on the outcome of the feasibility study GMSWORKS-9 (Dinosaur Reservoir Tributary Inventory). However, as explained in Section 6.2 below, as there were no feasible access restoration options identified in GMSWORKS-9, no works were constructed under GMSWORKS-8. Consequently, the CWR relieved BC Hydro of the obligation to deliver GMSWORKS-8 and GSMON-14. This project is complete.

6 Status of Physical Works

6.1 GMSWORKS-8 Dinosaur Reservoir Demonstration Tributary

As per section 5.1 GSMON-14 (above), the CWR relieved BC Hydro of the obligation to deliver this project. This project is complete.

6.2 GMSWORKS-9 Dinosaur Reservoir Tributary Inventory and Feasibility

The objective of this study was to evaluate the number and extent of tributaries around the Dinosaur Reservoir that were impacted by the operation of the reservoir and/or by the accumulations of debris, and determine whether restoration access opportunities existed. The inventory was completed in November 2009. The study concluded that debris levels were sparse and were not restricting fish access at tributaries, and that there were no feasible access restoration opportunities. This project is complete.

6.3 GMSWORKS-12 Dinosaur Recreational Access (Feasibility of Boat Ramps)

The objective of this feasibility study was to evaluate options for improved boat launch facilities on Dinosaur Reservoir including the options for relocating and improving the dock, and upgrading the ramp. The site on Dinosaur Reservoir is at Hudson's Hope Park, on the north side of the lake. At the time of this study, it had adequate upland parking area, a single-lane cast-in-place concrete boat ramp, a floating dock and a rubble mound breakwater.

Reconnaissance surveys were completed at the Hudson's Hope Park boat launch in 2009. Feasibility was assessed based on engineering, archaeological, and environmental criteria, and recommendations were provided for enhancements.

The report included options for replacing the floating dock, and extending and upgrading the breakwater. It also included options for boat ramp upgrades.

This project is complete.

The subsequent design work was completed under GSMWORKS-53 in Section 6.4 below.

6.4 GSMWORKS-51 Hudson's Hope Boat Launch Construction

This project is for the construction of the approved design for the boat ramp works at Hudson's Hope Park as described below in GSMWORKS-53. Construction commenced in 2012 and was completed in May 2013. The previously existing boat ramp, dock and gangway were replaced, the boat basin was dredged, and erosion controls were implemented to provide:

- Access to the full dock at all water levels;
- Double lane ramp;
- Tie up points around all sides of the dock to accommodate the size of watercraft specified in the user requirements;
- Larger floating dock;
- Extension and reconstruction of the rubble mount breakwater; and
- Minimized erosion and ice scour at the site through placement of riprap along the impacted shoreline areas and in front of the new foreshore site.

The construction on this project is complete.

Maintenance for this ramp occurs under GSMWORKS-56.

6.5 GSMWORKS-53 Hudson's Hope Boat Launch Design

Under Clause (m) of Conditional Water Licence 123025 for Dinosaur Reservoir, BC Hydro is required to provide reservoir access at areas as directed by the CWR. Hudson's Hope Park was identified as a site for improved access as part of the WUP.

The feasibility study was completed in 2009 under GSMWORKS-12 (see section 6.3).

The design approved by the CWR in 2010 included replacing the existing single lane ramp with a double lane concrete boat launch at the site to a toe elevation of El. 498.8 m (1636.5 ft.), replacing the floating walkway at a new alignment, and installation of a breakwater. The design also required a dredge of the basin to reach the toe elevation.

The works were constructed under GSMWORKS-51 above (section 6.4). This project is complete.

6.6 GSMWORKS-56 Hudson's Hope Boat Launch Maintenance

This project is for the maintenance of the boat ramp constructed under GSMWORKS-51 (Hudson's Hope Boat Ramp Construction). Annual installation of the floating access dock and walkway is completed before the recreation season

begins. The dock and walkway are removed at the end of the season for winter storage. Maintenance is in place.

Planning is underway to complete required structural maintenance after the 2018 recreation season, which is consistent with the approved TOR for GMSWORKS-56. The required maintenance is not a safety issue, and users can safely access the reservoir via this ramp for the immediate future.

7 Monitoring Program and Physical Works Costs

The following table summarizes the Dinosaur Reservoir Management Plan WUP monitoring program and physical works costs approved by the CWR and the Actual Costs to May 31, 2018.

Table 7-1: Dinosaur Reservoir Management Plan WUP Monitoring Program 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 |
|--|-----------------------|----------------------------|----------------------------------|-----------------------------------|----------------------------|---|-------------------|
| GMSM14A DNR Tributary Habita | \$150,364 | \$32,018 | | \$32,018 | \$118,346 | Project completed | |
| GMSM14A DNR Tributary Habita - OR DM | \$57,080 | \$14,509 | | \$14,509 | \$42,571 | | |
| GMSM14A DNR Tributary Habita - OR Imp | \$93,284 | \$17,509 | | \$17,509 | \$75,775 | | |
| GMSW08A DNR Demonstration | \$247,265 | \$15,886 | | \$15,886 | \$231,379 | Project completed | |
| GMSW08A DNR Demonstration - OR DM | \$63,222 | \$7,878 | | \$7,878 | \$55,344 | | |
| GMSW08A DNR Demonstration - OR Imp | \$184,043 | \$8,008 | | \$8,008 | \$176,035 | | |
| GMSW09A DNR Tributary Inven | \$41,013 | \$34,262 | | \$34,262 | \$6,751 | Project completed | |
| GMSW09A DNR Tributary Inven - OR DM | \$16,013 | \$11,137 | | \$11,137 | \$4,877 | | |
| GMSW09A DNR Tributary Inven - OR Imp | \$25,000 | \$23,125 | | \$23,125 | \$1,875 | | |
| GMSW12A DNR Recreation Acc | \$118,729 | \$72,364 | | \$72,364 | \$46,365 | Project completed | |
| GMSW12A DNR Recreation Acc - OR DM | \$60,765 | \$16,178 | | \$16,178 | \$44,587 | | |
| GMSW12A DNR Recreation Acc - OR Imp | \$57,964 | \$56,186 | | \$56,186 | \$1,778 | | |
| GMSW51A BRC Dinosaur | \$3,258,435 | \$4,252,393 | | \$4,252,393 | (\$993,958) | Project complete. This non-remissible project overspend was due to schedule delays and material deficiencies. | |
| GMSW51A BRC Dinosaur - ONR DM | \$180,300 | \$7,697 | | \$7,697 | \$172,603 | | |
| GMSW51A BRC Dinosaur - ONR Imp | \$3,078,135 | \$4,244,696 | | \$4,244,696 | (\$1,166,561) | | |
| GMSW53A BRD Dinosaur | \$87,965 | \$64,131 | | \$64,131 | \$23,834 | Project completed | |
| GMSW53A BRD Dinosaur - ONR DM | \$12,965 | \$11,510 | | \$11,510 | \$1,455 | | |
| GMSW53A BRD Dinosaur - ONR Imp | \$75,000 | \$52,621 | | \$52,621 | \$22,379 | | |
| GMSW56A Dinosaur Maintenance | \$504,143 | \$66,348 | \$398,952 | \$465,300 | \$38,843 | | |
| GMSW56A Dinosaur Maintenance - ONR DM | \$25,758 | \$13,503 | \$5,913 | \$19,416 | \$6,342 | | |
| GMSW56A Dinosaur Maintenance - ONR Imp | \$478,385 | \$52,845 | \$393,039 | \$445,884 | \$32,501 | | |

OR - Ordered Remissible
 ONR - Ordered Non-Remissible

* Red values in parentheses denote overage.