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## **Puntledge Water Use Plan**

## **Physical Works Terms of Reference**

**PUNWORKS-1: Gravel Replacement in the Puntledge River –  
Definition/Implementation**

**October 5, 2018**

## **PUNWORKS-1: Gravel Replacement in the Puntledge River Physical Works Terms of Reference**

### **1.0 Context**

This Terms of Reference (TOR) is for the PUNWORKS-1 Gravel Placement in the Puntledge River (PUNWORKS-1) physical works implementation phase. This TOR is submitted in response to the Order (Files No. 0265017 and 1001701) issued by the Comptroller of Water Rights (CWR) on January 19, 2005. Clause 4 and Schedule C, Section 1(a) of the Order required BC Hydro to submit a TOR:

*“...for the placement and periodic maintenance of approximately 2000 square metres of spawning gravel in the Puntledge River.”*

### **2.0 Background**

During the Water Use Planning (WUP) process, the Consultative Committee (CC) identified that the lack of gravel below the Puntledge Diversion Dam limited the quantity of spawning habitat for salmon and steelhead<sup>1</sup>. The lack of gravel was considered a footprint effect that could not be addressed through operational changes and was therefore deemed to be outside of the scope of the Puntledge WUP.

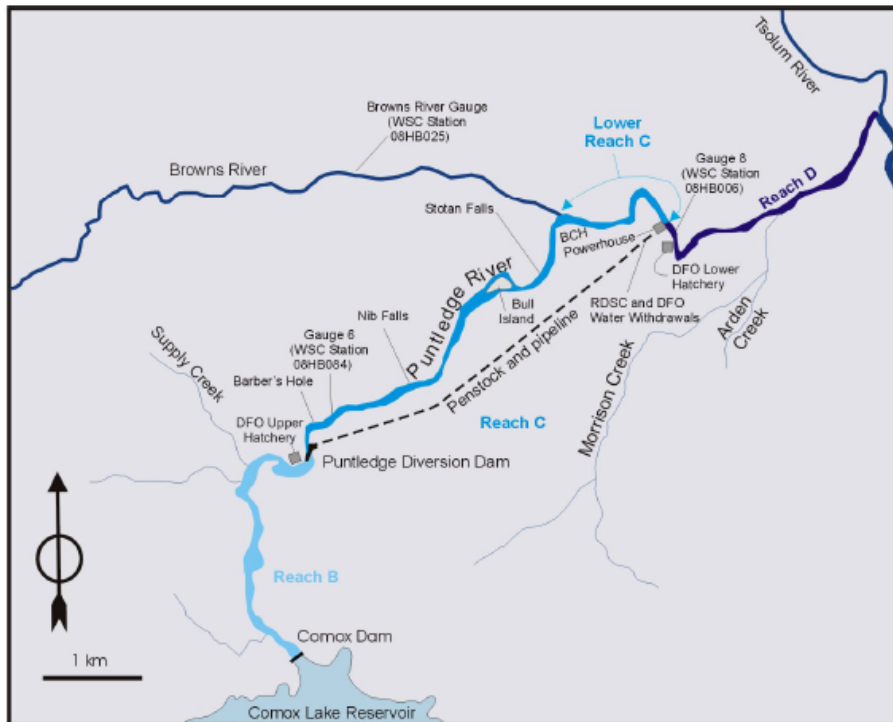
A higher minimum flow in Reach C to increase the area for chinook spawning was examined during the course of the WUP discussions. Gravel placement was included in the WUP as a trade-off for a higher minimum flow in Reach C to increase the area for chinook spawning, in lieu of a flow increase. The WUP (2003) and respective WUP Order (2005) included the requirement under Schedule C, Section 1(a).

In May 2005, a gravel placement project was approved and funded by the BC Fish and Wildlife Compensation Program (FWCP). The project was initiated to provide spawning habitat for 1,000 adult Chinook. The work occurred between 2004 and 2005 and placed 4,576 m<sup>2</sup> of gravel spawning habitat creating habitat for up to 400 spawners in Reach B of the Puntledge River approximately 300 m downstream of the confluence with Coltsfoot Creek (referred to as Supply Creek on Figure 1 below). Reach B is the area directly downstream of the Comox Dam to the Puntledge Diversion Dam.

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<sup>1</sup> Puntledge River Water Use Plan Consultative Committee Report, December 2003. Section 4.6.1.4 (Page 4-36)

Figure 1: Location and overview of the Puntledge River and facilities



This PUNWORKS-1 gravel placement project has been delayed at least three times as a result of the FWCP project. In 2006, the CWR approved delaying the project as the FWCP gravel placement project was expected to meet spawning habitat requirements until at least 2008. Then in 2008, and again in 2010 the agencies similarly recommended a further delay to allow continued increase use of the FWCP project and to continue monitoring the use of the existing site. In March 2010, the CWR accepted a further delay in PUNWORKS-1 until after the Puntledge Interim Review in which the results of the monitoring studies were assessed – which was to be held by 2012. The Interim Review took place on December 14, 2011 during which it was noted that the FWCP platform was being utilized by 50-100 spawners. It was intended that the works would be scheduled for 2013 (following a 2012 TOR). In March 2013, the project definition report was prepared to determine estimated project costs (Guimond 2005).

Resource constraints at both BC Hydro and Fisheries and Oceans Canada (DFO) delayed the project and TOR submissions by another two years. By early 2014, the Fish Entrainment Strategy (FES) Technical Committee (comprised of members from DFO, MFLNRORD, and BC Hydro) for Puntledge began looking at possible compensation options, including reviewing the suitability of gravel placement and locations, and all parties supported deferring the PUNWORKS-1 TOR submission until the FES action plan was complete. In December 2014, the FES Technical Committee endorsed the planned placement in Reach B, the location adjacent to the FWCP project (Connors, BM. And E. Parkinson 2015).

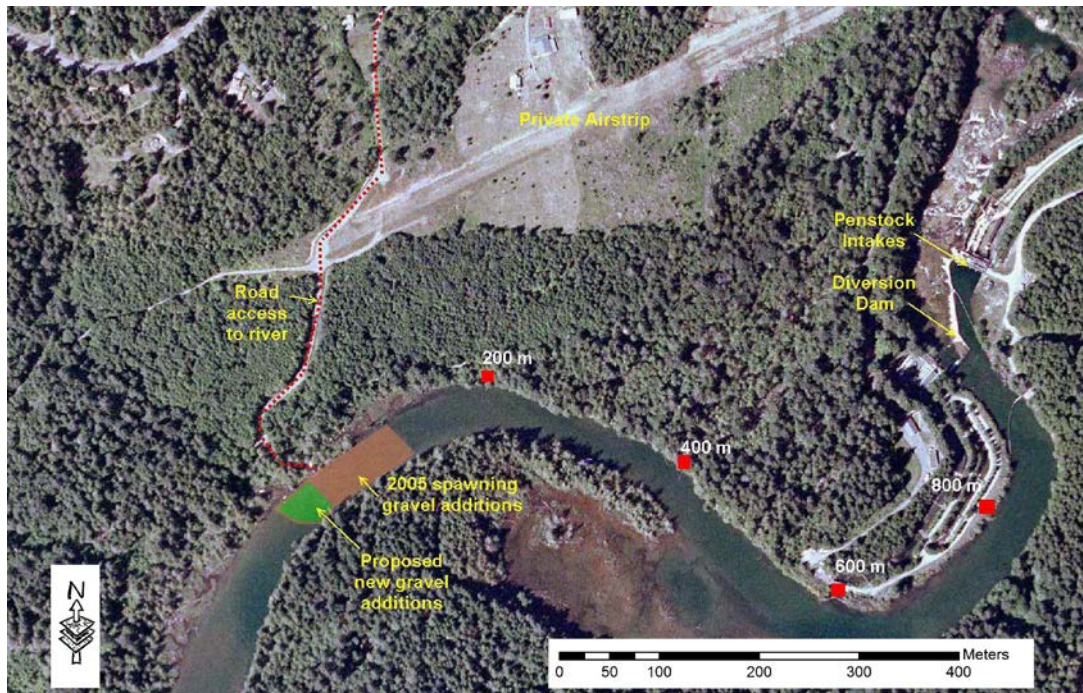
In 2015, as BC Hydro began developing the PUNWORKS-1 TOR and implementation plan, an issue arose regarding access to the construction site via a private property on Forbidden Plateau Road. The private landholder holds a water licence (C130292) for irrigation. Since that time, BC Hydro and the private landowner have been negotiating an appropriate access agreement and expects full resolution.

### **3.0 Project location – Reach B**

As mentioned above, the Puntledge FES Technical Committee reviewed the habitat enhancement options and found the Reach B area upstream of the Puntledge Diversion Dam would provide slightly improved spawning conditions over alternative locations upstream of the Comox Lake Reservoir (Connors, BM and E Parkinson. 2015).

The FWCP spawning gravel placement project is located approximately 1 km upstream of the Puntledge Diversion Dam and immediately downstream of the confluence of Coltsfoot Creek (a small tributary located on the north side of the river). The proposed WUP gravel placement will be immediately upstream of the FWCP spawning platform as shown in Figure 2 below.

**Figure 2: Location of the FWCP spawning gravel additions in the Puntledge River Reach B (brown shading), and the proposed upstream WUP gravel placement (green shading)**



#### 4.0 Approach to Physical Works

Water Use Plan physical works projects typically progress sequentially through the following phases: Identification/Feasibility, Definition, Implementation, Monitoring and Maintenance. The general descriptions of these phases are as follows:

- **Identification/Feasibility:** This phase typically includes the needs assessment, conceptual design and the feasibility design. In many cases, the Identification phase was initiated as part of the WUP development process. For this PUNWORKS-1 project, the project was first identified as part of the Puntledge CC and the requirement was incorporated into the WUP and the 2005 WUP Order. Additionally the 2014 FES work further reviewed the gravel placement concept and location.
- **Definition Phase:** The purpose of this phase is to refine the technical feasibility option(s) identified in the previous phase and propose recommendation(s) for a preferred option. Given the long lead times for permitting, this phase typically includes initiating regulatory approvals and permitting, which will require the development of supporting plans.
- **Implementation Phase:** In this phase, the final construction preparations and planning (procurement, safety, environmental and heritage protection) and the actual construction of the works occurs.
- **Completion/Sustainment:** This phase includes finalizing final construction and project completion reports including as-built drawings and may include recommendations for ongoing inspections or sustainment, as required.

## **5.0 Methods – Definition & Implementation Phases**

### **5.1 Task 1: Project Coordination**

Project coordination involves the general administration and technical oversight of the program, which will include, but not be limited to: project planning, resource identification and management, scope management and control, schedule oversight, and budget management and reporting.

### **5.2 Task 2: Design and specifications validation**

As mentioned in the Section 2.0 Background, in anticipation of a TOR submission in 2013, BC Hydro commissioned a definition report by the former DFO team who led the 2005 FWCP project (Guimond 2013). As this report is now a number of years out of date, it is expected to be reviewed and updated, as required to ensure the assessment and recommendations are valid for the current conditions in the Puntledge River.

### **5.3 Task 3: Archeological assessment and monitoring**

Depending on the outcome of an internal high-level heritage screening, including a search of the Provincial Archaeology Branches Remote Access to Archaeological Data (RAAD) online application, an archaeologist will undertake either an archaeological overview assessment (AOA) or Archeological Impact Assessment (AIA) as deemed appropriate for the proposed site location and works.

A detailed memo will be provided summarizing the studies undertaken will be prepared by the archaeologist, documenting existing conditions, including recommendations, and specific mitigation measures to be implemented, if required. All reports will be shared with local First Nations in draft format prior to finalizing.

If required, the archeologist will also develop a heritage management plan and will identify any archeological monitoring requirements. A provision for this monitoring during construction has been included in this TOR budget.

### **5.4 Task 4: Environmental management and planning**

A biologist will be responsible for liaising with the necessary environmental regulatory agencies to determine regulatory requirements. It may also include preparing any required environmental management plan(s) for the regulatory submissions, as well as for the contractor to use to ensure that potential environmental impacts associated with the work are avoided or minimized.

### **5.5 Task 5: Safety management and planning**

This task involves development of appropriate construction safety minimum requirements for the project, and if required, public safety plans for the construction phase of the work to ensure the all workers and contractors have adequately addressed

all safety hazards of the work. In subsequent phases, all safety management plans will need to be reviewed and verified by BC Hydro.

## **5.6 Task 6: Stakeholder and First Nations engagement and communications**

Communications will be developed as appropriate to inform the general public and First Nations regarding the project timing and impacts.

## **5.7 Task 7: Seek permits and approvals**

Below is a list of permits, agreements and approvals that may be required (but is not limited to):

- Private property access agreement required to access project site;
- *Water Sustainability Act* approvals;
- DFO; and
- Crown Tenure/Permissions policy, as applicable.

Additionally, the Puntledge River is utilized as a domestic water supply by the Comox Valley Regional District (CVRD) Domestic Water Supply. Additional approvals may be required.

## **6.0 Implementation & Completion Phases**

### **6.1 Task 8: Construction planning and management**

This task involves the support and oversight of a construction contractor to ensure the project is delivered to requirements. The task includes but is not limited to:

- Constructability review and planning with contractor, including site visits;
- Procurement and negotiation of supply/install contracts, as appropriate to deliver on the design specifications;
- Construction planning and development of construction management plan; and
- Review of contractor's safety management plan and environmental protection plan.

### **6.2 Task 9: Construction**

It is anticipated that the construction will be delivered on a supply/install basis (i.e., a contractor will be responsible for purchasing materials and installation. The following tasks will be required during the construction:

- Construction management oversight on-site to ensure the contractor delivers on the requirements of the contract;
- Appropriate environmental monitoring and reporting;
- As required, archeological monitoring and reporting; and

- Oversight/inspection by the design engineer.

The timing of the construction window is dependent on operations, fisheries risk, and water supply considerations as follows:

- Construction will be scheduled for the period of least risk to fish species (August 15 to September 15) as indicated in the Provincial Regional Timing Window<sup>2</sup> for the area.
- Puntledge River is utilized as a domestic water supply by the Comox Valley Regional District (CVRD) Domestic Water Supply and the construction work must be scheduled during a time of least risk to impact the water supply.
- The annual generating station maintenance period (September and April) results in ideal conditions for implementation. At this time, the generating unit is off-line and the majority of the river flow passes over the diversion dam down Reach C resulting in a lower flow in Reach B. This reduces the risk to the domestic water supply as it will allow significant time for settling of silt before it reaches the domestic water point of withdrawal (as shown in Figure 1).

### **6.3 Task 10: Completion reporting & inspection**

This involves development of the final completion records for the life cycle of the project including construction reports, as built drawings. A provision has been included for inspection of the site in 2021 to confirm the gravel placement platform has held up.

## **7.0 Schedule**

The anticipated project schedule is as follows. Should permits not be received in time, the construction window would need to be shifted to 2020 or to another DFO-approved work window.

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<sup>2</sup> <https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/water-licensing-rights/working-around-water/regional-terms-conditions-timing-windows>



<b>Milestone/Tasks</b>	<b>Date</b>
Project initiation and planning	September 2018 – October 2018
Design validation/update	November 2018 – December 2018
Archaeology and communications	November 2018 – March 2019
Planning & Permitting	September 2018 – August 2019
Construction Phase	September 2019
Completion Phase	October 2019 – December 2019

## **8.0 Budget**

Total Program Cost: \$257,476

## 9.0 References

Summer Chinook Spawning Habitat Restoration in the Puntledge River Headpond 2004 – 2005 (E. Guimond).

Connors, BM and E Parkinson. 2015. Puntledge River fish entrainment strategy Action Plan. Prepared by ESSA Technologies Ltd for BC Hydro, Vancouver, BC. 37pp.

Puntledge Water Use Plan Gravel Placement Project Definition Report  
Prepared by: E. Guimond and NHC March 31, 2013.