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Campbell River Project Water Use Plan

Physical Works Terms of Reference

- **JHTWORKS-2 Upper Campbell Lake Reservoir and Campbell Lake Reservoir Recreation Facility Upgrade Feasibility**

January 2016

Campbell River Water Use Plan

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Physical Works Terms of Reference

1.0 Introduction

This Terms of Reference is for the feasibility of improvements at recreation sites on both Upper Campbell Lake Reservoir and Campbell Lake Reservoir. A cost estimate for this phase of the work and a preliminary schedule are included.

This Terms of Reference is submitted in response to the *Water Act* Order issued by the Comptroller of Water Rights on November 21, 2012, Schedule C, Clause 1(b) and (d) and Schedule D, Clause 1 (a) and (b). The Order requires terms of reference for the “feasibility of upgrading boat ramps and beaches in Provincial Park sites and Forest recreation sites” in the Upper Reservoir, and Campbell Lake Reservoir, to “prioritize and upgrade as ordered by Comptroller,” and to “assess boating related recreation hazards” for both Upper Campbell Lake and Buttle Lake reservoir.

2.0 Description of Project

2.1 Location

The Campbell River System is located on central Vancouver Island as shown in Figure 1 below.

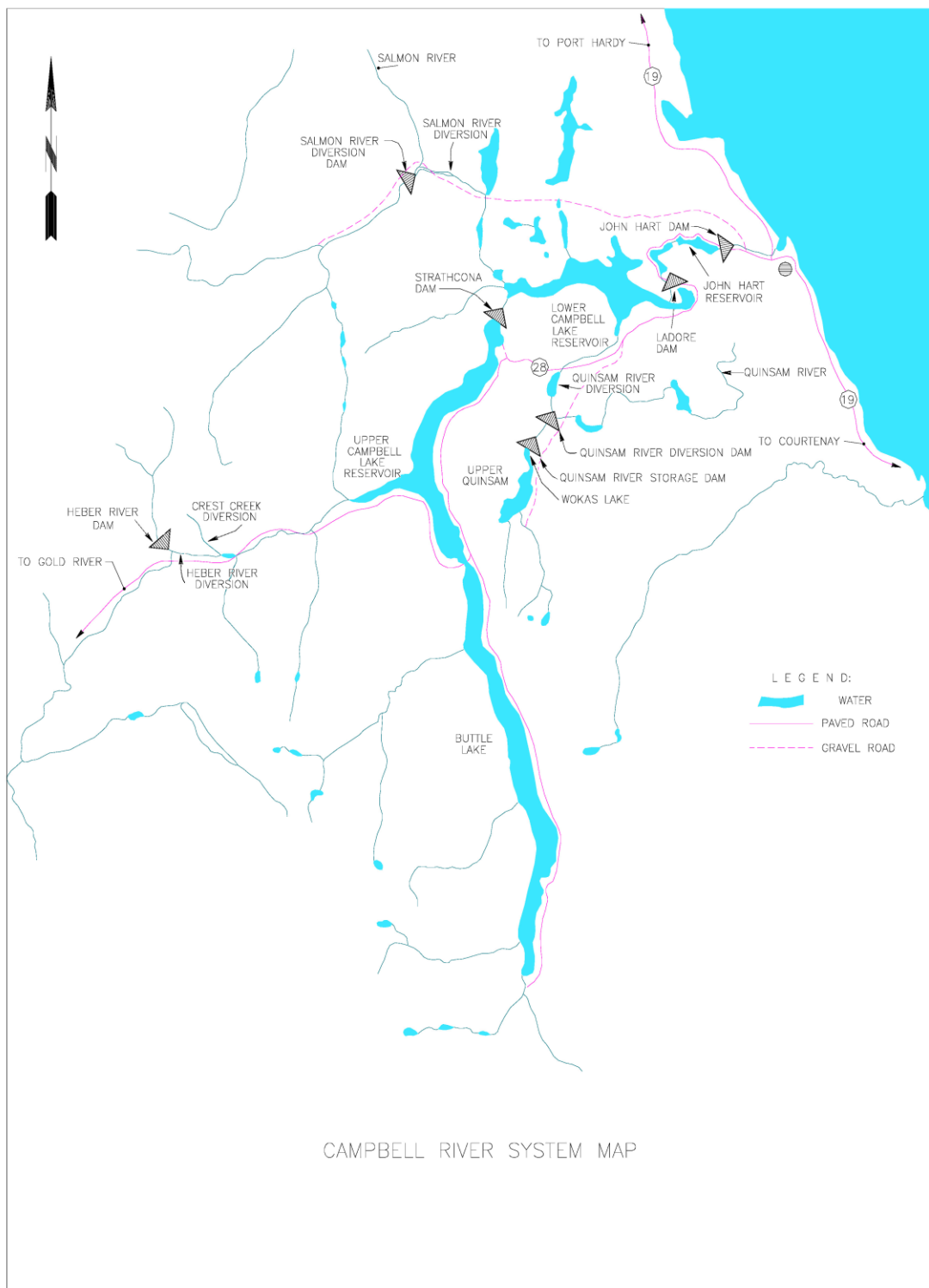


Figure 1: Location Map of the Campbell River System

2.2 Recreational Use

A wide variety of recreational activities take place on the Campbell River system rivers, lakes and reservoirs including but not limited to motorized boating, canoeing, kayaking, fishing, camping, picnicking, swimming, biking and hiking.

There are a number of established public recreation sites around the Upper Campbell Lake Reservoir, Buttle Lake and the Lower Campbell Lake Reservoir. These sites provide day use areas, beach access, overnight use camping areas and boater access to the reservoirs. The sites on the Upper Campbell Lake Reservoir are operated by BC Parks within Strathcona Provincial Park and the sites on the Lower Campbell Lake Reservoir are operated by Recreation Sites and Trails BC with the exception of Loveland Bay Provincial Park operated by BC Parks.

2.3 Background

The Consultative Committee (CC) recommended changes to the operation of the Upper Campbell Lake Reservoir and Campbell Lake Reservoir that were incorporated into the Water Use Plan (WUP). By Order of the Comptroller of Water Rights (issued November 21, 2012), the Upper Campbell Lake Reservoir now operates at a lower level than it had since 1996¹ for the summer recreational season from June 21 to September 10 with a maximum 220.5 m and a minimum of 217 m. Similarly, the Order set preferred upper and lower bounds of the Lower Campbell Lake Reservoir—from a maximum of 177.5 m to a minimum of 176.5 m during the June 21 to September 10 period.

In the Upper Campbell Lake Reservoir, the present facilities have been designed to operate at levels of 221 m – 219 m. Consequently, the new lower Ordered levels were anticipated to have impacts on recreation access. The CC recommended rebuilding selected facilities to better accommodate the new lower reservoir levels during the recreation period, including boat ramps, and beach access, and to manage site-specific swimming and boating hazards.

Most of the existing facilities in the Lower Campbell Lake Reservoir were designed to work optimally when the reservoir level is in the range of 177.5 m to 176.5 m, which is the same as the ordered level. It was anticipated that upgrades to boat ramps and beaches might be necessary even at these levels.

Table 1: Ordered levels vs recreation design levels

Location	Optimal levels for the current design of recreation facilities	WUP ordered Levels (June 21-Sept 10)
Upper Campbell Lake Reservoir	221-219 m	220.5-217 m
Lower Campbell Lake Reservoir	177.5 m-176.5 m	177.5 to 176.5 m

¹ Recommended maximum water level of Upper Campbell Reservoir: 222.0 m June 1 to September 30 (Campbell River Interim Flow Management Strategy, Table 14, May 1997)

2.4 Approach to Physical Works

The physical works project will be completed in phases: Identification/Feasibility, Definition and Implementation. This Terms of Reference includes the Identification/Feasibility and Definition phases. CWR approval will be sought before proceeding to Implementation. These phases are described further below.

- 1) **Identification/Feasibility:** This phase typically includes the needs assessment, conceptual and feasibility design. Identification was initiated as part of the WUP development process, as the Consultative Committee identified the need for upgrades to beaches and boat ramps. The feasibility study in this TOR will further identify specific candidate sites and feasible design options for those sites. Following First Nations and stakeholder engagement, recommended options will be taken to Definition phase.
- 2) **Definition Phase:** This phase includes preliminary designs associated with the recommended options emerging from the Identification/Feasibility phase. Given the low complexity of these projects, there may not be a significant difference between the conceptual design, the preliminary design and even the final detailed design. The designs will be followed by regulatory approvals as appropriate. BC Hydro will seek CWR approval at the end of the Definition Stage, prior to proceeding to the Implementation phase.
- 3) **Implementation Phase** (to be completed under future TOR addendum): In the subsequent TOR, BC Hydro will submit for the completion of the following:
 - Detailed design for issued for construction drawings, including refined cost estimates and construction schedule;
 - Permitting as required;
 - Construction of the design determined in previous phase; and
 - Completion reporting including ongoing maintenance, as required.

3.0 Project Objectives

The identification/feasibility stage will identify proposed sites and feasible design options for recreation upgrades in the Upper Campbell Lake, and Buttle Lake Reservoirs, and the Campbell Lake Reservoir. Specifically options will be identified to meet the following primary objectives (as derived from the November 21, 2012 Order):

- 1) Increase boater access and safety of existing boat ramps and related facilities for the recreation period.
- 2) Address boating-related and swimming hazards present during the recreation period.
- 3) Upgrade beaches to improve access for the recreation period.

The appropriate measures of each objective will be determined as part of the feasibility study. It may include both quantitative measures (e.g., % availability during the recreation period), or qualitative (e.g., high/medium/low safety risk).

4.0 Linkages with Other Campbell River Water Use Plan Projects

As the Consultative Committee contemplated that the recreation physical works would address concerns related to swimming and boating hazards as part of the upgrades to boating or beaches, there is a need to coordinate the assessment of boating recreation hazards as required by the Campbell River Water Use Plan Order, (November 21, 2012) Schedule C clause (d) and Schedule D, clause (b)). This task will be undertaken under JHTMON-1 Upper and Lower Campbell Lake Reservoir Elevation Models (TOR not yet submitted or approved) and will provide inputs to this feasibility study.

Additionally, once identified sites for proposed upgrades from JHTWORKS-2 are known, information will be incorporated into JHTMON-2 Upper and Lower Campbell and John Hart Reservoirs Public Use and Perception Survey to ensure that it will measure “public response to additional works constructed” (Schedule C (b) and Schedule D (c)).

Finally, there may also be opportunities to coordinate physical works projects identified in this study with the revegetation program (JHTWORKS-3), where practical.

5.0 Identification/Feasibility Phase

The purpose of this phase is to conduct a field study-based evaluation of existing boat ramps, beach upgrades, and swimming and boating hazard candidate sites to identify technically feasible improvements that meet the overall project objectives.

The key outcome of this stage will be a feasibility report including:

- A profile for each candidate site location of boat ramps, beaches or swimming/boating hazard areas.
- A series of conceptual design option (s) for meeting the project objectives identified in Section 3.0 above.
- Description of each option by which to evaluate the feasibility designs being considered. Full evaluation criteria will be determined as part of the feasibility study. Evaluation criteria will include but not limited to the following:
 - Meeting Order objectives (e.g., % availability during the recreation season or qualitative assessment)
 - Safety
 - Cost (estimate of construction cost and ongoing maintenance²)
 - Durability (e.g., life of investment)
 - Implementation complexity (e.g., high/low construction complexity)

² Once the physical works projects are complete, it is expected that the responsibility of these facilities including day to day and ongoing maintenance and management will remain with the existing owners and operators (BC Parks and Recreation Sites and Trails BC) scheduling of the work will require direct involvement with Recreation Sites and Trails BC, and BC Parks.

Task 1: Project Coordination

Project coordination involves the general administration and technical oversight of the program, which will include, but not be limited to: 1) budget management, 2) study team oversight 3) logistics coordination, and 4) technical oversight in field and analysis components.

Task 2: Information Gathering: Candidate Site Visits, Facilities Inspection, Site Surveys

Visits of the proposed candidate site locations are required to document existing conditions and to determine the of feasibility options for each location. Site surveys should to take advantage of forecast low-water conditions.

This Task should also coordinate with JHTMON-1 to gather information collected for the digital elevation mapping, as well as hydrological information and other pertinent data available from BC Hydro.

Task 3: Engineering Technical Feasibility

Preliminary engineering assessments of candidate site upgrades identified in Task 2 will be performed using existing civil engineering, geotechnical, hydrotechnical, and bathymetric information, site visit, and expert opinion.

This process will identify engineering challenges and provide solutions and/or engineering options for each candidate site. It is anticipated that the preliminary engineering assessments will occur concurrently with archeological and environmental assessments (Tasks 4 and 5).

A detailed examination of the existing site profile, including reservoir grades to the levels necessary to provide access during the recreation period. Where necessary, additional information collected under JHTMON-1 may supplement visual confirmation of the reservoir grade below the water surface.

Estimated annual maintenance requirements (cost and scope) will be estimated as part of the feasibility study. This will include regular annual maintenance to ensure facilities are operational, as well as an estimate of ongoing structural maintenance requirements over the lifetime of the site enhancement. This will be included in the report.

Task 4: Preliminary Archaeological Assessment

Following 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 be contracted to undertake an archaeological overview assessment (AOA) of the candidate site locations. The AOA will include a review of maps, reports on prior archaeological work in the area, site records, overview assessments and other pertinent historical or ethnographic studies relevant to the candidate site locations. A preliminary field reconnaissance (PFR) may also be required to refine the potential assessment.

The archaeologist will be responsible for identifying the archaeological potential at each of the site locations, including conflicts between the identified locations and any known archaeological or heritage sites in accordance with BC Hydro's "Best Management Practices" for heritage resources. Interviews with appropriate First Nations may provide additional information. It is not expected that any subsurface testing, or collection of artifacts or other archaeological materials exposed on the surface, will be required at this stage.

Local First Nations will have the opportunity to comment on the Terms of Reference for the archaeological overview assessment before it is carried out. The study will outline and include input of First Nations with an interest in the study area, and will be used to focus and inform the project design.

A detailed report summarizing the studies undertaken will be prepared by the archaeologist, documenting existing conditions, including recommendations for further studies to help inform project design. This can include but is not limited to, further investigation in the form of an archaeological impact assessment (AIA), or specific mitigation measures to be implemented. All reports will be shared with interested local First Nations in draft format prior to finalizing.

Task 5: Preliminary Environmental Assessment

The environmental assessment will investigate whether the technically feasible options for recreation upgrades considered at the candidate sites conflict with the environmental values at those locations. A registered professional biologist (RPBio) will be contracted to visit the candidate sites. The task will be to evaluate potential impacts to environmental resources such as fish and fish habitat, wildlife and wildlife habitat and vegetation for the proposed recreation site upgrades.

The biologist will be responsible for identifying sensitive areas near the proposed works, proposing alternative design options as required, suggesting methods for avoiding impacts, or providing mitigation plans for each location.

The biologist will also be responsible for liaising with the necessary environmental regulatory agencies to determine regulatory requirements for the proposed options to build into the Design phase.

Task 6: Reporting

It is anticipated the feasibility study will entail three components:

- 1) Engineering Technical Feasibility
- 2) Archaeological Feasibility
- 3) Environmental Feasibility

All reports will be provided in hard copy and as Microsoft Word and Adobe Acrobat (*.pdf) format, and all maps and figures will be provided either as embedded objects in

the Word file or as separate files. Raw data is to be provided in an Excel spreadsheet or other suitable format acceptable to BC Hydro.

Engineering Technical Feasibility

A detailed technical report outlining the findings from the site visit and investigation, as they relate to the primary components under Tasks 2 and 3 above, will be prepared. Engineering aspects for each site will be discussed and notes made where it is believed the site will prove difficult and / or infeasible. The report will include site-specific details as to what is deemed feasible for each location, including an approximate cost estimate for each of the alternatives. A conceptual design including sketches should accompany the report. The report may provide a recommendation of the most technically feasible option. However, full recommendations in relation to the overall objectives will be occur in Task 7.

Archaeological Feasibility

It is expected the archaeologist will issue a detailed report, including the aforementioned Best Management Practices and Field Guidelines, in an easily referenced format that could be used by field crews. The report will provide details on sites where potential conflicts exist, and itemize mitigating measures, if necessary. Additionally, the report should include procedures to undertake should a heritage site be discovered at one of the proposed upgrade sites.

Environmental Feasibility

A report detailing the conditions and circumstances at each site will be prepared, including site-specific recommendations on how to proceed with work in a manner that satisfied environmental concerns. Any mitigating measures and permitting requirements related to environmental concerns will be identified by the biologist. Procedures on how to secure all regulatory permits will be documented.

Task 7: Options Review and Prioritization

This task involves seeking stakeholder and First Nations input to a prioritization exercise to narrow down the technically feasible options and recommend set of preferred options for BC Hydro to request CWR approval for Implementation.

Task 7.1: Engagement and Consultation

The options for each candidate site will be reviewed with the Campbell River Monitoring committee, and local First Nations. The intent is to analyze the identified alternatives against the primary objectives as set out in the Order and other relevant evaluation criteria, to determine an agreed set of recommended works alternatives for both the Upper Campbell Lake and Buttle Lake Reservoir, and the Lower Campbell Reservoir.

Additional local stakeholder engagement may be undertaken (e.g., open house, print ads, or mail out) to validate recommendations and to determine if there are other considerations.

Task 7.2: Recommendation Report

A report providing the results of the assessment and recommendation will be developed based on a review of the technical feasibility study, the preliminary environmental and engineering assessments, and from agency, stakeholder, First Nations, and public input (Tasks 2- 5). This assessment will:

- i) Provide background information summarizing all the information compiled as part of this study;
- ii) Identify priority sites and describe the recommendation rationale and a description of the tradeoffs made, if required;
- iii) Describe, as required, any environmental, social, and archeological concerns/risks for each recommended site;
- iv) Propose a schedule and budget for implementing the recommended sites;
- v) Describe any coordination required for the physical works projects with the revegetation program (JHTWORKS-4), where required; and
- vi) Identify the scope of maintenance requirements, and associated costs, where applicable.

6.0 Definition Phase

The scope of the Definition Phase is the full development of the designs for the priority sites recommended in the previous phase.³ This will be followed by regulatory approvals as appropriate. BC Hydro will seek CWR approval at the end of the Definition Stage, prior to requesting approval to proceed to the Implementation phase.

The Definition phase deliverables to be submitted to the CWR will include:

- Estimated budget;
- Design drawings;
- Expected construction approach and schedule.

Task 8: Design and Specifications

Site-specific plans will be developed for recommended prescriptions at each candidate site. These include, but are not limited to:

- Develop engineering specifications: Design standards for engineering will meet professional standards and will be reviewed by BC Hydro.
- Identify property ownership, and tenure conditions and requirements.
- Identify permitting requirements (environmental etc.).

³ Depending on the complexity of the recommended options, the preliminary design may not be significantly different from the issued for construction design.

- Identify archeological monitoring requirements, if any.
- Develop environmental management plan: The biologist will produce an environmental management plan for each site to ensure that potential environmental impacts associated with the work are avoided or minimized.
- Develop stakeholder/communications plan.
- Develop Safety Plan/Public Safety Plan.

Task 9: Implementation Planning

It is anticipated that project requirements and specifications may change between the completion of the feasibility study and the subsequent environmental, engineering, and archeological assessments. As such, an implementation plan will be produced and function as a master plan for implementing the recreation works.

This plan will include:

- A summary of the pertinent background information.
- Findings of detailed engineering, environmental and archeology assessments.
- Project design specifications.
- A detailed budget for each candidate site.
- A detailed implementation schedule for each project.

7.0 Schedule

The feasibility/design phase will be undertaken in 2016 and early 2017.

8.0 Budget

Total Program Cost: \$119,128.

9.0 References

Order of the Comptroller of Water Rights dated November 21, 2012.

Campbell River Interim Flow Management Strategy, Prepared by: Campbell River Hydro/Fisheries Advisory Committee dated May 1997.

Campbell River System Water Use Plan, Revised for Acceptance by the Comptroller of Water Rights dated November 21, 2012.

Campbell River Water Use Plan, Consultative Committee Report dated March 2004.