

CONDITIONAL WATER LICENCE

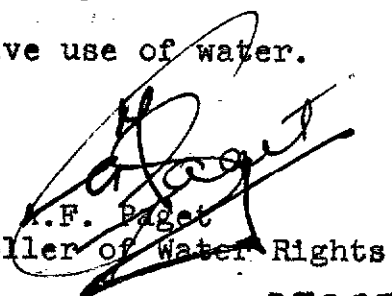
British Columbia Hydro and Power Authority of Victoria, B.C., is hereby authorized to store water as follows:

- (a) The sources of the water supply are Duncan Lake and Duncan River and tributaries.
- (b) The storage works are to be located as shown on the attached plan.
- (c) The reservoir is Duncan Lake and such portions of the Duncan River and its tributaries as may be flooded by the works authorized under this licence.
- (d) The date from which this licence shall have precedence is 26th June, 1961.
- (e) The purpose for which the water is to be used is Storage.
- (f) The maximum quantity of water which may be stored is 1,400,000 acre feet per annum.
- (g) The period of the year during which the water may be stored is the whole year, subject to clause (q) hereof.
- (h) This licence is appurtenant to the Undertaking of the Licensee.
- (i) The works authorized to be constructed are a dam and auxiliary works, which will store water to a pool elevation not to exceed 1892 feet.
- (j) The construction of the said works shall be commenced on or before the 31st day of December, 1962 and shall be completed and the water beneficially used on or before the 31st day of December, 1967.
- (k) The licensee shall not commence construction of the works authorized under clause (i) hereof until the plans for same have been approved by the Comptroller of Water Rights.
- (l) The licensee shall clear the reservoir in the manner and to the extent as directed by the Comptroller after consultation with the Deputy Minister of Forests.

C 27067

- (m) The licensee shall provide public access to the reservoir area as may be directed by the Comptroller.
- (n) The licensee shall make available an amount not to exceed \$5,000 (five thousand dollars) per annum to the Department of Recreation and Conservation in each of the years 1962 and 1963 to conduct a study and make a report on such remedial measures as may be determined to be necessary for the protection of fisheries and wildlife.
- (o) The licensee shall undertake and complete such remedial measures for the protection of fisheries and wildlife as the Comptroller may direct following receipt of the aforesaid report from the Department of Recreation and Conservation.
- (p) The licensee shall construct and operate such components of a hydrometeorological network as may be directed by the Comptroller and shall make the information obtained available to the Comptroller as he directs.
- (q) The licensee shall operate the reservoir as may be determined by the Comptroller in consultation with any boards or entities that may be established in respect to the interests and obligations of the Governments of Canada and British Columbia.
- (r) The licensee shall provide such facilities over any structure for the handling of forest products and general water transport as may be directed by the Comptroller.
- (s) The licensee shall release water at such times and in such quantities as may be directed by the Comptroller for the public benefit.
- (t) The licensee shall review with the Comptroller of Water Rights prior to expropriation under the Water Act or any other Act any matter where the licensee is unable to reach agreement with the owner or owners of lands affected by the works and the operation thereof as authorized under the licence.
- (u) The licensee's rights issued under this licence shall be deemed to be subsequent to any rights granted under any licence which may be issued at any time for the consumptive use of water.

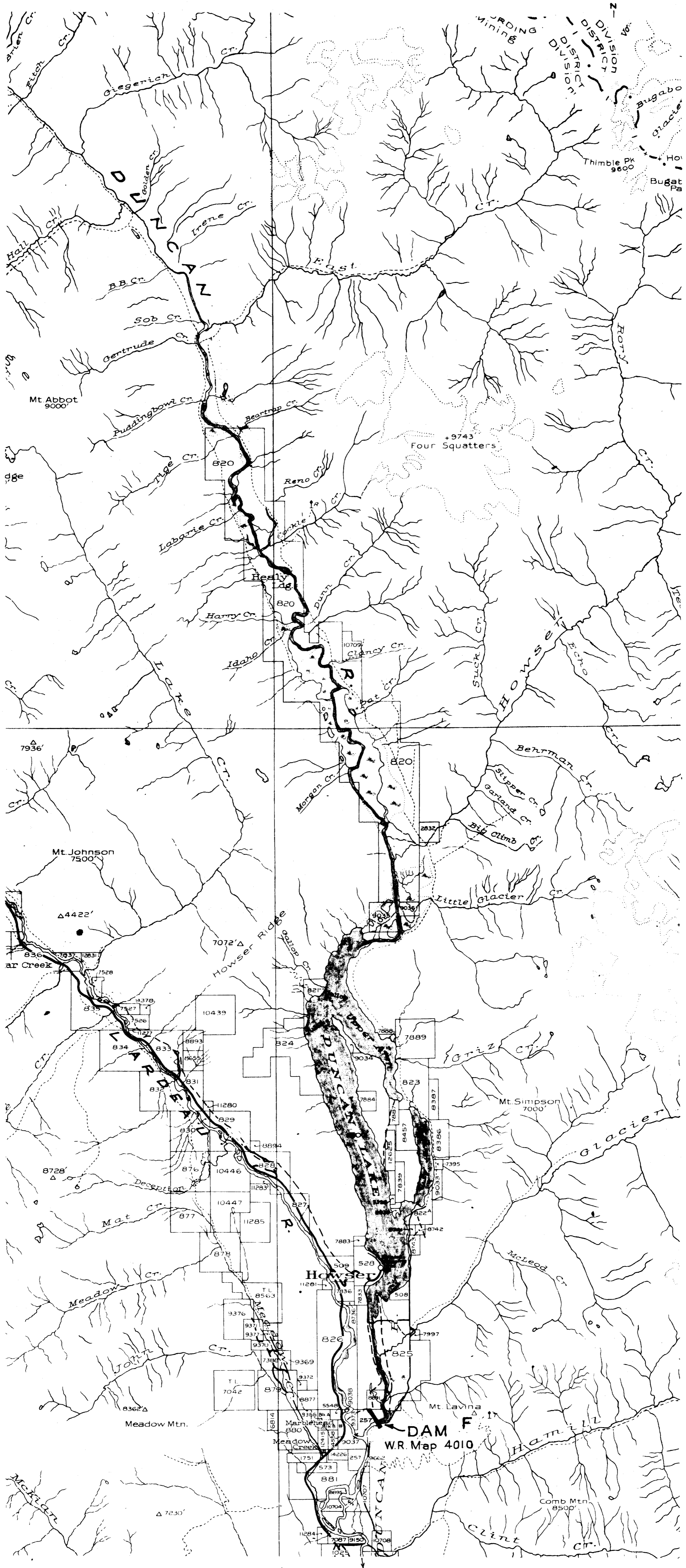
Map No. 4010
R.M.


K.F. Paget
Comptroller of Water Rights



KASLO WATER DISTRICT KOOTENAY DISTRICT

Scale: 2 Miles = 1 Inch



Signature

Date Apr. 16th. 1962

C.L. 27067

File 0236916

EXHIBIT "A"

W A T E R A C T

IN THE MATTER of clause (1) of Conditional Water Licence No. 27067, Duncan Lake, I hereby amend the clearing requirements for the Duncan Lake reservoir in respect of Areas 1, 2, 3 and 4 as shown on the attached plan and direct that the following modified clearing programme be carried out in respect of these areas:

Area 1 - All remaining trees and brush to be removed and burned; whole area to be scarified.

Area 2 - No clearing to be carried out.

Area 3 - All trees to be removed at 12 - 24" stump height; any slash to be carefully removed; all brush, small trees (less than 10 feet high), shrubs, to be left standing.

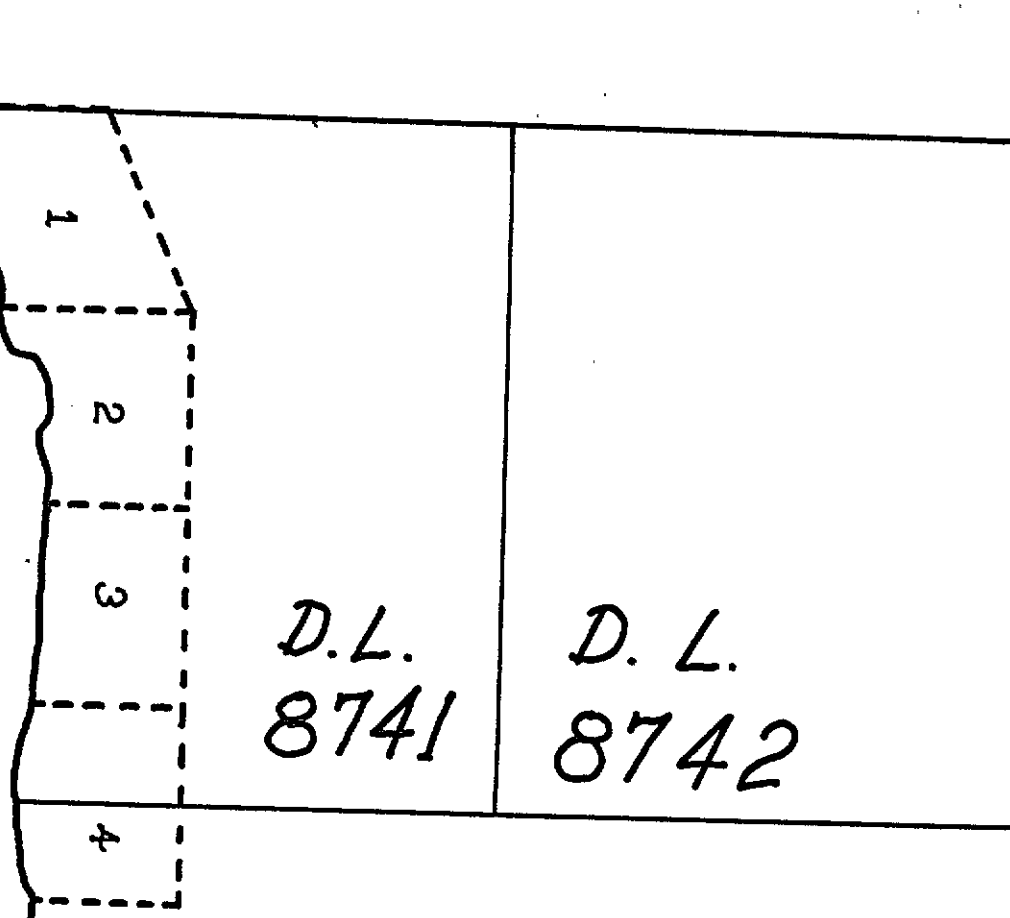
Area 4 - All trees, slash, brush and shrubs to be cut, piled and burned.

DATED at Victoria, B. C., this 18th day of July, 1966.



H. D. DeBeck,
Comptroller of Water Rights.


DUGGAN LAKE



D.L.
8741

D. L.
8742

D. L 8743


H. D. DeBeck,
Comptroller of Water Rights.

July 18th, 1966.

FROM B.C. HYDRO - DUGGAN
RESERVOIR MOSAIC
SHEET B
SCALE: 1 INCH TO 400 FEET (APPROX)

ORDER

WATER ACT

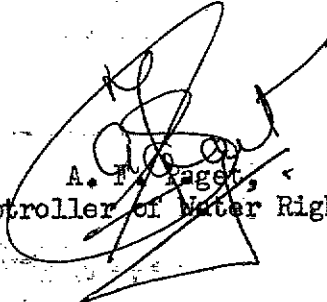
Section 15

FILE 0236916

Being satisfied that no person's rights will be injuriously affected, I hereby amend clause (j) of Conditional Water Licence No. 27067, Duncan Lake and Duncan River, and tributaries, to read:

- (j) The construction of the said works shall be commenced on or before the 31st day of December, 1963, and shall be completed and the water beneficially used on or before the 31st day of December, 1968.

Dated at Victoria, B.C., this 14th day of December, 1962.


A. T. Baget,
Comptroller of Water Rights.

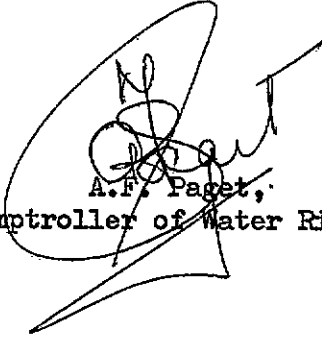
ORDER
WATER ACT
Section 15

File No. 0236916

Being satisfied that no person's rights will be injuriously affected, I hereby amend clause (j) of Conditional Water Licence No. 27067, Duncan Lake and Duncan River and tributaries, to read:

- (j) The construction of the said works shall be commenced on or before the 31st day of December, 1964, and shall be completed and the water beneficially used on or before the 31st day of December, 1969.

DATED at Victoria, B. C., this 19th day of November, 1963.


A.F. Paget,
Comptroller of Water Rights.



Province of British Columbia

Water Act

Water Act Section 88

File No. 76975-35/Duncan

WHEREAS British Columbia Hydro and Power Authority (BC Hydro) is the operator of the Duncan Dam and reservoir, in respect of which it holds Conditional Water Licence 2702⁷/₆;

WHEREAS BC Hydro has engaged in public consultation to determine values for system parameters and to develop operating procedures which may provide benefits as described below;

WHEREAS the licensee has submitted the Duncan Dam Project Water Use Plan, which recommends changes to the operations of the Duncan Dam Project and physical works which are intended to benefit fish and wildlife, shoreline conditions and recreation;

WHEREAS the Duncan Dam Water Use Plan proposes a monitoring programme to determine whether operating the project in accordance with the operating parameters, works and procedures in the Plan will provide the expected benefits; and

WHEREAS I have accepted the Duncan Dam Project Water Use Plan dated December 20, 2007;

I HEREBY ORDER THAT:

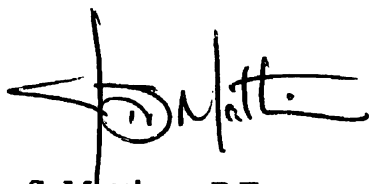
1. The licensee shall release a daily average minimum flow of 3.0 cubic metres per second (m³/s) from Duncan Dam (PD 25003). The licensee may decrease this quantity to facilitate bull trout passage between May 1 and June 30 of each year.
2. In addition to clause 1 above, the licensee shall release water from Duncan Dam in such manner as to follow the flow protocol specified in Schedule A, as measured below the confluence of Duncan and Lardeau Rivers in the vicinity of Water Survey Canada gauge 08NH118.
3. The reservoir shall be maintained between the elevations of 576.38 and 576.68 metres GSC from August 1 to August 10. After an elevation of 576.68 metres is reached, or on August 11 if this level is not reached, the reservoir will be drafted to 575.5 metres \pm 0.3 metres and maintained at this level until Labour Day. The flow

rates specified in clauses 1 and 2 above take priority over the elevations specified in this clause.

4. The licensee shall meet the following ramping rates:
 - a) any decrease in the rate of release from Duncan Dam shall not exceed 28 m³/s/hour and shall not exceed 113 m³/s in 24 hours;
 - b) any increase in the rate of release from Duncan Dam shall not exceed 113 m³/s/day; and
 - c) the obligations in 4a and 4b take precedence over meeting the scheduled changes to flow requirements specified in Schedule A.
5. The licensee shall submit, within 9 months of the date of this order, for approval by the Comptroller, terms of reference for the following:
 - a) plans for erosion protection in Argenta Slough;
 - b) plans for boat ramp extension at Glacier Creek including annual maintenance;
 - c) an action plan to minimize the stranding of Kokanee spawning in Duncan River side channels downstream of the Duncan dam;
 - d) plans to assess nutrient retention in Duncan Reservoir and the downstream nutrient reduction associated with Duncan Dam operations;
 - e) plans for an adaptive stranding protocol to manage fish stranding based on ramping trials, fish habitat use studies, hydraulic assessments, and fish stranding assessments;
 - f) an archaeological overview assessment of the reservoir drawdown zone; and
 - g) non-intrusive erosion monitoring of archaeological resources at two previously identified sites in the drawdown zone.
6. The licensee shall submit within 12 months of the date of this Order, for approval by the Comptroller, terms of reference for the following effectiveness monitoring programmes:
 - a) monitor kokanee spawning in Lower Duncan River in order to evaluate flow release benefits;
 - b) monitor bull trout migration through the Duncan Dam to evaluate benefits of current management practice;
 - c) monitor temperature and total gas pressure in Duncan River to determine whether changes occur through revised operations;
 - d) monitor cottonwood recruitment and wildlife habitat use in the Lower Duncan River floodplain;
 - e) monitor mosquitoes in the Lower Duncan River to determine whether reproductive success is reduced through operations;
 - f) monitor kokanee and rainbow trout populations in Duncan Reservoir;

- g) monitor burbot populations in Duncan Reservoir; and
 - h) monitor riparian vegetation and wildlife habitat, including nesting birds, in the drawdown zone of the Duncan Reservoir.
7. Upon receiving, from the Comptroller, approval of the above terms of reference and leave to commence, the licensee shall
- a) implement the works, feasibility studies, and effectiveness monitoring programmes in clauses 5 to 6 above in accordance with the approved terms of reference; and
 - b) submit annual reports to the Comptroller of Water Rights on the results of the works, plans and monitoring approved in clauses 5 to 6 above until the conclusion of the programmes as specified in each terms of reference.
8. With respect to the maintenance and provision of records the licensee must:
- a) Keep records of
 - i) flow release from Duncan Dam into Duncan River;
 - ii) Duncan Reservoir levels; and
 - iii) discharges measured in the vicinity of Water Survey Canada Gauge 08NH118.
 - b) Provide a written report to the Comptroller of Water Rights on or before February 1 of each year summarizing the records from the previous calendar year; and
 - c) Provide on request of the Comptroller of Water Rights records collected under 8a).
9. The licensee may operate the works in an alternate manner during annual maintenance and in the event of an emergency, dam safety requirement, an extreme hydrological event or to meet obligations under the Columbia River Treaty.
10. All emergency operations or other deviations from operations ordered above shall be reported to the Comptroller of Water Rights in a timely manner.

Dated at Victoria, B.C., this 21 day of December, 2007.



James S. Mattison, P.Eng.
Comptroller of Water Rights

**Schedule A
Target Flow Protocol**

1. The licensee shall provide flows below the confluence of Duncan and Lardeau Rivers, in the vicinity of Water Survey Canada gauge 08NH118 as follows:

Dates	Cubic Metres per Second	
	minimum	maximum
August 1 - August 24	73	400*
August 25 - September 24	73	250
September 25- 27	73	190
September 28-30	73	130
October 1-21	73	76
October 22 - December 21	73	110
December 22 - April 9	73	250
April 10 - May 15	73	120
May 16 - July 31	73	400

*during this time, the licensee will target a maximum of 250 cubic metres per second

2. Flows within 5% of the above figures are acceptable provided that the 3 day rolling average meets the minimum and maximum figures above.
3. The licensee shall adjust discharges from Duncan Dam at least once per working day in order to meet the flows in clause 1 above.
4. In the event that the maximum flows between December 22 and April 9, or minimum flows between March 1 and May 30 cannot be met as a result of reservoir level constraints under the Columbia River Treaty, BC Hydro will:
 - a) request a flood control variance from the US Army Corps of Engineers, and
 - b) if the variance is not granted,
 - i) increase the maximum flow to 300 cubic metres per second between December 22 and April 9 and inform the Comptroller of Water Rights in a timely manner or
 - ii) consult with federal and provincial fisheries agencies and seek direction from the Comptroller of Water Rights to implement a revised minimum or maximum flow for a specified time period.
5. This flow protocol takes priority over the target reservoir levels set in clause 3 of the Order.

[Signature]
2007.12.21



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ORDER

Section 88 of the
Water Act of British Columbia

IN THE MATTER OF Water Licence C027067, held by British Columbia Hydro & Power Authority (BC Hydro), which authorizes the storage of water for power purpose behind the Duncan Dam and identified by Provincial Dam Number D340000-00.

WHEREAS BC Hydro plans to improve the reliability of the flood discharge gate systems at the Duncan Dam.

WHEREAS BC Hydro has submitted a Spillway Gate Reliability Project plan in a letter dated February 11, 2011 requesting approval to alter the Duncan Dam.

WHEREAS the Dam Safety Section has reviewed the letter and accepted the Spillway Gate Reliability Project plan as being satisfactory.

NOW THEREFORE, I, Glen Davidson, Comptroller of Water Rights, hereby order pursuant to Section 88 of the *Water Act* of British Columbia, and pursuant to the Dam Safety Regulation, BC Reg. 44/2000, OIC 131/2000, that BC Hydro has authorization to proceed with the Spillway Gate Reliability Project at the Duncan Dam subject to the following:

- Maintain sufficient flood discharge capacity during construction by developing construction methodology and sequencing the work to manage the risk. Prior to construction, develop and forward to our office an Interim Dam Safety Risk Management Plan for placement in Appendix C of the Duncan Dam OMS manual.

Dated at Victoria, British Columbia this 15 day of February, 2011.

Glen Davidson, P.Eng.
Comptroller of Water Rights