



Province of British Columbia

Water Act

FINAL WATER LICENCE

British Columbia Hydro and Power Authority is hereby authorized to store water and divert water into storage as follows:

- a) The streams on which the rights are granted are Wahleach Lake and Boulder Creek and the reservoir is Wahleach Lake.
- b) The site of the dam, which creates Wahleach Lake Reservoir, is PD42965 and the point of diversion into storage is PD42969, which are located as shown on the attached plan.
- c) The date from which this licence shall have precedence is May 31, 1910.
- d) The purpose for which this licence is issued is storage. Storage purpose supports the power purpose at the Wahleach Generating Station, authorized under Final Water Licence 120303 and Conditional Water Licence 119821.
- e) The volume of water that may be stored is as described below:
 - i. The water may be stored in the reservoir between elevations of 621.8 metres, the minimum operating level, and 641.6 metres, the full supply level, measured at the power intake using Geodetic Survey of Canada (GSC) datum. The volume of water authorized to be stored between the minimum operating level and the full supply level under this licence is estimated to be 65.35 million cubic metres.
 - ii. Surcharging the reservoir above full supply level, drafting the reservoir to the full supply level, and drafting the reservoir below the minimum operating level shall be done in accordance with the Operation, Maintenance and Surveillance Manual.
- f) Water may be collected into storage, held in storage, and used throughout the whole year.
- g) This licence is appurtenant to the undertaking as set out in clause (g) of Final Water Licence 120303 and Conditional Water Licence 119821, the Wahleach Generating Station.
- h) The works authorized are a dam, a siphon and spillway at the outlet of Wahleach Lake (PD42965), a diversion berm on Boulder Creek (PD42969) with a fish-water by-pass gate and the Boulder Creek Diversion Channel to Wahleach Lake which are located as shown on the attached plan.
- i) This licence is issued in substitution of Conditional Water Licence 6409.

Pieter Bekker
Deputy Comptroller of Water Rights

File: 0265227

Date Issued: *Jun. 18/05*

Final Licence: 120307



Province of British Columbia
Water Act

Order
Section 88

File Nos.: 0265227 and 2002751

WHEREAS British Columbia Hydro and Power Authority (BC Hydro) is the operator of the Wahleach Power Development, in respect of which it holds Final Water Licence 120303 and 120307 and Conditional Water Licence 119821;

WHEREAS, the works authorized by Final Water Licence 120303 and 120307 and Conditional Water Licence 119821 at the Wahleach Power Development include: a dam, a siphon and spillway at the outlet of Wahleach Lake (PD42965), a diversion berm on Boulder Creek (PD42969) with a fish-water by-pass gate, the Boulder Creek Diversion Channel to Wahleach Lake, power intake (PD42968), tunnel, penstock, powerhouse;

WHEREAS, the operation of the works can also benefit the viability of fish and fish habitat and ecological values in Wahleach Lake Reservoir (also known as Jones Lake), Wahleach Creek (also known as Jones Creek), and Herring Island Side Channel of the Fraser River; and recreation opportunities on Wahleach Lake Reservoir;

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

WHEREAS the licensee has submitted a Water Use Plan, which recommends changes to the operations of Wahleach hydroelectric system which are intended to provide specific benefits to fish and fish habitat, ecological values and recreation; and

WHEREAS, I have accepted the Water Use Plan for the Wahleach Power Development, dated December 1, 2004; and

WHEREAS, BC Hydro has proposed a monitoring program to determine if operating the works in accordance with the operating parameters and procedures in the Wahleach Water Use Plan will provide the above listed expected benefits;

I HEREBY ORDER THAT:

1. The licensee must operate the Wahleach Power Development in accordance with Schedule A.
2. To determine the effectiveness of the regulation of the works in accordance with 1 above the licensee must undertake a monitoring program as set out in Schedule B.
3. In lieu of more restrictive regulation of the works than required under Schedule A, which would be intended to improve conditions for fish and wildlife, the licensee must :
 - a. provide a fertilization program for Wahleach Lake Reservoir which satisfies the criteria as set out in Schedule C; and
 - b. undertake a channel enhancement project in lower Wahleach Creek which satisfies the criteria as set out in Schedule D.
4. With respect to the maintenance and provision of records the licensee must:
 - a. keep records of:
 - i. Wahleach Lake Reservoir elevation;
 - ii. Boulder Creek Diversion Channel flow;
 - iii. Boulder Creek flow upstream of the Boulder Creek Diversion Channel;
 - iv. Lower Wahleach Creek discharge as measured at a gauge to be installed near Laidlaw;
 - v. Discharge through the Wahleach Powerhouse; and
 - vi. Siphon operation.
 - 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.
 - c. Provide on request of the Comptroller of Water Rights records collected under 4.a.
5. The licensee may operate the works in an alternate manner for planned maintenance, in the event of an emergency, a dam safety requirement, or an extreme hydrological event.
6. All emergency operations or other deviations from operations ordered under 1 above be reported to the Comptroller of Water Rights in a timely manner.

Dated at Victoria BC this 13th day of January, 2005



Pieter J. Bekker
Deputy Comptroller of Water Rights

Schedule A
OPERATING PARAMETERS

OPERATING CONDITIONS FOR THE WAHLEACH HYDROELECTRIC SYSTEM

1. Wahleach Lake Reservoir shall be operated such that the minimum reservoir elevation is 628.00 metres at all times.

2. In as much as the flow in Boulder Creek and the elevation of Wahleach Lake Reservoir allows, the fish-water by-pass gate on Boulder Creek (PD42969) and the Siphon on the Wahleach Dam shall be operated to provide a minimum flow in Wahleach Creek, measured at a gauge to be installed near Laidlaw, of 0.60 cubic metres per second for the period of December 1 to September 14. During the period of September 15 to November 30 the minimum flow is to be increased to 1.10 cubic metres per second. The works shall be operated in accordance with the following conditions:
 - a. The fish-water by-pass gate on Boulder Creek must be operated such that the first 0.14 cubic metres per second of water flowing in Boulder Creek at the point of the fish-water by-pass gate is diverted through the diversion channel into Wahleach Lake Reservoir.
 - i. For a period of five years from the issuance of this order BC Hydro shall operate the existing works and necessary temporary works to provide the required flow. During that five year period BC Hydro shall assess: Boulder Creek Inflows, Boulder Creek channel stability, the influence of the diverted water on the productivity of lower Wahleach Creek as a result of the required diversion, and the effectiveness of the existing works in providing the required flows.
 - ii. Following the five year period specified in i BC Hydro shall provide a report to the Comptroller of Water Rights assessing the viability and effectiveness of modifying the fish-water by-pass gate of the Boulder Creek Diversion Berm.
 - iii. On the findings of the report prepared in ii The Comptroller of Water Rights may order BC Hydro to improve the works.
 - b. If, due to low flow in Boulder Creek and/or reservoir elevation below 637.60 m, the minimum flow is not provided the licensee is to notify the Comptroller of Water Rights in a timely manner.

3. The Powerhouse shall be operated such that from September 15 to November 30 the rate of diversion is reduced to zero cubic metres per second for a minimum two hour period once every twenty-four hours.

Schedule B
MONITORING PROGRAMS

1. BC Hydro shall within four months of the date of issue of this order develop and submit for acceptance terms of reference with a proposed budget and schedule for a monitoring program which is to evaluate the effectiveness of the regulation of the works ordered in Schedule A in providing benefits to the anadromous section of Lower Wahleach Creek and to the Herring Island side channel of the Fraser River. The monitoring program is to achieve the objectives for each area noted below:

- a. Lower Wahleach Creek Anadromous Section

The Lower Wahleach Creek anadromous section is that part of Lower Wahleach Creek upstream from the confluence with Lorenzetta Creek to the migration barrier located upstream from the Laidlaw Road Bridge. Monitoring of the anadromous section of Wahleach Creek shall be conducted to determine if the change in operating parameters and procedures affect salmon productivity as assessed by enumeration of: fall spawners, fry outmigration, and spring spawners. In addition channel stability assessments shall be conducted which include an analysis of egg stranding with respect to flow.

- b. Herring Island side channel of the Fraser River

Monitoring of the Herring Island side channel shall be conducted to determine the effectiveness of the fall powerhouse operations on preventing stranding of chum spawners and redds. This shall be conducted by performing an analysis of the flows in the side channel with respect to the two hour curtailment and observation of spawning chum salmon behaviour.

2. Following review and acceptance in writing of the terms of reference by the Comptroller of Water Rights the licensee shall undertake the monitoring program as directed.
3. BC Hydro shall prepare and submit to the Comptroller of Water Rights, in the time period set out in the accepted terms of reference, reports summarizing the data collected from the monitoring studies which:
 - a. Provide an assessment of how effective the operating parameters are in providing the expected benefits.
 - b. A summary of deviations from the parameters and procedures and the responses to those deviations.
 - c. Recommendations for future changes to the parameters and procedures.

**SCHEDULE C
FERTILIZATION PROGRAM**

1. In lieu of ordering an operational change with respect to the elevations of Wahleach Lake Reservoir which would result in more power values being foregone the continuation of the Wahleach Lake Reservoir fertilization program has been recommended.
2. BC Hydro shall within four months of the date of issue of this order develop and submit for acceptance terms of reference for a reservoir fertilization program which will satisfy the following criteria:
 - a. An application schedule which includes timing, quantity and costs.
 - b. An assessment schedule which details how application rates will be determined and how effectiveness of the program will be evaluated including:
 - Annual assessments of Kokanee spawner abundance in tributaries to Wahleach Lake Reservoir;
 - Biennial estimates of population and density of Kokanee in Wahleach Lake Reservoir; and
 - Biennial estimates of zooplankton production in the Wahleach Lake Reservoir.
 - Annual, biennial, and fourth year reporting program.
3. Following review and acceptance in writing of the terms of reference by the Comptroller of Water Rights, BC Hydro shall undertake the fertilization program as directed.

Schedule D

Lower Wahleach Creek Channel Enhancement Project

1. In lieu of more extensive regulation of the works authorized under Final Water Licences 120303 and 120307 and Conditional Water Licence 119821 to provide increased benefits to fish and fish habitat in lower Wahleach Creek BC Hydro shall within four months of the date of issue of this order develop and submit for acceptance terms of reference for a Channel Enhancement Project for Lower Wahleach Creek.
2. The terms of reference for the Channel Enhancement Project for Lower Wahleach Creek shall be developed, with consideration to the affect it may have on other works in and about the stream, to provide improved habitat quality for spawning, rearing, and incubation of anadromous salmon.
3. The works proposed shall be planned to allow for regular maintenance and periodic reconstruction.
4. Following review and acceptance in writing of the terms of reference by the Comptroller of Water Rights, BC Hydro shall undertake the channel enhancement project as directed.
5. BC Hydro shall report progress of the construction and effectiveness of the works provided as set out in the terms of reference for the project and as required to pursuant to Schedule B of this order.



Province of British Columbia

Water Act

FINAL WATER LICENCE

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- b) The site of the dam, which creates Wahleach Lake Reservoir, is PD42965 and the point of diversion into storage is PD42969, which are located as shown on the attached plan.
- c) The date from which this licence shall have precedence is May 31, 1910.
- d) The purpose for which this licence is issued is storage. Storage purpose supports the power purpose at the Wahleach Generating Station, authorized under Final Water Licence 120303 and Conditional Water Licence 119821.
- e) The volume of water that may be stored is as described below:
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 - ii. Surcharging the reservoir above full supply level, drafting the reservoir to the full supply level, and drafting the reservoir below the minimum operating level shall be done in accordance with the Operation, Maintenance and Surveillance Manual.
- f) Water may be collected into storage, held in storage, and used throughout the whole year.
- g) This licence is appurtenant to the undertaking as set out in clause (g) of Final Water Licence 120303 and Conditional Water Licence 119821, the Wahleach Generating Station.
- h) The works authorized are a dam, a siphon and spillway at the outlet of Wahleach Lake (PD42965), a diversion berm on Boulder Creek (PD42969) with a fish-water by-pass gate and the Boulder Creek Diversion Channel to Wahleach Lake which are located as shown on the attached plan.
- i) This licence is issued in substitution of Conditional Water Licence 6409.

Pieter Bekker

Deputy Comptroller of Water Rights

File: 0265227

Date Issued: *Jan. 18/05*

Final Licence: 120307

Files: 0265227 + 2002751

August 5, 2009

76975-35/Wahleach

Ms. Renata Kurschner
Director, Generation Resource Management
BC Hydro
6911 Southpoint Dr
Burnaby BC V3N 4X8

Via email: Renata.Kurschner@bchydro.com

Water Licences

F120303

F120307

C119821

Dear Ms. Kurschner:

Re: Amendment to Wahleach Water Use Plan Order

The section 88 order to implement the Wahleach Project Water Use Plan was issued January 18, 2005.

Since then a greater understanding of the fisheries values in the Wahleach system has been gained, leading to proposed operational changes. The operational changes are embodied in the recently issued section 35(2) and 32 authorization under the Fisheries Act.

I understand the federal Department of Fisheries and Oceans reviewed the changes with First Nations and all fisheries agencies are in support of the change in operations.

I also understand the changes should lead to greater fish and power benefits while not affecting other water use values.

In recognition of the above, clause 2 of schedule A of the January 18, 2005 order is amended by adding the following:

“C. If during the Sept 15 to Nov 30 period the following conditions exist, the diversion at Boulder Creek fish-water by-pass gate (PD 42969) will be reduced to provide a minimum flow of 0.60 cms in Wahleach Creek, as measured at the gauge near Laidlaw, for as long as both conditions persist:

- i. Kokanee are utilizing Boulder Creek downstream of the fish-water by-pass gate for spawning and incubating, and;
- ii. Spawning salmon are not utilizing lower Wahleach Creek habitats below the Laidlaw Bridge.”

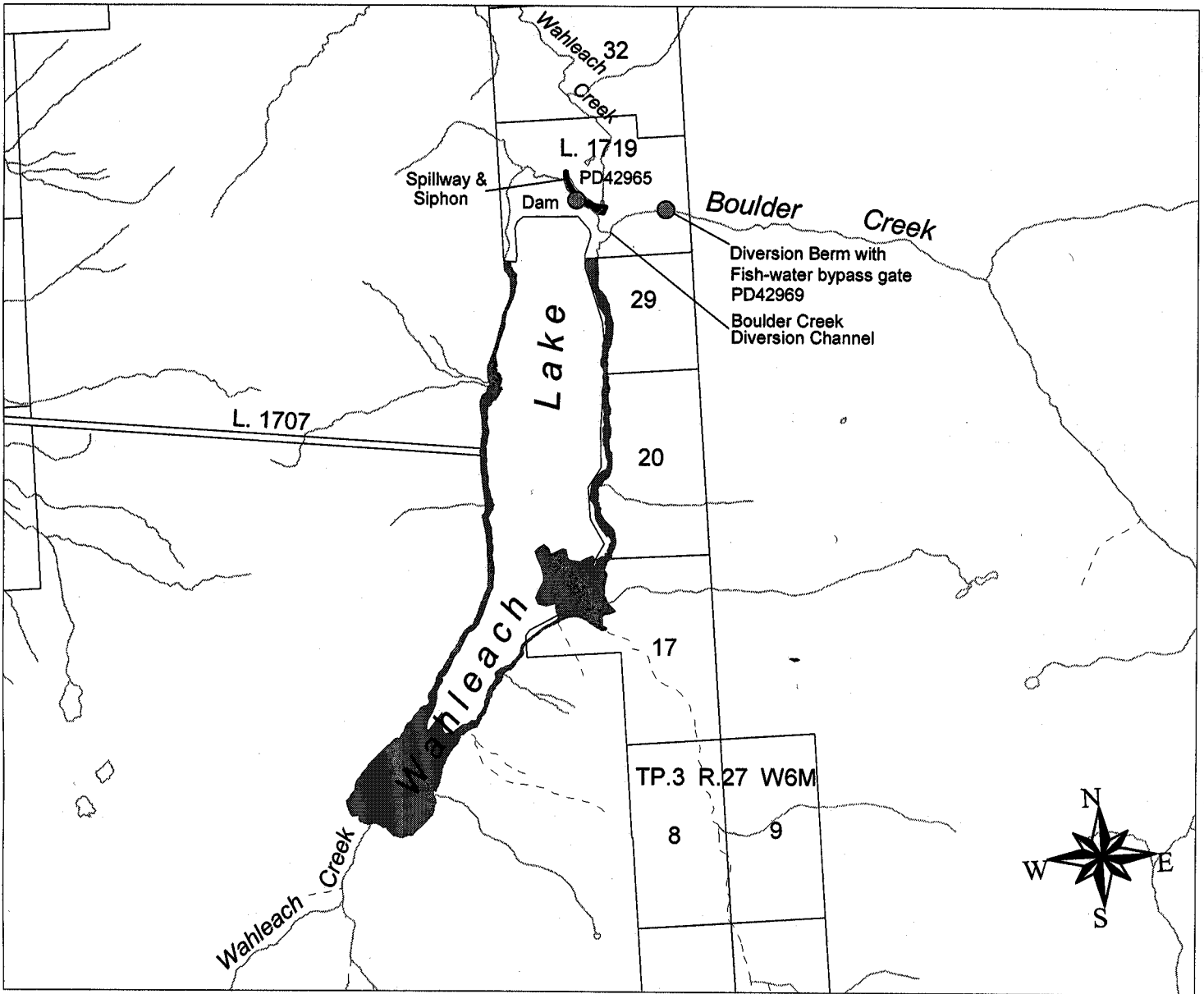
Sincerely,



Pieter Bekker
Deputy Comptroller of Water Rights

pc's: Dan Sneep, Habitat Assessment Biologist, Department of Fisheries and Oceans Canada
Ted Down, Manager, Fisheries Science Section, Ministry of Environment






WATER DISTRICT:
PRECINCT:
LAND DISTRICT:

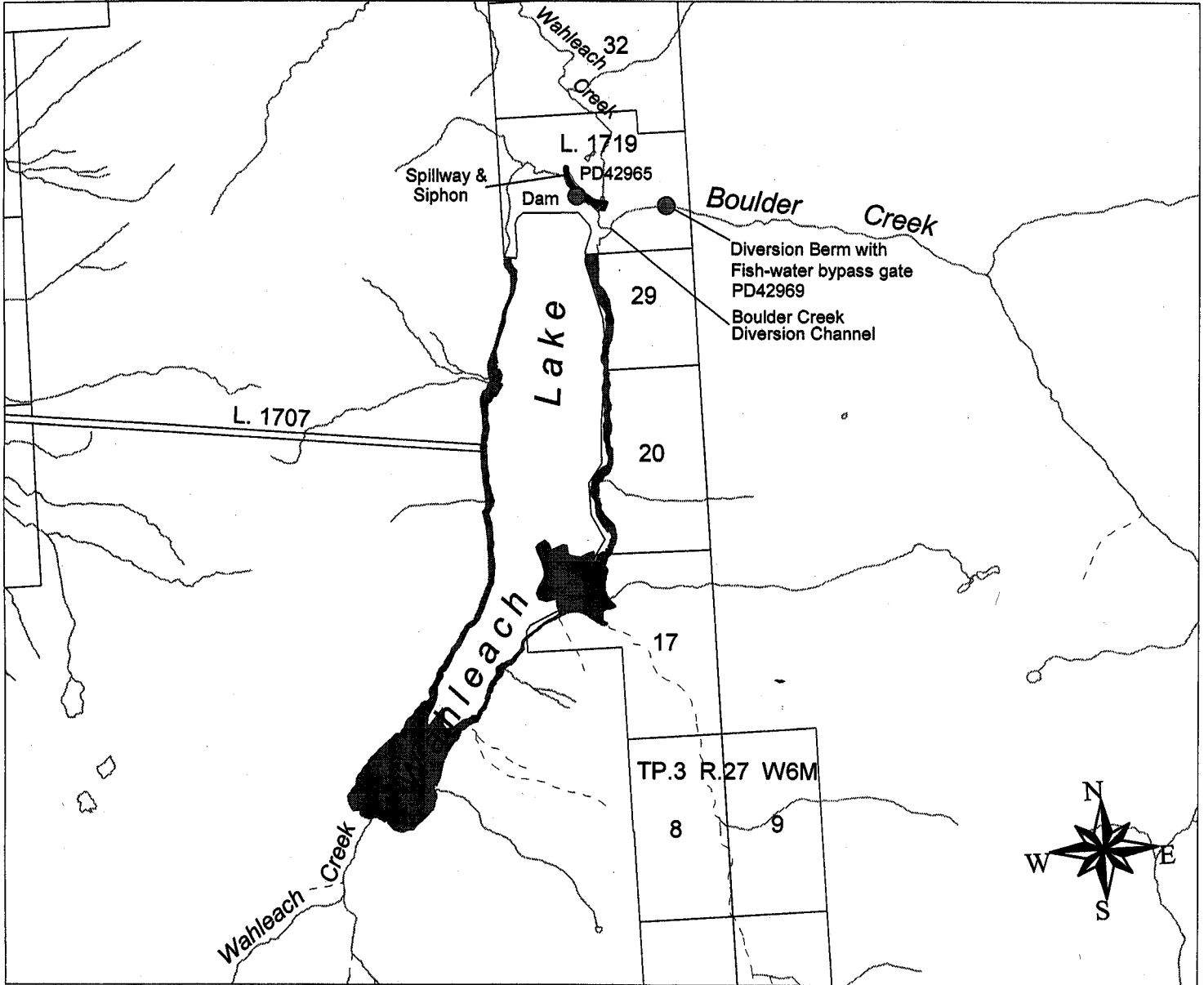
NEW WESTMINSTER
HOPE
YALE DIVISION OF YALE

Signature: *PA Schler*
Date: Jan. 18/05

LEGEND:

Scale: 1:54,000
Point of Diversion: ●
Map Number: WR 5842
Permit over Crown Land: 

F.L. 120307 for C.L. 6409
File 0265227
P.C.L 25163



WATER DISTRICT:
 PRECINCT:
 LAND DISTRICT:

NEW WESTMINSTER
 HOPE
 YALE DIVISION OF YALE

Signature: *W. Schler*
 Date: Jan. 18/05

LEGEND:

Scale: 1:54,000
 Point of Diversion: ●
 Map Number: WR 5842
 Permit over Crown Land: ██████████

F.L. 120307 for C.L. 6409
 File 0265227
 P.C.L 25163