



STATE OF WASHINGTON  
DEPARTMENT OF ECOLOGY

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October 9, 2006

**CERTIFIED MAIL 7005 2570 0000 4819 7887**

Ms. Holly Harwood  
PacifiCorp  
825 Northeast Multnomah  
Portland, OR 97232

Re: **Yale Hydroelectric Project (FERC No. 2071)**  
401 Certification / Order No. 3677

Dear Ms. Harwood:

We have reviewed PacifiCorp's request for certification under Section 401 of the Federal Water Pollution Control Act (Clean Water Act 33 U.S.C. § 1341) for the licensing of the Yale Hydroelectric Project (FERC No. 2071) in Clark and Cowlitz Counties, Washington. On behalf of the State of Washington, the Department of Ecology (Ecology) certifies that reasonable assurance exists that the project will comply with applicable provisions of 33 U.S.C. §§ 1311, 1312, 1313, 1316, and 1317, and other appropriate requirements of State law; subject to and limited by the conditions stated by the enclosed Certification-Order.

This Certification-Order shall be deemed withdrawn if the Federal Energy Regulatory Commission does not issue a license for the project within five (5) years of the date of this issuance of this Certification-Order. This Certification-Order may be modified or withdrawn by Ecology prior to the issuance of the license based upon new information or changes to the water quality standards or appropriate requirements of state law. If the Certification-Order is withdrawn, PacifiCorp will then be required to reapply for state certification under Section 401 of the Clean Water Act.

If you have any questions, please contact Chris Maynard at 360/407-6484. Written comments and correspondence relating to this document should be directed to Kelly Susewind, Water Quality Program, Department of Ecology, Southwest Regional Office, P.O. Box 47600, Olympia, WA 98504. The enclosed Certification-Order may be appealed by following the procedures described in the Certification-Order.

Sincerely,

Kelly Susewind, P.E., P.G.  
Southwest Region Manager  
Water Quality Program

KS:CM:lmc  
Enclosure



**STATE OF WASHINGTON  
DEPARTMENT OF ECOLOGY**

<b>IN THE MATTER OF GRANTING A</b>	)	<b>CERTIFICATION-ORDER</b>
<b>WATER QUALITY CERTIFICATION TO:</b>	)	<b>NO. 3677</b>
PacifiCorp	)	Licensing of the Yale Hydro-
in accordance with 33 U.S.C. § 1341	)	Electric Project (FERC No. 2071),
FWPCA § 401, RCW 90.48.120, RCW 90.48.260	)	Clark and Cowlitz Counties,
and WAC 173-201A	)	Washington

TO: Holly Harwood  
PacifiCorp  
825 NE Multnomah  
Portland, OR 97232

On December 2, 2005, PacifiCorp (Licensee) filed an application with the State of Washington Department of Ecology (Ecology) requesting issuance of a certification under the provisions of Section 401 of the Federal Water Pollution Control Act (Clean Water Act) (33 U.S.C. § 1341) to be submitted with its application for a license to the Federal Energy Regulatory Commission (FERC) for the Yale Hydroelectric Project.

#### **1.0 Nature of Project**

The Yale Hydroelectric Project (Yale or Project) is one of a total of four hydroelectric projects on the North Fork of the Lewis River (Lewis River). Starting upstream and going downstream, the projects are Swift No. 1, Swift No. 2, Yale, and Merwin. The Lewis River flows west from the Cascade Mountain Range and its western foothills 93 miles into the Columbia River near the town of Woodland, Washington. Two volcanic peaks, Mount Adams and Mount St. Helens lie on the northern and eastern edges of the basin, respectively. The Project is managed for power generation, with a capacity of 134 megawatts and for flood control, recreation, and fish resources.

Yale is located at river mile 34.2 on the North Fork of the Lewis River and includes a 323-foot high, 1,500 foot long concrete dam structure. One quarter-mile north of the Yale structure is Saddle Dam which is 40 feet high and 1,600 feet long. Yale Dam forms a 9.8 mile-long reservoir, known as Yale Lake. At full pool, the centers of the 18.5-foot diameter intakes to the turbines are 82.4 feet below the surface of the reservoir. Flows are directed through two turbines at the base of the dam. All flow from these turbines enters Lake Merwin.

#### **2.0 Authorities**

In exercising authority under Section 401 of the Clean Water Act (33 U.S.C. § 1341), RCW 90.48.120 and RCW 90.48.260, Ecology has investigated this application pursuant to the following:

- 1) Conformance with all applicable water quality-based, technology-based, and toxic or pretreatment effluent limitations as provided under Sections 301, 302, 303, 306, and 307 of the Clean Water Act (33 U.S.C. §§ 1311, 1312, 1313, 1316, and 1317);
- 2) Conformance with any and all applicable provisions of Chapter 90.48 RCW, including the provision to use all known, available and reasonable methods to prevent and control pollution of state waters as required by RCW 90.48.010; and
- 3) Conformance with the state water quality standards as provided for in Chapter 173-201A WAC and as authorized by 33 U.S.C. § 1313 and Chapter 90.48 RCW, and with other appropriate requirements of state law.

### **3.0 Findings**

#### ***Background Information about the Project***

- 1) Yale is managed for power generation, with a capacity of 9640 cfs and 134 megawatts, and for flood control, recreation, and fish resources.
- 2) The 'North Fork' Lewis River watershed is 93 miles long, covers 1050 square miles, and ranges in elevation from 12,281 feet above mean sea level (msl) at the summit of Mount Adams to eight (8) feet msl at the confluence with the Columbia River (RM 87.5) near the town of Woodland, Washington. The majority of the Lewis River basin is forested, with an area of approximately 30 square miles of upper basin denuded by the eruption of Mount St. Helens in 1980.
- 3) The mainstem of the Lewis River is known as the North Fork Lewis River, and flows southwesterly from its source at Mount St. Helens and Mount Adams through the Swift Creek Reservoir to Swift No. 1 Dam (RM 47.9); the Swift No. 2 canal bypassing three miles of the natural river channel to Swift No. 2 (RM 44); Yale Lake to Yale Dam (RM 34.2); and Lake Merwin to Merwin Dam (RM 19.5). PacifiCorp owns and operates Swift No. 1, Yale, and Merwin Dams. Cowlitz County PUD owns Swift No. 2 Dam, which is currently operated under contract by PacifiCorp.
- 4) Construction of Yale Dam began in 1952 and was completed by 1953.
- 5) Yale Dam typically passes water through its turbines from 6:00 a.m. to 10:00 p.m. and usually does not generate electricity at night.
- 6) Yale is operated in a coordinated system with Swift No 1, Swift No. 2, and Merwin hydroelectric projects.
- 7) Yale Lake water elevations are typically held within five feet of approximately 487 feet msl during the months of May to October. Natural inflow and flood control affect winter and spring elevations which range from about 470 to 490 feet msl.
- 8) Yale does not have structural facilities to allow for upstream migration of fish.
- 9) Fish in Lake Merwin include non-reproducing bull trout, sculpin, northern pike-minnow, tiger muskellunge, sturgeon, carp, bluegill, crappie, three-spined stickleback, cutthroat trout, Kokanee, rainbow trout, mountain whitefish, largescale suckers. Anadromous fish remain limited to below Merwin Dam except those excess hatchery fish planted in the reservoir to supplement the sport fishery. Fish in Yale Lake include char (bull trout), cutthroat trout, Kokanee, rainbow trout, mountain whitefish, largescale suckers, and other resident fish species. Anadromous fish are not present in either reservoir.
- 10) A Settlement Agreement was signed on November 30, 2004 and filed with FERC on December 9<sup>th</sup>, 2004. This agreement represented more than three years of collaboration between 26 parties interested in the Lewis River hydroelectric projects. In this agreement, PacifiCorp and Cowlitz PUD agreed to contribute resources towards the protection, mitigation and enhancement of fish resources, recreation, and aesthetics. Some of the requirements reflected in this Certification-Order are a direct result of the efforts and studies conducted by the parties involved. Ecology is not a party to the Settlement Agreement.

#### ***Compliance with Standards***

- 1) Existing Water Quality: Several water quality studies were performed to assess the existing water quality of the Lewis River hydropower projects. These studies analyzed the water quality characteristics of concern for each stretch of the Lewis River system. Relevant data regarding existing water quality is summarized in Table 1.

**Table 1. Existing Water Quality\***

Parameter	Location	Existing Water Quality
<b>Total dissolved gas (TDG)</b>	Yale tailrace	TDG exceedances occurred during turbine power-up and power-down. TDG levels were measured up to 118%. Improved operations have resulted in TDG levels <110%
	Yale tailrace and upper Lake Merwin	TDG levels greater than 110% may occur during spills.
<b>Temperature</b>	Yale Dam forebay, Yale Lake	Temperature profile with most pronounced stratification at ~20-25 feet from July through September with bottom temperatures ~8.5°C throughout the year and surface temperatures reaching 23°C in the summer. Little or no stratification seen in winter months.
	Yale tailrace, Lake Merwin	In the tailrace and adjacent waters of Lake Merwin, water temperatures fluctuated quickly over a 10°C range in the mornings and evenings due to turbine flows when producing power during the day and shutting off flows at night. Temperatures during the day were cold due to deepwater stratified forebay temperatures at the turbine intakes. Warm night time summer temperatures reflect the stratified surface temperatures of Lake Merwin. Temperatures during the summer months dropped ~6°C within a period of one (1) hour and heated 6°C within two hours in the evenings.
<b>Dissolved oxygen (D/O)</b>	Yale forebay and tailrace	Greater than 8 mg/L
<b>Turbidity</b>	Yale forebay and tailrace	Less than 5 NTU over background turbidity
<b>pH</b>	Yale forebay and tailrace	Between 6.5 and 8.5

\*Based on:

1. Preliminary Water Quality (WQ) Study, PacifiCorp Environmental Services July 1995
2. 1996-1998 WQ Study found in Final Technical Report, Aquatic Resources, Yale Hydroelectrical Project, March 1999.
3. Licensee's 2001 Technical Study Status Reports for the Lewis River Hydroelectric Projects, Volume 4, April, 2002

Total Dissolved Gas (TDG) exceedances occurred below the Yale Dam. These exceedances were a result of operations at Yale. The turbines at Yale were designed to use air to reduce cavitation on the turbine blades as the generators are powering up and powering down during electricity demand cycles at the beginning and end of each day. Operational adjustments to reduce the amount of time that air is entrained should correct the potential for exceedances.

- 2) TDG exceedances could occur below the dam when the dam spills water through the spillway to upper Lake Merwin. However, the large rock block near the end of the spillway acts to reduce air entrainment at depths for a large portion of the water at lower spill volumes. Flows above the 7-day 10-year flood (7Q10) are exempt from the Water Quality Standards (WAC 173 201A-060 (4)(a)). For Yale Dam, these river flows are calculated to be 27,088 cfs. Spills above the hydraulic capacity of the dam and below the 7Q10 flood flow are expected to occur an average of once or twice per year to control reservoir levels during periods of high rain and/or snowmelt.

- 3) Temperatures in the top ~26 feet of Yale Lake near the forebay of the dam were found to be greater than 18°C in June, July and August. Temperatures below this depth were cooler. This cooler water is released from the deep-water intakes into Lake Merwin and reflects the temperatures toward the bottom of the thermocline at >70 feet deep in the forebay. This water is about 13°C during the summer months. Temperatures in the hypolimnion remained around 8.5°C June through December.
- 4) Temperature fluctuations of up to 10°C occur in the tailrace of Yale Dam. This occurs in the mornings when cold, deep-water turbine flows enter the warmer epilimnion of upper Lake Merwin in the Yale tailrace and occurs again in the evenings when the turbines shut down, no water enters the tailrace, and the epilimnion waters of Lake Merwin flow back to the face of the dam.
- 5) Lake Class water quality standards apply from Merwin Dam to the Face of Yale Dam and from Yale Dam to the face of Swift No. 2 since Lake Merwin at 236.9 feet msl and Yale Lake at 487 feet msl are reservoirs with mean detention times of greater than 15 days. Mean detention time is calculated by dividing the reservoir's mean annual minimum total storage by the thirty-day ten-year low-flow from the reservoir. Lake class conditions for temperature require that the licensee maintaining the highest attainable water quality condition that is feasible to achieve to best protect the biota.
- 6) There is reasonable assurance that the other water quality characteristic uses listed in the 1997 water quality standards will be met.

#### **4.0 Conditions**

Through issuance of this Certification-Order, Ecology certifies that it has reasonable assurance that the operation of the Yale Project and activities associated with its continued operation as conditioned will be conducted in a manner that will not violate applicable water quality standards and other appropriate requirements of state law. In view of the foregoing and in accordance with 33 USC § 1341, RCW 90.48.120, RCW 90.48.260, and Chapter 173-201A WAC, this water quality certification is granted to PacifiCorp for the Yale Hydroelectric Project (FERC No. 2071) subject to the conditions within this Certification-Order.

Certification of this Project does not authorize the Licensee to exceed applicable state water quality standards (Chapter 173-201A WAC). Furthermore, nothing in this Certification-Order shall absolve the Licensee from liability for contamination and any subsequent cleanup of surface waters, ground waters, or sediments occurring as a result of activities associated with Project operations and FERC license conditions.

#### **4.1 General Requirements**

- 1) The project shall comply with all water quality standards approved by the Environmental Protection Agency (currently codified in ch. 173-201A WAC), ground water quality standards (currently codified in ch. 173-200 WAC), and sediment quality standards (currently codified in ch. 173-204 WAC) and other appropriate requirements of state law. The conditions below set forth adaptive management processes and measures to achieve full compliance with standards and constitute a water quality attainment plan under the 2003 WAC 173-201A-510(5) for TDG and temperature.
- 2) In the event of changes or amendments to the state water quality, ground water quality, or sediment standards, or changes in or amendments to the state Water Pollution Control Act (RCW 90.48), or changes in or amendments to the Clean Water Act, such provisions, standards, criteria, or requirements shall apply to this project and any attendant agreements, orders or permits. Ecology will notify the Licensee through an Administrative Order of any such changes or amendments applicable to its project.
- 3) Discharge of any solid or liquid waste to the waters of the state of Washington without approval from Ecology is prohibited.

- 4) The Licensee shall obtain Ecology review and approval before undertaking any change to the project or project operations that might significantly and adversely affect the water quality or compliance with any applicable water quality standard (including designated uses) or other appropriate requirement of state law.
- 5) This Certification-Order does not exempt compliance with other statutes and codes administered by federal, state, and local agencies.
- 6) A Hydraulic Project Approval (HPA) (under 77.55 RCW) shall be acquired from the Washington State Department of Fish and Wildlife (WDFW) prior to any work in waters of the State.
- 7) Ecology retains the right, by further Order, to modify schedules or deadlines provided under this Certification-Order or provisions it incorporates.
- 8) Ecology retains the right by Administrative Order to require additional monitoring studies or measures if it determines there is likelihood that violations of water quality standards or other appropriate requirements of state law have occurred or may occur, or insufficient information exists to make such determination.
- 9) Ecology reserves the right to amend this Certification-Order if it determines that the provisions hereof are no longer adequate to provide reasonable assurance of compliance with applicable water quality standards or other appropriate requirements of State law. Any such amended Certification-Order shall take effect immediately upon issuance, unless otherwise provided in the amended Certification-Order, and may be appealed to the Pollution Control Hearings Board (PCHB) under ch. 43.21B RCW.
- 10) Ecology reserves the right to issue orders, assess or seek penalties, and to initiate legal actions in any court or forum of competent jurisdiction for the purposes of enforcing the requirements of this Certification-Order.
- 11) The conditions of this Certification-Order shall not be construed to prevent or prohibit the Licensee from either voluntarily or in response to legal requirements imposed by a court, the FERC, or any other body with competent jurisdiction, taking actions which will provide a greater level of protection, mitigation, or enhancement of water quality or of existing or designated uses.
- 12) If five (5) or more years elapse between the date this Certification-Order is issued and issuance of the new FERC license for the Project, this Certification-Order shall be deemed to be expired and denied without prejudice at such time and the Licensee shall send Ecology an updated application for a Clean Water Act Section 401 Certification that reflects then current conditions, regulations and technologies. This provision shall not be construed to otherwise limit the reserved authority of Ecology to withdraw, amend, or correct the Certification-Order before or after the issuance of a FERC license.
- 13) This Certification-Order may be modified or withdrawn by Ecology prior to the issuance of the license based upon significant new information or changes to water quality standards or appropriate requirements of state law.
- 14) Copies of this Certification-Order and associated permits, licenses, approvals and other documents shall be kept on the Project site and made readily available for reference by the Licensee, its contractors and consultants, and by Ecology.
- 15) The Licensee shall allow Ecology access to inspect the project and project records required by this Certification-Order for the purpose of monitoring compliance with its conditions. Access shall occur after reasonable notice, except in emergency circumstances.
- 16) The Licensee shall, upon request by Ecology, fully respond to all reasonable requests for materials to assist Ecology in making determinations under this Certification-Order and any resulting rulemaking or other process.

- 17) Any work that is out of compliance with the provisions of this Certification-Order, or conditions that result in distressed, dying or dead fish, or any discharge of oil, fuel, or chemicals into state waters, or onto land with a potential for entry into state waters, or turbidity greater than 5 NTU over background conditions is prohibited. If these conditions occur, the Licensee shall immediately take the following actions:
- a) Cease operations at the location of the violation to the extent such operations may reasonably be causing or contributing to the problem.
  - b) Assess the cause of the water quality problem and take appropriate measures to correct the problem and/or prevent further environmental damage.
  - c) Notify Ecology of the failure to comply. Oil or chemical spill events shall be reported immediately to Ecology's 24-Hour Spill Response Team at (800) 258-5990 within 24 hours. Other non-compliance events shall be reported to Ecology's Federal Permit Manager at 800 424-8802.
  - d) Submit a detailed written report to Ecology within five (5) days that describes the nature of the event, corrective action taken and/or planned, steps to be taken to prevent a recurrence, results of any samples taken, and any other pertinent information.
  - e) Observed violations at the project shall be highlighted in the annual monitoring report.

Compliance with these requirements does not relieve the Licensee from responsibility to maintain continuous compliance with the terms and conditions of this Certification-Order or the resulting liability from failure to comply.

- 18) The project shall meet the Lake Class narrative standards listed in WAC 173-201A-030.

#### **4.2 Flow**

Spill from Yale Dam over the spillway will be calculated and reported for every change in gate opening as described in condition 4.8.3 of this Certification-Order under Monitoring and Reporting.

#### **4.3 Total Dissolved Gas (TDG)**

- 1) The Project shall not cause any exceedance of the TDG water quality criteria as specified in WAC 173-201A 030 (5)(c)(iii) and 173-201A-060 (4)(a) in any waters of the Project.
- 2) The Licensee shall operate Yale Dam to maintain the TDG associated with air-injected to turbine flows to 110% or less TDG.
  - a) The Licensee shall perform water quality monitoring in turbine water below Yale Dam for turbine air injection generated TDG as described in condition 4.8.3 of this Certification-Order under Monitoring and Reporting.
  - b) If, over the term of the license, turbines are replaced or modified, design such turbines to minimize TDG production.
- 3) The Licensee shall manage spill to limit TDG production to 110% or less saturation.
  - a) The Licensee shall monitor spill water during spill beginning during first spill events after this Certification-Order is issued and as specified in the monitoring plan in Exhibit A and in conditions 4.2 under Flows and 4.8.3 of this Certification-Order under Monitoring and Reporting.
  - b) Within six (6) months of the discovery of any exceedance of the 110% TDG criterion caused by spill, the Licensee shall submit a TDG Water Quality Attainment Plan (TDG WQAP) to Ecology for review and approval. The TDG WQAP plan shall include:
    - i. A description of standard Project operations with regard to minimizing TDG associated with spills;

- ii. A description of how the Project will minimize all spills that produce TDG exceedances at the Project;
  - iii. An evaluation of all potential and preferred structural and operational improvements to minimize TDG production;
  - iv. A timeline showing when operational adjustments will occur;
  - v. A schedule for construction; and
  - vi. Monitoring plans to further evaluate TDG production and to test effectiveness of gas abatement controls.
- c) The Project shall operate according to the approved TDG WQAP with the objective of eliminating TDG exceedances.
- d) Upon approval of the TDG WQAP, the Licensee shall immediately begin the necessary steps identified in the TDG WQAP to eliminate TDG criteria exceedances.
- e) If monitoring to test the effectiveness of gas abatement controls implemented through the TDG WQAP shows the TDG abatement measures identified in the Plan and subsequently employed are not successful in meeting the water quality criterion within the first ten (10) years of discovery of TDG criterion exceedances caused by spill, Ecology will require further activities to meet the water quality criterion. Significant structural or operational revisions that may impose potentially unreasonable costs or create potentially unreasonable societal effects may be evaluated as part of a formal Use Attainability Analysis consistent with the federal and state water quality regulations after the ten year compliance period has ended.
- 4) Provided that all reasonable operational efforts to minimize TDG exceedances are made and Ecology is notified within 24 hours after the onset of the spill, compliance with the 110% TDG criteria does not apply when:
- a) Actual or predicted flows in the Lewis River exceed the rate equivalent to the 7Q10 flows as defined in WAC 173-201A-060(4)(a). At the writing of this Certification-Order, the 7Q10 flow for the Lewis River at Merwin Dam is 32,884 cfs. Either the Licensee or Ecology may reassess and propose a revised value for the 7Q10 flow. Modification and application of the 7Q10 flow requires Ecology's approval.

Because the Project exerts some control over the timing and amplitude of storm flows, a qualifying 7Q10 event for the purposes of the TDG criteria exemption includes flows accompanied by an actual or forecasted large storm event that provides an equivalent amount of water to the drainage basin, regardless of flows at Yale Dam. Calculations of such qualifying events shall follow language contained in the Settlement Agreement pertaining to High Runoff Procedures (SA 12.8), which states:

*"PacifiCorp shall obtain 3-day river flow forecasts from a reputable third party forecasting organization (which may include the National Weather Service's River Forecasting Center) for the Lewis River Watershed. This 3-day river flow forecast shall be used by PacifiCorp in its forecast-based high runoff procedure as described below. PacifiCorp shall periodically evaluate the forecasts being used against other commonly available forecasts, with the goal of improving forecasting accuracy for flood management through the use of evolving technology, to the extent practicable."*

*"During the Flood Management Season, PacifiCorp shall calculate the "Forecasted Flow" for the Lewis River from the 3-day forecast by determining the forecasted flow that has an 85% probability of occurring. In the event that it appears that the Forecasted Flow will result in inflows significant enough to utilize a portion of the 17 feet of hole, as defined in the Manual, reserved for flood management purposes, PacifiCorp shall make a Pre-Release to provide additional capacity to store inflows into the reservoirs during the*



*high-runoff event. Once the total hole is reduced to 17 feet, PacifiCorp shall continue to follow the flow release procedures contained in the Manual as of the Effective Date."*

Any observed spike of TDG at the Yale Dam forebay shall not be considered a TDG criteria exceedance if it was formed during a qualifying 7Q10 event at Swift No. 1.

- b) Short term spills are necessary to protect public safety and respond to volcanic activity.
- 5) During high flows, including those greater than the 7Q10, the Licensee shall manage spill levels to minimize TDG production.
- 6) The Licensee shall include gas abatement measures during any design and removal of the rock mass in the spillway (modification of the Yale spillway).
  - a) If prior monitoring detects TDG production from the Project's spillway greater than 110%, the spillway shall be modified to decrease TDG production.
  - b) Continuous monitoring of TDG production during spills shall occur prior to any modification. This monitoring must collect information from spills that are close to 7Q-10 conditions. The Licensee shall send results of this monitoring to Ecology SWRO within six (6) months of monitoring.
  - c) Continuous monitoring shall be performed during the spills immediately following spillway modification. Monitoring must also collect information from spills close to the 7Q-10 conditions. Monitoring results shall be sent to Ecology SWRO Water Quality Program within six (6) months of the spill event.

#### 4.4 Temperature

- 1) Lake Merwin. The Project shall not cause any violation of the temperature water quality criterion as specified for Lake Class waters in WAC 173-201A-030(5)(c)(iv) in Lake Merwin and Yale Lake. If the presence or operation of the Yale Dam causes violation of this criterion, the Licensee shall modify its operation to the extent necessary following the compliance schedule outlined below to ensure that the Project does not cause such exceedance. The Lake Class temperature criterion that applies to the reservoir mandates no measurable change from natural conditions. Both the Yale and Merwin Dams have created artificial lake conditions over which the project has some control. In such circumstances, Ecology requires the Licensee to use all reasonable and feasible measures to achieve conditions that best protect the designated or characteristic uses for fish and shellfish (WAC 173-201A(2)(b)(iii)) within the reservoir.
- 2) The Licensee shall develop a Temperature Water Quality Attainment Plan (TWQAP) for the Lake Merwin canyon (Canyon). A draft of the TWQAP shall be submitted for Ecology review and approval. This draft shall be submitted within one (1) year of license issuance.

The purpose of this TWQAP is to identify and maintain the highest attainable water quality conditions to provide a temperature fluctuation regime that is reasonable and feasible to achieve and which will best protect the cold-water biota. The TWQAP must include a reasonable compliance schedule for carrying out an adaptive process within ten (10) years of license renewal for evaluating feasible technical and operational changes to improve temperature for cold water biota using the steps outlined below:

- a. identify the Canyon's species of fish and macroinvertebrates (identified to the lowest practical level) and determine where they are found in the water column at different life stages and different times of day;
- b. evaluate the temperature requirements of those organisms that use the upper water column;
- c. evaluate the effects of the project-related temperature fluctuations on these organisms;
- d. if necessary to protect the most sensitive beneficial uses, identify the target temperatures in the Canyon which will protect the organisms in the upper water column, lower water column and/or the benthos;

- e. if necessary to protect the most sensitive beneficial uses, identify all reasonable and feasible methods to ensure that the water temperature fluctuation regime in the Canyon remains below levels which would harm the aquatic biota or limit the potential healthy cold water habitat; and
  - f. identify adaptive management strategies to further improve the temperature fluctuation regime for cold-water biota in the event that target temperatures are not achieved.
- 3) If it is determined through the TWQAP that steps must be taken in order to protect the most sensitive beneficial uses, the Licensee shall employ all reasonable and feasible methods identified in response to condition 2(e and f) to ensure that the water temperature fluctuation regime in the Canyon remains below levels which would harm the aquatic biota or limit the potential healthy cold water habitat.
- 4) The Licensee shall monitor temperature in the forebay and tailrace of Yale Dam in accordance with condition 4.8.3 of this Certification-Order under Monitoring and Reporting. This monitoring is in addition to any temperature monitoring required in the approved TWQAP.

#### **4.5 Construction Projects, Miscellaneous Discharges, and Habitat Modifications**

The following applies to all in-water or over-water work related to the project that can impact surface- or ground-water quality. This includes, but is not limited to, construction, operation, and maintenance of fish collection structures, generation turbines, penstocks, hatcheries, transportation facilities, portable toilets, boat ramps, transmission corridors, structures, and staging areas. This also includes emergencies for all activities related to project operation.

- 1) If water quality exceedances are predicted as being unavoidable during construction or maintenance of a project, a short-term modification must be applied for in writing to Ecology at least three (3) months prior to Project initiation. If any Project has a long-term impact on a regulated water quality parameter, characterization monitoring must be performed for the impacted parameter(s), and a monitoring plan must be outlined in the Water Quality Protection Plan discussed below. This may require additional management practices to minimize impacts over the license period.
- 2) A Water Quality Protection Plan (WQPP) shall be prepared, and followed, for all project-related work that is in- or near-water that has the potential to impact surface- and/or groundwater quality. The WQPP shall include control measures to prevent contaminants from entering surface water and groundwaters, and shall include, but not be limited to, the following elements:
  - a) A Stormwater Pollution Prevention Plan (SWPPP) shall specify the Best Management Practices (BMPs) and other control measures to prevent contaminants entering the Project's surface water and groundwaters. The SWPPP shall address the pollution control measures for the Licensee's activities that could lead to the discharge of stormwater or other contaminated water from upland areas. The SWPPP must also specify the management of chemicals, hazardous materials and petroleum (spill prevention and containment procedures), including refueling procedures, the measures to take in the event of a spill, and reporting and training requirements.
  - b) An In-Water-Work Protection Plan (IWWPP) shall be consistent with the SWPPP and shall specifically address the BMPs and other control measures for the Licensee activities that require work within surface waters. Turbidity and dissolved oxygen shall be monitored upstream of the location where in-water construction is taking place and at the point of compliance (as defined in WAC 173 201A-110(3)(a-d)) during construction. Samples shall be taken at a minimum of once each day during construction in or adjacent to any water bodies within the Project area that may be affected by the construction. The IWWPP shall include all water quality protection measures consistent with a Hydraulics Project Approval (HPA) for the project.

- c) The WQPP shall include procedures for monitoring water quality, actions to implement should a water quality exceedance occur, and procedures for reporting any water quality violations to Ecology. The WQPP shall include all water quality protection measures consistent with a HPA for the Project. The WQPP shall be submitted to Ecology for review and approval at least three (3) months prior to project initiation, and a copy of the WQPP shall be in the possession of the on-site construction manager, and available for review by Ecology staff, whenever construction work is under way.
  - d) When a construction project meets the coverage requirements of the National Pollution Discharge Elimination System (NPDES) permit and State Waste Discharge General Permit for Stormwater Discharges associated with construction activity, the Licensee shall either, at Ecology's discretion, apply for this permit and comply with the terms and conditions of the permit or apply for and comply with the terms of an individual NPDES permit..
- 3) Best Management Practices
- a) Work in or near the reservoir, water within the dam, the river, or any wetlands shall include all reasonable measures to minimize the impacts of construction activity on waters of the state. Water quality constituents of particular concern are turbidity, suspended sediment, settleable solids, oil and grease, and pH. These measures include use of Best Management Practices (BMPs) to control erosion and sedimentation, proper use of chemicals, oil and chemical spill prevention and control, and clean-up of surplus construction supplies and other solid wastes.
  - b) During construction, all necessary measures shall be taken to minimize the disturbance of existing riparian, wetland or upland vegetation.
  - c) All construction debris shall be properly disposed of on land so that the debris cannot enter a waterway or cause water quality degradation to state waters. Retention areas or swales shall be used to prevent discharging of water from construction placement areas.
  - d) The Licensee shall ensure that any fill materials that are placed for the proposed habitat improvements in any waters of the state do not contain toxic materials in toxic amounts.
- 4) Maintain Turbidity Standards
- a) Certification of this Project does not authorize the Licensee to exceed the turbidity standard for Lake Class waters beyond the mixing zone described in (b) and (c) below. Turbidity in Lake Class waters shall not exceed five (5) NTU over background conditions.
  - b) Step 1. Mixing zones shall not be allowed unless it can be demonstrated to the satisfaction of Ecology that:
    - i. Other siting, technological, and managerial options that would avoid the need for a lake mixing zone are not reasonably achievable;
    - ii. Overriding considerations of the public interest will be served; and
    - iii. All technological and managerial methods available for pollution reduction and removal that are economically achievable would be implemented prior to discharge
  - c) Step 2. Mixing zones, singularly or in combination with other mixing zones, shall comply with the most restrictive combination of the following:
    - i. Not exceed ten percent of the waterbody volume;
    - ii. Not exceed ten percent of the waterbody surface area (maximum radial extent of the plume regardless of whether it reaches the surface); and
    - iii. Not extend beyond fifteen percent of the width of the waterbody.
- 5) The above conditions do not relieve the Licensee from the need to obtain all the applicable permits. Activities that could discharge pollutants to waters of the state must use appropriate Best Management Practices to protect water quality.

#### **4.6 Oil Spill Prevention and Control**

- 1) No oil, fuel, or chemicals shall be discharged into waters of the state, or onto land with a potential for entry into waters of the state as prohibited by Ch. 90.56 RCW and Ch. 90.48 RCW.
- 2) Contain and remove from the water, visible floating oils released from construction or Project operation.
  - a) In the event of a discharge of oil, fuel or chemicals into state waters, or onto land with a potential for entry into state waters, immediately begin and complete containment and clean-up efforts, taking precedence over normal work. Clean-up shall include proper disposal of any spilled material and used clean-up materials.
  - b) Do not use emulsifiers or dispersants in waters of the state without prior approval from Ecology, Southwest Regional Office.
  - c) Within three (3) months of receiving the license from FERC, establish an Ecology-approved on-site spill cleanup material inventory. Maintain this on-site inventory and a complete inventory list.
  - d) Project Operators shall be familiar with and trained on use of oil spill cleanup materials. In the event of an oil spill, properly dispose of used/contaminated materials and oil and as soon as possible restock new supplies. Include records of proper disposal in the oil consumption records and keep copies of disposal records of contaminated cleanup supplies on-site for inspection.
  - e) Ensure that operational work boats and trained boat operators are available on short notice in the event of a spill. Install mechanisms as appropriate to safely launch or lower work boats into areas where work boats would be deployed in the event of an oil spill. These mechanisms must be pre-approved by Ecology.
  - f) Keep SPCC Plans as required and historical spill records on-site. Provide these to Ecology immediately upon request.
  - g) Identify and map floor drains. Post these maps at the Project in a conspicuous location for use by Operators and other personnel in the event of an oil spill. Seal floor drains that are no longer needed.
  - h) Install, or have on site to deploy stair-cases, ladders, etc. which will allow for oil spill response staff to safely reach areas that could, in the event of an oil spill, need to be accessed to deploy sorbent pads and boom materials.
- 3) Oil-Water Separators (OWS)
  - a) Within three months of issuance of the FERC license, submit a maintenance plan for the OWS to Ecology for approval. This maintenance plan must include a process to periodically test the oil-stop valves and provide assurance that they will work as designed. (See condition 4.8.3 of this Certification-Order under Monitoring and Reporting)
  - b) OWS shall only admit rain and water run-off that originates in the containment area that is intended to drain into the OWS.
  - c) Perform periodic and appropriate maintenance and inspection on a schedule to include sediment removal. (See condition 4.8.3 of this Certification-Order under Monitoring and Reporting)
  - d) Clean and service the OWS after each event where oil is introduced into the OWS.
  - e) Evaluate each OWS for inflows to account for the total volume of all transformers located in the containment area plus 10 per cent. Verify and conduct corrective action that will insure that oil would not be "washed through" the OWS if a failure of all containers in the containment area occurs during a major rain event.

4) Transformers

- a) Transformer deck containment area surfaces must be impervious. Conduct periodic inspections and re-surface areas, fill cracks, caulk metal plate footings or otherwise ensure that containment areas will contain all spill fluids.
- b) Obtain prior approval from Ecology before breaching containment areas for reasons other than containment area maintenance.
- c) Conform to industry standards for protecting water quality and preventing and containing spills when transporting transformers and transformer oil.
- d) Snowy or icy conditions require daily inspections of transformer deck containment area including an inspection of the drains leading to the OWS for freeze-up conditions. Remove any observed rain water pooling in the containment areas. (See condition 4.8.3 of this Certification-Order under Monitoring and Reporting)

5) Sumps

- a) Locate oil sensors on the surface of the water in each sump in addition to the oil sensors located at the bottom of each pumping cycle. Inspect and test these sensors every three (3) months or sooner if needed to insure that they will work as designed. Include in the inspection provisions to verify that the oil sensors located at the bottom of each pumping cycle are properly placed at the proper level. Visually inspect all of these areas each week or immediately if oil is suspected to be present such as in the event of an oil sensor alarm or the observance of an oil or grease spill in the turbine pit of sufficient volume to reach the sump. Any oil detected in the sumps requires immediate cleanup and Emergency Management Division (EMD) and National Response Center (NRC) notification. (See condition 4.8.3 of this Certification-Order under Monitoring and Reporting)
- b) Immediately repair oil leaks in the turbine pit that are of sufficient volume to reach the sump and that can not be contained by placing a container underneath the leak. Immediately repair water leaks located in the turbine pit area that are leaking at a volume of greater than one (1) gallon per hour.
- c) Install or deploy hand rails and mechanisms so the sump covers can be removed for a visual inspection of the sump. Provide water-proof lighting in the sumps or spotlights adequate to view the surface water in the sumps. Provide a mechanism to satisfactorily deploy and recover sorbent boom in the sumps at each Project.

6) Oil, fuel and chemical storage containers, containment areas, and conveyance systems

- a) Provide proper containment around each storage container (including transformers) or around a combination of storage containers as appropriate and agreed upon by Ecology. Proper containment equals the volume of the container plus 10 per cent.
- b) Recalculate required containment areas to insure proper containment still exists after major equipment changes. Example: when converting from water cooled transformer to an air cooled unit, re-calculate oil volume and compare to containment area. Calculate containment volumes from *maximum* storage volumes, not normal oil level volumes.
- c) Provide external oil level gauges for governor oil tanks, transformers and other oil tanks that contain over 100-gallons of oil. Provide appropriate level markings for these gauges. Provide a sign or other means at each tank, near the tank level gauge, that describes these level markings and the relationship of each inch vs. how many gallons (in the case of a glass tube type of gauge). Dial gauges must also describe oil volume in gallons or have a sign or other indicator provided at each reservoir that adequately describes dial movement in relation to gallons. Provide a sign or other indication that shows  $\frac{1}{4}$ ,  $\frac{1}{2}$ ,  $\frac{3}{4}$ , and full gauge readings or indications in gallons. If equipment must be placed in a special mode of operation, prior to level observance, this must also be posted. Example: wicker gate ram position or other hydraulic ram positions, prior to oil level reading. (See condition 4.8 of this Certification-Order under Monitoring and Reporting)

- d) Regularly check all fuel hoses, oil drums, oil or fuel transfer valves and fittings, etc, for drips and leaks. Maintain and properly store them to prevent spills into state waters. (See condition 4.8.3 of this Certification-Order under Monitoring and Reporting)
  - e) Do not refuel equipment within 50 feet of rivers, creeks, wetlands, or other waters of the state.
  - f) Provide full oil spill containment capacity plus 10 per cent when working on transformers and other equipment that might spill or drip oil.
  - g) Inspect containers once per week. Maintain container inspection sheets to include: maximum container volume and an exact reading recording of the oil level by the staff/operator conducting the inspection. Weekly inspection readings must be consistent; provide training to the staff/operator to ensure consistent and accurate readings. (See condition 4.8 of this Certification-Order under Monitoring and Reporting)
  - h) Keep oil consumption records maintained on-site; provide these records to Ecology immediately upon request and in the annual report.
  - i) In the event that the project modifies the oil transfer operation to include hard-plumbing to reservoirs such as the governor oil tank from the oil tank room, or other extensive modifications, the Licensee must notify and receive approval from Ecology.
  - j) Contain wash water containing oils, grease, or other hazardous materials resulting from wash-down of equipment or working areas for proper disposal, and do not discharge this water into state waters.
- 7) Other
- a) Maintain site security at the Project site to reduce chance of oil spills.
  - b) Initiate, plan for, document, and train staff for the deployment of General Response Plan and boom strategies for each project. Review and update as needed annually.

**4.7 Pesticide Applications (see definition of pesticide in Exhibit B)**

- 1) Prior to the application of pesticides to waters of the state, coverage under applicable Aquatic Pesticides Permit shall be obtained, and conformance with any other applicable state requirement such as SEPA, shall be attained.
- 2) Best Management Practices and other control measures for the application of pesticides to waters of the state must be addressed in an In-Water-Work Protection Plan. An appropriate water quality monitoring plan shall be developed prior to the application and shall be implemented for all related work.
- 3) Prior to the use of pesticides adjacent to waters of the state, the Licensee shall follow Best Management Practices to avoid the entry of such materials into waters of the state. Applicable Best Management Practices include, but are not limited to, such actions as hand application and avoiding drift of materials into the water.

**4.8 Monitoring and Reporting**

- 1) The monitoring component of the Licensee's application to FERC is incorporated as a requirement of this Certification-Order and shall be followed except as further modified by the Certification-Order. Within 90 days of issuance of the new FERC license for the Project, the Licensee shall submit to Ecology for its review and approval a plan for any additional monitoring requirements set forth in this Certification-Order.
- 2) Monitoring pursuant to the requirements set forth in this Certification-Order shall begin as soon as practicable and in no event shall monitoring begin any later than one (1) year after issuance of the new FERC license for measures that do not specify a start date.
- 3) Representative water quality measurements shall be made for the parameters listed in Table 2 at the identified locations and frequencies. Further monitoring is required or may be required under compliance schedules or to respond to specific problems not identified at the time of this Certification-Order.

**Table 2. Water Quality Monitoring Schedule**

Parameter	Location	Depths (ft)	Frequency	Duration	Condition No.
Flow	Yale Dam spill gate	Calculated using elevation of Yale Lake x gate width x gate height	Every change in gate opening when spill occurs	Ongoing for the term of the license	4.2
Total Dissolved Gas (TDG)	Yale Dam turbine outlets	15	Hourly	1. One year after issuance of this Order. 2. One month before and after planned departure from normal operations reallocate the duration or the quantity of air injected into turbines to the point that the 110% criterion is likely exceeded. 3. Ongoing if exceedances occur until three months after such exceedances are corrected.	4.3.2a
	Yale spill downriver of aeration zone	~10-15	During spill events through the spillway, hourly, as close as possible to 24 hrs before to 48 hours after the event	Ongoing unless TDG during spill is found not to exceed 110% at river flows approaching 27,088 cfs	4.3.3a
Temperature	Yale forebay	1, 5, 10, 20 40, 60, 100	May 1–Oct 31: Hourly	Ongoing until temperature fluctuations in the Yale tailrace/upper Lake Merwin are sufficiently addressed per condition 4.3 (2) (a and b) of this Order.	4.4.4
	Yale Dam turbine outlets	15	Hourly all year	Ongoing	4.4.4

Parameter	Location	Depths (ft)	Frequency	Duration	Condition No.
Temperature due to power loading fluctuations and Lake Merwin stratification	Yale Dam tailrace	Profile	Hourly	Ongoing until temperature fluctuations in the Yale tailrace/upper Lake Merwin are sufficiently addressed per condition 4.3 (2) of this Order.	4.4.4
Oil & Grease	Record amounts of oil, grease and hydraulic fluids used	n/a	Weekly	Ongoing for the term of the license	4.6 6g
	Sumps	Surface and bottom	At least weekly (visual) At least three months (test)	Ongoing for the term of the license	4.6 5a
	Transformer deck	Drains	Daily during icy conditions	Ongoing for the term of the license	4.6.4d
	Oil tanks, transformers, other oil tanks >100 gallons	n/a	At least weekly	Ongoing for the term of the license	4.6 6c
	Fuel hoses, oil drums, oil & fuel transfer valves and fittings.	n/a	Weekly	Ongoing for the term of the license	4.6 6d
	Oil-water separators	n/a	Periodically test oil stop valves	Ongoing for the term of the license	4.6 3a
	Oil-water separators	n/a	Regularly prior to cleaning	Ongoing for the term of the license	4.6 3c

\* Yale Dam tailrace temperature monitoring plan to be approved by Ecology per Temperature per conditions 4.3, 2 & 3.

- 4) All water quality monitoring shall meet accepted standards for data quality. The monitoring plan shall include monitoring and data evaluation procedures and objectives that ensure data quality. Data quality procedures shall be consistent with United States Environmental Protection Agency and Ecology guidance on this subject.
- 5) The monitoring plan shall be updated annually by amendment to reflect any changes in monitoring parameters, schedule, or methodology. These amendments, or a notification of no change, shall be included in the Annual Report described below in condition 4.8.6 and in Section 14.2.6 of the Settlement Agreement. Ecology will provide its revisions and approval for the monitoring plan within three (3) months after receipt of an amendment or notification.



- 6) Data from all water quality monitoring shall be summarized and reported in a format approved by Ecology and submitted annually. The monitoring report shall include sample dates, times, locations, and results. Any exceedances of numeric state water quality standards shall be highlighted. The report shall be included in the Annual Report provided to FERC as described in Section 14.2.6 of the Settlement Agreement; provided that if Ecology determines that the format of that report does not meet Ecology's needs, the Licensee shall modify or supplement the report so that it is acceptable to Ecology. Data reports shall be submitted to Ecology's, Water Quality Program, Southwest Regional Office.
- 7) The Licensee may request to modify or eliminate parts of the monitoring program after a minimum of the ongoing monitoring requirements or a period of five (5) years of reliable data collection following issuance of the new license. Modifications to this monitoring schedule can be requested by submitting to Ecology reasons for the modifications along with a modified monitoring plan.
- 8) A more rigorous water quality sampling program for the parameters listed in Table 2 or additional parameters may be required by Ecology if necessary to protect water quality in the future based on monitoring results, regulatory changes, changes in project operations and/or requirements of TMDLs, or to otherwise provide reasonable assurance of compliance with state water quality standards.

## **5.0 Order**

Any person who fails to comply with any provision of this Certification-Order shall be liable under the Clean Water Act for a penalty of up to twenty (20) thousand dollars per day and under the state Water Control Act, for a penalty of up to ten (10) thousand dollars per day per violation or such other amount as may be authorized under state law as exists now or may be amended during the term of the license.

## **6.0 Appeal Process**

You have the right to appeal this Order to the Pollution Control Hearings Board. Pursuant to chapter 43.21B RCW, your appeal must be filed with the Pollution Control Hearings Board, and served on the Department of Ecology within thirty (30) days of the date of your receipt of this document.

To appeal this Order, your notice of appeal must contain a copy of the Ecology Order you are appealing.

Your appeal must be filed with:

The Pollution Control Hearings Board  
4224 – 6th Avenue SE, Rowe Six, Bldg. 2  
P.O. Box 40903  
Lacey, Washington 98504-0903

Your appeal must also be served on:

The Department of Ecology  
Appeals Coordinator  
P.O. Box 47608  
Olympia, Washington 98504-7608


In addition, please send a copy of your appeal to:

Federal Permit Appeals Coordinator  
Department of Ecology  
P.O. Box 47600  
Olympia, Washington 98504-7600

*For additional information: Environmental Hearings Office Website: <http://www.eho.wa.gov>*

Your appeal alone will not stay the effectiveness of this Order. Stay requests must be submitted in accordance with RCW 43.21B.320. These procedures are consistent with Ch. 43.21B RCW.

DATED this 9th day of October, 2006, at Olympia, Washington.



Kelly Sussewind, P.E., P.G.  
Southwest Region Manager  
Water Quality Program

**Exhibit A**  
**Total Dissolved Gas Spill Monitoring Plan**  
**for Swift No 1, Yale, and Merwin Dams**

This plan includes:

1. A quality assurance/quality control (QA/QC) plan;
2. A description of how spill events (including 7Q-10 events) will be anticipated;
3. A description of how equipment will be mobilized quickly prior to a spill event and timing of monitoring frequency and duration;
4. Location of monitoring equipment; and,
5. Reporting deadline.

**1) Quality Assurance/Quality Control**

Data Quality Objectives and Decision Criteria

Total Dissolved Gas meters can exhibit biased results depending on calibration, maintenance and/or field conditions. The Licensee's staff shall minimize bias by assuring proper maintenance and care of the TDG meters. Therefore, no Data Quality Objectives (DQOs) are being established.

TDG readings are expected to fall between 100% and 130% saturation. Washington State standard is 110% saturation. Measurement Quality Objectives (MQOs) are equivalent to DQOs and are equal to 1% saturation. MQOs will be met if the TDG meter readings are within 1 percent saturation or 5 mm HG of the expected value based on comparison to paired meters. If MQOs are not met for these pairs, the differences between paired data will be evaluated, including differences in the data quality procedures used, but the data will not be qualified or discarded unless other information indicates problems with the data.

Percent TDG measurements are dependent on barometric pressure readings, so secondary MQOs are also needed for the on-site barometric pressure readings. There are two weather stations at Yale and Swift so it is possible to obtain direct measurements of barometric pressure at those locations. A portable barometer will be employed at Merwin. The target for this monitoring effort will be an MQO of 5 mm HG for the field barometer readings. If the barometric pressure MQOs are exceeded, the data will be considered acceptable if the TDG percent saturation MQOs are met.

Temperature will also be collected during the monitoring periods. Since temperature is of secondary importance, DQOs will not be established but an MQO will be established to determine if data are acceptable for reporting. The MQO for temperature will be met and reported if post-calibration shows that the temperature is within 0.5 ° C.

In terms of data quality the following acceptance criteria shall be applied:

Data Reasonableness: Data will be reviewed to determine if the amount of variability is appropriate, based on expected values and comparison between data sets. Data with too much or reasonably too little variability will not be used.

Data Completeness: Data sets will be used that are reasonably complete during the period of sampling. Incomplete data sets will be used if they are considered representative of conditions during the sampling period.

Data Representation: Data will be used that are representative of the location or time period for sampling. Attention will be paid to the variations in meteorological conditions and to seasonal differences between high and low flow conditions.

Study Design and Field Procedures: All data will be collected using Hydrolab® Model MS5 remote TDG meters. Prior to deployment, instruments will be calibrated to ensure that total pressure (in air) equals barometric pressure. Meters will be attached to a streamside structure such as the Ariel USGS gage house below Merwin and existing cabling, or a large rock or tree below Yale and Swift No. 1.

The meters will be weighted such that they will maintain position in at least 10 feet of water (compensation depth) to prevent air bubble formation on the sensor membranes.

The Hydrolab® Model MS5 remote TDG meters will be checked for calibration before and after each deployment. Meters will be checked for performance at each site at the beginning and the end of each deployment.

Data Review, Quality Assessment, and Validation: Data will be downloaded from the Hydrolab® Model MS5 remote TDG meters to a spreadsheet and reviewed for reasonableness and any values exceeding the MQOs. Outliers will be evaluated for reasons behind any unexpected deviation. Exceedances related to equipment malfunction result in rejection of the data.

Data sets will be considered complete if the data meet the MQOs at least 85 percent of the time. All data meeting MQOs will be accepted. Data will then be evaluated for compliance and acceptance criteria.

## **2) How spill events will be anticipated including 7Q-10 events**

The Licensee will use prediction tools described below to determine when to deploy TDG meters for any anticipated spill event.

The following is a description of how the Licensee will anticipate spill events, including 7Q-10 events, at Merwin Dam, Yale Dam and Swift No. 1 Dam. The Licensee will regularly monitor weather and inflow forecasts from the National Weather Service and River Forecast Center as well as a number of private forecasting vendors. Based on expected inflows and current reservoir elevations, the Licensee will target total Project releases, typically 2 to 3 days in advance, so as to minimize the frequency and magnitude of Project spill. Given the fact that the Lewis River Project has a large amount of storage compared to typical inflow, the Licensee is often able to manage and re-regulate natural high flow events so as not to spill at the Projects thereby saving water for such purposes as generation, fishery needs and refill. The Licensee has real time reservoir elevation indication in each of its three reservoirs. With this data, total available Project storage is calculated on an hourly basis and made available to staff involved in Project operations. Reservoir elevations, available storage, and inflow forecasts are routinely monitored by Hydro Control Operators as well as technical water management staff. This information is scrutinized carefully particularly during actual and potential high run off situations.

During the high run off season (November 1 - April 1) the Licensee is required to maintain an aggregate of at least 70,000 AF of storage in the Lewis River reservoirs. If there is a reasonable threat of encroaching on this storage, the Licensee typically spills at Merwin dam as necessary to manage the available flood control storage. The rate at which inflow encroaches on required available storage is updated using existing Project telemetry and inflow forecasts provided by NOAA's National Weather Service River Forecast Center, and/or a third party consultant. Telemetered inflow and reservoir instrumentation currently includes:

- The Licensee's and USGS' stream gages on the river mainstem and tributaries
- The Licensee's lake stage gages
- The Licensee's and National Weather Services' weather stations
- The Licensee's and Natural Resource Conservation Services' snow stations

Some spill events are not driven by high flow events, and these are typically planned with enough time to provide ample opportunity for the installation of monitoring equipment. Examples include spilling for required periodic testing of the spill gates as well as meeting some special water management

needs, including minimum flow requirements, when the generation units are out of service.

Rainfall is but one factor considered in forecasting inflows. Other factors include air temperature (which will affect whether precipitation falls as rain or snow and at what elevations), wind, soil moisture and snowpack conditions. The Licensee relies on the output of complex weather and streamflow models, typically managed by National Weather Service and third party consultants to assimilate these conditions as well as forecasted weather to predict streamflows, including 7Q-10 events.

### **3) Deployment, Timing of Monitoring, Frequency, and Duration**

The Licensee's staff will have meters and deployment equipment at the ready at all times. A test deployment will take place at each site prior to the high run off season. During the high run off season (November 1 - April 1) staff will be on alert to be prepared to deploy at any time. The MS5 meters will be programmed to record TDG and temperature on an hourly schedule. Meters will be deployed at approximately 24 hours before a spill event and continuing for 48 hours afterward. While the meters will be removed following spill events/periods, The Licensee staff will be ready to deploy equipment as many times as needed to capture each event. Threat of vandalism or theft, and unwillingness to risk data loss drives the decision to remove equipment after each spill event.

### **4) Location of monitoring equipment**

Three meters will be deployed in spill water at the following locations:

- Approximately ¼ mile downstream of Merwin dam near the Ariel gage site;
- Approximately ½ mile downstream of Yale dam and upstream of the confluence with Canyon Creek; and,
- Approximately ½ mile downstream of Swift No.1 dam.

Placement will be far enough downstream of the dams to be outside the aeration area below each spillway in order to avoid air bubble accumulation on the sensing membrane.

### **5) Reporting**

Summary output of the streamflow forecast models, as well as inflow records shall be included in the Licensee's reports identifying and justifying periods of 7Q-10 exemptions identified in section 4.3.5.f. Likewise when Federal Energy Regulatory Commission license conditions or other safety and environmental requirements require spill not otherwise explicitly included in 7Q-10 exemptions, the Licensee shall document and report those events, including the basis of the operation. As called for in the Lewis River Settlement Agreement (Section 14.2.6), annual reporting of spill events and data analysis will be included in the joint Licensees' Annual Aquatics Coordination Committee Report.

**Exhibit B**  
**Definitions**

<b>7Q-10</b>	The high flow that is calculated to occur only once, for 7 consecutive days during any 10-year period.
<b>BMPs</b>	Best Management Practices to reduce pollution
<b>CWQPP</b>	Construction Water Quality Protection Plan – necessary for all construction projects in, over, or near water.
<b>FERC</b>	Federal Energy Regulatory Commission
<b>FWPCA</b>	Federal Water Pollution Control Act
<b>HPA</b>	Hydraulic Project Approval
<b>IWPP</b>	In Water Work Protection Plan. Part of the CWQPP as described above. This is for work in the water—such as boat ramps or cement work in the water. This does not apply inside the dam when before beginning the project, the water can be completely removed.
<b>MSL</b>	Mean Sea Level
<b>NPDES</b>	National Pollution Discharge Elimination System
<b>NTU</b>	Nephelometric Turbidity Units
<b>Pesticide</b>	<ul style="list-style-type: none"><li>a) Any substance or mixture of substances intended to prevent, destroy, control, repel, or mitigate any insect, rodent, snail, slug, fungus, weed, and any other form of plant or animal life or virus, except virus on or in a living person or other animal which is normally considered to be a pest or which the director may declare to be a pest;</li><li>b) Any substance or mixture of substances intended to be used as a plant regulator, defoliant or desiccant; and</li><li>c) Any spray adjuvant, such as a wetting agent, spreading agent, deposit builder, adhesive, emulsifying agent, deflocculating agent, water modifier, or similar agent with or without toxic properties of its own intended to be used with any pesticide as an aid to the application or effect thereof, and sold in a package or container separate from that of the pesticide with which it is to be used.</li></ul>
<b>RCW</b>	Revised Code of Washington
<b>RM</b>	River Mile
<b>SWPPP</b>	Stormwater Pollution Prevention Plan - Part of the CWQPP as described above. This is to prevent polluted stormwater from entering the reservoir or river.
<b>TDG</b>	Total Dissolved Gas
<b>TMDL</b>	Total Maximum Daily Load
<b>USC</b>	United States Code
<b>USDA-FS</b>	Forest Service of the United States Department of Agriculture
<b>USGS</b>	United States Geological Survey
<b>USFWS</b>	United States Fish and Wildlife Service
<b>WAC</b>	Washington Administration Code
<b>WQAP</b>	Water Quality
<b>WQMP</b>	Water Quality Monitoring Plan
<b>WDFW</b>	Washington Department of Fish and Wildlife
<b>WQS</b>	Water Quality Standards Rule, WAC 173 201A. For further descriptions of terms, refer to the definitions in this rule.