January 26, 2011

Ms. Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street N.E.
Washington, DC 20426

Subject: Spokane River Hydroelectric Project (FERC Project No. 2545)
License-Appendix B, Section 5.5.B, Long Lake Dam Reservoir and Tailrace Temperature Water Quality Attainment Plan

Dear Secretary Bose:

On June 18, 2009 the Federal Energy Regulatory Commission (FERC) issued a new license for the Spokane River Hydroelectric Project, FERC Project No. 2545 (License). Ordering Paragraph E of the License incorporated the *Washington Department of Ecology (Ecology) Certification under Section 401 of the Federal Clean Water Act (filed on May 11, 2009)*. The conditions pertaining to the certification can be found in Appendix B of the License.

Section 5.5.B of Appendix B requires Avista to submit a Long Lake Dam Reservoir and Tailrace Temperature Water Quality Attainment Plan (Temperature WQAP) to Ecology for approval within 18 months of FERC License issuance. In addition, FERC Order 2545-113 requires Avista to file the Temperature WQAP to FERC, along with documentation of Ecology's approval, no later than 45 days following the deadline established in the water quality certification for filing each Plan with Ecology. Copies of our consultation record, which includes Ecology's comments and recommendations, and Avista's responses to them are included in Appendix B of the Temperature WQAP.

With this, Avista is filing the Ecology-approved Temperature WQAP with FERC. Upon FERC's approval Avista will begin implementing the Temperature WQAP. If you have any questions regarding this filing, please feel free to contact Meghan Lunney of our office at (509) 495-4643.

Sincerely,

Speed Fitzhugh

Elvin "Speed" Fitzhugh
Spokane River License Manager

Enclosure

cc: Heather Campbell, FERC
Marcie Mangold, Ecology

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AVISTA CORPORATION

LONG LAKE DAM RESERVOIR AND TAILRACE TEMPERATURE WATER QUALITY ATTAINMENT PLAN

WASHINGTON 401 CERTIFICATION, SECTION 5.5

Spokane River Hydroelectric Project
FERC Project No. 2545

Prepared By:

January 25, 2011

Doc. No. 2011-0023

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Table of Contents

Figures

Appendices

1.0 INTRODUCTION

Avista Corporation (Avista) owns and operates the Spokane River Hydroelectric Project (Spokane River Project), which consists of five Hydroelectric Developments (HEDs) on the Spokane River; four in the state of Washington (Upper Falls, Monroe Street, Nine Mile, and Long Lake HEDs) and the Post Falls HED located in Idaho (Figure 1). The Spokane River Project was issued a License by the Federal Energy Regulatory Commission (FERC) on June 18, 2009 for a term of 50 years (FERC 2009).

Washington Department of Ecology's (Ecology) Section 401 Water Quality Certification (Washington 401) for Avista's Spokane River Project (Project) requires the development of a Temperature Water Quality Attainment Plan (WQAP) for the Long Lake Dam Reservoir and Tailrace (Ecology 2009). The Washington 401, incorporated by Ordering Paragraph E of the new Project License, requires the Temperature WQAP be developed for Ecology's review and approval within 18 months of License issuance. Avista will file the Temperature WQAP to FERC within 45 days following the deadline established in the Washington 401, as required by FERC's Order (issued September 17, 2009) Modifying and Approving Water Quality Monitoring and Quality Assurance Project Plan Pursuant to Article 401(A)(12).

The objective of the temperature WQAP is to provide a reasonable and feasible strategy for achieving the highest attainable water quality condition to best protect the biota with respect to temperature in Lake Spokane and the Long Lake HED tailrace.

1.1 Project Description

This WQAP is specific to the Long Lake HED, which is located on the Spokane River at River Mile (RM) 33.9 in Lincoln and Stevens Counties, approximately 25 to 30 miles northwest of the City of Spokane. The dam was originally constructed in 1913-1915. The HED consists of a 213-foot-tall, 593-foot-long main channel dam; a 108-foot-tall, 247-foot-long cutoff dam; four intake structures; three 16-foot-diameter and one 14-foot-diameter 236-foot-long steel penstocks; and a powerhouse including an indoor substation containing four double Francis type, horizontal shaft turbine-generator units with a total nameplate capacity of 71 Megawatts (MW) and a maximum hydraulic capacity of 6,300 cubic feet per second (cfs).

The dam creates a 5,060 acre reservoir, Lake Spokane, that extends 23.5 miles upstream (Figure 2). Lake Spokane is a long narrow reservoir with the lower portion contained within a bedrock canyon. The river flows to the northwest in the upper end of the reservoir and to the southwest in its lower end. The upper reaches of the reservoir transition from a shallow riverine environment (generally less than 25 feet deep) to a deeper lacustrine environment with a maximum depth of approximately 200 feet. The shoreline of the reservoir is generally steep and confined to one primary tributary, Little Spokane River, which enters the reservoir from the east, approximately 1.6 mile downstream of the Nine Mile Dam.

Long Lake Dam is operated as a storage facility with a total active storage capacity of 105,080 acre-feet. Normal full-pool elevation is 1,536 feet, however the reservoir's level can be lowered as much as 14 feet during winter drawdown. The Long Lake HED powerplant intake is located between elevation 1,491 and 1,507 feet, and withdraws reservoir water from a depth of about 30 to 45 feet during the summer. Downstream of Long Lake Dam, water is discharged to the Spokane River just upstream of Little Falls Reservoir, which is created by the Little Falls Dam.

2.0 LICENSE CONDITION

Section 5.5 of the Washington 401 is included in Appendix A and states:

A. *General Conditions*
The primary purpose of the following conditions is to achieve water quality, protects aquatic uses, and achieves numeric criteria for temperature. The Project shall comply with the standards found in WAC 173-201A, as further described in this Certification.
If at the end of the ten year compliance period, the Licensee is unable to meet water quality standards, after evaluating and implementing all reasonable and feasible alternatives under WAC 173-201A-510(5)(g), then the Licensee will propose an alternative action to achieve compliance with the standards, such as new reasonable and feasible technologies or other options to achieve compliance with the standards, a new compliance schedule, or other alternatives as allowed by WAC173-201A-510.

B. *Lake Spokane*
The Licensee shall develop a temperature Water Quality Attainment Plan (WQAP) for review and approval by Ecology within 18 months of FERC license issuance, in accordance with WAC 173-201A-510(5), that provides a detailed strategy for maintaining the highest attainable water quality condition to best protect the biota with respect to temperature that is reasonable and feasible to achieve in the Long Lake Dam reservoir and tailrace. Any operational or structural change that conflicts with other conditions of this Certification requires prior approval by Ecology.

The WQAP shall also identify a temperature regime that is reasonably and feasibly achievable based upon such evaluation, such that the summer temperature discharge from the Dam is not increased from current levels. Ecology recognizes that a trade-off between surface temperature and downstream temperatures may be required (i.e. discharging the preferred cooler waters from deep in a reservoir as opposed to mixing in the reservoir).
Thus, when it is not reasonable and feasible to meet the temperature criteria both upstream and downstream, the intent is to find the balance where biological protection would be optimized.

If at the end of the ten year compliance period, the Licensee is unable to meet water quality standards, after evaluating and implementing all reasonable and feasible alternatives under WAC 173-201A-510(5)(g), then the Licensee will propose an alternative action to achieve compliance with the standards, such as new reasonable and feasible technologies or other options to achieve compliance with the standards, a new compliance schedule, or other alternatives as allowed by WAC173-201A-510.

3.0 TEMPERATURE NUMERIC CRITERIA

Washington's relevant numeric temperature criterion for the Spokane River Project waters provides that the temperature shall not exceed a 1-day maximum temperature of 20.0°C due to human activities. When natural conditions exceed 20.0°C, water temperature shall not be increased by greater than 0.3°C (WAC 173-201A-602, Notes 1 and 3 to WRIA 54). This numeric temperature criterion applies to Lake Spokane and the Long Lake HED tailrace.

The Spokane Tribe's numeric temperature criterion, applicable from the upstream Spokane Indian Reservation boundary (approximately RM 32.7) to the mouth of the Spokane River (RM 0), shall not exceed a 7-day average daily maximum temperature of 18.5°C, from June 1 through September 1

(Spokane Tribe, 2003). For reference, the upstream boundary of the Spokane Indian Reservation is located approximately 1.2 miles downstream of Long Lake Dam.

3.1 Aquatic Life Uses

The Aquatic Life Use designated for Lake Spokane (downstream of Nine Mile Bridge to Long Lake Dam), as defined by the 2006 Washington State standards (173-201A WAC), is for core summer salmonid habitat. The key identifying characteristics of core summer salmonid habitat are the following, as defined by WAC 173-201A-200:

- summer (June 15 - September 15) salmonid spawning or emergence, or adult holding;
- use as important summer rearing habitat by one or more salmonids; or
- foraging by adult and sub-adult native char.

Other common characteristic aquatic life uses for waters in this category include spawning outside of the summer season, rearing and migration by salmonids (WAC 173-201A-200). In addition, WAC 173-201A-200(1)(a)(vi) requires "protection of waters where the dominant species under natural conditions would be temperature tolerant indigenous non-salmonid species.

3.2 Washington Department of Fish and Wildlife Reservoir Management

The Washington Department of Fish and Wildlife (WDFW) manages Lake Spokane as a mixed species fishery. In addition, WDFW is directed by the Washington Wild Salmonid Policy to protect, restore and enhance the productivity, production, and diversity of native salmonids.

During Avista's relicensing process, as well as during the development of the Spokane River and Lake Spokane Dissolved Oxygen Total Maximum Daily Load (DO TMDL) stakeholders have questioned the validity of Lake Spokane's existing uses, as well as its designated use, "core summer salmonid habitat".

This suggests documentation of Lake Spokane's cold-water fishery remains relatively undefined, with room for further evaluation of priority cold-water fish and their preferred habitat within Lake Spokane.

4.0 HISTORICAL/EXISTING CONDITIONS

The following provides the historical and existing temperature conditions for Lake Spokane and Long Lake Dam Tailrace waters as documented in the Draft Water Quality Assessment Report, completed by Golder Associates with the assistance of Parametrix, and submitted to Ecology on May 15, 2008 along with Avista's comments on the draft Washington 401 (issued April 7, 2008) for the Spokane River Hydroelectric Project (Golder and Parametrix, 2008). The report states:

> "Lake Spokane begins to thermally stratify in early April and generally has distinct thermal layers from June through October. During this period, warming occurs near the surface and density currents develop in the Lake with an interflow routing much of the inflow directly toward the Long Lake HED powerplant intake. In the shallow uppermost portion of the Lake where the Spokane River enters Lake Spokane water velocities maintain mixed conditions throughout the water column. As water flows into deeper portions of the Lake water velocities are reduced and warming becomes evident near the surface. Thermal stratification is apparent throughout the lacustrine zone of the Lake where three layers (epilimnion, metalimnion and hypolmnion) with differing thermal characteristics exist. The interflow (metalimnion), which is located at depths of

about 20-65 feet (6-20 meters), separates the warm surface layer (epilimnion) from the cool deep layer (hypolimnion).

The average surface water temperature for June to October between 1972 and 1985 exceeded 19°C while temperature at the bottom of Lake Spokane near the Long Lake HED forebay was less than 13°C (Patmont, et al., 1987, p. 32). The high temperature in the epilimnion of Lake Spokane is largely the result of solar heating and is typical of surface temperatures in other large lakes in eastern Washington and Idaho (Appendix B). The Lake begins to cool in late August and mixing ("turnover") usually begins in October or November each year.

Thermal stratification is strongest in Lake Spokane during August when the river inflow is least and when solar heating is the greatest (HDR, 2005; CH2MHILL, 2004). August water temperatures exceed 20°C near the surface of the Lake, although below a depth of 20 feet (6 meters) temperatures remain cooler than 20°C. CH2MHILL (2004) reported that 65 percent of the Lake's volume maintains temperatures of less than 20°C."

With regard to the Long Lake HED tailrace temperatures, the depth of the powerplant intakes results in cooler water being discharged downstream from the Long Lake HED compared with Lake Spokane's peak surface temperatures during the summer. The Long Lake tailrace water temperatures consistently meet Washington's temperature criteria. Monitoring records extending back to the early 1960s indicate there were only nine events in which the Washington criterion was exceeded.

Furthermore, natural conditions (i.e. no impoundments) appear to be worse for tailrace temperatures (compared with impounded conditions) as indicated by modeling results from 2001 (March through October) which show under unimpounded conditions Washington's temperature criteria was exceeded 13 times and the Spokane Tribe's temperature criteria was exceeded 90 times (HDR 2005).

5.0 PREVIOUS STUDIES/MODELING COMPLETED

Throughout the relicensing process, Avista, in collaboration with agencies, tribes and interested citizens, conducted studies and developed plans to support overall water quality improvements in the waters affected by the Spokane River Project. The following summarizes the studies and/or reports conducted during relicensing, specific to temperature in Lake Spokane and the Long Lake Dam tailrace.

5.1 Current Operations Water Quality Report, HDR (2005)

HDR completed the *Current Operations Water Quality Report* (2005) to assist the Spokane River Water Resources Work Group during the Spokane River Project Relicensing effort. HDR used the Spokane River CE-QUAL-W2 two-dimensional, hydrodynamic water quality model to simulate the following two model simulations to evaluate the Project's effects on Spokane River water quality for the year 2001, a critically low-flow period:

- Impounded: model simulations evaluated Spokane River water quality associated with current operation of the Project during 2001.
- Unimpounded: model simulations evaluated the Spokane River water quality during 2001 assuming that the five HEDs (Post Falls, Upper Falls, Monroe Street, Nine Mile, and Long Lake Dams) were not present.

Lake Spokane
With respect to temperature, HDR's model simulation results indicated that the unimpounded scenario showed a reduction in daily maximum water temperature in the surface layer of the reservoir at all locations with the average difference between the impounded and unimpounded scenario ranged from 3.6 to 6.8°C during the period from July to September 2001. However, the water temperature in the reservoir's hypolimnion was relatively lower in the impounded scenario as compared with the unimpounded scenario until the month of September.

The increase in water temperature in the upper layer and the decrease in water temperature in the lower layer in the impounded model results are due to stratification and increased residence time caused by Long Lake HED. The unimpounded scenario, of course, represents a river rather than a lake/reservoir, so that comparative evaluations are of little practical use.

Long Lake HED Tailrace
HDR's model simulation results indicated that under the unimpounded scenario up to 4°C warmer temperatures were observed at the Long Lake HED tailrace during the period from mid-April to August, and up to 4° cooler water temperatures in September and October, compared to the impounded scenario. While the tailrace temperature under the impounded scenario did not exceed the Washington numeric criteria, the tailrace temperature under the unimpounded scenario exceeded the criteria 13 times between March through October (2001). While both scenarios show an exceedance of the Spokane Tribe's temperature criteria, the unimpounded scenario results in an increase of the number of days of exceedance.

Overall, the model results indicate that seasonal maximum temperatures for Lake Spokane's interflow and hypolimnion tend to be cooler than unimpounded riverine conditions. Although the Lake's near-surface layer is warmer than riverine conditions would be in the summer and fall, Long Lake HED tailrace waters meet the 20°C criterion under impounded conditions.

HDR concluded that on average, the Long Lake HED has both cooling and warming effects on the downstream Spokane River water temperature depending on the time of year. The reason for the positive (cooling) influence is due to the depth of the Long Lake HED powerplant intake, which allows relatively cool water to be discharged from Lake Spokane to the downstream Spokane River.

5.2 Spokane River Project Temperature Analysis, Golder (2007)

During the Project Relicensing Effort, Ecology requested that Avista provide an analysis on operational options that might impact temperatures in Lake Spokane. On September 20, 2005, Ecology submitted a letter requesting FERC require Avista to conduct such a temperature evaluation. No alternative operation scenario was suggested, and no specific alternatives were proposed during the years of the Alternative Licensing Process water resource meetings. While FERC determined such a study was not necessary, Avista agreed to provide this information to Ecology during its processing of the Washington 401 application. The purpose of the modeling was to determine if operational changes at the Long Lake

HED result in cooler water temperatures in Lake Spokane and in the Spokane River below the Long Lake HED.

Golder completed the Spokane River Project Temperature Analysis (2007) which included using the CE-QUAL-W2 water quality model to simulate two different operational scenarios and compare the results to the current model output. The two scenarios modeled by Golder are considered "extreme" and were chosen as they are the most likely to produce a significant temperature change. The two scenarios, as defined below, included a "Late Fill" and a "Mid-Season Drawdown".

Late Fill

The Late Fill scenario operates Long Lake HED so that the lake fills later in the spring than under current conditions. Filling the lake would be postponed until the second flow pulse in mid May, when the lake would be filled to the summer pool level (1536 ft). It is important to note, the timing, shape and magnitude of the "flood pulse" is not predictable, and varies from year to year. In 2001 there were two distinct pulses, and the model represents the actual hydrograph for 2001. After filling, the Lake elevation would be operated at the summer pool level until late fall.

Golder's modeling results of the Late Fill scenario indicated the reservoir temperatures were similar within the lake compared with 2001 conditions. The average absolute temperature difference between the Late Fill scenario and the 2001 condition was less than 0.25°C within the representative Lake Spokane modeling segments, 154 (just below Nine Mile Dam) and 188 (segment at Long Lake Dam). The outflow temperatures below Long Lake Dam were predicted to be slightly warmer (by less than 0.1° C).

The small temperature differences between the Late Fill results and the 2001 conditions suggest that a delay in the lake-filling period from late April to mid-May would have negligible effect on water temperature in Lake Spokane.

Mid-Season Drawdown

The Mid-Season Drawdown scenario encompassed the Lake drawn down during the middle of the summer. The lake would be filled to the summer pool level with the first flow pulse in late April, similar to the 2001 conditions. The Lake elevation would then be maintained at the summer pool level until June 1, followed by a uniform drawdown of approximately 12 feet to elevation 1523.5 feet within a two-week time period. The lake would then be regulated at elevation 1523.5 feet until late fall.

Results of the Mid-Season Drawdown Scenario indicated a portion of the upper reservoir would transform to a more riverine condition and, combined with the cooling effects of the Little Spokane River, would provide as much as 6.6°C cooler temperatures in this reach than under the current conditions. Much less cooling was predicted for reaches closer to Long Lake Dam. However, this scenario would also result in warmer tailrace waters downstream of Long Lake Dam, as withdrawals from the intakes would come from closer to the Lake's surface.

The Mid-Season Drawdown is not a feasible operational measure for the following reasons:

- Changing the hydraulics from a reservoir to a more riverine environment in the upper portion of the Reservoir would be in violation of the FERC License for the Project which requires Avista to maintain the entire reservoir at a summer full pool elevation of 1536 feet.

- This scenario would result in warmer tailrace waters released downstream of the Long Lake HED which would negatively impact downstream water quality conditions in the Spokane River.
- Such operations would interfere with other beneficial uses at Long Lake, including recreation and its fisheries.

6.0 REASONABLE & FEASIBLE MEASURES

6.1 Lake Spokane

Natural year-to-year variability in water temperatures is much more significant than the very minor temperature changes that could be achieved through changes in Long Lake HED operations. The surface layer of the lake will always be most affected by meteorological conditions, regardless of how the HED is operated (Golder, 2007). The surface temperature of natural lakes in eastern Washington and north Idaho routinely exceed 20° C during the summer months.

Ecology recognized in the Washington 401 when it's not reasonable and feasible to meet the temperature criteria in both the reservoir, and the tailrace waters, the intent is to find the balance where biological protection would be optimized. Recognizing this, the temperature criteria, aquatic life use, and WDFW's management goals for Lake Spokane, Avista will continue to monitor temperature conditions in both the reservoir and tailrace waters, as specified in Section 8.0, Temperature Monitoring.

In the meantime, Avista will continue evaluating relative reasonable and feasible measures which could be implemented through its Lake Spokane Dissolved Oxygen Water Quality Attainment Plan (DO WQAP), as identified in the following Section 6.1.1, Parallel Improvements.

6.1.1 Parallel Improvements

Avista is currently evaluating potential projects as it develops the DO WQAP, which is due to Ecology on May 27, 2012. The DO WQAP requires Avista to provide a detailed strategy to address its proportional level of responsibility, based on its contribution to lower dissolved oxygen (DO) levels in Lake Spokane as determined by the DO TMDL.

Avista has completed a preliminary list of reasonable and feasible improvements and/or mitigation measures that could be used to potentially improve DO in Lake Spokane. Ecology, in a preliminary meeting held on July 22, 2010 regarding the Temperature WQAP, indicated that some of the items identified on this preliminary list of potentially reasonable and feasible improvements and/or mitigation measures if applied, might secondarily improve temperature conditions in Lake Spokane. Avista will pursue and research the measures identified in the above mentioned list, and identified below, in an effort to achieve the highest attainable level of improvement with regard to temperature in Lake Spokane.

Wetland restoration/enhancement

As required by Section 5.3.G of the Washington 401, Avista will acquire, restore, and/or enhance a minimum of 42 acres of wetlands. As a first priority, Avista will evaluate potential wetland areas that are located within 300 feet of the shoreline, where the current land use is contributing sediment into Lake Spokane. Development of a wetland buffer along the shoreline could reduce sediment and nutrient loading to the lake by filtering runoff from the fields. By shifting agricultural use away from the shoreline and restoring the 42 acres as a wetland buffer along the shoreline, Avista could potentially

prevent a substantial amount of sediment and nutrients from entering the water, and therefore potentially reduce temperature in surface waters of the Lake.

Reduction of size and conversion of lakeshore lawns to native vegetation

A conservative estimate of the development of Lake Spokane's shoreline indicates there are approximately 74 acres of manicured lawns within 200 feet of the lake's shoreline. In the development of the DO WQAP, Avista is looking into various options to reduce the size and number of manicured lawns near the lake's shoreline and shift fertilizer use to phosphorus-free fertilizers. With consideration to slope and shading, the reduction of the size and number of manicured lawns and potential conversion to native vegetation along the lake's southern shoreline may result in a more shaded shoreline, reducing localized surface water temperatures.

Hangman Creek Basin shoreline stabilization and agricultural practices

Hangman Creek, a major tributary joining the Spokane River approximately 14.4 miles upstream of the Nine Mile HED, contributes substantial amounts of sediment and phosphorus to the Spokane River. The amount of sediment present in water can affect water temperature as suspended particles in a water column will absorb sunlight. Avista is evaluating the potential of working with Ecology, other government agencies, and area landowners to implement practices to reduce sediment loadings into Hangman Creek from cropland, pastures, or stream bank erosion. Reducing the amount of sediments deposited in Lake Spokane could potentially reduce the temperature in Lake Spokane surface waters.

Native Tree Plantings on Avista Shoreline Property

Avista owns approximately 350 acres of land located within 200 feet of Lake Spokane in Spokane, Stevens, and Lincoln Counties. This land is currently undeveloped, and under the new FERC License will be managed for conservation and public recreation to protect or enhance wildlife, botanical, cultural, and aesthetic resources, while providing outdoor recreation opportunities.

In its non forested lands, Avista will evaluate whether planting native trees within the 200-ft buffer could shade the shoreline from sunlight and potentially result in reducing surface water temperatures. Avista will then plant trees as appropriate, based on the evaluation.

Carp Reduction in Lake Spokane

One additional mitigation measure that had not yet been explored during the development of the possible reasonable and feasible improvements and/or mitigation measures includes potentially reducing the carp population in Lake Spokane.

In early July of 2010, hundreds of dead, large, adult carp were observed in the upper portion of Lake Spokane. Ecology and WDFW have indicated the fish kill was a natural occurrence, potentially caused by a carp-specific virus resulting from spawning/temperature induced stress. While hundreds of carp carcasses were observed, a WDFW representative indicated this most likely represents a small portion of the total carp population in Lake Spokane.

Carp are known to degrade water quality, alter food webs, and negatively impact native or recreationally important fish populations (Zambrano et al. 2001; Jackson et al. 2010). Carp are benthic omnivores and feed primarily on aquatic invertebrates by rooting in sediments (Panek 1987). This feeding behavior increases turbidity by re-suspending sediments leading to lower light penetration and increased temperatures. Additionally, nitrogen and phosphorus are re-distributed in the water column

which may facilitate nuisance algae blooms further reducing light penetration (Moss et al. 2002). Increased turbidity at high magnitudes decreases foraging efficiency for sight-oriented piscine predators (bass, crappie and perch), reduces beneficial primary productivity, and reduces aesthetic values of lakes and reservoirs. Furthermore, the feeding behavior of carp destroys the root system of aquatic plants, thus decreasing food or cover for invertebrates, juvenile fish, and waterfowl (Crivelli 1983; Bajer et al. 2009). Through the development of the DO WQAP Avista will explore what sort of water quality improvement, if any, could be expected from potential short and long-term control measures for carp in Lake Spokane.

6.2 Long Lake HED Tailrace

The Long Lake tailrace water temperatures consistently meet Washington's temperature criteria. However, Avista will continue to monitor temperature conditions in the tailrace waters as it implements the Washington 401 required total dissolved gas (TDG) and DO improvements at Long Lake Dam as described in Section 8.0, Temperature Monitoring. Maintaining the temperature benefits in the tailrace waters from the operation of the Long Lake HED while addressing these additional water quality issues will fully support biota and other beneficial uses. In addition and as Avista evaluates potential TDG abatement and DO enhancement measures for its Long Lake HED, as required under the Washington 401, it will consider both the positive and negative effects, if any, on temperature.

In the mean time, Avista is providing the Spokane Tribe with funds to complete water quality improvements in waters downstream of the HED. To date, the Spokane Tribe has planted trees and completed stream stabilization efforts in the Chamokane Creek watershed to reduce surface water temperatures. Avista will continue to work with the Spokane Tribe to implement and monitor improvements in water temperature in waters downstream of the Long Lake HED.

7.0 BENCHMARKS/COMPLIANCE SCHEDULE

7.1 Lake Spokane

Avista is currently working with Ecology to collect nutrient data at six stations in Lake Spokane, as described in the Monitoring Section below. The monitoring program includes collection of water temperature, along with other nutrient parameters, from May through October, during 2010 and 2011. The monitoring is being conducted under a Quality Assurance Project Plan (QAPP) developed by Ecology. Avista will continue this monitoring program until 2016, at which time Avista will evaluate the results and success of monitoring baseline nutrient conditions in Lake Spokane and work with Ecology to define future monitoring goals/programs for Lake Spokane, as discussed in Section 8.0, Temperature Monitoring.

Avista will be conducting annual creel surveys in Lake Spokane under Article 406 of the FERC License, which also requires Avista to annually stock 155,000 catchable-sized rainbow trout in Lake Spokane. A pre-stocking creel survey will be conducted in 2011 to provide baseline information regarding the existing fishery. Stocking will be conducted from 2012 through 2016, and the annual creel surveys will be conducted from 2013 through 2016.

In addition, and under the DO WQAP, Avista will work to define suitable fish habitat (temperature and DO levels) that support priority cold-water fish populations in Lake Spokane. Priority fish populations are defined as those cold-water fish species under WDFW management goals for Lake Spokane. This evaluation will include an assessment of temperature/DO profiles in 2010 and 2011 paired with current (2009) bathymetry of Lake Spokane. Literature values can be used in the absence of site and species

specific data to define suitable habitat for priority fish species. Once suitable habitat is defined, the total volume of suitable habitat can be calculated under existing conditions (from the 2010 and 2011 sampling data). The CE-QUAL-W2 model may also be useful in helping to predict how changes in nutrient input affects suitable habitat for fish. The results of the creel surveys will be used to help determine if fishery management objectives for hatchery rainbow trout are being met.

The following provides the compliance schedule for meeting the previously identified benchmarks for Lake Spokane.

Lake Spokane Benchmarks	Timeframe
Nutrient Monitoring Program	2010 - 2016
Pre-Stocking Creel Survey	2011
DO WQAP Submittal to Ecology	2012
Hatchery Rainbow Trout Stocking	2012-2016
Lake Spokane Creel Survey	2013 - 2016

8.0 TEMPERATURE MONITORING

8.1 Lake Spokane

Temperature monitoring is currently being conducted in the Spokane River upstream of Lake Spokane, as well as within Lake Spokane. These monitoring efforts are described in more detail below.

Ecology and Avista

In 2010, Ecology implemented a two-year nutrient monitoring program in Lake Spokane in order to support the DO TMDL effort. The program includes conducting one sampling event in May and October, and two sampling events per month, from June through September. The sampling is conducted at six lake monitoring stations in Lake Spokane. Due to Ecology's personnel time constraints, Avista agreed to conduct one of the monthly sampling events from June through September for the 2010 and 2011 field seasons. All sampling is completed in accordance with the QAPP developed by Ecology (Ecology, 2010), which is further described in Section 8.3, Data Control and Quality Assurance.

Avista will continue the Lake Spokane nutrient monitoring program until 2016, at which time Avista will evaluate the results and success of monitoring baseline nutrient conditions in Lake Spokane and work with Ecology to define future monitoring goals/programs for Lake Spokane, including whether the temperature monitoring locations, duration, and frequency should be modified. The monitoring will be conducted under Ecology's 2010 QAPP developed specifically for monitoring nutrients in Lake Spokane. The QAPP will be updated annually, as needed. All nutrient monitoring efforts will be in accordance with the developing DO WQAP.

Ecology

In addition, Ecology through its River and Stream Water Quality Ambient Monitoring Program, conducts water quality monitoring at hundreds of stream stations throughout the state on a monthly basis. These stations are monitored monthly, October through September, on an annual basis for temperature, as well as other parameters. Two of these stations are located just upstream of the upper portion of Lake

Spokane and provide pertinent nutrient and temperature data relative to conditions affecting Lake Spokane and include:

- Station 55B070 is located approximately 1.5 miles upstream from the confluence of the Little Spokane River with Lake Spokane on the Highway 291 bridge crossing (Old Fort Spokane Historical Site, RM 1.1). The data collected at this station can be accessed through the following link:http:/www.ecy.wa.gov/apps/watersheds/riv/station.asp?theyear=&tab=notes&scrolly=0&wria=55&sta=first; and
- Station 54A090 is located approximately 0.2 miles downstream of Nine Mile Dam (at Nine Mile Bridge, RM 58). The data collected at this station can be accessed through the following link: http://www.ecy.wa.gov/apps/watersheds/riv/station.asp?theyear=&tab=notes&scrolly=0&sta=54A090.

Ecology's sampling efforts at these two stations is conducted in accordance with the Stream Ambient Monitoring QAPP developed by Ecology (Ecology, 2003), which is further described in Section 8.3, Data Control and Quality Assurance.

8.2 Long Lake Dam Tailrace

Temperature monitoring is currently being conducted by Ecology and Avista in the Spokane River downstream of Lake Spokane. These monitoring efforts are described in more detail as follows.

Avista

Specific to the Long Lake Dam tailrace waters, Avista is conducting a monitoring program in accordance with its DO Detailed Phase II Feasibility and Implementation Plan and TDG Monitoring Plan. These two Plans have separate seasonal monitoring timeframes; however both programs collect temperature, TDG, and DO concentrations utilizing identical monitoring equipment. The quality control protocols for these two monitoring programs are further described in Section 8.3, Data Control and Quality Assurance.

With respect to temperature, because the tailrace waters meet Washington's temperature criteria, Avista will only continue monitoring temperature below the dam until 2016. At that time Avista will re-evaluate the need, if any, for additional tailrace temperature monitoring with Ecology.

Ecology

Ecology conducts monitoring through its River and Stream Water Quality Ambient Monitoring Program at a station, 54A070, which is located 0.6 miles downstream of Long Lake Dam (at the Highway 231 Bridge, RM 33.3). The data collected at this station location provides pertinent information regarding temperature conditions below Long Lake Dam. A summary of the data can be accessed through the following link:
http://www.ecy.wa.gov/apps/watersheds/riv/station.asp?theyear=&tab=notes&scrolly=0&sta=54A070.

8.3 Data Control and Quality Assurance

The monitoring programs identified in the previous section are completed under a QAPP developed specifically for each of the individual monitoring programs. These individual QAPPs are below.

Ecology, Quality Assurance Project Plan, Stream Ambient Water Quality Monitoring, Publication No. 03-03-200. April 2003.
Ecology conducts water quality monitoring at hundreds of stream stations throughout the state on a monthly basis through its River and Stream Water Quality Ambient Monitoring Program. The monitoring is conducted in accordance with the Stream and Water Quality Monitoring QAPP, Publication No. 03-03-200, which Ecology updates on an as needed basis. Of importance to this temperature WQAP, Ecology conducts monitoring at the three ambient monitoring stations, Stations 55B070, 54A090, and 54A070, in accordance with the Stream Ambient Water Quality Monitoring QAPP, which can be found at the following link: http://www.ecy.wa.gov/biblio/0303200.html.

Ecology, Quality Assurance Project Plan, Lake Spokane Nutrient Monitoring, Publication No. 10-03-120. October 2010.
Ecology's Lake Spokane Nutrient Monitoring Quality Assurance Project Plan (Lake Spokane QAPP), which incorporates Avista, includes conducting regular critical-period (May to October) sampling on Lake Spokane to monitor nutrients, DO, and measures of productivity. The objective of the monitoring program is to compile data and use it to verify the baseline condition of Lake Spokane. This QAPP is available for review at the following link: http://www.ecy.wa.gov/biblio/1003120.html.

Golder, Washington Total Dissolved Gas Monitoring Plan, Washington 401 Certification, Section 5.4(A), Spokane River Hydroelectric Project, FERC Project No. 2545. March 26, 2010.
Golder, on behalf of Avista, completed a Total Dissolved Gas Monitoring Plan for both the Long Lake and Nine Mile HEDs, as required in Section 5.4(A) of the Washington 401. The monitoring plan includes the following components: a description of the monitoring objectives; stations; equipment; procedures (including calibration, maintenance, data quality control, and quality assurance); study coordination and schedule; adaptive management; and annual reporting.

Specific to the Long Lake HED, this Monitoring Plan includes monitoring TDG, temperature, and DO, along with depth, at the following three locations: in the generation plume (LLGEN); on the left bank downstream of the powerhouse (LLTR); and on the right bank downstream of the powerhouse (LLTRSP1). The specific coordinates of these three locations are identified in the TDG monitoring Plan. Under this Plan, monitoring will be conducted during the spring high flow, run-off season.

The TDG Monitoring Plan was approved by the Spokane Tribe and Ecology on February 18, 2010 and March 17, 2010, respectively. On December 14, 2010, FERC issued an order modifying and approving the Attainment and Monitoring Plans for the Long Lake Development (FERC Order 2545-118).

Golder, Detailed DO Phase II Feasibility and Implementation Plan, Washington 401 Certification, Section 5.6(B), Spokane River Hydroelectric Project, FERC Project No. 2545. June 11, 2010.
Golder, on behalf of Avista, completed a Detailed DO Phase II Feasibility and Implementation Plan for the Long Lake HED, as required in Section 5.6(B) of the Washington 401. This plan incorporated a monitoring, reporting, and quality assurance planning process consisting of monitoring objectives, stations, equipment, procedures (including calibration, maintenance, data quality control, and quality assurance), study coordination and schedule, adaptive management, and annual reporting.

Specific to the Long Lake HED, the Detailed DO Phase II Feasibility and Implementation Plan includes monitoring TDG, temperature, and DO, along with depth, and at the following three locations: in the forebay (LLFB); on the left bank downstream of the powerhouse (LLTR); and in the generation plume (LLGEN). The specific coordinates of these three locations are identified in the Phase II Feasibility and

Implementation Plan, and monitoring is scheduled to occur during the months of July through October, and will be coordinated with the TDG monitoring for the Long Lake HED.

The Detailed DO Phase II Feasibility and Implementation Plan was approved by the Spokane Tribe and Ecology on April 20, 2010 and June 11, 2010, respectively. On December 9, 2010, FERC issued an order modifying and approving this Plan (FERC Order 2545-125).

8.4 Adaptive Management

Avista will evaluate, through consultation with Ecology, the need to modify the temperature monitoring locations in Lake Spokane and the Long Lake Dam tailrace waters based upon the outcome of each program's monitoring results.

Avista will continue the Lake Spokane nutrient monitoring program until 2016, at which time Avista will evaluate the results and success of monitoring baseline nutrient conditions in Lake Spokane and work with Ecology to define future monitoring goals/programs for Lake Spokane, including whether the temperature monitoring locations, duration, and frequency should be modified. The monitoring will be conducted under Ecology's 2010 QAPP developed specifically for monitoring nutrients in Lake Spokane. The QAPP will be updated annually, as needed. All nutrient monitoring efforts will be in accordance with the developing DO WQAP.

With regard to the monitoring program established below Long Lake Dam, since the tailrace waters meet Washington's temperature criteria, Avista will only continue monitoring temperature below the dam until 2016.

9.0 REPORTING

Avista will provide an annual summary report of the available temperature water quality monitoring results to Ecology by March 1st of the following year. The annual report will document the monitoring period and the monitoring results with the overall goal of providing a basis to track the Spokane River Project's compliance with the applicable temperature water quality standards. As required by FERC's Order (2545-113), issued September 17, 2009, the annual report will also include the DO and total dissolved gas monitoring periods and results, consistent with each parameter's applicable WQAP(s). Each annual report will include a description of any proposed changes to the WQM/QAPP or other appropriate plan and the rationale for the change(s).

10.0 REFERENCES

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Crivelli, A. J. 1983. The destruction of aquatic vegetation by carp. A comparison between Southern France and the United States. Hydrobiologia 106:37-41.

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Golder. 2010. Washington Total Dissolved Gas Monitoring Plan, Washington 401 Certification, Section 5.4(A), Spokane River Hydroelectric Project, FERC Project No. 2545. March 26.

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Spokane Tribe, 2003. Spokane Tribe of Indians, Surface Water Quality Standards. Resolution 2003-259. March 7.

Zambrano, L., M. Scheffer, and M. Martinez-Ramos. 2001. Catastrophic response of lakes to benthivorous fish introductions. Oikos 94: 344-350.

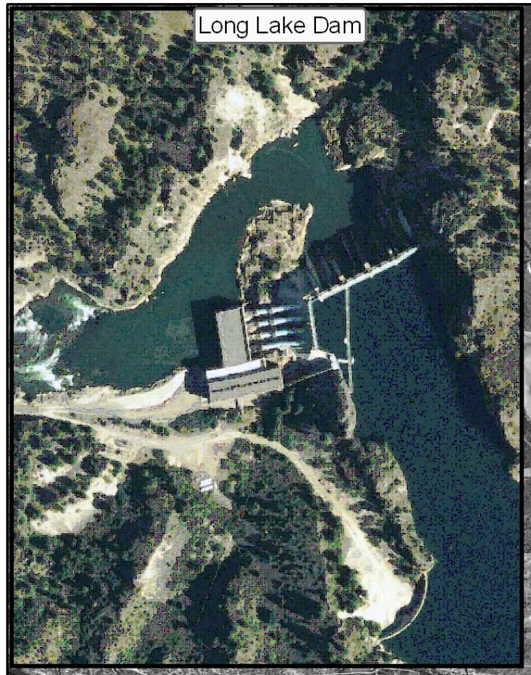
FIGURES

Deer Park
Lake Spokane
Long Lake
Nine Mile
Nine Mile Reservoir
Fairwood
Mead
Washington
Idaho
Rathdrum
Hauser
Hauser
Post Falls
State Line
Otis Orchards-East F
Post Falls
City of Spokane's Upriver Dam
Millwood
Liberty Lake
Spokane
Spokane Valley
Upper Falls
Monroe Street
Airway Heights
Fairchild AFB
N
W
E
S
0
2.5
5 Miles
draft_fig1_spokane_river_ccl

FIGURE 1
Spokane River Project Location Map
Long Lake Dam Reservoir and Tailrace
Temperature WQAP
January 2011

Avista-owned Hydro Electric Dam
Project Boundary
Towns
Spokane Tribe Reservation

Doc. No. 2011-0023



Tum Tum
Sunset Bay
Willow Bay
Lake Spokane
StevensCounty
Highway 291
Long Lake Dam Overlook
Long Lake Campground
North Shore Campsites
Long Lake Dam
Long Lake-Devil's Gap Rd
SpokaneCounty
LincolnCounty
Medical Lake
Highland
Prewett
Riverside State Park
Boat Launch/Canoe Take-out
Nine Mile Resort
Project Boundary
Little Spokane River
Nine Mile Dam
Nine Mile Overlook

LEGEND

- Access Site
- HED
- Recreation Site
- Boater Safety Cable
- Road
- FERC Project Boundary
- Wetlands

N

0.9 Miles

FIGURE 2
Long Lake HED Map
Long Lake Dam Reservoir and Tailrace
Temperature WQAP
January 2011
Doc. No. 2011-0023

APPENDICES

APPENDIX A

SECTION 5.5 OF THE WASHINGTON SECTION 401 WATER QUALITY CERTIFICATION

3. A description of how the Project will minimize all spills that produce TDG exceedances at the Project;
4. An evaluation of all potential and preferred structural and operational improvements to minimize TDG production;
5. A timeline showing when operational adjustments will occur;
6. A schedule for construction; and
7. Monitoring plans to further evaluate TDG production and to test effectiveness of gas abatement controls.

The Project shall operate according to the approved TDG WQAP with the objective of eliminating TDG exceedances.

Upon approval of the TDG WQAP, the Licensee shall immediately begin the necessary steps identified in the TDG WQAP to eliminate TDG criteria exceedances.

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 ten year compliance period, and the Licensee is unable to meet water quality standards after evaluating all reasonable and feasible alternatives under WAC 173-201A-510(5)(g), then the Licensee will propose an alternative action to achieve compliance with the standards, such as new reasonable and feasible technologies or other options to achieve compliance with the standards, a new compliance schedule, or other alternatives as allowed by WAC173-201A-510.

5.5 Temperature

A. General Conditions

The primary purpose of the following conditions is to achieve water quality, protects aquatic uses, and achieves numeric criteria for temperature. The Project shall comply with the standards found in WAC 173-201A, as further described in this Certification.

If at the end of the ten year compliance period, the Licensee is unable to meet water quality standards, after evaluating and implementing all reasonable and feasible alternatives under WAC 173-201A-510(5)(g), then the Licensee will propose an alternative action to achieve compliance with the standards, such as new reasonable and feasible technologies or other options to achieve compliance with the standards, a new compliance schedule, or other alternatives as allowed by WAC173-201A-510.

B. Lake Spokane

The Licensee shall develop a temperature Water Quality Attainment Plan (WQAP) for review and approval by Ecology within 18 months of FERC license issuance, in accordance with WAC 173-201A-510(5), that provides a detailed strategy for maintaining the highest attainable water quality condition to best protect the biota with respect to temperature that is reasonable and feasible to achieve in the Long Lake Dam reservoir and tailrace. Any operational or structural change that conflicts with other conditions of this Certification requires prior approval by Ecology.

The WQAP shall also identify a temperature regime that is reasonably and feasibly achievable based upon such evaluation, such that the summer temperature discharge from the Dam is not increased from current levels. Ecology recognizes that a trade-off

between surface temperature and downstream temperatures may be required (i.e. discharging the preferred cooler waters from deep in a reservoir as opposed to mixing in the reservoir).

Thus, when it is not reasonable and feasible to meet the temperature criteria both upstream and downstream, the intent is to find the balance where biological protection would be optimized.

If at the end of the ten year compliance period, the Licensee is unable to meet water quality standards, after evaluating and implementing all reasonable and feasible alternatives under WAC 173-201A-510(5)(g), then the Licensee will propose an alternative action to achieve compliance with the standards, such as new reasonable and feasible technologies or other options to achieve compliance with the standards, a new compliance schedule, or other alternatives as allowed by WAC173-201A-510.

5.6 Dissolved Oxygen

A. General Conditions

The primary purpose of the following conditions is to achieve water quality numeric criteria for DO, in order to protect beneficial uses. The Project shall comply with the standards found in WAC 173-201A, as further described in this Certification.

Upon completion of the ten year compliance period, the Licensee shall operate the Project in full compliance with the state water quality standards.

Ecology is developing a Total Maximum Daily Load for Dissolved Oxygen in the Spokane River (DO TMDL). As part of that process, Ecology will determine the Project's contribution to the DO problem in the Spokane River, and the Licensee's proportional level of responsibility for control measures.

B. Long Lake Dam

The Licensee shall submit to Ecology a Detailed Phase II Feasibility and Implementation Plan based on the Long Lake HED DO Aeration Study within one year of license issuance, choosing one or several options to implement. The plan shall contain:

- Anticipated compliance schedule for conducting preliminary and final implementation plans; and
- A monitoring plan to evaluate compliance (including avoidance of super-saturation) and coordinate results with the DO TMDL efforts.

C. Lake Spokane

After EPA's approval of the DO TMDL, Ecology will amend this Certification by Adminstrative Order to require the Licensee to develop, within two years of the effective date of the amendment, and FERC has issued the new license , a DO WQAP for review and approval by Ecology, in accordance with WAC 173-201A-510(5).

The DO WQAP will provide a detailed strategy to address the Licensee's proportional level of responsibility, based on its contribution to the dissolved oxygen problem in Lake Spokane as determined in the DO TMDL.

The DO WQAP shall include, at a minimum, the following elements:

- Implementation plan – A plan to analyze, evaluate and implement reasonable and feasible measures to improve dissolved oxygen conditions in Lake Spokane, based on the DO TMDL. The Licensee's commitments shall be sufficient to

APPENDIX B

COMMENTS AND AVISTA RESPONSES

AVISTA

October 19, 2010

Brian Crossley
Spokane Tribe of Indians
P.O. Box 480
Wellpinit, WA 99040

Subject: Spokane River Hydroelectric Project, FERC Project No. 2545
Draft Long Lake Dam Reservoir and Tailrace Temperature Water Quality Attainment Plan as Required by the Spokane River License, Appendix B, Section 5.5.B

Dear Mr. Crossley:

On June 18, 2009 the Federal Energy Regulatory Commission (FERC) issued a new license for the Spokane River Hydroelectric Project, FERC Project No. 2545 (License). Ordering Paragraph E of the License incorporated the *Washington Department of Ecology (Ecology) Certification Conditions under Section 401 of the Federal Clean Water Act (Issued on May 8, 2009 and filed on May 11, 2009).* The conditions pertaining to the certification can be found in Appendix B of the License.

In accordance with Appendix B, Section 5.5.B of the License, Avista has developed a Draft Long Lake Dam Reservoir and Tailrace Temperature Water Quality Attainment Plan (Temperature WQAP). Per the October 2008 Settlement Agreement between Avista and the Tribe, we request your review and comments on the Draft Temperature WQAP by **November 19, 2010**. Avista will incorporate your comments and recommendations as appropriate, and submit the final Temperature WQAP to Ecology for approval.

Please feel free to call me at 509-495-4643 if you have any questions during your review of the Draft Temperature WQAP.

Sincerely,

Meghan Lunney
Aquatic Resource Specialist

Attachment

1411 East Mission Avenue
PO Box 3727
Spokane, Washington 99220-3727

800.227.9187
www.avistautilities.com

Lunney, Meghan

From: Brian Crossley [crossley@spokanetribe.com]
Sent: Thursday, December 02, 2010 3:36 PM
To: Lunney, Meghan
Subject: Temperature Attainment Plan

Megan I appreciate the time you gave me to comment on the Spokane River Project, I spoke with you over the phone about my comments and would like to emphasize that you always continue to do what you can to reduce temperatures and to consider the proposed changes and other mitigation efforts in light of the temperature issue on the Spokane River.

I would also like to remind you to include that we will support any efforts below the "project" to reduce temperature using mitigation funds related to improving the fishery.

Brian Crossley
Water & Fish Program Manager
Spokane Tribe, DNR

SPOKANE TRIBE COMMENTS ON DRAFT LONG LAKE DAM RESERVOIR AND TAILRACE TEMPERATURE WQAP

Spokane Tribe, Comment 1: I spoke with you over the phone about my comments and would like to emphasize that you always continue to do what you can to reduce temperatures and to consider the proposed changes and other mitigation efforts in light of the temperature issue on the Spokane River.

Avista Response: We agree and have included the following sentence on page 9 of the report to address your concern, "In addition and as Avista evaluates potential TDG abatement and DO enhancement measures for its Long Lake HED, as required under the Washington 401, it will consider both the positive and negative effects, if any, on temperature".

Spokane Tribe, Comment 2: I would also like to remind you to include that we will support any efforts below the "project" to reduce temperature using mitigation funds related to improving the fishery.

Avista Response: We agree, as stated in the following sentence included on page 9 of the report, "Avista will continue to work with the Spokane Tribe to implement and monitor improvements in water temperature in waters downstream of the Long Lake HED."

AVISTA

December 17, 2010

Marcie Mangold, Water Quality Program
Washington Department of Ecology
Eastern Region Office
4601 N. Monroe Street
Spokane, WA 99205-1295

Subject: **Spokane River Hydroelectric Project, FERC Project No. 2545**
Draft Long Lake Dam Reservoir and Tailrace Temperature Water Quality Attainment Plan as Required by the Spokane River License, Appendix B, Section 5.5.B

Dear Ms. Mangold:

On June 18, 2009 the Federal Energy Regulatory Commission (FERC) issued a new license for the Spokane River Hydroelectric Project, FERC Project No. 2545 (License). Ordering Paragraph E of the License incorporated the *Washington Department of Ecology (Ecology) Certification Conditions under Section 401 of the Federal Clean Water Act (Issued on May 8, 2009 and filed on May 11, 2009)*. The conditions pertaining to the Washington Water Quality Certification (Washington 401) can be found in Appendix B of the License.

In accordance with Appendix B, Section 5.5.B of the License, Avista has developed a Draft Long Lake Dam Reservoir and Tailrace Temperature Water Quality Attainment Plan (Temperature WQAP) which is enclosed for your review and approval. We request your review by **January 17, 2011**. This will allow us time to incorporate your comments and recommendations as appropriate, and submit the final Temperature WQAP to FERC by **January 31, 2011**.

Please feel free to call me at 509-495-4643 if you have any questions during your review of the Draft Temperature WQAP.

Sincerely,

Meghan Lunney
Aquatic Resource Specialist

Enclosure (1)

1411 East Mission Avenue
PO Box 3727
Spokane, Washington 99220-3727

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www.avistautilities.com

Lunney, Meghan

From: Mangold, Marcie (ECY) [DMAN461@ECY.WA.GOV]
Sent: Friday, January 14, 2011 12:16 PM
To: Lunney, Meghan; Fitzhugh, Speed (Elvin)
Subject: Draft Long Lake Dam Reservoir and Tailrace Temperature WQAP

Hi Meghan,

Just a few comments on the Plan, after our meeting on 1/6.

- Page 7, Section 6.1, second paragraph, first sentence. Please delete the first sentence.
- Section 6.1.1 regarding parallel improvements. Please continue to pursue and research parallel improvements before the DO WQAP is due to Ecology.
- Please consider including native tree planting on Avista property where appropriate.
- Section 8.1, monitoring, describe duration of monitoring in the reservoir and include that upon close of monitoring and evaluation of monitoring data, Ecology will re-evaluate temperature monitoring location, duration, and frequency. Please include this statement in the Adaptive management section as well.
- Please include a QAPP section/subsection. Ecology's QAPP is valid for your QAPP and can be updated annually if needed.

Please let me know if you have any questions.

Thank you,

D. Marcie Mangold
Department of Ecology
Water Quality Program
phone (509) 329 3450
fax (509) 329 3570

ECOLOGY COMMENTS ON DRAFT LONG LAKE DAM RESERVOIR AND TAILRACE TEMPERATURE WQAP

Ecology, Comment 1: Page 7, Section 6.1, second paragraph, first sentence. Please delete the first sentence.

Avista Response: The first sentence of the second paragraph on page 7, Section 6.1 was deleted.

Ecology, Comment 2: Section 6.1.1 regarding parallel improvements. Please continue to pursue and research parallel improvements before the DO WQAP is due to Ecology.

Avista Response: Avista will pursue and research the parallel improvements identified in Section 6.1.1 before the DO WQAP is due to Ecology.

Ecology, Comment 3: Please consider including native tree planting on Avista property where appropriate.

Avista Response: In its non forested lands, Avista will pursue evaluating whether planting native trees within the 200-ft buffer could shade the shoreline from sunlight and potentially result in reducing surface water temperatures, as indicated in Section 6.1.1.

Ecology, Comment 4: Section 8.1, monitoring, describe duration of monitoring in the reservoir and include that upon close of monitoring and evaluation of monitoring data, Ecology will re-evaluate temperature monitoring location, duration, and frequency. Please include this statement in the Adaptive management section as well.

Avista Response: Avista revised Section 8.1 to state the following:

"Avista will continue the Lake Spokane nutrient monitoring program until 2016, at which time Avista will evaluate the results and success of monitoring baseline nutrient conditions in Lake Spokane and work with Ecology to define future monitoring goals/programs for Lake Spokane, including whether the temperature monitoring locations, duration, and frequency should be modified. The monitoring will be conducted under Ecology's 2010 QAPP developed specifically for monitoring nutrients in Lake Spokane. The QAPP will be updated annually, as needed. All nutrient monitoring efforts will be in accordance with the developing DO WQAP."

This statement was also included in Section 8.4, Adaptive Management.

Ecology, Comment 5: Please include a QAPP section/subsection. Ecology's QAPP is valid for your QAPP and can be updated annually if needed.

Avista Response: Avista incorporated a Data Control and Quality Assurance Section, as Section 8.3 of the Temperature WQAP.

Lunney, Meghan

From: Lunney, Meghan
Sent: Tuesday, January 25, 2011 9:46 AM
To: Marcie Mangold (dman461@ecy.wa.gov)
Cc: Fitzhugh, Speed (Elvin)
Subject: Long Lake Dam Reservoir & Tailrace Temperature Water Quality Attainment Plan

Importance: High


Avista_Temp
QAP_1-25-11_TEXT


Avista_Temp
QAP_1-25-11_APPEN

Marcie,
Attached for your approval is the Long Lake Dam Reservoir and Tailrace Temperature Water Quality Attainment Plan which was revised to incorporate your comments, which we received via e-mail on January 14, 2011.

Also attached, is a pdf of a red-lined version of the text showing our edits.


Avista_Temp
QAP_1-25-11_REDLI

Figures will be sent in an a separate e-mail due to their large file size. Please give me a call with any questions at 509-495-4643.

Thanks!!!

Meghan Lunney
Aquatic Resource Specialist
Avista Utilities
(509) 495-4643

Lunney, Meghan

From: Lunney, Meghan
Sent: Tuesday, January 25, 2011 9:49 AM
To: Marcie Mangold (dman461@ecy.wa.gov)
Cc: Fitzhugh, Speed (Elvin)
Subject: Figures_Long Lake Dam Reservoir and Tailrace Temperature Water Quality Attainment Plan

Importance: High


Figure1_TempWQAP_MLedited_1-24...


FigurenpWQAP_mledited_

Marcie,
Attached are Figures 1 and 2 from the Long Lake Dam Reservoir and Tailrace Temperature Water Quality Attainment Plan.
Thanks,

Meghan Lunney
Aquatic Resource Specialist
Avista Utilities
(509) 495-4643

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
4601 N Monroe Street • Spokane, Washington 99205-1295 • (509)329-3400

January 25, 2011

Mr. Elvin "Speed" Fitzhugh
Spokane River License Manager
Avista Corporation
1411 East Mission Ave., MSC-1
Spokane, WA 99220-3727

RE: Request for Approval – Spokane River Hydroelectric Project No. 2545
Temperature Water Quality Attainment Plan for Long Lake Dam Reservoir and Tailrace – Washington 401 Certification, Section 5.5.B

Dear Mr. Fitzhugh:

We have reviewed the Temperature Water Quality Attainment Plan (WQAP) for Long Lake Dam Reservoir and Tailrace that was emailed to the Department of Ecology (Ecology) on January 25, 2011. We thank you for answering our questions and incorporating our comments into the final document.

Ecology approves the Temperature Water Quality Attainment Plan for Long Lake Dam Reservoir and Tailrace.

Please feel free to contact me at (509) 329-3450 or by email at dman461@ecy.wa.gov if you have any further questions regarding this matter.

Sincerely,

D. Marcie Mangold

D. Marcie Mangold
Water Quality Program

DMM:dw
cc: Doug Robison, WDFW
Brian Crossley, Spokane Tribe of Indians
Tom Young, Ecology/ATG
James M. Bellatty, Ecology/WQP