December 28, 2009

Washington Department of Ecology
Eastern Region Office
Attn: Ms. Marcie Mangold
4601 N. Monroe St.
Spokane, WA 99205

Re: Potential Reasonable and Feasible Improvements and/or Mitigation Measures that Could be Used to Address Avista's Proportional Level of Responsibility for Dissolved Oxygen in Lake Spokane

Dear Ms. Mangold:

Section 6 of the February 2009 Settlement Agreement (Washington Pollution Control Hearings Board Nos. 08-067, 08-068, 08-072), signed by the Washington Department of Ecology (Ecology), Avista Corporation (Avista), Inland Empire Paper Company, the Sierra Club/Center for Environmental Law and Policy, provides that:

> *Avista further commits to Ecology that, within 6 months after Ecology notifies Avista in writing that Ecology, EPA, and the Idaho Department of Environmental Quality, and the Spokane Tribe have accepted the final technical report on the dissolved oxygen modeling being conducted as part of the Spokane River TMDL process (but in no event later than December 31, 2009), Avista will identify reasonable and feasible improvements and/or mitigation measures that could be used to address its proportional level of responsibility for dissolved oxygen in Lake Spokane.*

To date, the final Spokane River and Lake Spokane Dissolved Oxygen Total Maximum Daily Load (DO TMDL) technical report has not been completed nor accepted by the above referenced agencies. As such, Avista is submitting the enclosed *Potential Reasonable and Feasible Improvements and/or Mitigation Measures for Dissolved Oxygen in Lake Spokane*, dated December 28, 2009 to Ecology in advance of its level of responsibility for DO being defined in the DO TMDL, and in accordance with the alternative deadline of December 31, 2009.

The potential reasonable and feasible improvements and/or mitigation measures will be further evaluated by Avista during development of the Lake Spokane DO Water Quality Attainment Plan (DO WQAP). The DO WQAP will be developed within two years of the effective date that Ecology amends its *Washington Department of Ecology Certification Conditions Under Section 401 of the Federal Clean Water Act* for the Spokane River Project to include Avista's proportional level of responsibility for DO in Lake Spokane.

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

509.489.0500
800.227.9187
www.avistautilities.com

We are also providing the other parties to the Settlement Agreement copies of the enclosed document for their information. If you have questions regarding the potential reasonable and feasible improvements and/or mitigation measures for Avista's proportional level of responsibility for DO in Lake Spokane, please feel free to call me at (509) 495-4998. In my absence please contact Meghan Lunney at (509) 495-4643.

Sincerely,

Speed Fitzhugh

Elvin "Speed" Fitzhugh
Spokane River License Manager

Enclosure

CC: David Moore, Ecology
Doug Krapas, Inland Empire Paper Company
Rachael Paschal Osborn, Sierra Club/Center for Environmental Law and Policy

POTENTIAL REASONABLE AND FEASIBLE IMPROVEMENTS AND/OR MITIGATION MEASURES FOR DISSOLVED OXYGEN IN LAKE SPOKANE

Prepared By:

Avista Corporation

1411 East Mission Ave., MSC-1

Spokane, WA 99220-3727

December 28, 2009

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Avista Corporation (Avista) has prepared this document identifying potentially reasonable and feasible improvements and/or mitigation measures that could be implemented to address its proportional level of responsibility for dissolved oxygen (DO) in Lake Spokane, which will be identified in the pending Spokane River dissolved oxygen total maximum daily load (DO TMDL).

1.0 BACKGROUND

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.

1.1 Dissolved Oxygen Deficit in Lake Spokane

Long Lake dam, located at River Mile 33.9, creates Lake Spokane, a 5,060 acre reservoir that extends 23.5 miles upstream. During seasonal low flows in late summer, Lake Spokane is thermally stratified with minimal mixing between water layers (Cusimano 2004). Studies conducted since the 1970s have shown that under low flow and thermally-stratified conditions, DO concentrations decrease with depth (Cusimano 2004). Low DO levels measured in the lake, particularly in the hypolimnion, led to a portion of it being included on the 303(d) list of water-quality limited waterbodies. Similarly, low DO levels measured in the Spokane River led to portions of the river also being included on the 303(d) list. The Washington State Department of Ecology (Ecology) is working with the Idaho Department of Environmental Quality (IDEQ), the U.S. Environmental Protection Agency (EPA), the Spokane Tribe, and numerous other parties, including Avista, to address low DO in the Spokane River and Lake Spokane through development of a TMDL. The goal of the TMDL process is to support beneficial uses and bring the river and lake into compliance with the Washington DO water quality standard, which is to be measured in areas representative of dominant aquatic habitat.

Generally speaking, the dominant aquatic habitat is where either existing or designated aquatic life uses would tend to thrive in a natural waterbody. In a stratified water body, such as Lake Spokane, this area would generally be above the hypolimnion. The Washington Department of Fish and Wildlife has concluded that spawning and rearing habitat exists in the Spokane River and the shallower portion of Lake Spokane's upper reservoir and tributaries, while the lower reservoir provides refuge and forage habitat. Recognizing this, Avista's intent will be to improve dissolved oxygen in areas of the Lake where the dominant aquatic habitats exist.

Avista has taken a proactive approach to protecting, mitigating, and enhancing water quality and aquatic habitat in the waters affected by the Spokane River Project. This has included active participation in the Spokane River DO TMDL process for a number of years even prior to Avista volunteering to join the TMDL process. Additionally, Avista contributed $10,000 annually to the Spokane County Conservation District for 9 years, for the purpose of stream bank stabilization and sediment reduction efforts in the Hangman Creek watershed. Throughout the relicensing process, Avista, in collaboration with agencies, tribes and interested citizens, conducted studies and developed plans to support overall water quality improvements.

1.2 Settlement Agreement

In conjunction with the relicensing of the Spokane River Project by the Federal Energy Regulatory Commission (FERC), Avista sought a water quality certification from Ecology under Section 401 of the Clean Water Act. On June 10, 2008, Ecology issued a Section 401 Certification (Certification), which was appealed by Avista, Inland Empire Paper Company, and the Sierra Club/Center for Environmental Law and Policy to the Washington Pollution Control Hearings Board (PCHB Nos. 08-067, 08-068, and 08-072). Pursuant to a Settlement Agreement signed by the parties in February of 2009, Ecology issued an amended Certification on May 8, 2009. On June 18, 2009, FERC issued the Spokane River Project a license for a term of 50 years.

Section 6 of the Settlement Agreement provides as follows:

> *Avista further commits to Ecology that, within 6 months after Ecology notifies Avista in writing that Ecology, EPA, and the Idaho Department of Environmental Quality, and the Spokane Tribe have accepted the final technical report on the dissolved oxygen modeling being conducted as part of the Spokane River TMDL process (but in no event later than December 31, 2009), Avista will identify reasonable and feasible improvements and/or mitigation measures that could be used to address its proportional level of responsibility for dissolved oxygen in Lake Spokane.*

To date, Ecology has not notified Avista in writing that Ecology, EPA, and IDEQ have accepted the final Spokane River and Lake Spokane DO TMDL technical report. Avista is therefore submitting this document in accordance with the alternative deadline of December 31, 2009 and in advance of its level of responsibility for DO being defined in the DO TMDL.

Section 5.6.C of the Certification provides that Ecology may re-open the Certification to address Avista's responsibility for the DO problem in Lake Spokane following EPA's approval of the final DO TMDL. At that time, Avista will further investigate the measures identified below, and perhaps other measures yet to

be identified, to determine whether any would be reasonable and feasible to address Avista's proportional level of responsibility for DO in Lake Spokane as part of its DO Water Quality Attainment Plan (DO WQAP). Avista will then implement measures determined to be reasonable and feasible.

2.0 POTENTIALLY REASONABLE AND FEASIBLE MITIGATION MEASURES

Avista has identified a preliminary list of potentially reasonable and feasible improvements and/or mitigation measures that could be used to reduce phosphorus loadings and address its proportional level of responsibility for DO in Lake Spokane. The potential measures are identified as follows:

- Aquatic weed control
- Wetland restoration/enhancement
- Vegetative shoreline buffer on Avista-owned property
- Reduction of size and conversion of lakeshore lawns to native vegetation
- Hangman Creek Basin shoreline stabilization and agricultural practices
- Irrigation water pumping system modifications
- Conversion of grazing lands to open space
- Septic system education and improvements

Each of these potential reasonable and feasible improvements and/or mitigation measures will be evaluated to assess DO improvements in Lake Spokane in areas where the dominant aquatic habitat exists. Avista will coordinate its efforts with the responsible state and local governmental agencies as it develops and implements each potential reasonable and feasible improvement and/or mitigation measure.

2.1 Aquatic Weed Control

Avista will develop a Lake Spokane Aquatic Weed Management Program in accordance with Section 5.3.E of the Certification, which is included as Appendix B of the FERC License (p. 128-129). A recent aquatic plant survey completed by Aqua Technex (2007) documented the identity and extent of invasive plants in Lake Spokane, including Eurasian watermilfoil (242 acres), Yellow Floating Heart/Water Lily (392 acres), and other plants occupying smaller areas. These weeds accumulate phosphorus from both sediments and water during the growing season, and then release it upon their death and decay. Oxygen is consumed during the decomposition of the plant material, leaving the waterbody with less oxygen available to aquatic life. In addition, the phosphorus released upon death and decay then becomes available for algae and/or macrophyte growth in the following growing season.

During the development and implementation of the Aquatic Weed Management Program, Avista will explore various weed management control actions in an effort to decrease the resulting phosphorus loading to Lake Spokane, which tends to occur in the late summer and fall. The management actions may

include public awareness and education, biological methods (i.e. weevil application), physical methods (i.e. bottom barriers, mechanical and manual harvesting), and chemical methods (i.e. herbicide application). The goal of the aquatic weed management program will be to limit the occurrence and spread of invasive weeds, enhance dominant aquatic habitat, and reduce phosphorus loading to the lake.

Harvesting aquatic plants is an example of physical control and is typically done during the growing season when submersed vegetation has grown to or near the water surface. Removal of the harvested biomass would reduce the amount of phosphorus loading to the lake during the fall when the plants die and decay. However, removal can also inadvertently encourage the spread of invasive noxious weeds such as Eurasian watermilfoil. During the development of the DO WQAP, Avista will estimate the phosphorus load reductions that would result from aquatic plant control, and evaluate the advantages and disadvantages of each of the identified control methods.

2.2 Wetland Restoration/Enhancement

As required by Section 5.3.G of the Certification (p. 131-134 of the FERC License) Avista will acquire, restore, and/or enhance a minimum of 42 acres of wetlands. Avista will, as a first priority, evaluate potential wetland areas that are located within 300 feet of the shoreline, where the current land use is contributing phosphorus loading to Lake Spokane. Other areas for potential wetland restoration/enhancement may be within the immediate vicinity of the confluence of the Spokane River and Little Spokane River, and/or the confluence of Hangman Creek and the Spokane River. It is possible that other areas farther upstream from the mouth of Hangman Creek and the mouth of the Little Spokane River may be evaluated based on land availability. Avista will develop a site-specific wetland creation, restoration, enhancement, and protection plan, and implement the plan following approval by Ecology and FERC.

One way Avista could accomplish this is to acquire the necessary property or rights to 42 acres of land within 300 feet of the shoreline that consists of, or is next to, an existing wetland or farm, then reclaim, develop, or protect existing wetlands as appropriate. Agricultural loading of phosphorus is primarily associated with erosion and sediment transport from cropland. Development of a wetland buffer along the shoreline could reduce potential phosphorus loading to the lake by filtering runoff from the fields and by the wetland vegetation's natural uptake of phosphorus during the growing season. 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 phosphorus from entering Lake Spokane, while concurrently enhancing wildlife habitat.

During the development of the DO WQAP, Avista will evaluate potential phosphorus load reductions of converting various current land uses to wetlands.

2.3 Vegetative Shoreline Buffer on Avista Owned Property

Avista owns a number of parcels of land, totaling approximately 350 acres, that are located within 200 feet of the Lake Spokane shoreline in Spokane, Stevens, and Lincoln Counties. These parcels are currently undeveloped. Avista is interested in identifying the potential phosphorus loads that could be avoided by maintaining the new 200-foot buffer along the lake's shoreline for the land that it owns. The lands within the 200-foot buffer would be managed and protected as conservation lands. Conservation lands are managed primarily to protect or enhance identified wildlife, botanical, cultural, aesthetic, or other natural resource values, while still providing for low-to-moderate levels of public use and enjoyment (e.g., hiking, bank fishing, etc.) where compatible with site-specific resource protection and safety needs.

During the development of the DO WQAP, Avista will evaluate the amount of phosphorus loading that would be prevented by Avista further limiting future development within the 200-foot shoreline buffer zone. The purpose of this potential method would be to create the same sediment filtering effect as previously described in the wetland/restoration enhancement section.

2.4 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. Fertilization of these lawns has the potential to increase phosphorus loadings to the lake through runoff of excess fertilizer, and through leaching of phosphorus to the groundwater. The amount of phosphorus loading depends on a number of factors, including the amount and timing of when fertilizer is applied to the lawn, the phosphorus content of the fertilizer that is used, and the frequency and intensity of storm events that produce runoff. 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. As Avista develops the DO WQAP, it will evaluate the amount of phosphorus loading that could be avoided and the feasibility of accomplishing this level of protection by working with land owners and the local conservation districts to reduce the size and convert manicured lawns to native vegetation along the lakeshore. Avista may also explore opportunities to reduce the size and number of manicured lawns located along the Little Spokane River shoreline if appropriate.

2.5 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. This is a result of naturally occurring stream bank erosion that is exacerbated by agricultural and range land uses, placement of impervious surfaces (e.g. roads), and timber activities in the Hangman Creek Basin. Modeling done for the Hangman Creek TMDL (The Cadmus Group and CDM 2007) indicates that the primary sources of phosphorus are from cropland and pasture use, and from stream bank erosion. Stream bank erosion accounts for 27% of Hangman Creek's phosphorus loadings to the Spokane River, and is most prevalent in the lowermost reach of the creek (The Cadmus Group and CDM 2007). Agricultural (cropland/pasture) loadings account for 31% of Hangman Creek's phosphorus loadings to the Spokane River, although phosphorus loadings are significant throughout much of the basin (The Cadmus Group and CDM 2007).

Avista is evaluating the potential to reduce phosphorus loadings from Hangman Creek by working with area landowners to implement practices that will reduce contributions from cropland/pasture land use and stream bank erosion. Avista will coordinate and work with the appropriate county and state agencies during this evaluation as the DO WQAP is developed. Phosphorus loading evaluations will be refined to focus on site-specific measures within the Hangman Creek Basin during the development of the DO WQAP.

2.6 Irrigation Water Pumping System Modifications

There are a number of farmers with water rights that pull surface water from Lake Spokane in order to irrigate their fields. Drafting water from deeper in the water column could withdraw water with lower DO and higher total phosphorus as compared to current operations, potentially improving water quality conditions. Avista will evaluate the potential water quality improvement of drafting water from deeper in the water column during development of the DO WQAP. If the potential improvements to DO are significant, and if this measure is found to be reasonable and feasible, Avista may work with the farmer(s) to modify their pump systems accordingly.

2.7 Conversion of Grazing Lands to Open Space

Avista is evaluating how the conversion from grazing lands along Lake Spokane and the tributaries to open space could reduce phosphorus loadings. Grazing frequently results in increased erosion, particularly near surface water, which is accessed by the livestock. Eliminating and/or modifying

management of livestock uses on these lands could potentially reduce erosion (and associated phosphorus loadings) along Lake Spokane, the Little Spokane River and Hangman Creek. In addition, reducing grazing use has the potential to reduce phosphorus and ammonia loadings caused by livestock defecating and urinating in or near surface waters. During the development of the DO WQAP, Avista will coordinate and work with the appropriate state and local agencies when evaluating the potential for reducing nutrient loadings to Lake Spokane, the Little Spokane River and Hangman Creek by converting these land uses to open space.

2.8 Septic Systems Education and Improvements

Septic system improvements may have the potential to reduce phosphorous loadings to Lake Spokane. Failing or inadequate on-site septic systems can contribute dissolved phosphorus to nearby waterbodies when they are in close proximity to surface waters and there is limited opportunity for phosphorus adsorption to take place. The closer a septic system is to a lake (or to groundwater that flows into the lake), the more likely it is to contribute nutrient loads to the lake. The effluent from on-site septic systems flows through a drainfield and percolates into the soil where chemicals, including phosphorus, are adsorbed and retained by the soil before reaching the groundwater table or a surface waterbody. The percolation of the effluent is dependent upon the systems' location, age, maintenance, soil type, and depth to groundwater.

There are 410 parcels with at least one residence within 300 feet of the lake's shoreline, based on Avista's review of aerial photographs. Application of the average number of residents per household in Spokane and Stevens Counties (i.e., 2.5 residents per household, U.S. Census Bureau - 2008) indicates that more than 1,000 residents are serviced by these on-site septic systems. Avista will evaluate the reasonableness and feasibility of reducing phosphorus loadings from high-risk septic systems to the lake and thereby increasing DO in the lake by improving the efficiency of septic systems located near the lake. Depending on the results of this analysis, Avista will also investigate the reasonableness and feasibility of implementing a public outreach program as well as an incentive program to prioritize, improve, and/or possibly remove septic systems near Lake Spokane.

Avista will coordinate septic tank improvement and public awareness opportunities with the appropriate local and state agencies during the evaluation of these measures and development of the DO WQAP.

3.0 ADDITIONAL POTENTIAL MEASURES

In addition to the potential reasonable and feasible improvements and/or mitigation measures identified in this document, Avista may also evaluate other potential reasonable and feasible measures not yet identified. These potential reasonable and feasible measures will be evaluated as part of the DO WQAP. All evaluations will be performed in coordination with the responsible state and local agencies.

4.0 REFERENCES

AquaTechnex. 2007. Avista RFP No. R-3561. Aquatic Plant Survey and Mapping Project for Lake Spokane. Fall.

Cadmus Group, Inc. and CDM. 2007. Final Model Report for Hangman (Latah) Creek TMDL Model Project. Prepared for EPA, Ecology, IDEQ, and the Coeur d'Alene Tribe. January 16.

Cusimano. R. F. 2004. Spokane River and Lake Spokane (Long Lake) Pollutant Loading Assessment Report for Protecting Dissolved Oxygen. Publication Number 04-03-006. Washington Department of Ecology, Environmental Assessment Program, Olympia, WA.

Ecology. 2009. 401 Certification-Order, Spokane River Hydroelectric Project Certification Amended Order No. 6702, FERC License No. 2545. May 8.

FERC. 2009. Order Issuing New License and Approving Annual Charges for Use of Reservation Lands. Project Nos. 2545-091 and 12606-000. June 18.

Pollution Control Hearings Board For the State of Washington. 2009. Settlement Agreement PCHB Nos. 08-067, 08-068, 08-072, consolidated. February.

U.S. Census Bureau. 2008. 2006-2008 American Community Survey. Accessed December 15, 2009. Available online at http://factfinder.census.gov/