Water Quality Plan (WQP)

Henry M. Jackson Hydroelectric Project (FERC No. 2157)

Public Utility District No. 1 of Snohomish County

SNOHOMISH COUNTY PUD PUBLIC UTILITY DISTRICT NO. 1

Everett, WA

May 2011

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Acronyms

AGM	Assistant General Manager
ARC	Aquatic Resources Committee
BMP	Best Management Practice
CWA	Federal Clean Water Act
DDVP	Diversion Dam Volitional Passage
DNR	Washington Department of Natural Resources
DO	dissolved oxygen
ECC	Energy Control Center
Ecology	Washington Department of Ecology
EDDS	Engineering design and development standards
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FERC	Federal Energy Regulatory Commission
FHE	Fish Habitat Enhancement
FPA/N	Forest Practices Application/Notification
HPA	Hydraulic Project Approval
IT	Intake Tower
JARPA	Joint Aquatic Resource Permit Application
LWD	large woody debris
m	Meter
MCS	Marsh Creek Slide
NPDES	National Pollutant Discharge Elimination System
NRC	National Response Center
NWMP	Noxious Weed Management Plan
OHWM	ordinary high water mark

Project	Henry M. Jackson Hydroelectric Project
RCW	Revised Code of Washington
RMAP	Road Maintenance and Abandonment Plan
RMP	Project Facilities Tract Resource Management Plan
ROW	Right-of-way
RRMP	Recreation Resources Management Plan
SCADA	Supervisory Control and Data Acquisition
SCC	Snohomish County Code
SCE	side channel enhancement
SEPA	State Environmental Policy Act
SF	South Fork Sultan River
SLRF	Spada Lake Recreational Fishery
SPCC	Spill Prevention Control and Countermeasures
TRMP	Terrestrial Resources Management Plan
UDC	Unified Development Code
USGS	U.S. Geological Survey
VMP	Vegetation Management Plan
WAC	Washington Administrative Code
WDFW	Washington Department of Fish and Wildlife
WHMP	Wildlife Habitat Management Plan
WSEMD	Washington State Emergency Management Division
WTC	Water Temperature Conditioning

SECTION 1

Introduction

1.1 Purpose

This Water Quality Plan (WQP) describes procedures and measures to protect water quality during construction and maintenance activities associated with the Henry M. Jackson Hydroelectric Project (Project) (FERC Project No. 2157). The Project is located on the Sultan River in Snohomish County, Washington, and is operated and maintained by Public Utility District No. 1 of Snohomish County (District). The Project consists of a dam (Culmback Dam), an impoundment (Spada Lake Reservoir), a smaller diversion dam owned by the City of Everett, a powerhouse and associated equipment, and transmission facilities (Figure 1-1).

The District is in the process of seeking a new 45-year license for continued operation of the Project from the Federal Energy Regulatory Commission (FERC). The FERC is expected to issue a new license before the end of May 2011. To support issuance of the license from the FERC, Washington Department of Ecology (Ecology) issued a water quality certification, pursuant to Section 401 of the Clean Water Act (CWA, 33 U.S.C. § 1341) for operation of the Project under the new license. The District received the water quality certification from Ecology on October 18, 2010. The certification provides Ecology's confirmation that there is reasonable assurance the Project will meet applicable State water quality requirements. The development and implementation of this WQP is a condition of the water quality certification.

In October 2009, the District submitted to the FERC a comprehensive Settlement Agreement on behalf of itself, the National Marine Fisheries Service, U.S. Forest Service, U.S. Fish and Wildlife Service, National Park Service, Washington Department of Fish and Wildlife, Ecology, Tulalip Tribes of Washington, Snohomish County, City of Everett, City of Sultan, and American Whitewater. The purpose of the Settlement Agreement is to resolve among the signatories all issues associated with issuance of the new license for the Project, including, in part, reservoir operations, minimum instream flows, process flows, whitewater boating flows, ramping rates, fish passage, fish habitat improvements, wildlife habitat management, noxious weed management, marbled murrelet protection measures, recreation, and historic properties management. The District requested that the FERC accept and incorporate all of the proposed license articles in the Settlement Agreement in the new license.

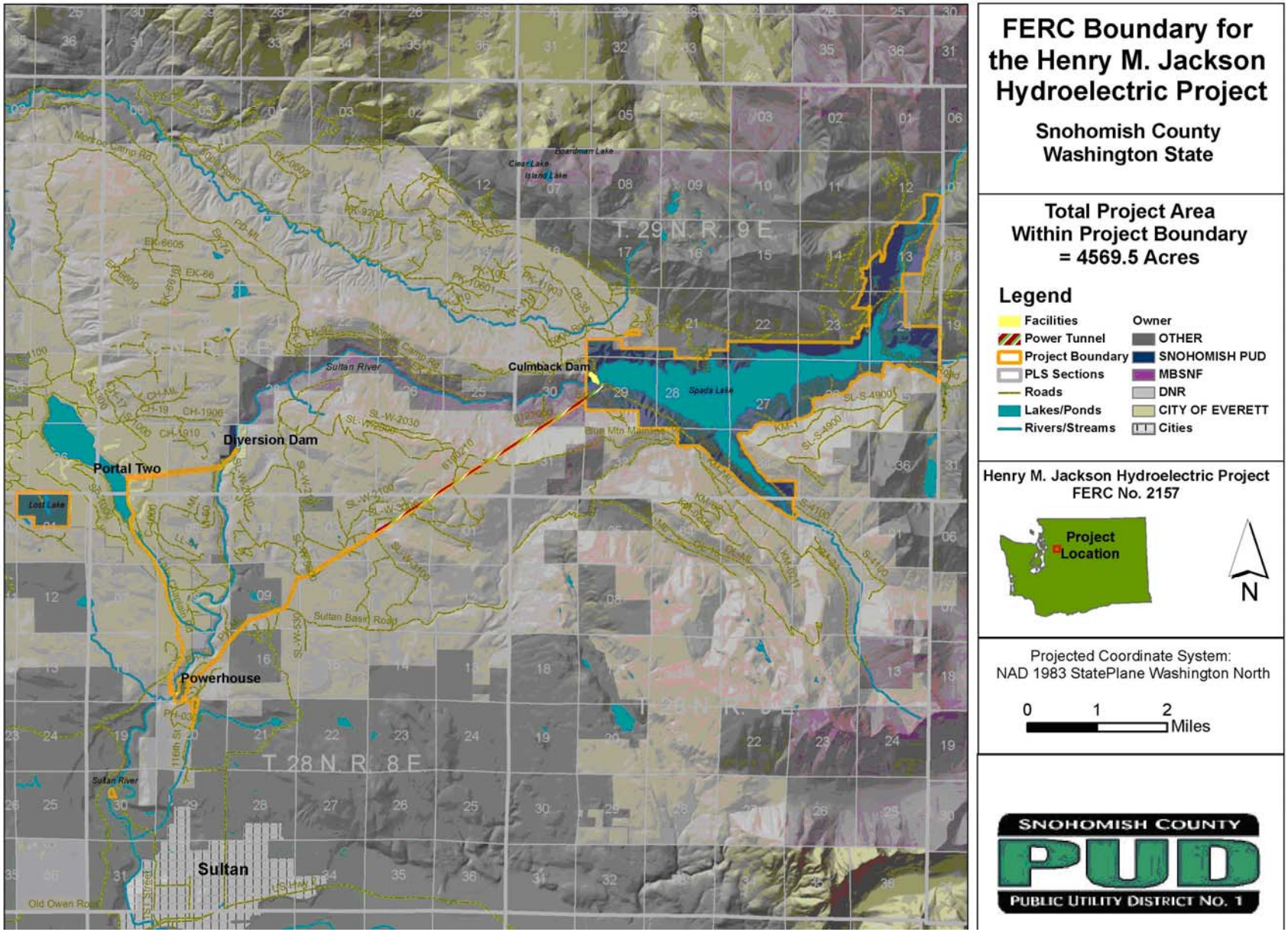

FIGURE 1-1: Map of the Henry M. Jackson Hydroelectric Project (FERC No. 2157) Vicinity

Water License Article 1 (W-LA 1) of the Settlement Agreement specifies development and implementation of this WQP[1] to ensure compliance with Washington State water quality standards in the Sultan River (as codified in WAC 173-201A). The Settlement Agreement specifies that, at a minimum, the WQP include the following components:

1. water quality protection measures related to Project construction or maintenance activities (includes Best Management Practices (BMPs) for in-water and upland construction and maintenance activities);
2. spill prevention and containment procedures;
3. procedures for application of herbicides, pesticides, fungicides, and disinfectants; and
4. a Water Quality Monitoring Plan (WQMP), which details compliance monitoring and reporting procedures for select water quality parameters (including, but not necessarily limited to, stream flow, water temperature, and turbidity).

Article W-LA 1 also specifies that the District will develop the WQP in consultation with Ecology, along with other members of the Project's Aquatic Resource Committee (ARC)[2], and submit the WQP to the FERC for approval, within 180 days of issuance of the new FERC license. Upon the FERC's approval, the District will implement the WQP.

This WQP describes the measures and procedures for the first three components listed above. The fourth component listed above – the WQMP – is a stand-alone document attached in Appendix A.

1.2 Background

The overall water quality in the Sultan River in the vicinity of the Project is very good. The Sultan River Basin is a remote watershed characterized by rugged forested terrain and high precipitation. These conditions result in surface waters that have diluted dissolved solids and ions content, and are generally free of pollutants or contaminants. The Sultan River Basin has been protected as the source of the City of Everett's municipal water supply since 1917. Protective measures include restrictions on the range of recreational and other activities that may occur in the Project area, which further limits the potential for anthropogenic effects on water quality.

The District completed a two-year Water Quality Parameter Study in March 2009 to obtain information on existing water quality conditions in the vicinity of the Project. This study assessed 19 parameters at 13 sampling sites in the vicinity of the Project over the period April 2007 through March 2009. Results of the study, including descriptions of existing data and information on water quality conditions in the Project vicinity, are provided in the

[1] The WQP is referred to as the Water Quality Protection Plan in W-LA 1. To standardize the language/terminology used in the 401 Water Quality Certification and W-LA1, this Plan will conform to the terminology used by Ecology in the 401 Water Quality Certification.

[2] Settlement Agreement proposed Aquatic License Article 1 stipulates establishment and convening of the Aquatic Resource Committee (ARC) for the purpose of consultation to assist in the implementation of aquatic resource-related License Articles. Members of the ARC will include the District, the Tulalip Tribes, NMFS, USFWS, USFS, WDFW, Ecology, the City of Everett, the City of Sultan, Snohomish County, and American Whitewater. The ARC will consult, review plans, and advise the District as expressly provided in specific License Articles.

Water Quality Final Technical Report (CH2M HILL 2010). The Water Quality Final Technical Report is available online at the Project relicensing web site at: http://www.snopud.com/PowerSupply/hydro/jhprelicense/jhprdocrel/jhprstudyrpts.ashx?p=1480.

Results of the study confirm that water quality conditions in the vicinity of the Project are very good. Conditions in the vicinity of the Project conform to Washington State water quality standards throughout the year with few exceptions. The water quality sampling indicates that the trophic state of Spada Lake Reservoir is oligotrophic. In general, oligotrophic lakes have low nutrients, low algal biomass and productivity, and high water clarity.

Spada Lake Reservoir serves as the City of Everett's municipal water supply, supplying drinking water to approximately 80 percent of Snohomish County. Because of this use, access and activities are restricted to protect water quality in the watershed. Non-electric motorized boating, overnight camping, and body-contact activities, such as swimming, are not permitted in the reservoir. This source water is monitored according to Safe Drinking Water Act (SDWA) regulations, which ensures the continuing integrity of the water supply system. The City monitors Spada Lake Reservoir outflow at a sampling point on the Lake Chaplain pipeline. The on-going monitoring programs provide routine data on over 40 parameters, including physical characteristics, biological parameters, conventional parameters, cyanide, metals, and volatile and synthetic organics.

The District monitored water temperatures below the Diversion Dam as a condition of the 1983 Settlement Agreement with the Joint Agencies (FERC 1982, FERC 1983). Since 2004, the District also continuously monitored water temperature at eight additional locations throughout the Sultan River basin. The Water Quality Final Technical Report (CH2M HILL 2010) describes these data.

Ecology monitors water quality at the mouth of the Sultan River, near Sultan, Washington (Station 07E055). Water quality data have been collected at this site since 1960. The overview of the data for this station provided on Ecology's web site indicates that, "overall water quality at this station met or exceeded expectations and is of lowest concern" (http://www.ecy.wa.gov/apps/watersheds/riv/station.asp?sta=07E055). No reaches in the Sultan River Basin are listed by Ecology as "water quality limited" under Section 303(d) of the CWA[3].

1.3 Applicable Project Activities

This section summarizes the Project activities that are pertinent to the various elements and measures contained in the WQP. These include several Project construction, operation, and maintenance activities that are in or near water that have the potential to affect surface and/or ground water quality. These activities are summarized below in three subsections.

[3] Section 303(d) of the CWA requires Ecology to prepare a list of all surface waters in Washington for which beneficial uses (such as drinking, recreation, aquatic habitat, and industrial use) are impaired by pollutants. These are water quality limited lakes, rivers, and streams that fall short of state surface water quality standards. Waters placed on the 303(d) list require the preparation of Total Maximum Daily Loads (TMDLs). The TMDL provides a regulatory tool to establish the maximum amount of a pollutant that is allowed to be released into a waterbody so as not to impair uses of the water.

Subsection 1.3.1 summarizes Project activities associated with existing, on-going operation and maintenance of Project facilities. Subsection 1.3.2 summarizes new "direct" Project activities; that is, activities that are proposed to proceed directly under the new license with no need for additional planning or study (other than the planning or study already done to support the District's Final License Application or Settlement Agreement). Subsection 1.3.3 summarizes new "dependent" Project activities; that is, new activities that would occur only following, or contingent upon, additional planning, study, or other preliminary activities.

The procedures and measures described in this WQP are assumed to fully address water quality protection for on-going operation and maintenance of Project facilities and new direct Project activities as summarized below. The procedures and measures described in this WQP may or may not be adequate to fully address water quality protection for new dependent Project activities summarized below. Additional water quality protection procedures and measures for new dependent Project activities may be needed pending the outcomes of additional planning, study, or other preliminary activities.

1.3.1 Project Operations and Maintenance Activities

The District proposes to continue operating and maintaining many of the Project facilities fundamentally the same as it has since 1984, meeting key objectives associated with the City of Everett's water supply; providing reliable electric power to the District's customers; and protecting and enhancing aquatic, terrestrial, and recreation resources. The District's Final License Application provides detailed descriptions of existing Project facilities and operations, which are summarized as follows:

- Spada Lake Reservoir. Spada Lake Reservoir is operated to store and release inflows to the reservoir, generate power at the Powerhouse, provide required minimum instream flow releases (to protect and enhance fisheries) and minimize any spill at Culmback Dam. Water required to meet the City of Everett's municipal supply demands and to supplement instream flows for fisheries below the Diversion Dam generates power through two Francis turbine units installed at the Powerhouse, using the 700 feet of elevation difference (head) between Spada Lake Reservoir and Lake Chaplain. Water in excess of the above requirements generates power through two Pelton turbine units discharging directly to the Sultan River from the Powerhouse, utilizing the 1,000 feet of head between Spada Lake Reservoir and the Powerhouse.
- Culmback Dam. Culmback Dam is an earth and rock-filled dam, located at river mile (RM) 16.5 on the Sultan River. The dam creates the Spada Lake Reservoir impoundment, and serves as the control point for flow releases from the dam as described above. Features of the dam that are operated and maintained by the District include:
    - a concrete morning glory spillway located just up-reservoir from the main dam structure to safely pass spill flows as needed;
    - reservoir outlet works located near the base of the dam consisting of conduits equipped with gate valves or aeration valves to provide flow releases from the dam as needed;
    - a Powerhouse intake structure with moveable panels to facilitate selective withdrawal of reservoir water for downstream water temperature control;

  - a 60-kilowatt turbine generator at the dam outlet works to provide on-site electrical power;
  - a fixed-wheel gate, operated by a motorized hydraulic power unit, which allows for closure of the power tunnel when inspection or maintenance is needed.

- Power Conduit. The District operates and maintains a power tunnel, 14 feet in diameter, extending 3.8 miles from the intake structure at Culmback Dam to the Powerhouse located on the lower Sultan River. At the end of the power tunnel is a 150-foot-long rock trap to capture materials that fall into the tunnel. This collector prevents debris from entering the 10-foot-diameter welded steel power pipeline that transports water to the Powerhouse.

- Powerhouse. The District operates and maintains a semi-outdoor-type Powerhouse located adjacent to the left riverbank at RM 4.3. Two Pelton turbines and two Francis turbines are housed inside on the lower generator floor of the two-story structure. The two Pelton turbines discharge directly into 40-foot long discharge canals that transport water to the main river channel. The Francis turbines re-route a portion of flow under the river via a pipeline (the Lake Chaplain pipeline) to the City's municipal water supply storage, Lake Chaplain, and to the Diversion Dam to supplement and meet minimum instream flows between the City's Diversion Dam and the Project's Powerhouse. The District maintains a low-head fish passage berm at the upstream end of the Powerhouse. This berm has a passageway or slot near the Powerhouse outflow to concentrate the river flows into an area that draws migrating fish into the river habitat above the Powerhouse.

- Lake Chaplain Pipeline. The District operates and maintains the Lake Chaplain pipeline to route water from the Powerhouse to Lake Chaplain to meet the City of Everett's water supply requirements. These water supply requirements are met by diverting water from Spada Lake Reservoir through the Powerhouse's two Francis units. The Lake Chaplain pipeline is a 72-inch-diameter buried pipeline that carries water from the Powerhouse's two Francis units to the Portal 2 control structure located on the shore of Lake Chaplain. Sufficient pressure is retained in the pipeline to move the water because of the 700-foot elevation difference between Spada Lake Reservoir and Lake Chaplain and the Diversion Dam. The two Francis units are sized at 170 cfs each to provide water delivery to Lake Chaplain and the minimum instream flow requirements below the Diversion Dam at RM 9.7.

- Portal 2 Structure. The District operates and maintains the Portal 2 control structure located at the terminus of the Lake Chaplain pipeline. The Portal 2 control structure allows accurate control of the amount of water diverted from the Powerhouse to Lake Chaplain to meet the City of Everett's water supply requirements and returned to the Diversion Dam to maintain minimum instream flows in the Sultan River below the Diversion Dam.

- Diversion Dam Tunnel and Pipeline. The District operates and maintains the 1.5-mile-long diversion tunnel connecting Lake Chaplain to the Sultan River. This 72-inch diameter concrete pipeline connects the upstream tunnel portal to the Diversion Dam where, under current Project operating conditions, flows are discharged back into the

Sultan River to meet instream flow requirements in the reach between the Diversion Dam and the Powerhouse. Maximum flow return capacity of the existing facilities is 189 cfs.

- Sultan River Diversion Dam. The Diversion Dam is a low-head (25 feet high) concrete dam, located at RM 9.7 on the Sultan River. The Diversion Dam currently serves as the control point for providing instream flow releases to the Sultan River below the Diversion Dam. The dam creates only a small headpond measuring a few acres in size. Water from Portal 2 flows into the headpond and is accurately measured through a weir in the dam's main sluice gate. All flow below 280 cfs is routed through this weir. Higher flows are passed over the Diversion Dam's 120-foot-wide concrete spillway.
- Transmission System. The District operates and maintains a transmission system for power generated within the Project. The system transmits power from the turbine generators in the Powerhouse to a switchyard located adjacent to the Powerhouse. From the switchyard, power is transmitted to the "Jackson Loop," comprised of two single-circuit 115-kilovolt (kV) transmission lines. The "south transmission line" extends approximately 3.8 miles east and south from the Powerhouse switchyard and follows existing roads for most of the distance into the community of Sultan, where it connects to the District's Sultan Substation. The "north transmission line" crosses the Sultan River and connects to the District's Lake Chaplain Substation approximately one mile to the west of the Powerhouse.
- Other Appurtenant Equipment and Systems. The District operates and maintains other appurtenant equipment and systems, including:
  - Oil storage and handling system for governor and bearing lubricating oil in the Powerhouse.
  - Compressed air system for the purpose of generator air brakes, instrument air and service air.
  - Fire prevention system, including extinguishers, fire hose reels, and hydrants inside and outside the Powerhouse (using a fire water supply taken from the turbine pits and Lake Chaplain pipeline).
  - Sanitary disposal system consisting of a large tank that collects all sewage (for off-site disposal) from the bathrooms and water washing stations.
  - Gantry crane with a main and auxiliary hoist for maintenance purposes located on the top deck of the Powerhouse.
  - Heating, ventilating, and air-conditioning systems for the Powerhouse.
  - Pipeline drainage system consisting of pressure reducing valves for draining the power conduit and the Lake Chaplain pipeline.
  - Lighting system supplied by lighting panels and fixtures suitably located in and around the Powerhouse.
  - Power generators for site power at Culmback Dam facilities.

- Project Roads Maintenance. The District owns or has easements, and maintains certain roads that provide access to Project land and facilities. Roads, ditches, and culverts are kept free of debris. Maintenance that can be performed without closure of roads is performed as soon as practicable.

1.3.2 Project Activities Planned to Proceed Under the New License

New Project activities that are planned to proceed directly under the new license with no need for additional planning, study, or other preliminary activities are summarized below (actual specific plans will be followed and may be subject to change over the course of the license term).

1.3.2.1 Phase 2 Temperature Conditioning Structure (Settlement Agreement Article A-LA 3)

The District will implement its Water Temperature Conditioning (WTC) Plan to increase the temperature of the water released from Culmback Dam to provide a seasonally appropriate water temperature for aquatic habitat in the reach of the Sultan River from Culmback Dam to the Diversion Dam ("Reach 3" from RM 9.7 to 16.1). Conditioning of water temperature in Reach 3 is expected to result in a more normative water temperature regime (similar to the water temperature regimes in Reaches 1 and 2) that will increase macroinvertebrate production, improve fish growth, fish distribution and population dynamics, and facilitate fish survival in Reach 3. Temperature conditioning would comply with applicable State water quality standards.

The District will implement water temperature conditioning of Reach 3 in two phases. In Phase One, the District will condition the temperature of Culmback Dam water releases using the Project's existing infrastructure (i.e. the 10-inch cone valve, the hydro unit, and the 16-inch auxiliary release line). Phase One of the WTC Plan will be implemented when (1) Spada Lake Reservoir elevations are greater than 1410 feet mean sea level (msl), and (2) the reservoir is stratified (typically April through October). Phase One will last until the earlier of: (a) January 1, 2020; or (2) two years after the date that the District completes the Diversion Dam's volitional fish passage modifications (as summarized below under *Diversion Dam Volitional Passage*).

Subsequently, in Phase Two, the District will install and operate a new water temperature conditioning structure at Culmback Dam. The flow components for the various Phase 2 structures, except for the valves, will have a combined hydraulic capacity to allow the District to provide no less than 165 cfs (at Spada Lake Reservoir elevation of 1430 feet msl) of temperature-conditioned water immediately below Culmback Dam. The installation of a new water temperature control structure at Culmback Dam will improve the District's ability to attain appropriate water temperature targets below Culmback Dam using lower Spada Lake Reservoir surface elevations compared to what could be achieved using the existing infrastructure. Phase Two of the water temperature conditioning program will be implemented when (a) reservoir elevations are greater than 1380 feet msl and (b) the reservoir is stratified (typically April through October).

1.3.2.2 Pelton Unit Flow Continuation System (Settlement Agreement Article A-LA 5)

The District has recently upgraded the governor and needle valve controls for each Pelton turbine unit at the Powerhouse to allow flow continuation through the Powerhouse into the

Sultan River while either unit is shut down. Pelton turbine unit shutdown is a protective operation that previously stopped the flow of water into the Sultan River below the Powerhouse over a short period.

Flow continuation protects the aquatic resources of the Sultan River below the Powerhouse from rapid dewatering when either of the Pelton turbine units trips off line. Previously, any sudden shutdown had the potential for stranding fry that may have been present in the lower Sultan River during some times of the year (usually March through August).

These upgrades of governor and needle valve controls have ensured that future shutdown events will have minimal impacts to the aquatic resources of the Sultan River. Because this is an important aquatic protective measure, the District offered to make the expenditures to accomplish this goal by the end of 2009. Early implementation before the issuance of a new FERC license in 2011 allowed for testing of the existing equipment with the new governor controls to obtain information necessary for the Endangered Species Act Biological Opinion required for the new license.

1.3.2.3 Large Woody Debris Installations (Settlement Agreement Article A-LA 6)

The District will enhance aquatic habitat diversity in the lower Sultan River through the implementation of a Large Woody Debris (LWD) Plan. Installation of LWD structures is intended to enhance habitat productivity and diversity, and thereby increase salmon and steelhead production and contribute to the recovery of ESA listed fish species in the Snohomish River basin.

The proposed LWD Plan includes the installation of up to 12 LWD structures in the Sultan River between RM 0 and RM 16. The District would install up to eight LWD structures within five years after the FERC approves the LWD Plan. The District will install up to four additional LWD structures in the Sultan River after 10 years from issuance of a new Project license (resulting in a total of 12 structures). These additional four structures could also be used to replace any of the original structures that are destroyed during high flow events. In addition, throughout the term of the new license, the District will move woody debris accumulated in Spada Lake Reservoir between Culmback Dam and the log boom to areas targeted for habitat restoration by the ARC.

1.3.2.4 Side Channel Projects (Settlement Agreement Article A-LA 7)

The District will develop a Side Channel Enhancement (SCE) Plan[4] to enhance the habitat function in a minimum of 10,000 linear feet of side channel in the lower Sultan River (to provide a minimum of three acres of habitat area). This enhancement will be achieved through projects that improve side channel flow connectivity or other habitat modification projects located within the wetted floodplain area of the Sultan River channel (as defined by a flow of 4,100 cfs) downstream of the Powerhouse.

The existing side channels in the lower Sultan River provide important spawning and rearing habitats for numerous salmonids and other aquatic species. Enhancement of habitat within side channels and maintenance of year-round connectivity will substantially increase the amount and quality of habitat available to anadromous and resident fish particularly

[4] The SCE Plan will likely be a combined plan with the LWD Plan since many of the components and functions of the two plans overlap.

during the summer and early fall low flow period. This increase in critical side channel habitat area is expected to increase the survival and production of resident and anadromous salmonids, particularly for coho, Chinook, and cutthroat rearing, and pink and chum salmon spawning.

The District will consult with the ARC on the SCE Plan. The SCE Plan will include details on:

1) the methods and schedules for specific side channel enhancements;

2) the uses of LWD or other flow re-direction means to re-direct a portion of the mainstem flow into the side channels;

3) the use of LWD collected at Culmback Dam or elsewhere to add structure and function within the side channel; and

4) the method and schedule for monitoring (including reporting requirements) and maintaining side channel enhancements throughout the term of the new Project license.

1.3.2.5 Spada Lake Tributaries Fish Barrier Removal (Settlement Agreement Article A-LA 10)

The District developed a Spada Lake Recreational Fishery (SLRF) Plan. This SLRF Plan documents how the District is implementing a program to enhance the Spada Lake Reservoir recreational resources. As part of the SLRF Plan, existing barriers to fish passage, primarily culverts, have been removed within tributaries along South Shore Road beyond Recreation Site 3.

The removal of these barriers was done by the Washington Department of Natural Resources in conjunction with abandonment of portions of the South Shore Road beyond Recreation Site 3. Culvert removal provides fish access to about 1.5 miles of stream habitat. This increase in the amount of available trout spawning and early rearing habitat is expected to increase the abundance of cutthroat and rainbow trout residing in Spada Lake Reservoir, increasing the number of trout available for recreational harvest.

1.3.2.6 Recreation Site 2 Boat Launch Improvement (Settlement Agreement Article A-AL 10)

As part of the SLRF Plan, the District will improve the Recreation Site 2 boat launch by providing boat trailer access. This improvement shall provide better access to the southern part (South Fork arm) of the Spada Lake Reservoir, an area that has relatively high fish densities and historically good catch rates. This improvement shall also provide increased access to an area of the reservoir not subjected to the high winds prevalent in the main body.

This improvement shall provide launch access to reservoir water level elevations as low as 1410 feet mean sea level (msl). The District will maintain the boat launch, including grading and improving ramp structures down to elevation 1410 feet msl. The District also will remove debris from the boat launch on an annual basis before the start of the recreation season, as snow conditions permit.

1.3.2.7 Recreation Resources Management Plan Activities (Settlement Agreement Article R-LA 1)

The District will implement the Settlement Agreement Recreation Resource Management Plan (RRMP, Snohomish County PUD 2009a). The RRMP is attached as Appendix 5 to the Settlement Agreement for Licensing of the Jackson Hydroelectric Project (October 14, 2009). The RRMP includes recreation facility development measures for the following recreation sites and/or areas:

- Olney Pass Recreation Site. The District will continue to maintain the Olney Pass Recreation Site.
- South Fork Recreation Site. The District will continue to maintain the South Fork Recreation Site and improve the existing boat ramp at the site.
- South Shore Recreation Site. The District will maintain the South Shore Recreation Site and improve the existing boat ramp at the site.
- Nighthawk Recreation Site. The District modified and will maintain the Nighthawk Recreation Site to reduce potential water quality impacts and accommodate hike-in only access.
- Bear Creek Recreation Site. The District modified and will maintain the Bear Creek Recreation Site to reduce potential water quality impacts and accommodate hike-in only access.
- New Recreation Site. The District will develop a new recreation site along Culmback Dam Road, near the intersection with the 6122 Road. This new recreation site will be the trailhead for access to the new Sultan River Canyon Trail (former 6122 Road) primarily for whitewater boater use below Culmback Dam and non-motorized public day-use access across Culmback Dam to the North Shore Recreation Site.
- Culmback Dam Trail (Sultan River Access From Culmback Dam). The District will provide and maintain access to the Sultan River for whitewater boating from Culmback Dam via the "Culmback Dam Trail".
- 6122 Road to Trail Conversion. The District will convert about 0.5 miles of the 6122 Road that is located on District lands to a trail for public non-motorized access to National Forest System land. This trail will accommodate off-road vehicle (ORV) use for administration/maintenance and non-Project mining claimants. State Forest Practice Standards will be followed.
- Sultan River Canyon Trail. The District will develop and maintain a trail from the boundary of National Forest Service Land and the District-owned land along the 6122 Road to the Sultan River. The first portion of the trail on the 6122 Road will allow mining claimants and administrative ORV access, as well as bicycle access to a beginning point for a pedestrian-only trail that leads down to the Sultan River. USFS standards will be followed.
- North Shore Access Trail. The District will provide non-motorized access across Culmback Dam during daylight hours to the North Shore Recreation Site.

- North Shore Recreation Site. The District will maintain the North Shore Recreation Site for non-motorized access during daylight hours.
- Trout Farm Road River Access Site. The District will enhance and maintain the Trout Farm Road River Access Site. Improvements will include a better defined parking area, the removal of boulders that inhibit boat launching, native vegetation plantings beneficial to wildlife, and noxious weed management.
- Other Sultan River Access. The District will continue to allow public access to the Sultan River at designated river access points (including Diversion Dam Road, Old Gaging Station Road, Powerhouse West, Powerhouse East, and Horseshoe Bend/116th Street).

1.3.2.8 Noxious Weed Management Activities (Settlement Agreement Article T-LA 2)

Weed management activities at the Project will occur to address noxious weeds at Project facilities, recreation areas, and along Project roads (for example, such noxious weeds include non-native hawkweeds, tansy ragwort, invasive knotweed, bull thistle and Canada thistle). The District has prepared a Noxious Weed Management Plan (NWMP, Smayda Environmental Associates, Inc. 2009) that lists the noxious weeds at the Project and describes their occurrence and threats. The NWMP describes available management methods for each weed, and recommends methods most suitable for use on Project lands. Prevention measures to reduce the opportunity for reintroduction and spread of noxious weeds also are included in the NWMP. The NWMP reflects the requirements of the District's Vegetation Management Plan (VMP; Snohomish County PUD 2003; described below in section 5.2).

Noxious weeds are managed by manual and mechanical removal to the maximum extent possible. When necessary, and where allowed, herbicides are used to treat individual plants and populations, but every attempt is made to preserve the adjacent desirable vegetation. Herbicides are avoided on District lands in the Spada Lake watershed, given that the primary purpose of Spada Lake Reservoir is municipal drinking water supply. However, the District acknowledges the challenge of managing noxious weeds over such a large area exclusively by manual and mechanical methods, and may investigate the use of chemical herbicides when no other method of weed management is effective at achieving control as required by State and/or County regulations, or when the available methods are cost prohibitive. The District is investigating the use of natural herbicides such as vinegar and clove. The District will consult with the City of Everett on methods and the findings of any such investigation.

1.3.2.9 Terrestrial Resource Management Plan Activities (Settlement Agreement Article T-LA 1)

The Terrestrial Resource Management Plan (TRMP, Snohomish County PUD 2009b) describes the actions the District will take to mitigate impacts to wildlife resources associated with the Project. The primary objective of the TRMP is to direct the management of District owned and controlled wildlife mitigation lands for the term of the new license. The objectives of the TRMP are consistent with the objectives of the existing Wildlife Habitat Management Plan (WHMP), except for updates in response to current regional priorities for wildlife habitat management. The TRMP lands include old-growth and second-growth conifer forest, mixed deciduous and conifer forest, riparian forest, wetland, lake and

reservoir. The TRMP lands include 4,456 acres in four management tracts located in or directly adjacent to the Sultan River basin.

The Lost Lake Tract includes 23 acres of wetlands and 177 acres of second-growth forest in the vicinity of Lost Lake located approximately 6 miles north-northwest of Sultan, Washington. This tract has been managed under the WHMP since 1989. Under the TRMP, the lake and wetlands will continue to be protected from site disturbance and the forest outside of the lake and wetland buffer zone will be managed for mixed forest and late-successional conifer forest wildlife by creating gaps and thinning the overstory. Thinning in the forest stands may occur where it is operationally and economically feasible to accelerate old-growth forest development and increase forage in the understory.

The Project Facility Lands Tract includes approximately 80 acres of right-of-way, grass, shrubs and forest under District control downstream of Spada Lake Reservoir. Lands include the power pipeline right-of-way, the transmission line right-of-way, the Powerhouse site and a small stand of timber. Most lands in the tract must be maintained in non-forested upland vegetation (grass and shrubs) for operational and/or safety reasons. They have been enhanced to provide meadow, shrub and open woodland under the WHMP since 1989. Management for high-quality meadow, shrub and woodland habitat will continue under the TRMP.

The Spada Lake Tract consists of 1,908 acres of reservoir area and 1,773 acres of adjacent land. Approximately 1,720 acres of the tract are forested. All forestlands in the tract will be managed for natural habitat conditions, except where precluded by operational constraints (primarily reservoir fluctuation) or recreational improvements. Existing old-growth forest will be maintained without management intervention. Young upland conifer stands will be allowed to develop into old-growth forest. Deciduous and mixed forest stands will be allowed to remain in these states as long as natural processes allow. Periodic thinning and creation of gaps, snags, decaying live trees and coarse woody debris will occur, as needed, to promote natural forest stand characteristics.

The Williamson Creek Tract consists of approximately 481 acres of upland forest, riparian forest and wetland along Williamson Creek, northeast of Spada Lake Reservoir. It contains one of the largest remaining low-elevation stands of old-growth forest in the Sultan Basin above Culmback Dam. No activity has occurred in old-growth forest under the WHMP, and the creation of snags and decaying live trees has been the only activity in young forest. Existing old growth habitat will be maintained without intervention. Young conifer and mixed forest will be allowed to develop into old-growth forest, with periodic creation of snags, decaying live trees and coarse woody debris.

Gap creation within young forest stands (less than 100 years of age) will be one of the primary TRMP activities. Gaps will be created by felling, live-topping or otherwise treating all trees within small contiguous areas to create a collection of snags, decaying live trees and coarse woody debris. Gap creation will occur where needed to add structural diversity to dense, uniform overstories, to increase the amount of deer forage and understory production, or as part of snag and coarse woody debris creation. Dense, overstocked conifer and mixed forest stands on upland sites may be thinned where it is operationally and economically feasible. Thinning will not occur where it would require new road construction, result in excessive accumulations of logging debris, or have a negative impact

on water quality. Where thinning is feasible and appropriate, it will occur at intervals of no less than 10 years within individual stands.

Spada Lake Reservoir and the Sultan River are components of the City's municipal drinking water supply system. Spada Lake Reservoir and the surrounding shoreline are managed to ensure that water quality is maintained for the municipal supply. The City and District, with the support of Washington Department of Health, developed use restrictions in the form of regulations that apply to the reservoir, its shorelines, and the watershed as a whole. These regulations are described in District Directive Number 73, FERC license article 44, and Snohomish County Codes 12.08.030 and 12.28.020.

1.3.3 Project Activities that May Occur Under the New License

Project activities that would occur only following, or contingent upon, biological triggers being met or by approval of the ARC, include the following:

1.3.3.1 Marsh Creek Slide Modification (Settlement Agreement Article A-LA 2)

In December 2004, the Marsh Creek Slide (MCS) blocked or reduced the upstream passage of adult anadromous salmonids upstream of RM 7.6 on the Sultan River. Since then, the characteristics and geometry of the landslide have changed and currently allow some fish passage in part due to high flows. The District has prepared, in consultation with the ARC, the Marsh Creek Slide Monitoring and Modification (MCS) Plan to modify the slide to enhance and maintain anadromous fish passage at the site. The District will implement such modifications pursuant to the MCS Plan, a schedule approved by the ARC and the FERC, and acquisition of all necessary regulatory permits.

Modification of the slide will provide safe, timely, and effective access to 2.1 miles of salmon and steelhead habitat up to the Diversion Dam, and an additional 6.6 miles of historically available habitat upstream of the Diversion Dam after passage is provided at that structure. The Settlement Agreement parties anticipate that this measure will increase salmon and steelhead production in the Sultan River by allowing these species to fully utilize available habitat and production capacity upstream of the site of the MCS.

1.3.3.2 Fish Habitat Enhancements (Settlement Agreement Article A-LA 12)

The District has developed a Fish Habitat Enhancement (FHE) Plan, in consultation with the ARC, to enhance fish habitat by implementing additional Project-related enhancements to aquatic resources and hydrologic processes in the Sultan River basin. Throughout the term of the new Project license, the District will consult with the ARC to develop and implement specific aquatic habitat enhancement and restoration projects within and adjacent to the Sultan River. Such projects may include, but not be limited to: (1) instream structure enhancements; (2) side-channel habitat development; (3) removal, maintenance or construction of large woody debris; (4) removal of barriers to upstream migration such as future slides; (5) gravel augmentation; (6) land purchases related to aquatic habitat enhancement; (7) purchase of additional water for process or special purpose flows; and (8) other projects such as maintaining a SNOTEL site in the basin, that provide for adaptive management in the Sultan basin. In addition, if available funds remain (as stipulated in Settlement Agreement Article A-LA 12), the District will implement other appropriate

aquatic habitat enhancement and restoration projects developed by the ARC within the Snohomish River Basin.

The habitat enhancement projects under the FHE Plan will be implemented by the District in addition to other Project enhancement measures, such as improved side channel connectivity, increased instream flows, and the anticipated fish passage at the Diversion Dam (as summarized below). These measures will substantially increase the quantity and quality of aquatic habitat available to anadromous and resident fish in the lower Sultan River. Establishment of the ongoing FHE Plan will also allow for adaptive management as conditions change in the basin and guide in the implementation of the most effective resource protection measures throughout the life of the new Project license.

1.3.3.3 Diversion Dam Volitional Passage (Settlement Agreement Article A-LA 13)

The District plans to develop and implement, in consultation with the ARC, a Diversion Dam Volitional Passage (DDVP) Plan. The goal of the DDVP Plan is to provide for the construction, maintenance, and operation of safe, timely, and effective upstream and downstream volitional fish passage at the City of Everett's Diversion Dam through structural modifications to the Diversion Dam or sluice way. The District will file the DDVP Plan with FERC within one year of issuance of the new Project license, and will implement the plan upon FERC approval.

The District's design for modifying the Diversion Dam to provide upstream and downstream volitional fish passage will conform to the National Marine Fisheries Service (NMFS) 2008 Anadromous Salmonid Passage Facility Design Manual, prepared by the NMFS Northwest Region Hydro Division, dated February 8, 2008 (NMFS Design Manual), while continuing to meet the City of Everett's water supply requirements. The District's obligation regarding volitional passage is subject to: (1) the ARC's determination that spawning escapement of either Chinook salmon or steelhead trout within the Diversion Dam Index Area equals or exceeds in any one year 10 percent of the combined total spawning escapement for either Chinook salmon or steelhead trout within the four index areas of the Sultan River downstream of the Diversion Dam; and (2) the District obtaining all necessary regulatory approvals.

If it is determined that the spawning escapement above the Diversion Dam exceeds six anadromous redds in any one year, the District will not reverse flow (divert) or authorize the reverse flow of water from the Sultan River into the Diversion Dam outlet pipe unless required for the City of Everett's water supply needs. If this water supply requirement is triggered, the District will consult with the ARC and respond appropriately to protect ESA listed fish. Notwithstanding, in the event that the District installs and operates a fish screen at the outlet pipe, the District may resume reverse flow (divert) or may authorize the reverse flow of water from the Sultan River into the Diversion Dam outlet pipe. Such fish screen will conform to the NMFS Design Manual.

Providing access to historical spawning and rearing habitat upstream of the Diversion Dam is expected to increase salmon and steelhead production in the Sultan River by allowing these species to fully utilize available habitat and potential production capacity. The reintroduction of anadromous salmonids to this reach is also expected to benefit resident

rainbow trout and other aquatic and terrestrial species by increasing primary productivity through the addition of marine derived nutrients (i.e. salmon carcasses).

SECTION 2

Water Quality Protection Measures for Upland Construction and Maintenance Activities

This chapter describes the Best Management Practices (BMPs) and other control measures implemented by the District to prevent contaminants from entering the Project's surface water and groundwaters during Project-related construction and maintenance activities in upland areas. Upland areas include those areas outside of the channel and shorelines of streams, rivers, or lakes in the Project vicinity, and are generally defined as the areas above and landward of the Ordinary High Water Mark[5] (OHWM).

2.1 Erosion and Sedimentation Control Requirements

Title 30 of the Snohomish County Code (SCC) constitutes the Unified Development Code (UDC). The UDC is unified set of standards and procedures to regulate construction and land development activities within unincorporated Snohomish County. Erosion and sedimentation control requirements are specified in SCC 30.63A.220 for all development activity in Snohomish County.

Project-related construction and maintenance activities in upland areas will adhere to erosion and sedimentation control requirements as specified in SCC 30.63A.220[6]. The District will implement fully the erosion and sedimentation control measures described below at each stage of site development.

These requirements include:

1. The District will meet the standards and requirements specified in SCC 30.63A.220 by using appropriate best management practices (BMPs) for erosion and sedimentation control in accordance with the Snohomish County Drainage Manual, the Snohomish County Engineering Design and Development Standards (EDDS), or as approved by the Director of Snohomish County's Department of Public Works (Public Works director). In addition to the Snohomish County Drainage Manual and EDDS, the District will use Ecology's Stormwater Management Manual for Western Washington (Ecology 2005), as appropriate, for guidance on erosion and sedimentation control BMPs.
2. During and after Project-related construction activities, the District will prevent or minimize erosion and sedimentation on-site and shall protect properties and water courses downstream from the site from erosion due to increases in the volume,

[5] The OHWM is the point on a bank to which the presence and action of surface water is so continuous as to leave a district marked by erosion; destruction or prevention of woody terrestrial vegetation; predominance of aquatic vegetation; or other easily recognized characteristic. However, in any area where the ordinary high-water mark cannot be found, the ordinary high-water mark adjoining freshwater shall be the elevation of the mean annual flood (Hydraulic Code Rules, WAC 220-110-020 (57)).

[6] Alternatively, as updated by the County throughout the term of the new license.

velocity and peak flow rate of storm water runoff from the site (per requirement of SCC 30.63A.220 (1)(a)).

3. The District will prevent the transport of sediment onto adjacent properties (per requirement of SCC 30.63A.220 (1)(b)).

4. The District will apply BMPs from the Snohomish County Drainage Manual or as approved by the Public Works director to prevent or minimize the transport of sediment onto paved surfaces during construction, and if sediment is transported onto a paved surface, to clean the paved surface immediately or at the end of each day (per requirement of SCC 30.63A.220 (1)(c)).

5. The District will stabilize denuded areas and soil stockpiles as follows (per requirement of SCC 30.63A.220 (1)(d)):

    a) From October 1 to April 30, no soil may remain exposed for more than 2 days. From May 1 to September 30, no soil may remain exposed for more than 7 days. On portions of the site where active grading is in progress, the director may extend the deadline for soil stabilization upon determining that the likelihood of erosion impacts is low based on the type and amount of soil exposed, site topography, the potential for discharge to critical areas and lakes, and other factors. Upon finding a risk of erosion, the District will immediately apply soil stabilization, regardless of any previously established deadline, and the director may require immediate stabilization at any time for this purpose. The District will keep materials, equipment, and other resources on site at all times, in adequate quantities to stabilize all soil immediately.

    b) Denuded areas will be covered by mulch, sod, plastic, or other BMP in the Snohomish County Drainage Manual, or approved by the director.

    c) Soil stockpiles will be stabilized or protected with sediment retention BMPs within 24 hours of formation to prevent soil loss.

    d) Grading and construction will be timed and conducted in stages to minimize soil exposure.

6. The District may remove all temporary erosion and sedimentation control BMPs within 30 days after final site stabilization or after they are no longer necessary (per requirement of SCC 30.63A.220 (1)(e)).

7. Before construction acceptance by the County, the District will establish a permanent vegetative ground cover to control soil erosion and to survive severe weather conditions on all areas of land disturbance not otherwise permanently stabilized by impervious surfaces or other means (per requirement of SCC 30.63A.220 (1)(f)).

8. The District will maintain and repair as necessary all temporary and permanent erosion and sedimentation control BMPs to assure their continued performance through construction acceptance and extending to the release of all associated warranty security and maintenance security (per requirement of SCC 30.63A.220 (1)(g)).

9. Before performing any grading or clearing, the District will mark in the field, or otherwise instruct persons conducting the work, the limits of all proposed clearing and grading, critical areas and their buffers pursuant to SCC 30.62, 30.62A and 30.62B, trees to be retained, and drainage courses (per requirement of SCC 30.63A.220 (1)(h)).

10. The District will protect storm sewer inlets receiving storm water runoff during construction so that water will not enter the inlet without first being filtered or otherwise treated to minimize the amount of sediment entering the inlet (per requirement of SCC 30.63A.220 (1)(i)).

11. The District will route storm water runoff from disturbed areas of the site through sediment ponds, traps or other sediment retention BMPs prior to discharge from the site. The BMPs will be installed as the first step in grading, and will be in operation before any other site disturbance occurs. The District will stabilize temporary earth structures within the period specified in measure 5 above. If site conditions warrant, the director may require additional sediment controls, including but not limited to, preserving a vegetated buffer strip around the lower perimeter of the site (per requirement of SCC 30.63A.220 (1)(j)).

12. The District will design and construct all temporary sediment ponds and sediment traps in accordance with the EDDS to accommodate the peak discharge from the 10-year, 24-hour design storm based on the post development site conditions. Periodic removal of trapped sediments shall be performed as necessary, however trapped sediment may also be permanently stabilized on-site (per requirement of SCC 30.63A.220 (1)(k)).

13. The District will design and construct all temporary storm water conveyance systems to withstand, without erosion, the peak discharge from the 2-year, 24-hour design storm. The peak discharge shall be calculated based on post-development site conditions (per requirement of SCC 30.63A.220 (1)(l)).

14. The District will design and construct temporary and permanent BMPs adequate to prevent erosion of outlets, adjacent stream banks, slopes and downstream reaches (per requirement of SCC 30.63A.220 (1)(m)).

15. The installation of underground utility lines shall be subject to the following additional requirements (per requirement of SCC 30.63A.220 (1)(n)):

    a) Between October 1 and March 31, no more than 500 feet of continuous trench may remain open at one time unless check dams to reduce flow velocities and prevent erosion are installed in accordance with the Snohomish County Drainage Manual.

    b) Excavated material shall be placed on the uphill side of trenches, unless inconsistent with safety or site constraints.

16. Water from a dewatering device will discharge into a sediment-retention BMP (per requirement of SCC 30.63A.220 (1)(o)).

2.2 Construction and Maintenance of Roads, and New Construction Projects

The District has developed and implemented the *Project Facility Lands Tract Resource Management Plan* (RMP) (Snohomish County PUD 2001) to guide District employees in construction and maintenance activities associated with the Project Facility Lands Tract. The RMP describes the goals, objectives, tasks, and specific methods to be followed by the District for conducting activities within the Project Facility Lands Tract. The Project Facility Lands Tract is one of five Tracts of land included in the District's Wildlife Habitat Management Plan (WHMP) (Snohomish County PUD and the City of Everett 1988) for the Project. The 79-acre Project Facility Lands Tract consists of: (1) the power pipeline right-of-way (ROW) between the tunnel portal and the Powerhouse (40 acres); (2) the Powerhouse site (27 acres); (3) a wedge-shaped parcel of land adjacent to the Powerhouse access road (11 acres); and (4) an 800-foot portion of the transmission line ROW from the Powerhouse to the Powerhouse access road (1 acre).

Section 8 of the RMP describes the objectives, tasks, and procedures to be followed by the District for managing and maintaining roads, and facilitating new construction projects, if needed. The objectives are to minimize construction of new access roads associated with management on the tract and to maintain and repair existing District access roads as needed following state, county and local regulations; and to minimize environmental impacts and regulatory problems associated with new construction and maintenance of roads that may be needed for Project operation or other purposes.

Ecology's 401 Certification Order (October 18, 2010) stipulates that road construction through forest lands shall meet the requirements for water quality protection in the State Forest Practice Rules - WAC 222-24-020 road location and design, WAC 222-24-030 road construction, and WAC 222-24-040 water crossing structures (401 Certification Order No. 7918; section 5.1 General Conditions).

SECTION 3

Water Quality Protection Measures for In-Water Work

This chapter will describe the BMPs and other control measures for Project activities that require construction or maintenance work within surface waters (that is, "in-water work"). In-water areas include those areas inside of the channel and shorelines of streams, rivers, or lakes in the Project vicinity, and are generally defined as the areas below and within the OHWM.

3.1 Water Quality Protection Measures

Project-related construction activities involving in-water work will include protection and control measures to prevent contaminants from entering surface waters. These protection and control measures include:

- The District will implement reasonable measures to minimize the impact of any construction activities on waters of the state. Applicable BMPs for erosion and sediment control will be implemented as described above in Section 2.1 to avoid or minimize effects from turbidity, suspended sediment, and other potential contaminants. Applicable BMPs also will be implemented to prevent and control oil and chemical spills as described below in Section 4.1, and to properly dispose of surplus construction supplies and other solid wastes.
- The District will implement necessary measures to minimize the construction-related disturbance of existing riparian, wetland, and upland vegetation.
- The District will ensure that construction equipment is placed so that it cannot accidentally enter a waterway or cause water quality degradation to state waters.
- The District will use retention areas or swales as needed to prevent discharging of water from construction areas.
- The District will ensure that any fill materials placed for habitat improvements in any waters of the state do not contain toxic materials in toxic amounts (by reference to applicable standards.
- The District will implement BMPs and other control measures for the use, if any, of herbicides, pesticides, fungicides, disinfectants, fertilizers, or algaecides as described in Section 5.0 below. Use of these materials will be avoided on Project-related construction activities involving in-water work.

3.2 Hydraulic Project Approvals

The District will obtain Hydraulic Project Approval (HPA) permits from the Washington State Department of Fish and Wildlife (WDFW) at the appropriate time in the future, when plans and specifications of proposed in-water Project construction activities have been further developed. An HPA permit is required by Chapter 77.55 of the Revised Code of Washington (RCW) for hydraulic projects in state waters. State waters include all marine waters and fresh waters of the state, except those watercourses that are entirely artificial, such as irrigation ditches, canals and storm water run-off devices.

Activities requiring an HPA permit include all construction or other work that uses, diverts, obstructs, or changes the natural flow or bed of any fresh water or saltwater of the state. The District received a 401 Certification Order from Ecology in October 2010 that provided approval of Project operation and maintenance activities (as described in Sections 1.3.1 and 1.3.2) under the new Project license. Therefore, additional HPA permits will be needed only for planned in-water Project construction activities (as described in Sections 1.3.2 and 1.3.3). This includes projects that would occur under and over the ordinary high water line, including dry channels, and may include projects landward of the ordinary high water line if those activities will directly impact fish life and habitat in both fish bearing and non-fish bearing streams (for example, falling trees into streams or lakes, bridge maintenance, or dike construction). Such activities would include, but are not limited to: stream bank protection; log, log jam, or debris removal; construction or repair of bridges, piers, and docks; channel change or realignment; conduit (pipeline) crossing; culvert installation; placement of outfall structures; installation or maintenance of water diversions; and pile driving.

The District will obtain an HPA permit in two ways: either (1) submitting a Joint Aquatic Resource Permit Application (JARPA) to the Washington Department Fish and Wildlife (WDFW); or (2) submitting a Forest Practices Application/Notification (FPA/N) to the Washington Department of Natural Resources (DNR). The JARPA would serve as the request for in-water Project construction activities, except forestland-related activities requiring a Forest Practices Permit from DNR. For these exceptions, the FPA/N would serve as a request for an HPA permit for forestland activities involving state waters, such as installing, removing, or replacing culverts or stream crossings, and/or constructing or decommissioning forest roads.

A JARPA or FPA/N will be submitted, as applicable, and HPA permits sought, at the appropriate time in the future, when plans and specifications of proposed in-water Project construction activities have been further developed. In anticipation of acquiring the necessary HPA permits, the District will adhere to BMPs and other control measures for Project construction activities as described elsewhere in this WQP that are standard conditions of HPA permits such as described below.

3.2.1 Allowable In-Water Work Times

The District will adhere to in-water work timing limitations (allowable work windows) as specified in HPA permits to protect potentially-vulnerable life stages of fish, such as spawning, incubation, and rearing. The generally allowable work windows specified by WDFW for State waters in the Project vicinity include:

Sultan River - Mouth to Diversion Dam (RM 9.4)	August 1 to August 15
Sultan River - Diversion Dam to Elk Creek	July 16 - February 28
Sultan River - Upstream of Elk Creek	July 16 - February 28
Snohomish County (general; otherwise from above)	July 16 - September 15

The District will consult with, and verify allowable work windows, with WDFW as work windows can vary depending on the type of work to be conducted and the fish species present at work locations.

3.2.2 Other HPA Provisions for In-Water Work

3.2.2.1 Work Area Isolation

When a JARPA or FPA/N is submitted, the District will ensure the JARPA or FPA/N demonstrates compliance with the work area isolation requirements outlined in WAC 220-110-120. The District will include project plans for removing and excluding fish from work areas for proposed construction activities that have the potential to harm to fish life. If applicable, the JARPA or FPA/N will describe and show temporary water bypasses, pipes, culverts, screens, cofferdams, deflectors, or other methods to remove and exclude fish from the work area.

3.2.2.2 Construction Site Access and Staging

When a JARPA or FPA/N is submitted, the District will include plans for proposed timing, installation, operation, and removal of construction site access and staging in, adjacent to, or over state waters. This includes temporary fill and excavation, roads, work platforms, and other methods. Application drawings would show temporary construction site access and staging areas, as well as plans to protect and restore vegetation.

3.2.2.3 Culverts

When a JARPA or FPA/N is submitted for activities involving culverts, the District will ensure the JARPA demonstrates compliance with the water crossing structures requirements and technical provisions outlined in WAC 220-110-070. The District's JARPA or FPA/N will include design and implementation information consistent with *Design of Road Culverts for Fish Passage* (WDFW 2003a). To the extent practicable, proposed culvert projects will minimize the length and maximize the width of the culvert, and countersink it below the elevation of the streambed.

3.2.2.4 Bank Protection

When a JARPA or FPA/N is submitted for activities involving bank protection or stabilization, the District will ensure the JARPA or FPA/N demonstrates compliance with the bank protection requirements and technical provisions outlined in WAC 220-110-050. The District's JARPA or FPA/N will describe the extent to which techniques are employed that mimic natural processes, and how the District considered design guidelines including the *Integrated Streambank Protection Guidelines* (WDFW 2003b) when selecting the proposed bank protection. The District will describe the risk associated with the proposed approach and any alternatives considered.

3.2.2.5 Channel Changes

When a JARPA or FPA/N is submitted for activities involving stream channel changes, the District will ensure the JARPA or FPA/N demonstrates compliance with the channel change/realignment requirements and technical provisions outlined in WAC 220-110-080. The District's JARPA will describe the extent to which techniques are employed that mimic natural processes, why it is necessary to change the stream channel, how design guidelines (including the *Integrated Streambank Protection Guidelines* [WDFW 2003b]) have been used to select the proposed bank protection, and the risk of the proposed approaches and alternatives.

3.3 Monitoring During In-Water Work Activities

Sampling and monitoring will occur during construction activities involving in-water work to assess compliance with the state turbidity standard (consistent with WAC 173-201A-200). Turbidity criteria are established under WAC 173-201A-200 (1)(e). The turbidity criteria applicable to Project waters (including "Core Summer Salmonid Habitat" and "Salmonid Spawning, Rearing, and Migration" criteria) stipulate that turbidity shall not exceed 5 nephelometric turbidity units (NTU) over background when the background is 50 NTU or less; or shall not exceed a 10 percent increase in turbidity when the background turbidity is more than 50 NTU.

Consistent with WAC 173-201A-200 (1)(e), the turbidity criteria is applied to sampling points upstream and downstream of a temporary area of mixing during and immediately after necessary in-water construction activities. The temporary area of mixing shall be as follows:

- For waters up to 10 cfs flow at the time of construction, the point of compliance shall be 100 feet downstream from the activity that could potentially cause an increase in turbidity.
- For waters above 10 cfs up to 100 cfs flow at the time of construction, the point of compliance shall be 200 feet downstream of the activity that could potentially cause an increase in turbidity.
- For waters above 100 cfs flow at the time of construction, the point of compliance shall be 300 feet downstream of the activity that could potentially cause an increase in turbidity.
- For projects working within or along lakes, ponds, wetlands, estuaries, marine waters or other nonflowing waters, the point of compliance shall be at a radius of 150 feet from the activity that could potentially cause an increase in turbidity.

This temporary area of mixing is subject to the constraints of WAC 173-201A-400 (4) and (6) and can occur only after the activity has received all other necessary local and state permits and approvals, and after the implementation of appropriate BMPs to avoid or minimize disturbance of in-place sediments and exceedances of the turbidity criteria.

SECTION 4

Spill Prevention and Containment Procedures

This section describes the District's spill prevention and containment procedures related to chemicals, hazardous materials and petroleum, including refueling procedures, the measures to take in the event of a spill, and reporting and training requirements.

4.1 Spill Prevention Control and Countermeasure Plan

The District has developed and implemented the *Spill Prevention Control and Countermeasure Plan for the Jackson Hydropower Project* (Snohomish County PUD 2009c). The District's Spill Prevention Control and Countermeasure (SPCC) Plan for the Project conform to the regulations of 40 CFR Parts 112, 109 and 280 as applicable. The SPCC Plan has been revised and will continue to be revised as necessary to keep it current with the requirements of 40 CFR Part 112, and any relevant changes to applicable facilities and their operation. When revised, applicable measures will be incorporated as stipulated in the 401 Certification Order from Ecology (October 18, 2010). As part of the SPCC Plan, the District has:

- Implemented an ongoing capital improvement program to retrofit oil spill containment at its facilities,
- Incorporated containment into the construction of all new Project facilities that use or store oil,
- Developed a Contingency Plan as an integral part of its SPCC Plan,
- Instituted employee training requirements, purchased and staged oil spill countermeasures equipment,
- Committed resources to expeditiously control and remove any harmful quantity of oil spilled at any of its regulated facilities.

The Contingency Plan was developed for use at facilities that do not have full containment or where containment is not practical, e.g. mobile equipment. The Contingency Plan was also designed to be a stand alone Action Plan in the event of any oil discharge incident that meets the threshold level of these regulations or any other federal, state and/or local regulations or District policy.

The Project has oil using and oil storage facilities at two locations that are subject to the requirements of a SPCC Plan. These facilities consist of the Powerhouse, electrical substations/switchyards, fuel oil storage tanks and equipment storage areas. Culmback Dam has a 1,000-gallon diesel storage tank, which is below the SPCC threshold, but follows best management for spill prevention and containment. (A detailed description of each facility is included in the Contingency part of the SPCC Plan.)

4.2 Spill Prevention

Methods of spill prevention at Project facilities are described in the SPCC Plan, and include facility inspections and refueling procedures as discussed below.

4.2.1 Best Management Practices

Ecology's 401 Certification Order (October 18, 2010) stipulates that several best management practices (BMPs) must be included in the SPCC Plan (401 Certification Order No. 7918; section 6.0 Contaminant Spill and Release Prevention and Control). These spill prevention BMPs include:

a) Care must be taken to prevent any petroleum products, paint, chemicals, or other harmful materials from entering waters of the state.

b) Visible floating oils released from construction or Project operation shall be immediately contained and removed from the water.

c) All oil, fuel or chemical storage tanks shall be contained and located on impervious surfaces to prevent spills from escaping to surface waters or ground waters of the state.

d) Fuel hoses, oil drums, oil or fuel transfer valves and fittings shall be checked regularly for drips or leaks, and shall be maintained and stored properly to prevent spills into state waters. Refueling of equipment on land shall occur where there is no potential of spilling fuel into rivers, creeks, wetlands, or other waters of the state. Equipment that requires refueling in-water shall be maintained and operated to prevent any visible sheen from petroleum products from appearing on the water. Proper security shall be maintained to prevent vandalism.

e) Oil and grease usage should be regularly monitored. Observation of significant increase in usage should trigger an investigation for leaks, followed by any required maintenance or corrective action.

f) No emulsifiers or dispersants are to be used in waters of the state without prior approval from the Department of Ecology, Northwest Regional Office.

g) Wash water containing oils, grease, or other hazardous materials resulting from wash down of equipment or working areas shall be contained for proper disposal, and shall not be discharged into state waters.

4.2.2 Inspections

Inspection procedures include the following:

- Major containment structures, including the Powerhouse sump and containment surrounding the transformer, will be inspected regularly for the presence of petroleum products. The Jackson Project Superintendent will establish the frequency of inspection for each containment structure.
- Plant personnel observing any petroleum product in containment structures shall immediately inform their supervisor and an inspection shall be performed. The

inspection shall be evaluated and signed by the supervisor. Any discrepancies shall be immediately rectified. A report of all corrective measures taken and the date completed will be appended to the Superintendent's Log.

- Irrespective of conducted inspections, all tanks shall be inspected according to the following schedule: six months following the date of the first inspection or after the last recorded inspection, and 12-month intervals thereafter.
- All performed inspections will be recorded and the record kept on file as part of the Superintendent's Log. The inspection records will be maintained for a period of at least three years.

4.3 Spill Containment

Containment methods in the event of a spill at or near Project facilities are described in the SPCC Plan (Snohomish County PUD 2009c), and are listed below.

4.3.1 On-Site Containment

On-site containment will occur by taking the following actions:

- Block locations where oil can possibly exit the facility.
- Use a backhoe to excavate trenches and/or construct containment berms.
- Line with plastic and drain oil into trenches and bermed areas.

4.3.2 Off-Site Containment

Off-site containment will occur by taking the following actions:

- Block any ditches, storm water catch basins or sanitary sewer inlets that might receive oil.
- Request assistance from local storm water and sanitary sewer utilities.
- Install booms, barriers and / or absorbent pads to control oil in storm drains or sanitary sewers.
- Recover oil from catch basins and inlets with Vactor truck or pumping equipment.
- Utilize booms, skimmer pumps and absorbents to control & contain oil that could reach a watercourse.
- Set up containers to receive recovered oil/water.
- Install barriers to protect sensitive areas from potential contamination.

4.4 Spill Response Actions

In the event of a release of hazardous materials to the environment (soil or surface water), the District response team will attempt to contain the spill and will report it to the appropriate agencies and personnel as discussed below.

4.4.1 Response Actions

Ecology's 401 Certification Order (October 18, 2010) stipulates that several actions will be taken if Project-related work or operations result in any discharge of oil, fuel, or chemicals into state waters, or onto land with a potential for entry into state waters (401 Certification Order No. 7918; section 5.1 General Conditions and section 6.0 Contaminant Spill and Release Prevention and Control). These actions include:

1. In the event of a discharge or release of oil, fuel, or chemicals into state waters, or onto land with a potential for entry into state waters, containment and clean-up efforts shall begin immediately and be completed as soon as possible, taking precedence over normal work. Clean-up shall include proper disposal of any spilled material and used clean-up materials.
2. Samples shall be collected and analyzed to assess the extent of the spill and to assure all contaminants have been thoroughly removed.
3. Spills into state waters, spills onto land with a potential for entry into state waters, or other significant water quality impacts, shall be reported immediately or no later than 24 hours after discovery to the Ecology Northwest Regional Office at 425-649-7000 (24-hour phone number).
4. The District shall provide a written follow-up report to Ecology within two (2) weeks of the incident. The report will describe what occurred, whether the incident was due to natural events or human-related activities, and the District's response. The report will describe a plan detailing long-term corrective actions and monitoring protocols if needed, any measures the District proposes to reduce future similar occurrences, results of any samples taken, and any additional pertinent information.

4.4.2 Response Control Center

The response control center will be located at the facility involved with the spill. However, if the District's Assistant General Manager (AGM) of Water, Generation, and Corporate Services (or its successor) assumes the role of Response Coordinator due to a major discharge event, the response control center may be moved to the District's Operation Center. A discharge is considered a spill that has the potential to exit the facility.

4.4.3 Response Team

The core response team consists of:

- Initially the Spill Observer
- The District's Energy Control Center (ECC) Duty dispatcher
- Response Coordinator (Jackson Superintendent or designated Hydro Constructor). In the event of a major discharge, the District's AGM of Water Resources may assume the role of the overall Response Coordinator. The Jackson Superintendent will remain as the on-scene Coordinator under the direction of the AGM of Water, Generation, and Corporate Services (or its successor, or designee).

- Response Crew including the Jackson Project personnel and an Environmental Affairs Spill Responder

The core team may be supplemented by:

- Additional District staff
- Spill response contractor
- Local Agency staff
- State and Federal Agencies staff

The initial responder (typically a District Hydro Constructor investigating an alarm at a Project facility) will assume the responsibility of "Spill Observer". If the initial investigation discloses a hazardous materials discharge that is not within the ability of the Spill Observer to control or contain, the Spill Observer will immediately report the spill to ECC and the Hydro Superintendent.

4.4.4 Communications and Notification Procedures

Most communication during response operations will be conducted over the District's 900 MHz radio network. The system provides coverage throughout the District's service area and is supported by an emergency backup power source. The District's regional cellular phone system and telecommunications systems will also be used for access to parties that do not have access to the radio network.

Persons or agencies to be notified immediately include:

- Persons on the Notification Call List (included in the SPCC Plan)
- Coast Guard National Response Center (phone number: 1-800-424-8802) and Washington State Emergency Management Division (WSEMD) (phone number: 1-800-258-5990). Under federal regulations, all discharges to water require immediate notification. The National Response Center will notify the U.S. Coast Guard and WSEMD will notify Ecology and Snohomish County Office of Emergency Management
- Ecology (phone number: 1-360-407-6300). Under Washington State regulations, all hazardous material discharges to the environment (soil and water) are to be reported immediately. Oil spills that are contained in secondary containment or to impervious surfaces are not considered a release to the environment and are not reportable.
    - USEPA Region Office X and the State are required to be notified by the District whenever a facility discharges either: 1) more than 1000 gallons of oil, or 2) more than 42 gallons in each of two discharges within one 12-month period.

The Response Coordinator has the authority to request additional assistance from the Coast Guard National Response Center (NRC) Environmental Services, Snohomish County Office of Emergency Management Division, Ecology Office of Emergency Management, and the Federal National Response Center.

The District has executed an professional services contract with NRC Environmental Services, a commercial spill response contractor. NRC will respond to any requests for assistance initiated by the District's Response Coordinator.

A low oil level or sudden pressure condition at any Jackson Project power transformers will result in a local alarm and is also transmitted to the ECC using the Supervisory Control and Data Acquisition (SCADA) system. Transformer alarm events will be immediately investigated on the presumption that the alarm may indicate an oil discharge and require activation of the SPCC Plan.

4.5 Training Requirements

Training sessions in spill prevention and cleanup procedures will be conducted on an annual basis. All personnel working in areas containing this type of equipment will be familiar with spill prevention and cleanup rules and procedures.

Spill response personnel will be trained and familiar with the following plans and procedures:

- Oil Spill Control and Countermeasures Plan
- Potential physical and chemical hazards associated with an oil spill
- Use and limitations of personal protective equipment
- Oil containment techniques for land and water
- Use of spill control absorbents and equipment
- Handling, storage and transportation of spill cleanup materials
- Decontamination procedures
- Health and safety operating procedures
- Emergency response procedures

Supervisors will conduct oil spill briefings for their plant personnel at frequent intervals to assure adequate understanding of the Oil Spill Plan for that facility. All new employees will be given the briefing upon commencement of their positions. Such briefings should highlight and describe known spill events or failures, malfunctioning components, and recently developed precautionary methods. The importance of preventing any oil from entering natural waterways should be stressed.

SECTION 5

Procedures for Application of Use of Herbicides, Pesticides, Fungicides, Disinfectants, Fertilizers, or Algaecides

This section describes the District's procedures for use of herbicides, pesticides, fungicides, disinfectants, fertilizers, or algaecides, also including and reporting and training requirements.

5.1 General Requirements

Ecology's 401 Certification Order (October 18, 2010) stipulates requirements for use of herbicides, pesticides, fungicides, disinfectants, fertilizers, or algaecides (401 Certification Order No. 7918, section 8.0), as follows:

- Prior to the use of herbicides, pesticides, fungicides, disinfectants, fertilizers, or algaecides in or adjacent to waters of the state, coverage under a National Pollutant Discharge Elimination System (NPDES) Aquatic Pesticides Permit shall be obtained, and conformance with any other applicable state requirement such as the Washington State Environmental Policy Act (SEPA), shall be attained.
- Use of herbicides, pesticides, fungicides, disinfectants, fertilizers, or algaecides will be avoided on Project-related construction activities involving in-water work (as also addressed in Section 3.0 Water Quality Protection Measures for In-Water Work).
- Prior to the use of non-aquatic permitted pesticides adjacent to waters of the state, the District shall follow BMPs to avoid the entry of such materials into waters of the state. Applicable BMPs include such actions as hand application and avoiding drift of materials into the water, and other measures as described in the sections below.
- An appropriate water quality monitoring plan shall be developed prior to the application of aquatic herbicides and implemented for all related work.

5.2 Procedures for Application of Herbicides

The District has adopted a Vegetation Management Policy that directs the District to establish a safe, economical and environmentally responsible Vegetation Management Plan (VMP; Snohomish County PUD 2003) that utilizes an integrated pest management approach with minimal negative impacts to the environment and human health. In 1993, the District's Board of Commissioners Resolution 4028 directed the District to use less hazardous materials and reduce the generation of hazardous waste. In 2000, the District's Board of Commissioners Ends Policy directed the District to mitigate adverse environmental impacts and take reasonable opportunities to protect and enhance the environment. Together, these

policies, along with applicable federal, state and local regulations, have defined the District's VMP. The Jackson Project Noxious Weed Management Plan (Smayda Environmental Associates, Inc. 2009) provides further species specific guidance for weed management on Project lands.

5.2.1 Herbicide Use Restrictions by Project Locations

Herbicide use in the Project vicinity is restricted by location as follows:

- The District will not use pesticides, herbicides, fertilizers and other chemicals on the Project Facility Lands Tract unless no other alternative is considered feasible. The District will consult with the City of Everett regarding the use of herbicides and application procedures on lands within the Sultan River watershed including those adjacent to Spada Lake. If the use of pesticides, herbicides, fertilizers or other chemicals is considered necessary then the District's Vegetation Management Program guidelines will be consulted prior to use.
- Herbicides may be applied as necessary to control unwanted vegetation along the transmission line right-of way, the back slope of the Powerhouse, and on portions of the power pipeline right-of-way that are outside of the City of Sultan's watershed, defined as the area between the Lake Bronson Camp chain link fence and the City of Sultan chain-link fence line on the power pipeline right-of–way access road.
- The District acknowledges the challenge of managing noxious weeds over such a large area exclusively by manual and mechanical methods, and may investigate the use of chemical herbicides when no other method of weed management is effective at achieving control as required by State and/or County regulations, or when the available methods are cost prohibitive.

5.2.2 Herbicide Application Criteria

If herbicide is used as directed above, the procedures for applying herbicides are as follows:

- Herbicides used shall be of relatively low toxicity (rating 3 or higher) and be degradable in the environment. No herbicide or mixture containing an herbicide shall be used which has been determined by the EPA, or the National Institute for Occupational Safety and Health to be carcinogenic, teratogenic or mutagenic, or to cause reproductive harm in humans. (See Toxicity Rating Guidelines, section V).
- Personnel applying herbicides shall maintain current training certifications to the level required by law, apply herbicides in accordance with the product label, and conform to all local, state and federal laws.
- Herbicide applications shall be applied in such a way as to minimize drift or runoff of chemicals due to wind or rainfall.
- Applications made within 50 feet of waterbodies shall require prior approval from National Marine Fisheries Services, US Fish and Wildlife, Washington Department of Fish and Wildlife, or other applicable regulatory agency.

- Herbicides/pesticides may be applied to areas within municipal watershed areas, and critical areas, when authorized by law and required by local, state, or federal agencies to control insects and noxious weeds.
- Applicators shall acknowledge herbicide restrictions within buffer zones established by local, state, or federal agencies.
- An application within 100 feet of a public water supply well site requires written authorization from the water purveyor.
- Target applications are standard practice with broadcast applications reserved for areas where the target is too widespread to make target applications feasible..
- Applications shall not be applied on snow-covered surfaces.
- Any application to berry-producing plants shall be before blossoming or after berry production is completed.
- No applications shall be allowed within three feet of the fence line of active pasture areas.
- All equipment and chemicals used by District personnel shall be stored in a safe and secured location when not in use. All empty chemical containers shall be disposed of in accordance with label directions and Ecology container disposal guidelines.
- Rinse water, used to clean spray equipment, shall be applied according to the same restrictions that apply to chemical applications.

5.2.3 Record Keeping

The District will keep records of all pesticide applications in accordance with RCW 17.21, Section 100 (Washington State Legislature 1992) for at least seven years from the date applied. Per RCW 17.21, Section 100, records for each application shall include the following information:

a) The location of the land where the pesticide was applied;

b) The year, month, day and beginning and ending time of the application of the pesticide each day the pesticide was applied;

c) The product name used on the registered label and the EPA registration number, if applicable, of the pesticide which was applied;

d) The site to which the pesticide was applied;

e) The amount of pesticide applied per acre or other appropriate measure;

f) The concentration of pesticide that was applied;

g) The number of acres, or other appropriate measure, to which the pesticide was applied;

h) The licensed applicator's name, address, and telephone number and the name of the individual or individuals making the application and their license number, if applicable;

i) The direction and estimated velocity of the wind during the time the pesticide was applied. This subsection (i) shall not apply to applications of baits in bait stations and pesticide applications within structures; and

j) Any other reasonable information required.

5.2.4 Training Requirements

Personnel applying herbicides shall maintain current training certifications to the level required by law, apply herbicides in accordance with the product label, and conform to all local, state, and federal laws.

SECTION 6

References

CH2M HILL. 2010. *Water Quality Final Technical Report. Henry M. Jackson Hydroelectric Project (FERC No. 2157) Water Quality Parameter Study (RSP 1)*. Prepared for Public Utility District No. 1 of Snohomish County. October 2010.

Federal Energy Regulatory Commission (FERC). 1982. In the Matter of: Public Utility District No. 1 of Snohomish County and City of Everett Project No. 2157. Uncontested Offer of Settlement – Joint Agencies. March 24, 1982.

Federal Energy Regulatory Commission (FERC). 1983. Public Utility District No. 1 of Snohomish County and City of Everett, Washington, Project Nos. 2157-001, 002, 003, 004, 005 and 2157-010. Order Approving Uncontested Settlements and Amending License. February 9, 1983.

Public Utility District No. 1 of Snohomish County (Snohomish County PUD). 1997. *Right-of-Way Management Standard Operating Procedures*. March 1997.

Public Utility District No. 1 of Snohomish County (Snohomish County PUD). 2001. *Project Facility Lands Tract Resource Management Plan (RMP)*.

Public Utility District No. 1 of Snohomish County (Snohomish County PUD). 2003. *Vegetation Management Plan (VMP)*. October 2003.

Public Utility District No. 1 of Snohomish County (Snohomish County PUD) and the City of Everett. 1988. *Wildlife Habitat Management Plan (WHMP). Henry M. Jackson Hydroelectric Project.*

Public Utility District No. 1 of Snohomish County (Snohomish County PUD). 2009a. *Settlement Agreement Recreation Resource Management Plan. Henry M. Jackson Hydroelectric Project*. August 2009a.

Public Utility District No. 1 of Snohomish County (Snohomish County PUD). 2009b. *Terrestrial Resource Management Plan. Henry M. Jackson Hydroelectric Project*. May 2009.

Public Utility District No. 1 of Snohomish County (Snohomish County PUD). 2009c. *Oil Spill Prevention Control and Countermeasure Plan for the Jackson Hydropower Project. 2009 Update*. Prepared by the Public Utility District No. 1 of Snohomish County. Printed Date: May 28, 2009.

Smayda Environmental Associates, Inc. 2009. *Noxious Weed Management Plan. Henry M. Jackson Hydroelectric Project*. May 2009.

Washington Department of Ecology (Ecology). 2005. Stormwater Management Manual for Western Washington. Prepared by the Washington State Department of Ecology, Water Quality Program. Publication Numbers 05-10-029 through 05-10-033. February 2005.

Washington Department of Fish and Wildlife (WDFW). 2003a. Design of Road Culverts for Fish Passage. Olympia, Washington.

Washington Department of Fish and Wildlife (WDFW). 2003b. Integrated Streambank Protection Guidelines. Washington Department of Fish and Wildlife. Olympia, Washington.

Washington State Legislature. 1992. Washington Pesticide Application Act: Chapter 17.21 RCW, Section 100. Effective date: April 1, 1992.

Appendix A:
Water Quality Monitoring Plan (WQMP)

Water Quality Monitoring Plan (WQMP)

Henry M. Jackson Hydroelectric Project (FERC No. 2157)

Public Utility District No. 1 of Snohomish County

Everett, WA

May 2011

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Acronyms

°C	degrees Centigrade
°F	degrees Fahrenheit
7-DAD Max	7-day average of the daily maximum temperature
cfs	cubic feet per second
CWA	Federal Clean Water Act
datasonde	Hydrolab Series 5X DataSonde (or equivalent)
DO	dissolved oxygen
DQO	data quality objective
Ecology	Washington Department of Ecology
EPA	U.S. Environmental Protection Agency
FERC	Federal Energy Regulatory Commission
IT	Intake Tower
m	meter
mg/L	milligrams per liter
NTU	nephelometric turbidity units
ppm	parts per million
Project	Henry M. Jackson Hydroelectric Project
RM	River Mile
RPD	relative percent difference
SF	South Fork Sultan River
SM	Standard Method
SR-1	Spada Reservoir near outlet
TDG	total dissolved gas
USGS	U.S. Geological Survey
WAC	Washington Administrative Code
WC	Williamson Creek

1. Introduction

1.1. Purpose

This Water Quality Monitoring Plan (WQMP) describes monitoring procedures for select water quality parameters in the vicinity of the Henry M. Jackson Hydroelectric Project (Project) (No. P-2157). The Project is located on the Sultan River in Snohomish County, Washington, and is operated and maintained by the Public Utility District No. 1 of Snohomish County (District). The Project consists of a dam (Culmback Dam), an impoundment (Spada Lake Reservoir), a smaller diversion dam owned by the City of Everett, a powerhouse and associated equipment, and transmission facilities (Figure 1-1).

The District is in the process of seeking a new 45-year license for continued operation of the Project from the Federal Energy Regulatory Commission (FERC). The FERC is expected to issue a new license before the end of May 2011. To support issuance of the license from the FERC, Washington Department of Ecology (Ecology) issued a water quality certification, pursuant to Section 401 of the Clean Water Act (CWA, 33 U.S.C. § 1341) for operation of the Project under the new license. The District received the water quality certification from Ecology on October 18, 2010. The certification provides Ecology's confirmation that there is reasonable assurance the Project will meet applicable State water quality requirements.

As stipulated in Ecology's 401 Certification Order (October 18, 2010), the District will conduct monitoring of water quality conditions in the Sultan River and Spada Lake Reservoir in the vicinity of the Project to ensure continued protection and compliance with Washington State water quality standards currently codified in WAC 173-201A (401 Certification Order No. 7918; section 9.0 Monitoring and Reporting Requirements). The District's approach to this water quality monitoring is described in the following sections, including sites and parameters to be monitored, sampling frequency, sampling procedures and equipment, analytical methods, quality control procedures, and data assessment and reporting.

In October 2009, the District submitted to the FERC a comprehensive Settlement Agreement on behalf of itself, the National Marine Fisheries Service, U.S. Forest Service, U.S. Fish and Wildlife Service, National Park Service, Washington Department of Fish and Wildlife, Ecology, Tulalip Tribes of Washington, Snohomish County, City of Everett, City of Sultan, and American Whitewater. The purpose of the Settlement Agreement is to resolve among the signatories issues associated with issuance of the new license for the Project. The District requested that the FERC accept and incorporate all of the proposed license articles in the Settlement Agreement in the new license.

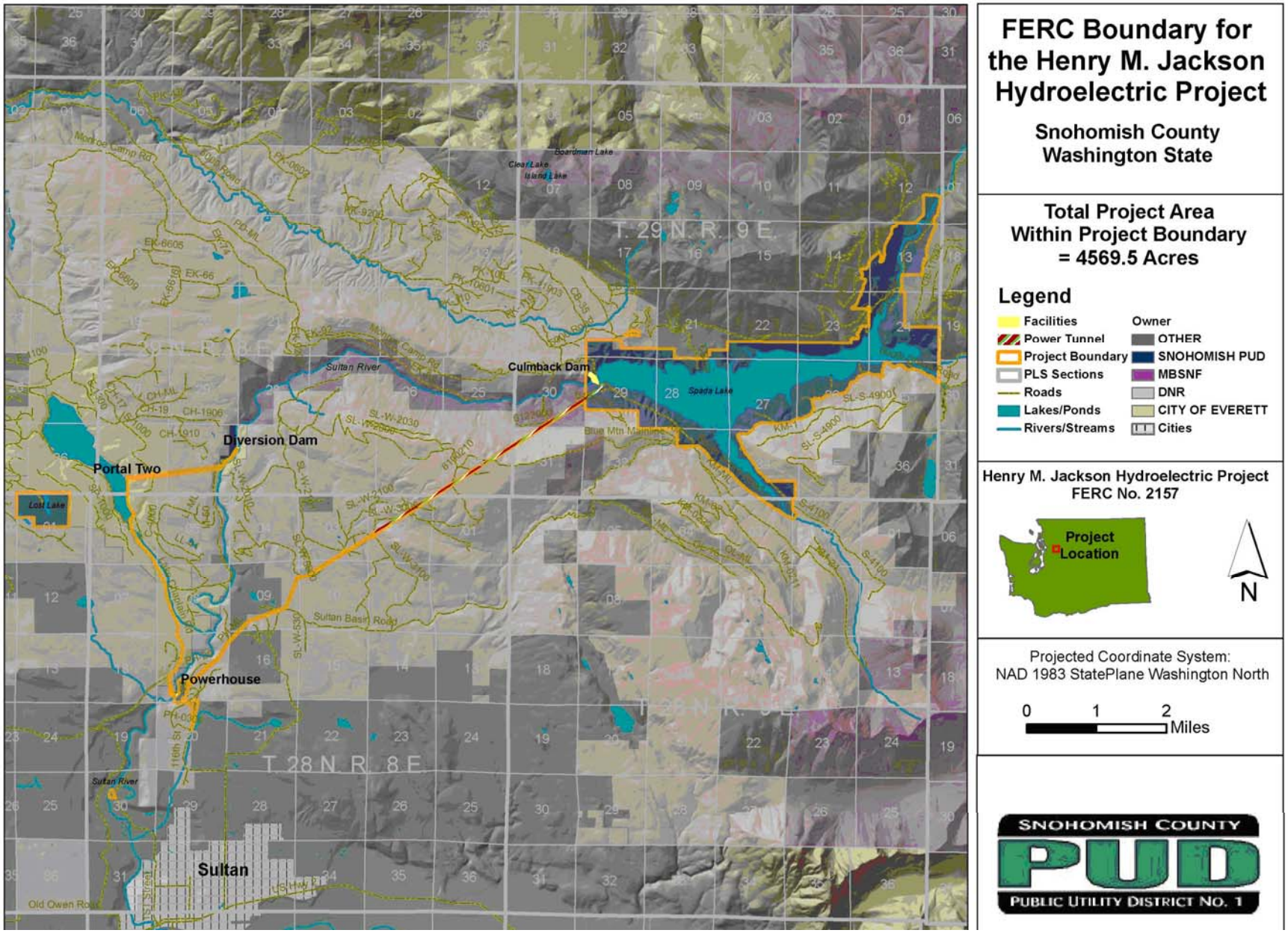

Figure 1-1. Map of the Henry M. Jackson Hydroelectric Project (FERC No. 2157) Vicinity.

Water License Article 1 (W-LA 1) of the Settlement Agreement specifies development and implementation of a Water Quality Plan (WQP)[1] to ensure compliance with Washington State water quality standards in the Sultan River as codified in WAC 173-201A (see Appendix 1). The Settlement Agreement specifies that, at a minimum, the WQP include the following components:

1. water quality protection measures related to Project construction or maintenance activities (includes Best Management Practices (BMPs) for in-water and upland construction and maintenance activities);
2. spill prevention and containment procedures;
3. procedures for application of herbicides, pesticides, fungicides, and disinfectants; and
4. a Water Quality Monitoring Plan (WQMP), which details compliance monitoring and reporting procedures for select water quality parameters (including, but not necessarily limited to, stream flow, water temperature, and turbidity).

Article W-LA 1 also specifies that the District will develop the WQP in consultation with Ecology, along with the Aquatic Resource Committee (ARC), and submit the WQP to the FERC for approval, within 180 days of issuance of the new FERC license. Upon the FERC's approval, the District will implement the WQP.

The District has developed a draft WQP that describes the measures and procedures for the first three components listed above (Snohomish County PUD 2010). This WQMP provides the fourth component listed above. This WQMP serves as a stand-alone document that is attached as Appendix A to the draft WQP (Snohomish County PUD). The WQMP is effective for the entire license term and is complementary to the numerous shorter duration water quality and biological monitoring efforts tied to specific license articles. The District developed this WQMP in consultation with the Aquatic Resource Committee (ARC); copies of consultation are included in Appendix 2. A complete tabular listing of the monitoring commitments tied to the license is presented in Appendix 3.

1.2. Background

The overall water quality in the Sultan River in the vicinity of the Project is very good. The Sultan River Basin is a remote watershed characterized by rugged forested terrain and high precipitation. These conditions result in surface waters that have diluted dissolved solids and ions content, and are generally free of pollutants or contaminants. The Sultan River Basin has been protected as the source of the City of Everett's municipal water supply since 1917. Protective measures include restrictions on the range of recreational and other activities that may occur in the Project area, which further limits the potential for anthropogenic effects on water quality.

The District completed a two-year Water Quality Parameter Study in March 2009 to obtain information on existing water quality conditions in the vicinity of the Project. This study

[1] The WQP is referred to as the Water Quality Protection Plan in W-LA 1. To standardize the language/terminology used in the 401 Water Quality Certification and W-LA1, this Plan will conform to the terminology used by Ecology in the 401 Water Quality Certification.

assessed 19 parameters at 13 sampling sites in the vicinity of the Project over the period April 2007 through March 2009. Results of the study, including descriptions of existing data and information on water quality conditions in the Project vicinity, are provided in the Water Quality Final Technical Report (CH2M HILL 2010). The Water Quality Final Technical Report is available online at the Project relicensing web site at: http://www.snopud.com/PowerSupply/hydro/jhprelicense/jhprdocrel/jhprstudyrpts.ashx?p=1480.

Results of the study confirm that water quality conditions in the vicinity of the Project are very good. Conditions in the vicinity of the Project conform to Washington State water quality standards throughout the year with few exceptions. The water quality sampling indicates that the trophic state of Spada Lake Reservoir is oligotrophic. In general, oligotrophic lakes have low nutrients, low algal biomass and productivity, and high water clarity.

Spada Lake Reservoir serves as the City of Everett's municipal water supply, supplying drinking water to approximately 80 percent of Snohomish County. Because of this use, access and activities are restricted to protect water quality in the watershed. Non-electric motorized boating, overnight camping, and body-contact activities, such as swimming, are not permitted in the reservoir. This source water is monitored according to Safe Drinking Water Act (SDWA) regulations, which ensures the continuing integrity of the water supply system. The City monitors Spada Lake Reservoir outflow at a sampling point on the Lake Chaplain pipeline. The on-going monitoring programs provide routine data on over 40 parameters, including physical characteristics, biological parameters, conventional parameters, cyanide, metals, and volatile and synthetic organics.

The District monitored water temperatures below the Diversion Dam as a condition of the 1983 Settlement Agreement with the Joint Agencies (FERC 1982, FERC 1983). Since 2004, the District also continuously monitored water temperature at eight additional locations throughout the Sultan River basin. The Water Quality Final Technical Report (CH2M HILL 2010) describes these data.

Ecology monitors water quality at the mouth of the Sultan River, near Sultan, Washington (Station 07E055). Water quality data have been collected at this site since 1960. The overview of the data for this station provided on Ecology's web site indicates that, "overall water quality at this station met or exceeded expectations and is of lowest concern" (http://www.ecy.wa.gov/apps/watersheds/riv/station.asp?sta=07E055). No reaches in the Sultan River Basin are listed by Ecology as "water quality limited" under Section 303(d) of the CWA[2].

[2] Section 303(d) of the CWA requires Ecology to prepare a list of all surface waters in Washington for which beneficial uses (such as drinking, recreation, aquatic habitat, and industrial use) are impaired by pollutants. These are water quality limited lakes, rivers, and streams that fall short of state surface water quality standards. Waters placed on the 303(d) list require the preparation of Total Maximum Daily Loads (TMDLs). The TMDL provides a regulatory tool to establish the maximum amount of a pollutant that is allowed to be released into a waterbody so as not to impair uses of the water.

2. Monitoring Approach

The District's water quality monitoring will assess eight parameters at ten sampling sites in the Project vicinity. Water quality monitoring will include measurements of conventional parameters related to water chemistry at all ten sites and physical measurements of stream discharge at six of these sites. Monitoring of these parameters at these sites will allow the District to assess on-going trends in water quality conditions and compliance with applicable water quality standards (per WAC 173-201A-200 in Ecology 2006) in the Project area. In addition to the monitoring identified, the District will be conducting further monitoring of the resource as described in specific management plans (see Appendix 3).

2.1. Parameters to be Monitored

2.1.1. Water Chemistry

Specific water quality parameters to be monitored are listed in Table 2-1, including the key statistic to be used to describe the condition of the parameter. Also listed in Table 2-1 are the applicable standards and criteria for the Sultan River Basin for four of the parameters listed, including water temperature, dissolved oxygen, turbidity, and pH (per WAC 173-201A-200 in Ecology 2006).

In addition to the parameters listed in Table 2-1, standards are in effect for the Sultan River Basin for two other parameters: (1) total dissolved gas (TDG); and (2) fecal coliform organism levels for contact recreation (per WAC 173-201A-200 in Ecology 2006). However, TDG and fecal coliform are not included in the District's water quality monitoring as described in this WQMP. The District's recent two-year Water Quality Parameter Study established that: (1) current conditions of TDG and fecal coliform in the Project vicinity are well within (and therefore comply with) the applicable standards; and (2) Project facilities and operations do not affect these parameters (CH2M HILL 2010).

As stipulated in Ecology's 401 Certification Order (October 18, 2010), the District will implement and comply with Settlement Agreement proposed license articles requiring monitoring of instream flows (401 Certification Order No. 7918; section 5.2 Specific Conditions – Instream Flow and Flow-Habitat). To provide instream flows, releases of water by means other than the penstock and Powerhouse may occasionally be necessary during Powerhouse inspection or testing activities. These alternative releases from the base of Culmback Dam discharge immediately into a high gradient, boulder-strewn canyon reach. As such, it is highly unlikely that these releases would result in short term elevated TDG levels. As indicated in the 401 Certification Order, Ecology has determined that the benefits to biota of the required instream flow releases outweigh any potential effects of possible short-term elevated TDG levels. Although monitoring of TDG is not included in this WQMP, the 401 Certification Order stipulates that the District will apply to Ecology and WDFW for short-term modifications in advance of such releases, if anticipated (401 Certification Order No. 7918; section 5.3.2 Total Dissolved Gas). Any such releases will be described in annual reports by the District as stipulated in the 401 Certification Order (section 9.0, Monitoring and Reporting Requirements).

Table 2-1. Specific Parameters of Water Chemistry to be Monitored

Parameters	Unit	Key Statistic	Associated Standard
Water temperature (Continuous data)	^{o}C	7-day average of the maximum daily water temperature (7-DAD Max)	Criteria in WAC 173-201A-200 in Ecology (2006): 16^{o}C (core summer salmonid habitat) 17.5^{o}C (salmonid rearing and migration) When temperatures exceed the above levels (or within 0.3^{o}C) due to natural conditions, then cumulative human actions may not increase the 7-DAD Max by more than 0.3^{o}C. When the background condition of the water is cooler that the above levels, human actions may not increase the 7-DAD Max by more than 28/(T+7) (where "T" is unaffected background water temperature in ^{o}C). [3]
Water temperature (Vertical profile)	^{o}C	Individual sample values as measured	None. For purposes of this monitoring, profiles will be used to assess stratification in the lake.
Dissolved oxygen	mg/L	Individual sample values as measured	Criteria in WAC 173-201A-200 in Ecology (2006): 9.5 mg/L (core summer salmonid habitat) 6.5 mg/L (salmonid rearing and migration) When dissolved oxygen is lower than the above levels due to natural conditions, cumulative human actions may not decrease dissolved oxygen by more than 0.2 mg/L[4].
Dissolved oxygen (vertical profile)	mg/L	Individual sample values as measured	None. For purposes of this monitoring, profiles will be used to assess stratification in the lake.
Turbidity	NTU	Individual sample values as measured	Criteria in WAC 173-201A-200 in Ecology (2006): 5 NTU over background when background is 50 NTU or less, or a 10% increase when background is more than 50 NTU[5].
pH	pH units	Individual sample values as measured	Criteria in WAC 173-201A-200 in Ecology (2006): 6.5 to 8.5 pH units, with a human-caused variation within the above range of less than 0.5 units.
Secchi transparency	meters	Individual values as measured	None. For purposes of this monitoring, Secchi depth will be used to assess lake conditions, including photic zone depth.

[3] The two-year Water Quality Parameter Study (CH2M HILL 2010) demonstrated that temperatures in the Project area rarely exceed the criteria. However, if necessary (i.e., if and when temperature exceeds the criteria as indicated), "natural conditions" or "unaffected background" will be determined using data from the South Fork (SF) site, which represents a site upstream of, and unaffected by, the Project.

[4] The two-year Water Quality Parameter Study (CH2M HILL 2010) demonstrated that that dissolved oxygen in the Project area is rarely less than the criteria. However, if necessary (i.e., if and when dissolved oxygen is less than criteria), "natural conditions" will be determined using data from the South Fork (SF) site, which represents a site upstream of, and unaffected by, the Project. Alternatively, "natural conditions" will be determined by assuming 100% dissolved oxygen saturation of waters at ambient temperature conditions.

[5] Background turbidity will be determined using data from the South Fork (SF) site, which represents a site upstream of, and unaffected by, the Project.

2.1.2. Physical Measurements of Stream Discharge

Flow discharge measurement data is available at three U.S. Geological Survey (USGS) gaging stations that are currently in use in the Project vicinity (Table 2-2). These three gaging stations are well dispersed within the Project vicinity, and are specifically associated with water quality sampling sites as summarized in Table 2-2. Data from these stations will provide information if necessary to characterize flow conditions that occur during water quality sampling at these sites. Flow discharge measurement data will also be collected by the District at RM 16.1, RM 9.8, and RM 4.9 using on-site pressure transducers or equivalent instrumentation. Stage-discharge rating curves for these locations will be developed and maintained in accordance with Chapter A10, Discharge Ratings at Gaging Stations, Techniques of Water-Resources Investigations of the United States Geological Survey. Monitoring at the five locations downstream of Culmback Dam will be used to determine compliance with minimum flows (A-LA 9), downramping rates (A-LA 5), and process flows (A-LA 8) within the three discrete operational reaches.

Table 2-2. USGS Stream Gaging Stations in the Project Vicinity

Station Name	USGS Gage Number	River Mile [a]	Period of Record	Associated Water Quality Site
Stations Currently in Use				
South Fork Sultan River	12137290	18.2	1992 to present	SF
Sultan River below Diversion Dam	12137800	9.4	1983 to present	RM 9.6
Sultan River below Powerplant	12138160	4.5 [b]	1983 to present	RM 4.4

a: Official USGS location.
b: The official USGS location for this gage is RM 4.5; however, this gage is actually just downstream of the Powerhouse, which is located at RM 4.4.

2.1.3. Reservoir Water Level Elevation

Spada Lake Reservoir elevation data is collected at a point off the southeast corner of the power tunnel intake structure located approximately 250 feet upstream of the dam. The District has a nitrogen gas bubbler monitored in real time by its SCADA system year around.

2.2. Monitoring & Sampling Locations and Frequencies

The ten sampling sites are listed in Table 2-3 and their locations are shown in Figure 2-1. The sampling sites are located within six segments in the Project vicinity:

- South Fork Sultan River above entrance to Spada Lake Reservoir
- Spada Lake Reservoir at the Culmback Dam Intake Structure

- Sultan River from Culmback Dam to the Diversion Dam
- Sultan River from the Diversion Dam to the Powerhouse
- Sultan River downstream from the Powerhouse
- Skykomish River near the confluence with the Sultan River

Parameters and sampling frequency vary by sampling locations as summarized in Table 2-4. In general, the sampling sites are selected for their ability to represent conditions within these segments, and to ascertain potential effects of Project facilities and operations on water quality.

Water temperature, in stream reaches, will be monitored year-round for the term of the license[6]. The annual monitoring period for water temperature at SR-1 and the remaining parameters will be from May 1 to October 31. This period encompasses the months when potential water quality effects from Project operations would be most likely to occur. In addition, meteorological conditions may limit or prevent site access outside this period, particularly during winter (e.g., snow pack).

Table 2-3. List of Water Quality Monitoring Sites (and Associated Codes)

Sample Site	Associated Code
South Fork Tributary	SF
Spada Reservoir (near Log Boom)	SR-1
Sultan River below Culmback Dam	RM 16.1
Sultan River above Diversion Dam	RM 9.8
Sultan River below Diversion Dam	RM 9.6
Sultan River above Powerhouse	RM 4.9
Sultan River below Powerhouse (Tailrace)	RM 4.4
Sultan River near confluence	RM 0.2
Skykomish River upstream of Sultan River	RM 34.6[7]
Skykomish River downstream of Sultan River	RM 33.7

[6] Water temperature will be monitored at three additional locations (RM 14.3, RM 12.8, and RM 11.3) in the Sultan River in association with A-LA 3, Temperature Conditioning in Reach 3. The duration of this monitoring will be 3 to 5 years.

[7] Published RM values refer to the Skykomish River as an extension of the Snohomish River. The Skykomish and Snoqualmie rivers join together to form the Snohomish River at RM 20.5. The Sultan River is 13.9 miles upstream of this point of convergence.

Table 2-4. Parameters to be Monitored, Locations, and Sampling Frequency

Parameter	SF	SR-1	RM 16.1	RM 9.8	RM 9.6	RM 4.9	RM 4.4	RM 0.2	Skyko. RM 14.1	Skyko. RM 13.2	Frequency
Water temperature	•	•	•	•	•	•	•	•	•	•	Year-round .(hourly) in stream reaches. Monthly between May 1 and October 31 for lake profile.
Dissolved oxygen	•	•		•			•				May 1 to October 31. Monthly in stream reaches. Monthly for lake profile.
Turbidity	•	•		•			•				May 1 to October 31. Monthly in stream reaches. Monthly for lake profile.
pH	•	•		•			•				May 1 to October 31. Monthly in stream reaches. Monthly for lake profile.
Secchi transparency		•									May 1 to October 31. Monthly.
Flow discharge	•		•	•	•	•	•				Year-round. Daily.
Reservoir elevation		•									Year-round. Daily.

2.2.1. Descriptions of Sampling and Monitoring Locations

Major Tributary to Spada Lake (South Fork)

Monitoring will occur in the South Fork of the Sultan River, a main tributary to Spada Lake Reservoir, at a site located near the mouth of the tributary. The site is located above the high water level of the reservoir to ensure samples are representative of the tributary, without influence from the lake. The site is coded SF (South Fork), and corresponds to the same SF site sampled during the previous Water Quality Parameter Study (CH2M HILL 2010). Monitoring for water temperature and flow discharge will occur by USGS gaging station 12137290 (Table 2-2), and monitoring of dissolved oxygen, turbidity, and pH will occur at this site (Table 2-4).

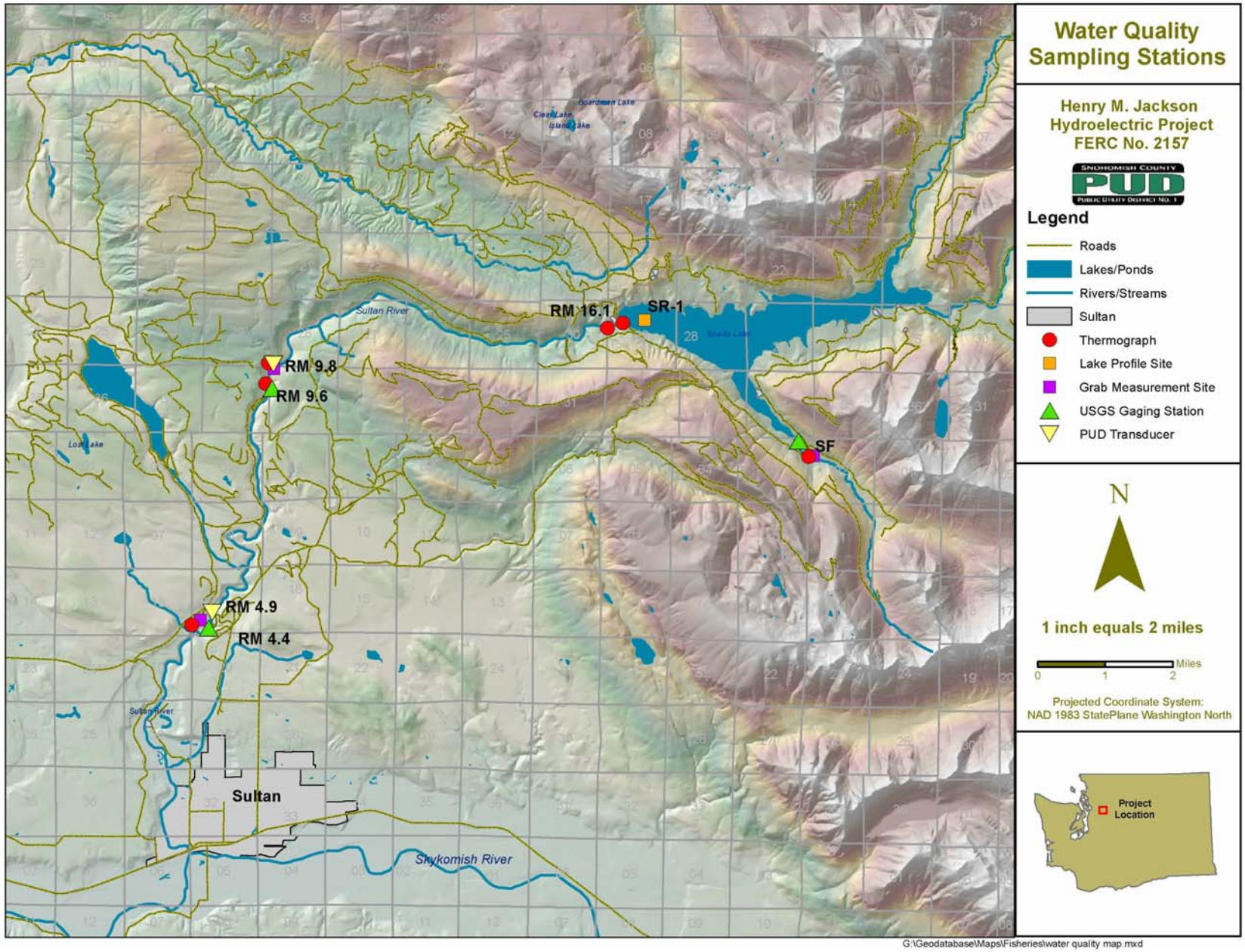

Figure 2-1. Map showing locations of Project water quality monitoring sites.

Spada Lake Reservoir

Spada Lake Reservoir monitoring will occur at a site near the outlet in the area of greatest water depth. This site is coded SR-1 (Spada Reservoir near outlet), and corresponds to the same SR-1 site sampled during the previous Water Quality Parameter Study (CH2M HILL 2010). At SR-1, profiling will occur for water temperature, dissolved oxygen, turbidity, and pH. Monitoring also will include measurements of Secchi transparency and reservoir elevation.

Sultan River from Culmback Dam to the Diversion Dam

This reach is a steep, narrow canyon. Monitoring will occur at two sites: one located just below Culmback Dam and the other just above the Diversion Dam. These sites are coded RM 16.1 and RM 9.8, respectively, and correspond to the sites with the same codes sampled during the previous Water Quality Parameter Study (CH2M HILL 2010). Selection of these sites was based on accessibility and safety, as well as reach representation. At RM 16.1, water temperature and flow discharge monitoring will occur. At RM 9.8, monitoring will occur for water temperature, dissolved oxygen, turbidity, and pH.

Sultan River from the Diversion Dam to the Powerhouse

Monitoring of water temperature and flow discharge will occur at one site located just below the Diversion Dam near the existing USGS gaging station 12137800. This site is coded RM 9.6, and corresponds to the site with the same code sampled during the previous Water Quality Parameter Study (CH2M HILL 2010).

Sultan River Downstream of the Powerhouse

Monitoring of water temperature and flow discharge will occur by USGS gaging station 12138160 (Table 2-2), and monitoring of dissolved oxygen, turbidity, and pH will occur at one site located in the tailrace of the Powerhouse. This site is coded RM 4.4 (tailrace), and corresponds to the site with the same code sampled during the previous Water Quality Parameter Study (CH2M HILL 2010).

2.2.2. Sampling Frequency

Continuous hourly measurements of water temperature will occur at sites SF, RM 16.1, RM 9.8, RM 9.6, and RM 4.4 from May 1 to October 31. Instream measurements of dissolved oxygen, turbidity, and pH will be taken monthly at sites SF, RM 9.8, and RM 4.4 from May 1 to October 31.

Spada Lake Reservoir (site SR-1) profiles of water temperature, dissolved oxygen, turbidity, and pH will be collected monthly from May 1 to October 31. Secchi depth measurements also will be obtained monthly at SR-1.

3. Monitoring and Analysis Procedures

3.1. Field Procedures

All in-situ measurements and field sampling procedures used for the monitoring will follow established protocols as described below.

3.1.1. Streamflow Monitoring

3.1.1.1 USGS

The collection, recording, and publishing of streamflow measurements of streamflow at South Fork, RM 9.6, and RM 4.4 will be conducted by the USGS following their established protocols as outlined in:

- Rantz, S.E. 1982. Geological Survey Water Supply Paper 2175, Measurement and Computation of Streamflow: Volume 1. Measurement of Stage and Discharge.
- Kennedy, E.J. 1984. Techniques of Water-Resources Investigations of the United States Geological Survey, Chapter A10, Discharge Ratings at Gaging Stations.

3.1.1.2 District

The collection and recording of streamflow measurements at RM 9.8 and RM 4.9 will be conducted by the District following USGS protocols. The development of site specific rating curves will be based on routine measurements of stage and discharge. Intermittent measurements of both discharge at RM 16.1 and reservoir elevation will used to calibrate the manufacturers rating curves for valves used to release water into Reach 3.

3.1.2. Reservoir Sampling

For in-situ measurements in Spada Lake Reservoir of water temperature, dissolved oxygen, turbidity, and pH, vertical profiles will be measured using an in-situ datasonde (Hydrolab Series 5 DataSonde or equivalent). Measurements will be taken at vertical increments of 1 meter (m) in water depths less than 15 m, 2-m increments in water 15 to 30 m deep, 3-m increments in water 30 to 50 m deep, and 5-m increments in water more than 50 m deep. Measurements also will be made at 0.5 m below the surface and 2 m above the bottom. Depth in Spada Lake Reservoir will be measured by the datasonde.

Secchi transparency will be measured in Spada Lake Reservoir with a standard 20-cm Secchi disk. There will be two independent measurements taken until the difference between the paired measurements is no more than 0.5 m.

3.1.3. Riverine Sampling

Continuously-recording thermographs (Onset Water Temp Pro or equivalent) will be deployed at sites SF, RM 16.1, RM 9.8, RM 9.6, and RM 4.4 (Table 2-4). The thermographs will be located at a point where complete mixing is expected. The thermographs will be programmed to record water temperature on an hourly basis. The thermographs will be

calibrated and data downloaded approximately monthly according to the procedures described below in the Quality Control section.

Instream grab measurements of dissolved oxygen, turbidity, and pH will be obtained at sites SF, RM 9.8, and RM 4.4 (Table 2-4) using an in-situ datasonde (Hydrolab Series 5 DataSonde or equivalent). Measurements will be obtained below the water surface (at about 0.5 m deep), and where flow is sufficiently turbulent to provide representative mixed water conditions. The datasondes will be calibrated and data downloaded for each sampling event according to the procedures described below in the Quality Control section.

3.2. Analytical Methods and Quality Control

The analytical methods that will be used for in-situ measurements of water temperature, dissolved oxygen, turbidity, and pH come from the operation manuals for the instruments to be used. The operation manuals for the instruments provide further detail regarding procedures used for collecting data, equipment use, and calibration, inspection, and maintenance / replacement schedule of the instruments. The operation manuals will be kept in hardcopy and will be maintained by the District.

3.2.1. Datasondes (Hydrolab Series 5 or Equivalent)

Calibration, inspection, and maintenance of the datasondes (Hydrolab Series 5 or equivalent), and data collection methods using the datasondes will follow detailed procedures described in the manufacturer operations manuals (e.g., Hydrolab DS5X Manual; Hach Company 2006; available online at: http://www.hydrolab.com/pdf/S5_Manual.pdf). Calibration checks will be performed to document datasonde bias and performance to ensure the quality of the data. Calibration checks will be completed in advance of datasonde deployment and upon retrieval, according to the detailed procedures described in the manufacturer operations manuals (e.g., Hydrolab DS5X Manual; Hach Company 2006).

3.2.2. Onset Water Temp Pro (or Equivalent) Thermographs

Procedures used for calibration, inspection, and maintenance of the thermographs (Onset Water Temp Pro or equivalent), and data collections using the thermographs will follow manufacturer instructions. Prior to the initial deployment, a calibration check will be performed by comparing the thermographs with water temperature measurements using a liquid thermometer (accurate to 0.1°C) or laboratory-grade digital thermometer. During the pre-deployment check, any thermograph having a mean absolute value difference greater than 0.2°C shall be rejected until the problem is corrected and the instrument passes another calibration check.

Calibration also will be checked during routine field servicing of the thermographs. Calibration checks will be used to document bias and performance to assure the quality of the data. All thermographs will be serviced and data downloaded approximately monthly. Field checks of the thermographs will be done using a liquid thermometer or laboratory-grade digital thermometer.

3.3. Data Quality Assessment and Reporting

3.3.1. Data Quality Assessment

All monitoring data will be reviewed to determine if the data meets designated Data Quality Objectives (DQOs) for precision, accuracy and completeness. DQOs for measurement data (also known as data quality indicators) include targets for precision, accuracy, and completeness. The overall objective for analytical data is to ensure that data of known and acceptable quality are obtained.

Table 3-1 lists the specific DQOs by parameter, including targets for precision, accuracy, completeness, and reporting limits. These DQOs provide the basis for the field and data analysis procedures as described below.

Precision is a measure of the scatter of the data when more than one measurement is made of the same sample. Field precision will be measured by collecting field duplicate samples for each sampling event, and will be evaluated by the relative percent difference (RPD) between field duplicate measurements.

Accuracy describes how close the measurement is to its true or expected value. Field accuracy will be ensured by field instrument calibration according to the manufacturers' instructions and by using standards and chemicals that are current (prior to expiration dates), and by following proper field measurement protocols.

Completeness is the percentage of valid results obtained compared to the total number of samples taken for a parameter. An invalid measurement would be one that does not meet the sampling methods requirements and the other data quality objectives. Completeness is ideally 100 percent, but the actual completeness is typically less than 100 percent, depending on the nature of sampling conditions. Completeness targets of less than 100 percent account for potential adverse field conditions or equipment problems.

Table 3-1. Data Quality Objectives (DQOs) for the Water Quality Monitoring

Parameters	Unit	Precision (RPD)	Accuracy [8] (% Recovery)	Completeness (% Valid Results)	Reporting Limit
Water temperature	^{o}C	<10%	95-105%	>90%	0.1
Dissolved oxygen	mg/L	<20%	80-120%	>80%	0.1
Turbidity	NTU	<20%	80-120%	>80%	0.1
pH	pH units	<10%	90-110%	>90%	0.1
Secchi transparency	meters	<10%	NA	>90%	0.1

Calculations and determinations for precision, accuracy and completeness will be made following each monitoring event. All of the DQOs are expected to be met. However, any data that do not meet DQOs will be tagged for potential corrective actions. The corrective

[8] NA: Not applicable. Standards unavailable or accuracy will be ensured based on instrument calibration.

actions may include, but are not limited to, the following: (1) re-sampling and re-analysis; (2) evaluating and amending sampling and analytical procedures; (3) accepting data and acknowledging level of uncertainty or inaccuracy by flagging the data and providing an explanation for their qualification; and (3) rejecting data and providing an explanation for their disqualification.

The reporting limits contained in Table 3-1 represent what are considered the level of quantitation desired to assess monitoring data, including reporting relative to compliance with standards and objectives for this monitoring program (as discussed in section 3.3.2). These reporting limits also represent the significant-digit level to which data will be tabulated and reported.

3.3.2. Water Quality Monitoring Reports

Water quality monitoring reports will be completed annually. The annual reports will describe the status of scheduled monitoring activities, summarize data acquisition and quality, present tables and graphs of key statistics and their trends, discuss compliance with standards and objectives, and highlight violations, if any. The reports will include appendices of all accepted data, explanations for unaccepted data, and other explanatory information as appropriate. The annual reports (by calendar year) will be made available to agencies, tribes and interested stakeholders by April 30 of the year following collection of the data.

The annual reports also will fulfill monitoring and reporting requirements as stipulated in Ecology's 401 Certification Order (October 18, 2010). As described in the 401 Certification Order (section 9.0, Monitoring and Reporting Requirements), the report will include summaries of the water quality data, and will include sample dates, times, locations, and results. Compliance with state water quality standards will be discussed. The reports will be submitted to the hydropower certification manager at Ecology, Water Quality Program, Northwest Regional Office, and the FERC.

4. References

CH2M HILL. 2010. *Water Quality Final Technical Report. Henry M. Jackson Hydroelectric Project (FERC No. 2157) Water Quality Parameter Study (RSP 1)*. Prepared for Public Utility District No. 1 of Snohomish County. October 2010.

Federal Energy Regulatory Commission (FERC). 1982. In the Matter of: Public Utility District No. 1 of Snohomish County and City of Everett Project No. 2157. Uncontested Offer of Settlement – Joint Agencies. March 24, 1982.

Federal Energy Regulatory Commission (FERC). 1983. Public Utility District No. 1 of Snohomish County and City of Everett, Washington, Project Nos. 2157-001, 002, 003, 004, 005 and 2157-010. Order Approving Uncontested Settlements and Amending License. February 9, 1983.

Hach Company. 2006. User Manual. Hydrolab DS5X, DS5, and MS5 Water Quality Multiprobes (Catalog Number 003078HY). Edition 3. February 2006.

Public Utility District No. 1 of Snohomish County (Snohomish County PUD). 2010. *Water Quality Plan (WQP)*. Draft. December 2010.

Washington Department of Ecology (Ecology). 2006. *Water Quality Standards for Surface Waters of the State of Washington*. Chapter 173-201A WAC. Amended November 20, 2006. Washington State Department of Ecology. November 2006. Publication Number 06-10-091.

APPENDIX 1

Proposed License Article

W-LA 1: Water Quality Protection Plan

Within 180 days of issuance of the FERC License, the Licensee shall file with the Commission, for approval, a Water Quality Protection Plan (WQPP). This WQPP shall document how the Licensee will implement a program to ensure compliance with Washington State water quality standards (as codified in WAC 173-201A) in the Sultan River. At a minimum WQPP shall include following components:

(1) water quality protection measures related to Project construction or maintenance activities (includes Best Management Practices (BMPs) for in-water and upland construction and maintenance activities);
(2) spill prevention and containment procedures;
(3) procedures for application of herbicides, pesticides, fungicides, and disinfectants; and
(4) compliance monitoring and reporting procedures for select water quality parameters, such as stream flow, temperature, turbidity etc..

The WQPP shall follow the Guidelines for Preparing Quality Assurance Project Plans (QAPP) for Environmental Studies (July 2004 Ecology Publication Number 04-03-030) or its successor. The WQPP shall contain, at a minimum, a list of water quality parameter(s) to be monitored, a map of sampling locations, and descriptions of the purpose of the monitoring, sampling frequency, sample type or number of samples, sampling procedures and equipment, analytical methods, quality control procedures, data handling and data assessment procedures, and reporting protocols.

The Licensee shall prepare an annual report based on data collected. The Licensee shall review and update the WQPP as needed.

The Licensee shall allow a minimum of thirty (30) days for members of the Aquatic Resource Committee (ARC) to comment and make recommendations before submitting the WQPP to the Commission. When filing the WQPP with the Commission, the Licensee shall include documentation of consultation; copies of comments and recommendations; and specific descriptions of how comments and recommendations from the ARC are accommodated by the Licensee's plan. If the Licensee does not adopt a recommendation, the filing shall include the Licensee's reasons based upon Project-specific information.

Upon Commission's approval, the Licensee shall implement the WQPP.

The following is from the Settlement Agreement's Joint Explanatory Statement:

W. Article W-LA1: Water Quality Monitoring License Article

The water quality protection plan conditions outlined in W-LA 1 are similar to those proposed in the License Application (*see* Appendix B at 3). Within 180 days of issuance of the FERC License, the District will file with the Commission, for approval, a Water Quality Protection Plan ("WQPP"). This WQPP will document how the District will implement a program to ensure compliance with Washington State water quality standards (as codified

in WAC 173-201A) in the Sultan River. At a minimum the WQPP will include the following components:

1. water quality protection measures related to Project construction or maintenance activities (includes Best Management Practices ("BMPs") for in-water and upland construction and maintenance activities);
2. spill prevention and containment procedures;
3. procedures for application of herbicides, pesticides, fungicides, and disinfectants; and
4. compliance monitoring and reporting procedures for select water quality parameters, such as temperature and turbidity.

The WQPP will follow the Guidelines for Preparing Quality Assurance Project Plans ("QAPP") for Environmental Studies (July 2004 Ecology Publication Number 04-03-030) or its successor.

The District will prepare an annual report based on data collected. The District will review and update the WQPP as needed and provide the updated WQPP to Ecology.

Appendix 2

Documentation of Consultation

Presler, Dawn

From: Presler, Dawn
Sent: Monday, January 10, 2011 12:59 PM
To: 'Maynard, Chris (ECY)'; 'mkan461@ecy.wa.gov'
Cc: Binkley, Keith; Moore, Kim
Subject: Jackson Hydro (P2157) - DRAFT WQ and WQMP for review
Attachments: DRAFT_p2157_WQMP_Water_Quality_Monitoring_Plan.DOC; DRAFT_p2157 _Water_Quality_Plan.DOC

Monika and Chris,
Attached are the draft Water Quality and Water Quality Monitoring Plans per the Jackson Project's Settlement Agreement and 401. Keith will be in touch with you in a couple weeks to see if you have any initial questions/want to set up a meeting to discuss. We would like Ecology's review and approval of the Plans prior to sending it to the ARC for their review. Since we're hoping to do the Marsh Creek Slide fix this August (if license and permits received), we also need to make sure these Plans get reviewed and approved in a timely manner to support the Marsh Creek Slide fix as well.

Let me know if you have any questions.

Happy New Year!

Dawn Presler
Sr. Environmental Coordinator
Generation Resources

Snohomish County PUD No. 1
PO Box 1107 Everett, WA 98206-1107
Phone: 425-783-1709

Presler, Dawn

From: Binkley, Keith
Sent: Friday, February 25, 2011 4:08 PM
To: Maynard, Chris (ECY)
Cc: Presler, Dawn
Subject: Monitoring for Aquatic PM&E's - spreadsheet CM DOE.xls
Attachments: Monitoring for Aquatic PM&E's - spreadsheet CM DOE.xls

Hi Chris – Attached is a spreadsheet depiction of our global monitoring effort under the pending license for Jackson. My intent is to have this as an Appendix to the WQMP which I hope to send out to the ARC on Monday. Let me know what you think.

Meanwhile – have a good weekend!

Keith

Presler, Dawn

From: Presler, Dawn
Sent: Friday, March 04, 2011 12:47 PM
To: 'Deborah Knight'; 'okeefe@amwhitewater.org'; 'Jim Miller'; 'steven.m.fransen@noaa.gov'; 'Haas, Andy'; 'Abby Hook'; 'Tim_Romanski@fws.gov'; 'Loren Everest'; 'Maynard, Chris (ECY)'; 'Applegate, Brock A (DFW)'
Cc: 'mick.matheson@ci.sultan.wa.us'; 'jsklare@ci.everett.wa.us'; Binkley, Keith; Moore, Kim
Subject: ARC - draft Water Quality Monitoring Plan - for your review
Attachments: DRAFT_WQMP_Water_Quality_Monitoring_Plan_030411.DOC

Dear ARC,
Attached is the draft Water Quality Monitoring Plan. Please take the next 30-days to review and provide your comments to Keith and me by April 4. Contact Keith directly for any questions/clarifications on the WQM Plan at 425-783-1769 or KMBinkley@snopud.com .

Have a great weekend!

Dawn

From: Presler, Dawn
Sent: Thursday, February 17, 2011 12:14 PM
To: 'Deborah Knight'; 'okeefe@amwhitewater.org'; 'Jim Miller'; 'steven.m.fransen@noaa.gov'; 'Haas, Andy'; 'Abby Hook'; 'Tim_Romanski@fws.gov'; 'Loren Everest'; 'Maynard, Chris (ECY)'; 'Applegate, Brock A (DFW)'
Cc: 'mick.matheson@ci.sultan.wa.us'; 'jsklare@ci.everett.wa.us'; Binkley, Keith; Moore, Kim
Subject: ARC - draft Water Quality Plan - 3-week review

Per the ARC meeting yesterday, attached is the **draft Water Quality Plan** for your 3-week review. (The WQ Monitoring Plan will be provided in the next week after Keith addressed the Ecology's edits/comments.) Please provide your comments/edits, if any, on the WQ Plan back to me and Keith by Thursday March 10. If you need the full 30-days, please let us know. You can also contact Keith directly for any questions/clarifications at 425-783-1769 or KMBinkley@snopud.com .

Dawn

From: Presler, Dawn
Sent: Thursday, February 17, 2011 11:56 AM
To: 'Deborah Knight'; 'okeefe@amwhitewater.org'; 'Jim Miller'; 'steven.m.fransen@noaa.gov'; 'Haas, Andy'; 'Abby Hook'; 'Tim_Romanski@fws.gov'; 'Loren Everest'; 'Maynard, Chris (ECY)'; 'Applegate, Brock A (DFW)'
Cc: 'mick.matheson@ci.sultan.wa.us'; 'jsklare@ci.everett.wa.us'; Binkley, Keith; Moore, Kim
Subject: ARC Mtg 2/16 - draft meeting summary

Attached is the draft ARC meeting summary and attachments from our ARC meeting yesterday. Per the ARC Guidelines, please review and provide edits, if any, back to me by Thursday Feb 24.

Future Y2011 ARC Meetings are:

- April 13, 2011 (2nd Wednesday since Loren was unavailable the week of April 19)
- June 15, 2011
- August 17, 2011
- October 19, 2011

Dawn Presler
Sr. Environmental Coordinator
Generation Resources

Snohomish County PUD No. 1
PO Box 1107 Everett, WA 98206-1107
Phone: 425-783-1709

APPENDIX 3

Table of License Monitoring Components

A-LA	Description	Purpose	Monitoring Components	Location	Timing	Frequency	Duration	Reporting	Comments
2	Marsh Creek Slide Modification and Monitoring	Document effectiveness	Annual escapement surveys to assess relative use in index areas upstream and downstream of the slide	Within four established index areas between RM 0.0 and 9.7 of the Sultan River	Spring and Fall	Annually	License Term	ARC, FERC	Redundant to A-LA 13 and A-LA 17
2	Marsh Creek Slide Modification and Monitoring	Document effectiveness	Post modification topographic surveys, if passage remains obstructed	Site specific evaluation at RM 7.5 (slide location) of the Sultan River	During summer, low-flow conditions	One time	N/A	ARC	
3	Temperature Conditioning in Reach 3	Document modified thermal regime	Longitudinal monitoring	Five total mainstem locations (RM 16.1, 14.3, 12.8, 11.3 and 9.8), one tributary location (Big Four Creek)	Year-round, hourly monitoring		Monitoring immediately downstream of Culmback Dam (near RM 16.1) and immediately upstream of Diversion Dam (near RM 9.8) will occur through term of new license, monitoring at the three remaining locations (RM 14.3, 12.8, and 11.3) will continue until correlations with permanent stations have been established	ARC, FERC within annual operations reports	Year-round monitoring at RM 16.1 and 9.8 for the license term is common with A-LA 17 and W-LA 1
3	Temperature Conditioning in Reach 3	Document community response to modified thermal regime	Periphyton	Five total mainstem locations (RM 16.1, 14.3, 12.8, 11.3 and 9.8)	Late August / early September	Once annually during Years 0 (baseline), 1, 3, and contingently 5		ARC, FERC	
3	Temperature Conditioning in Reach 3	Document community response to modified thermal regime	Chlorphyll A	Five total mainstem locations (RM 16.1, 14.3, 12.8, 11.3 and 9.8)	Late August / early September	Once annually during Years 0 (baseline), 1, 3, and contingently 5		ARC, FERC	
3	Temperature Conditioning in Reach 3	Document community response to modified thermal regime	Drift	Two mainstem locations (RM 14.3 and 12.8)	Early summer / late summer	Twice annually during Years 0 (baseline), 1, and 3		ARC, FERC	
3	Temperature Conditioning in Reach 3	Document community response to modified thermal regime	Benthic Macroinvertebrates	Five total mainstem locations (RM 16.1, 14.3, 12.8, 11.3 and 9.8)	Late August / early September	Once annually during Years 0 (baseline), 1, 3, and contingently 5		ARC, FERC	
3	Temperature Conditioning in Reach 3	Document community response to modified thermal regime	Fish, relative abundance	Two mainstem locations (RM 14.3 and 12.8)	Late summer	Once annually during Years 0 (baseline), 1, 3, and contingently 5		ARC, FERC	

A-LA	Description	Purpose	Monitoring Components	Location	Timing	Frequency	Duration	Reporting	Comments
3	Temperature Conditioning in Reach 3	Document community response to modified thermal regime	Fish growth, stable isotope analysis	Two mainstem locations (RM 14.3 and 12.8)	Late summer	Once annually during Years 0 (baseline), 1, and 3		ARC, FERC	
4	Whitewater Boating Flows	Document compliance with license terms	Flow conditions (magnitude and duration)	Compliance measured at USGS gages at PH and DDAM and PUD instrumentation at CD, U/S of DDAM, and U/S of PH	Per event		License term		
4	Whitewater Boating Flows		Number of users and skill level by location, run time		Per event		License term		
5	Downramping Rate Conditions	Document compliance with license terms	Rate of change in stage (elevation) at compliance point	Compliance measured at USGS gages at PH and DDAM	Ongoing, tied to routine operations		License term	Compliance reporting to FERC	
5	Downramping Rate Conditions	Document compliance with license terms	Rate of change in stage (elevation) at compliance point	Compliance measured at USGS gages at PH and DDAM	During process flow releases		License term	Compliance reporting to FERC	
5	Downramping Rate Conditions	Evaluation of connectivity	Rate of change in stage (elevation)	Site specific analysis at side channel locations	Prior to 1 year after completion of side channel enhancement projects			ARC, FERC	
6	Large Woody Debris	Document effectiveness	Evolution of structure (degradation, racking), change in localized hydraulics and habitat features at structure, fish use	Downstream of RM 2.7 at mainstem engineered log jam locations	summer, low-flow	Annually for the first 5 years after installation and then after each high flow > 4,100 cfs		ARC	
7	Side Channel PM&E Conditions	Document effectiveness	Flow connectivity with mainstem	Side Channels 1, 2, 3, and 4	summer, low-flow	Ongoing, surveys focused during summer months when near minimum flows			
7	Side Channel PM&E Conditions	Document effectiveness	Discharge (seasonal)	Side Channels 1, 2, 3, and 4	summer, low-flow	Ongoing, spot measurements over a range of flow conditions			
7	Side Channel PM&E Conditions	Document effectiveness	Fish use	Side Channels 1, 2, 3, and 4	summer, low-flow	Annual surveys during the first 5 years after construction			
7	Side Channel PM&E Conditions	Document effectiveness	Temperature	Side Channels 1, 2, 3, and 4	summer, low-flow	Ongoing, surveys focused during summer months when near minimum flows			
8	Process Flow Regime	Document compliance with license terms	Magnitude, duration, and timing of events,		Ongoing, constant, and continuous		License term	Compliance reporting to FERC	
8	Process Flow Regime	Document effectiveness	Physical monitoring consistent with and supplementary to A-LA 17 including permanent reference transects in each operational reach	Downstream of RM 2.7	Post high flow events during years 1 through 10. After channel forming flows for the remainder of the license.			Process Flow Effectiveness Report every ten (10) years	
9	Minimum Flows	Document compliance with license terms	Discharge	Compliance measured at USGS gages at PH and DDAM and PUD instrumentation at CD	Ongoing, tied to routine operations		License term	Compliance reporting to FERC	
10	Spada Lake Recreational Fishery	Monitor population trends	Use gill netting to collect data on relative abundance and structure of trout population	Consistent with past surveys	Summer / fall	Every 5 years, starting in 2012			

A-LA	Description	Purpose	Monitoring Components	Location	Timing	Frequency	Duration	Reporting	Comments
13	Diversion Dam Volitional Passage	Document passage effectiveness	Spawning surveys (relative utilization of index areas, including a Reach 3 Index Area)	Within four established index areas between RM 0.0 and 9.7 of the Sultan River plus a new index area to be established upstream of DDAM once passage is completed	Spring and Fall	Annually	License Term		Redundant with A-LA 2 and A-LA 17
14	Reservoir Operations	Document compliance with license terms	Reservoir elevation	Spada Reservoir	Ongoing, tied to routine operations		License term	Compliance reporting to FERC	
17	Fisheries and Habitat Monitoring Plan	Riverine Habitat	Habitat units, substrate composition, gradient, channel exposure, woody debris, bank stability, riparian vegetation content, and photo documentation	Focus on lower river, Reach 1	Post high flow events during years 1 through 10. After channel forming flows for the remainder of the license.		License term		
17	Fisheries and Habitat Monitoring Plan	Water Temperature	Basin wide monitoring	South Fork Sultan River, base of Culmback Dam, upstream and downstream of the Diversion Dam, upstream and downstream of the Powerhouse, at the confluence with the Skykomish River, and in the Skykomish River upstream and downstream of the Sultan River.	Year-round, hourly monitoring		License term	Redundant with W-LA 1	
17	Fisheries and Habitat Monitoring Plan	Spawner abundance, distribution, and timing	Surveys per current survey protocol	Four (five when passage occurs) established index areas downstream of CD	Spring and Fall	Annually	License Term	Annual Operations Report	Redundant with A-LA 2 and A-LA 13
17	Fisheries and Habitat Monitoring Plan	Juvenile production, distribution, and habitat utilization	A juvenile trapping operation will be employed	Lower river near RM 0.2	February through June	Annually for the first six years and then two out of every six years thereafter			

Appendix B:
Proposed License Article

W-LA 1: Water Quality Protection Plan

Within 180 days of issuance of the FERC License, the Licensee shall file with the Commission, for approval, a Water Quality Protection Plan (WQPP). This WQPP shall document how the Licensee will implement a program to ensure compliance with Washington State water quality standards (as codified in WAC 173-201A) in the Sultan River. At a minimum WQPP shall include following components:

(1) water quality protection measures related to Project construction or maintenance activities (includes Best Management Practices (BMPs) for in-water and upland construction and maintenance activities);
(2) spill prevention and containment procedures;
(3) procedures for application of herbicides, pesticides, fungicides, and disinfectants; and
(4) compliance monitoring and reporting procedures for select water quality parameters, such as stream flow, temperature, turbidity etc..

The WQPP shall follow the Guidelines for Preparing Quality Assurance Project Plans (QAPP) for Environmental Studies (July 2004 Ecology Publication Number 04-03-030) or its successor. The WQPP shall contain, at a minimum, a list of water quality parameter(s) to be monitored, a map of sampling locations, and descriptions of the purpose of the monitoring, sampling frequency, sample type or number of samples, sampling procedures and equipment, analytical methods, quality control procedures, data handling and data assessment procedures, and reporting protocols.

The Licensee shall prepare an annual report based on data collected. The Licensee shall review and update the WQPP as needed.

The Licensee shall allow a minimum of thirty (30) days for members of the Aquatic Resource Committee (ARC) to comment and make recommendations before submitting the WQPP to the Commission. When filing the WQPP with the Commission, the Licensee shall include documentation of consultation; copies of comments and recommendations; and specific descriptions of how comments and recommendations from the ARC are accommodated by the Licensee's plan. If the Licensee does not adopt a recommendation, the filing shall include the Licensee's reasons based upon Project-specific information.

Upon Commission's approval, the Licensee shall implement the WQPP.

From the Settlement Agreement's Joint Explanatory Statement:

W. Article W-LA1: Water Quality Monitoring License Article

The water quality protection plan conditions outlined in W-LA 1 are similar to those proposed in the License Application (*see* Appendix B at 3). Within 180 days of issuance of

the FERC License, the District will file with the Commission, for approval, a Water Quality Protection Plan ("WQPP"). This WQPP will document how the District will implement a program to ensure compliance with Washington State water quality standards (as codified in WAC 173-201A) in the Sultan River. At a minimum the WQPP will include the following components:

1. water quality protection measures related to Project construction or maintenance activities (includes Best Management Practices ("BMPs") for in-water and upland construction and maintenance activities);
2. spill prevention and containment procedures;
3. procedures for application of herbicides, pesticides, fungicides, and disinfectants; and
4. compliance monitoring and reporting procedures for select water quality parameters, such as temperature and turbidity.

The WQPP will follow the Guidelines for Preparing Quality Assurance Project Plans ("QAPP") for Environmental Studies (July 2004 Ecology Publication Number 04-03-030) or its successor.

The District will prepare an annual report based on data collected. The District will review and update the WQPP as needed and provide the updated WQPP to Ecology.

Appendix C:
Documentation on Consultation Opportunities

Presler, Dawn

From: Presler, Dawn
Sent: Monday, January 10, 2011 12:59 PM
To: 'Maynard, Chris (ECY)'; 'mkan461@ecy.wa.gov'
Cc: Binkley, Keith; Moore, Kim
Subject: Jackson Hydro (P2157) - DRAFT WQ and WQMP for review
Attachments: DRAFT_p2157_WQMP_Water_Quality_Monitoring_Plan.DOC; DRAFT_p2157 _Water_Quality_Plan.DOC

Monika and Chris,
Attached are the draft Water Quality and Water Quality Monitoring Plans per the Jackson Project's Settlement Agreement and 401. Keith will be in touch with you in a couple weeks to see if you have any initial questions/want to set up a meeting to discuss. We would like Ecology's review and approval of the Plans prior to sending it to the ARC for their review. Since we're hoping to do the Marsh Creek Slide fix this August (if license and permits received), we also need to make sure these Plans get reviewed and approved in a timely manner to support the Marsh Creek Slide fix as well.

Let me know if you have any questions.

Happy New Year!

Dawn Presler
Sr. Environmental Coordinator
Generation Resources

Snohomish County PUD No. 1
PO Box 1107 Everett, WA 98206-1107
Phone: 425-783-1709

Presler, Dawn

From: Presler, Dawn
Sent: Thursday, February 17, 2011 12:14 PM
To: 'Deborah Knight'; 'okeefe@amwhitewater.org'; 'Jim Miller'; 'steven.m.fransen@noaa.gov'; 'Haas, Andy'; 'Abby Hook'; 'Tim_Romanski@fws.gov'; 'Loren Everest'; 'Maynard, Chris (ECY)'; 'Applegate, Brock A (DFW)'
Cc: 'mick.matheson@ci.sultan.wa.us'; 'jsklare@ci.everett.wa.us'; Binkley, Keith; Moore, Kim
Subject: ARC - draft Water Quality Plan - 3-week review
Attachments: DRAFT_p2157_Water_Quality_Plan.doc

Per the ARC meeting yesterday, attached is the **draft Water Quality Plan** for your 3-week review. (The WQ Monitoring Plan will be provided in the next week after Keith addressed the Ecology's edits/comments.) Please provide your comments/edits, if any, on the WQ Plan back to me and Keith by Thursday March 10. If you need the full 30-days, please let us know. You can also contact Keith directly for any questions/clarifications at 425-783-1769 or KMBinkley@snopud.com .

Dawn

From: Presler, Dawn
Sent: Thursday, February 17, 2011 11:56 AM
To: 'Deborah Knight'; 'okeefe@amwhitewater.org'; 'Jim Miller'; 'steven.m.fransen@noaa.gov'; 'Haas, Andy'; 'Abby Hook'; 'Tim_Romanski@fws.gov'; 'Loren Everest'; 'Maynard, Chris (ECY)'; 'Applegate, Brock A (DFW)'
Cc: 'mick.matheson@ci.sultan.wa.us'; 'jsklare@ci.everett.wa.us'; Binkley, Keith; Moore, Kim
Subject: ARC Mtg 2/16 - draft meeting summary

Attached is the draft ARC meeting summary and attachments from our ARC meeting yesterday. Per the ARC Guidelines, please review and provide edits, if any, back to me by Thursday Feb 24.

Future Y2011 ARC Meetings are:

- April 13, 2011 (2nd Wednesday since Loren was unavailable the week of April 19)
- June 15, 2011
- August 17, 2011
- October 19, 2011

Dawn Presler
Sr. Environmental Coordinator
Generation Resources

Snohomish County PUD No. 1
PO Box 1107 Everett, WA 98206-1107
Phone: 425-783-1709

Presler, Dawn

From: Presler, Dawn
Sent: Thursday, June 09, 2011 12:01 PM
To: 'Steve Fransen'; 'Leonetti, Frank'; 'Abby Hook'; 'Tim_Romanski@fws.gov'; 'Loren Everest'; 'Maynard, Chris (ECY)'; 'Applegate, Brock A (DFW)'; 'okeefe@amwhitewater.org'; 'Jim Miller'; 'Deborah Knight'
Cc: Binkley, Keith; Moore, Kim
Subject: ARC - final review of plans
Attachments: FINAL_WQMP_Water_Quality_Monitoring_Plan.pdf; FINAL_Water_Quality_Plan.pdf; FINAL_SCELWD_Plan.pdf

Dear ARC Members:
Attached are the final plans to be filed with the FERC after the new license is issued as discussed at the April ARC meeting. Plans include: SCE/LWD, WQ, and WQM. DDVP will come in another email due to size of attachments.

SCE/LWD Plan – Keith updated per discussions at the last ARC meeting and specifically integrates suggestions from Brock and Abby. In addition, the revised version includes an updated map to reflect the relocation of one engineered log jam. We have also modified the naming convention for the ELJ's to be consistent with the plans being prepared by Herrera.

Please take the next week to review these final plans and provide comments, if any, back to me by June 17 COB. Otherwise, I will take your silence as concurrence with the attached plans and I will file them with the FERC for their approval after the new license is issued. Thanks everyone!

Dawn Presler
Sr. Environmental Coordinator
Generation Resources
(425) 783-1709
****
PUD No. 1 of Snohomish County
PO Box 1107
Everett, WA 98206-1107