



STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

REPORT OF EXAMINATION
TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON



Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology.)



Ground Water (Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

PRIORITY DATE June 20, 1990	APPLICATION NUMBER S1-25746	PERMIT NUMBER	CERTIFICATE NUMBER
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NAME Snohomish County Public Utility District No. 1			
ADDRESS (STREET) 2320 California Street	(CITY) Everett	(STATE) Washington	(ZIP CODE) 98201

PUBLIC WATERS TO BE APPROPRIATED

SOURCE Youngs Creek		
TRIBUTARY OF (IF SURFACE WATERS) Elwell Creek, a tributary of the Skykomish River		
MAXIMUM CUBIC FEET PER SECOND 120	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE FEET PER YEAR 80,000
PURPOSE OF USE, PERIOD OF USE		

Hydropower Year round when instream flows are met

Based on consideration of instream flow requirements incorporated into the project's Federal Energy Regulatory Commission (FERC) license and on streamflow records for Youngs Creek, it is anticipated that continuous operation will generally occur from October 1 through May 15. From May 16 through July 15, the operation is expected to be intermittent to capture peak flows during storm events, but there will be periodic shutdowns when instream flows are not met. Between July 16 and September 30, infrequent operation will occur only during peak flows above the instream flows.

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION--WITHDRAWAL

River Mile 5.0 on Youngs Creek, Snohomish County, Washington

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION) NE 1/4 SE 1/4	SECTION 33	TOWNSHIP N. 27	RANGE, (E. OR W.) W.M. 8E	W.R.I.A. 7	COUNTY Snohomish
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RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)
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LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

The place of use is considered to be the powerhouse location:

A TRACT OF LAND LOCATED IN THE NORTHEAST ONE-QUARTER OF SECTION 30, TOWNSHIP 27 NORTH, RANGE 8 EAST, WILLAMETTE MERIDIAN, SNOHOMISH COUNTY, WASHINGTON, DESCRIBED AS FOLLOWS:

BEGINNING AT STATION 151+-57.99 OF THE YOUNG'S CREEK HYDROELECTRIC PROJECT, BEING A POINT LOCATED NORTH 51° 30' 04" WEST A DISTANCE OF 4378.62 FEET FROM THE SOUTH ONE-QUARTER CORNER OF SECTION 29, TOWNSHIP 27 NORTH, RANGE 8 EAST, WILLAMETTE MERIDIAN; THENCE SOUTH 39° 40' 01" WEST A DISTANCE OF 37.00 FEET; THENCE NORTH 50° 19' 59" WEST A DISTANCE OF 178.00 FEET; THENCE NORTH 39° 40' 01" EAST A DISTANCE OF 106.00 FEET; THENCE SOUTH 50° 19' 59" EAST A DISTANCE OF 178.00 FEET; THENCE SOUTH 39° 40' 01" WEST A DISTANCE OR 69.00 FEET, MORE OR LESS, TO THE POINT OF BEGINNING. (see Attachment 1 for map of place of use, point of diversion, and location)

DESCRIPTION OF PROPOSED WORKS

The Youngs Creek project is a run of the river hydropower project proposed by the Snohomish County Public Utility District No. 1 (District) that is expected to produce about 20 gigawatt-hours of electricity annually. Generation output is maximized during winter high flows which are generally coincident with periods of high energy demands. The proposed works include the following components:

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- a) An approximately 12-foot high, 65-foot long concrete diversion weir with a crest elevation of 1,530 feet above mean sea level (msl);
- b) An intake structure;
- c) A 14,300 foot long penstock, with 51-inch initial diameter, tapering to 48 inch diameter;
- d) A powerhouse containing one 7.5 Megawatt (MW) Pelton type turbine connected to a synchronous type generator;
- e) A short tailrace, approximately 20 feet wide and 80 feet long;
- f) A 12.47-kilovolt, 8.2 mile-long underground and overhead transmission line; and
- g) Other appurtenances associated with the project.

The Federal Energy Regulatory Commission (FERC) license for the project (Number 10359) was granted on May 5, 1992, and license extensions were granted in 12/95, 9/98, 5/04, and 10/08. The license expiration date is April 30, 2042. The project was originally for 7.5 MW, but was later amended to 8.3 MW in 1994. The District has filed an amendment to revert the project back to 7.5 MW.

Additional details on the project are summarized below.

Diversion Weir: The weir will be approximately 12 feet high and 65 feet long. Water will back up behind the weir for approximately 200 feet at normal pool elevation. Maximum water depth will be approximately 11.5 feet near the weir, although in most of the pool it will be significantly less. The total pool size will be approximately 9,150 square feet (0.21 acre). The water intake will consist of a concrete structure with a trash rack, fish screens, and closure gate built to Washington Department of Fish and Wildlife (WDFW) fish protection standards. A small amount of water flowing into the intake will not pass through the screens, but will transport fish through a bypass pipe back into the stream immediately downstream of the weir.

Penstock: A 14,300-foot-long, steel penstock with an initial diameter of 51 inches tapering to 48 inches, will deliver water from the headworks to the powerhouse. The penstock will be routed down existing roads, an abandoned railroad grade, and through managed forestlands to the powerhouse site. It will be located on the north (right) bank of the creek and will be buried for most of its length.

Powerhouse: The powerhouse, a 60-foot by 40-foot-wide concrete structure, will be set back from the ordinary high water mark (OHWM) of the creek approximately 40 feet. Discharge flows will be returned to the creek in a 12-foot-wide concrete and riprap lined channel. An outdoor switchyard will be constructed next to the powerhouse to contain the main power transformer and other electrical equipment. The powerhouse will contain a Pelton type turbine/generator with an installed capacity of 7.5 MW. The full load for the power plant is 120 cfs.

Operation of the project is intended to be fully automatic, using electronic monitoring of water levels and in the creek to control diversions based on instream flow restrictions and ramping rates. Work completed to date on the project includes stream gaging, surveying, clearing of the powerhouse site, some clearing of the penstock route, construction of a bridge, and some road work.

The ramping rates in the FERC license (Article 412) are summarized as follows:

Article 412. The licensee shall maintain maximum rates of change in river flow (ramping rates) during project start-up and shut-down according to the following table:

Ramping rates to be maintained for the Youngs Creek Project

Season	Daylight	Night	Rationale
February 16-June 15 Salmon Emergence	No Ramping	2 in/hr	Chinook fry in gravel during day
June 15-October 31 Steelhead Emergence and rearing	1 in/hr	2 in/hr	Steelhead fry show opposite behavior
November 1 –February 15 Winter refuge activity	2 in/hr	2 in/hr	Low fish activity

*Daylight is defined as 1 hour before dawn and 1 hour after sunset.

The location at which to determine ramping rates compliance shall be mutually determined by the licensee, the Washington Department of Wildlife, and the U.S. Fish and Wildlife Service prior to project operation. The location of this site should be identified in the as-built drawings as required by Article 304.

Under a Memorandum of Understanding (MOU) between the District, WDFW, and the Washington State Department of Ecology (Ecology), signed on June 12, 2009, the District proposes to use a 4 inch per hour downramping rate (in the bypass reach) for flows > 20 cfs and a 2 inch per hour ramping rate would apply for flows < 20 cfs. Also, the District plan to avoid normal shut-down during the nighttime hours between June 15 and October 15 each year.

Included within the project area are 5.3 acres of lands acquired for mitigation under the license. The mitigation parcel is situated between the penstock/access road and the 75-foot riparian management zone along Youngs Creek, and extends downstream from the intake to the unnamed stream in the NE ¼ of Section 33, Township 27 North, Range 08 East. Under the FERC license, this mitigation lands tract is to be protected during the term of the license. However, to provide greater protection to compensate for critical areas impacts under the Snohomish County Critical Areas Ordinance, the 5.3 acres will be placed into a permanent protective land designation to preclude all future development and timber harvest activities. Forest in the mitigation parcel will be protected from timber harvest, promoting the future establishment of mature forest conditions.

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE: July 2010	COMPLETE PROJECT BY THIS DATE: December 2012	WATER PUT TO FULL USE BY THIS DATE: July 2025
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REPORT

**REPORT OF EXAMINATION FOR APPLICATION S1-25746 SNOHOMISH COUNTY
PUBLIC UTILITY DISTRICT NO. 1**

BACKGROUND

Snoqualmie River Hydro (SRH) filed water right application S1-25746 (priority date of June 20, 1990) for a permit to appropriate surface water from Youngs Creek for a run of the river hydropower project. The application requested 120 cubic feet per second (cfs). SRH later submitted a second water right application (S1-25746B; priority date of January 26, 1994) to appropriate an additional 20 cfs from Youngs Creek for run of the river hydropower generation. Public notices for both applications were published in September 1990 and February 1995, respectively. Two protests were received for the original water right application.

The District purchased the Youngs Creek project from SRH effective October 31, 2008. The FERC license associated with the project was transferred to the District in an order on October 7, 2008. The District requested that the two applications be combined into a single application (S1- 25746), and this was approved by Ecology with the original June 20, 1990 priority date retained. As a result, the combined application is for 140 cfs for run of the river hydropower generation. Public notice of the combined water right application was published in the Monroe Monitor-Valley News in June 2008, consistent with requirements. No protests for the combined application were received. A reservoir permit is not required for this project, since it is a run of the river project and there is no intent to retain a portion of the annual runoff of Youngs Creek for beneficial use (WAC 508-12-260).

Youngs Creek is in the Snohomish River Basin within Water Resource Inventory Area (WRIA) 7. Youngs Creek is tributary to Elwell Creek, which is tributary to the Skykomish River and enters the Skykomish River on the south bank about 2.4 miles southeast of the Town of Sultan (Figure 1). The geologic conditions in the Youngs Creek basin generally consist of a thin layer of glacial materials (till and outwash) or colluvium over volcanic bedrock. The stream is generally steep, with the gradient ranging from about 3% below the powerhouse to 7% to 8% in the bypass reach and above the diversion. A natural anadromous fish barrier occurs about one mile upstream of the Elwell Creek confluence, with fish above the barrier limited to resident rainbow trout.

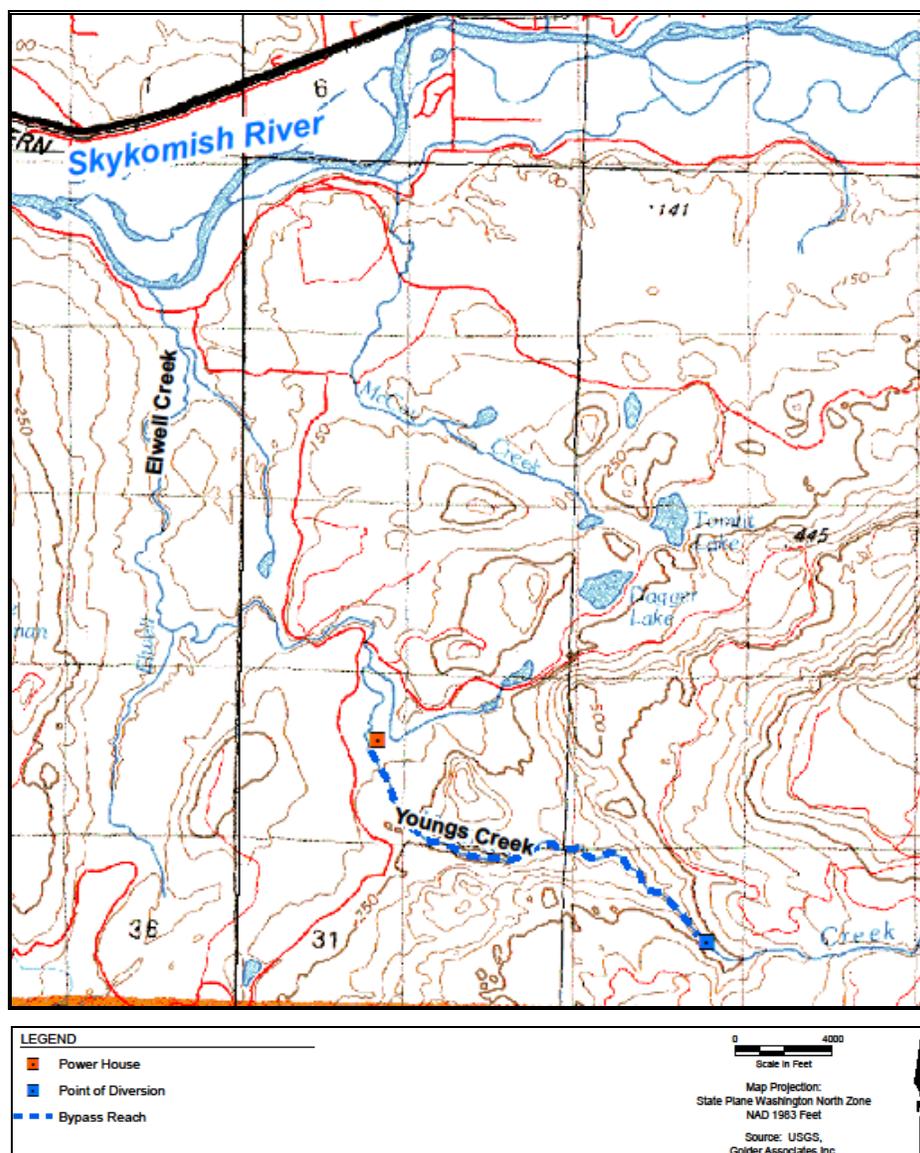


Figure 1. Project Site Location

The proposed Youngs Creek hydropower project design components include a 12-foot high, 65-foot long diversion weir with a crest elevation of 1,530 feet, an intake structure, a 51-inch to 48-inch diameter, 14,300-foot long penstock, and a powerhouse and transmission line. The design generation capacity of the project is 7.5 MW at a diversion rate of 120 cfs. The point of diversion is located in Section 33, T27N, R8E, at River Mile 5.0 on Youngs Creek (Figure 1). The diversion is four miles upstream of the natural anadromous fish barrier (River Mile 1), and will be screened to prevent resident rainbow trout from entering the diversion. The powerhouse is planned at River Mile 2.4, resulting in a bypass reach of 2.6 miles. The project layout is shown on Figure 2.

Operation Start Up and Shutdown

Given the concern for stranding fish in the bypass reach, start-up of the project will need to incorporate the ramping rate criteria governing the project. Prior to start-up, flows will be passing through the minimum instream flow weir, and no water will be traveling through the penstock to the powerhouse. The turbine main inlet valve at the powerhouse will be closed, but the penstock would likely be filled. The Programmable Logic Controller (PLC) at the powerhouse will be constantly monitoring the level gages at the intake. The PLC will also include programming identifying the time of year, date, and additional program routines tested and refined during start-up to follow the philosophy of operation described in Section D of Part 1.04 of Section 16450, Turbine Generator Control Panels.

When monitoring shows there is enough flow in the stream to operate the powerhouse (with respect to minimum instream flows, and other factors being monitored) the penstock head gate and main inlet valve will be opened. At this point, the needle valves will begin to open at a pre-programmed rate. This rate of opening directly correlates to the decrease in flow in the bypass reach; so the rate at which opening occurs is dependent on current flow and stage.

The majority of the year, the project will be operating on a run-of-the-river mode. The PLC of the governor which controls the turbine will monitor the elevation of the head-pond, and will increase or decrease flows through the

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turbine (by throttling, i.e. opening or closing the needle valves) in an effort to keep the head-pond water surface elevation constant.

In this mode, the bypass reach will experience consistent minimum instream flows – with occasional large flows created during natural large storm events, when flow exceeds the capacity of the powerhouse, and streamflow overtops the diversion dam.

Shut-down of the project will require meeting the ramping rate criteria governing the project, and to ensure that there are not downramps in the downstream reach which would violate the established ramping criteria.

As described in the Philosophy of Operation, if any of the following items occur, the turbine controls will initiate a normal shutdown sequence:

- Intake level drops below alarm low-flow level.
- An operator manually initiates a normal shutdown with lock-out either locally or remotely.
- Activation of generator or transformer electrical system protective relays.

The normal shutdown sequence will consist of immediately closing the deflectors and locking the needle jets into whatever position they were in at the moment of trip. In other words, flows will remain the same through the diversion, but power will not be produced. This method accomplishes the need for flow continuation, without using a flow continuation valve. The operator will then have an 8-hour period to determine the problem, and restart if possible.

If after 8 hours the plant is not restarted, a controlled closure of the needle jets will begin. Needle jet closure will have to occur very slowly to meet the downstream water level ramping rate restriction of 2” per hour maximum. The PLC will determine the allowable rate of needle jet closure based on three levels of total river flow in Youngs Creek, high, medium, or low flow. At low flows in Youngs Creek, needles will close at a rate equal to 16 hours (field adjustable) from fully open to fully closed. This approach is intended to meet target ramping rates at the downstream monitoring point. At medium flows in Youngs Creek, needles will close at a rate equal to 8 hours from fully open to fully closed. At high flows in Youngs Creek, needles will close at a rate equal to 4 hours from fully open to fully closed.

While the design is intended to minimize the possibility of ramping rate exceedences, a completely fail-proof system is not feasible. The District’s designer identified the following potential circumstances in which immediate plant shutdown may-be necessary for safety reasons:

- A needle jet positioning failure;
- Turbine vibration in excess of the allowable limits;
- Lubricating oil or HPU system failure;
- Cooling system failure;
- Turbine overspeed detected;
- Mechanical or temperature related generator protective relay action;
- A penstock rupture is detected;
- Operator initiated fast shutdown;
- Failure of essential instrumentation;
- Turbine controller failure or loss of DC control power;
- Operator initiated emergency shutdown; and
- Failure of vital instrumentation.

The above events are considered to be abnormal emergency events that would be rare in occurrence. They indicate a major mechanical or computer failure, and the District reports that the plant is being specifically designed to avoid these occurrences. For example, HPU and lube oil pumps will have 100% spare pumps in place, so failure of one pump would not cause plant shutdown. Items like penstock rupture, high vibration, or controller failures are possible but unlikely to occur even once every 5 years. In general it is expected by the District that all these events combined would not occur more than once per year on a long term average basis.

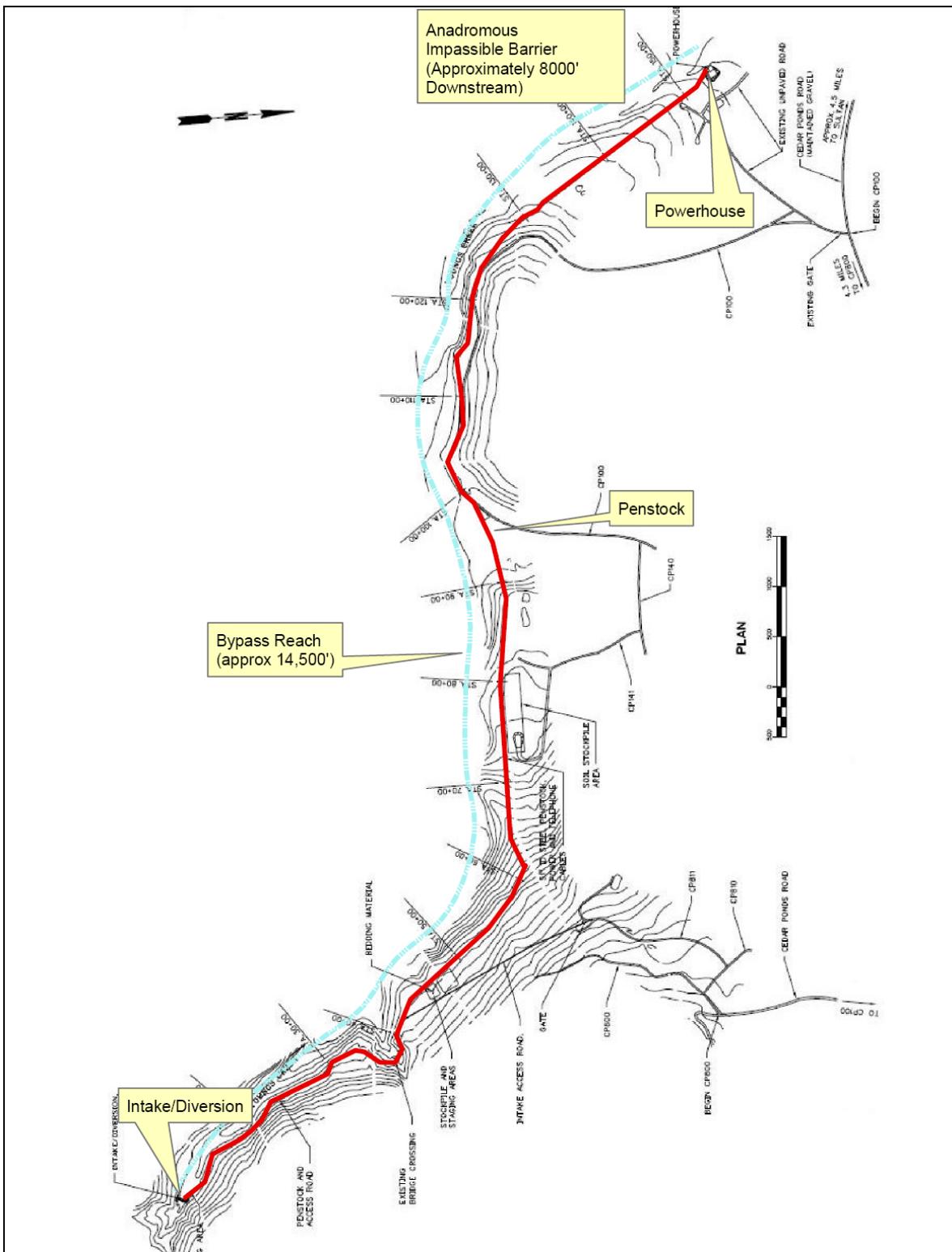


Figure 2. Overall Site Plan & Penstock Route along the Bypass Reach.

SRH obtained a license for Project Number 10359 from the Federal Energy Regulatory Commission (FERC) in 1992. To date, numerous studies have been completed, some of which are in the process of being updated, including engineering feasibility and design work and a SEPA checklist. Some site work has been completed, including access road and bridge construction and clearing of the diversion and powerhouse sites and some of the penstock route.

The project license and permit status as of 4/14/09 are summarized in the following tables:

Table 1. FERC License and Related Plans

FERC License Articles/Studies	Issued/ Approved	Expires	No.	Comments
FERC Environmental Assessment FERC Federal license	12/23/91 5/5/92		10359	License extensions granted in 12/95, 9/98, 5/04, 10/08. License extended to December 31, 2011.
Wildlife Habitat Mitigation Plan	5/6/93		Art. 403	Plan approved and two years of monitoring was completed. Field work initiated in 2008 for Biological Evaluation & Critical Areas Study.
Bald Eagle Protection Plan	6/30/93		Art. 405	FERC Approved. District applying for amendment, 2009, as Bald Eagle no longer ESA listed.
Cultural Resources Survey Report	6/24/93		Art. 406	Surveys of Project area conducted and approved.
Cultural Resources Management Plan			Art. 407	File before construction starts.
Resident Trout Monitoring Plan	6/8/95		Art. 408	Plan approved and four years of monitoring was completed. Three more years of baseline monitoring initiated in 2008. Update Plan/flow agreement.
Rare Plant Survey	April 1991		10359	Biological Evaluation update initiated in 2008.

Table 2. Project Permits

Permits	Issued/ Approved	Expires	No.	Comments
Army Corp of Engineers 404 Permit (discharge of dredged or fill mat'l)	Permit 2/24/94 Extension 2/25/97	2/24/98	1993-4-00013 NWS-2008-1020-NO	Expired (only one extension allowed). Submitted JARPA to Army Corps 6/27/08. Submitted response to additional info request 8/21/08. Submitted BE and Critical Areas Study to Corps 2009.
Ecology 401 WQ Certification (any activity that may result in a discharge to waters of the State)	2/24/92 Revised 11/18/93		FERC No. 10359	Good for life of FERC license. Modification needed to include updated water quality standards. Collect temperature data. Conditions of Permit include: <ul style="list-style-type: none"> • Before Operation-Prepare Oil Spill Prevention, Containm. & Counterterm. Plan • Before Operation-Prepare plan for treatment & disposal of process waste- water generated by project. • Quarterly from start up-obtain WQ samples weekly at upstream & downstream locations. • For 2 years after start up-conduct sediment & bedload passage study.
Ecology Coastal Zone Management Program Consistency Certification	4/15/92		FERC No. 10359	Good for life of FERC license.
Ecology Surface Water Permit				
Original 120 cfs application submitted	6/13/90 (submitted)		S1-25746	Amended application "pending"
Application for additional 20 cfs submitted	1/26/94 (submitted)		S1-25746B	
Ecology National Pollution Discharge Elimination System (NPDES)	6/15/93		S03-001316	New NPDES General Permit for construction activity needed prior to construction.
WDFW Hydraulic Project Approval	5/3/93 5/21/93 6/14/93	9/30/94 9/30/94	01-86616-01 01-86819-01 01-87122-01	Diversion/Intake-Expired, new permit required. Powerhouse/Tailrace-Expired, new permit required. Bridge-construction completed in 1994. Conditions include construction of diversion weir/intake only between July 1 and Sept. 31. Submitted JARPA to WDFW 6/27/08. Agreed to delay until further Corps review and engineering design. WDFW has 45-day turnaround.
State Environmental Policy Act (Snohomish County Lead Agency)	7/8/92		ZA-9109289	DNS issued. SEPA/NEPA has maintained validity over time. Recent review of additional biological studies conducted by the District

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Permits	Issued/ Approved	Expires	No.	Comments
Snohomish County Shoreline Management Development and Zoning Conditional Use Permit	3/10/93		1993-14456	Received extension of Shoreline Permit 2/8/00 to coincide with FERC extensions. County believes permit still viable. Ecology only processes locally approved Shoreline Substantial Development Permits – they do not deny or approve. Following receipt of FERC License extension to complete project construction, County will ensure extension of County Shoreline Permit and use of existing SEPA DNS. Critical Areas Study will be forwarded to County when completed. CUP remains viable. Conditions require detailed drainage plan, grading plan and geotech report prior to construction
Snohomish Co Grading permit	7/16/93	1/16/95	G93-147	Expired. Will need new permit prior to construction. Application April, 2009.
Snohomish Co Building permit	10/5/93 (Bridge)		C9307262	Bridge completed. Will need permits for powerhouse and diversion prior to construction.
Snohomish Co Mechanical, Electrical, etc.				Needed prior to construction.
Washington Dept of Natural Resources Forest Practice Permit	11/19/92	11/19/94	FP-1915826	Expired. Need completed FPA, SEPA DNS, grading permit and release letter from County. DNR has 30 days to process.

Application Background

Applicant: Snohomish County Public Utility District No. 1
 Priority Date: June 20, 1990
 Diversion Rate: 140 cfs
 Annual Volume: na
 Public Notice: Monroe Monitor-Valley News (amended application)
 Publication Dates: June 17, and June 24, 2008 (amended application)
 Protest Letters: Valerie Ward, April 28, 1994 and Clifford Richer, May 1994 (for original application); None for amended application.

INVESTIGATION

Based on the provisions of RCW 43.21A.690 and RCW 90.03.265 Golder Associates Inc. (Golder) of Redmond, Washington, has assisted with the investigation and preparation of this Report of Examination under a contract with Ecology (C0500008). In consideration of this application, the investigation included, but was not limited to, research and review of:

- Relevant state water statutes;
- State Environmental Policy Act (SEPA);
- USGS Topographical maps of the Youngs Creek basin and surrounding areas;
- Site visit completed on April 27, 2009; and
- Reports and information supplied by the District.

Statutory Authority

Chapter 43.27A RCW assigns the Department of Ecology the duties, powers, and functions of managing the water resources of the state. RCW 43.27A.020 specifically states: “Water resources means all waters above, upon, or beneath the surface of the earth, located within the state and over which the state has sole or concurrent jurisdiction.”

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Statutory language contained in chapter 90.03 RCW is also relevant to this application. RCW 90.03.010 states: "Subject to existing rights all waters within the state belong to the public, and any right thereto, or to the use thereof, shall be hereafter acquired only by appropriation for a beneficial use and in the manner provided and not otherwise..."

The water right permitting process is outlined in RCW 90.03.250 through 90.03.340 and RCW 90.54.020(1) contains a list of beneficial uses.

State Environmental Policy Act (SEPA)

On July 8, 1992, Snohomish County issued a SEPA Determination of Nonsignificance (DNS) ZA-9109289) for this application under 197-11-340(2) WAC. Snohomish County determined that the proposal does not have a probable significant adverse impact on the environment. The District recently conducted a review of the previous SEPA determination for validity in light of new information available since 1992. The District conducted several studies in 2008 and early 2009 to review the existing environment, species of concern (including Chinook, steelhead trout, bull trout, Coho, marbled murrelets, spotted owls), critical habitat/essential fish habitat, and Federal and state listed botanical species (none were found in the Project area). The Biological Evaluation (BE) prepared as part of this study (R2 Resource Consultants, 2009) concluded:

- Neither the National Marine Fisheries Services (NMFS) nor the Pacific Fisheries Management Council (PFMC) has designated Youngs Creek as critical habitat under the Endangered Species Act (ESA) or as essential fish habitat (EFH) under the Magnuson-Stevens Fishery Conservation and Management Act (MSA).
- The proposed development is upstream of an anadromous fish barrier. No anadromous salmonid fishes are found within 1.4 mile of the project because of this barrier.
- Based on habitat conditions and the conservation measures proposed in this BE, a finding that the proposed action May Affect but is Not Likely to Adversely Affect listed fish species, including Chinook salmon, steelhead and bull trout, and Dolly Varden or their habitat was recommended.
- Similarly, a recommendation that the proposed action would have No Adverse Effect on EFH designated for Chinook salmon, Coho salmon, and pink salmon was recommended.
- There are no active spotted owl site centers within 1.8 miles of the proposed project and no known marbled murrelet occupied habitat within 1.0 mile.
- Based on habitat conditions and the conservation measures proposed in this BE, a finding that the proposed action May Affect but is Not Likely to Adversely Affect spotted owls, marbled murrelets or their habitat was recommended.

To date, formal concurrence on these findings has been received from the US Fish and Wildlife Services and informal concurrence from NMFS. The DNS issued by Snohomish County is still considered valid for the project, based on the recent review.

Site Visit

A site visit was made on April 27, 2009. The site visit was made by Scott Spahr, P.E. (District), Doug Wood, L.Hg., (Ecology), and Michael Klisch L.Hg., and Carl Einberger, L.Hg. (Golder). Scott Spahr provided a history and overview of the project and led the site visit.

The following areas of the project were visited:

- General project area in the Youngs Creek basin.
- Natural fish barrier on Youngs Creek (River Mile 1.0).
- Powerhouse Location (River Mile 2.4).
- Diversion Location (River Mile 5.0).

Hydrology

Youngs Creek is a tributary to Elwell Creek. The confluence of Elwell Creek and Youngs Creek is at river Mile 2.5 on Elwell Creek. Elwell Creek is a tributary to the Skykomish River, entering the river at River Mile 31.8. The catchment area of Youngs creek above the gage is 8 square miles.

Youngs Creek has a natural anadromous fish barrier (waterfall) at River Mile 1.

Stream gages have been installed at various locations at various times on Youngs Creek near the diversion as part of the project. These include:

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- Gages installed above and below the diversion operable between May 1989 and September 1992 (Permit/Engineering 1992).
- A gage installed and operated between May 1997 and April 2001. The location was approximately 150 feet downstream of the proposed dam site on the left bank, in approximately the same location as the current gage (discussed below).
- A gage installed in April 2008 about 150 feet downstream of the proposed dam site on the left bank. The gage consists of a Global Water WL15 water level logger to measure stream stage. Streamflow in Youngs Creek is periodically measured at the gage location to develop a rating curve. A rating curve was developed for Water Year 2008.

Synthetic streamflow data were developed for Youngs Creek based on measured flows from nearby rivers. The synthetic streamflow data include:

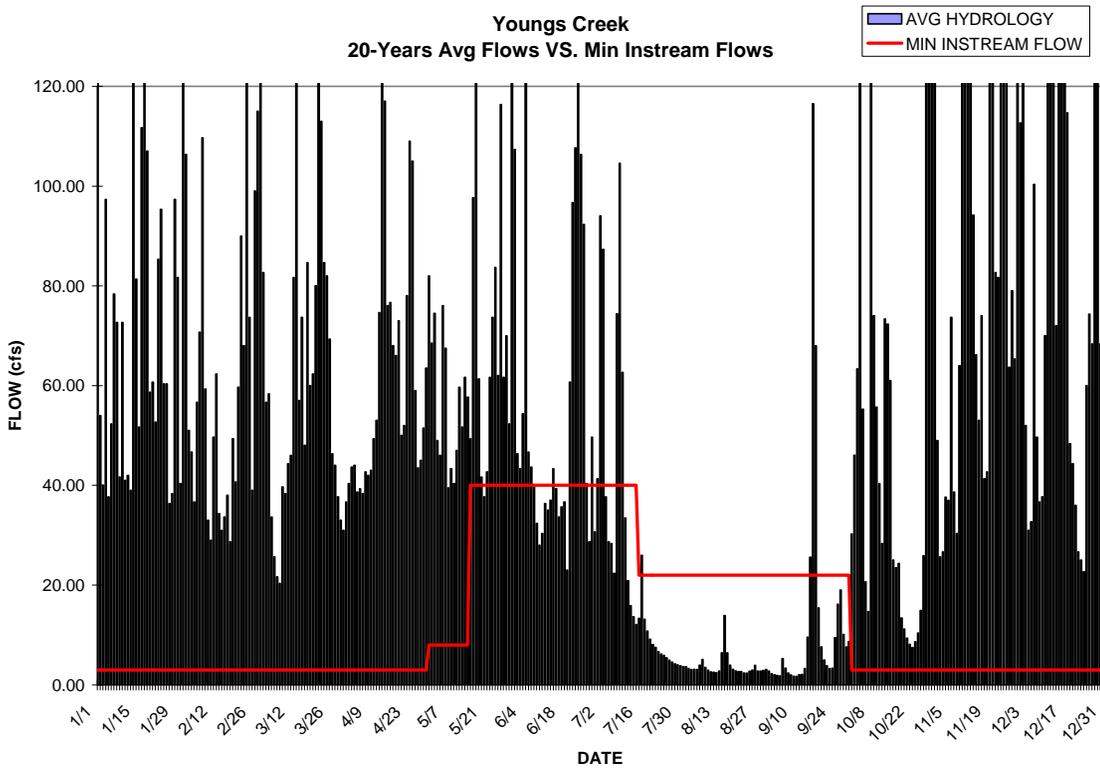
- Streamflow data for 1928 to 1977 generated using data from the Wallace River and South Fork Skykomish River (Cascade Environmental Sciences Inc., 1993)
- Streamflow data for Youngs Creek for 1928 to 1998 synthesized using data from the Tolt River (Duke Engineering and Services, 2000)
- Flow-exceedance curves calculated for Youngs Creek based on the gage data between 1997 and 2001 (HDR, 2001)

Minimum instream flows or closures have not been set on Youngs Creek or Elwell Creek under the applicable WAC 173-507 *Instream Resources Protection Program – Snohomish River Basin, Water Resource Area (WRIA) 7*. There are minimum instream flows set for the Skykomish and Snoqualmie River; however, given that this is a ‘run of the river’ project as proposed, no effect on either Skykomish or Snoqualmie instream flows are anticipated. The nearest downstream flow control point is on the Skykomish River at Monroe (Control Station 12.1411.00). As part of the FERC licensing, WDFW was consulted and recommended the following minimum streamflows in the bypass reach or downstream of the project:

- October 1 to April 30: 3 cfs
- May 1 to May 15 : 8 cfs
- May 16 to July 15: 40 cfs
- July 16 to September 30: 22 cfs

These minimum instream flows are incorporated into the FERC license and MOU between the District, WDFW, and Ecology.

The average 20-year streamflow and the minimum instream flows agreed on in the license are summarized on the following chart:



Based on the streamflow in the creek and the instream flows, the project will be operated as follows:

October 1 – April 30 (3 cfs):

The project will typically operate continuously during this period based on the historical streamflows and associated water availability relative to the established instream flow of 3 cfs.

May 1 – May 15 (8 cfs):

The project will generally operate continuously during this period based on the historical streamflows and associated water availability relative to the established instream flow of 8 cfs.

May 16 – July 15 (40 cfs):

The project will generally operate intermittently when the instream flow of 40 cfs is met during this period. During high flow events, the project will typically capture peaks, but the high instream flow requirement over this period will also result in the project being periodically shut-down.

July 16 – September 30 (22 cfs):

The project will generally operate infrequently during this period, since the instream flow of 22 cfs is rarely met. During high flow events, the project will capture peaks, but the high instream flow requirement over this period will also result in the project being largely shut-down.

The District has also agreed to increase the instream flows using adaptive management provided by 5-year increment flow-increases to be adjusted if the resident trout monitoring program indicates a decrease in resident trout population. This agreed upon schedule is as follows:

Years of Project Operation	1 - 5 yrs	6 - 10 yrs	10-15 yrs	16-20+ yrs		
Month	Start-up Flows	Flow Schedule Adjustment ¹			95% Flow ²	POC ³
		1st	2nd	3rd ⁴		
October	3	4	6	5.5	8	8
November	3	4	6	5.5	18	8
December	3	4	6	5.5	27	4
January	3	4	6	5.5	20	4
February	3	4	6	5.5	21	4
March	3	4	6	5.5	24	4
April	3	4	6	5.5	37	4
May 1-15	8	9	11	10.5	47	8
May 16-31	40	40	40	40	42	>150
June	40	40	40	40	36	>150
July 1-15	40	40	40	40	13	>150
July 16-31	22	22	22	22	8	22
August	22	22	22	22	6	22
September	22	22	22	22	6	22

¹ Flow increases to be adjusted only if approved monitoring plan determines decrease in resident trout population

² 95% flow exceedence

³ POC (Peak-of-the-curve) Flow at which maximum weighted usable area for the lifestage of concern would result

⁴ Instream flow rates would decrease by 0.5-cfs if after consecutive 5-year population showed recovery; continuing in 5-year blocks beyond 20-years of operation

Water Rights

There are no other water rights held by the District associated with this project.

The Washington State Department of Ecology Water Rights Tracking System database was queried to locate water rights within or near the bypass reach (T27N/R8E, section 29, 30, 33, and 34). The search of the database indicated that there were two long form claims for domestic purposes and one certificate for 0.01 cfs and 0.5 acre-feet (AF) for domestic purposes. The sources for these claims and certificate are springs. These claims and certificates are likely associated with residences near Cedar Ponds Lake.

The database also indicates there is one long form claim for domestic purposes from Youngs Creek upstream of the diversion (S1-116317CL), and one application for 0.223 cfs for commercial industrial purposes upstream of the diversion (S1-28283). The water rights are summarized in the following table:

Table 3. Other Water Rights

DOCUMENT NUMBER	DOCUMENT TYPE	PURPOSE LIST	NAME	PRIORITY DATE	CFS	ACRE FEET	TRS LOCATION	SOURCE NAME
S1-117057CL	Claim Long Form	DG	CHOUNDED & EVANS				T27N/R08E-29	SPRING
S1-117060CL	Claim Long Form	DG	CHOUNDED & EVANS				T27N/R08E-29	SPRING
S1-24669CWRIS	Certificate	DS	HARDEE ERIC W	24-Jun-85	0.01	0.5	T27N/R08E-29 NW/NE	UNNAMED SPRING
S1-25746	NewApp	PO	Snohomish Cnty PUD 1	20-Jun-90	140		T27N/R08E-33	YOUNGS CREEK
S1-116317CL	Claim Long Form	DG	GEORGE E CHAMPEAUX				T27N/R08E-34	YOUNGS RIVER
S1-28283	NewApp	CI	FTGA Timberlands LLC	22-Jul-05	0.223		T27N/R08E-35 NW/NW	YOUNGS CREEK

Note: DS: Domestic Single, CI: Commercial – Industrial, DG: Domestic General, PO: Power

The Washington Department of Ecology well log database was queried to locate any exempt wells that could be in or near the bypass reach. There were three exempt wells located in the area:

Table 4. Exempt Wells

Well Tag Number	Well Depth (feet)	Well Diameter	Well Owner	Location	Date Drilled	Well Completion Material
AEC640	200	6	JUDITH LANFEAR	T27N/R8E-29NW/NE	2000	Bedrock
AET396	226	6	ROD & ROBERTA ZOOK	T27N/R8E-29NW/NW	2000	Bedrock
ACC612	58	6	SOUND EXTERIORS	T27N/R8E-30NE/SW	1998	Glacial Materials

The wells are likely associated with residences near Cedar Ponds Lake.

The locations of the water rights and exempt wells in or near the bypass reach are shown on Figure 3:

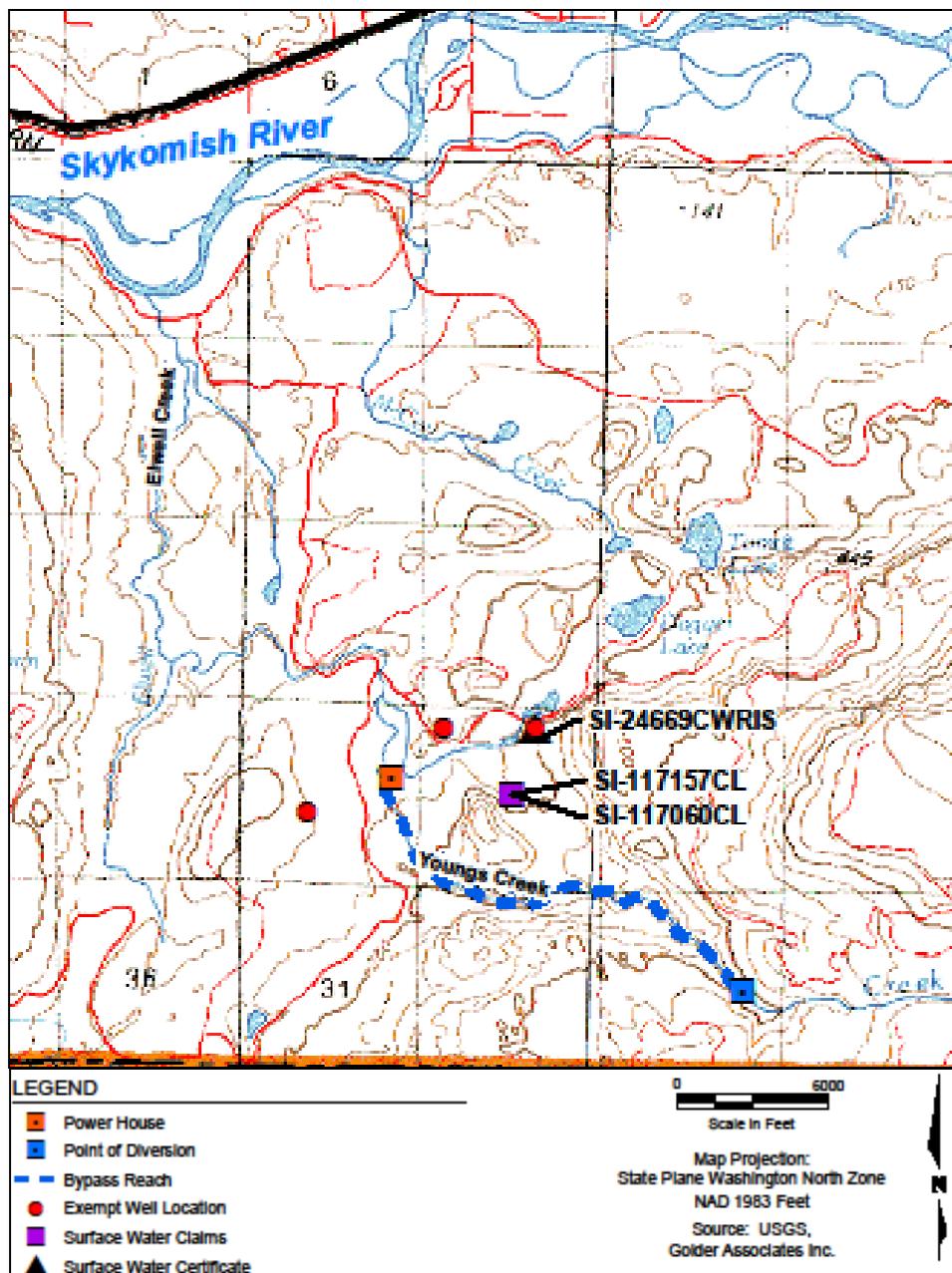


Figure 3. Water Rights and Claims in Project Vicinity

Impacts to Other Water Users and Instream Flows

There are no impacts to other water users or to instream flows expected to occur from this project, with the exception of decreased flow in the bypass reach when diversions are occurring. There are no surface water diversions evidenced by certificates, claims, or claims of vested water use on Youngs Creek in the bypass reach. There is one exempt well that appears to be in the Youngs Creek basin (ACC612) near the powerhouse location. The well appears to be completed in glacial sediments. Groundwater in the glacial sediments is expected to discharge to Youngs Creek. Therefore operation of the project should not affect this well.

There are no impacts to instream flows expected in downstream water bodies (Youngs Creek below the fish barrier, Elwell Creek, or the Skykomish River) because of the run of the river nature of the diversion. Minimum instream flows for the bypass reach in Youngs Creek approved by WDFW have been incorporated into the project FERC license. No diversion should occur when streamflows are at or below the agreed minimum instream flows in Youngs Creek.

Tribal Concerns

The District has consulted with the Tulalip, Snohomish, and Snoqualmie Tribes. Ecology contacted the tribes in 2008 to confirm that they were aware of the project. The District conducted a meeting with the Tulalip tribe on February 19, 2009. The District described the project elements. The main concerns of the Tribe were:

- Erosion control during construction of the penstock and other project facilities and the effects on Elwell Creek (index area for Chinook and Steelhead).

The District noted that there was an extensive Erosion & Soil Control Plan prepared by Shannon & Wilson filed with the license application. The 2009 Biological Evaluation prepared by R2 Resources Consultants also identifies these control measures. The control measures will be articulated in the bid documents and the District will have an on-site inspector to make sure plans are properly being implemented. Daryl Williams (Tulalip tribes) stated that he would not need to review the Erosion & Soil Control Plan if Ecology was in agreement with the plan.

- Passage of sediment and large woody debris through the diversion dam.

The District reviewed the current drawings for the intake site. There will be a sluice gate at the intake site that will be opened periodically and/or during high flow events to allow gravel to pass through. High flow events occur often (over ten times per year based on historical flow records). The District noted that during high flow events, the head pond will fill quickly and pass any large woody debris over the spillway.

The Tulalip Tribes sent a letter to the Corps on May 28, 2009, stating that the Tribe does not have any objections to the project based on review of recent information provided by the District. There have been no known communications from the Snoqualmie or Snohomish Tribes.

Discussion of Protests

- Two protests were received for the original application. There were no protests received when the combined application was published. The original protests are summarized as follows:
- A protest by Valerie Ward was received by Ecology on May 2, 1994. The concerns raised in the protest letter relate to the diversion of water from a stream with low flows during the summer and the potential impacts on fish. There is a note in the file that the protest was not accompanied by the protest fee, and it is unknown if the fee was received.
- A protest by Clifford Richer was received by Ecology on May 9, 1994. The concerns raised in the protest relate to the diversion of water from a stream affected by logging and road building.
- Both of these protests involve the same concern of diversion of water from a stream in a basin impacted by logging and road building with low flows in the summer. Because both protests involve the same concerns, they are addressed together:
- As the proposed project is run of the river, the project would divert water from the creek above the natural fish barrier, and return the water to the creek at the Powerhouse above the fish barrier. The proposed project will not reduce streamflow in Youngs Creek below the natural fish barrier or other downstream water bodies because the water diverted from Youngs Creek will be returned to the stream about 1.4 miles upstream of the natural fish barrier. Similarly, the project will not affect streamflows in Elwell Creek or the Skykomish River.
- The project license includes instream flow provisions in the bypass reach where flows will be reduced when the project is operational. Beak Consultants, Inc completed an Instream Flow Study Report for the Youngs Creek Hydroelectric Project in 1991 which included proposed instream flows which were agreed upon by SRH, WDFW, and Ecology. Instream flows for the bypass reach are incorporated into the FERC license. A monitoring plan for resident trout is in place for the bypass reach. The proposal specifically included adaptive management, as discussed previously, provided by 5-year increment flow-increases to be adjusted if

monitoring under the adopted resident trout monitoring plan indicated a decrease in the resident trout population in the bypass reach. This is consistent with the MOU between the District, Ecology, and WDFW.

Quantities for Permit

The combined water right application requested a diversion of 140 cfs for operation of an 8.3MW plant. Subsequent work including stream gaging and synthetic streamflow generation, suggests that streamflow in Youngs Creek is generally less than 140 cfs except during peak flows during storm events, but streamflow generally exceeds the minimum instream flows for the bypass reach except in summer months. The plant was originally sized for 7.5 MW, with the diversion of 120 cfs. The plant design was subsequently upgraded to 8.3 MW and 140 cfs. The District has now redesigned the plant back to a capacity of 7.5 MW. At full load, the 7.5 MW plant requires the diversion of 120 cfs. Given the current plan for putting water to beneficial use, this report recommends approval of a maximum diversion rate of 120 cfs, rather than the 140 cfs requested in the combined application.

Monthly 5%, 25%, 50%, 75%, and 95% streamflows and the percent of time each month the instream flows are exceeded are summarized in the following table (HDR 2001):

Month	5% (cfs)	25% (cfs)	50% (cfs)	75% (cfs)	95% (cfs)	Flow Exceeds MISF (%)	Instream Flow (cfs)
October	222	51	19	11	3	94	3
November	337	90	41	19	8	99	3
December	375	92	42	21	14	99	3
January	212	81	39	23	14	99	3
February	174	64	36	21	12	98	3
March	157	82	52	26	18	99	3
April	130	67	50	35	22	98	3
May	137	78	58	37	23	93	8 (May 1-15) 40 (May 16-31)
June	167	62	35	17	12	44	40
July	72	17	8	5	3	12	40 (July 1-15) 22 (July 16-31)
August	7	4	2	2	1	1	22
September	49	8	3	2	1	11	22

Based on the streamflow data, water is usually available above the instream flows between October 1 and May 15. Between May 16 and September 30, water may be available for relatively short periods during storm events when the minimum instream flows are exceeded.

FINDINGS

Under state law (RCW 90.03.290(3)) the following four criteria must be met for a permit to be approved:

- Water must be available,
- Existing rights can not be impaired,
- The water use must be beneficial, and
- The water use must not be detrimental to the public welfare

Water Availability

Based on the historical streamflows in Youngs Creek, and established minimum instream flows approved by WDFW, water is available for diversion for the project when the natural streamflow exceeds the agreed upon instream flows for the bypass reach.

Potential for Impairment

Approval of the proposed appropriation will not result in impairment of senior water right holders. There are no senior water rights in the bypass reach or nearby that could be affected. There are no instream flows or closures set for Youngs

Creek or Elwell Creek. Instream flows on the Skykomish and Snohomish Rivers downstream of the project will not be affected because of the run of the river operation of the project.

Beneficial Uses

According to RCW 90.54.020(1), the use of water for hydroelectric power production is considered a beneficial use.

Potential for Detriment to the Public Welfare

Approval of the proposed appropriation is not detrimental to the public interest. There are no known Tribal objections to the proposed project. Streamflows downstream of the Project, below the natural fish barrier, will not be negatively impacted because of the run of the river nature of the project. The Project license contains instream flow requirements to maintain streamflow in the bypass reach for resident trout. Operation of the project is contingent upon meeting these minimum instream flows for the bypass reach set in the FERC license and the District has agreed to increase flow in the bypass reach of the project if the resident trout monitoring plan indicates that declining resident trout populations are associated with the project.

RECOMMENDATIONS

I recommend approval of this application and issuance of a permit authorizing the beneficial use of up to 120 cfs of water for hydropower when water is available above instream flow requirements. The period of use shall be year-round, subject to instream flows, as needed.

PROVISIONS

This permit is issued subject to all applicable State laws and regulations, the FERC license for the project, and to the following provisions:

1. The amount of water granted is a maximum limit that shall not be exceeded and the water user shall be entitled only to that amount of water within the specified limit that is beneficially used and required.
2. An approved measuring device shall be installed and maintained for each of the sources identified by this water right in accordance with the rule "Requirements for Measuring and Reporting Water Use", Chapter 173-173 WAC.
3. Chapter 173-173 WAC describes the requirements for data accuracy, device installation and operation, and information reporting. It also allows a water user to petition Ecology for modification to some of the requirements. Installation, operation, and maintenance requirements are enclosed as a document entitled "Water Measurement Device Installation and Operation Requirements".
4. Department of Ecology personnel, upon presentation of proper credentials, shall have access at reasonable times, to the records of water use that are kept to meet the above conditions, and to inspect at reasonable times any measuring device used to meet the above conditions.
5. Water use data shall be recorded daily and maintained by the property owner for a minimum of five years. The maximum monthly rate of diversion and the monthly total volume shall be submitted to the Department of Ecology by January 31st of each calendar year.
6. The PUD will operate the project in accordance with the November 1993 *Youngs Creek Hydroelectric Project Resident Trout Monitoring Plan* prepared by Beak Consultants Inc. as amended by the *Memorandum of Understanding Youngs Creek Hydroelectric Project (FERC NO. 10359) Minimum Flow Releases to the Bypass Reach of Youngs Creek and Operational Plan, Ramping Rates, and Compliance Monitoring* between the WDFW and Ecology and the District.
7. A minimum flow of the agreed upon instream flows, or the natural flow, shall be maintained in the bypass reach at all times:
 - October 1 to April: 3 cfs
 - May 1 to May 15: 8 cfs
 - May 16 to July 15: 40 cfs
 - July 16 to September 30: 22 cfs

The instream flows shall be re-evaluated under the November 1993 *Youngs Creek Hydroelectric Project Resident Trout Monitoring Plan* prepared by Beak Consultants Inc. as amended by the *Memorandum of Understanding Youngs Creek Hydroelectric Project (FERC NO. 10359) Minimum Flow Releases to the Bypass Reach of Youngs Creek and Operational Plan, Ramping Rates, and Compliance Monitoring* if declines in resident trout population are observed.

8. The District shall install and maintain stream gages on Youngs Creek as described in the Memorandum of Agreement. Representatives from WDFW and Ecology agreed that the compliance gage could be located downstream of the powerhouse in the anadromous reach (River Mile 0.6). For the bypass reach, the representatives suggested the District establish a rating curve with field proof for ramping at a critical location (About 800 feet downstream from the diversion), so that compliance could be interrelated and verified with the downstream gage. A permanent, continuous gage should be located downstream, with a field-proofed, rating curve established at start-up for the bypass reach.
9. Power Generation Fees: This authorization is subject to the fees in RCW 90.16.050 and 90.16.090.

REFERENCES

Beak Consultants Inc., 1991, Instream Flow Study Report for the Youngs creek Hydroelectric Project, FERC Project Number 10359.

Beak Consultants Inc., 1993, Youngs Creek Hydroelectric Project Resident Trout Monitoring Plan.

Biota Pacific Environmental Sciences, Inc, Meridian Environmental Inc., R2 resource Consultants Inc., and Smayda Environmental Associates Inc., 2009, Youngs Creek Hydroelectric Project (FERC Project No. 10359) Critical Area Study.

Cascades Environmental Services, Inc., 1993, Synthetic Streamflow Generation for Youngs Creek, Snohomish County, WA.

Duke Engineering & Services, 2000, Youngs Creek Hydrology and Energy Production Report.

HDR Inc, 2001, Instream flow Comparisons, Exceedance Curves, and Energy Estimates.

Golder Associates Inc., 2009, Phase I Report – Snohomish County PUD Proposed Youngs creek Hydroelectric Project (Snoqualmie River Hydro Water Right Application S1-25746)

Permit/Engineering, Inc., 1992, Gauge Flows at Youngs Creek.

R2 Resource Consultants, Inc., 2009, Draft Biological Evaluation, Youngs Creek Hydroelectric Project, February 2009.

Shannon and Wilson, 2008, Revised Geotechnical Report, Youngs Creek Hydroelectric Project, Snohomish County, Washington.

Snohomish County Public Utility District No. 1, 2008, Section 16540, Turbine Generator Control Panels, Youngs Creek Turbine Generator Equipment Contract, December 15, 2008.

Snohomish County Public Utility District No. 1, 2009, Youngs Creek – Hydroelectric Project: Operational Plan, Ramping Rates, and Compliance Monitoring, White Paper prepared by Snohomish County Public Utility District No. 1.

Washington State Department of Ecology Online Well Database.

Washington State Department of Ecology Water Rights Application Tracking Database (<http://apps.ecy.wa.gov/welllog/index.asp>).

Washington State Department of Ecology Online Water Rights Mapping System (<https://test-fortress.wa.gov/ecy/wrxt/statewide/viewer.htm>).

Memorandum of Understanding, Youngs Creek Hydroelectric Project (FERC NO. 10359) Minimum Flow Releases to the Bypass Reach of Youngs Creek and Operational Plan, Ramping Rates, and Compliance Monitoring, between

SIGNATURES

Reported by: _____

Michael Klisch, L.Hg., and Carl Einberger, L.Hg.

Golder Associates Inc.

Date: _____

Reviewed by: _____

Douglas H. Wood, P.Geo., L.Hg.

Department of Ecology, Water Resources Program

Date: _____

FINDINGS OF FACT AND DECISION SURFACE WATER

Upon reviewing the above report, I find all facts, relevant and material to the subject application, have been thoroughly investigated. Furthermore, I find water is available for appropriation and the appropriation as recommended is a beneficial use and will not be detrimental to existing rights or the public welfare.

Therefore, I ORDER a permit be issued under Surface Water Application Number S1-25746, subject to existing rights and indicated provisions, to allow appropriation of public surface water for the amount and uses specified in the foregoing report.

You have a right to appeal this decision. To appeal this decision you must:

- File your appeal with the Pollution Control Hearings Board within 30 days of the “date of receipt” of this document. Filing means actual receipt by the Board during regular office hours.
- Serve your appeal on the Department of Ecology within 30 days of the “date of receipt” of this document. Service may be accomplished by any of the procedures identified in WAC 371-08-305(10). “Date of receipt” is defined at RCW 43.21B.001(2).

Be sure to do the following:

- Include a copy of this document that you are appealing with your Notice of Appeal.
- Serve and file your appeal in paper form; electronic copies are not accepted.

1. To file your appeal with the Pollution Control Hearings Board

Mail appeal to:

The Pollution Control Hearings Board
PO Box 40903
Olympia, WA 98504-0903

OR

Deliver your appeal in person to:

The Pollution Control Hearings Board
4224 – 6th Ave SE Rowe Six, Bldg 2
Lacey, WA 98503

2. To serve your appeal on the Department of Ecology

Mail appeal to:

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

OR

Deliver your appeal in person to:

The Department of Ecology
Appeals Coordinator
300 Desmond Dr SE
Lacey, WA 98503

Report Continued

3. And send a copy of your appeal to:

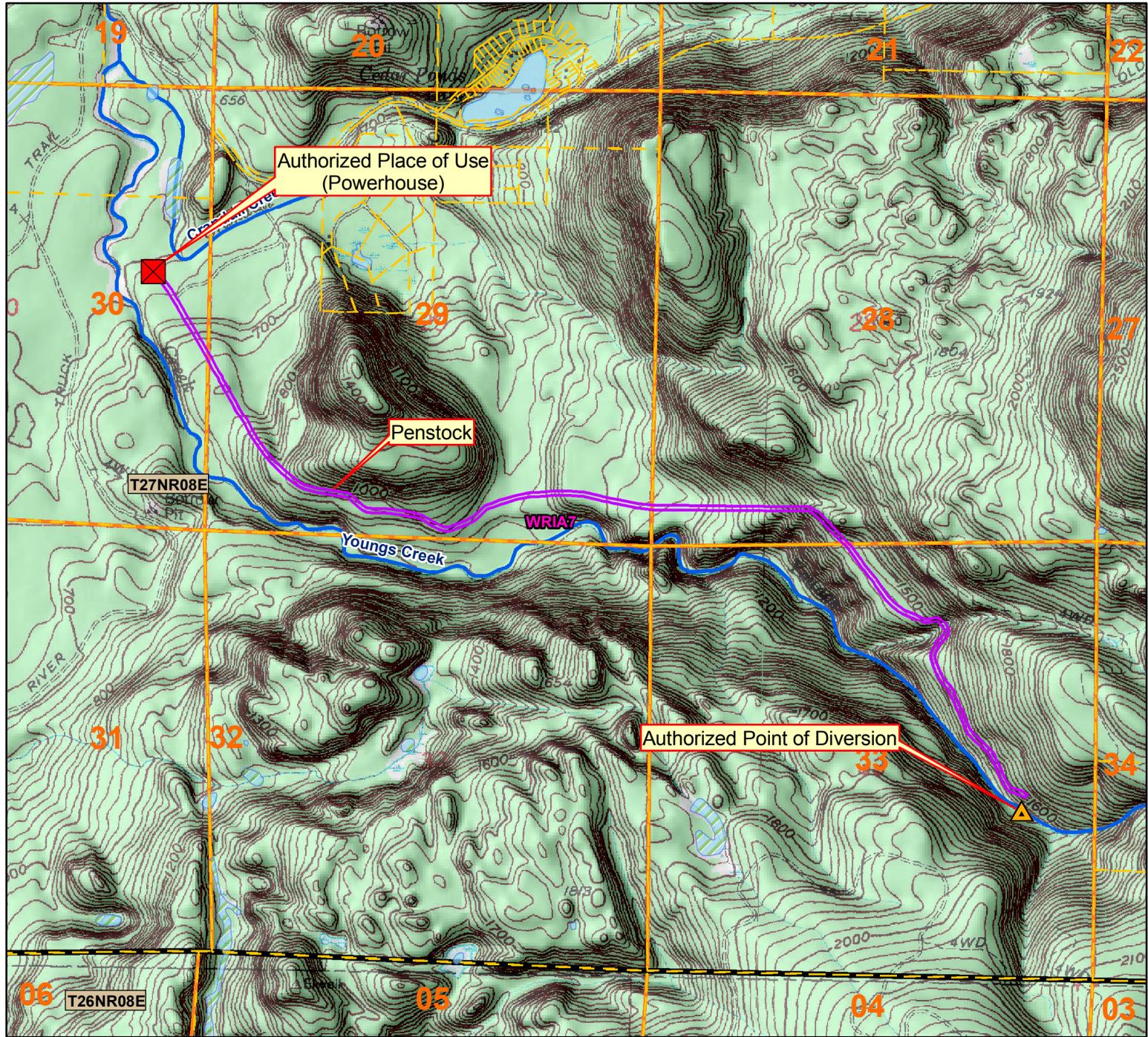
Andy Dunn
Department of Ecology
Northwest Regional Office
3190 160th Avenue SE
Bellevue, WA 98008-5452

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

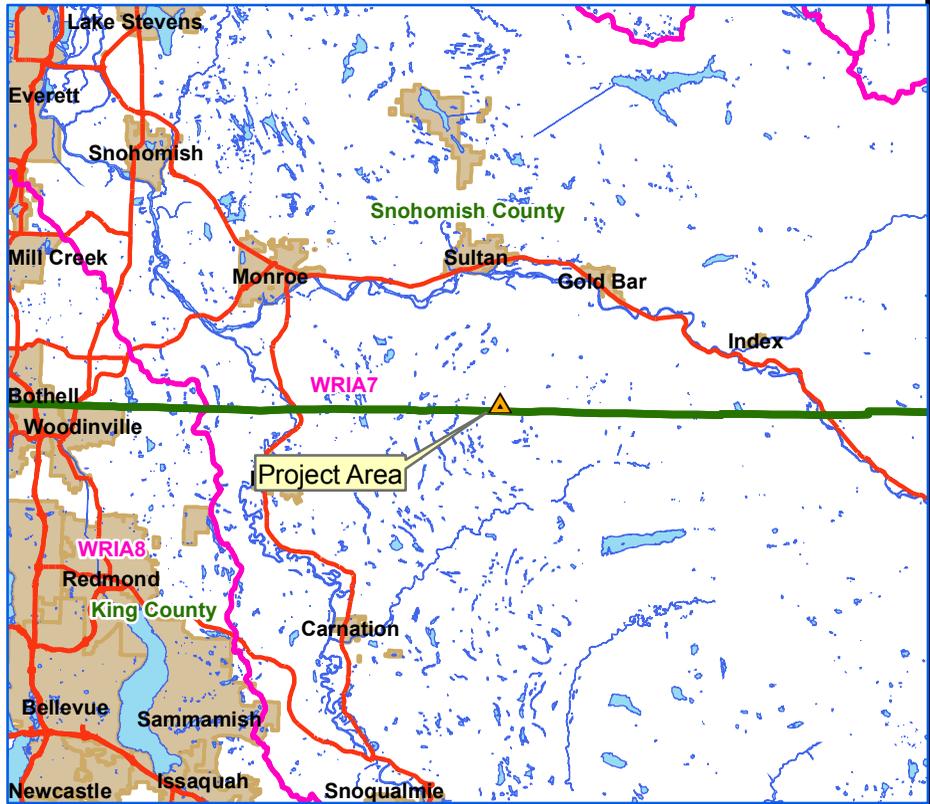
To find laws and agency rules visit the Washington State Legislature Website: <http://www1.leg.wa.gov/CodeReviser>

Signed at Bellevue, Washington, this _____ day of _____, 2009.

Andrew B. Dunn, LG,LHG, Section Manager
Water Resources Program
Northwest Regional Office



Snohomish Cnty PUD 1
 Water Right Number S1-25746
 Sect. 33 T 27N R 08E W.M.
 WRIA 7 - Snohomish County



Attachment 1

- Legend**
- County
 - WRIA
 - Highways
 - Townships
 - cities
 - Sections
 - Authorized Point of Diversion
 - Authorized Place of Use
 - Penstock

Place of use and point(s) of diversion/withdrawal are as defined on the cover sheet under the headings, 'LOCATION OF DIVERSION/WITHDRAWAL' and 'LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED.'

