Fact Sheet for NPDES Permit WA0022403

City of Snoqualmie Water Reclamation Facility

Public Notice of Draft date: January 24, 2020

Purpose of this fact sheet

This fact sheet explains and documents the decisions the Department of Ecology (Ecology) made in drafting the proposed combined National Pollutant Discharge Elimination System (NPDES) Reclaimed Water permit for the City of Snoqualmie Water Reclamation Facility (WRF). It complies Section 173-220-060 and Section 173-219-280 of the Washington Administrative Code (WAC), which require Ecology to prepare a draft permit and accompanying fact sheet for public evaluation before issuing a NPDES or Reclaimed Water permit. This fact sheet complies with Section 173-220-060 of the Washington Administrative Code (WAC), which requires Ecology to prepare a draft permit and accompanying fact sheet for public evaluation before issuing an NPDES permit.

Ecology makes the draft permit and fact sheet available for public review and comment at least thirty (30) days before issuing the final permit. Copies of the fact sheet and draft permit for the City of Snoqualmie WRF, NPDES permit WA0022403, were available for public review and comment from January 24, 2020, until February 24, 2020. For more details on preparing and filing comments about these documents, please see *Appendix A - Public Involvement Information*.

The City of Snoqualmie reviewed the draft permit and fact sheet for factual accuracy. Ecology corrected any errors or omissions regarding the facility's location, history, wastewater discharges, or receiving water prior to publishing this draft fact sheet for public notice.

After the public comment period closes, Ecology will summarize substantive comments and provide responses to them. Ecology will include the summary and responses to comments in this fact sheet as *Appendix G - Response to Comments*, and publish it when issuing the final NPDES permit. Ecology generally will not revise the rest of the fact sheet. The full document will become part of the legal history contained in the facility's permit file.

Summary

The City of Snoqualmie owns, operates and maintains an oxidation ditch wastewater treatment facility that provides conventional secondary wastewater treatment and biological nutrient removal. Following the oxidation ditch treatment process, the facility uses gravity sand filtration and UV disinfection to produce Class A Reclaimed Water for seasonal irrigation uses on the Club at Snoqualmie Ridge. Ecology issued the previous permit for this facility on April 29, 2014, and modified it on May 11, 2018.

The proposed permit changes the total ammonia average monthly effluent limit (August – October) from 21.9 lbs/day to 21.6 lbs/day. This change is due to effluent variability observed during the last permit cycle and it was computed using the coefficient of variance (CV). The effluent limits for Carbonaceous Biochemical Oxygen Demand ($CBOD_5$), Total Suspended Solids (TSS), temperature and fecal coliform bacteria are the same as the limits included in the previous permit. In 2017, the City upgraded its UV Disinfection system and chlorine addition to the reclaimed water is no longer required. Therefore, the maximum daily chlorine limit has been removed.

Table of Contents

I. Introduction

The Federal Clean Water Act (FCWA, 1972, and later amendments in 1977, 1981, and 1987) established water quality goals for the navigable (surface) waters of the United States. One mechanism for achieving the goals of the Clean Water Act is the National Pollutant Discharge Elimination System (NPDES), administered by the federal Environmental Protection Agency (EPA). The EPA authorized the state of Washington to manage the NPDES permit program in our state. Our state legislature accepted the delegation and assigned the power and duty for conducting NPDES permitting and enforcement to Ecology. The Legislature defined Ecology's authority and obligations for the wastewater discharge permit program in 90.48 RCW (Revised Code of Washington).

The following regulations apply to domestic wastewater NPDES permits:

- Procedures Ecology follows for issuing NPDES permits (chapter 173-220 WAC)
- Technical criteria for discharges from municipal wastewater treatment facilities (chapter 173-221 WAC)
- Water quality criteria for surface waters (chapter 173-201A WAC)
- Water quality criteria for groundwaters (chapter 173-200 WAC)
- Whole effluent toxicity testing and limits (chapter 173-205 WAC)
- Sediment management standards (chapter 173-204 WAC)
- Submission of plans and reports for construction of wastewater facilities (chapter 173-240 WAC)

These rules require any treatment facility owner/operator to obtain an NPDES permit before discharging wastewater to state waters. They also help define the basis for limits on each discharge and for requirements imposed by the permit.

In enacting the Reclaimed Water Use law, chapter 90.46 RCW, the Washington State Legislature found that it was in the best interest of present and future generations to encourage the use of reclaimed water in ways that protect the environment as well as the health and safety of all Washington citizens. The Legislature declared that the people of the state of Washington have a primary interest in the development of facilities to provide reclaimed water to replace potable water in nonpotable applications, to supplement existing surface and groundwater supplies, and to assist in meeting the future water requirements of the state. The law directed Ecology, in coordination with the Department of Health (DOH), to adopt rules for reclaimed water use. Ecology adopted the Reclaimed Water Rule, chapter 173-219 WAC, in January 2018.

RCW 90.46.220 and WAC 173-219-070 require any person proposing to generate any type of reclaimed water for a use regulated under the Reclaimed Water Use law to obtain a permit from either Ecology or DOH. The Reclaimed Water Rule designates the lead agency responsible for overseeing the engineering reviews and permitting of reclaimed water facilities based on the type of facility. Ecology is the lead agency when the source water for reclaimed water production is an effluent from a domestic wastewater treatment or water pollution control facility that would typically require a permit from Ecology for effluent disposal to surface water under WAC 173-220 or to groundwater under WAC 173-216. Reclaimed water facility owners must obtain a permit before they may distribute or use any reclaimed water.

All reclaimed water permits issued by Ecology must specify conditions requiring the facility to adequately and reliably treat its wastewater to a level appropriate for the approved beneficial uses of the water. In addition to meeting the water quality limits, the standards require specific treatment and disinfection requirements beyond those of most conventional wastewater treatment facilities. The standards also require automated alarms, redundancy of treatment units, emergency storage, stringent operator training requirements and public notification of reclaimed water use.

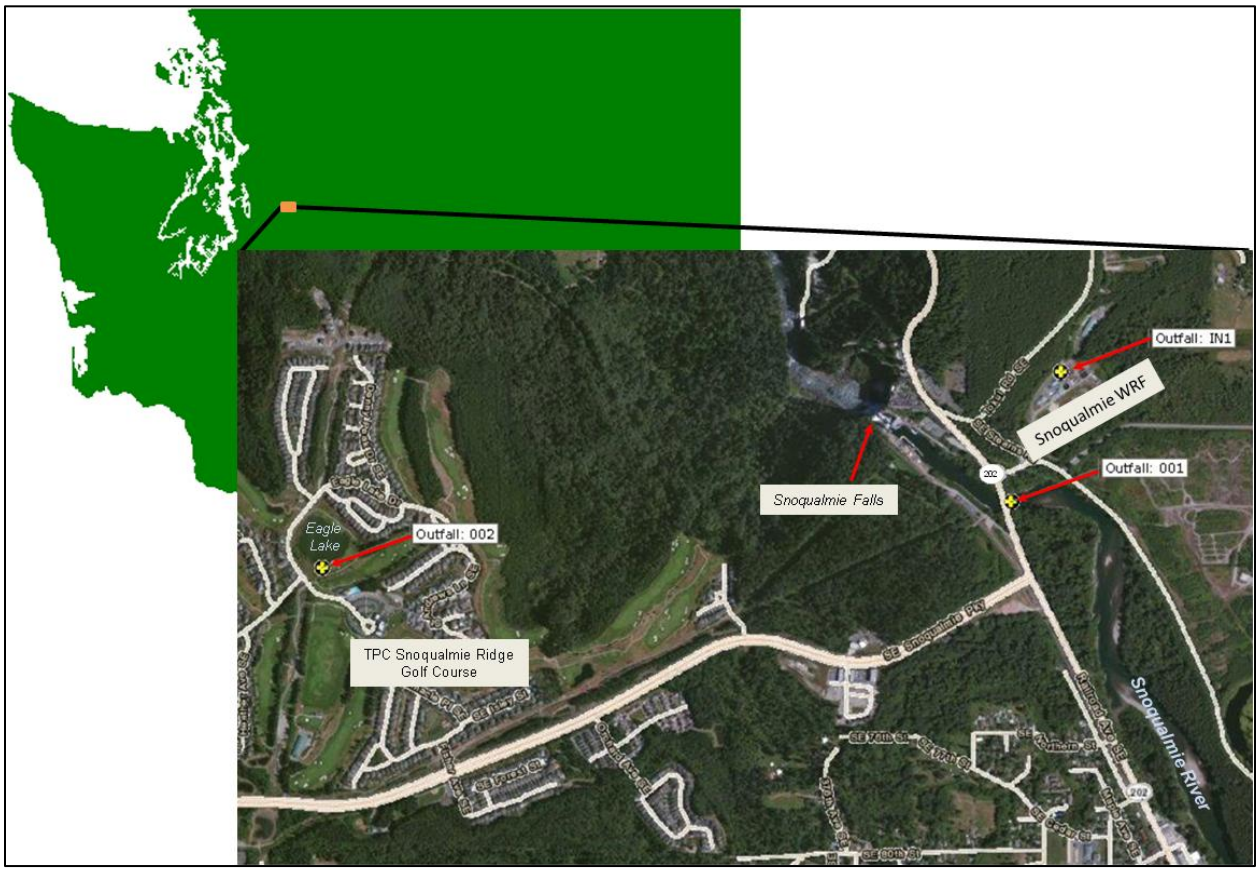
Under the NPDES and reclaimed water permit programs and in response to complete and accepted NPDES and reclaimed water permit applications, Ecology must prepare a draft permit and accompanying fact sheet, and make it available for public review before final issuance. Ecology must also publish an announcement (public notice) telling people where they can read the draft permit, and where to send their comments, during a period of thirty days (WAC 173-220-050 and WAC 173-219-110). (See *Appendix A-Public Involvement Information* for more detail about the public notice and comment procedures). After the public comment period ends, Ecology will summarize the responses to comments and any changes to the permit in *Appendix G*.

II. Background Information

Table 1. General Facility Information

Applicant	City of Snoqualmie
Facility Name and Address	City of Snoqualmie WRF 38190 SE Sterns Road Snoqualmie, WA 98065
Contact at Facility	Name: Thomas Holmes Title: Wastewater Superintendent Telephone #: (425) 888-4153
Responsible Official	Name: Matthew Larson Title: Mayor Address: 38624 SE River Street Snoqualmie, WA 98065 Telephone #: (425) 888-5307
Type of Treatment	Oxidation Ditch followed by gravity sand filtration
Highest class of reclaimed water produced:	Class A
Approved beneficial uses:	Seasonal landscape irrigation
Facility Location (NAD83/WGS84 reference datum)	Latitude: 47.54091 Longitude: -121.83140
Discharge Waterbody Name and Location (NAD83/WGS84 reference datum)	Snoqualmie River, approximately ¼ mile above Snoqualmie Falls Latitude: 47.53916 Longitude: -121.83222
Reclaimed Water Storage Location (Outfall 002)	Eagle Lake (9th Hole Pond) at the Snoqualmie Ridge Golf Course Latitude: 47.53722 Longitude: -121.86250
Issuance Date of Previous Permit	April 29, 2014
Application for Permit Renewal Submittal Date	October 1, 2018
Date of Ecology Acceptance of Application	November 6, 2018
Date of Last Non-sampling Inspection Date	July 17, 2019

Figure 1. Facility Location Map



A. Facility description

History

The City of Snoqualmie (City) constructed their first wastewater treatment plant, a 6.7-acre facultative lagoon system, in 1967. The treatment system remained unchanged for more than 20 years until anticipated growth required a substantial facility upgrade. In the early 1990s the City started planning for a new facility to accommodate projected population increases that would result with planned development of the Snoqualmie Ridge area. In addition to expanding treatment capacity for increasing population, the City's planning effort examined strategies to reduce pollutant loadings to the Snoqualmie River that Ecology identified as contributors to water quality impairments in the river. As part of the City's planning effort, Ecology approved a general sewer plan in 1992 and a wastewater facilities engineering report in 1995, which recommended construction of new wastewater treatment facilities, including improvements for production of Class A reclaimed water and a force main pipeline for delivery of reclaimed water for summer golf course reuse.

The City completed construction of a new advanced treatment facility in 1997. The new facility consisted of a single oxidation ditch, two secondary clarifiers, and a UV disinfection system. The new facility also included sand filtration, chlorination and pumping systems necessary to produce and distribute Class A reclaimed water. The plant expansion project converted the old

treatment lagoons into sludge stabilization and storage. The City completed a second phase of expansion in 2002 with the addition of a second oxidation ditch and more UV light banks.

In 2017, the City completed the Ultraviolet (UV) disinfection system upgrades and installed a new standby generator system. The new open-channel UV disinfection system has two channels, three UV reactor banks per channel and a total of 324 lamps. The 1,500 kW generator has the capability to accommodate existing and future electrical loads at the facility. In 2018, the City completed other items of the WRF Improvement Phase 1 project, including the raw wastewater pump station upgrades, and air gap system and non-potable water system improvements.

In June 2019, the City completed the WRF Improvements Phase 2 project. Major improvements related to this phase include replacement of the existing grit classifier and the air lift grit removal system, replacement of anaerobic zone mixers, construction of a three cell aerobic digester, upgrades to the WAS pump station, and a new Solids Handing Building. The project also included the addition of odor control systems for the headworks and solids handling facilities.

The City of Snoqualmie WRF primarily serves residential customers and light commercial establishments within the City's incorporated limits. Customers contributing significant flows to the facility include the Snoqualmie Casino, Snoqualmie Valley Hospital, and the Department of Social and Health Service's (DSHS) Echo Glen Children's Center. The City of Snoqualmie WRF also receives flows from three industrial discharges that require pretreatment permits from Ecology, namely Microconnex, Girard Resources and Technical Glass.

The Snoqualmie WRF is located in close proximity to the Snoqualmie Falls – an area designated as a "Traditional Cultural Property" (TCP) on the National Register of Historic Places. The area received the TCP designation in 2009 in an effort to recognize the cultural and religious significance of the Snoqualmie Falls, the waters that flow over, and the surrounding land to the people of the Snoqualmie Indian Tribe. The Snoqualmie Tribe is a federally-recognized Indian Tribe and signatory to the Treaty of Point Elliot of 1855 that has historically occupied the Snoqualmie Valley and areas around the Snoqualmie Falls.

Collection system status

The collection system comprises of seventeen pump stations, 43 miles of gravity sewers and 6.8 miles of force mains. Additionally, the collection system includes three private pump stations. One is owned by DSHS and serves the Echo Glenn Children's Center, the second is a small pump station owned by Puget Sound Energy that serves restroom facilities at Snoqualmie Falls, and the third is located at the Weyerhaeuser mill site. Most of the City's collection system conveys sewage to the Kimball Creek lift station, which pumps the sewage across the river to the WRF. A small portion of the city's collection system on the north side of the river flows by gravity directly to the treatment plant. Flows from the Salish Lodge, the old Weyerhaeuser Mill Site, the Snoqualmie Falls Visitor Center, and from the City's Water Treatment Plant discharge to the In-Plant lift station at the WRF.

The City renovated Lift Station #3 (Riverview Park) and #4 (Meadowbrook) between 2009 and 2010. Renovations included raising the lift station structures above the 100-yr flood elevation. City staff also completed a series of repair projects at the Kimball Creek lift station, which

included replacing a damaged volute and impeller on one of the pumps and installing third pump to increase the station's pumping capacity and to improve redundancy.

The WRF's Supervisory Control and Data Acquisition (SCADA) system uses remote telemetry to monitor operations at all lift stations. The SCADA system logs all alarms and uses an auto-dialer system to alert an on-call operator to problems. All but two lift stations have dedicated generators for emergency back-up power. The two stations without dedicated generators are "Honey Farm" and Lift Station #2 (Pickering Court). Both stations have the ability to connect to a portable generator. The City maintains an inventory of spare lift station pumps at the treatment plant and the plant's mechanic repairs/refurbishes pumps and motors on site when needed.

The City submitted an evaluation of inflow and infiltration (I&I) in November 2012. The evaluation used plant flow, water usage, and rainfall data from 2007 to 2010 to estimate I&I in the system. While the study identified that the older portions of the collection system in the historic Snoqualmie City core has I&I rates approximately 14 times higher than newer section in the Snoqualmie Ridge area, the overall rates of I&I are not above the level EPA considers "excessive". The Snoqualmie WRF presently has sufficient treatment capacity to treat excess flow caused by I&I and the City has not reported any sanitary sewer overflows that can be attributed to I&I.

In conclusion, the results of the evaluation determined that the estimated infiltration and inflow rates into the collection system are not excessive. Presently, the City is drafting an updated general sewer plan that will discuss the current status of I/I in the service area.

Treatment processes

Raw sewage from Kimball Creek and In-Plant pump stations are pumped to the headworks for flow measurement, screening and influent sampling. The 10 MGD headworks consist of a 6-mm perforated plate mechanical screen, two in-series manual bar screens in the bypass channel (1.5-inch and 3/8-inch) and a Parshall flume equipped with ultrasonic sensor for influent flow measurements. The manual bar screens are readily available during any emergency, maintenance of the fine screen, and when influent flow exceeds the capacity of the fine screen. Screened wastewater flows by gravity to a vortex grit chamber for grit removal.

Degritted wastewater flows to two identical oxidation ditches. Return activated sludge and influent flow are combined in a flow control structure and then split between the two oxidation ditches. Each ditch consists of an anaerobic zone, an anoxic zone and an aerobic zone. The anaerobic zone has two chambers and each chamber is equipped with a mechanical mixer. The anoxic zone is also furnished with a mixer. The aeration zone is equipped with a vertical shaft aerator/mixer, an diverter weir that allows nitrate-rich mixed liquor to be recycled to the anoxic zone to support denitrification, and DO and ORP probes for treatment process control. Oxidation ditch system has a SRT of approximately 14 days and a mixed liquor concentration of 2,500 mg/L. Phosphorus and nitrogen are monitored in the influent and effluent of the ditches.

Effluent from the oxidation ditches flows to a mixed liquor control structure outfitted with slide gates that distribute the flows evenly between two 70-foot circular secondary clarifiers for solids removal. Each clarifier has two rake arms with solids removal pipes, effluent weir and scum removal mechanisms. Wasted activated sludge (WAS) is collected in a sump, and then pumped to the sludge thickening process in the new Solids Handling Building.

Secondary clarifier effluent flows to the secondary effluent control structure that directs and manages the flow either to the UV disinfection system or to the reclaimed water sand filters. This control structure has a V-notched weir, an ultrasonic sensor for flow measurement and an injection pipe for polymer and alum addition. During wet weather months, effluent flow from the secondary clarifiers are directed to a Trojan UV disinfection system with two channels and an average annual flow capacity of about 10 MGD per channel at 67.5 percent UVT. Each channel houses three banks, each bank has nine modules and each module has 6 lamps. Disinfected effluent is then discharge into the Snoqualmie River via outfall 001.

During dry weather months, secondary clarifier effluent is sent to three rectangular sand filters to produce Class A reclaimed water for irrigation purposes. Scour air is supplied by low pressure blowers to fluidize the filter media and facilitate the flow of effluent through the media. Two extra blowers and a traveling head backwashing system are used for backwashing purpose. Backwash water is collected in a trough and sent to the In-Plant pump station. Turbidity is monitored upstream and downstream of the sand filters. Effluent from the sand filters flows to the UV disinfection system prior to pumping to the at the Snoqualmie Ridge Golf Course.

Appendix E includes a schematic diagram showing the existing treatment process flow.

Reclaimed water production process

The Snoqualmie WRF produces Class A reclaimed water for irrigation uses during the dry weather season, from June through October. During reclaimed water production, overflow from the secondary clarifiers is collected at the secondary diversion structure and routed through a flash mixer for polymer addition then through rapid sand filtration beds. Filtered underflow is then routed to the UV disinfection system for disinfection before flowing to the effluent wet well. From the wet well, Class A product water is pumped approximately one mile to the Eagle Lake storage reservoir at the Golf Club at Snoqualmie Ridge.

After the installation of the new UV disinfection system, chlorination is no longer required to meet the State's current design standards for complete disinfection of reclaimed water with UV light. Therefore, the City has decommissioned its chlorine disinfection system and will not use it as a backup to the new UV disinfection system.

Production of Class A reclaimed water at the Snoqualmie WRF is limited by the capacity of the rapid sand filtration system. Based on the *Wastewater Treatment Plant Phase 2 Contract Drawings*, which were approved by Ecology in 2002, the design flow for the sand filters is 1.56 million gallons per day (MGD) for the maximum monthly average.

Operator certification

Washington State law requires an operator certified by Ecology under Chapter 173-230 to operate municipal wastewater treatment plants and reclaimed water treatment facilities. Certification levels size of the facility and the type of treatment systems used. Guidance in Ecology's *Permit Writer's Manual* and WAC 173-230 classify the treatment system at the Snoqualmie WRF as a Class III facility. As such, the operator in responsible charge of the day-to-day operations at the facility must, at a minimum, be rated as a Group III operator. An operator certified for at least a Group III facility must be in charge of each scheduled shift at the facility. In addition, the Snoqualmie WRF must use an operator or consultant certified under

Department of Health's Waterworks Operator Certification program (chapter 246-292) to perform certain tasks associated with the distribution of reclaimed water. Staffing at the Snoqualmie WRF complies with the requirements for certified treatment plant operators, but may not meet requirements related to reclaimed water distribution. The proposed permit includes a requirement in condition R6.C for the City to evaluate staffing requirements for reclaimed water distribution and to take necessary steps to correct deficiencies.

Reclaimed water distribution

The Snoqualmie WRF delivers Class A reclaimed water to the Eagle Lake storage reservoir at the Snoqualmie Ridge Golf Course. Water delivered to the storage reservoir has two distinct allotted withdrawals. The City's agreement with the Snoqualmie Ridge golf course allocates a daily average use of 730,000 gallons per day (gpd) of water (maximum of 857,000 gpd on dry days) for golf course irrigation. The City retains an allotment of 570,000 gpd for irrigation use by the City and other customers at various areas around Snoqualmie Ridge. According to the reclaimed water permit application, advisory signs are posted near the storage reservoir and at irrigation locations to alert the public of the use of reclaimed water. All distribution systems components (pipes, valves and outlets) are color-coded with purple paint and city employees receive training on the appropriate use of reclaimed water.

While Ecology and Health originally determined that the distribution configuration described above complied with interim reclaimed water standards established in 1997, it does not comply with requirements in the current Reclaimed Water Rule (WAC 173-219). Specifically, the distribution system lacks adequate cross-connection controls necessary to protect reclaimed water delivered under the "city allotment" from contamination by lower-quality water sources. Section VI.D of this fact sheet provides addition discussion about changes the City must make to comply with the requirements of the Reclaimed Water Rule.

Authorized beneficial uses

The Snoqualmie WRF produces Class A reclaimed water for the following beneficial use category of land application or irrigation, as defined in WAC 173-219-390. Table 2 identifies locations with existing agreements to use reclaimed water along with the authorized uses at those locations.

Table 2. Authorized reclaimed water uses

Authorized Water User	Site Location	Authorized Uses
Snoqualmie Ridge Golf Course	36005 SE Ridge Street	Turf irrigation (golf course)
Snoqualmie Ridge Business Park	Vicinity of SE Douglas St. and Snoqualmie Pkwy.	Landscape irrigation
Venture Commerce Center	35300-35400 SE Center St.	Landscape irrigation
Snoqualmie Public Works – Snoqualmie Pkwy median and swales	Snoqualmie Parkway	Landscape irrigation
Snoqualmie Ridge ROA	35131 SE Douglas St	Landscape irrigation

The proposed permit allows the City to add new users and use locations during the permit term for the same types of authorized uses listed above without modification of the permit.

Water rights protection

Chapter 90.46.120 RCW states that the owner of a wastewater treatment facility producing reclaimed water under a reclaimed water permit has the exclusive rights to that water. That right is tempered, however, by chapter 90.46.130 RCW, which states that the use of reclaimed water must not impair any existing water rights downstream of any freshwater discharge points of the facilities unless compensation or mitigation is agreed upon by the holder of the affected water right. Ecology cannot issue a reclaimed water permit or permit renewal unless the permit applicant demonstrates compliance with water rights protection.

Based on the "*2019 Wastewater Treatment and Water Reclamation Facility Impairment Analysis"* written by RH2 Consulting and verbal communication with the Department of Ecology Water Resources Program, the City will maintain the authorized reclaimed water production limit of 1.56 MGD during the proposed permit cycle. This maximum production volume has been authorized in permits since 2002 and regularly recognized as the design production limit for the SWRF. Continued production of reclaimed water up to this monthly average design limit will result in no new stream impacts or impairment of existing water rights or instream flows.

Discharge outfall

The Snoqualmie WRF discharges secondary treated and disinfected effluent through a 36" outfall into the Snoqualmie River at a location approximately 1,700 feet upstream of the Snoqualmie Falls. The line is buried to a location approximately 15 feet offshore, then extends uncovered another 15 feet to its terminus. The pipe is anchored to the river bottom with "H" piling and chains.

The outfall was last inspected September 26, 2018, by Global Diving and Salvage. The inspection report revealed that the pipe, joints, and anchor are serviceable and intact with no visible signs of damage. The outlet pipe was flowing free and unobstructed with no signs of sediment accumulation. The inspection also revealed that the H pilings, wire rope, shackles were intact and working as designed.

Solid wastes/Residual solids

Screenings, rags and grit are dewatered, compacted and then discharged to a dumpster. Screenings are transported by a screenings screw conveyor to the dumpster located adjacent to the headworks. Grit is pumped through a grit classifier prior to being discharged to the dumpster.

In 2019, the City completed Phase 2 Improvements Project, which included the construction of a New Solids Handling Facility – sludge thickening, aerobic digestion and dewatering. Waste activated sludge (WAS) is pumped by three rotary lobe pumps to a new rotary drum thickener (RDT) with design capacity of 125 gpm and 325 lbs/hr mass loading. The RDT can run either semi-continuously or continuously and help the City to manage the loads to the new aerobic digestion system. After thickening, TWAS is pumped to three aerobic digesters in series for stabilization. Each digester has a capacity of 250,000 gallons, contains a top mixer in the center of the reactor and coarse air diffusers at the bottom. Digesters are operated at 20 degrees Celsius and a minimum 40-day SRT. Scum collected in the secondary clarifiers is also pumped to the aerobic digesters. Stabilized solids are then pumped by a rotary lobe feed pump to two

dewatering units. The dewatering system can achieve approximately 21 percent solids concentration with polymer addition and dewatered solids are loaded to a truck located in the new loadout area. Odorous air is removed from the solids handling facility and digesters and treated with an in-ground biofilter.

Since completion of the New Solids Handling Facility Project, the City produces and hauls Class B biosolids to a beneficial use facility for farming via Tenelco, Inc. of Lake Stevens.

B. Description of the receiving water

Table 3. Ambient Background Data

Parameter	Value Used
Temperature (highest annual 7-DADMax) (90th percentile)	20.7° C
pH (Maximum / Minimum)	8.08 / 6.59 standard units (s.u.)
pH (50th Percentile)	7.1 s.u.
Dissolved Oxygen (10th percentile)	9.3 mg/L
Total Ammonia-N (90th percentile)	0.01 mg/L
Fecal Coliform (90th percentile)	62.4 /100 mL
Fecal Coliform (Geometric Mean)	11.4 /100 mL
Turbidity (90th percentile / Average)	15.2 / 6.7 NTU
TSS (90th percentile / Average)	35.2 / 14.9 mg/L
Hardness (Maximum / Average)	24.9 / 12.9 mg/L as CaCO3
Alkalinity (90th percentile)*	23.6 mg/L as CaCO3
Arsenic (90th percentile)	1.51 µg/L
Cadmium (90th percentile)	0.1 µg/L
Chromium (90th percentile)	2.2 µg/L
Copper (90th percentile / geometric mean)	2.7 / 0.9 µg/L
Lead (90th percentile)	0.42 µg/L
Mercury (90th percentile / geometric mean)	0.0036 / 0.0024 µg/L
Nickel (90th percentile / geometric mean)	2.2 / 0.4 µg/L
Silver (90th percentile)	0.1 µg/L
Zinc (90th percentile)	6.1 µg/L
*Alkalinity data is limited, with most samples taken between Oct. 2014-Nov. 2015 and Nov. 2017-Aug. 2018.	

The Snoqualmie WRF discharges treated effluent to the main stem of the Snoqualmie River approximately one-quarter mile above the Snoqualmie Falls. The Snoqualmie Falls, the waters that flow over the falls, and the surrounding area are listed on the National Register of Historic Places as a Traditional Cultural Place (TCP) and holds special cultural and religious significance for the Snoqualmie Indian Tribe. The Snoqualmie WRF outfall and its mixing zone are located upstream of the Snoqualmie Falls TCP boundary.

Other nearby point source outfalls include the City of North Bend WWTP, which discharges into the South Fork of the Snoqualmie River approximately five miles above the Snoqualmie WRF outfall. Ecology has also issued a General Upland Fish Hatchery permit to authorize the discharge of water from hatchery operations at the Washington Department of Fish and Wildlife's Tokul Creek Hatchery, located approximately one mile downriver from the Snoqualmie WRF. In addition to the point sources noted above, the Snoqualmie River receives urban runoff from the cities of Snoqualmie and North Bend, as well runoff from agricultural, sand & gravel mining, and construction activities throughout the Snoqualmie Valley area.

Ecology used data from its water quality monitoring station #07D130, located approximately 1.5 miles above the WRF outfall at the Meadowbrook bridge, as the primary source for ambient background conditions for this discharge. Table 3 summarizes data for conventional parameters collected between January 2003 and August 2018. Metals data are from six sampling events that occurred between October 2008 and August 2009 and temperature data are taken from continuous monitoring conducted by Ecology in 2006 in connection with the Snoqualmie River Temperature TMDL.

C. Wastewater influent characterization

The Snoqualmie WRF monitors influent flow and waste loading to verify actual loading does not exceed approved design capacity. Table 4 summarizes facility loadings as reported on discharge monitoring reports (DMRs) from May 2014 through October 2018. The influent wastewater is characterized as follows:

Table 4. Wastewater Influent Characterization

Parameter	Units	Average of Average Monthly Values	Maximum of Average Monthly Values
Flow	MGD	1.2	1.8
Carbonaceous Biochemical Oxygen Demand ($CBOD_5$)	mg/L	298.7	506.8
Biochemical Oxygen Demand (BOD_5)	mg/L	355.2	590.7
Biochemical Oxygen Demand (BOD_5)	lbs/day	3,122	4,985
Total Suspended Solids (TSS)	mg/L	289.4	379.8
Total Suspended Solids (TSS)	lbs/day	2,511	3,490

D. Treated Wastewater characterization

Table 5. Treated Wastewater Characterization for Snoqualmie River Discharge

Parameter	Units	Average Value	Maximum Value
Flow	MGD	0.82	3.92
$CBOD_5$	mg/L	2.3	5.6
$CBOD_5$ (full year)	lbs/day	18	180
$CBOD_5$ (TMDL season)	lbs/day	8.76	82.6
TSS	mg/L	3.6	9.5
TSS	lbs/day	29	247
Ammonia	mg/L	0.66	11.9
Ammonia (full year)	lbs/day	6.3	144.6
Ammonia (TMDL season)	lbs/day	0.89	12.2
Ortho-phosphate	mg/L	0.66	3.5
Ortho-phosphate	lbs/day	4.0	49.7
Temperature (7DAD-Max)	°C	18.6	23.0
Temperature (Daily Max)	°C	18.8	23.2
Parameter	**Units**	**Maximum Monthly Geometric Mean**	**Maximum Weekly Geometric Mean**
Fecal Coliforms	cfu / 100 mL	4.0	22.0
Parameter	**Units**	**Typical Minimum Value**	**Typical Maximum Value**
pH	standard units	6.63	7.48

The Snoqualmie WRF reported the concentration of pollutants in treated wastewater produced by the facility in the permit application and in discharge monitoring reports. The following tables summarize data representing the quality of treated wastewater produced from May 2014 through October 2018. The data represents the quality of water either discharged to the Snoqualmie River (Table 5) or distributed as Class A Reclaimed Water (Table 6).

Table 7 summarizes expanded testing for conventional, non-conventional, and priority pollutants, as reported by the Snoqualmie WRF in the permit application. The data below represent the quality of water during periods when the facility discharges to the Snoqualmie river or when producing reclaimed water.

Table 6 Treated Wastewater Characterization for Reclaimed Water Distribution [1]

Parameter	Units	Average Value	Maximum Value
Flow	MGD	0.65	1.29
$CBOD_5$	mg/L	1.5	2.6
TSS	mg/L	2.1	3.2
Turbidity (post filtration)	NTU	0.7	4.9
Total Nitrogen – as N	mg/L	4.1	9.0
Dissolved Oxygen	mg/L	2.4	3.2
Total Coliform – 7 day median	#/100 mL	1.9	17.8

[1] The Snoqualmie WRF generally distributes reclaimed water during the months of May through September each year, although distribution may begin as early as April. The permit does not restrict the reclaimed water production season.

Table 7. Expanded Effluent Characterization

Parameter	Units	Average Values	Maximum Values
Dissolved Oxygen	mg/L	7.1	8.2
Total Kjeldahl Nitrogen	mg/L	1.4	3.0
Nitrate + Nitrite	mg/L	3.8	6.7
Oil and grease	mg/L	3.1	3.8
Alkalinity (as $CaCO_3$)	mg/L	61.5	99
Total Phosphorus	mg/L	0.45	2.3
Total Dissolved Solids	mg/L	270	360
Hardness (as $CaCO_3$)	mg/L	86	120
Antimony	ug/L	1.17	2.55
Arsenic	ug/L	3.46	7.61
Beryllium	ug/L	-	0.03
Cadmium	ug/L	0.03	0.06
Chromium	ug/L	0.26	0.63
Copper	ug/L	7.44	12.4
Lead	ug/L	1.17	4.26
Mercury	ug/L	1.76	3.26
Nickel	ug/L	3.54	12.5
Selenium	ug/L	1.11	3.15
Zinc	ug/L	101	305
Cyanide	ug/L	-	17
Total Phenolic Compounds	ug/L	0.02	0.04
Toluene	ug/L	-	2.9
Bis(2-ethylhexyl)phthalate	ug/L	-	0.3

E. Summary of compliance with previous permit issued on April 21, 2014, and modified on May 11, 2018

The previous permit placed effluent limits on $CBOD_5$, TSS, fecal coliform, pH, ammonia, temperature and on total residual chlorine when used as back-up disinfectant for discharges to the river. The permit also included limits on Class A Reclaimed Water produced by the Snoqualmie WRF. The Reclaimed Water Conditions placed additional limits on flow, turbidity, dissolved oxygen, coagulant, total nitrogen, total coliform, and residual chlorine.

The Snoqualmie WRF has not consistently complied with the limits and other conditions governing discharges to the Snoqualmie River throughout the duration of the permit. Ecology assessed compliance based on its review of the facility's discharge monitoring reports (DMRs) and on inspections. Table 8 summarizes violations of the NPDES discharge limits reported by the facility during the past permit cycle.

Table 8. Violations/Triggers of the NPDES Permit

Date	Parameter	Units	Reported Value	Permit Limit	Violation or Trigger
May 2016	BOD_5	lbs/day	4,985.5	5,220	Permit Trigger (85% design)
November 2016	Fecal Coliforms	Incorrect sampling frequency			Permit Violation
November 2016	BOD_5	lbs/day	4,918.4	5,220	Permit Trigger (85% design)
January 2017	Late DMR submittal				Permit Violation
June 2017	$CBOD_5$	Analysis not complete			Permit Violation
June 2017	TSS	Analysis not complete			Permit Violation
July 2017	pH	s.u.	5.23	6.3	Permit Violation
July 2017	pH	s.u.	5.23	6.3	Permit Violation
July 2017	pH	s.u.	5.8	6.3	Permit Violation

The Snoqualmie WRF also did not consistently comply with permit limits associated with reclaimed water production. Table 9 summarizes reclaimed water production limit violations reported during the permit term.

Table 9. Reclaimed Water Limits Violations

Date	Parameter	Units	Reported Value	Permit Limit
August 2016	Total Coliforms	MPN/100 mL	60.9	23
June 2017	Total Nitrogen	Analysis not complete		
June 2017	Total Coliforms	MPN/100 mL	200.5	23
August 2017	Total Coliforms	MPN/100 mL	4.2	2.2

F. State environmental policy act (SEPA) compliance

State law exempts the issuance, reissuance or modification of any wastewater discharge permit from the SEPA process as long as the permit contains conditions that are no less stringent than federal and state rules and regulations (RCW 43.21C.0383). The exemption applies only to existing discharges, not to new discharges.

III. Proposed Permit Limits

Federal and state regulations require that effluent limits in an NPDES permit must be either technology- or water quality-based.

- Technology-based limits are based upon the treatment methods available to treat specific pollutants. Technology-based limits are set by the EPA and published as a regulation, or Ecology develops the limit on a case-by-case basis (40 CFR 125.3, and chapter 173-220 WAC).
- Water quality-based limits are calculated so that the effluent will comply with the Surface Water Quality Standards (chapter 173-201A WAC), Ground Water Standards (chapter 173-200 WAC), Sediment Quality Standards (chapter 173-204 WAC), or the National Toxics Rule (40 CFR 131.36).
- Ecology must apply the most stringent of these limits to each parameter of concern. These limits are described below.

The limits in this permit reflect information received in the application and from supporting reports (engineering, hydrogeology, etc.). Ecology evaluated the permit application and determined the limits needed to comply with the rules adopted by the state of Washington. Ecology does not develop effluent limits for all reported pollutants. Some pollutants are not treatable at the concentrations reported, are not controllable at the source, are not listed in regulation, and do not have a reasonable potential to cause a water quality violation.

Ecology does not usually develop limits for pollutants not reported in the permit application but may be present in the discharge. The permit does not authorize discharge of the non-reported pollutants. During the five-year permit term, the facility's effluent discharge conditions may change from those conditions reported in the permit application. The facility must notify Ecology if significant changes occur in any constituent [40 CFR 122.42(a)]. Until Ecology modifies the permit to reflect additional discharge of pollutants, a permitted facility could be violating its permit.

A. Design criteria

Under WAC 173-220-150 (1)(g), flows and waste loadings must not exceed approved design criteria. Ecology approved design criteria listed in Table10 in the *2002 Wastewater Treatment Plant Phase 2 Contract Drawings* prepared by Tetra Tech/KCM.

Table 10. Design Criteria for the City of Snoqualmie WRF

Parameter	Design Quantity
Maximum Month Design Flow (MMDF)	2.15 MGD
BOD_5 Loading for Maximum Month	5,220 lb/day
TSS Loading for Maximum Month	5,220 lb/day

B. Technology-based effluent limits

Federal and state regulations define technology-based effluent limits for domestic wastewater treatment plants. These effluent limits are given in 40 CFR Part 133 (federal) and in chapter 173-221 WAC (state). These regulations are performance standards that constitute all known, available, and reasonable methods of prevention, control, and treatment (AKART) for domestic wastewater.

Table 11 below identifies technology-based limits for pH, fecal coliform, $CBOD_5$, and TSS, as listed in chapter 173-221 WAC. Section III.F of this fact sheet describes the potential for water quality-based limits and Section IV.B discusses standards applicable to reclaimed water production.

Table 11. Technology-based Limits

Parameter	Average Monthly Limit	Average Weekly Limit
$CBOD_5$ (concentration)	25 mg/L	40 mg/L
$CBOD_5$ (concentration)	In addition, the $CBOD_5$ effluent concentration must not exceed fifteen percent (15%) of the average influent concentration.	
TSS (concentration)	30 mg/L	45 mg/L
TSS (concentration)	In addition, the TSS effluent concentration must not exceed fifteen percent (15%) of the average influent concentration.	

Parameter	Monthly Geometric Mean Limit	Weekly Geometric Mean Limit
Fecal Coliform Bacteria	200 organisms/100 mL	400 organisms/100 mL

Parameter	Daily Minimum	Daily Maximum
pH	6.0 standard units	9.0 standard units

The City has decommissioned its chlorine disinfection system and will no longer use chlorine as a backup alternative for disinfection. In 2017, the City replaced its old UV disinfection system with a new UV disinfection system that can reliably meet Class A reclaimed water standards and provide automation for improved operations and maintenance. The City also installed an uninterruptible power supply (UPS) system that provides emergency power to the new UV disinfection system whenever the input power source fails. If the reclaimed water disinfection requirements are not met, the facility can either turn on the redundant UV disinfection banks and channels or divert the effluent to the secondary effluent outfall at the Snoqualmie River. Therefore, the proposed permit does not include chlorine limits.

Technology-based mass limits are based on WAC 173-220-130(3)(b) and 173-221-030(11)(b). Ecology calculated the monthly and weekly average mass limits for $CBOD_5$ and Total Suspended Solids as follows:

Mass Limit = CL x DF x CF
where: CL = Technology-based concentration limits listed in the above table
DF = Maximum Monthly Average Design flow (MGD)
CF = Conversion factor of 8.34

Table 12. Technology-based Mass Limits

Parameter	Concentration Limit (mg/L)	Mass Limit (lbs/day)
$CBOD_5$ Monthly Average	25	448
$CBOD_5$ Weekly Average	40	717
TSS Monthly Average	30	538
TSS Weekly Average	45	807

C. Surface water quality-based effluent limits

The Washington State surface water quality standards (chapter 173-201A WAC) are designed to protect existing water quality and preserve the beneficial uses of Washington's surface waters. Waste discharge permits must include conditions that ensure the discharge will meet the surface water quality standards (WAC 173-201A-510). Water quality-based effluent limits may be

based on an individual waste load allocation or on a waste load allocation developed during a basin wide total maximum daily load study (TMDL).

Numerical criteria for the protection of aquatic life and recreation

Numerical water quality criteria are listed in the water quality standards for surface waters (chapter 173-201A WAC). They specify the maximum levels of pollutants allowed in receiving water to protect aquatic life and recreation in and on the water. Ecology uses numerical criteria along with chemical and physical data for the wastewater and receiving water to derive the effluent limits in the discharge permit. When surface water quality-based limits are more stringent or potentially more stringent than technology-based limits, the discharge must meet the water quality-based limits.

Numerical criteria for the protection of human health

In 1992, U.S. EPA published 91 numeric water quality criteria for the protection of human health that are applicable to dischargers in Washington State in its National Toxics Rule (40 CFR (EPA, 1992). Ecology submitted a standards revision for 192 new human health criteria for 97 pollutants to EPA on August 1, 2016. In accordance with requirements of CWA section 303(c)(2)(B), EPA finalized 144 new and revised Washington specific human health criteria for priority pollutants, to apply to waters under Washington's jurisdiction. EPA approved 45 human health criteria as submitted by Washington. The EPA took no action on Ecology submitted criteria for arsenic, dioxin, and thallium. The existing criteria for these three pollutants as adopted in the National Toxics Rule (40 CFR 131.36) remain in effect.

These newly adopted criteria, located in WAC 173-201A-240, are designed to protect humans from exposure to pollutants linked to cancer and other diseases, based on consuming fish and shellfish and drinking contaminated surface waters. The water quality standards also include radionuclide criteria to protect humans from the effects of radioactive substances.

Narrative criteria

Narrative water quality criteria (e.g., WAC 173-201A-240(1); 2006) limit the toxic, radioactive, or other deleterious material concentrations that the facility may discharge to levels below those which have the potential to:

- Adversely affect designated water uses.
- Cause acute or chronic toxicity to biota.
- Impair aesthetic values.
- Adversely affect human health.

Narrative criteria protect the specific designated uses of all fresh waters (WAC 173-201A-200, 2006) and of all marine waters (WAC 173-201A-210, 2006) in the state of Washington.

Antidegradation

Description--The purpose of Washington's Antidegradation Policy (WAC 173-201A-300-330; 2006) is to:

- Restore and maintain the highest possible quality of the surface waters of Washington.

- Describe situations under which water quality may be lowered from its current condition.
- Apply to human activities that are likely to have an impact on the water quality of surface water.
- Ensure that all human activities likely to contribute to a lowering of water quality, at a minimum, apply all known, available, and reasonable methods of prevention, control, and treatment (AKART).
- Apply three tiers of protection (described below) for surface waters of the state.

Tier I ensures existing and designated uses are maintained and protected and applies to all waters and all sources of pollutions. Tier II ensures that waters of a higher quality than the criteria assigned are not degraded unless such lowering of water quality is necessary and in the overriding public interest. Tier II applies only to a specific list of polluting activities. Tier III prevents the degradation of waters formally listed as "outstanding resource waters," and applies to all sources of pollution.

A facility must prepare a Tier II analysis when all three of the following conditions are met:

- The facility is planning a new or expanded action.
- Ecology regulates or authorizes the action.
- The action has the potential to cause measurable degradation to existing water quality at the edge of a chronic mixing zone.

Facility Specific Requirements--This facility must meet Tier I requirements.

- Dischargers must maintain and protect existing and designated uses. Ecology must not allow any degradation that will interfere with, or become injurious to, existing or designated uses, except as provided for in chapter 173-201A WAC.
- For waters that do not meet assigned criteria, or protect existing or designated uses, Ecology will take appropriate and definitive steps to bring the water quality back into compliance with the water quality standards. Ecology has developed and EPA has approved plans to correct impairments for the following parameters: Ammonia-Nitrogen (as a nutrient), BOD, fecal coliform, and temperature. Tier I requires the Snoqualmie WRF to comply with waste load allocations in the approved plan.

Ecology's analysis described in this section of the fact sheet demonstrates that the proposed permit conditions will protect existing and designated uses of the receiving water.

Mixing zones

A mixing zone is the defined area in the receiving water surrounding the discharge port(s), where wastewater mixes with receiving water. Within mixing zones, the pollutant concentrations may exceed water quality numeric standards, so long as the discharge doesn't interfere with designated uses of the receiving water body (for example, recreation, water supply, and aquatic life and wildlife habitat, etc.) The pollutant concentrations outside of the mixing zones must meet water quality numeric standards.

State and federal rules allow mixing zones because the concentrations and effects of most pollutants diminish rapidly after discharge, due to dilution. Ecology defines mixing zone sizes to limit the amount of time any exposure to the end-of-pipe discharge could harm water quality, plants, or fish.

The state's water quality standards allow Ecology to authorize mixing zones for the facility's permitted wastewater discharges only if those discharges already receive all known, available, and reasonable methods of prevention, control, and treatment (AKART). Mixing zones typically require compliance with water quality criteria within a specified distance from the point of discharge and must not use more than 25% of the available width of the water body for dilution [WAC 173-201A-400 (7)(a)(ii-iii) or WAC 173-201A-400(7)(b)(ii-iii)].

Ecology uses modeling to estimate the amount of mixing within the mixing zone. Through modeling Ecology determines the potential for violating the water quality standards at the edge of the mixing zone and derives any necessary effluent limits. Steady-state models are the most frequently used tools for conducting mixing zone analyses. Ecology chooses values for each effluent and for receiving water variables that correspond to the time period when the most critical condition is likely to occur (see Ecology's *Permit Writer's Manual*). Each critical condition parameter, by itself, has a low probability of occurrence and the resulting dilution factor is conservative. The term "reasonable worst-case" applies to these values.

The mixing zone analysis produces a numerical value called a dilution factor (DF). A dilution factor represents the amount of mixing of effluent and receiving water that occurs at the boundary of the mixing zone. For example, a dilution factor of 4 means the effluent is 25% and the receiving water is 75% of the total volume of water at the boundary of the mixing zone. Ecology uses dilution factors with the water quality criteria to calculate reasonable potentials and effluent limits. Water quality standards include both aquatic life-based criteria and human health-based criteria. The former are applied at both the acute and chronic mixing zone boundaries; the latter are applied only at the chronic boundary. The concentration of pollutants at the boundaries of any of these mixing zones may not exceed the numerical criteria for that zone.

Most aquatic life *acute* criteria are based on the assumption that organisms are not exposed to that concentration for more than one hour and more often than one exposure in three years. Most aquatic life *chronic* criteria are based on the assumption that organisms are not exposed to that concentration for more than four consecutive days and more often than once in three years.

The two types of human health-based water quality criteria distinguish between those pollutants linked to non-cancer effects (non-carcinogenic) and those linked to cancer effects (carcinogenic). The human health-based water quality criteria incorporate several exposure and risk assumptions. These assumptions include:

- A 70-year lifetime of daily exposures.
- An ingestion rate for fish or shellfish measured in kg/day.
- An ingestion rate of two and four tenths (2.4) liters/day for drinking water (increased from two liters/day in the 2016 Water Quality Standards update).
- A one-in-one-million cancer risk for carcinogenic chemicals.

This permit authorizes a small acute mixing zone, surrounded by a chronic mixing zone around the point of discharge (WAC 173-201A-400). The water quality standards impose certain conditions before allowing the discharger a mixing zone:

1. **Ecology must specify both the allowed size and location in a permit.**

   The proposed permit specifies the size and location of the allowed mixing zone (as specified below).

2. **The facility must fully apply "all known, available, and reasonable methods of prevention, control and treatment" (AKART) to its discharge.**

   Ecology has determined that the treatment provided at the City of Snoqualmie WRF meets the requirements of AKART (see "Technology-based Limits").

3. **Ecology must consider critical discharge conditions.**

   Surface water quality-based limits are derived for the water body's critical condition (the receiving water and waste discharge condition with the highest potential for adverse impact on the aquatic biota, human health, and existing or designated waterbody uses). The critical discharge condition is often pollutant-specific or waterbody-specific.

   Critical discharge conditions are those conditions that result in reduced dilution or increased effect of the pollutant. Factors affecting dilution include the depth of water, the density stratification in the water column, the currents, and the rate of discharge. Density stratification is determined by the salinity and temperature of the receiving water. Temperatures are warmer in the surface waters in summer. Therefore, density stratification is generally greatest during the summer months. Density stratification affects how far up in the water column a freshwater plume may rise. The rate of mixing is greatest when an effluent is rising. The effluent stops rising when the mixed effluent is the same density as the surrounding water. After the effluent stops rising, the rate of mixing is much more gradual. Water depth can affect dilution when a plume might rise to the surface when there is little or no stratification. Ecology's *Permit Writer's Manual* describes additional guidance on criteria/design conditions for determining dilution factors. The manual can be obtained from Ecology's website at:
   https://apps.ecology.wa.gov/publications/documents/92109.pdf

Table 13. Critical Conditions Used to Model the Discharge

Critical Condition	Value
The seven-day-average low river flow with a recurrence interval of ten years (7Q10)	346 cfs
The thirty-day low river flow with a recurrence interval of five years (30Q5) [1]	484 cfs
Harmonic Mean Flow [2]	1038 cfs
River depth at the 7Q10 period	10.5 feet
Estimated river width at the 7Q10 period [3]	170 feet
Estimated river slope[3]	.000129
Maximum average monthly effluent flow for chronic and human health non-carcinogen	1.62 MGD
Maximum daily flow for acute mixing zone	3.92 MGD
Annual average flow for human health carcinogen	0.92 MGD

Table 13 Footnotes
[1] *30Q5 flow estimated as 1.4 times the 7Q10 flow.*
[2] *Harmonic mean flow estimated as three times the 7Q10 flow.*
[3] *River width and slope estimated based on aerial photo interpretation and topographic map measurements.*

4. **Supporting information must clearly indicate the mixing zone would not:**

   - Have a reasonable potential to cause the loss of sensitive or important habitat.
   - Substantially interfere with the existing or characteristic uses.

- Result in damage to the ecosystem.
- Adversely affect public health.

Ecology established Washington State water quality criteria for toxic chemicals using EPA criteria. EPA developed the criteria using toxicity tests with numerous organisms and set the criteria to generally protect the species tested and to fully protect all commercially and recreationally important species.

EPA sets acute criteria for toxic chemicals assuming organisms are exposed to the pollutant at the criteria concentration for one hour. They set chronic standards assuming organisms are exposed to the pollutant at the criteria concentration for four days. Dilution modeling under critical conditions generally shows that both acute and chronic criteria concentrations are reached within minutes of discharge.

The discharge plume does not impact drifting and non-strong swimming organisms because they cannot stay in the plume close to the outfall long enough to be affected. Strong swimming fish could maintain a position within the plume, but they can also avoid the discharge by swimming away. Mixing zones generally do not affect benthic organisms (bottom dwellers) because the buoyant plume rises in the water column. Ecology has additionally determined that the effluent will not exceed 33 degrees C for more than two seconds after discharge; and that the temperature of the water will not create lethal conditions or blockages to fish migration.

Ecology evaluates the cumulative toxicity of an effluent by testing the discharge with whole effluent toxicity (WET) testing.

Because this is a domestic wastewater discharge, the effluent contains fecal coliform bacteria. Ecology developed the water quality criteria for fecal coliforms (discussed below) to assure that people swimming (primary contact recreation) in water meeting the criteria would not develop gastro enteric illnesses. Ecology has authorized a mixing zone for this discharge; however, the discharge is subject to a performance-based effluent limit of 100 colony forming units/100mL. This means the effluent meets the water quality criteria at the point of discharge and doesn't need dilution to meet the water quality criteria.

Starting on January 1, 2021, the recreational water quality criteria for bacteria will change to *E. coli* for freshwater. In addition, all waterbodies will become designated for primary contact recreation. No change to the indicator will occur during this permit cycle as a site-specific correlation between fecal coliform and the *E.coli* needs developing. Ecology will reevaluate bacteria limits for this discharge during the next permit development period.

Ecology reviewed the above information, the specific information on the characteristics of the discharge, the receiving water characteristics, and the discharge location. Based on this review, Ecology concluded that the discharge does not have a reasonable potential to cause the loss of sensitive or important habitat, substantially interfere with existing or characteristics uses, result in damage to the ecosystem, or adversely affect public health if the permit limits are met.

5. The discharge/receiving water mixture must not exceed water quality criteria outside the boundary of a mixing zone.

Ecology conducted a reasonable potential analysis, using procedures established by the EPA and by Ecology, for each pollutant and concluded the discharge/receiving water mixture will

not violate water quality criteria outside the boundary of the mixing zone if permit limits are met.

6. **The size of the mixing zone and the concentrations of the pollutants must be minimized.**

   At any given time, the effluent plume uses only a portion of the acute and chronic mixing zone, which minimizes the volume of water involved in mixing. The plume mixes as it rises through the water column therefore much of the receiving water volume at lower depths in the mixing zone is not mixed with discharge. Similarly, because the discharge may stop rising at some depth due to density stratification, waters above that depth will not mix with the discharge. Ecology determined it is impractical to specify in the permit the actual, much more limited volume in which the dilution occurs as the plume rises and moves with the current.

   Ecology minimizes the size of mixing zones by requiring dischargers to install diffusers when they are appropriate to the discharge and the specific receiving waterbody. When a diffuser is installed, the discharge is more completely mixed with the receiving water in a shorter time. Ecology also minimizes the size of the mixing zone (in the form of the dilution factor) using design criteria with a low probability of occurrence. For example, Ecology uses the expected 95th percentile pollutant concentration, the 90th percentile background concentration, the centerline dilution factor, and the lowest flow occurring once in every ten years to perform the reasonable potential analysis.

   Because of the above reasons, Ecology has effectively minimized the size of the mixing zone authorized in the proposed permit.

7. **Maximum size of mixing zone.**

   The authorized mixing zone does not exceed the maximum size restriction.

8. **Acute mixing zone.**

   - **The discharge/receiving water mixture must comply with acute criteria as near to the point of discharge as practicably attainable.**

     Ecology determined the acute criteria will be met at 10% of the volume fraction of the chronic mixing zone at the ten year low flow.

   - **The pollutant concentration, duration, and frequency of exposure to the discharge will not create a barrier to migration or translocation of indigenous organisms to a degree that has the potential to cause damage to the ecosystem.**

     As described above, the toxicity of any pollutant depends upon the exposure, the pollutant concentration, and the time the organism is exposed to that concentration. Authorizing a limited acute mixing zone for this discharge assures that it will not create a barrier to migration. The effluent from this discharge will rise as it enters the receiving water, assuring that the rising effluent will not cause translocation of indigenous organisms near the point of discharge (below the rising effluent).

   - **Comply with size restrictions.**

     The mixing zone authorized for this discharge complies with the size restrictions published in chapter 173-201A WAC.

9. Overlap of mixing zones.

This mixing zone does not overlap another mixing zone.

D. Designated uses and surface water quality criteria

Applicable designated uses and surface water quality criteria are defined in chapter 173-201A WAC. In addition, the U.S. EPA set human health criteria for toxic pollutants (EPA 1992). The tables included below summarize the criteria applicable to the receiving water's designated uses.

- Aquatic Life Uses are designated based on the presence of, or the intent to provide protection for the key uses. All indigenous fish and non-fish aquatic species must be protected in waters of the state in addition to the key species. The Aquatic Life Uses for this receiving water are identified below.

Table 14. Freshwater Aquatic Life Uses and Associated Criteria

Core Summer Salmonid Habitat	
Temperature Criteria – Highest 7-DAD MAX	16°C (60.8°F)
Dissolved Oxygen Criteria	9.5 mg/L
Turbidity Criteria	• 5 NTU over background when the background is 50 NTU or less; or • A 10 percent increase in turbidity when the background turbidity is more than 50 NTU.
Total Dissolved Gas Criteria	Total dissolved gas must not exceed 110 percent of saturation at any point of sample collection.
pH Criteria	The pH must measure within the range of 6.5 to 8.5, with a human-caused variation within the above range of less than 0.2 units.

- The *recreational uses* for this receiving water are identified below.

Table 15. Recreational Uses and Associated Criteria

Recreational Use	**Criteria**
Primary Contact Recreation (effective 1/1/2021)	*E. coli* organism levels must not exceed a geometric mean value of 100 CFU or MPN per 100 mL, with not more than 10 percent of all samples (or any single sample when less than ten sample points exist) obtained within the averaging period exceeding 320 CFU or MPN per100 mL.

- The *water supply uses* are domestic, agricultural, industrial, and stock watering.
- The *miscellaneous freshwater uses* are wildlife habitat, harvesting, commerce and navigation, boating, and aesthetics.

E. Water quality impairments

Ecology conducted water quality assessments of the Snoqualmie River in 1989-91 that identified impairments existed within the basin. The *Snoqualmie River Total Maximum Daily Load Study* (#94-71) published in May 1994 recommended waste load allocations necessary to correct impairments due to nutrient loading and high fecal coliform bacteria levels. Ecology also published the *Snoqualmie River Basin Temperature Total Maximum Daily Load: Water Quality Improvement Report and Implementation Plan* (#11-10-041) in 2011 to address

temperature impairments in the system. The studies included waste load allocations for temperature, $CBOD_5$, ammonia, and fecal coliform. Additional study of dissolved oxygen levels is needed in the lower South Fork Snoqualmie to determine whether soluble reactive phosphorus limits are necessary.

F. Evaluation of surface water quality-based effluent limits for narrative criteria

Ecology must consider the narrative criteria described in WAC 173-201A-160 when it determines permit limits and conditions. Narrative water quality criteria limit the toxic, radioactive, or other deleterious material concentrations that the facility may discharge which have the potential to adversely affect designated uses, cause acute or chronic toxicity to biota, impair aesthetic values, or adversely affect human health.

Ecology considers narrative criteria when it evaluates the characteristics of the wastewater and when it implements all known, available, and reasonable methods of treatment and prevention (AKART) as described above in the technology-based limits section. When Ecology determines if a facility is meeting AKART it considers the pollutants in the wastewater and the adequacy of the treatment to prevent the violation of narrative criteria.

In addition, Ecology considers the toxicity of the wastewater discharge by requiring whole effluent toxicity (WET) testing when there is a reasonable potential for the discharge to contain toxics. Ecology's analysis of the need for WET testing for this discharge is described later in the fact sheet.

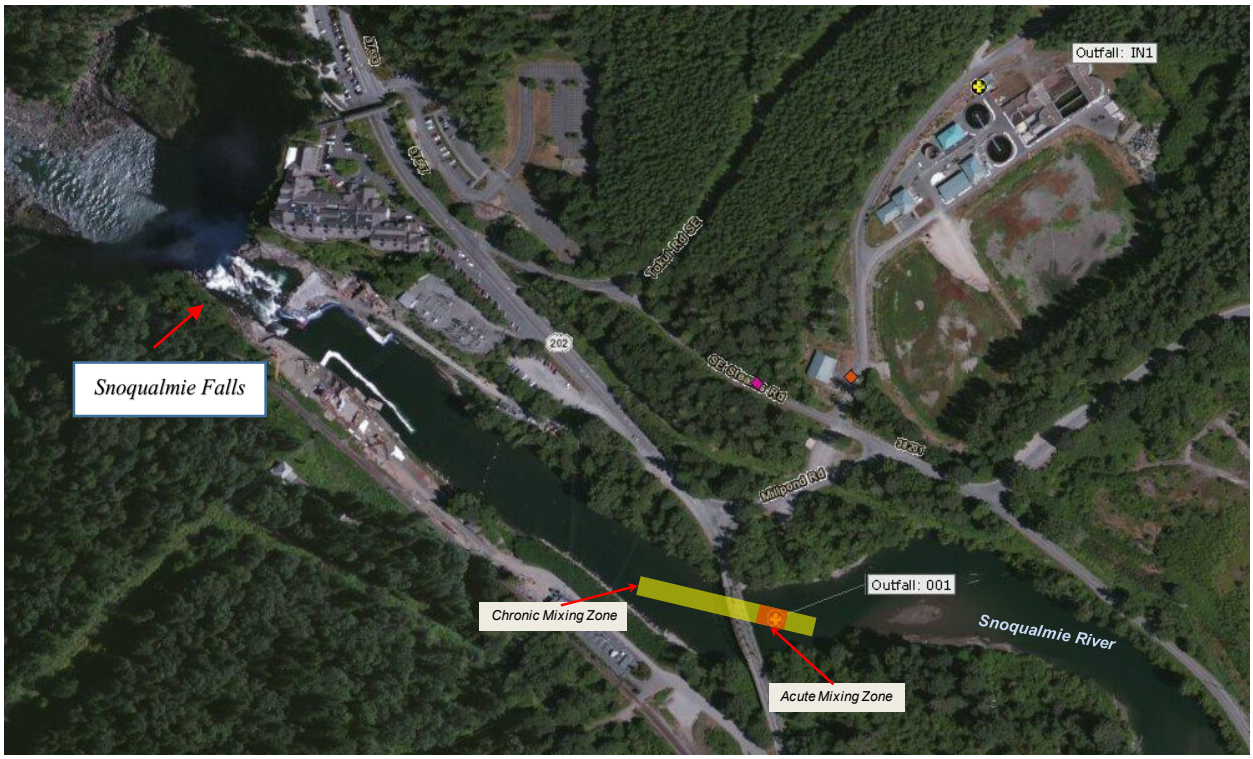
G. Evaluation of surface water quality-based effluent limits for numeric criteria

Pollutants in an effluent may affect the aquatic environment near the point of discharge (near-field) or at a considerable distance from the point of discharge (far-field). Toxic pollutants, for example, are near-field pollutants; their adverse effects diminish rapidly with mixing in the receiving water. Conversely, a pollutant such as biochemical oxygen demand (BOD_5) is a far-field pollutant whose adverse effect occurs away from the discharge even after dilution has occurred. Thus, the method of calculating surface water quality-based effluent limits varies with the point at which the pollutant has its maximum effect.

With technology-based controls (AKART), predicted pollutant concentrations in the discharge exceed water quality criteria. Ecology therefore authorizes a mixing zone in accordance with the geometric configuration, flow restriction, and other restrictions imposed on mixing zones by chapter 173-201A WAC.

Outfall 001 consists of a 36-inch diameter open-ended pipe that discharges immediately upstream of the Railroad Avenue (Hwy 202) Bridge at a location approximately 30 feet from the north bank of the Snoqualmie River. The outfall pipe terminates at a depth of 10.5 feet at 7Q10 flow. Ecology carried out a preliminary dilution modeling effort of the outfall using river channel dimensions estimated from maps and aerial photos. This effort determined that dilution obtained through modeling would be less restrictive than using percent of river flow based calculations listed in regulations. Therefore, this permit limits the authorized mixing zones to the size and dilution ratios listed in WAC 173-201A-400, as discussed below. Figure 2 depicts the approximate size and location of the authorized mixing zone.

Figure 2. Approximate Mixing Zones



Chronic Mixing Zone -- WAC 173-201A-400(7)(a) specifies that mixing zones must not extend in a downstream direction from the discharge ports for a distance greater than 300 feet plus the depth of water over the discharge ports or extend upstream for a distance of over 100 feet, not utilize greater than 25% of the flow, and not occupy greater than 25% of the width of the water body. Given these constraints, the proposed permit authorizes a chronic mixing zone with a maximum width of 42.5 feet, and that extends a maximum of 310.5 feet downstream and 100 feet upstream from the end of the pipe. The discharge must comply with water quality standards for chronic aquatic life criteria along with carcinogen and non-carcinogen human health criteria at the edge of this mixing zone. Ecology will restrict maximum chronic dilution based on mixing the effluent with 25% of the 7Q10 flow.

Acute Mixing Zone -- WAC 173-201A-400(8)(a) specifies that in rivers and streams a zone where acute toxics criteria may be exceeded must not extend beyond 10% of the distance towards the upstream and downstream boundaries of the chronic zone, not use greater than 2.5% of the flow and not occupy greater than 25% of the width of the water body Given these constraints, the proposed permit authorizes an acute mixing zone with a maximum width of 42.5 feet, and that extends a maximum of 31.0 feet downstream and 10.0 feet upstream from the end of the pipe. The discharge must comply with water quality standards for acute aquatic life criteria at the edge of this mixing zone. Ecology will restrict maximum acute dilution based on mixing the effluent with 2.5% of the 7Q10 flow.

Dilution Factors -- Ecology determined the dilution factors associated with the authorized mixing zones based on simple mixing of the effluent with the percentage of the river flow at the critical conditions noted above. Ecology uses the maximum dilution listed in Table 16 below to evaluate the impacts the discharge may have on downstream water quality and to

determine whether the proposed permit requires water quality-based limits for dissolved oxygen deficiency, nutrients, pH, fecal coliform, chlorine, ammonia, metals, other toxics, and temperature. The derivation of surface water quality-based limits also takes into account the variability of pollutant concentrations in both the effluent and the receiving water.

Dilution factors are slightly different from the ones established in the previous permit cycle because Ecology used updated flow conditions reported by the City in the last five years. These flow conditions reflect the current operating conditions at the City of Snoqualmie WRF.

Table 16. Dilution Factors (DF)

Criteria	Acute	Chronic
Aquatic Life	2.4	35.5
Human Health, Carcinogen		183.3
Human Health, Non-carcinogen		49.3

Ecology determined the impacts of dissolved oxygen deficiency, nutrients, pH, fecal coliform, ammonia, metals, other toxics, and temperature as described below, using the dilution factors in the above table. The derivation of surface water quality-based limits also takes into account the variability of pollutant concentrations in both the effluent and the receiving water.

Dissolved Oxygen--BOD_5 and Ammonia Effects--Natural decomposition of organic material in wastewater effluent impacts dissolved oxygen in the receiving water at distances far outside of the regulated mixing zone. The 5-day Biochemical Oxygen Demand (BOD_5) of an effluent sample indicates the amount of biodegradable material in the wastewater and estimates the magnitude of oxygen consumption the wastewater will generate in the receiving water. The amount of ammonia-based nitrogen in the wastewater also provides an indication of oxygen demand potential in the receiving water.

The *1994 Snoqualmie River Total Maximum Daily Load Study* established waste load allocations (WLAs) for $CBOD_5$ and ammonia for discharges occurring during the August – October critical season. Waste load allocations for the Snoqualmie WRF are:

- 206 lbs/day $CBOD_5$
- 68.7 lbs/day Ammonia (as N)

The WLA listed above are the maximum daily limits (MDL) for those parameters. According to federal NPDES regulations, all permit limits must be expressed as both average monthly and maximum daily limits. The average monthly limit (AML) is calculated according to the method in EPA's Technical Support Document for Water Quality-based Toxics Control (1991). See Appendix D for detailed calculations. The AML calculation is affected by effluent variability and number of samples per month. Ecology calculated the average monthly limit based on 12 sampling events per month (3 per week) for $CBOD_5$ and 4 sampling events per month (1 per week) for ammonia. The calculated coefficients of variation (CV) used are 0.81 and 2.51 for $CBOD_5$ and ammonia, respectively. Average monthly limits (AML) for the proposed permit are:

- 51.6 lbs/day $CBOD_5$
- 21.6 lbs/day Ammonia (as N)

The proposed permit will include water quality-based mass limits for $CBOD_5$ and total ammonia during the critical season and technology-based mass limits for $CBOD_5$ only during the non-critical season. $CBOD_5$ concentration limits apply throughout the year.

pH -- Ecology modeled the impact of the effluent pH on the receiving water using the calculations from EPA, 1988, and the chronic dilution factor of 35.5. Ecology used ambient values in Table 3 for this analysis along with the extremes of the technology-based limits (pH of 6.0 and 9.0). Ecology also assumed discharge temperature and alkalinity in Tables 5 and 7 remain constant throughout the pH range.

Ecology predicts no violation of the pH criteria under critical conditions at the upper boundary of pH 9.0. However, the incremental pH change at the lower end of the range (pH 6.0) exceeds the allowable change of 0.2 standard units. In developing the previous permit for the Snoqualmie WRF, Ecology determined that the pH must remain above 6.3 to protect water quality. As shown in the calculations presented in Appendix D, a limit of 6.3 remains protective. Therefore, the proposed permit retains the previous permit's pH limit range of 6.3 to 9.0.

Fecal Coliform -- The 1994 *Snoqualmie River Total Maximum Daily Load Study* examined the need for waste load allocations for fecal coliform bacteria. The report concluded that wastewater treatment plants within the system represented a minor contribution to the overall loading when the plants comply with technology-based limits for fecal coliform. Although the study included a numeric waste load allocation of 2.5×10^{10} CFU/day for the Snoqualmie facility, Ecology has routinely enforced the technology-based limits described in Part III.B of this fact sheet as the required controls necessary to comply with the TMDL.

To confirm that technology-based limits remain sufficient to protect water quality downstream of the discharge, Ecology modeled the numbers of fecal coliform by simple mixing analysis using the technology-based limit of 400 organisms per 100 ml, an ambient concentration of 49 organisms per100 ml and a dilution factor of 35.5. As shown in Appendix E, the calculation predicts that the discharge will increase fecal coliform levels by 10 organisms per 100 ml at the edge of the chronic mixing zone to a level of 59 organisms per 100 ml. Since this remains less than the water quality standard of 100 organisms per 100 ml, the proposed permit includes the technology-based effluent limit for fecal coliform bacteria.

Effective January 2021, the water quality fecal coliform bacteria recreational criterion changed from fecal coliform to E. coli. Dual indicator monitoring will be a part of this permit so that a site-specific correlation can be developed during the permit cycle. Ecology will use this data to assess the reasonable potential to exceed the applicable water quality criterion in the next iteration of this permit.

Turbidity--Ecology evaluated the impact of turbidity based on the range of total suspended solids in the effluent and turbidity of the receiving water. Ecology expects no violations of the turbidity criteria outside the designated mixing zone provided the facility meets its technology-based total suspended solids permit limits.

Toxic Pollutants--Federal regulations (40 CFR 122.44) require Ecology to place limits in NPDES permits on toxic chemicals in an effluent whenever there is a reasonable potential for those chemicals to exceed the surface water quality criteria. Ecology does not exempt facilities with technology-based effluent limits from meeting the surface water quality standards.

The following toxic pollutants are present in the discharge: ammonia, arsenic, beryllium, cadmium, chromium (hexavalent), copper, lead, mercury, nickel, selenium, zinc and cyanide. Ecology conducted a reasonable potential analysis (See Appendix D) on these parameters to determine whether it would require effluent limits in this permit.

No valid ambient background data were available for antimony, beryllium, cyanide, selenium, phenols, toluene and bis(2-ethylhexyl) phthalate. Ecology used zero for background. Ambient data was also not available for hexavalent chromium; however data was available for total chromium. Since total chromium includes hexavalent chromium, Ecology used the ambient concentration of total chromium as a "worst case" concentration of hexavalent chromium in the reasonable potential analysis. Valid ambient background data were available for the remaining pollutants.

Ecology determined that pollutants listed pose no reasonable potential to exceed the water quality criteria at the critical condition using procedures given in EPA, 1991 (Appendix D) and as described above. Ecology's determination assumes that this facility meets the other effluent limits of this permit.

Temperature--The state temperature standards [WAC 173-201A-200-210 and 600-612] include multiple elements:

- Annual summer maximum threshold criteria (June 15 to September 15)
- Supplemental spawning and rearing season criteria (September 15 to June 15)
- Incremental warming restrictions
- Protections against acute effects

Ecology evaluates each criterion independently to determine reasonable potential and derive permit limits.

- Annual summer maximum and supplementary spawning/rearing criteria

  Each water body has an annual maximum temperature criterion [WAC 173-201A-200(1)(c), 210(1)(c), and Table 602]. These threshold criteria (e.g., 12, 16, 17.5, 20°C) protect specific categories of aquatic life by controlling the effect of human actions on summer temperatures.

  Some waters have an additional threshold criterion to protect the spawning and incubation of salmonids (9°C for char and 13°C for salmon and trout) [WAC 173-201A-602, Table 602]. These criteria apply during specific date-windows.

  The threshold criteria apply at the edge of the chronic mixing zone. Criteria for most fresh waters are expressed as the highest 7-Day average of daily maximum temperature (7-DADMax). The 7-DADMax temperature is the arithmetic average of seven consecutive measures of daily maximum temperatures. Criteria for marine waters and some fresh waters are expressed as the highest 1-Day annual maximum temperature (1-DMax).

- Incremental warming criteria

  The water quality standards limit the amount of warming human sources can cause under specific situations [WAC 173-201A-200(1)(c)(i)-(ii), 210(1)(c)(i)-(ii)]. The incremental warming criteria apply at the edge of the chronic mixing zone.

At locations and times when background temperatures are cooler than the assigned threshold criterion, point sources are permitted to warm the water by only a defined increment. These increments are permitted only to the extent doing so does not cause temperatures to exceed either the annual maximum or supplemental spawning criteria.

At locations and times when a threshold criterion is being exceeded due to natural conditions, all human sources, considered cumulatively, must not warm the water more than 0.3°C above the naturally warm condition.

When Ecology has not yet completed a TMDL, our policy allows each point source to warm water at the edge of the chronic mixing zone by 0.3°C. This is true regardless of the background temperature and even if doing so would cause the temperature at the edge of a standard mixing zone to exceed the numeric threshold criteria. Allowing a 0.3°C warming for each point source is reasonable and protective where the dilution factor is based on 25% or less of the critical flow. This is because the fully mixed effect on temperature will only be a fraction of the 0.3°C cumulative allowance (0.075°C or less) for all human sources combined.

- Protections for temperature acute effects

  Instantaneous lethality to passing fish: The upper 99th percentile daily maximum effluent temperature must not exceed 33°C, unless a dilution analysis indicates ambient temperatures will not exceed 33°C two seconds after discharge.

  General lethality and migration blockage: Measurable (0.3°C) increases in temperature at the edge of a chronic mixing zone are not allowed when the receiving water temperature exceeds either a 1DMax of 23°C or a 7DADMax of 22°C.

  Lethality to incubating fish: Human actions must not cause a measurable (0.3°C) warming above 17.5°C at locations where eggs are incubating.

Reasonable potential analysis

Annual summer maximum and incremental warming criteria: Due to documented temperature impairments in the Snoqualmie River basin, Ecology completed The *Snoqualmie River Basin Temperature Total Maximum Daily Load: Water Quality Improvement Report and Implementation Plan* in 2011. This plan established strategies and waste load allocations necessary to restore river temperatures to levels consistent with approved standards for summer maximum, supplemental spawning (in areas with supplemental temperature criteria), and incremental warming. The plan includes a temperature waste load allocation of 24.7° C for discharges from the Snoqualmie WRF to the Snoqualmie River during the period of June 1st through September 30th. Ecology will incorporate this allocation into the proposed permit as a seasonal daily temperature limit.

Protection against acute effects: A discharge does not pose a reasonable potential to risk acute effects when it meets the following conditions:

- Effluent temperature must not exceed 33°C or cause ambient temperature to exceed 33°C two seconds after discharge.
- Does not increase ambient temperature more than 0.3°C when receiving water temperature exceeds either a 1DMax of 23°C or a 7DADMax of 22°C.

- Does not cause temperature to warm more than 0.3°C above 17.5°C at locations where eggs are incubating.

The wastewater effluent characterization in Table 5 of this fact sheet shows that discharges from the Snoqualmie WRF do not approach 33°C. In addition, ambient data in Table 3 shows that the river temperature does not approach a 7DADMax temperature of 22°C and the facility does not discharge into an area in which eggs are incubating. Therefore, the proposed permit does not require a limit to protect against acute effects since the discharge complies with the acute criteria listed above.

H. Human health

Washington's water quality standards include numeric human health-based criteria for priority pollutants that Ecology must consider when writing NPDES permits. Ecology determined the effluent from the Snoqualmie WRF contains chemicals of concern for human health, based on data or information reported in priority pollutant testing that indicate regulated chemicals occur in the discharge. A list of the pollutants of concern for human health includes: antimony, arsenic, chloroform, cyanide, mercury, nickel, zinc, selenium, phenols, toluene, and bis(2-ethylhexyl)phthalate.

Ecology evaluated the discharge's potential to violate the water quality standards as required by 40 CFR 122.44(d) by following the procedures published in the *Technical Support Document for Water Quality-Based Toxics Control* (EPA/505/2-90-001) and Ecology's *Permit Writer's Manual* to make a reasonable potential determination. The evaluation showed that the discharge has no reasonable potential to cause a violation of water quality standards for the parameters listed above and, therefore, effluent limits are not needed. Ecology will reevaluate this discharge for impacts to human health at the next permit reissuance.

I. Sediment quality

The aquatic sediment standards (chapter 173-204 WAC) protect aquatic biota and human health. Under these standards Ecology may require a facility to evaluate the potential for its discharge to cause a violation of sediment standards (WAC 173-204-400). You can obtain additional information about sediments at the Aquatic Lands Cleanup Unit website. https://ecology.wa.gov/Spills-Cleanup/Contamination-cleanup/Sediment-cleanups

Ecology has promulgated aquatic sediment standards (Chapter 173-204 WAC) to protect aquatic biota and human health. These standards state that the department may require Permittees to evaluate the potential for the discharge to cause a violation of applicable standards (WAC 173-204-400).

Through a review of the discharger characteristics and of the effluent characteristics, and no visible signs of sediment accumulation in the vicinity of outfall #001, Ecology determined that this discharge has no reasonable potential to violate the sediment management standards.

J. Whole effluent toxicity

The water quality standards for surface waters forbid discharge of effluent that has the potential to cause toxic effects in the receiving waters. Many toxic pollutants cannot be measured by commonly available detection methods. However, laboratory tests can measure toxicity directly by exposing living organisms to the wastewater and measuring their responses. These tests measure

the aggregate toxicity of the whole effluent, so this approach is called whole effluent toxicity (WET) testing. Some WET tests measure acute toxicity and other WET tests measure chronic toxicity.

> *Acute toxicity tests measure mortality as the significant response* to the toxicity of the effluent. Dischargers who monitor their wastewater with acute toxicity tests find early indications of any potential lethal effect of the effluent on organisms in the receiving water.
>
> *Chronic toxicity tests measure various sublethal toxic responses*, such as reduced growth or reproduction. Chronic toxicity tests often involve either a complete life cycle test on an organism with an extremely short life cycle, or a partial life cycle test during a critical stage of a test organism's life. Some chronic toxicity tests also measure organism survival.

Laboratories accredited by Ecology for WET testing know how to use the proper WET testing protocols, fulfill the data requirements, and submit results in the correct reporting format. Accredited laboratory staff know about WET testing and how to calculate an NOEC, LC50, EC50, IC25, etc. Ecology gives all accredited labs the most recent version of Ecology Publication No. WQ-R-95-80, *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria* (https://apps.ecology.wa.gov/publications/summarypages/9580.html), which is referenced in the permit. Ecology recommends that City of Snoqualmie send a copy of the acute or chronic toxicity sections(s) of its NPDES permit to the laboratory.

WET testing conducted during effluent characterization showed no reasonable potential for effluent discharges to cause receiving water acute or chronic toxicity. The proposed permit will not include an acute or chronic WET limit. The Snoqualmie WRF must retest the effluent before submitting an application for permit renewal. Summary of WET testing results can be found in *Appendix F*.

If this facility makes process or material changes which, in Ecology's opinion, increase the potential for effluent toxicity, then Ecology may (in a regulatory order, by permit modification, or in the permit renewal) require the facility to conduct additional effluent characterization. The City of Snoqualmie may demonstrate to Ecology that effluent toxicity has not increased by performing additional WET testing and/or chemical analyses after the process or material changes have been made. Ecology recommends that the Permittee check with it first to make sure that Ecology will consider the demonstration adequate to support a decision to not require an additional effluent characterization.

If WET testing conducted for submittal with a permit application fails to meet the performance standards in WAC 173-205-020, Ecology will assume that effluent toxicity has increased.

K. Groundwater quality limits

The groundwater quality standards (chapter 173-200 WAC) protect beneficial uses of groundwater. Permits issued by Ecology must not allow violations of those standards (WAC 173-200-100). The Snoqualmie WRF does not discharge wastewater to groundwater. Although the facility produces and distributes Class A reclaimed water for irrigation purposes, the reclaimed water conditions in the proposed permit do not allow for the use of the water in any way that will impact groundwater. Therefore, the proposed permit does not require numeric limits to protect groundwater.

L. Comparison of effluent limits with the previous permit issued on April 29, 2014, and modified on May 11, 2018

Table 17. Comparison of Previous and Proposed Effluent Limits

		Previous Effluent Limits: Outfall # 001		Proposed Effluent Limits: Outfall # 001	
Parameter	**Basis of Limit**	**Average Monthly**	**Average Weekly**	**Average Monthly**	**Average Weekly**
$CBOD_5$ Concentration Limits	Technology	25 mg/L 85% Removal	40 mg/L	25 mg/L 85% Removal	40 mg/L
$CBOD_5$ Mass Limits *Effective Nov-Jul Only*	Technology	448 lbs/day	717 lbs/day	448 lbs/day	717 lbs/day
TSS	Technology	30 mg/L 538 lbs/day 85% Removal	45 mg/L 807 lbs/day	30 mg/L 538 lbs/day 85% Removal	45 mg/L 807 lbs/day

Parameter		**Monthly Geometric Mean Limit**	**Weekly Geometric Mean Limit**	**Monthly Geometric Mean Limit**	**Weekly Geometric Mean Limit**
Fecal Coliform Bacteria	Technology	200/100 ml	400/100 ml	200/100 ml	400/100 ml

Parameter		**Limit**	**Limit**
pH	Technology	Within the range of 6.3 to 9.0	Within the range of 6.3 to 9.0

Parameter		**Average Monthly**	**Maximum Daily**	**Average Monthly**	**Maximum Daily**
Total Residual Chlorine	Water Quality	20 µg/L	52 µg/L	-	-

Parameter		**Average Monthly**	**Average Weekly**	**Average Monthly**	**Average Weekly**
$CBOD_5$, Seasonal mass limit *Effective Aug-Oct Only*	Water Quality	51.6 lbs/day	206 lbs/day	51.6 lbs/day	206 lbs/day
Total Ammonia (as N), Seasonal mass limit *Effective Aug-Oct Only*	Water Quality	21.9 lbs/day	68.7 lbs/day	21.6 lbs/day	68.7 lbs/day
Temperature, 7DADMAX *Effective Jun-Sep Only*	Water Quality	N/A	24.7° C	N/A	24.7° C

Change to the total ammonia average monthly effluent limit (August – October) from 21.9 lbs/day to 21.6 lbs/day is due to effluent variability observed during the last permit cycle and it was computed using the coefficient of variance (CV). The $CBOD_5$ mass average monthly effluent limit was computed using the same methodology. However, the revised limit is less stringent than the $CBOD_5$

mass limit proposed in the previous permit, which constitutes backsliding. Therefore, Ecology will retain the most stringent $CBOD_5$ mass average monthly effluent limit in the proposed permit. A summary of both limits computation is presented in Appendix D.

The City has decommissioned its chlorine disinfection system and has installed a new UV system equipment that functions as the primary method of disinfection. Therefore, the old residual chlorine limits are no longer applicable.

IV. Proposed Reclaimed Water Limits

The Reclaimed Water Use law, Chapter 90.46 RCW requires reclaimed water generators to adequately and reliably treat reclaimed water prior to distribution and beneficial use. Chapter 173-219-270 WAC requires Ecology to include enforceable limits on water quality in the reclaimed water permits it issues. The enforceable limits are based on:

- General performance standards listed in chapter 173-219-330 WAC.
- Specific use-based requirements listed in chapter 173-219-390 WAC.
- Water quality standards for groundwater of the State of Washington in chapter 173-200 WAC when the reclaimed water authorizes groundwater recharge as a beneficial use.
- Water quality standards for surface waters of the State of Washington in chapter 173-201A WAC when the reclaimed water permit authorizes surface water augmentation or wetland enhancements as a beneficial use.
- Drinking water maximum contaminant levels in chapter 246-290-310 WAC when the permit authorizes certain groundwater recharge and surface water augmentation beneficial uses.
- Ecology applies the most stringent of the standards listed above in developing limits to each parameter of concern. These limits are described below.

The limits in this permit reflect information received in the application and from supporting reports (engineering, hydrogeology, monitoring, etc.). Ecology evaluated the permit application and determined the limits needed to comply with the rules and standards adopted by the State of Washington. Ecology does not develop reclaimed water limits for all reported pollutants. Some pollutants are not treatable at the concentrations reported, are not controllable at the source, and are not listed in regulation.

Ecology does not usually develop permit limits for pollutants not reported in the permit application but may be present in the reclaimed water. The permit does not authorize the discharge of the non-reported pollutants. During the five-year permit term, the facility may change the conditions of use of its reclaimed water from those conditions reported in the permit application. The facility must notify Ecology if significant changes occur in any constituent. Until Ecology modifies the permit to reflect additional pollutants, a permitted facility could be violating its permit.

A. Reclaimed treatment process design criteria

Under WAC 173-219-240, flows and waste loadings must not exceed approved design criteria. Ecology approved design criteria for this facility's reclaimed water production processes in the *2002 Wastewater Treatment Plant Phase 2 Contract Drawings* prepared by Tetra Tech/KCM. Table 18 below summarizes the approved design criteria for the sand filtration system that limits the facility's reclaimed water production capabilities.

Table 18. Design Criteria for Reclaimed Water Production Facility

Parameter	Design Quantity
Reclaimed Water Production MMDF	1.56 MGD

B. Limits based on reclaimed water performance standards

Reclaimed water produced and distributed in accordance with the proposed permit must meet minimum standards for biological oxidation, water clarity, and disinfection. The biological oxidation standard generally requires compliance with the secondary treatment requirements in chapter 173-221-040 WAC. Chapter 173-219-330 establishes the applicable performance standards for all Class A and Class B reclaimed water shown in Table 19.

Table 19. Minimum Biological Oxidation Standards

Parameter	Average Monthly Limit	Average Weekly Limit
Dissolved Oxygen	Must be measurably present (minimum of 0.2 mg/L)	
$CBOD_5$ concentration	25 mg/L	40 mg/L
	In addition, the average $CBOD_5$ effluent concentration must not exceed fifteen percent (15%) of the average influent concentration.	
TSS concentration	30 mg/L	45 mg/L
	In addition, the average TSS effluent concentration must not exceed fifteen percent (15%) of the average influent concentration.	
Parameter	**Minimum**	**Maximum**
pH	6.0 standard units	9.0 standard units

The biological oxidation standard listed above primarily defines the minimum quality of the source water to the reclaimed treatment facility, with the compliance point typically after the last secondary treatment unit and prior to the reclaimed water filtration and disinfection systems. Since not all water reclamation facilities use separate side-stream treatment systems to produce reclaimed water, Ecology may specify alternate compliance points based on the design of each permitted facility. The compliance point for the Snoqualmie WRF is located after UV disinfection and prior to water entering the Reclaimed Water Pump Station clear well.

The performance standards require that dissolved oxygen be "measurably present" at the compliance point. Ecology includes a minimum limit of 0.2 mg/L in the permit for dissolved oxygen based on the quantitation level for dissolved oxygen testing using Standard Method 4500-OC/OG, as listed in Appendix A of the proposed permit.

In addition to the biological oxidation standards above for all Class A and B reclaimed water, each class of water must comply with separate standards for turbidity, a measure of water clarity, and disinfection. The City of Snoqualmie must ensure Class A reclaimed water from the permitted facility complies with following standards prior to distribution.

Table 20. Class A Turbidity and Disinfection Standards

Parameter	Average Monthly Limit	Sample Maximum Limit
Turbidity	2 NTU	5 NTU
	7-day median limit	**Sample Maximum Limit**
Total Coliform	2.2 MPN/100 mL	23 MPN/100 mL
Virus Removal	Minimum 4-log virus removal or inactivation see WAC 173-219-340	

Ecology based the turbidity standard on the levels typically achievable from a properly operated and maintained coagulation and filtration system, with the compliance point at the end of the filtration system prior to disinfection. Since continuous turbidity meters often record momentary fluctuations over the course of a day, the standards specify that a treatment system only violates the standard when the maximum turbidity remains over the sample maximum limit for more than five minutes.

Although chapter 173-219-330 WAC include virus removal as a performance standard for Class A reclaimed water, Ecology does not place a numeric limit for this parameter in permits. As stated in WAC 173-219-340, the combination of biological treatment, filtration and disinfection must achieve a minimum of 4-log virus removal or inactivation. In addition, the system must be capable of consistently complying with the water quality standard through the proper design, operation, and maintenance of each unit process in the treatment system. Ecology assesses whether proposed facility designs will comply with the virus removal standard during initial facility engineering reviews and approves the system designs before construction. Ecology-approved engineering documents for the upgraded UV disinfection system included sufficient validation that the system achieves at least a 4-log virus inactivation when operated according to design specifications for reclaimed water production. To ensure that the City complies with the virus reduction standard, the proposed permit requires the City to properly operate and maintain all reclaimed water treatment processes according to the approved operations and maintenance manual to maintain compliance with all other performance standards.

C. Distribution system limits

Chapter 173-219-370 requires that the producer and distributor of reclaimed water maintain a chlorine residual in the distribution system to prevent biological growth, prevent deterioration of the reclaimed water quality, and to protect public health. The residual requirement applies only to the distribution system conveying reclaimed water from the production facility to the point of use. It does not apply to water held in storage (in impoundments, storage tanks or storage ponds) or to water conveyed to a point of use through surface waters or groundwater. Ecology may also waive the requirement on a case-by-case basis.

On August 1, 2019, the City of Snoqualmie requested a waiver of the residual chlorine requirement based on the fact that Eagle Lake is located on the end user site (Snoqualmie Ridge Golf Course), where Class A reclaimed water is withdrawn for seasonal landscape irrigation. In consultation with the Department of Health, Ecology determined that a waiver is warranted for water released into Eagle Lake. Therefore, the proposed permit does not include a chlorine residual requirement for the distribution system. The proposed permit does, however, require the City to evaluate the distribution system's compliance with requirements for protecting the quality of reclaimed water to all end users and, as necessary, to complete improvements to the system (see further discussion in Section VI.D of this fact sheet). Based on the outcome of this evaluation, future permits may require the City to maintain a chlorine residual in all or part of its reclaimed water distribution system.

D. Comparison of reclaimed water limits with the previous permit issued on April 29, 2014, and modified on May 11, 2018

Table 21. Comparison of Previous and Proposed Limits

		Previous Limits		Proposed Limits	
Parameter	**Monitoring Point**	**MMDF**		**MMDF**	
Flow	Outfall 002	1.56 MGD		1.56 MGD	
Parameter	**Monitoring Point**	**Average Monthly**	**Average Weekly**	**Average Monthly**	**Average Weekly**
$CBOD_5$	Outfall 002	25 mg/L	40 mg/L	25 mg/L	40 mg/L
TSS	Outfall 002	30 mg/L	45 mg/L	30 mg/L	45 mg/L
Parameter	**Monitoring Point**	**Average Monthly**	**Sample Maximum**	**Average Monthly**	**Sample Maximum**
Total Nitrogen	Outfall 002	10 mg/L	15 mg/L	N/A	N/A
		Minimum	**Maximum**	**Minimum**	**Maximum**
Dissolved Oxygen	Outfall 002	0.2 mg/L	N/A	0.2 mg/L	N/A
pH	Outfall 002	6.3	9.0	6.3	9.0
		Average Monthly	**Sample Maximum**	**Average Monthly**	**Sample Maximum**
Turbidity	Outfall 002	2 NTU	5 NTU	2 NTU	5 NTU
		7-Day Median	**Sample Maximum**	**7-Day Median**	**Sample Maximum**
Total Coliform	Outfall 002	2.2 MPN/100 mL	23 MPN/100 mL	2.2 MPN/100 mL	23 MPN/100 mL

The previous reclaimed water permits included limits on total nitrogen that were based on guidance from the 1997 interim Reclaimed Water Standards. The final Reclaimed Water Rule does not include limits on total nitrogen for Class A reclaimed water produced for irrigation purposes. Therefore, Ecology has removed this limit from the proposed permit.

V. Monitoring Requirements

Ecology requires monitoring, recording, and reporting (WAC 173-220-210 and 40 CFR 122.41) to verify that the treatment process is functioning correctly and that the discharge complies with the permit's effluent limits.

If a facility uses a contract laboratory to monitor wastewater, it must ensure that the laboratory uses the methods and meets or exceeds the method detection levels required by the permit. The permit describes when facilities may use alternative methods. It also describes what to do in certain situations when the laboratory encounters matrix effects. When a facility uses an alternative method as allowed by the permit, it must report the test method, detection level (DL), and quantitation level (QL) on the discharge monitoring report or in the required report.

A. Wastewater monitoring

The monitoring schedule is detailed in the proposed permit under Special Condition S.2. Specified monitoring frequencies take into account the quantity and variability of the discharge, the treatment method, past compliance, significance of pollutants, and cost of monitoring. The required monitoring frequency is consistent with agency guidance given in the current version

of Ecology's *Permit Writer's Manual* (Publication Number 92-109) for a 2.15 MGD oxidation ditch treatment facility.

On January 1, 2021, the new water contact recreation use criteria became effective. The new criteria will require changing bacterial indicators for protecting primary contact recreation activities. For fresh waters, the new bacterial indicator will be *E. Coli*. In order to make an efficient transition from the current fecal coliform-based criteria to the new criteria bacterial indicator (*E. Coli*), the proposed permit requires quarterly E. Coli monitoring during the last two years of this permit cycle. The purpose of the dual monitoring (fecal coliform and *E. Coli*) is to develop a site-specific correlation between the two indicators.

Ecology has included some additional monitoring of nutrients in the proposed permit to establish a baseline for this discharger. It will use this data in the future as it develops TMDLs for dissolved oxygen and establishes WLAs for nutrients.

Monitoring of sludge quantity and quality is necessary to determine the appropriate uses of the sludge. Biosolids monitoring is required by the current state and local solid waste management program and also by EPA under 40 CFR 503.

B. Reclaimed water monitoring

Reclaimed Water Condition R2.A in the proposed permit lists the detailed monitoring requirements for the Snoqualmie WRF. Specified monitoring frequencies take into account the quantity and variability of the reclaimed water, quantity of each of the approved uses, the treatment method, past compliance, significance of pollutants, and cost of monitoring. The required monitoring frequency is consistent with agency guidance given in the current version of Ecology's *Permit Writer's Manual* (Publication Number 92-09) for an oxidation ditch treatment facility.

The proposed permit includes Condition R2, which details the monitoring requirements for reclaimed water production. Specified monitoring frequencies take into account the quantity and variability of the reclaimed water, quantity of each of the approved uses, the treatment method, past compliance, significance of pollutants, and cost of monitoring. The required monitoring frequency is consistent with agency guidance given in the current version of Ecology's *Permit Writer's Manual* (Publication Number 92-09) for an oxidation ditch treatment facility.

While the reclaimed water performance standards include limits for $CBOD_5$, TSS and pH in the source water to the water reclamation process, Ecology has discretion in establishing appropriate monitoring points for these parameters. Ecology determined the appropriate monitoring point for the Snoqualmie WRF is at a location following the UV disinfection and prior to the diversion point between the reclaimed water pump station clear well and outfall 001. The proposed permit requires the facility to monitor and report $CBOD_5$, TSS, and pH according to the base monitoring schedule in special condition S2 and to report results on a monthly DMR for outfall 001. The permit does not require separate monitoring or reporting of these parameters for outfall 002 (reclaimed water).

C. Lab accreditation

Ecology requires that facilities must use a laboratory registered or accredited under the provisions of chapter 173-50 WAC, Accreditation of Environmental Laboratories, to prepare all monitoring data (with the exception of certain parameters). The laboratory at the Snoqualmie WRF holds an accreditation (#R745) for the following parameters:

Table 22. Accredited Parameters

Parameter	Category	Method	Matrix Description
Carbonaceous BOD_5 ($CBOD_5$)	General Chemistry	SM 5210 B-01	Non-Potable Water
TSS	General Chemistry	SM 2540 D-97	Non-Potable Water
Ammonia	General Chemistry	EPA 350.1_2_1993	Non-Potable Water
Orthophosphate	General Chemistry	EPA 365.1_2_1993	Non-Potable Water
Dissolved Oxygen	General Chemistry	Hach 10360 Rev 1.1	Non-Potable Water
pH	General Chemistry	SM 4500-H+ B-00	Non-Potable Water
Fecal Coliform	Microbiology	SM 9222 D (m-FC)-97	Non-Potable Water
Total Fecal Coliform	Microbiology	SM 9223 B Colilert	Non-Potable Water
Solids, Total, Fixed and Volatile	General Chemistry	SM 2540 G-97	Solids & Chemical Materials

VI. Other Permit Conditions

A. Reporting and record keeping

Ecology based Special Condition S3 and Reclaimed Water Condition R3 on its authority to specify appropriate reporting and recordkeeping requirements. Requirements in S3 are based on Ecology's authority to prevent and control waste discharges (WAC 173-220-210). Requirements in R3 are to verify that the production, distribution and storage of reclaimed water complies the terms and conditions WAC 173-219 and the reclaimed water permit.

B. Prevention of facility overloading

Overloading of the treatment plant is a violation of the terms and conditions of the permit. To prevent this from occurring, RCW 90.48.110 and WAC 173-220-150 require the City of Snoqualmie WRF to:

- Take the actions detailed in proposed permit Special Condition S.4.
- Design and construct expansions or modifications before the treatment plant reaches existing capacity.
- Report and correct conditions that could result in new or increased discharges of pollutants.

Special Condition S.4 restricts the amount of flow.

In addition, Chapter 173-219-240 states that "where design criteria have been established, the [reclaimed water] generator must not allow flows or waste loadings to exceed approved design criteria". Ecology includes design criteria for the reclaimed water treatment system as enforceable conditions in the permit to ensure that the Snoqualmie WRF operates the permitted facility within the approved design capacity. Reclaimed water condition R5 requires the City to:

- Take the actions detailed in proposed permit if flows or waste loadings reach 85% of the rated capacity for three consecutive months, or exceed rated capacity in any month.
- Design and construct expansions or modifications before the treatment plant reaches existing capacity.
- Report and correct conditions that could result in new or increased discharges of pollutants.

Reclaimed Water Condition R5 restricts the amount of flow.

C. Operation and maintenance

The proposed permit contains Special Condition S.5 as authorized under RCW 90.48.110, WAC 173-220-150, chapter 173-230 WAC, and WAC 173-240-080. Ecology included it to ensure proper operation and regular maintenance of equipment, and to ensure that the City of Snoqualmie WRF takes adequate safeguards so that it uses constructed facilities to their optimum potential in terms of pollutant capture and treatment. In 2018, the City completed the WRF Improvements Phase 1 Project and in 2019 will complete the WRF Improvements Phase 2 Project. Therefore, the Operations and Maintenance (O&M) manual must be updated to incorporate all elements of the projects listed above.

Ecology requires the owner and operator of reclaimed water facilities to take all reasonable steps to properly operate and maintain their reclaimed water system in accordance with state regulations (WAC 173-219-240). They must ensure that ensure that facility operators use operation and maintenance (O&M) manuals that include detailed instructions for operating and maintaining all components of the reclaimed water production and distribution system under its control.

The proposed permit requires the Snoqualmie WRF to update the existing manual for the reclaimed water system based on the requirements of the Reclaimed Water Rule and to submit the revised manual to Ecology by December 15, 2023. Once the manual is updated, the City must periodically review the O&M manual to ensure the contents are up to date. If significant changes are made, they must submit the updates to Ecology.

Past I/I studies completed by the City of Snoqualmie have documented localized instances of high inflow and infiltration in the collection system serving the historic area of the City. However, the City has not documented that I/I contributes to sanitary sewer overflows and the treatment plant currently has sufficient capacity to treat the excess flow. Therefore, the proposed permit requires the City of Snoqualmie WRF to characterize the collection system for the presence of leaks by providing the following information:

- Volume of the annual average and peak daily flow under worst conditions (inflow or infiltration) attributed to leaks.
- Location of each individual leaks.
- Size of each leak and/or volume of excess flow contributed by a run of sewer.
- Whether exfiltration occurs in the system's force mains and/or inverted siphons.

Three good references to aid in these tasks include:

- American Society of Civil Engineers and Water Environment Federation Manual of Practice FD-6, *Existing Sewer Evaluation and Rehabilitation*.
- U.S. Environmental Protection Agency, *Handbook for Sewer System Infrastructure Analysis and Rehabilitation*, EPA/625/6-91/030, 1991.
- Washington State Department of Transportation, *Standard Specifications for Road, Bridge, and Municipal Construction*, 2002.

Following characterization of the leaks, Ecology may require corrective actions by issuing an administrative order following review of the assessment.

D. Reclaimed water distribution and use

Reclaimed water condition R4 includes requirements governing the distribution and use of reclaimed water from the permitted facility. Ecology based these permit requirements on the following sections of the Reclaimed Water Rule:

- WAC 173-219-270 – Reclaimed water permit terms and conditions.
- WAC 173-219-290 – Use agreements.
- WAC 173-219-310 – Cross-connection control.
- WAC 173-219-360 – Storage and distribution system requirements.

This condition specifies the beneficial uses authorized by the permit and the areas in which reclaimed water from the permitted facility may be used. It also provides a mechanism for the City of Snoqualmie to expand the use of reclaimed water to areas not listed in the permit without modifying the permit.

The condition also specifies that the City of Snoqualmie may not allow the distribution or use of reclaimed water from the permitted facility unless it has signed enforceable use or distribution agreements with each user or distributor. The agreements must include specific conditions on the use and distribution of the water that are included in the proposed permit.

Reclaimed water condition R4.C requires City of Snoqualmie to develop and implement a cross-connection control program designed to protect the reclaimed water produced at the permitted facility from contamination with lower quality water. The condition also requires coordination with local water purveyors to ensure properties supplied with both reclaimed water and potable water have appropriate cross-connection controls in place to protect the potable water supply. While the drinking water purveyor is responsible for evaluating and approving the cross-connection controls installed to protect potable water, the City of Snoqualmie must ensure such approval has been granted before it may provide water to the use location.

The City of Snoqualmie's reclaimed water distribution system does not fully comply with the reclaimed water rule's requirements. Section 5.6 of the 1996 "Snoqualmie Ridge Class 'A' Water System and Irrigation Plan" identifies that the "pond at Hole 9" (Eagle Lake) was designed as a "non-restricted recreational impoundment" and to provide stormwater treatment. This configuration allows for at least one pathway for contamination of reclaimed water by a lower-quality water – specifically urban stormwater runoff. This practice is inconsistent with the cross-connection control principals required by the reclaimed water rule. To address this deficiency as well as other potential distribution system shortcomings, condition R8 of the proposed permit requires the City to submit an engineering report that evaluates options to improve the reclaimed water distribution system so that the City can ensure the water it distributes meets Class A quality at all times. Following approval by Ecology, the City must implement the improvements identified in the approved report. The permit requires the City to implement the corrections by June 2026.

Condition R4.B of the proposed permit requires the City to revise existing reclaimed water use agreements to ensure that they comply with the requirements of WAC 173-219-290(2) and with the proposed permit. The condition allows existing agreements to remain in effect for one year after the effective date of the new permit. Based on a review of the agreements included with the City's reclaimed water permit application, the existing agreements do not adequately

identify specific use areas or quantity of water each user is authorized to use. The revised agreements must provide this information as well as make any other changes necessary to update them to the standards in the permit and the reclaimed water rule.

E. Pretreatment

Duty to enforce discharge prohibitions

This provision prohibits the publicly owned treatment works (POTW) from authorizing or permitting an industrial discharger to discharge certain types of waste into the sanitary sewer.

- The first section of the pretreatment requirements prohibits the POTW from accepting pollutants which causes "pass-through" or "interference". This general prohibition is from 40 CFR §403.5(a). **Appendix C** of this fact sheet defines these terms.
- The second section reinforces a number of specific state and federal pretreatment prohibitions found in WAC 173-216-060 and 40 CFR §403.5(b). These reinforce that the POTW may not accept certain wastes, which:
    a. Are prohibited due to dangerous waste rules.
    b. Are explosive or flammable.
    c. Have too high or low of a pH (too corrosive, acidic or basic).
    d. May cause a blockage such as grease, sand, rocks, or viscous materials.
    e. Are hot enough to cause a problem.
    f. Are of sufficient strength or volume to interfere with treatment.
    g. Contain too much petroleum-based oils, mineral oil, or cutting fluid.
    h. Create noxious or toxic gases at any point.

40 CFR Part 403 contains the regulatory basis for these prohibitions, with the exception of the pH provisions which are based on WAC 173-216-060.

- The third section of pretreatment conditions reflects state prohibitions on the POTW accepting certain types of discharges unless the discharge has received prior written authorization from Ecology. These discharges include:
    a. Cooling water in significant volumes.
    b. Stormwater and other direct inflow sources.
    c. Wastewaters significantly affecting system hydraulic loading, which do not require treatment.

Federal and state pretreatment program requirements

Ecology administers the Pretreatment Program under the terms of the addendum to the "Memorandum of Understanding between Washington Department of Ecology and the United States Environmental Protection Agency, Region 10" (1986) and 40 CFR, part 403. Under this delegation of authority, Ecology issues wastewater discharge permits for significant industrial users (SIUs) discharging to POTWs which have not been delegated authority to issue wastewater discharge permits. Ecology must approve, condition, or deny new discharges or a

significant increase in the discharge for existing significant industrial users (SIUs) [40 CFR 403.8 (f)(1)(i) and(iii)].

Industrial dischargers must obtain a permit from Ecology before discharging waste to the City of Snoqualmie WRF [WAC 173-216-110(5)]. Industries discharging wastewater that is similar in character to domestic wastewater do not require a permit.

Routine identification and reporting of industrial users

The permit requires non-delegated POTWs to take "continuous, routine measures to identify all existing, new, and proposed significant industrial users (SIUs) and potential significant industrial users (PSIUs)" discharging to their sewer system. Examples of such routine measures include regular review of water and sewer billing records, business license and building permit applications, advertisements, and personal reconnaissance. System maintenance personnel should be trained on what to look for so they can identify and report new industrial dischargers in the course of performing their jobs. The POTW may not allow SIUs to discharge prior to receiving a permit, and must notify all industrial dischargers (significant or not) in writing of their responsibility to apply for a State Waste Discharge Permit. The POTW must send a copy of this notification to Ecology.

Requirements for performing an industrial user survey

This POTW has the potential to serve significant industrial or commercial users and must conduct an industrial user (IU) survey. The purpose of the IU Survey is to identify all facilities that may be subject to pretreatment standards or requirements so that Ecology can take appropriate measures to control these discharges. The POTW should identify each such user, and require them to apply for a permit before allowing their discharge to the POTW to commence. For SIUs, the POTW must require they actually are issued a permit prior to accepting their discharge. The steps the POTW must document in their IU Survey submittal include:

1. The POTW must develop a master list of businesses that may be subject to pretreatment standards and requirements and show their disposition. This list must be based on several sources of information including business licenses, and water and sewer billing records.
2. The POTW must canvas all the potential sources, having them either complete a survey form or ruling them out by confirming they only generate domestic wastewater.
3. The POTW must develop a list of the SIUs and potential SIUs in all areas served by the POTW. The list must contain sufficient information on each to allow Ecology to decide which discharges merit further controls such as a state waste discharge permit.

Ecology describes the information needed in IU Survey submittals to allow Ecology to make permitting decision in the manual "Performing an Industrial User Survey". Properly completing an Industrial User Survey helps Ecology control discharges that may otherwise harm the POTW including its collection system, processes, and receiving waters. Where surveys are incomplete, Ecology may take such enforcement as appropriate and/or require the POTW to develop a fully delegated pretreatment program.

The proposed permit requires City of Snoqualmie to conduct an industrial user survey to determine the extent of compliance of all industrial users of the sanitary sewer and wastewater treatment facility with federal pretreatment regulations [40 CFR Part 403 and Sections 307(b)

and 308 of the Clean Water Act)], with state regulations (chapter 90.48 RCW and chapter 173-216 WAC), and with local ordinances.

F. Solid wastes

To prevent water quality problems, the facility is required in permit Special Condition S7 to store and handle all residual solids (grit, screenings, scum, sludge, and other solid waste) in accordance with the requirements of RCW 90.48.080 and state water quality standards.

The final use and disposal of sewage sludge from this facility is regulated by U.S. EPA under 40 CFR 503, and by Ecology under chapter 70.95J RCW, chapter 173-308 WAC "Biosolids Management," and chapter 173-350 WAC "Solid Waste Handling Standards." The disposal of other solid waste is under the jurisdiction of the Seattle-King County Public Health.

Requirements for monitoring sewage sludge and record keeping are included in this permit. Ecology will use this information, required under 40 CFR 503, to develop or update local limits.

G. Spill plan

The City of Snoqualmie developed a plan for preventing the accidental release of pollutants to state waters and for minimizing damages if such a spill occurs. The proposed permit requires the facility to update this plan and submit it to Ecology.

H. Effluent mixing study

Ecology estimated the amount of mixing of the discharge with receiving water and the potential for the mixture to violate the water quality standards for surface waters at the edge of the mixing zone (chapter 173-201A WAC). The proposed permit requires the City of Snoqualmie to more accurately determine the mixing characteristics of the discharge (Special Condition S.10). The effluent mixing study must measure or model the characteristics of the discharge under conditions specified in the permit to assess whether the receiving water quality is protected outside the mixing zone boundary.

I. General conditions

Ecology bases the standardized General Conditions on state and federal law and regulations. They are included in all individual domestic wastewater NPDES permits issued by Ecology.

VII. Permit Issuance Procedures

A. Permit modifications

Ecology may modify this permit to impose numerical limits, if necessary to comply with water quality standards for surface waters, with sediment quality standards, or with water quality standards for groundwaters, based on new information from sources such as inspections, effluent monitoring, outfall studies, and effluent mixing studies.

Ecology may also modify this permit to comply with new or amended state or federal regulations.

B. Proposed permit issuance

This proposed permit meets all statutory requirements for Ecology to authorize a wastewater discharge. The permit includes limits and conditions to protect human health and aquatic life, and the beneficial uses of waters of the state of Washington. Ecology proposes to issue this permit for a term of 5 years.

VIII. References for Text and Appendices

Environmental Protection Agency (EPA)

1992. National Toxics Rule. Federal Register, V. 57, No. 246, Tuesday, December 22, 1992.

1991. *Technical Support Document for Water Quality-based Toxics Control*. EPA/505/2-90-001.

1988. *Technical Guidance on Supplementary Stream Design Conditions for Steady State Modeling*. USEPA Office of Water, Washington, D.C.

1985. *Water Quality Assessment: A Screening Procedure for Toxic and Conventional Pollutants in Surface and Ground Water*. EPA/600/6-85/002a.

1983. *Water Quality Standards Handbook*. USEPA Office of Water, Washington, D.C.

Earth Tech

1996. *Snoqualmie Ridge Class "A" Water System and Irrigation Plan*

1998. *Amendment No. 1 to Snoqualmie Ridge Class "A" Water System and Irrigation Plan*

Tetra Tech/KCM, Inc.

1994. *City of Snoqualmie Draft Wastewater Facilities Engineering Report*

2002. *Wastewater Treatment Plant Phase 2 Contract Drawings*

2003. *City of Snoqualmie General Sewer Plan*

RH2 Engineering, Inc.

2015. *City of Snoqualmie Water Reclamation Facility Improvements* – Engineering Report

2017. *Design Criteria for Solids Handling System Improvements* – Technical Memorandum

Tsivoglou, E.C., and J.R. Wallace.

1972. *Characterization of Stream Reaeration Capacity*. EPA-R3-72-012. (Cited in EPA 1985 op.cit.)

Washington State Department of Ecology.

July 2018. *Permit Writer's Manual*. Publication Number 92-109 (https://apps.ecology.wa.gov/publications/documents/92109.pdf)

September 2011. *Water Quality Program Guidance Manual – Supplemental Guidance on Implementing Tier II Antidegradation*. Publication Number 11-10-073 (https://apps.ecology.wa.gov/publications/summarypages/1110073.html)

October 2010 (revised). *Water Quality Program Guidance Manual – Procedures to Implement the State's Temperature Standards through NPDES Permits*. Publication Number 06-10-100 (https://apps.ecology.wa.gov/publications/summarypages/0610100.html)

Laws and Regulations (http://leg.wa.gov/LawsAndAgencyRules/Pages/default.aspx)

Permit and Wastewater Related Information

https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Water-quality-permits-guidance

1972. *Characterization of Stream Reaeration Capacity*. EPA-R3-72-012. (Cited in EPA 1985 op.cit.).

1994. *Snoqualmie River Total Maximum Daily Load Study* Publication Number 94-71

2008. *Snoqualmie River Basin Fecal Coliform Bacteria, Dissolved Oxygen, Ammonia-Nitrogen, and pH Total Maximum Daily Load: Water Quality Effectiveness Monitoring Report* Publication Number 08-03-005

2011. *Snoqualmie River Basin Temperature Total Maximum Daily Load - Water Quality Improvement Report and Implementation Plan* Publication Number 11-10-041

Water Pollution Control Federation.

1976. *Chlorination of Wastewater*.

Wright, R.M., and A.J. McDonnell.

1979. *In-stream Deoxygenation Rate Prediction*. Journal Environmental Engineering Division, ASCE. 105(EE2). (Cited in EPA 1985 op.cit.)

Appendix A--Public Involvement Information

Ecology proposes to reissue a permit to the City of Snoqualmie Water Reclamation Facility. The permit includes wastewater discharge limits and other conditions. This fact sheet describes the facility and Ecology's reasons for requiring permit conditions.

Ecology placed a Public Notice of Draft on January 24, 2020, in the *Snoqualmie Valley Record* to inform the public and to invite comment on the proposed draft National Pollutant Discharge Elimination System permit and fact sheet.

The notice:

- Tells where copies of the draft permit and fact sheet are available for public evaluation (a local public library, the closest regional or field office, posted on our website).
- Offers to provide the documents in an alternate format to accommodate special needs.
- Asks people to tell us how well the proposed permit would protect the receiving water.
- Invites people to suggest fairer conditions, limits, and requirements for the permit.
- Invites comments on Ecology's determination of compliance with antidegradation rules.
- Urges people to submit their comments, in writing, before the end of the comment period.
- Tells how to request a public hearing about the proposed NPDES permit.
- Explains the next step(s) in the permitting process.
-

You may obtain further information from Ecology by telephone, (425) 649-7037, or by writing to the address listed below.

Water Quality Permit Coordinator
Department of Ecology
Northwest Regional Office
3190 160th Avenue SE
Bellevue, WA 98008-5452

The primary author of this permit and fact sheet is Lazaro Eleuterio.

Appendix B--Your Right to Appeal

You have a right to appeal this permit to the Pollution Control Hearing Board (PCHB) within thirty (30) days of the date of receipt of the final permit. The appeal process is governed by chapter 43.21B RCW and chapter 371-08 WAC. "Date of receipt" is defined in RCW 43.21B.001(2) (see glossary).

To appeal, you must do the following within 30 days of the date of receipt of this permit:

- File your appeal and a copy of this permit with the PCHB (see addresses below). Filing means actual receipt by the PCHB during regular business hours.
- Serve a copy of your appeal and this permit on Ecology in paper form - by mail or in person. (See addresses below.) E-mail is not accepted.

You must also comply with other applicable requirements in chapter 43.21B RCW and chapter 371-08 WAC.

ADDRESS AND LOCATION INFORMATION

Street Addresses	Mailing Addresses
Department of Ecology Attn: Appeals Processing Desk 300 Desmond Drive SE Lacey, WA 98503	**Department of Ecology** Attn: Appeals Processing Desk PO Box 47608 Olympia, WA 98504-7608
Pollution Control Hearings Board 1111 Israel RD SW STE 301 Tumwater, WA 98501	**Pollution Control Hearings Board** PO Box 40903 Olympia, WA 98504-0903

Appendix C--Glossary

1-DMax or 1-day maximum temperature -- The highest water temperature reached on any given day. This measure can be obtained using calibrated maximum/minimum thermometers or continuous monitoring probes having sampling intervals of thirty minutes or less.

7-DADMax or 7-day average of the daily maximum temperatures -- The arithmetic average of seven consecutive measures of daily maximum temperatures. The 7-DADMax for any individual day is calculated by averaging that day's daily maximum temperature with the daily maximum temperatures of the three days prior and the three days after that date.

Acute toxicity -- The lethal effect of a compound on an organism that occurs in a short time period, usually 48 to 96 hours.

AKART -- The acronym for "all known, available, and reasonable methods of prevention, control and treatment." AKART is a technology-based approach to limiting pollutants from wastewater discharges, which requires an engineering judgment and an economic judgment. AKART must be applied to all wastes and contaminants prior to entry into waters of the state in accordance with RCW 90.48.010 and 520, WAC 173-200-030(2)(c)(ii), and WAC 173-216-110(1)(a).

Alternate point of compliance -- An alternative location in the groundwater from the point of compliance where compliance with the groundwater standards is measured. It may be established in the groundwater at locations some distance from the discharge source, up to, but not exceeding the property boundary and is determined on a site specific basis following an AKART analysis. An "early warning value" must be used when an alternate point is established. An alternate point of compliance must be determined and approved in accordance with WAC 173-200-060(2).

Ambient water quality -- The existing environmental condition of the water in a receiving water body.

Ammonia -- Ammonia is produced by the breakdown of nitrogenous materials in wastewater. Ammonia is toxic to aquatic organisms, exerts an oxygen demand, and contributes to eutrophication. It also increases the amount of chlorine needed to disinfect wastewater.

Annual average design flow (AADF) -- The average of the daily flow volumes anticipated to occur over a calendar year.

Average monthly (intermittent) discharge limit -- The average of the measured values obtained over a calendar month's time taking into account zero discharge days.

Average monthly discharge limit -- The average of the measured values obtained over a calendar month's time.

Background water quality -- The concentrations of chemical, physical, biological or radiological constituents or other characteristics in or of groundwater at a particular point in time upgradient of an activity that has not been affected by that activity [WAC 173-200-020(3)]. Background water quality for any parameter is statistically defined as the 95% upper tolerance interval with a 95% confidence based on at least eight hydraulically upgradient water quality samples. The eight samples are collected over a period of at least one year, with no more than one sample collected during any month in a single calendar year.

Beneficial use -- The uses of reclaimed water for domestic, stock watering, industrial, commercial, agricultural, irrigation, hydroelectric power production, mining, fish and wildlife maintenance and enhancement, recreational, and thermal power production purposes, and for preservation of environmental and aesthetic values, and for all other uses compatible with the enjoyment of the waters of the state. Beneficial use of reclaimed water includes all uses authorized under chapter 90.46 RCW, and contained within WAC 173-219-390.

Best management practices (BMPs) -- Schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the state. BMPs include treatment systems, operating procedures, and practices to control: plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. BMPs may be further categorized as operational, source control, erosion and sediment control, and treatment BMPs.

BOD5 -- Determining the five-day Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of organic material present in an effluent that is utilized by bacteria. The BOD5 is used in modeling to measure the reduction of dissolved oxygen in receiving waters after effluent is discharged. Stress caused by reduced dissolved oxygen levels makes organisms less competitive and less able to sustain their species in the aquatic environment. Although BOD_5 is not a specific compound, it is defined as a conventional pollutant under the federal Clean Water Act.

Bypass -- The intentional diversion of waste streams from any portion of a treatment facility.

Categorical pretreatment standards -- National pretreatment standards specifying quantities or concentrations of pollutants or pollutant properties, which may be discharged to a POTW by existing or new industrial users in specific industrial subcategories.

Chlorine -- A chemical used to disinfect wastewaters of pathogens harmful to human health. It is also extremely toxic to aquatic life.

Chlorine, free -- The amount of chlorine available in a water sample as dissolved gas (Cl_2), hypochlorous acid (HOCl), or hypochlorite ion (ClO^-).

Chlorine, total -- The sum of free chlorine and combined chloramines (compounds of organic or inorganic nitrogen and chlorine).

Class A reclaimed water -- A high-quality water resource derived from treated domestic wastewater that is suitable for use in areas with unlimited public access. The water must meet or exceed the minimum Class A performance standards in WAC 173-219-330 including, at a minimum, oxidation, coagulation, filtration, and disinfection.

Class B reclaimed water -- A high-quality water resource derived from treated domestic wastewater that is suitable for regulated use in areas with restricted public access. The water must meet or exceed the minimum Class B performance standards in WAC 173-219-330 including, at a minimum, oxidation, and disinfection.

Chronic toxicity -- The effect of a compound on an organism over a relatively long time, often 1/10 of an organism's lifespan or more. Chronic toxicity can measure survival, reproduction or growth rates, or other parameters to measure the toxic effects of a compound or combination of compounds.

Clean water act (CWA) -- The federal Water Pollution Control Act enacted by Public Law 92-500, as amended by Public Laws 95-217, 95-576, 96-483, 97-117; USC 1251 et seq.

Compliance inspection-without sampling -- A site visit for the purpose of determining the compliance of a facility with the terms and conditions of its permit or with applicable statutes and regulations.

Compliance inspection-with sampling -- A site visit for the purpose of determining the compliance of a facility with the terms and conditions of its permit or with applicable statutes and regulations. In addition it includes as a minimum, sampling and analysis for all parameters with limits in the permit to ascertain compliance with those limits; and, for municipal facilities, sampling of influent to ascertain compliance with the 85 percent removal requirement. Ecology may conduct additional sampling.

Composite sample -- A mixture of grab samples collected at the same sampling point at different times, formed either by continuous sampling or by mixing discrete samples. May be "time-composite" (collected at constant time intervals) or "flow-proportional" (collected either as a constant sample volume at time intervals proportional to stream flow, or collected by increasing the volume of each aliquot as the flow increased while maintaining a constant time interval between the aliquots).

Construction activity -- Clearing, grading, excavation, and any other activity, which disturbs the surface of the land. Such activities may include road building; construction of residential houses, office buildings, or industrial buildings; and demolition activity.

Continuous monitoring -- Uninterrupted, unless otherwise noted in the permit.

Critical condition -- The time during which the combination of receiving water and waste discharge conditions have the highest potential for causing toxicity in the receiving water environment. This situation usually occurs when the flow within a water body is low, thus, its ability to dilute effluent is reduced.

Cross-connection Control -- The practice of using approved devices and management strategies designed to eliminate or prevent the potential for contaminating high-quality waters with lower quality waters.

Date of receipt – This is defined in RCW 43.21B.001(2) as five business days after the date of mailing; or the date of actual receipt, when the actual receipt date can be proven by a preponderance of the evidence. The recipient's sworn affidavit or declaration indicating the date of receipt, which is unchallenged by the agency, constitutes sufficient evidence of actual receipt. The date of actual receipt, however, may not exceed forty-five days from the date of mailing.

Detection limit -- The minimum concentration of a substance that can be measured and reported with 99 percent confidence that the pollutant concentration is above zero and is determined from analysis of a sample in a given matrix containing the pollutant.

Dilution factor (DF) -- A measure of the amount of mixing of effluent and receiving water that occurs at the boundary of the mixing zone. Expressed as the inverse of the percent effluent fraction, for example, a dilution factor of 10 means the effluent comprises 10% by volume and the receiving water 90%.

Distribution uniformity -- The uniformity of infiltration (or application in the case of sprinkle or trickle irrigation) throughout the field expressed as a percent relating to the average depth infiltrated in the lowest one-quarter of the area to the average depth of water infiltrated.

Distributor -- The person authorized through a use agreement with a reclaimed water generator to distribute or supply reclaimed water to users. A distributor may also be a generator or a user. Users that distribute reclaimed water to use areas through a gravity conveyance system for agricultural water uses are not distributors.

Domestic wastewater -- Wastewater predominantly from residential sources that includes greywater, toilet, or urinal sources. Also includes wastewater generated by commercial, institutional and light industrial entities including restaurants, office complexes, schools, and hospitals. It may include process wastewaters from industrial sources when allowed under federal pretreatment regulations.

Early warning value -- The concentration of a pollutant set in accordance with WAC 173-200-070 that is a percentage of an enforcement limit. It may be established in the effluent, groundwater, surface water, the vadose zone or within the treatment process. This value acts as a trigger to detect and respond to increasing contaminant concentrations prior to the degradation of a beneficial use.

Enforcement limit -- The concentration assigned to a contaminant in the groundwater at the point of compliance for the purpose of regulation, [WAC 173-200-020(11)]. This limit assures that a groundwater criterion will not be exceeded and that background water quality will be protected.

Engineering report -- A document that thoroughly examines the engineering and administrative aspects of a particular domestic or industrial wastewater facility. The report must contain the appropriate information required in WAC 173-240-060 or 173-240-130.

Fecal coliform bacteria -- Fecal coliform bacteria are used as indicators of pathogenic bacteria in the effluent that are harmful to humans. Pathogenic bacteria in wastewater discharges are controlled by disinfecting the wastewater. The presence of high numbers of fecal coliform bacteria in a water body can indicate the recent release of untreated wastewater and/or the presence of animal feces.

Grab sample -- A single sample or measurement taken at a specific time or over as short a period of time as is feasible.

Greywater -- Domestic type wastewater flows from bathtubs, showers, bathroom sinks, washing machines, dishwashers, and kitchen or utility sinks. It does not include wastewater from a toilet or urinal.

Generator -- Any person that generates any type of reclaimed water for a use regulated under RCW 90.46 and WAC 173-219. A generator may also be a distributor or a user.

Groundwater -- Water in a saturated zone or stratum beneath the surface of land or below a surface water body.

Industrial user -- A discharger of wastewater to the sanitary sewer that is not sanitary wastewater or is not equivalent to sanitary wastewater in character.

Industrial wastewater -- Water or liquid-carried waste from industrial or commercial processes, as distinct from domestic wastewater. These wastes may result from any process or activity of industry, manufacture, trade or business; from the development of any natural resource; or from animal operations such as feed lots, poultry houses, or dairies. The term includes contaminated stormwater and, also, leachate from solid waste facilities.

Interference -- A discharge which, alone or in conjunction with a discharge or discharges from other sources, both:

- Inhibits or disrupts the POTW, its treatment processes or operations, or its sludge processes, use or disposal; and

- Therefore is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation) or of the prevention of sewage sludge use or disposal in compliance with the following statutory provisions and regulations or permits issued thereunder (or more stringent State or local regulations): Section 405 of the Clean Water Act, the Solid Waste Disposal Act (SWDA) (including title II, more commonly referred to as the Resource Conservation and Recovery Act (RCRA), and including State regulations contained in any State sludge management plan prepared pursuant to subtitle D of the SWDA), sludge regulations appearing in 40 CFR Part 507, the Clean Air Act, the Toxic Substances Control Act, and the Marine Protection, Research and Sanctuaries Act.

Local limits -- Specific prohibitions or limits on pollutants or pollutant parameters developed by a POTW.

Major facility -- A facility discharging to surface water with an EPA rating score of > 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Maximum daily discharge limit -- The highest allowable daily discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. The daily discharge is calculated as the average measurement of the pollutant over the day.

Maximum day design flow (MDDF) -- The largest volume of flow anticipated to occur during a one-day period, expressed as a daily average.

Maximum month design flow (MMDF) -- The largest volume of flow anticipated to occur during a continuous 30-day period, expressed as a daily average.

Maximum week design flow (MWDF) -- The largest volume of flow anticipated to occur during a continuous 7-day period, expressed as a daily average.

Method detection level (MDL) -- See Detection Limit.

Minor facility -- A facility discharging to surface water with an EPA rating score of < 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Mixing zone -- An area that surrounds an effluent discharge within which water quality criteria may be exceeded. The permit specifies the area of the authorized mixing zone that Ecology defines following procedures outlined in state regulations (chapter 173-201A WAC).

National pollutant discharge elimination system (NPDES) -- The NPDES (Section 402 of the Clean Water Act) is the federal wastewater permitting system for discharges to navigable waters of the United States. Many states, including the state of Washington, have been delegated the authority to issue these permits. NPDES permits issued by Washington State permit writers are joint NPDES/State permits issued under both state and federal laws.

Nonpotable -- Water that is not approved by state or local health authorities as being safe for human consumption.

pH -- The pH of a liquid measures its acidity or alkalinity. It is the negative logarithm of the hydrogen ion concentration. A pH of 7 is defined as neutral and large variations above or below this value are considered harmful to most aquatic life.

Pass-through -- A discharge which exits the POTW into waters of the State in quantities or concentrations which, alone or in conjunction with a discharge or discharges from other sources, is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation), or which is a cause of a violation of State water quality standards.

Peak hour design flow (PHDF) -- The largest volume of flow anticipated to occur during a one-hour period, expressed as a daily or hourly average.

Peak instantaneous design flow (PIDF) -- The maximum anticipated instantaneous flow.

Point of compliance -- The location in the groundwater where the enforcement limit must not be exceeded and a facility must comply with the Ground Water Quality Standards. Ecology determines this limit on a site-specific basis. Ecology locates the point of compliance in the groundwater as near and directly downgradient from the pollutant source as technically, hydrogeologically, and geographically feasible, unless it approves an alternative point of compliance.

Potable water or drinking water -- Water that is approved under WAC 246-290 or WAC 246-291 as being safe for human consumption.

Potential significant industrial user (PSIU) -- A potential significant industrial user is defined as an Industrial User that does not meet the criteria for a Significant Industrial User, but which discharges wastewater meeting one or more of the following criteria:

a. Exceeds 0.5 % of treatment plant design capacity criteria and discharges <25,000 gallons per day; or

b. Is a member of a group of similar industrial users which, taken together, have the potential to cause pass through or interference at the POTW (e.g. facilities which develop photographic film or paper, and car washes).

Ecology may determine that a discharger initially classified as a potential significant industrial user should be managed as a significant industrial user.

Quantitation level (QL) -- Also known as Minimum Level of Quantitation (ML) – The lowest level at which the entire analytical system must give a recognizable signal and acceptable calibration point for the analyte. It is equivalent to the concentration of the lowest calibration standard, assuming that the lab has used all method-specified sample weights, volumes, and cleanup procedures. The QL is calculated by multiplying the MDL by 3.18 and rounding the

result to the number nearest to (1, 2, or 5) x 10^n, where n is an integer (64 FR 30417).
ALSO GIVEN AS:
The smallest detectable concentration of analyte greater than the Detection Limit (DL) where the accuracy (precision & bias) achieves the objectives of the intended purpose. (Report of the Federal Advisory Committee on Detection and Quantitation Approaches and Uses in Clean Water Act Programs Submitted to the US Environmental Protection Agency, December 2007).

Reasonable potential -- A reasonable potential to cause a water quality violation, or loss of sensitive and/or important habitat.

Reclaimed water -- Water derived in any part from a wastewater with a domestic wastewater component that has been adequately and reliably treated to meet the requirements of WAC 173-219, so that it can be used for beneficial purposes. Reclaimed water is not considered a wastewater.

Responsible corporate officer -- A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or the manager of one or more manufacturing, production, or operating facilities employing more than 250 persons or have gross annual sales or expenditures exceeding $25 million (in second quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures (40 CFR 122.22).

Sample Maximum -- No sample may exceed this value.

Significant industrial user (SIU) --

1) All industrial users subject to Categorical Pretreatment Standards under 40 CFR 403.6 and 40 CFR Chapter I, Subchapter N; and

2) Any other industrial user that: discharges an average of 25,000 gallons per day or more of process wastewater to the POTW (excluding sanitary, noncontact cooling, and boiler blow-down wastewater); contributes a process wastestream that makes up 5 percent or more of the average dry weather hydraulic or organic capacity of the POTW treatment plant; or is designated as such by the Control Authority* on the basis that the industrial user has a reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement [in accordance with 40 CFR 403.8(f)(6)].

   Upon finding that the industrial user meeting the criteria in paragraph 2, above, has no reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement, the Control Authority* may at any time, on its own initiative or in response to a petition received from an industrial user or POTW, and in accordance with 40 CFR 403.8(f)(6), determine that such industrial user is not a significant industrial user.

   *The term "Control Authority" refers to the Washington State Department of Ecology in the case of non-delegated POTWs or to the POTW in the case of delegated POTWs.

Slug discharge -- Any discharge of a non-routine, episodic nature, including but not limited to an accidental spill or a non-customary batch discharge to the POTW. This may include any pollutant released at a flow rate that may cause interference or pass through with the POTW or in any way violate the permit conditions or the POTW's regulations and local limits.

Soil scientist -- An individual who is registered as a Certified or Registered Professional Soil Scientist or as a Certified Professional Soil Specialist by the American Registry of Certified Professionals in Agronomy, Crops, and Soils or by the National Society of Consulting Scientists or who has the credentials for membership. Minimum requirements for eligibility are: possession of a baccalaureate, masters, or doctorate degree from a U.S. or Canadian institution with a minimum of 30 semester hours or 45 quarter hours professional core courses in agronomy, crops or soils, and have 5,3, or 1 years, respectively, of professional experience working in the area of agronomy, crops, or soils.

Solid waste -- All putrescible and non-putrescible solid and semisolid wastes including, but not limited to, garbage, rubbish, ashes, industrial wastes, swill, sewage sludge, demolition and construction wastes, abandoned vehicles or parts thereof, contaminated soils and contaminated dredged material, and recyclable materials.

Soluble BOD_5 -- Determining the soluble fraction of Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of soluble organic material present in an effluent that is utilized by bacteria. Although the soluble BOD_5 test is not specifically described in Standard Methods, filtering the raw sample through at least a 1.2 um filter prior to running the standard BOD_5 test is sufficient to remove the particulate organic fraction.

Source water -- Water entering the reclaimed water treatment facility or unit processes from which Class A or Class B reclaimed water is generated. Source water generally refers to the effluent from a domestic wastewater treatment facility that meets or exceeds secondary treatment standards defined in WAC 173-221.

State waters -- Lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, and all other surface waters and watercourses within the jurisdiction of the state of Washington.

Stormwater -- That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a stormwater drainage system into a defined surface water body, or a constructed infiltration facility.

Technology-based effluent limit -- A permit limit based on the ability of a treatment method to reduce the pollutant.

Total coliform bacteria -- A microbiological test, which detects and enumerates the total coliform group of bacteria in water samples.

Total dissolved solids -- That portion of total solids in water or wastewater that passes through a specific filter.

Total maximum daily load (TMDL) -- A determination of the amount of pollutant that a water body can receive and still meet water quality standards.

Total suspended solids (TSS) -- Total suspended solids is the particulate material in an effluent. Large quantities of TSS discharged to a receiving water may result in solids accumulation. Apart from any toxic effects attributable to substances leached out by water, suspended solids may kill fish, shellfish, and other aquatic organisms by causing abrasive injuries and by clogging the gills and respiratory passages of various aquatic fauna. Indirectly, suspended solids can screen out light and can promote and maintain the development of noxious conditions through oxygen depletion.

Upset -- An exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limits because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, lack of preventative maintenance, or careless or improper operation.

Use -- Application of reclaimed water in a manner and for a purpose, as designated in a permit or use agreement, and in compliance with all applicable requirements of the permit and WAC 173-219.

Use agreement -- An agreement or contract between the generator and the distributor or user, or between the distributor and user, that identifies terms and conditions for reclaimed water distribution and use to ensure compliance with the reclaimed water permit conditions.

Use area -- Any facility, building, or land area, surface water, or groundwater identified in the use agreement as the location where reclaimed water is beneficially used.

User -- Any person who uses reclaimed water under an agreement with a reclaimed water generator or distributor.

Water quality-based effluent limit -- A limit imposed on the concentration of an effluent parameter to prevent the concentration of that parameter from exceeding its water quality criterion after discharge into receiving waters.

Appendix D--Technical Calculations

Several of the Excel® spreadsheet tools used to evaluate a discharger's ability to meet Washington State water quality standards can be found in the PermitCalc workbook on Ecology's webpage at: https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Water-quality-permits-guidance

Dilution Factors Calculation:

Ecology uses the following zero-dimensional model to determine the maximum dilution factor allowed under Washington State law for rivers.

$$DF_{max} = \frac{(RF\% * Q_{amb}) + Q_{eff}}{Q_{eff}}$$

where,
DF_{max} = maximum regulatory dilution factor
RF% = the percentage of ambient flow allowed by regulation
Q_{amb} = Ambient flow rate
Q_{eff} = Effluent flow rate

The following table shows the output calculations from this method for the Snoqualmie WRF's discharge into the Snoqualmie River.

Dilution Factor Calculations and Receiving Water Critical Conditions

Step 1: Enter Waterbody Type

Water Body Type	Freshwater

Facility Name	City of Snoqualmie WWTWRF
Receiving Water	Snoquaknie River

Step 2: Enter Dilution Factors -OR- Calculate DFs by entering Facility/Receiving Water Flow Data

Do you want to enter dilution factors -or- flow data?	Flow Data

	Annual Average	Max Monthly Average	Daily Max
Facility Flow, MGD	0.92	1.62	3.92
Facility Flow, cfs (calculated)	1.42	2.51	6.06

	Condition	Receiving Water Flow, cfs	Allowable % of river flow	Max Dilution Factor Allowed
Aquatic Life - Acute	7Q10	346	0.025	**2.4**
Aquatic Life - Chronic	7Q10	346	0.25	**35.5**
HH-Non-Carcinogen	30Q5	484	0.25	**49.3**
HH-Carcinogen	Harmonic Mean	1038	0.25	**183.3**
Whole river at 7Q10	7Q10	346	1	**139.1**

Calculation of Water Quality-Based Effluent Limits:

Water quality-based effluent limits are calculated by the two-value wasteload allocation process as described on page 100 of the TSD (EPA, 1991) and shown below.

1. Calculate the acute wasteload allocation WLA_a by multiplying the acute criteria by the acute dilution factor and subtracting the background factor. Calculate the chronic wasteload allocation (WLA_c) by multiplying the chronic criteria by the chronic dilution factor and subtracting the background factor.

WLA_a = (acute criteria x DF_a) – [(background conc. x (DF_a - 1)]

WLA_c = (chronic criteria x DF_c) – [(background conc. x (DF_c -1)]

where:

DF_a = Acute Dilution Factor

DF_c = Chronic Dilution Factor

When calculating TMDL-based limits, the maximum daily limit from the approved TMDL becomes the wasteload allocation.

2. Calculate the long term averages (LTA_a and LTA_c) which will comply with the wasteload allocations WLA_a and WLA_c.

LTA_a = $WLA_a \times e^{[0.5\sigma^2 - z\sigma]}$

where:

$\sigma^2 = \ln[CV^2 + 1]$

$z = 2.326$

CV = coefficient of variation = std. dev/mean

LTA_c = $WLA_c \times e^{[0.5\sigma^2 - z\sigma]}$

where:

$\sigma^2 = \ln[(CV^2 \div 4) + 1]$

$z = 2.326$

3. Use the smallest LTA of the LTA_a or LTA_c to calculate the maximum daily effluent limit (MDL) and the monthly average effluent limit (AML).

Maximum Daily Limit

$MDL=(LTA_x)\, e^{(z\sigma - 0.5\sigma^2)}$

where:

LTA_x = the Limiting Long Term Average

$\sigma^2 = \ln[CV^2 + 1]$

$z = 2.326$ (99^{th} percentile occurrence probability)

Average Monthly Limit

$AML=(LTA_x)e^{(z\sigma_n - 0.5\sigma_n^2)}$

where:

LTA_x = the Limiting Long Term Average

$\sigma^2 = \ln[(CV^2 \div n) + 1]$

$z = 1.645$ (95^{th} percentile occurrence probability)

n = number of samples per month

Ecology used the above method to calculate the average monthly TMDL-based limits for $CBOD_5$ and ammonia. The calculations shown in the following table uses the wasteload allocations from the approved TMDL along with the observed variability (coefficient of variation) calculated from reported discharge data.

NBOD+CBOD and Ammonia Limit Calculations			
	$CBOD_5$ WLA	Ammonia WLA	
1. TMDL Waste Load Allocations (WLAs) (Maximum Daily Limit)	206	68.7	lbs/day
2. Calculate Long Term Average (LTA) from Maximum Daily Limit (MDL)			
σ^2	0.50447	1.987888047	
z_{99}	2.326	2.326	
CV	0.81	2.51	
LTA	51	7	lbs/day
3. Calculate Average Monthly Limit (AML) from LTA			
# of Samples	12	4	per month
z_{95}	1.645	1.645	
σ_n^2	0.053232663	0.945859243	
CV	0.81	2.51	
AML	**72.3**	**21.6**	lbs/day

Reasonable Potential Analysis:

The spreadsheets Input 2 – Reasonable Potential, and LimitCalc in Ecology's PermitCalc Workbook determine reasonable potential (to violate the aquatic life and human health water quality standards) and calculate effluent limits. The process and formulas for determining reasonable potential and effluent limits in these spreadsheets are taken directly from the *Technical Support Document for Water Quality-based Toxics Control*, (EPA 505/2-90-001). The adjustment for autocorrelation is from EPA (1996a), and EPA (1996b).

Ammonia Criteria Calculation

The reasonable potential analysis for Ammonia depends on site-specific criteria for this parameter since ammonia's toxicity depends on that portion which is available in the unionized form. The amount of unionized ammonia depends on the temperature and pH in the receiving freshwater. To evaluate ammonia toxicity, Ecology used the available receiving water information for its historical monitoring station #07D130, located approximately 1.5 miles above the Snoqualmie WRF outfall at the Meadowbrook bridge, and equations presented in chapter173-201A-240 WAC. The following table summarizes the ammonia criteria calculations.

Freshwater Un-ionized Ammonia Criteria Calculation

Based on Chapter 173-201A WAC, amended November 20, 2006

INPUT	
1. Receiving Water Temperature (deg C):	20.7
2. Receiving Water pH:	7.6
3. Is salmonid habitat an existing or designated use?	Yes
4. Are non-salmonid early life stages present or absent?	Present
OUTPUT	
Using mixed temp and pH at mixing zone boundaries?	no
Ratio	15.631
FT	1.400
FPH	1.305
pKa	9.380
Unionized Fraction	0.016
Unionized ammonia NH3 criteria (mg/L as NH_3)	
Acute:	0.226
Chronic:	0.028
RESULTS	
Total ammonia nitrogen criteria (mg/L as N):	
Acute:	11.375
Chronic:	1.413

Reasonable Potential Calculation

Facility	City of Snoqualmie WWTWRF
Water Body Type	Freshwater
Rec. Water Hardness	Acute=64.1, Chronic=27.6 mg/L

Dilution Factors:	Acute	Chronic
Aquatic Life	2.4	35.5
Human Health Carcinogenic		183.3
Human Health Non-Carcinogenic		49.3

Pollutant, CAS No. & NPDES Application Ref. No.		AMMONIA, Criteria as Total NH3	ANTIMONY (INORGANIC) 7440360 1M	ARSENIC (dissolved) 7440382 2M	BERYLLIUM 7440417 3M	BIS(2-ETHYLHEXYL) PHTHALATE 117817 13B	CADMIUM - 7440439 4M Hardness dependent	CHROMIUM(HEX) 18540299 - Dissolved	COPPER - 744058 6M Hardness dependent	CYANIDE 57125 14M	LEAD - 7439921 7M Dependent on hardness	MERCURY 7439976 8M
Effluent Data	# of Samples (n)	54	4	4	4	4	4	4	4	4	4	4
	Coeff of Variation (Cv)	2.3	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
	Effluent Concentration, ug/L (Max. or 95th Percentile)	11,900	2.55	7.61	0.03	0.3	0.06	0.63	12.4	17	4.26	0.0033
	Calculated 50th percentile Effluent Conc. (when n>10)											
Receiving Water Data	90th Percentile Conc., ug/L	30		1.51			0.1	2.2	2.7	0	0.42	0.0036
	Geo Mean, ug/L		0			0			0.9	0		0.0024
Water Quality Criteria	Aquatic Life Criteria, ug/L Acute	11,375	-	360	-	-	2.2859	15	11.19	22	39.663	2.1
	Aquatic Life Criteria, ug/L Chronic	1,413	-	190	-	-	0.3972	10	3.7756	5.2	0.6041	0.012
	WQ Criteria for Protection of Human Health, ug/L	-	6	-	-	0.045	-	-	1300	9	-	0.14
	Metal Criteria Translator, decimal Acute	-	-	1	-	-	0.943	-	FALSE	-	0.466	0.85
	Metal Criteria Translator, decimal Chronic	-	-	1	-	-	0.943	-	FALSE	-	0.466	-
	Carcinogen?	N	N	Y	Y	Y	N	N	N	N	N	N

Aquatic Life Reasonable Potential

Effluent percentile value		0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950
s	$s^2=\ln(CV^2+1)$	1.356	0.555	0.555	0.555	0.555	0.555	0.555	0.555	0.555
Pn	$Pn=(1-\text{confidence level})^{1/n}$	0.946	0.473	0.473	0.473	0.473	0.473	0.473	0.473	0.473
Multiplier		1.00	2.59	2.59	2.59	2.59	2.59	2.59	2.59	2.59
Max concentration (ug/L) at edge of…	Acute	4,922	8.996	0.119	1.965	1.587	18.113	2.362	0.005	
	Chronic	364	2.021	0.101	2.184	2.624	1.237	0.553	0.004	
Reasonable Potential? Limit Required?		**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**

Human Health Reasonable Potential

s	$s^2=\ln(CV^2+1)$	0.5545	0.5545	0.5545	0.5545	0.5545
Pn	Pn=(1-confidence level)1/n	0.473	0.473	0.473	0.473	0.473
Multiplier		1.0385	1.0385	1.0385	1.0385	1.0385
Dilution Factor		49.281	183.33	49.281	49.281	49.281
Max Conc. at edge of Chronic Zone, ug/L		0.0537	0.0017	1.143	0.3582	0.0024
Reasonable Potential? Limit Required?		**NO**	**NO**	**NO**	**NO**	**NO**

Reasonable Potential Calculation - Page 2

Facility	City of Snoqualmie WWTWRF
Water Body Type	Freshwater
Rec. Water Hardness	Acute=64.1, Chronic=27.6 mg/L

Dilution Factors:	Acute	Chronic
Aquatic Life	2.4	35.5
Human Health Carcinogenic		183.3
Human Health Non-Carcinogenic		49.3

Pollutant, CAS No. & NPDES Application Ref. No.		NICKEL - 7440020 9M - Dependent on hardness	PHENOL 108952 10A	SELENIUM 7782492 10M	TOLUENE 108883 25V	ZINC- 7440666 13M hardness dependent						
Effluent Data	# of Samples (n)	4	4	4	4	4						
	Coeff of Variation (Cv)	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
	Effluent Concentration, ug/L (Max. or 95th Percentile)	12.5	0.04	3.15	2.9	305						
	Calculated 50th percentile Effluent Conc. (when n>10)											
Receiving Water Data	90th Percentile Conc., ug/L	2.2		0		6.1						
	Geo Mean, ug/L	0.4	0	0	0	0						
Water Quality Criteria	Aquatic Life Criteria, ug/L Acute	971.51	-	20	-	78.509						
	Chronic	52.862	-	5	-	35.086						
	WQ Criteria for Protection of Human Health, ug/L	80	9000	60	72	1000						
	Metal Criteria Translator, decimal Acute	0.998	-	-	-	FALSE						
	Chronic	0.997	-	-	-	FALSE						
	Carcinogen?	N	N	N	N	N						

Aquatic Life Reasonable Potential

Effluent percentile value		0.950		0.950		0.950						
s	$s^2=\ln(CV^2+1)$	0.555		0.555		0.555						
Pn	$Pn=(1\text{-confidence level})^{1/n}$	0.473		0.473		0.473						
Multiplier		2.59		2.59		2.59						
Max concentration (ug/L) at edge of…	Acute	14.585		3.356		3.586						
	Chronic	3.045		0.229		5.928						
Reasonable Potential? Limit Required?		**NO**		**NO**		**NO**						

Human Health Reasonable Potential

s	$s^2=\ln(CV^2+1)$	0.5545	0.5545	0.5545	0.5545	0.5545						
Pn	Pn=(1-confidence level)1/n	0.473	0.473	0.473	0.473	0.473						
Multiplier		1.0385	1.0385	1.0385	1.0385	1.0385						
Dilution Factor		49.281	49.281	49.281	49.281	49.281						
Max Conc. at edge of Chronic Zone, ug/L		0.6553	0.0008	0.0664	0.0611	6.427						
Reasonable Potential? Limit Required?		**NO**	**NO**	**NO**	**NO**	**NO**						

Simple Mixing – Fecal Coliform:

Ecology uses simple mixing calculations to assess the impacts of certain conservative pollutants, such as the expected increase in fecal coliform bacteria at the edge of the chronic mixing zone boundary. Simple mixing uses a mass balance approach to proportionally distribute a pollutant load from a discharge into the authorized mixing zone. The approach assumes no decay or generation of the pollutant of concern within the mixing zone. The predicted concentration at the edge of a mixing zone (C_{mz}) is based on the following calculation:

$$C_{mz} = Ca + \frac{(Ce - Ca)}{DF}$$

where: Ce = Effluent Concentration
Ca = Ambient Concentration
DF = Dilution Factor

The following table summarizes the results of this calculation for discharges of treated wastewater from the Snoqualmie WRF to the Snoqualmie River.

Calculation of Fecal Coliform at Chronic Mixing Zone

INPUT	
Chronic Dilution Factor	35.5
Receiving Water Fecal Coliform, #/100 ml	49
Effluent Fecal Coliform - worst case, #/100 ml	400
Surface Water Criteria, #/100 ml	*100*
OUTPUT	
Fecal Coliform at Mixing Zone Boundary, #/100 ml	**59**
Difference between mixed and ambient, #/100 ml	10

Conclusion: At design flow, the discharge has no reasonable potential to violate water quality standards for fecal coliform.

pH Analysis

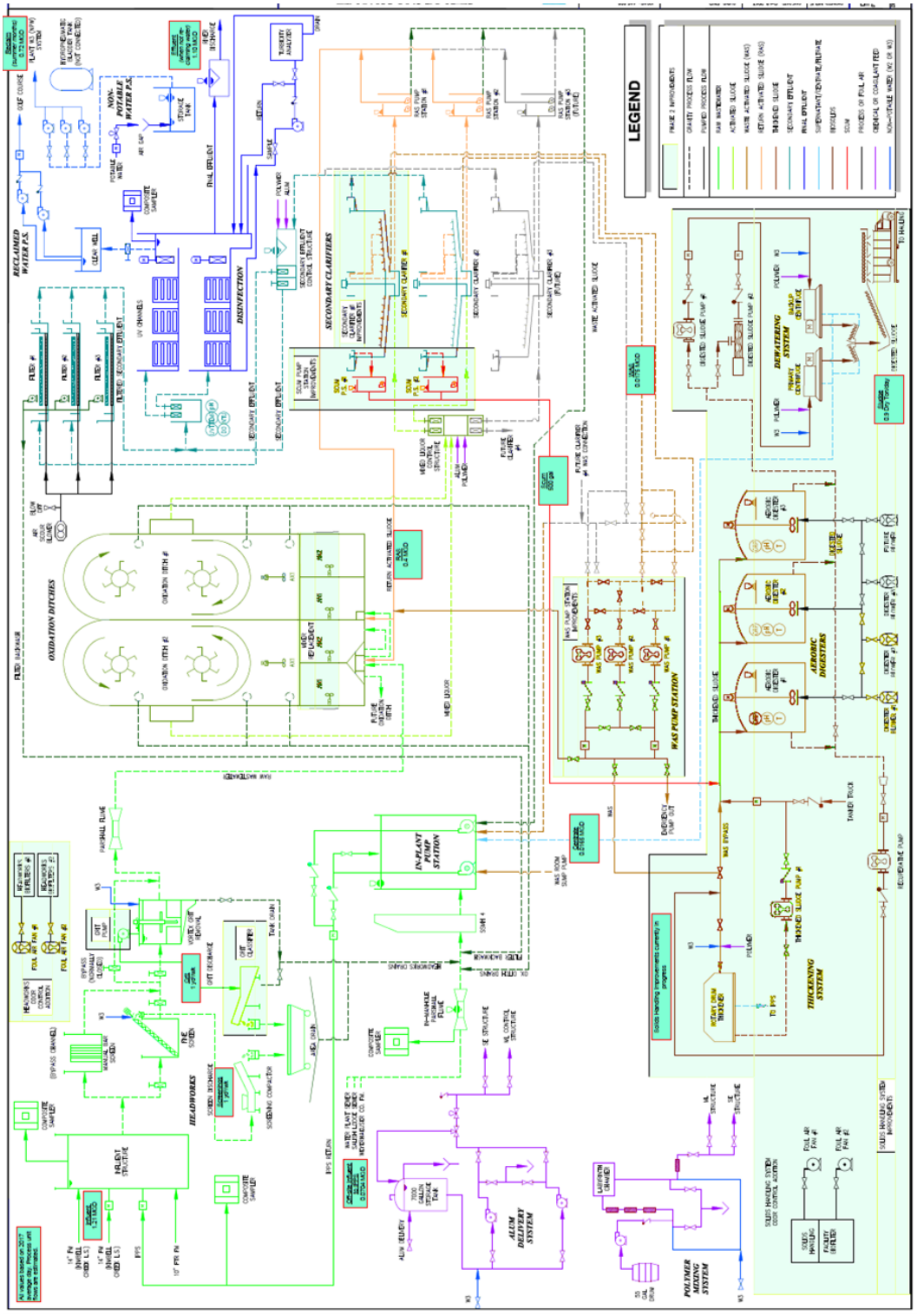
Ecology uses a spreadsheet tool to calculate the pH of a mixture of two flows using the procedure in EPA's DESCON program (EPA, 1988. Technical Guidance on Supplementary Stream Design Conditions for Steady State Modeling. EPA Office of Water, Washington DC). The major form of alkalinity is assumed to be carbonate alkalinity. Also, alkalinity and total inorganic carbon are assumed to be conservative. Table E-7 presents the calculated pH at the edge of the chronic mixing zone for outfall 001. Ecology evaluated resultant pH when effluent is at the extremes of the technology standards of 6.0 and 9.0.

Calculation of pH of a Mixture of Two Flows

Based on the procedure in EPA's DESCON program (EPA, 1988. Technical Guidance on Supplementary Stream Design Conditions for Steady State Modeling. USEPA Office of Water, Washington D.C.)

INPUT			
	@ pH = 6.0	**@ pH = 6.3**	**@ pH = 9.0**
1. Dilution Factor at Mixing Zone Boundary	35.5	35.5	35.5
2. Ambient/Upstream/Background Conditions			
Temperature (deg C):	20.70	20.70	20.70
pH:	7.10	7.10	7.10
Alkalinity (mg CaCO3/L):	23.60	23.60	23.60
3. Effluent Characteristics			
Temperature (deg C):	21.70	21.70	21.70
pH:	6.0	6.3	9.0
Alkalinity (mg CaCO3/L):	99.00	99.00	99.00
4. Aquatic Life Use Designation	Char spawning & rearing and/or core summer habitat		
OUTPUT			
1. Ionization Constants			
Upstream/Background pKa:	6.38	6.38	6.38
Effluent pKa:	6.37	6.37	6.37
2. Ionization Fractions			
Upstream/Background Ionization Fraction:	0.84	0.84	0.84
Effluent Ionization Fraction:	0.30	0.46	1.00
3. Total Inorganic Carbon			
Upstream/Background Total Inorganic Carbon (mg CaCO3/L):	28	28	28
Effluent Total Inorganic Carbon (mg CaCO3/L):	331	215	99
4. Condtions at Mixing Zone Boundary			
Temperature (deg C):	20.73	20.73	20.73
Alkalinity (mg CaCO3/L):	25.72	25.72	25.72
Total Inorganic Carbon (mg CaCO3/L):	36.61	33.35	30.07
pKa:	6.38	6.38	6.38
5. Allowable pH change	0.20	0.20	0.20
RESULTS			
pH at Mixing Zone Boundary:	**6.75**	**6.91**	**7.15**
pH change at Mixing Zone Boundary:	0.35	0.19	0.05
Is permit limit needed?	YES	NO	NO

Appendix E--City of Snoqualmie WRF Process Flow Diagram



Appendix F--City of Snoqualmie WRF Data

The following tables and graphs summarize monitoring data reported by the Snoqualmie WRF to Ecology in monthly Discharge Monitoring Reports and other periodic monitoring reports from August 2014 to October 2018.

Discharge Monitoring Data, 2014-2018

Facility: Snoqualmie WRF
Permit No: WA0022403

	Influent											
Date	Flow, MGD	Flow, MGD	CBOD, mg/L	CBOD, mg/L	BOD, mg/L	BOD, mg/L	BOD, ppd	BOD, ppd	TSS, mg/L	TSS, mg/L	TSS, ppd	TSS, ppd
	Monthly Ave	Monthly Max	Monthly Ave	Monthly Max	Monthly Ave	Monthly Max	Monthly Ave	Monthly Max	Monthly Ave	Monthly Max	Monthly Ave	Monthly Max
May-14	1.2	35.5	272.2	308.0	279.5	340	2,489.5	3,082	305.8	418	2,815	4,034
June-14	1.1	1.3	337.5	375.0	302.8	325	2,562.6	2,877	337.1	413	2,887	3,402
July-14	1.0	1.3	294.6	409.0	296.9	413	2,429.4	3,398	304.6	356	2,566	3,422
August-14	1.0	1.4	305.2	368.0	321.5	500	2,462.7	4,112	339.9	504	2,862	4,405
September-14	1.0	1.2	298.8	355.0	297.4	350	2,612.6	3,283	316.4	506	2,794	4,895
October-14	1.3	1.8	267.0	422.0	275.9	338	2,762.6	4,665	315.6	618	3,280	6,692
November-14	1.4	2.0	232.7	354.0	279.0	473	2,892.7	5,021	250.3	332	2,607	3,613
December-14	1.3	1.8	247.9	313.0	295.9	430	3,264.6	6,195	257.4	311	2,831	3,687
January-15	1.3	2.3	237.5	360.0	277.2	500	2,708.3	4,238	245.9	336	2,430	3,706
February-15	1.3	1.9	230.8	350.0	272.4	380	2,573.2	3,145	278.8	363	2,678	3,327
March-15	1.1	1.5	287.3	360.0	340.0	430	2,943.7	3,405	324.3	411	2,838	3,577
April-15	1.0	1.4	319.4	410.0	367.1	470	2,772.3	3,775	335.4	462	2,546	3,796
May-15	0.9	1.1	299.4	355.0	385.8	600	2,750.4	4,611	379.8	578	2,752	4,111
June-15	1.0	1.2	294.4	370.0	357.7	560	2,712.2	3,929	349.2	412	2,707	3,594
July-15	0.9	1.1	302.6	455.0	375.7	540	2,618.4	4,186	349.3	681	2,423	4,233
August-15	0.9	1.1	289.8	340.0	335.4	390	2,316.4	3,280	333.5	384	2,338	3,187
September-15	0.9	1.0	312.6	450.0	375.7	470	2,427.7	3,464	301.6	350	1,929	2,256
October-15	0.9	1.6	322.8	420.0	366.7	510	2,268.6	3,192	326.8	390	2,041	2,697
November-15	1.5	3.1	281.0	430.0	316.2	470	3,559.8	7,025	222.7	300	2,459	5,944
December-15	1.8	4.3	281.6	425.0	325.6	490	4,309.7	8,164	218.1	302	2,853	5,759
January-16	1.2	1.8	275.6	325.0	321.3	380	3,011.3	3,959	260.3	436	2,417	3,837
February-16	1.3	1.5	288.8	390.0	343.3	450	3,267.2	4,275	293.5	386	2,814	3,760
March-16	1.3	1.8	332.3	520.0	384.7	570	3,970.8	6,267	340.1	520	3,490	5,738
April-16	1.0	1.1	352.1	415.0	391.7	470	3,077.2	3,701	296.5	434	2,304	3,348
May-16	1.0	1.5	506.8	998.0	590.7	1140	4,985.5	8,780	351.9	506	2,896	3,898
June-16	1.1	1.3	397.3	473.0	456.1	555	3,811.4	5,638	355.0	545	2,948	4,522
July-16	1.0	1.1	408.5	520.0	462.5	570	3,700.8	4,734	330.0	447	2,606	3,444
August-16	1.0	1.2	372.7	503.0	428.2	540	3,472.4	4,296	324.2	423	2,608	3,357
September-16	1.0	1.1	372.8	465.0	440.4	585	3,535.3	5,264	324.1	390	2,570	3,239
October-16	1.3	1.9	338.4	510.0	380.7	525	3,717.0	4,431	266.7	330	2,609	3,584
November-16	1.5	2.1	312.4	593.0	390.0	780	4,918.4	7,885	239.7	340	2,947	4,120
December-16	1.3	1.8	343.8	435.0	389.2	495	3,951.3	4,895	269.6	392	2,691	3,867
January-17	1.0	1.7	448.2	608.0	493.1	630	3,920.7	5,090	359.7	555	2,856	4,059
February-17	1.5	3.0	304.3	465.0	366.2	585	3,873.0	5,964	298.2	601	3,086	6,174
March-17	1.5	2.3	227.9	280.0	262.1	330	3,059.1	3,544	201.6	253	2,345	3,129
April-17	1.3	1.6	235.1	349.0	309.8	428	3,239.8	4,429	244.6	553	2,644	7,271
May-17	1.1	1.5	362.9	638.0	463.1	675	4,156.0	6,265	311.9	385	2,746	3,533
June-17	1.0	1.1	320.7	413.0	445.4	630	3,445.7	4,843	353.6	542	2,717	3,966
July-17	1.0	1.3	272.5	340.0	368.6	495	2,802.7	4,211	311.8	401	2,354	3,076
August-17	1.0	1.4	312.0	645.0	397.7	765	3,177.9	6,186	305.4	443	2,440	3,738
September-17	0.9	1.0	332.9	440.0	420.8	550	3,052.3	4,058	301.7	386	2,154	2,742
October-17	1.1	1.9	245.3	425.0	303.3	520	2,393.5	3,832	271.5	341	2,306	3,715
November-17	1.5	2.4	208.7	570.0	233.6	340	2,801.3	4,506	180.7	260	2,045	2,539
December-17	1.4	2.2	248.8	345.0	335.0	500	3,540.4	5,246	204.8	334	2,168	4,305
January-18	1.6	2.2	260.4	350.0	357.9	510	4,633.2	6,888	183.2	254	2,283	3,073
February-18	1.3	1.9	315.0	380.0	417.5	580	4,149.3	6,387	262.2	360	2,493	3,328
March-18	1.0	1.4	313.8	425.0	426.9	550	3,419.0	4,054	261.6	360	2,042	2,721
April-18	1.4	2.1	252.9	365.0	340.0	460	3,462.3	5,559	219.3	260	2,232	3,059
May-18	1.1	1.4	231.3	315.0	303.7	460	2,551.2	3,885	241.2	286	2,005	2,580
June-18	0.9	1.0	222.3	289.0	299.7	383	2,060.8	2,649	270.0	311	1,874	2,233
July-18	0.9	1.0	268.1	330.0	321.0	368	2,129.7	2,552	313.2	374	2,114	2,642
August-18	0.8	0.9	241.2	293.0	298.1	368	1,859.1	2,299	285.7	402	1,812	2,578
September-18	0.9	1.1	246.2	320.0	299.8	400	1,970.4	3,445	272.1	324	1,796	2,562
October-18	0.9	1.5	241.6	320.0	294.7	350	2,019.8	2,870	229.2	370	1,546	2,323
AVE:	1.2	2.3	298.7	420.0	355.2	498.4	3,122	4,591	289.4	406	2,511	3,748
MIN:	0.8	0.9	208.7	280.0	233.6	325.0	1,859	2,299	180.7	253	1,546	2,233
MAX:	1.8	35.5	506.8	998.0	590.7	1,140.0	4,985	8,780	379.8	681	3,490	7,271
Median	1.1	1.5	294.5	399.5	341.7	492.5	3,032	4,256	299.9	388	2,568	3,589
95th Percentile	1.5	3.0	401.2	618.5	462.7	706.5	4,423	7,326	354.1	586	2,996	6,024
Standard Deviation	0.22	4.65	58.48	119.44	68.15	136.90	749.41	1453.24	48.88	98.82	389.02	1092.38
CV	0.2	2.1	0.2	0.3	0.2	0.3	0.2	0.3	0.2	0.2	0.2	0.3
DESIGN (after 7/2011):	2.2						5,220				5,220	
85% DESIGN:	1.8						4,437				4,437	
DESIGN (after 7/2011):	2.2						5,220				5,220	
85% DESIGN:	1.8						4,437				4,437	

approaching design limits (85%)
exceeds design limits

Discharge Monitoring Data, 2014-2018

Facility: Snoqualmie WRF
Permit No: WA0022403

	Effluent														
Date	Flow, MGD	Flow, MGD	CBOD, mg/L	CBOD, mg/L	CBOD, ppd	CBOD, ppd	CBOD, ppd	CBOD, % Removal	TSS, mg/L	TSS, mg/L	TSS, ppd	TSS, ppd	TSS, % Removal	PH	PH
	Monthly Ave	Monthly Max	Monthly Ave	Wkly Ave	Monthly Ave	Wkly Ave	Daily Max	Ave	Monthly Ave	Wkly Ave	Monthly Ave	Wkly Ave	Ave	Min	Max
May-14	1.05	1.58	1.8	2.3	16	19	25.0	99.3	2.2	2.7	19	22	99.3	7.28	7.51
June-14	0.49	1.03	1.3	1.7	5	7	8.5	99.6	1.9	2.0	8	12	99.4	7.32	7.66
July-14	0.26	0.72	1.2	3.5	3	4	4.9	99.6	2.4	3.3	5	7	99.2	6.70	7.69
August-14	0.27	0.65	1.7	2.2	4	7	10.8	99.5	2.8	3.3	8	12	99.2	7.22	7.65
September-14	0.63	1.13	2.1	2.3	12	18	26.3	99.3	2.5	3.0	13	21	99.2	6.34	8.23
October-14	1.08	1.63	2.6	5.3	23	41	82.6	99.0	8.8	32.0	71	243	97.2	6.53	8.10
November-14	1.20	1.85	1.6	1.8	17	23	31.7	99.3	1.5	1.7	15	16	99.4	6.55	8.10
December-14	1.23	1.73	2.7	3.3	29	33	44.0	98.9	2.7	4.0	29	40	99.0	6.34	8.04
January-15	1.25	2.20	3.5	5.0	36	54	74.3	98.5	4.8	6.0	49	76	98.0	7.00	7.54
February-15	1.22	1.85	3.1	4.7	30	45	55.5	98.7	3.8	4.7	37	41	98.7	6.62	8.12
March-15	1.04	1.41	3.0	4.0	27	33	44.5	98.9	3.0	3.7	26	30	99.1	6.47	7.52
April-15	0.93	1.29	2.8	3.3	22	34	32.4	99.1	2.9	3.3	22	27	99.2	6.60	8.74
May-15	0.67	0.86	2.1	3.2	12	21	26.3	99.3	1.9	3.3	11	21	99.5	6.79	7.59
June-15	0.21	0.61	1.8	2.0	3	4	20.0	99.4	2.4	3.3	4	7	99.3	6.39	8.67
July-15	0.13	0.57	1.6	2.3	3	10	19.0	98.5	2.0	2.0	3	13	99.4	6.34	7.89
August-15	0.05	0.37	1.5	1.7	1	2	3.1	99.5	1.2	1.3	1	2	99.6	6.75	7.68
September-15	0.56	0.84	1.4	2.0	7	13	13.5	99.6	2.2	3.7	11	21	99.3	6.99	7.64
October-15	0.88	1.52	2.2	3.0	15	20	27.9	99.3	5.3	13.0	38	94	98.4	6.32	7.67
November-15	1.40	3.17	2.5	2.7	31	56	79.4	99.0	4.2	5.7	55	123	98.0	6.59	7.28
December-15	1.62	3.92	2.9	4.7	38	58	65.5	99.0	4.1	4.7	58	103	98.0	6.60	7.30
January-16	1.11	1.58	3.4	3.7	32	32	42.8	98.8	3.6	4.7	33	39	98.6	6.54	7.74
February-16	1.14	1.39	3.3	4.0	30	33	46.5	99.0	3.1	3.3	29	37	98.9	6.85	7.29
March-16	1.16	1.59	3.7	4.0	36	36	57.1	98.0	4.5	6.7	45	75	98.0	6.58	7.07
April-16	0.79	0.95	2.3	3.3	15	24	28.9	99.4	2.8	4.0	18	29	99.1	6.82	7.44
May-16	0.27	0.88	1.5	2.0	4	7	14.7	99.8	1.8	2.0	5	8	99.0	6.90	7.69
June-16	0.49	0.91	1.1	1.4	4	7	10.6	99.0	2.9	3.7	10	25	99.0	6.87	7.57
July-16	0.22	0.87	1.5	1.7	2	3	4.4	99.7	2.5	3.0	4	5	99.2	6.62	7.04
August-16	0.22	0.30	1.0	1.0	2	2	2.5	99.0	1.8	2.7	3	5	99.5	6.58	7.17
September-16	0.78	0.91	1.2	1.7	8	11	13.3	99.0	2.2	3.0	14	19	99.0	6.77	7.10
October-16	1.13	1.62	1.2	1.6	11	18	22.9	99.0	2.1	3.7	19	35	99.0	6.50	7.12
November-16	1.33	1.78	2.5	4.0	28	40	55.3	99.0	6.4	10.0	70	97	97.0	6.49	6.94
December-16	1.20	1.64	4.5	6.3	44	59	66.4	98.0	7.8	9.3	77	86	97.0	6.68	7.13
January-17	0.97	1.55	5.1	7.0	42.1	57	59.9	98.0	8.2	12.6	69	103	97.0	6.89	7.25
February-17	1.35	2.45	5.6	8.3	65	108	179.5	99.1	9.2	19.7	107	247	96.0	6.62	6.96
March-17	1.42	2.13	3.0	3.4	36	49	53.2	98.0	5.4	6.7	65	86	97.0	6.41	6.96
April-17	1.15	2.05	4.6	4.9	45	50	60.7	98.0	9.5	10.7	92	96	96.0	6.37	7.86
May-17	0.86	1.31	1.8	3.0	13	25	39.5	99.0	3.8	6.3	27	53	98.0	6.70	7.59
June-17	0.76	0.95	1.4	2.0	8	11	13.6	99.0	2.5	3.0	16	21	99.0	6.94	8.28
July-17	0.79	1.28	1.9	3.3	13	20	42.9	99.3	2.3	2.5	16	20	99.3	**5.23**	8.20
August-17	0.12	0.69	1.0	1.0	1	3	5.7	99.0	2.7	3.3	3	11	99.0	6.53	7.52
September-17	0.94	1.03	1.2	1.3	9	11	16.4	99.0	2.9	3.3	23	28	99.0	6.75	7.15
October-17	0.68	1.09	1.6	2.8	9	22	29.1	99.0	2.9	4.7	17	32	99.0	6.34	7.12
November-17	0.97	1.81	2.6	3.3	22	33	36.7	98.0	5.4	9.3	44	60	96.0	6.41	6.92
December-17	1.14	2.08	2.7	3.5	24	31	37.4	98.0	5.1	6.7	45	58	97.0	6.44	7.01
January-18	1.50	2.01	2.5	3.0	31	45	50.3	99.0	4.6	6.0	59	91	97.0	6.48	6.89
February-18	1.25	1.67	2.5	4.0	24	36	37.7	99.0	4.5	5.6	46	51	98.0	6.43	6.98
March-18	1.04	1.37	2.1	3.3	18	38	31.2	99.0	3.7	4.3	32	39	99.0	6.38	7.23
April-18	1.30	2.10	1.6	2.6	18	37	42.0	99.0	3.6	4.6	37	46	98.0	6.47	7.19
May-18	0.70	1.20	2.0	3.0	11	17	22.9	99.0	2.5	3.0	15	24	98.0	6.86	7.11
June-18	0.07	0.53	2.0	2.7	2	7	13.3	99.0	2.0	2.3	2	6	99.0	6.74	7.12
July-18	0.03	0.65	1.8	2.0	0	2	5.4	99.0	2.0	2.0	1	4	99.0	6.77	7.21
August-18	0.04	0.52	1.2	1.3	0	2	4.3	99.0	1.9	2.0	1	3	99.0	7.02	7.22
September-18	0.57	1.00	1.6	2.0	9	13	15.6	99.0	2.5	4.3	14	29	99.0	6.79	7.21
October-18	0.84	1.41	2.6	3.6	20	35	51.7	99.0	5.3	7.0	38	51	98.0	6.63	7.11
AVE:	0.82	1.37	2.3	3.1	18	26	35.4	99.0	3.6	5	29	47.2	98.5	6.63	7.48
MIN:	0.03	0.30	1.0	1.0	0	2	2.5	98.0	1.2	1	1	1.7	96.0	5.23	6.89
MAX:	1.62	3.92	5.6	8.3	65	108	179.5	99.8	9.5	32	107	247.2	99.6	7.32	8.74
Median	0.91	1.34	2.0	3.0	15	23	30.1	99.0	2.9	4	20	29.7	99.0	6.61	7.37
95th Percentile	1.41	2.29	4.6	5.7	43	58	76.1	99.6	8.4	13	73	110.2	99.4	7.09	8.25
Standard Deviation	0.44	0.68	1.05	1.48	14.45	20.60	29.19	0.46	2.01	4.98	25.41	50.38	0.98	0.31	0.45
CV	0.5	0.5	0.5	0.5	0.8	0.8	0.8	0.0	0.6	0.9	0.9	1.1	0.0	0.05	0.06
Aug-Oct LIMIT (up to 7/2011):			25	40			206	85	30	45	538	807	85.0	6.0	9
Nov-July LIMIT (up to 7/2011):			25	40	259	414		85	30	45	538	807	85.0	6	9
Aug-Oct LIMIT (after 7/2011):			25	40			206	85	30	45	538	807	85.0	6.0	9
Nov-July LIMIT (after 7/2011):			25	40	448	717		85	30	45	538	807	85.0	6	9

exceeds permit limits

Discharge Monitoring Data, 2014-2018

Facility: Snoqualmie WRF
Permit No: WA0022403

	Effluent											
Date	Fecal Coliform, #/100 ml	Fecal Coliform, #/100 ml	Ammonia, mg/l (as N)	Ammonia, mg/l (as N)	Ammonia, ppd (as N)	Ammonia, ppd (as N)	Ortho-phosphate, mg/l (as P)	Ortho-phosphate, mg/l (as P)	Ortho-phosphate, ppd (as P)	Ortho-phosphate, ppd (as P)	Temperature °C	Temp - 7DADMax oC
	GEM	GM7	Monthly Ave	Max	Monthly Ave	Daily Max	Monthly Ave	Max	Monthly Ave	Daily Max	Daily Max	Monthly Averag
May-14	1	3	0.05	0.1	0.4	0.6	0.52	0.8	4.4	7.27	18.30	17.93
June-14	1	1	0.05	0.1	0.2	0.5	1.10	1.9	3.8	14.35	20.20	19.96
July-14	2	2	0.01	0.0	0.0	0.0	0.36	0.4	0.8	1.16	21.80	21.60
August-14	2	3	0.43	1.6	1.6	6.1	0.89	1.5	3.4	6.52	22.30	21.90
September-14	1	2	0.02	0.0	0.1	0.2	0.30	0.3	1.7	2.94	21.90	21.69
October-14	1	2	0.36	0.9	4.3	12.2	0.57	1.1	5.4	9.67	20.50	20.14
November-14	1	1	1.03	2.1	11.8	29.4	0.40	0.5	3.9	4.76	17.90	17.77
December-14	1	2	3.55	5.5	42.0	65.6	1.07	3.5	14.1	49.73	15.30	14.88
January-15	1	3	3.46	11.1	38.9	124.4	0.28	0.8	3.0	9.27	14.60	14.36
February-15	2	5	0.36	1.2	3.1	10.7	0.57	1.5	5.0	12.56	14.70	14.54
March-15	1	2	0.05	0.1	0.5	0.8	0.43	0.6	3.8	4.48	15.90	15.50
April-15	1	2	0.13	0.3	1.1	3.2	0.58	0.9	4.8	9.59	17.40	16.50
May-15	1	1	0.10	0.1	0.7	0.9	1.40	2.3	8.9	13.93	19.80	19.37
June-15	1	1	0.05	0.1	0.1	0.4	0.94	1.6	2.6	6.49	22.20	21.40
July-15	1	3	0.75	3.7	0.4	1.7	1.31	2.0	1.2	2.75	23.00	22.31
August-15	1	1	0.05	0.1	0.0	0.0	1.27	2.0	0.4	1.05	23.20	23.03
September-15	1	2	0.06	0.2	0.4	1.0	1.07	1.4	5.1	9.01	21.90	22.00
October-15	2	5	0.30	0.5	2.2	3.5	1.32	1.6	9.6	11.58	20.60	20.49
November-15	2	4	0.64	1.2	7.5	17.8	0.53	1.6	5.3	15.51	17.80	18.77
December-15	3	12	1.16	1.3	15.0	27.0	0.38	0.8	3.6	6.25	14.50	14.53
January-16	1	2	1.49	1.7	13.5	15.8	0.60	0.8	5.3	7.04	13.20	13.04
February-16	1	1	0.48	1.1	4.2	9.7	0.58	0.8	5.2	6.90	14.00	13.80
March-16	1	3	0.13	0.2	1.4	2.4	0.33	0.7	3.2	5.51	14.60	14.17
April-16	1	1	0.09	0.1	0.6	0.7	0.94	1.3	5.9	8.77	18.10	17.64
May-16	1	1	0.10	0.3	0.2	0.8	1.04	1.1	2.0	2.66	19.20	18.63
June-16	1	1	0.03	0.0	0.1	0.2	0.63	1.5	1.4	2.73	20.00	19.94
July-16	1	1	0.03	0.0	0.0	0.1	1.73	2.8	2.4	3.78	22.10	21.83
August-16	1	1	0.01	0.0	0.0	0.0	0.56	0.9	1.1	2.01	22.40	22.16
September-16	1	1	0.02	0.0	0.1	0.1	0.48	0.8	3.3	5.08	21.50	21.64
October-16	1	1	0.03	0.1	0.2	0.4	0.54	0.7	4.4	6.05	20.40	20.71
November-16	2	2	0.26	0.6	3.0	6.3	1.68	3.2	19.8	23.46	17.90	17.63
December-16	1	4	8.37	11.9	79.2	102.2	0.47	1.2	4.7	11.97	15.50	15.71
January-17	4	22	8.67	11.6	81.2	144.6	0.44	0.6	3.9	5.78	13.60	13.23
February-17	2	4	0.16	0.4	1.8	4.8	0.44	0.6	4.5	8.20	12.80	13.21
March-17	1	2	0.07	0.1	0.9	1.4	0.66	1.3	7.9	13.68	13.00	12.83
April-17	3	6	0.25	0.5	2.4	5.5	1.08	1.8	11.2	19.30	15.00	14.81
May-17	1	3	0.09	0.3	0.7	2.2	0.96	1.4	6.7	11.06	18.90	18.30
June-17	2	4	0.04	0.1	0.2	0.5	0.72	1.4	4.6	8.56	20.50	19.69
July-17	1	1	0.07	0.1	0.4	0.6	0.60	0.8	3.7	5.06	31.88	23.41
August-17	1	1	0.03	0.0	0.0	0.1	0.44	0.6	0.4	1.63	23.03	23.40
September-17	1	1	0.04	0.0	0.3	0.3	0.28	0.4	2.2	3.13	22.84	22.73
October-17	2	5	0.23	0.5	1.6	5.0	0.35	0.5	2.0	2.86	23.50	21.26
November-17	2	3	0.65	0.9	4.7	6.6	0.37	0.5	2.8	2.95	17.35	18.28
December-17	1	2	0.51	0.8	4.7	8.5	0.30	0.4	0.5	2.12	14.69	14.48
January-18	1	3	0.10	0.2	1.1	2.8	0.04	0.1	0.4	1.01	13.68	13.33
February-18	1	1	0.17	0.3	1.8	3.5	0.11	0.3	0.8	2.52	13.24	13.07
March-18	1	1	0.03	0.1	0.2	0.4	0.02	0.0	0.2	0.30	14.78	14.31
April-18	1	2	0.03	0.1	0.4	0.9	0.37	0.7	4.4	10.27	16.11	15.67
May-18	1	1	0.05	0.1	0.3	0.6	0.85	1.9	3.5	7.13	19.76	19.45
June-18	1	1	0.18	0.5	0.1	0.4	1.06	1.8	0.7	3.61	22.10	21.22
July-18	1	1	0.06	0.1	0.0	0.0	0.19	0.4	0.0	0.07	23.84	23.43
August-18	1	1	0.05	0.1	0.0	0.0	0.42	0.5	0.1	0.29	23.76	23.53
September-18	3	18	0.10	0.2	0.6	1.2	0.51	0.9	3.1	6.18	22.73	22.58
October-18	2	4	0.26	0.5	2.0	3.3	0.56	1.0	4.1	6.70	21.06	21.06
AVE:	1	3	0.66	1.2	6.3	11.8	0.66	1.1	4.0	7.5	18.8	18.6
MIN:	1	1	0.01	0.0	0.0	0.0	0.02	0.0	0.0	0.1	13.2	13.0
MAX:	4	22	8.67	11.9	81.2	144.6	1.73	3.5	19.8	49.7	23.2	23.0
Median	1	2	0.10	0.2	0.6	1.3	0.56	0.9	3.6	6.2	19.5	19.1
95th Percentile	3	8	3.49	7.4	40.0	78.4	1.35	2.5	10.1	16.8	22.8	22.3
Standard Deviation	1	4	1.70	2.71	16.69	29.61	0.39	0.74	3.56	7.64	3.18	3.16
CV	0.4	1.3	2.60	2.3	2.7	2.5	0.60	0.7	0.9	1.0	0.2	0.2
Aug-Oct LIMIT (up to 7/2011):	200	400				68.7						
Nov-July LIMIT (up to 7/2011):	200	400										
Aug-Oct LIMIT (after 7/2011):	200	400				68.7						
Nov-July LIMIT (after 7/2011):	200	400										

exceeds permit limits

Reclaimed Water Monitoring Data, 2014-2018

Facility: Snoqualmie WRF
Permit No: WA0022403

	Production Monitoring									
Date	Dissolved Oxygen, mg/L	Dissolved Oxygen, mg/L	Pre-filtered Turbidity, NTU	Pre-filtered Turbidity, NTU	Post-filtered Turbidity, NTU	Post-filtered Turbidity, NTU	Coagulant, ppd	Coagulant, ppd	Coagulant Aid, ppd	Coagulant Aid, ppd
	Monthly Ave	Monthly Min	Monthly Ave	Monthly Max	Monthly Ave	Monthly Max	Monthly Ave	Monthly Max	Monthly Ave	Monthly Max
May-14	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
June-14			0.6	1.9	0.5	1.4	23.8	M|	81.6	135
July-14			0.6	0.9	0.5	1.0	25.7	145	M|	M|
August-14			0.9	2.3	0.5	1.2	19.7	ND	ND	ND
September-14			0.9	5.0	0.4	0.6	17.5	ND	ND	ND
October-14	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
November-14	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
December-14	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
January-15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
February-15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
March-15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
April-15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
May-15	3.2	1.6	0.8	1.7	0.5	1.3	1.0	15	M|	M|
June-15	2.3	**0.1**	0.6	1.0	0.4	0.5	15.2	10	M|	M|
July-15	ND	ND	0.6	2.0	0.4	0.8	25.7	ND	ND	ND
August-15	ND	ND	0.6	2.6	0.3	0.4	8.8	ND	ND	ND
September-15	ND	ND	1.3	3.0	1.0	2.4	17.4	ND	ND	ND
October-15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
November-15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
December-15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
January-16	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
February-16	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
March-16	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
April-16	ND	ND	1.0	1.0	0.6	0.9	11.4	ND	ND	ND
May-16	ND	ND	1.6	2.4	0.8	1.6	18.4	ND	ND	ND
June-16	1.7	1.1	1.4	3.5	0.9	3.0	19.5	3	1.1	1
July-16	ND	ND	1.0	1.6	0.4	0.5	15.1	ND	ND	ND
August-16	ND	ND	0.9	1.1	0.3	0.4	17.1	ND	ND	ND
September-16	ND	ND	0.8	0.9	0.3	0.3	14.5	ND	ND	ND
October-16	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
November-16	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
December-16	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
January-17	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
February-17	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
March-17	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
April-17	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
May-17	ND	ND	1.5	1.7	0.6	0.7	18.2	ND	ND	ND
June-17	0.4	0.2	2.3	5.0	0.6	0.7	11.5	22	1	1
July-17	ND	ND	2.8	3.7	1.6	1.9	93.0	ND	ND	ND
August-17	ND	ND	3.3	11.7	1.9	4.9	43.7	ND	ND	ND
September-17	ND	ND	2.1	4.7	1.1	2.6	27.1	ND	ND	ND
October-17	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
November-17	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
December-17	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
January-18	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
February-18	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
March-18	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
April-18	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
May-18	3.1	2.7	4.1	7.6	1.6	2.6	21.0	1	0.02	0
June-18	2.9	2.4	5.2	20.0	0.9	2.3	22.2	3	1	1
July-18	2.9	2.8	2.8	6.1	0.4	0.9	21.6	3	1	1
August-18	ND	ND	2.1	4.1	0.4	1.1	21.4	ND	ND	ND
September-18	ND	ND	1.9	2.2	0.5	0.9	22.2	ND	ND	ND
October-18	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
AVE:	2.4	1.6	1.7	3.9	0.7	1.4	22	25	14.3	23
MIN:	0.4	0.1	0.6	0.9	0.3	0.3	1	1	0.0	-
MAX:	3.2	2.8	5.2	20.0	1.9	4.9	93	145	81.6	135
Median	2.9	1.6	1.3	2.4	0.5	1.0	20	7	1.0	1
95th Percentile	3.2	2.8	4.0	10.9	1.6	2.9	40	102	61.5	102
LIMIT (up to 7/2011):		0.1			2	5				
LIMIT (after 7/2011):		0.1			2	5				

exceeds permit limits

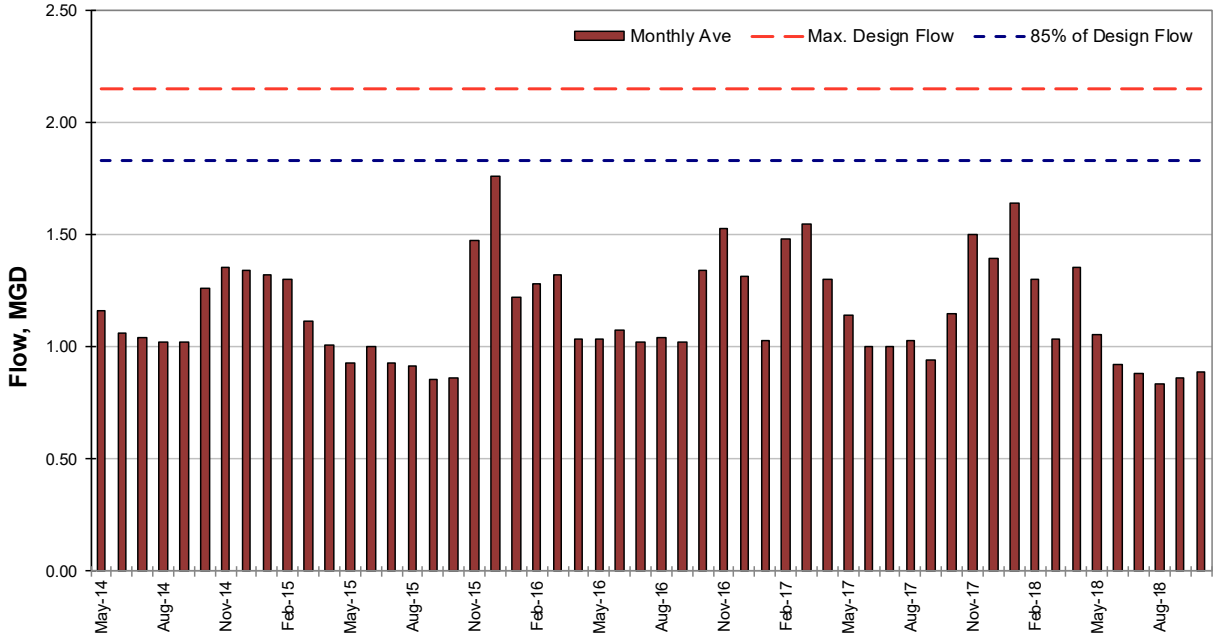
Reclaimed Water Monitoring Data, 2014-2018

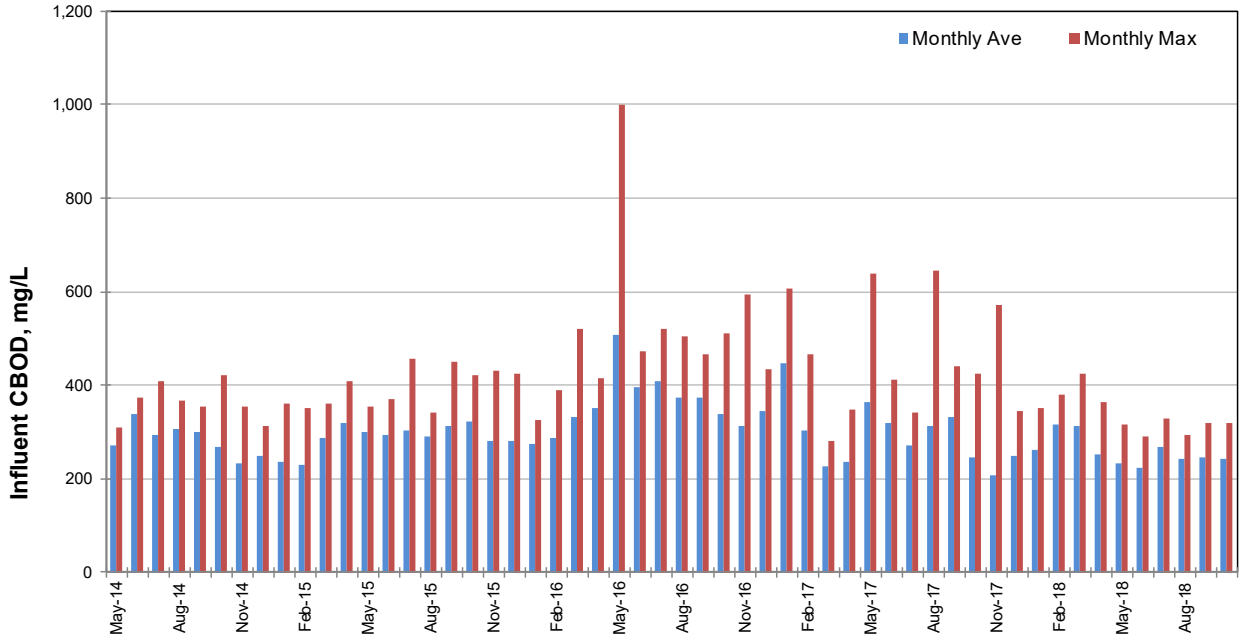
Facility: Snoqualmie WRF
Permit No: WA0022403

	Product Water Distribution															
Date	Flow, MGD	Flow, MGD	CBOD, mg/L	CBOD, mg/L	Dissolved Oxygen, mg/L	Dissolved Oxygen, mg/L	Total Nitrogen, mg/l (as N)	Total Nitrogen, mg/l (as N)	TSS, mg/L	TSS, mg/L	PH	PH	Total Coliform, MPN/100 ml	Total Coliform, MPN/100 ml	Chlorine Residual, mg/L	Chlorine Residual, mg/L
	Monthly Ave	Monthly Max	Monthly Ave	Wkly Ave	Monthly Ave	Monthly Min	Ave	Daily Max	Monthly Ave	Wkly Ave	Min	Max	7-day Median	Max	Min	Avg
May-14	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
June-14	0.63	0.99	1.4	1.7	4.8		2.8	4.9	2.0	2.0	7.4	7.7	1.0	1.0	0.7	2
July-14	0.67	0.80	1.2	1.3	6.9	4.8	1.4	1.7	2.4	3.3	6.7	7.7	1.0	12.4	1.7	1
August-14	0.69	1.29	1.7	2.2	ND	ND	3.5	4.8	2.8	3.3	7.2	7.7	1.0	1.0	0.7	ND
September-14	0.57	0.75	2.3	3.0	ND	ND	4.3	5.1	2.8	3.3	6.3	8.2	1.0	1.0	2.2	ND
October-14	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
November-14	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
December-14	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
January-15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
February-15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
March-15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
April-15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
May-15	0.40	0.72	1.4	2.0	5.8	3.0	2.7	3.2	1.1	1.3	6.8	7.5	1.0	1.0	2.5	5
June-15	0.66	0.99	1.8	2.0	5.5	4.7	2.3	4.5	2.4	3.3	6.4	8.7	1.0	8.7	0.8	5
July-15	0.72	0.93	1.6	2.3	ND	ND	4.7	7.6	2.0	3.3	6.3	7.9	1.0	3.1	1.1	ND
August-15	0.76	0.91	1.5	1.3	ND	ND	4.1	4.9	1.2	1.3	6.8	7.7	1.0	2.0	1.2	ND
September-15	0.59	0.69	1.0	1.0	ND	ND	2.4	2.6	1.6	1.7	7.0	7.6	1.0	1.0	2.1	ND
October-15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
November-15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
December-15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
January-16	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
February-16	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
March-16	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
April-16	0.54	0.68	1.3	1.3	ND	ND	3.4	3.4	2.7	2.7	7.0	7.2	1.0	1.0	5.1	ND
May-16	0.65	0.73	1.4	2.0	ND	ND	2.4	5.7	1.8	2.0	7.0	7.7	1.0	1.0	1.3	ND
June-16	0.62	0.73	1.6	4.7	6.2	6.2	1.6	2.2	1.6	3.7	6.9	7.6	1.0	1.0	0.9	4
July-16	0.67	0.75	1.5	1.7	ND	ND	5.7	6.1	2.5	3.0	6.6	7.0	1.0	1.0	4.5	ND
August-16	0.67	1.02	1.0	1.0	ND	ND	2.8	4.4	1.8	2.7	6.6	7.2	1.0	**60.9**	5.0	ND
September-16	0.46	0.68	1.0	1.0	ND	ND			1.0	1.0	7.0	7.1	1.0	1.0	6.8	ND
October-16	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
November-16	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
December-16	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
January-17	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
February-17	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
March-17	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
April-17	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
May-17	0.62	0.70	1.5	2.0	ND	ND	7.0	9.0	3.0	3.0	6.8	7.2	1.0	1.0	5.8	ND
June-17	0.48	0.76	2.0	2.5	4.6	8.0			2.3	2.5	7.0	8.3	**17.8**	**200.5**	20.0	3
July-17	0.90	1.02	1.3	1.3	ND	ND	5.7	5.7	2.0	2.0	7.1	7.4	1.0	4.2		ND
August-17	0.70	1.10	1.0	1.0	ND	ND	5.8	5.8	2.7	3.3	6.5	7.5	**4.2**	9.9	C	ND
September-17	0.63	0.83	1.1	1.3	ND	ND	4.4	4.6	3.2	3.3	6.9	7.2	2.0	15.0	M	ND
October-17	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
November-17	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
December-17	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
January-18	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
February-18	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
March-18	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
April-18	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
May-18	0.63	0.84	2.6	3.0	6.0	6.0	4.8	5.0	2.6	3.0	6.9	7.1	1.0	2.0	M	8
June-18	0.75	0.90	2.0	2.7	6.5	5.5	6.5	7.9	2.0	2.3	6.7	7.1	1.3	2.5	M	10
July-18	0.76	0.86	1.8	2.0	6.7	5.8	4.5	5.5	2.0	2.0	6.8	7.2	1.0	2.0	M	2
August-18	0.71	0.79	1.2	1.3	ND	ND	7.1	8.6	1.9	2.0	7.0	7.2	1.0	1.0	M	ND
September-18	0.68	0.80	1.0	1.0	ND	ND	5.5	5.5	2.0	2.0	6.9	7.2	1.0	1.0	M	ND
October-18	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
AVE:	0.65	0.85	1.5	1.9	5.89	5.50	4.1	5.2	2.1	3	6.8	7.5	1.9	13.45	4	4
MIN:	0.40	0.68	1.0	1.0	4.60	3.00	1.4	1.7	1.0	1	6.3	7.0	1.0	1.00	1	1
MAX:	0.90	1.29	2.6	4.7	6.90	8.00	7.1	9.0	3.2	4	7.4	8.7	17.8	200.50	20	10
Median	0.66	0.80	1.4	1.7	6.00	5.65	4.3	5.0	2.0	3	6.9	7.5	1.0	1.00	2	4
95th Percentile	0.76	1.08	2.3	3.0	4.68	3.60	6.9	8.5	3.0	3	7.2	8.3	3.8	51.72	9	9
DESIGN LIMIT:	1.56															
85% DESIGN:	1.33															
LIMIT (up to 7/2011):			25	40			10	15	30	45	6.0	9.0	2.2	23.0	0.5	
LIMIT (after 7/2011):			25	40			10	15	30	45	6.0	9.0	2.2	23.0	0.7	

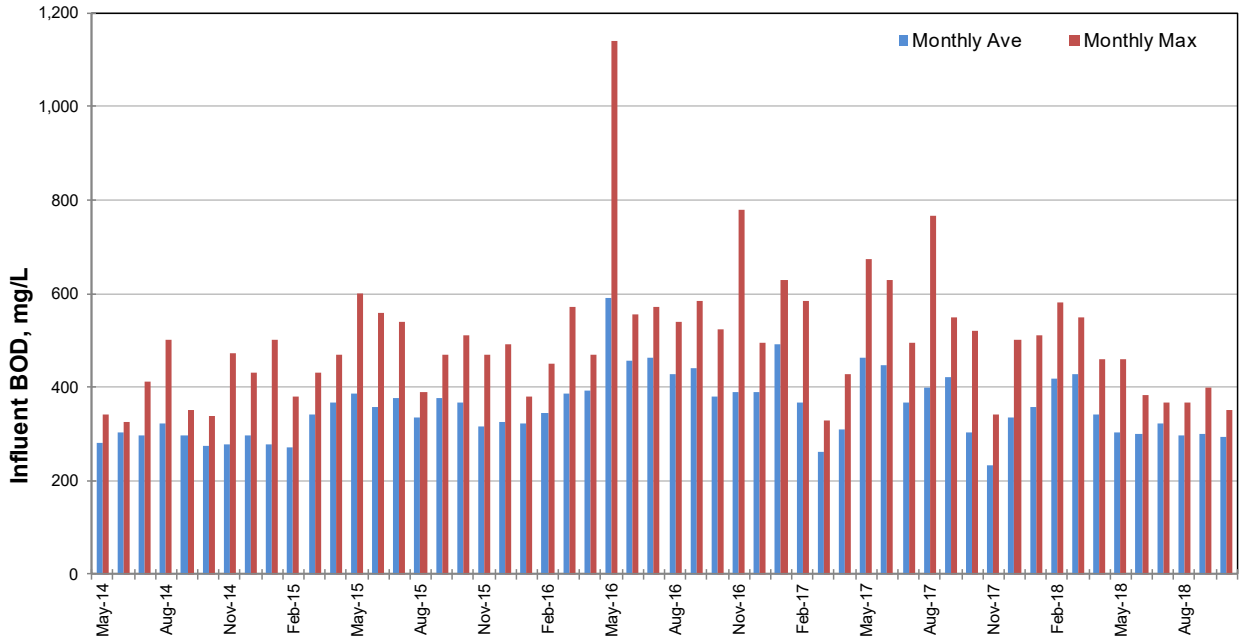
exceeds permit limits

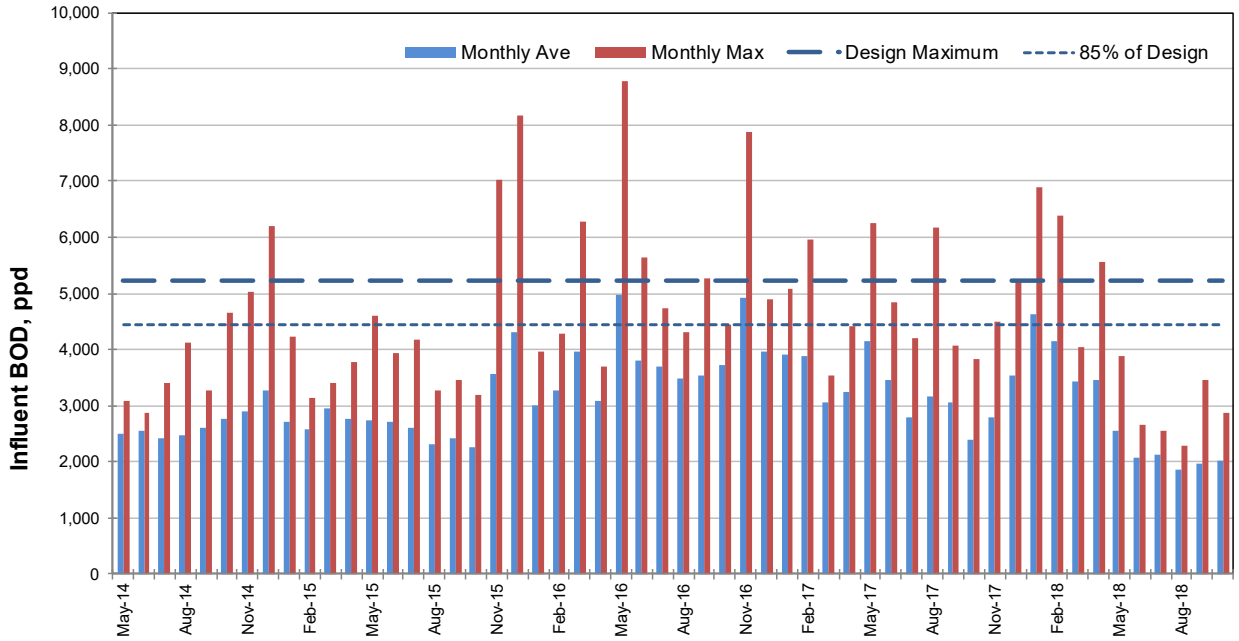
City of Snoqualmie WRF Influent – Flow and CBOD



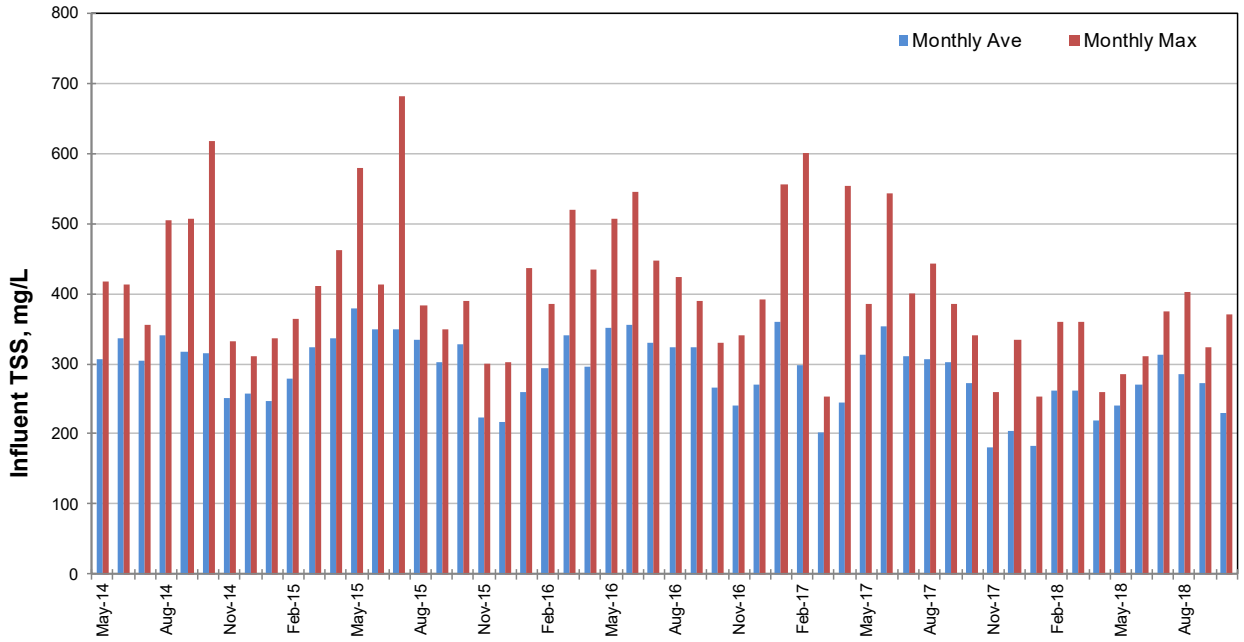


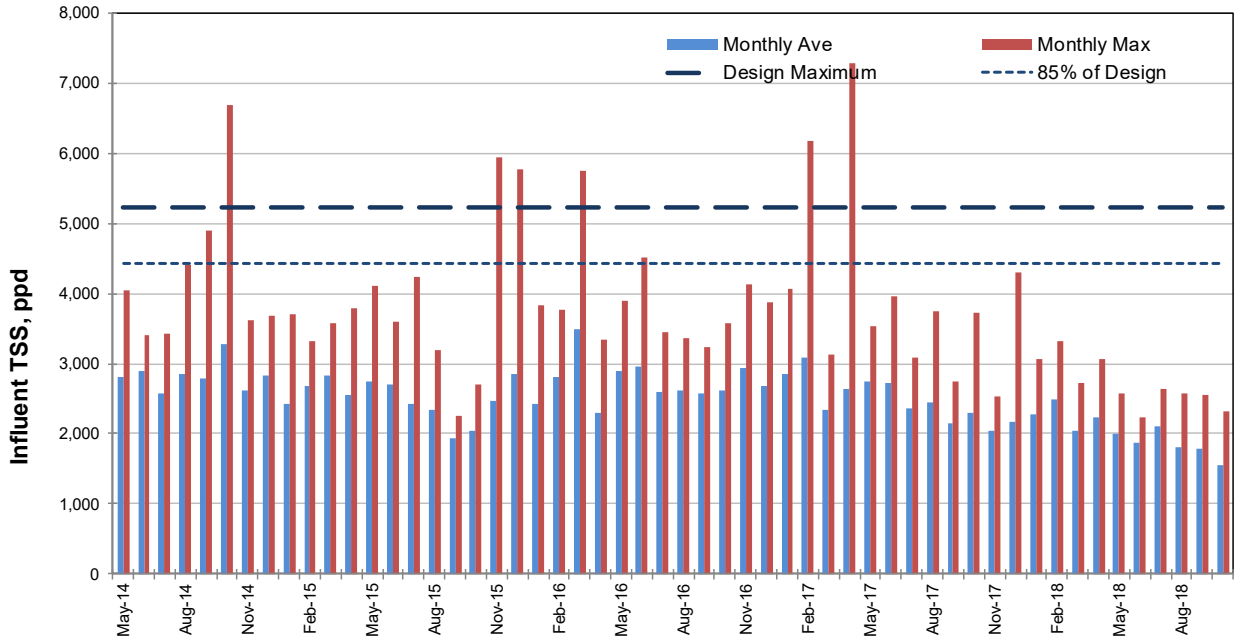
City of Snoqualmie WRF Influent – BOD



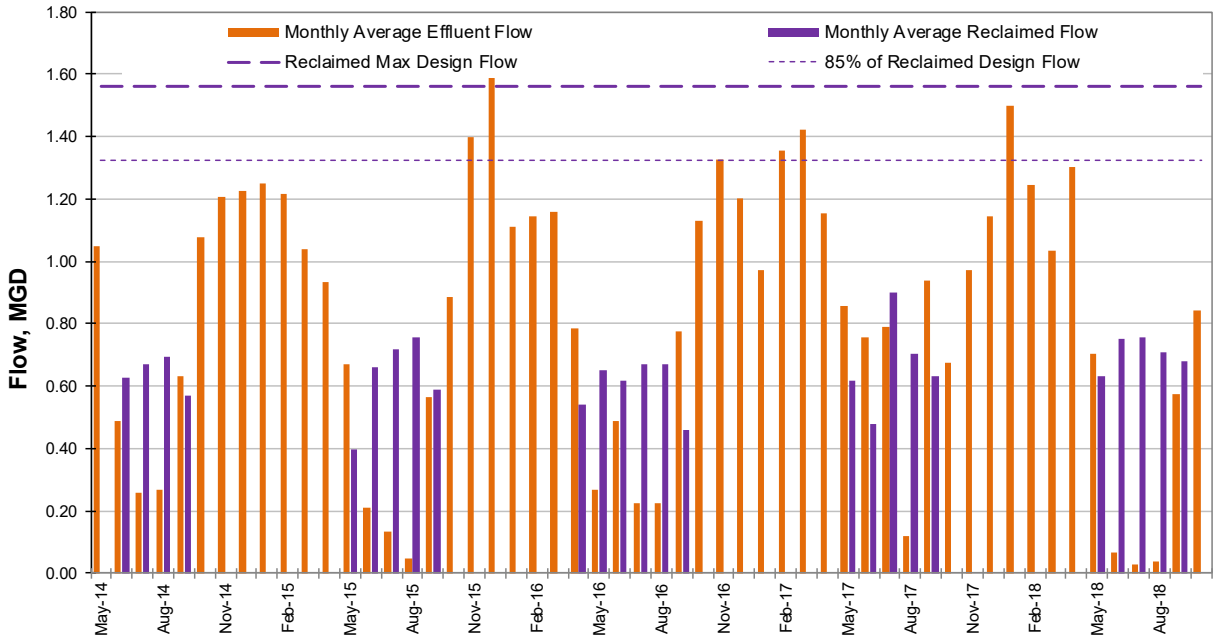


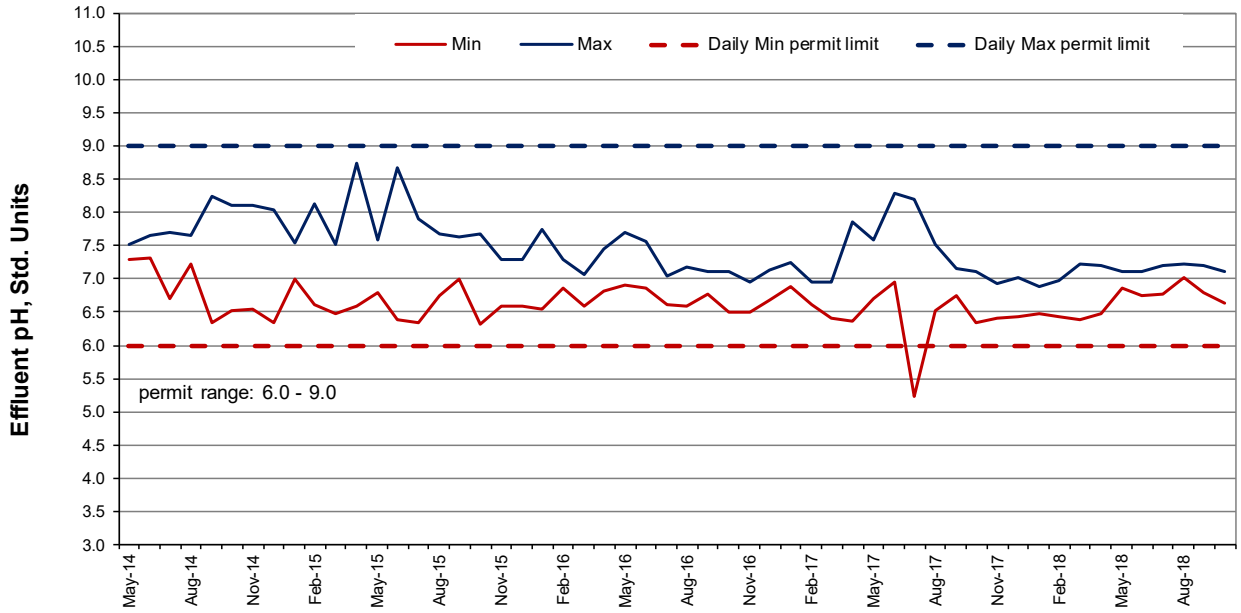
City of Snoqualmie WRF Influent – TSS



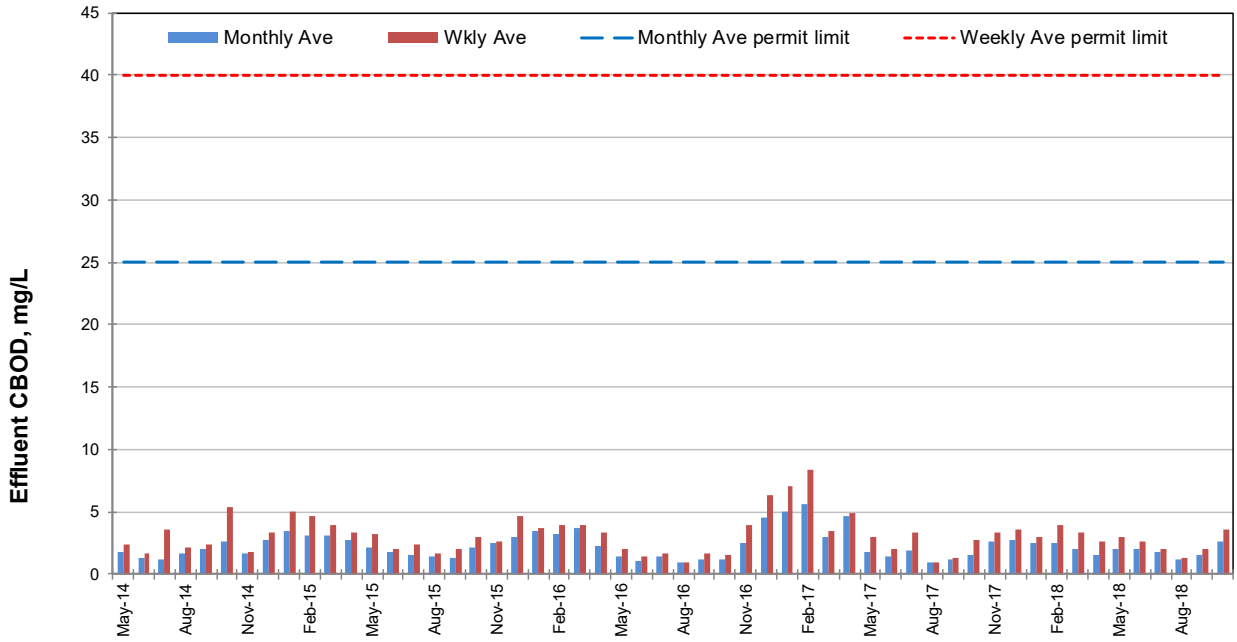


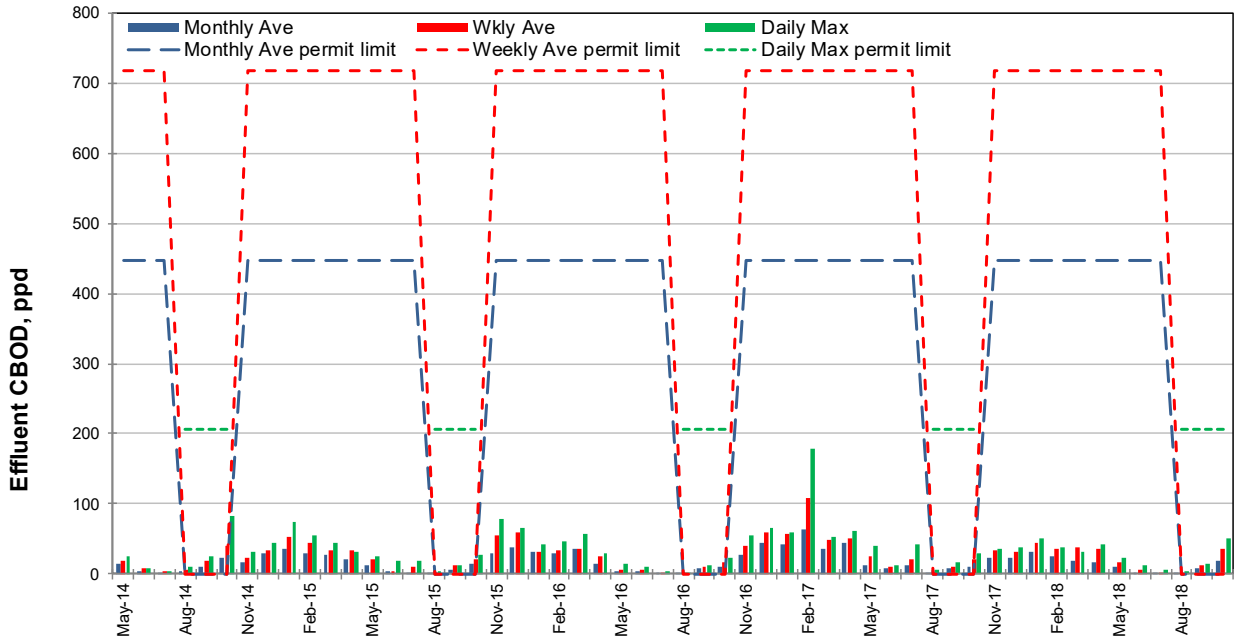
City of Snoqualmie WRF Effluent – Flow and pH



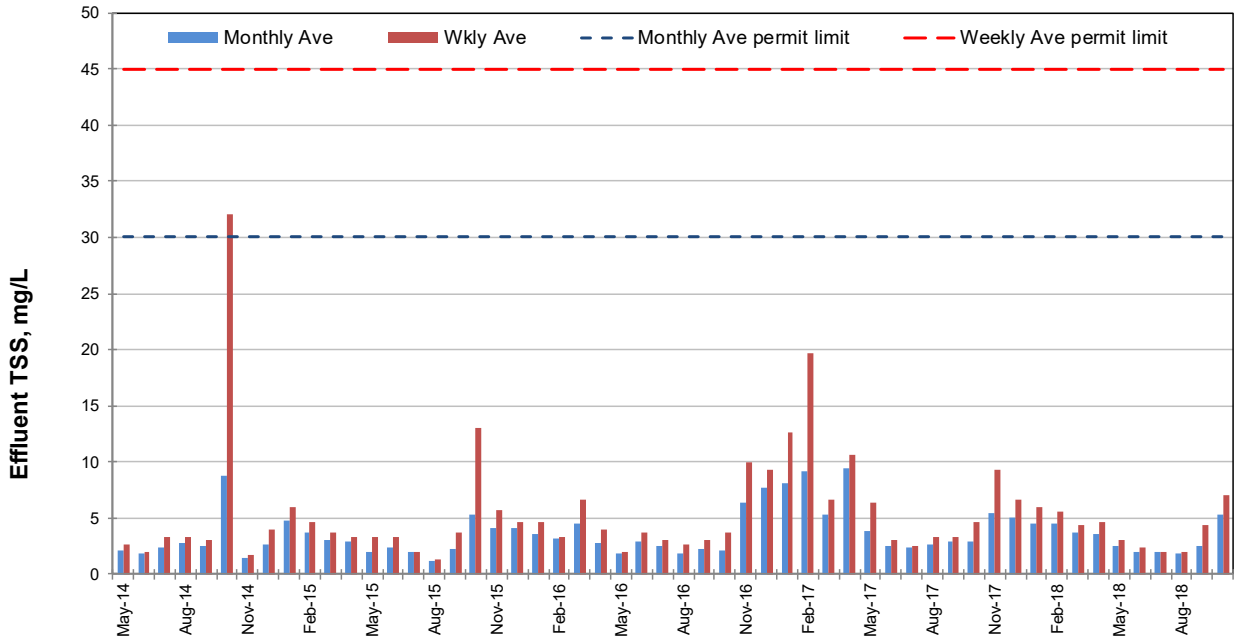


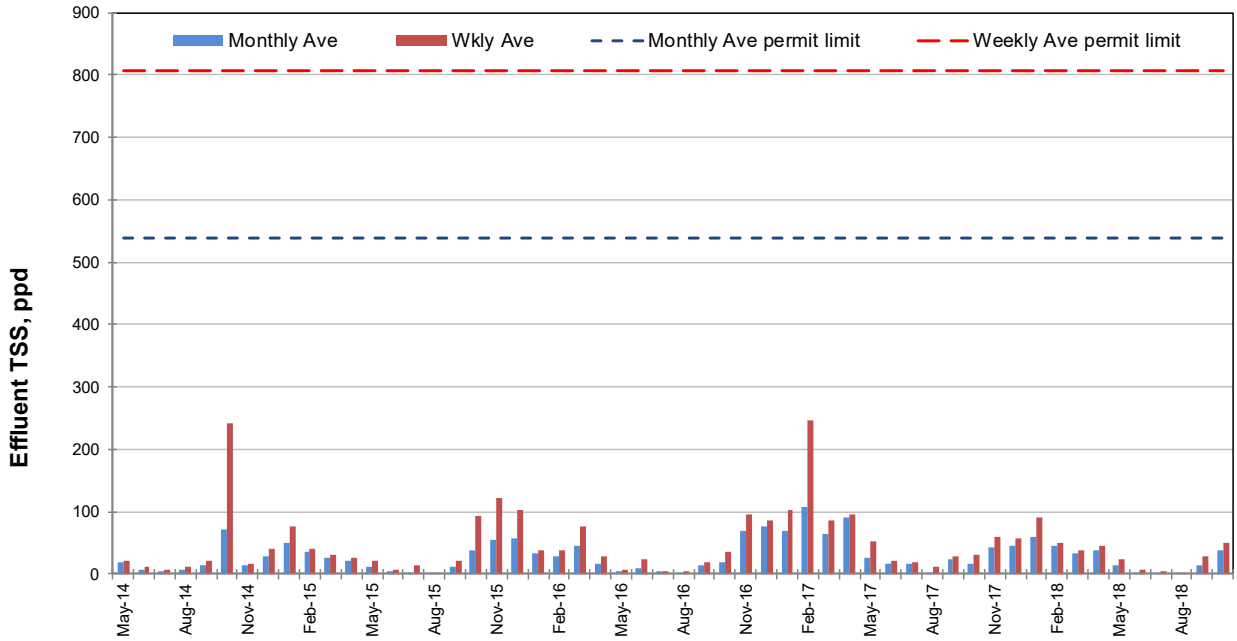
City of Snoqualmie WRF Effluent – CBOD



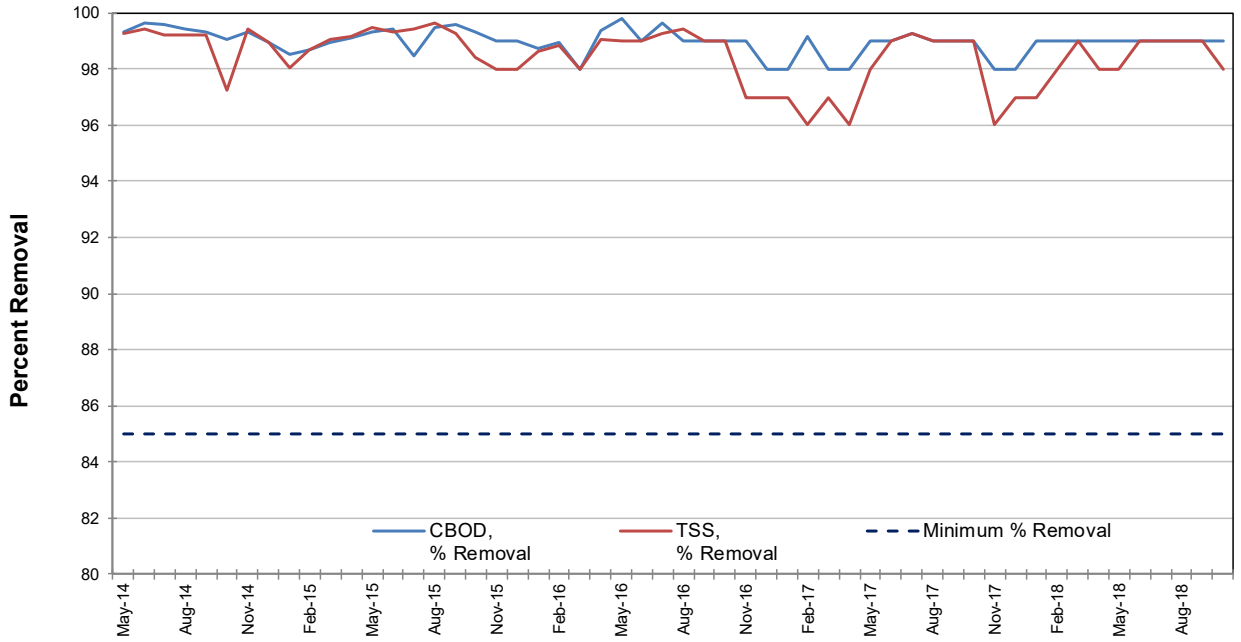


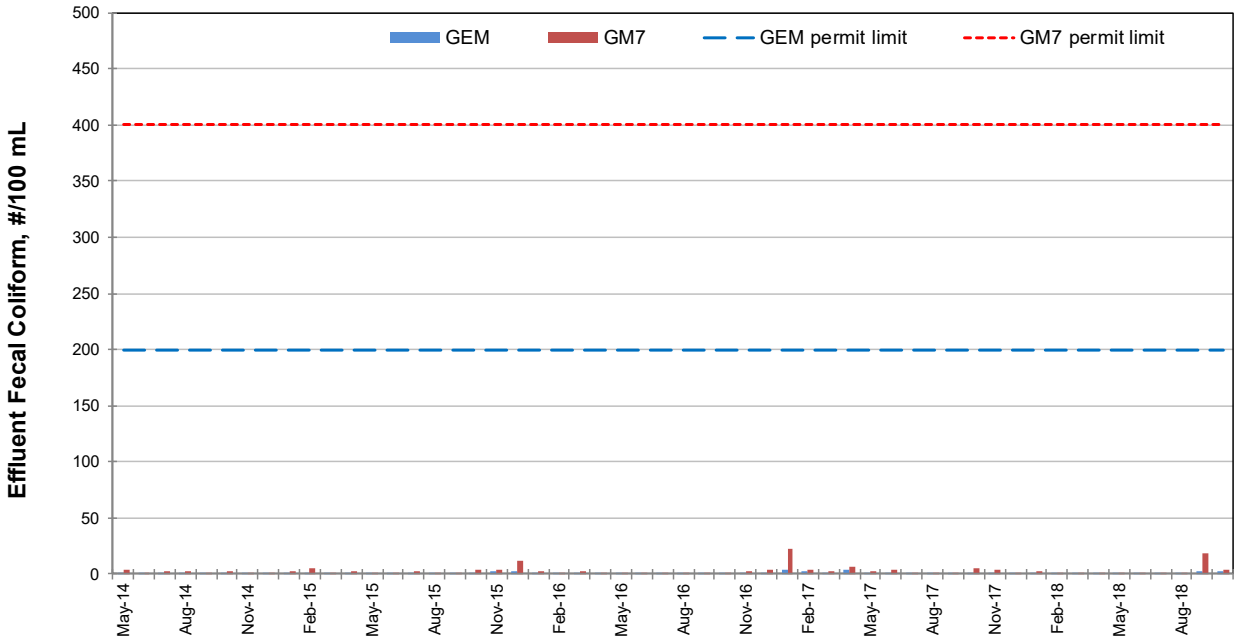
City of Snoqualmie WRF Effluent – TSS



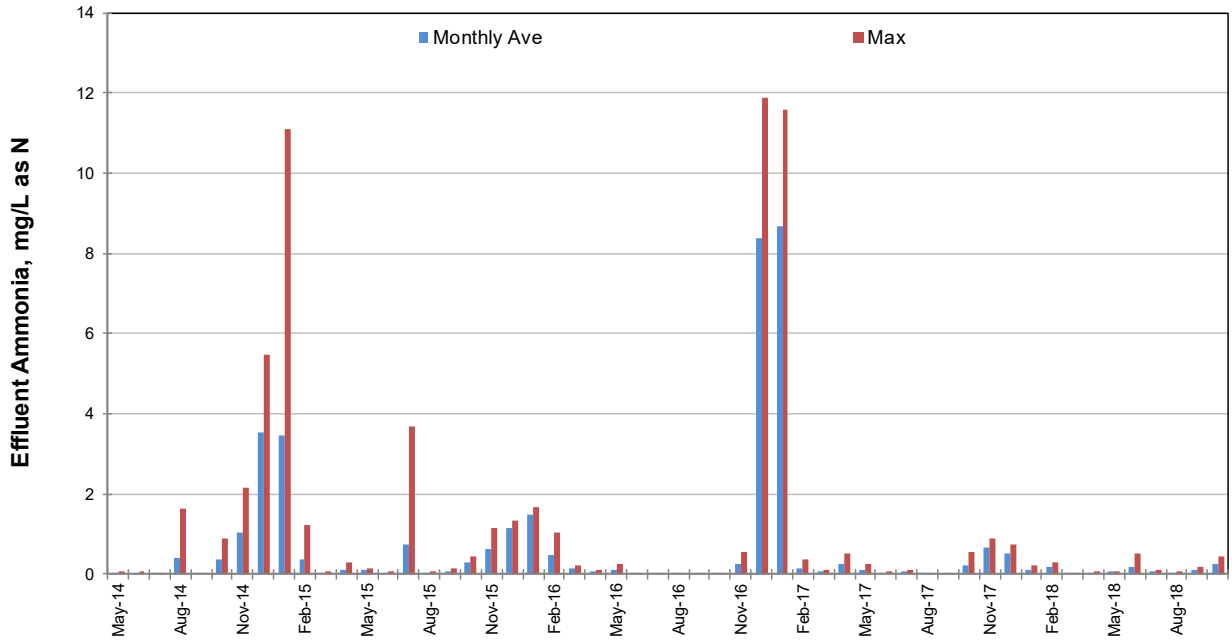


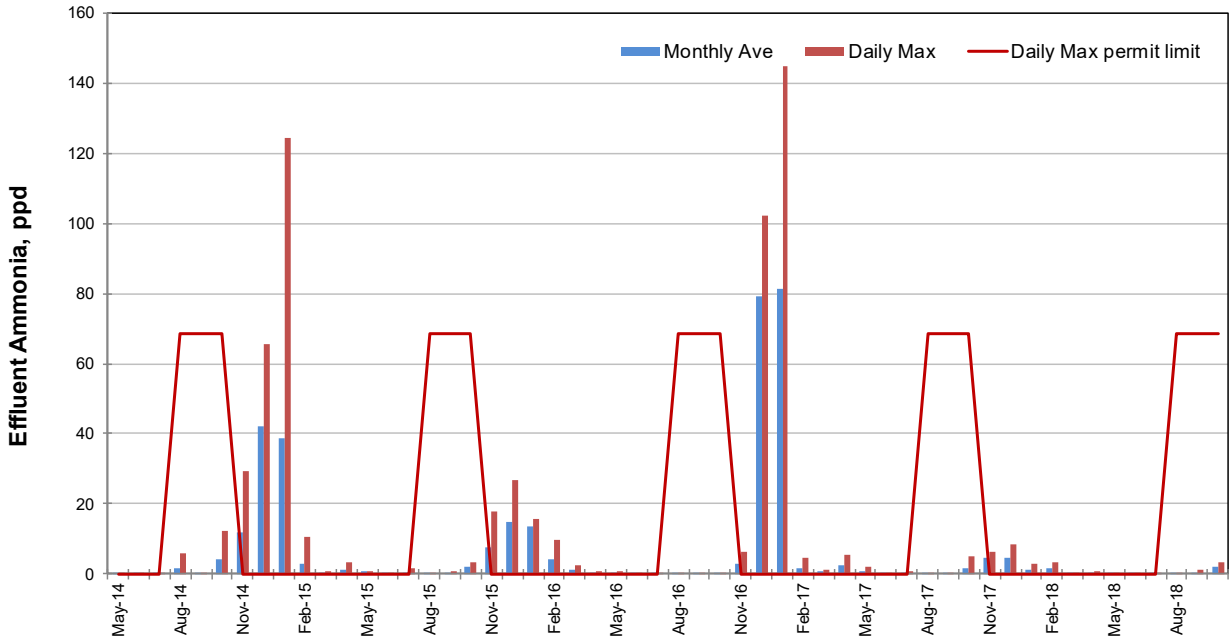
City of Snoqualmie WRF – CBOD & TSS % Removal and Effluent Fecal Coliform



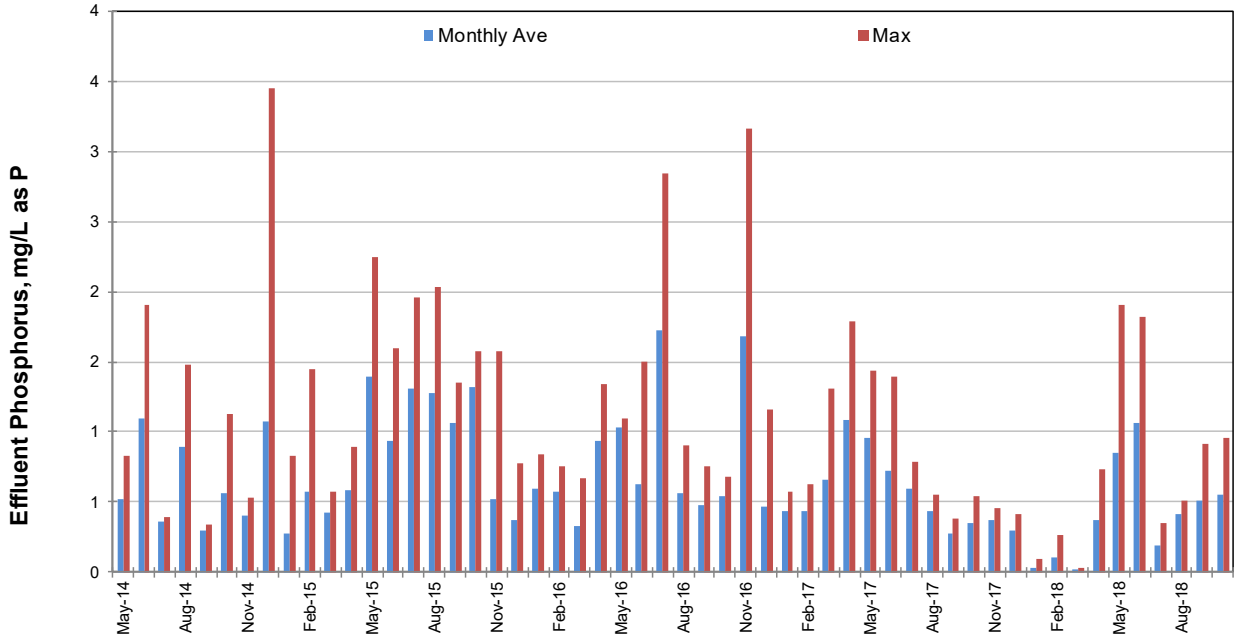


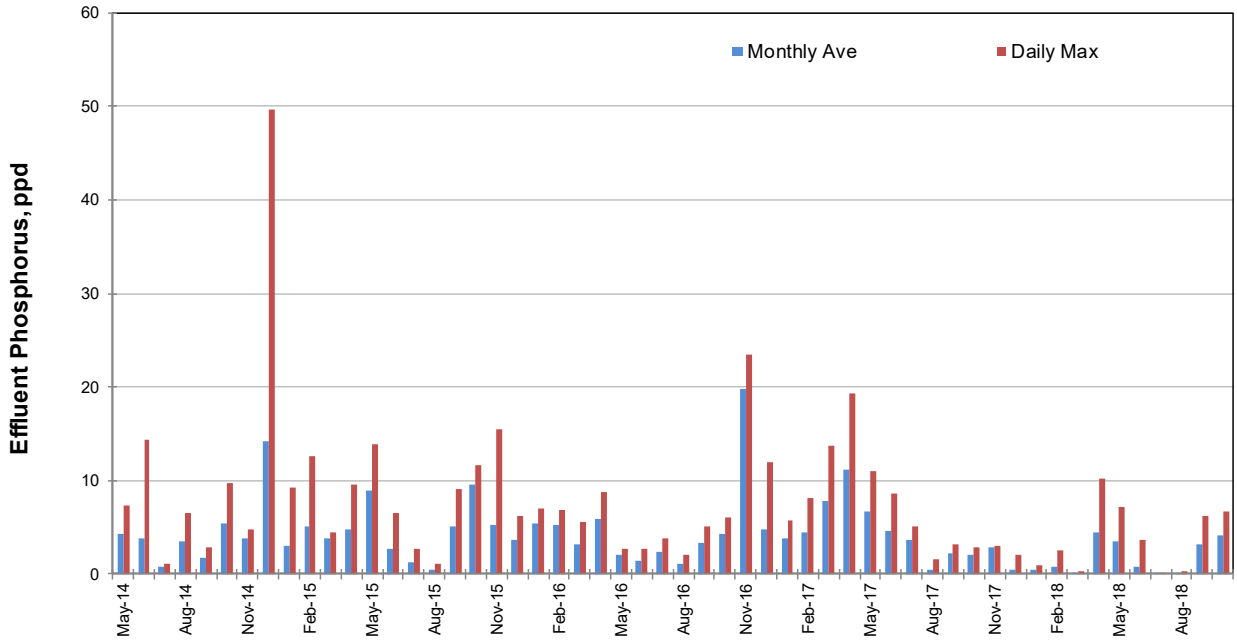
City of Snoqualmie WRF Effluent – Ammonia



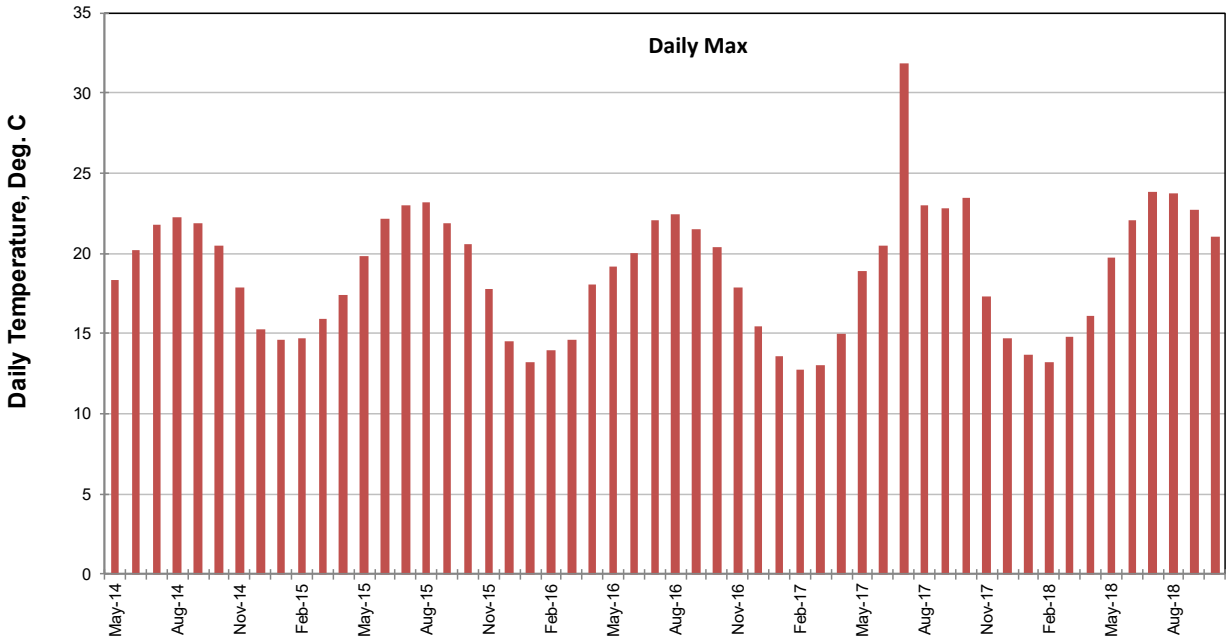


City of Snoqualmie WRF Effluent – Phosphorus





City of Snoqualmie WRF Effluent – Temperature



WET Test Results Summary for City of Snoqualmie WWTWRF

Scheduled	Test Code	Collected	Start Date	Duration	Organism	Endpoint	NOEC	LOEC	PMSD	Effluent Survival (100%)	Met Performance Standard?
2017 January	JAMM0141	1/17/2017	1/18/2017	Acute	*Ceriodaphnia dubia*	48-Hour Survival	100%	>100	n/a	100.0%	**Yes**
					Water Flea						
2017 January	JAMM0142	1/17/2017	1/18/2017	Acute	*pimephales promelas*	96-Hour Survival	50%	100%	4.9%	95.0%	**Yes**
					Fathead Minnow						
2017 April	JAMM0143	4/24/2017	4/25/2017	Chronic	*Ceriodaphnia dubia*	7-Day Survival	100%	>100%	n/a	N/A	**Yes**
					Water Flea	7-Day Reproduction	100%	>100%	16.80%		
2017 April	JAMM0144	4/24/2017	4/25/2017	Chronic	*pimephales promelas*	7-Day Survival	100%	>100%	5.6%	N/A	**Yes**
					Fathead Minnow	7-Day Growth	100%	>100%	9.26%		
2017 July	CDUD010	7/10/2017	7/11/2017	Acute	*Ceriodaphnia dubia*	48-Hour Survival	100%	>100%	n/a	100.0%	**Yes**
					Water Flea						
2017 July	CDUD011	7/10/2017	7/11/2017	Acute	*pimephales promelas*	96-Hour Survival	100%	>100%	12.0%	100.0%	**Yes**
					Fathead Minnow						
2017 October	CDUD071	10/3/2017	10/2/2017	Chronic	*Ceriodaphnia dubia*	7-Day Survival	100%	>100%	n/a	N/A	**Yes**
					Water Flea	7-Day Reproduction	100%	>100%	38.9%		
2017 October	CDUD072	10/3/2017	10/2/2017	Chronic	*pimephales promelas*	7-Day Survival	100%	>100%	16.0%	N/A	**Yes**
					Fathead Minnow	7-Day Growth	100%	>100%	11.0%		

Appendix G--Response to Comments

Ecology received three sets of comments on the draft NPDES permit and fact sheet for the Snoqualmie WRF during the public comment period that ran between January 24, 2020, and February 24, 2020. Ms. Peggy Shepard (via email on 2/20/2020 and 2/23/2020), the Snoqualmie Indian Tribe (Tribe) (via email on 2/24/2020), and the City of Snoqualmie (via email on 2/24/2020) submitted substantive comments. This appendix summarizes the comments received from each commenter and documents Ecology's responses. Due to the length of some of the comments, Ecology has not included the complete text of each comment. However, Ecology will preserve the complete set of comments as part of the official permit record.

Comments from Ms. Peggy Shepard

Comments received from Ms. Shepard on 2/20/2020 exclusively discussed concerns with activities of Girard Resources. While Girard Resources is a regulated industrial discharger to the Snoqualmie WRF, the concerns expressed in the comments were outside of the scope of draft NPDES permit for the Snoqualmie WRF and are largely issues for the local jurisdiction. Therefore, Ecology will not include responses to questions raised in that email.

Ms. Shepard's comments received on 2/23/2020 included a request for a public hearing on the proposed NPDES permit for the Snoqualmie WRF. Ecology contacted Ms. Shepard directly and explained to her that public hearings are intended to gather input and relevant information on the conditions of a specific permit. Ecology generally schedules public hearings for permit renewals when there is reason to believe that a hearing would be an appropriate forum to gather public input on the draft permit. Since Ecology only received a hearing request from Ms. Shepard and many of the concerns she identified were outside the scope of the draft permit, we declined to schedule a hearing.

Ms. Shepard offered the following additional comments that are relevant to the draft permit for the Snoqualmie WRF:

Shepard Comment #1 – Identify pretreatment facilities and summarize information in required pretreatment reports.

Please incorporate into all of the permit documents the names as known to the Department of Ecology, addresses and permit numbers of the entities referenced in this statement: "The City of Snoqualmie WRF also receives flows from two industrial discharges that require pretreatment permits from Ecology." Please incorporate references in all permit documents to a website where the following documents can be found by the public:

- Routine identification and reporting of industrial users
- Requirements for performing an industrial user survey

Ecology Response: *The fact sheet statement identified in this comment erroneously identifies the number of industrial facilities permitted by Ecology to discharge process wastewater to the Snoqualmie WRF. Ecology has issued three pretreatment permits for discharges to the Snoqualmie WRF. The following table identifies those facilities, their pretreatment permit number, process type and authorized discharge volume. Copies of each facility's permit are available through Ecology's PARIS permitting database: https://apps.ecology.wa.gov/paris/PermitSearch.aspx.*

Name	State Waste Discharge Permit #	Industrial Process	Categorical Pretreatment Standards	Permitted Process Wastewater Flow (gallons per day)
Girard Resources & Recycling Snoqualmie	ST0045516	Concrete Solids Processing	Non-Categorical	50,000
MicroConnex Corporation	ST0501298	Circuit Board Printing	40 CFR 433.17 (Metal Finishing)	9,200
Technical Glass Products, Inc.	ST0045534	Glass Finishing	40 CFR 433.17 (Metal Finishing)	5,000
Total				**64,200**

The two pretreatment reports identified in this comment are future submittal requirements in the permit for the Snoqualmie WRF. Copies of the submittals will also be available in the PARIS database after the City submits them.

Shepard Comment #2 – Facility Address

The address for the Snoqualmie WRF shown in the draft permit and fact sheet, 38190 Stearns Road, is not listed in King County's iMap system. The permit should list addresses that are recognized by the King County Assessor's Office.

Ecology Response: *Ecology relies on permittees to provide accurate information in their permit applications. The facility location address listed in the draft permit and fact sheet are accurate according to the application submitted by the City of Snoqualmie. It is also consistent with the address listed in all previous permits for the Snoqualmie WRF. If this address is not correct, the City must submit a revised application to report the correction.*

Shepard Comment #3 – NPDES Stormwater Permit

The comment asks why the Snoqualmie WRF was able receive an exemption from coverage under the Industrial General Stormwater Permit while Girard Resources' operation at the same site was required to gain coverage under the general permit.

Ecology Response: *This comment topic is outside the scope of the draft individual NPDES permit for the Snoqualmie WRF. Information related to the Industrial General Stormwater Permit is available on Ecology's website: https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Stormwater-general-permits/Industrial-stormwater-permit. Decisions related to the industrial general stormwater permit do not influence decisions related to this individual permit.*

Shepard Comment #4 – Top contributors and industrial authorization requests

The comment requests that the permit documents account for the top contributors to the Snoqualmie WRF, their discharge volume and proportion of total, and "any significant observations". The comment also asks for an accounting of industrial categories and the reporting requirements for each authorization. It also goes on to require specific and detailed information about Girard Resources and Recycling.

Ecology Response: *Please refer to Ecology's response to Shepard comment #1 for a summary of industrial facilities that Ecology permits for discharges to the Snoqualmie WRF. The summary table in that response includes much of the information requested in this comment. Ecology must note, however, that this table does not represent all users of the City's sewer system. It only lists those industrial users that are required to secure a pretreatment permit from Ecology under state and*

federal regulations. Many large sewer users, such as the Snoqualmie Valley Hospital, Snoqualmie Casino, and Echo Glen Children's Center, are not required to receive a permit from Ecology to discharge into the City's system. It is up to the City's discretion to track information about flow and waste loading from these facilities. Furthermore, flow information listed in the response to Shepard comment #1 represents approved maximum flow rates. Actual flow rates from each facility may be much lower. Please refer to the records in Ecology's PARIS database for each of the individual pretreatment permits listed in that table for actual discharge flows, pollutant loadings, and any reported violations.

The requests in this comment specific to the Girard Resources facility are beyond the scope and authority of the draft permit for the Snoqualmie WRF.

Shepard Comment # 5 – Two Permits for two entities at one address

How does Ecology separate permit requirements between the City of Snoqualmie and Girard since they occupy the same address? Please include the certification requirement for operations and who each entity has on staff that is qualified to run each entity and their certification.

Ecology Response: *It is not uncommon for Ecology to issue multiple permits to different individuals or entities that may share a common site location. This draft permit authorizes the City of Snoqualmie to discharge treated domestic wastewater to the Snoqualmie River and to produce Class A reclaimed water. It covers wastewater treatment and water reclamation activities at the facility described in the permit and fact sheet as well as certain activities within the City of Snoqualmie more broadly. The permit and fact sheet do not regulate activities beyond those described or identified in the documents. Activities related to the Girard Resources facility are regulated by a separate state waste discharge permit and are outside of the scope of the permit for the Snoqualmie WRF.*

Shepard Comment #6 – Suspected contamination at the Weyerhaeuser Mill site

Please incorporate in the permit the current use of Snoqualmie WRF by the Snoqualmie Mill site, and projected use; what are the testing requirements for this site's concern for contamination? Will this site be required to have a permit? The site is zoned for industrial use.

Ecology Response: *The draft fact sheet identifies on page 9 under the header "Collection System Status" that the Snoqualmie WRF receives flow from a small private lift station at the Weyerhaeuser Mill site. Ecology does not currently permit the discharge of industrial process wastewater from the site. Cleanup activities at this site are regulated by Ecology's Toxic Cleanup Program under the Model Toxics Control Act. If cleanup activities at the site include a request to discharge to the Snoqualmie WRF, Ecology will evaluate the request to determine whether the discharge will require a pretreatment permit. At present, we cannot speculate on potential permitting requirements since we have not received any requests to discharge contaminated water to the Snoqualmie WRF.*

Ecology cannot place speculative information in the draft permit or fact sheet related to the "projected use" of the former mill site as a site zoned for industrial use. This topic is generally beyond the scope of the draft permit for the Snoqualmie WRF. However, Special Condition S6 of the permit requires the City to work with Ecology in issuing pretreatment permits to qualifying industrial facilities within the Snoqualmie WRF service area. This would include any qualifying industrial facility that may ultimately become established in the mill site area.

Shepard Comment #7 – Reclaimed water release to Eagle Lake

Please provide a requirement to reference in the permit a future document - a plan and engineering reports detailing how the reclaimed water for future customers will be conveyed. Currently Eagle Lake (golf course) receives reclaimed water, is there a plan detailing the same for Eagle Lake? Does the golf course have / need a permit to receive the reclaimed water?

Ecology Response: *Ecology added reclaimed water condition R8 to the permit to require the City to submit appropriate engineering documents for improvements to the reclaimed water conveyance system. The improvements are necessary to ensure that water distributed to each customer complies with the requirements of the Reclaimed Water Rule (WAC 173-219) and with the reclaimed water conditions in the permit. With respect to Eagle Lake, Ecology recognizes this water body as a constructed impoundment. It is generally a recreational impoundment that serves as a storage reservoir for reclaimed water. The draft permit authorizes the conveyance of reclaimed water to this storage reservoir, as allowed by Reclaimed Water Rule.*

Shepard Comment #8 – Reclaimed water use by golf course

Please provide information in the permit regarding how much water is used by the golf course (Eagle Lake) and how the volume was determined (water meter, or calculation – and what parameters were used for the calculation).

Ecology Response: *The reclaimed water use agreement for the Snoqualmie Ridge Golf Course, as presented in the reclaimed water permit application package, identifies a maximum allowable reclaimed water use of 0.85 MGD. Actual historical usage was not reported in the application and that data is not available to Ecology. The annual summary report required by reclaimed water condition R3.B of the draft permit requires the City to report reclaimed water production and distribution statistics in the future. This information includes the annual volume of water supplied to each user.*

Additional comments not related to the draft permit or fact sheet:

Ms. Shepard also provided comments under the following topic headers:

- Account for observations that are a concern to the environment by industrial sources.
- Girard's facility is growing
- Borst Lake/Mill Pond

The comments in these topic areas are outside of the scope of the draft permit and fact sheet for the Snoqualmie WRF. Therefore, we offer no response to these comments.

<u>Comments from the Snoqualmie Indian Tribe</u>

The comment letter from the Snoqualmie Indian Tribe included an opening statement to describe the significance of the Snoqualmie Falls and surrounding lands to the Tribe. Ecology includes the complete statement as Comment #1 for accuracy.

Tribe Opening Statement and Comment #1 – Significance of Snoqualmie Falls and Surrounding Lands

Snoqualmie Falls remains central to the Tribe's creation story and religious practice. The Tribe believes that the mist generated by Snoqualmie Falls connects the earth to the heavens and that a powerful water spirit lives in the plunge pool below Snoqualmie Falls. In further recognition of the

importance of Snoqualmie Falls, Snoqualmie Falls was designated as a TCP on the National Register of Historic Places (NRHP) in 2009.

The Snoqualmie Falls TCP was designated pursuant to the submission of the NRHP Registration Form (Registration Form). The Registration Form draws from numerous studies documenting the cultural kinship, ecological, religious and even commercial significance of Snoqualmie Falls to the Snoqualmie people. In the following ways, the Registration Form confirms that Snoqualmie Falls and the lands surrounding it, including the Project site, are sacred sites of the Snoqualmie people.

The Registration Form describes the continuing significance of the Falls to Snoqualmie tribal members: "In a recent survey of contemporary Snoqualmie tribal members (Tollefson 1991), a majority of respondents indicated that the Falls continues to be an important cultural site for the Snoqualmie." NRHP Reg. Form, Section 8 at 5. Further, the NRHP Registration Form discusses the Snoqualmie villages historically located above the Falls: "When the Point Elliot treaty was signed in 1855, the Upper Snoqualmie band occupied multi-family houses on the prairies above Snoqualmie Falls". It also describes the distinct diets, kinship ties, and trade characterizing the cultures of the Upper and Lower Bands of the Snoqualmie Tribe. *Id.* According to the Registration Form, Snoqualmie Falls functioned as the critical link between the Upper and Lower Bands. For example, each Band shared their subsistence foods with one another—game from the prairie above the Falls in exchange for salmon and other coastal foods from below the Falls. Land above the Falls also plays a central role in the Tribe's creation story which lies at the foundation of the Tribe's existence. *Id.* at 2-4.

The cultural and religious significance of Snoqualmie Falls and the lands above it was documented even prior to the nomination of the Falls as a TCP. In 1996, a Cultural Resources Mitigation and Management Plan was submitted on behalf of Puget Sound Power and Light Company for the relicensing of the hydroelectric dam at Snoqualmie Falls, FERC No. 2493 (Cultural Plan). The Cultural Plan similarly conveys the cultural and religious significance of Snoqualmie Falls and surrounding lands. Further, the Plan describes the Tribe's belief that their religious practices would be diminished by development in the vicinity of the Falls. In relevant part, the Cultural Plan states:

Snoqualmie representatives also wish to keep the entire Falls area in as natural state as possible by avoiding any additional construction and recreation development. They are concerned about archaeological sites, including burials, that their oral tradition holds are located in the vicinity of the Falls, and they are also concerned about the cumulative effects of overall development in the vicinity of the Falls.

Comment: The Tribe has reviewed the draft NPDES permit and Fact Sheet through this unique lens. In our review of the draft permit and Fact Sheet, the Tribe has determined that these documents neglect to include critical contextual information about how the City's treated water outfall into the Snoqualmie River is positioned less than 1500 feet upstream from the TCP boundary, and that the chronic mixing zone from this outfall approaches to within 1000 feet of the TCP. The Tribe requests that the following be included in the NPDES documents: Snoqualmie Falls' status as a Federal TCP; the Snoqualmie Falls TCP's relevance to the Snoqualmie Tribe; the location of the City's treated water outfall and said outfall's corresponding mixing zone's location just upstream of the Falls TCP; and its corresponding potential to negatively affect the cultural and religious importance of Snoqualmie Falls.

Ecology's response*: Ecology appreciates the cultural and religious significance of the Snoqualmie Falls to the people of the Snoqualmie Indian Tribe. We agree that the fact sheet for the Snoqualmie*

WRF permit should discuss these connections to add context to the permitting decisions. To this end, Ecology has made the following changes to the fact sheet:

- *We have added a paragraph to the "History" portion of the facility background discussion (page 9) that identifies the designation of the area as a "Traditional Cultural Property"; the reasons for the designation; and identifies that the Snoqualmie WRF discharges in close proximity to this area.*
- *We have modified the "Description of the receiving water" section (page 14) to add in the context that the Snoqualmie WRF outfall is located upstream of the designated traditional cultural property area.*

We believe that including this information helps to support the permitting decisions documented in the rest of the fact sheet.

Tribe Comment # 2 – System inflow and infiltration (I&I): The comment notes that page 10 of the fact sheet identifies that "older portions of the collection system in the historic Snoqualmie City core has I&I rates approximately 14 times higher than newer section in the Snoqualmie Ridge area." The Tribe expressed concern that this could jeopardize resources and believes that the City should provide more information about plans to locate and fix the problems in historic Snoqualmie.

Ecology's response*: While we agree that the 2012 study cited in the fact sheet suggests localized problem areas, the study did not identify that these issues contribute to overall collection system or treatment facility problems. The City does not have a history of sanitary sewer overflows or treatment plant disruptions attributed to this. Ecology does not generally require I&I corrections as a condition of NPDES permits unless the Permittee has a documented history of I&I contributing to environmental harm. However, given the conditions documented in the 2012 study, special condition S4.E of the permit requires the City to conduct a new I&I evaluation. This condition also requires the City to take corrective actions if the study shows that I&I has increased from previous studies.*

We encourage the City to identify and correct collection system deficiencies that allow for inflow or infiltration as part of their comprehensive sewer system preventive maintenance program. However, decisions related to prioritizing the repair or rehabilitation of specific portions of the collection system are left to the City as part of their overall comprehensive sewer planning efforts.

Tribe Comment # 3 – Impairment analysis: The Tribe noted that the original text on page 13 in the section on "Water Rights Protection" appeared to omit the word "not" in the sentence: "Therefore, the production of reclaimed water will cause water rights impairment."

Ecology's response*: Ecology appreciates the Tribe pointing out the typographical error. This section was revised and no longer contains this sentence.*

Tribe Comment # 4 – Biosolids disposal: The Tribe noted that the final paragraph of the "Solid Waste/Residual Solids" discussion on page 14 of the fact sheet states that the City has permission to dispose of biosolids that do not meet Class B standards until November 30, 2019. The comment requested an undated status since this date has passed. The Tribe also inquired whether the status is permanent or temporary.

Ecology's response*: Ecology revised the fact sheet and removed this paragraph. The revision identifies that the City now transports Class B biosolids to a beneficial use facility.*

Tribe Comment # 5a – Violations and permit triggers of NPDES permit: The format of the "Date" column in tables 6 and 7 of the fact sheet is ambiguous and would benefit from a clearer format, i.e. "June 2017" with column heading "Month & Year."

Ecology's response*: Ecology reformatted the tables.*

Tribe Comment # 5b: The Tribe also suggested that including an explanation of the violations and information about resolutions would strengthen confidence in the completeness of the document.

Ecology's response*: Comment noted. In general, Ecology will include a discussion in the fact sheet when permit violations warrant an enforcement action or lead to placement of a compliance schedule in a permit to correct deficiencies. Ecology did not issue any enforcement actions during the past permit term and the violations did not indicate a need for a compliance schedule.*

Tribe Comments # 6 – Designated uses and surface water quality criteria: The Tribe identified the discussion related to designated uses and surface water quality criteria on pages 24-26 as a possible area to include an explanation of the relevance of the Snoqualmie Falls Traditional Cultural Property designation, as discussed in comment #1.

Ecology's response*: The identified fact sheet section relies on the legal definition of "designated uses" contained in the state's Surface Water Quality Standards, WAC 173-201A. The numeric and narrative criteria listed in this section are also taken from the Surface Water Quality Standards as requirements necessary to protect the identified designated uses listed in the standards. While Ecology appreciates the significance of the Snoqualmie Falls to the Tribe and recognizes the designation of the area as a Traditional Cultural Property, we prefer to keep the wording in this section as it was originally written. As noted in Tribe comment #1, we have included discussions related to the significance of Snoqualmie Falls to the Tribe in other areas of the fact sheet.*

Tribe Comment # 7 – Approximate mixing zones: Figure 2 should depict the location of the Snoqualmie Falls Traditional Cultural Property.

Ecology's response*: Ecology expanded Figure 2 to show the Snoqualmie Falls in relation to the outfall and mixing zone. We note, however, that this image shows the approximate outfall location and mixing zone area. Ecology provides this image for illustration purposes only.*

Tribe Comment # 8a – Calculation of dissolved oxygen at chronic mixing zone: Appendix D of the fact sheet includes a table titled "Calculation of Dissolved Oxygen at Chronic Mixing Zone" on page 67. This table shows a conclusion that the discharge has a reasonable potential to violate water quality standards for dissolved oxygen at design flows. The comment asks for Ecology to describe what steps will be taken to address this issue.

Ecology's response*: The table originally included in Appendix D of the fact sheet contained numerous errors. It did not use accurate ambient and effluent dissolved oxygen values and inappropriately assumed a high immediate dissolved oxygen demand (IDOD) of 7 mg/L. Ultimately, Ecology removed this table because it was not relevant for our permit decision. The simple mixing analysis presented by that table is appropriate for an initial screening of potential dissolved oxygen impacts by a discharge to a receiving water that does not have documented impairments. This type of screening is not necessary in this case since a TMDL is already in place to manage a documented dissolved oxygen impairment in the Snoqualmie River. Compliance with the permit limits derived from the wasteload allocations in the TMDL is sufficient to protect freshwater quality with respect to dissolved oxygen.*

Comment # 8b: The Fact Sheet uses an effluent dissolved oxygen (DO) concentration of 8.2 mg/L. Is this reflective of reality? Elsewhere the documents say that the DO requirement is merely for 0.2 mg/l in the effluent, which would appear to cause a violation at design flow.

Ecology's response*: The City reported a maximum effluent dissolved oxygen concentration of 8.2 mg/L in their NPDES permit renewal application. Ecology considers this a realistic value. The previous permit required the City to test for dissolved oxygen in effluent samples collected on a quarterly basis in 2017. The results from this sampling ranged from 6.4 mg/L to 8.2 mg/L. In addition, the permit required routine monitoring of dissolved oxygen in reclaimed water produced at the facility.*

It is not clear what the comment "elsewhere the documents say that the DO requirement is merely 0.2 mg/L in the effluent" refers to. Ecology assumes this may reference the reclaimed water minimum dissolved oxygen limit of 0.2 mg/L. As discussed on page 38 of the fact sheet, Ecology established this limit to demonstrate that reclaimed water complies with the performance standard of dissolved oxygen being "measurably present". This standard does not apply to effluent discharged to the Snoqualmie River and should not be interpreted as establishing an effluent standard that is protective of surface water quality.

Comment # 8c: The documents could more clearly indicate the intended and actual relative distribution of effluent between the 2 outfalls, which would help improve understanding of how the discharge may or may not result in water quality violations in practice.

Ecology's response*: The permit does not mandate a specific distribution of effluent between the outfall to the Snoqualmie River and the distribution for use as reclaimed water. The permit authorizes the Snoqualmie WRF to discharge all effluent to the Snoqualmie River up to the treatment plant's design capacity of 2.15 MGD. While the City may divert some or all of that flow (up to 1.56 MGD) to reclaimed water production, our analysis of potential water quality impacts must assume a worst case scenario that all of the flow discharges to the river.*

Tribe Comment # 9 – Production monitoring and product water distribution: The comment notes that the data tables presented in Appendix F do not clearly describe the parts of the system the tables represent. It also notes that the tables on pages 73 and 74 do not include important data for several months, namely dissolved oxygen.

Ecology's response*: Ecology has reformatted the table headings to add clarity. The tables on pages 73 and 74 provide data collected through reclaimed water production and distribution monitoring required by Reclaimed Water Condition R2 of the previous permit. These data do not present the results of any monitoring required of effluent discharged to the Snoqualmie River. The table on page 72 of the draft fact sheet presents data collected through required effluent monitoring.*

Tribe Comment # 10 – Distribution of reclaimed water: This comment pertains to Ecology's response to a comment made by the City of Snoqualmie during a courtesy entity review of the preliminary draft permit and fact sheet. The Tribe's comment asks the City to clarify their reclaimed water customers and requested information about whether the "TPC Ridge Club" will remain a reclaimed water customer or use potable water for irrigation.

Ecology's response*: Ecology cannot answer questions directed at the Permittee when responding to comments on a draft permit. The draft permit included authorization for the City to only distribute class A reclaimed water to The Club at Snoqualmie Ridge Golf Course for irrigation purposes. The City's comments on the public draft of the permit objected to this restriction in their*

distribution and asked Ecology to restore previous authorizations. Ecology has discussed the issue with the City and developed a compliance schedule (reclaimed water condition R8) for them to make system upgrades necessary to ensure the distribution of reclaimed water complies with the reclaimed water rule.

Tribe Comment # 11 – Nutrient waste load allocations: This comment pertains to Ecology's response to a comment made by the City of Snoqualmie during a courtesy entity review of the preliminary draft permit and fact sheet. The Tribe added their concurrence with Ecology's use of waste load allocations from the 1994 Snoqualmie River Dissolved Oxygen TMDL and objected to "any backsliding in water quality related to the City's desire to increase nutrient pollution of Puget Sound by not complying with both daily WLAs and critical average monthly limits".

Ecology's response*: Ecology appreciates the Tribe's support on this matter.*

Tribe Comment # 12 – pH limit: This comment pertains to Ecology's response to a comment made by the City of Snoqualmie during a courtesy entity review of the preliminary draft permit and fact sheet. The Tribe added their concurrence with Ecology for a more stringent lower pH limit of 6.5. The comment also asked why the permit did not include a lower pH limit of 6.68 that Ecology originally calculated during early work on the draft permit.

Ecology's response*: Ecology appreciates the Tribe's support of a lower pH limit of 6.5. However, after completing a comprehensive review of the data and calculations presented in the fact sheet for the draft permit, Ecology discovered significant flaws in the previous analysis of pH in the effluent from the Snoqualmie WRF. The previous analysis used inappropriate ambient data, which led to an incorrect conclusion. We reevaluated the impacts of pH and determined that the lower pH limit of 6.3 that was in the previous permit remains protective of water quality. The final permit retains the previous limit, but also requires additional effluent alkalinity monitoring by the City to improve data quality for future analyses.*

Tribe Comment # 13 – Temperature limit: This comment pertains to Ecology's response to a comment made by the City of Snoqualmie during a courtesy entity review of the preliminary draft permit and fact sheet. The Tribe added their concurrence with Ecology's inclusion of a temperature limit of 24.7°C and objected to any backsliding by increasing the limit to 31.1°C as requested by the City.

Ecology's response*: Ecology appreciates the Tribe's support on this matter.*

Tribe Comment # 14 – Water rights protection: The Tribe requested more explicit discussion of how the City's water reclamation program and practices may affect water rights in the Snoqualmie River. They asked whether increased discharges from the facility to the Snoqualmie River during summer months would make it possible for the river to comply with regulatory instream flow requirements for a longer period. They also inquired whether this would increase access to water by holders of junior water rights or impact mitigation requirements under the City of North Bend's Centennial Well water right. The comment also asks whether irrigation practices in the City would need to change in order to achieve a net benefit to the river system and how the timing of pumping, effluent discharge, and irrigation factor into the analysis.

The Tribe speculated whether cross-jurisdictional opportunities were being missed and expressed support for "increased conservation and creative approaches to water consumption and reclamation" as a strategy to benefit the ecosystem.

Ecology's response*: The City of Snoqualmie's permit renewal authorizes a 1.56 MGD reclaimed*

water production limit. This is consistent with previous authorizations and reflects the City's maximum authorized production level since the permit with reclaimed water authorization was first issued in December 2002. While we recognize the benefits of any practices (irrigation or other) that may reduce consumptive use and possibly increase discharge, these analyses and undertakings are not a requirement for a reclaimed water facility during a permit renewal. This renewal will not modify existing operations or discharge levels into the Snoqualmie River and thus, there are no new anticipated effects on Snoqualmie basin water rights from the permitting decision. This includes both senior and junior water users in the basin.

We applaud the Tribe's interest in and support of using reclaimed water as a tool to achieve net ecological benefit in the basin, as well as encouragement of conservation practices. This permit renewal authorization does not diminish the opportunity for future discussions; however, these are outside the scope of this current permit renewal decision.

Comments from the City of Snoqualmie

City Comment #1 – Legal background: The City of Snoqualmie prefaced their main comments with a section that presented their interpretation of AKART. The preface cites legal rulings to support their interpretation, including: *Puget Soundkeepers Alliance v. Dept. of Ecology* (2000 Court of Appeals, 102 Wn.Ap.783, 793, 9 P.3d 892), *Puget Soundkeepers Alliance v. Dept. of Ecology* (1999 PCHB No. 98-50), and *Washington State Dairy Federation et. al. v. Department of Ecology* (2018 PCHB No. 17-016c). The City's interpretation focuses generally on defining "reasonableness" as a primary controlling factor for establishing permit conditions. It also infers that AKART constrains Ecology's ability to set limits in NPDES permits based on a reasonableness test.

Ecology's Response: *Ecology must comply with the full body of state and federal laws when making permit decisions – AKART does not override other requirements that may be more stringent. Ecology considers AKART as "a technology-based approach to limiting pollutants from wastewater discharges" (Ecology's Permit Writer's Manual, page 84). The permit conditions taken as a whole constitute AKART for the facility. Ecology may impose limits that are more stringent than technology-based limits when necessary to achieve or protect water quality standards (see 40 CFR 122.44(d)).*

City Comment #2 – Draft Permit Temperature Waste Load Allocations

Comment #2a: The comment notes that "Section S1.A" identifies both "average monthly" and "maximum daily" permit limits, with "footnote g" defining maximum daily as "the highest allowable daily discharge". The comment further characterizes the temperature limit of 24.7 degrees Celsius as "the highest allowable daily discharge temperature, averaged over a calendar day".

Ecology Response: *This is not a correct interpretation of the limit. The temperature parameter in table S1.A is listed as "Temperature, Maximum 7-day Running Average". This is a calculated parameter that relies on individual daily temperature readings taken over seven consecutive days. The monitoring schedule in table S2.A.2 provides directions for calculating this value using temperature data collected through continuous temperature monitoring. The permit requires the City to calculate and report this seven-day average each day. Ecology evaluates compliance with the permit limit based on the calculated value.*

Comment #2b: The comment asserts that the proposed temperature limit is "incorrect and technically infeasible, because the City has not been able to demonstrate that it can meet 24.7 degrees C limitation at all of the flow conditions anticipated to occur at the SWRF during the Permit renewal period, including at the design flow condition." The comment alleges that the limit is not "reasonable" and "does not constitute AKART".

Ecology Response: *Ecology disagrees with the City's assertion that this temperature is "infeasible". As required by the 2014 permit for the facility, the City reported more than 2,200 individual values of 7-day average temperature data calculated from daily temperature monitoring conducted between May 1, 2014 and May 31, 2020. At no time did any of the more than 2,200 values approach the limit of 24.7 degrees C. The highest value reported during this period was 23.5 degrees C – more than 1 degree cooler than the temperature limit. Ecology believes past monitoring provides abundant evidence that the SWRF can consistently comply with the temperature limit of 24.7 degrees C.*

Ecology also disagrees with the assertion that it must demonstrate that the limit is "reasonable" or establish that the limit constitutes "AKART" in order to include it in a NPDES permit. As is discussed on page 26 of the fact sheet, past environmental monitoring resulted in the Snoqualmie River being listed as an impaired water body by not meeting approved water quality standards for temperature. A discussion on page 32 of the fact sheet further described the limit of 24.7 degrees C as a "waste load allocation" for the SWRF that was developed to ensure discharges do not contribute to the documented impairment. In issuing NPDES permits, Ecology must apply limits that are more stringent than those that might constitute "AKART" when necessary to protect water quality or as required by a TMDL (see WAC 172-220-130(1)(b)). The fact sheet clearly demonstrates that the maximum 7-day average temperature limit is appropriate and necessary to ensure the discharge complies with applicable water quality standards. If, during the permit term, the SWRF is not able to comply with this effluent limit, Ecology may establish a compliance schedule through enforcement actions to allow for any necessary facility improvements.

Comment #2c: The comment notes that the temperature limit of 24.7 degrees C "appears to have been set based on Ecology's June 2011 Snoqualmie River Basin Temperature Total Maximum Daily Load Water Quality Improvement Report and Implementation Plan". It also characterizes the contents of the report as "including 'load allocations' that 'set limits on allowable heat coming from all areas except WWTPs" and "recommends certain 'waste load allocations' that can be incorporated as conditions in NPDES permits in order to meet state surface water quality requirements" (emphasis added from comment).

Ecology Response: *The temperature limit was set according to the 2011 TMDL study, as described on Page 32 of the fact sheet. However, wasteload allocations constitute one type of water quality-based effluent limitation" (emphasis added). As discussed in the responses to City comments #1 and #2b, WAC 173-220-130 requires Ecology to include water quality-based limits established by TMDLs as enforceable limits in NPDES permits.*

Comment #2d: The comment questions the assumptions and analytical methodologies used to establish the waste load allocations presented in the TMDL report. It asserts that the analysis presented in the report is flawed and, therefore, the waste load allocations are incorrect.

Ecology's response: *The City's comments in this area relate to the development of the waste load allocations in the TMDL and not with Ecology's inclusion of the waste load allocation as a permit*

limit. The permit appropriately applies the waste load allocations in the EPA-approved TMDL report as permit limits, as required by state and federal regulations.

Comment #2e: The City's comments argue that the permit should use Table 28 from the TMDL report as the source of the temperature limit placed in the permit. They point out that this table shows a temperature of 31.1 degrees C would comply with the water quality criterion based on dilution factors calculated for "current flows" of 1.24 MGD. The City also contends that using this value would not constitute "backsliding" because it complies with AKART requirements.

Ecology's Response: *Ecology rejects the City's arguments for the following reasons. First, the TMDL report on page 103 clearly states that Table 27 contains the waste load allocation applicable to the SWRF. That allocation is 24.7 degrees C. The fifth paragraph on page 103 also states that "the remaining text and tables [which includes Table 28] in this section step through the process and data used to calculate these waste load allocations". This statement provides further clarity that data shown in Table 28 is not intended to serve as a permit limit.*

The second reason for Ecology's rejection is that the City's proposed limit of 31.1 degrees C, as shown in Table 28, was calculated based on a flow rate of 1.24 MGD and a corresponding chronic dilution factor of 51.3. These values are not consistent with the flow rate identified in the fact sheet as the "current maximum month flow" or with the updated chronic dilution factor authorized in the permit. Table 4 of the fact sheet shows that the highest average monthly flow reported during the past permit term (2014-2018) was 1.62 MGD. Based on this flow rate, the permit authorizes an allowable chronic dilution factor of 35.5. This means that the City's proposed temperature limit of 31.1 degrees C would have a reasonable potential to violate the incremental warming allowance of the water quality standards under current conditions. The TMDL-based limit placed in the permit will assure that the facility's discharge complies with this standard at all flows up to the facility's design flow.

Finally, 40 CFR 122.44 requires Ecology to place limits in reissued permits that are as stringent as the previous permit (anti-backsliding). The previous permit for the SWRF contained the same TMDL-based temperature limit. Therefore, the reissued permit may not include a less stringent limit. The City's comments have not identified any applicable exception or practical need to allow for a less stringent limit.

City Comment #3 – Draft Permit Ammonia (NH_3) and CBOD Waste Load Allocations: The City's comment argues that Ecology's approach to establishing TMDL-based limits in the permit is not appropriate. They contend that the limits are not "reasonable" and therefore do not constitute "AKART". The comment also compares the limits in the SWRF permit to TMDL-based limits for facilities in different regions of Washington – the Peshastin POTW, based on a 2009 TMDL, and Spokane County's Water Reclamation Facility, based on a 2011 TMDL. The comment suggests that Ecology should use similar limits in the SWRF permit and cites two EPA memos from 2004 and 2006 to support their argument.

Ecology Response: *Ecology used the same method for establishing the TMDL-based limits on CBOD and ammonia in this version of the SWRF permit as it used in the previous permit. Ecology also uses the same method for to establish TMDL-based limits in permits for all other point sources covered by the 1994 Snoqualmie River Total Maximum Daily Load (TMDL) Study. With exception to a 0.3 pound per day increase in the monthly average ammonia limit, the limits in this version of the SWRF permit are identical to those in the 2014 permit version.*

With respect to the claims that the limits do not constitute AKART, the SWRF has been consistently able to comply with these permit limits; thus there is no evidence that they are not "reasonable". Please also see our responses to City comments #1 and #2b. Ecology must set limits in NPDES permits at levels it determines to be protective of water quality and those limits may be more stringent than a technology-based standard.

City's Comment #4 – Reclaimed Water Non-Impairment: The City suggests adding the following to discussions related to water rights impairment on pages 12-13 and page 17 of the fact sheet. The City believes the information is necessary to add context to the fact sheet. The City also suggests adding the same language to reclaimed water condition R4.D of the SWRF permit. Suggested addition:

> The joint Departments of Ecology and Health Reclaimed Water Facilities Manual, Publication No. 15-10-024, known as "the Purple Book," states that the "purpose of the impairment analysis is to evaluate the potential for impairment of existing water rights when a new reclaimed water project is planned." Accordingly, the Purple Book indicates, "the Reclaimed Water Rule, WAC 173-219-090(1), requires that an applicant for a reclaimed water permit demonstrate compliance with RCW 90.46.130 for all new reclaimed water projects and for existing reclaimed water permits when permit modifications that change capacity and/or discharge volume are proposed."

Ecology's Response: *Ecology will not add the suggested language to the permit or fact sheet. The suggested edit inappropriately limits the applicability of RCW 90.46.130 to only new reclaimed water facilities or to existing facilities when they expand operations. The Reclaimed Water Rule explicitly states that water rights protection requirements apply to all facilities. The rule states: "Any person applying to ecology or health for a reclaimed water permit, permit renewal, or permit modification under this chapter must demonstrate compliance with RCW 90.46.130" (WAC 173-219-090(1)). In addition, the rule specifically requires that "permit renewals and modifications must demonstrate compliance with RCW 90.46.130" (WAC 173-219-090(5)).*

After reviewing the draft permit and fact sheet with Ecology's Water Resources Program, we modified both documents to clarify our permit decision. Ecology changed the documents as follows:

- *The "Water rights protection" text on pages 12-13 was changed to more clearly document that the permit renewal continues to authorize the same maximum reclaimed water production capacity as previous permits. The section also states that no new impacts or impairments of existing water rights will result since the SWRF will not increase its maximum reclaimed water production volume.*
- *Section II.F of the fact sheet, "Water rights impairment analysis", was deleted. This section duplicated the "Water rights protection" discussion on pages 12-13 and should not have been included in the draft.*
- *Reclaimed water condition R4.D was revised to clarify that the SWRF must not exceed its reclaimed water production capacity in order to protect water rights. The condition was also edited to clarify the requirement for documenting how the facility will continue to comply with the water rights protection requirements as part of the next permit renewal application.*

City's Comment #4b: The City's comment also expressed concern that Reclaimed Water Condition R4.D of the permit "omits any statement whatsoever concerning Ecology's determination that the SWRF will not cause water rights impairment". They requested that Ecology include a statement in the permit affirming that the distribution of reclaimed water from the SWRF does not impair downstream water rights.

Ecology's Response: *Ecology does not agree that the permit requires a statement declaring a determination of no impairment. The Reclaimed Water Rule states: "Ecology will make the final determination of compliance with RCW 90.46.130 as part of the decision to issue or deny the reclaimed water permit" (WAC 173-210-090(7)). Ecology may only issue a reclaimed water permit once it determines that doing so complies with the requirements of RCW 90.46 and WAC 173-219. Therefore, the act of issuing a reclaimed water permit is sufficient to demonstrate our decision that the regulated production and distribution of reclaimed water complies with applicable laws and regulations. The fact sheet documents the basis for our decision.*

City Comment #5 – Reclaimed Water Distribution and Customers: The City expressed concern that "the draft fact sheet erroneously states that the City has made a determination to cease utilizing reclaimed water to supply the City's municipal irrigation needs". They take exception to a statement on page 12 of the fact sheet that they accurately quote as follows: "In 2019, the City decided to discontinue the transmission of reclaimed water for irrigation of athletic fields at Snoqualmie Community Park, plants in the Snoqualmie Parkway median strip and landscape planters around businesses along Snoqualmie Parkway." The City recommends deleting the "erroneous language" from the fact sheet.

The comment also notes that the cover page of the permit removed "the City of Snoqualmie and related irrigation customers from the approved areas of use for reclaimed water". In addition, it identifies that reclaimed water condition R4 deleted the City of Snoqualmie and related irrigation customers from the approved areas of use for reclaimed water. The City requested restoring authorization for the use of reclaimed water at previously identified customers. To support the request, the City cites requirements related to maintenance of a chlorine residual in reclaimed water distribution systems. They claim that the reclaimed water rule does not require maintenance of a chlorine residual because "the SWRF produces and distributes reclaimed water to the Eagle Lake storage impoundment, whose place of use is 'Snoqualmie Ridge I' generally, and more specifically at the golf course and nearby municipally- and commercially-owned properties". The City argues that requirements of WAC 173-219-370 should not apply to the distribution of water to the municipal and commercial properties since past permits allowed the distribution. They also propose that the City should be given a compliance schedule if changes are necessary.

Ecology Response: *In August 2019, Ecology received a letter from the City's consultant, RH2 Engineering, that we believed represented the City's plans for addressing deficiencies in the reclaimed water distribution system. Prior to receiving the letter, Ecology met with City staff and their consultants to discuss how the City planned to comply with distribution system standards in the Reclaimed Water Rule. We concede, however, that the letter was not sent by the City, nor was it accompanied by a cover letter from the City's mayor or his delegated representatives. Therefore, we should not have accepted the letter as an official representation of the City's intentions.*

As Ecology and Health discussed with the City's staff and consultants in 2019, the City's existing reclaimed water distribution system does not comply with the Reclaimed Water Rule's requirements for storage and distribution systems (WAC 173-219-360). Specifically, the system lacks adequate

cross-connection controls designed to protect public health by preventing the contamination of the Class A reclaimed water produced at the SWRF by lower quality water. Urban stormwater runoff from areas near the golf course flow into Eagle Lake and represents a source of contamination that compromises the quality of the reclaimed water. During the 2019 meeting, Ecology and Health informed City staff that the City must document how it would distribute water to municipal and commercial customers in a manner that complies with the Reclaimed Water Rule.

Ecology acknowledges that previous permits did not contain similar requirements related to cross-connection control. However, all previous permits were issued prior to Ecology adopting the Reclaimed Water Rule. Ecology and Health agreed on the importance of placing robust requirements for cross-connection controls in the rule to ensure public health protection. These requirements are found in WAC 173-219-310. The adopted rule also included a provision that required compliance with all portions of the rule as of the rule's effective date of February 23, 2018. Ecology notified the City of this provision through a letter addressed to Mayor Larson and sent on January 26, 2018. The letter also stated that the City may submit a written request for an extension to comply. Ecology does not have a record of the City submitting an extension request.

Ecology views the following statement in the City's comment letter as a written request for an extension: "…a more reasonable course of action would be for Ecology to provide the City a reasonable compliance schedule, during which the City could explore various alternatives, propose a project to Ecology, and obtain Ecology engineering document and plans and specifications approval". Based on this request, Ecology has included a compliance schedule in the permit (reclaimed water condition R8) to ensure that the City makes necessary improvements in the shortest time possible.

City Comment #6 – DMR QA/QC report: This comment relates to the summary list of permit required submittals on page 5 of the draft permit. This list identified a required monthly submission of a "DMR QA/QC Review Letter". The City requested deletion of this requirement. They noted that the requirement was part of the previous permit and that the City had not experienced any issues submitting monthly reports on time during the past permit term.

Ecology's Response: *The report identified in the summary list of the draft permit did not exist in the body of the draft permit. Ecology had already removed this requirement from the permit, but failed to delete it from the summary. Although Special Condition S3.A.3 requires submission of "QA/QC results" as a component of laboratory reports submitted with DMRs, this pertains only to the compliance testing performed by a contracted outside lab. This is standard permit language that is unrelated to the "QA/QC letter" required in the previous permit. Ecology has deleted the identified entry from the summary table on page 5.*

In addition to the comments documented above, the City of Snoqualmie provided substantive comments on preliminary drafts of the permit and fact sheet during a courtesy review period intended to identify and correct factual errors prior to issuing the drafts for public comment. The following paragraphs summarize responses to the City's comments submitted prior to the public comment period.

City Comment # 7 – Requirement for Infiltration and Inflow Evaluation: The comment asks why the draft permit requires the City to perform this analysis "when the comp plan clearly takes into account how we will deal with the projected flows for instance either by reducing I&I or increase system capacity through upgrades"? The City requested deleting this requirement because the flows and loads are included and projected in the comp plan.

Ecology's Response: *As discussed in the Facility Description section of the fact sheet, the City completed an evaluation of inflow and infiltration (I&I) in November 2012. The evaluation used plant flow, water usage, and rainfall data from 2007 to 2010 to estimate I&I in the system. While the study identified that the older portions of the collection system in the historic Snoqualmie City core has I&I rates approximately 14 times higher than newer section in the Snoqualmie Ridge area, the overall rates of I&I are not above the level EPA considers "excessive". The Snoqualmie WRF presently has sufficient treatment capacity to treat excess flow caused by I&I and the City has not reported any sanitary sewer overflows that can be attributed to I&I.*

However, the City has verbally communicated to Ecology that the 2012 General Sewer Plan is currently being updated and it will present a discussion of the current status of I/I in the collection system. This may meet the permit requirement for I/I evaluation.

City Comment #8 – Reclaimed Water Annual Report: The City's comment states that it is not possible to provide all the requested data because each use location doesn't have a water meter.

Ecology's Response: *This report is designed to gather basic information that the city should have available related to the production, distribution and use of reclaimed water from the Snoqualmie WRF. The City's statement that "each use location doesn't have a water meter" is concerning since it raises question about how the city tracks whether each authorized user is using water consistent with limitations in their use agreements or how the City accurately bills users for the service. The City must ensure that adequate systems are in place to verify compliance with the terms and conditions of the permit. The annual report requires the City to provide data that it should be collecting as a standard practice.*

City Comment #9 – Cross-connection Control Program: The City stated that it is unclear how these requirements are different from local purveyor's cross connection control program. Is this a cross connection control program that is in addition to the City's water system cross connection control program? Please verify.

Ecology's Response: *The cross-connection control program plan discussed in Section R4.C is different from the City's plan for drinking water cross-connection that is required under DOH's Drinking Water Rules (WAC-246-290-490). The drinking water rules outline the requirements for a drinking water purveyor to ensure that the potable water they distribute remains free of potential sources of contamination through cross-connections with lower quality water, such as reclaimed water. Similar to this requirement, the Reclaimed Water Rule requires distributors of reclaimed water to ensure that reclaimed water remains free from potential contamination through cross-connections with lower quality water (WAC 173-219-310). In this context, lower quality water may mean untreated urban stormwater runoff or untreated wastewater. The permit requires the City to develop and implement a cross-connection control program that protects the quality of reclaimed water from contamination. While both programs for drinking water and reclaimed water may rely on similar principles, the goal of the program required by this permit is to protect the quality of reclaimed water at all points from the treatment facility to each use location.*

Errata

Following the public comment period, Ecology changed portions of the permit and fact sheet for the Snoqualmie Water Reclamation Facility. In addition to changes addressed through our responses to public comments documented above, Ecology made the following changes to correct errors.

Permit changes:

1. Due dates for submittals required by the permit were adjusted for consistency with the actual issuance date of the permit.
2. The monitoring frequency for E. Coli listed in condition S2.A.2 (Final wastewater effluent monitoring) was changed from "1/quarter in 2023 and 2024) to "3/week in 2024 only". The footnote for this monitoring (footnote 7) was also changed to specify that the "Permittee must test for E. Coli bacteria using the same grab sample used to test for fecal coliform bacteria". Ecology made these changes to ensure that the monitoring satisfies the goal of establishing a correlation between fecal coliform and E. Coli bacteria.
3. The permit renewal monitoring in condition S2.A.4 was changed from "Once per year" to "Quarterly in 2024" to ensure that the monitoring captures seasonal variability in effluent quality. This quarterly monitoring frequency is consistent with requirements in Snoqualmie's existing permit.
4. References to submitting annual DMRs and a separate DMR with permit renewal monitoring were removed. The quarterly and monthly DMRs previously listed in the draft permit are adequate for reporting the required monitoring.
5. Ecology removed the compliance schedule-related facility improvements necessary to adjust effluent pH that appeared in the draft permit. Ecology determined that the existing facility does not have a reasonable potential to violate the water quality standard for pH when discharging effluent with a pH of 6.3 standard units.
6. The following parameters were removed from the Reclaimed Water Limit Tables in condition R1.A because they are not consistent with the requirements of WAC 173-219 (Reclaimed Water Rule):
    - Coagulant: While the Reclaimed Water Rule requires Class A Reclaimed Water to be "coagulated and filtered", it does not set a performance standard for this parameter. Compliance with this narrative standard is more appropriately addressed through condition R6, Operations and Maintenance.
    - Flow: This parameter is a design constraint that is appropriately addressed through requirements in condition R5, Facility loading.
    - Total Nitrogen: The performance standards in the reclaimed water rule do not place a limit on nitrogen for water produced for irrigation uses.
7. Ecology also removed Total Nitrogen and temperature monitoring from the reclaimed water monitoring schedule in condition R2 as this monitoring is not necessary to demonstrate compliance with a limit or other reclaimed water permit condition.
8. Ecology made several changes to the reclaimed water reporting and recording requirements in condition R3 to conform to current permit writing standards for reclaimed water permits. The changes removed language that either duplicated or conflicted with requirements in condition S3.

9. The text in condition R4, Reclaimed water distribution and use, was changed to clearly identify existing use locations and to allow addition of new uses consistent with the reclaimed water rule. The changes also removed outdated language in condition "R4.B.c, Use and distribution constraints – use area requirements". This text was redundant.
10. Conditions R5.A was added to include the reclaimed water production design capacity of 1.56 MGD, consistent with current permit writing practices. Conditions R5.B, Duty to mitigate, and R5.C, Notification of new or altered sources, were removed since they duplicated requirements in condition S4 of the permit. Likewise, Ecology removed conditions R6.D, Prevention connection of inflow, and R6.E, Wastewater bypass procedures, due to duplication of other requirements of the permit.
11. Ecology added Appendix B to the final permit. This appendix provides a sample of the annual report questionnaire the City will submit to satisfy condition R3.B.

Changes to fact sheet:

1. Updated text in section II.A related to operator certification to discuss requirements for treatment system and distribution operator certification under the Reclaimed Water Rule. This is content that fact sheets for reclaimed water permits must contain, but was not originally included. This change provides background information and does not alter any permit requirements.
2. Text on pages 12-13 related to the Reclaimed Water Distribution System and Use Areas was substantially modified. Ecology divided the material into two sub-sections – one describing the distribution system and the other describing existing use areas. The changes were necessary to clarify how the City distributes reclaimed water to its users and to identify the specific locations for authorized reclaimed water use.
3. Ecology discovered errors in the data originally reported in Table 2 – Ambient Background Data. Values in the table for pH, Dissolved Oxygen, Total Ammonia, Fecal Coliform, Turbidity, TSS, and Alkalinity were not accurate summary values for the date range of January 2003 through August 2018. Ecology corrected this table and reevaluated calculations that relied on values from this table.
4. Ecology revised section II.D – Treated wastewater characterization – to improve clarity with respect to the quality of water either discharged into the Snoqualmie River or distributed as reclaimed water. A new Table 5 was added to specifically show the water quality characterization of the Class A reclaimed water distributed by the City.
5. Section III.G – Analysis for water quality limit on pH (page 32) was revised due to corrections made to the Ambient Background Data shown in Table 2. The revised analysis with corrected ambient pH and alkalinity data resulted in a conclusion that the existing pH lower limit of 6.3 standard units is appropriate for water quality protection. The revision to this section shows the results of the updated analysis. This change also resulted in a change in the pH calculations tables presented in Appendix D.
6. Ecology made several changes to section IV – Proposed Reclaimed Water Limits – to ensure consistency with requirements of the Reclaimed Water Rule. Changes include:

- Revising the design criteria table in sub-section A (previously Table 16) to show that the design capacity for reclaimed water production is limited to capacity of the sand filtration system (1.56 MGD).
- Eliminated Total Nitrogen from the Biological Oxidation Standards in sub-section B (previously Table 17) and added an explanation that this standard does not apply for irrigation uses. The standard for pH was also corrected to accurately reflect that the performance standard in the rule requires a minimum pH of 6.0 standard units instead of 6.5 standard units.
- The text on page 40 was revised to accurately document that the point of compliance for reclaimed water monitoring is at the Snoqualmie WRF, not at Eagle Lake.
- Ecology revised sub-section C – Distribution system limits – to clarify that Ecology and Health will continue to waive the requirement for the City to maintain a chlorine residual in reclaimed water released to Eagle Lake. The revision also notes that future permits may require the City to maintain a residual to some use locations depending on the outcome of system improvements the City will make during the next permit term.

7. Ecology also revised the text on the following sections to either remove outdated text or add new text to ensure that the fact sheet content remains consistent with the requirements of the Reclaimed Water Rule:
   - V.B – Reclaimed Water Monitoring
   - VI.A – Reporting and record keeping
   - VI.B – Prevention of facility overloading
   - VI.C – Operation and maintenance
8. Ecology revised section VI.D – Reclaimed water distribution and use – to discuss the existing deficiency of the reclaimed water distribution system with respect to required cross-connection controls. The added discussion provides the basis for a compliance schedule added to the permit to allow the City adequate time to design and construction necessary improvements.
9. Ecology removed a table showing calculated dissolved oxygen concentrations at the edge of the chronic mixing zone from Appendix D as well as a table showing freshwater temperature reasonable potential and limit calculations. Since compliance with the water quality standards for both parameters is controlled waste load allocations developed through TMDLs, these general calculations are not appropriate.