

Fact Sheet for State Reclaimed Water Permit ST0045498

King County Brightwater Reclaimed Water Facilities

Public Notice of Draft date: November 9, 2018

Purpose of this fact sheet

This fact sheet explains and documents the decisions the Department of Ecology (Ecology) made in drafting the proposed State Reclaimed Water permit for King County's Brightwater Reclaimed Water Facilities (Brightwater Reclaimed). It complies with Section 173-219-280 of the Washington Administrative Code (WAC), which requires Ecology to prepare a fact sheet to support each reclaimed water permit.

Ecology makes the draft permit and fact sheet available for public review and comment at least thirty (30) days before it issues the final permit to the facility operator. Copies of the fact sheet and draft permit for King County's Brightwater Reclaimed Water Facilities, State Reclaimed Water Permit No. ST0045498, are available for public review and comment from November 9, 2018, until December 10, 2018. For more details on preparing and filing comments about these documents, please see **Appendix A--Public Involvement Information**.

King County Department of Natural Resources and Parks, Wastewater Treatment Division (KC-WTD) has reviewed the draft permit and fact sheet for factual accuracy. Ecology corrected any errors or omissions regarding the facility's location, history, type and rate of reclaimed water production, or distribution and use area details 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 to this fact sheet as **Appendix F--Response to Comments**, and publish it when issuing the final State Reclaimed Water 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

KC-WTD's Brightwater Reclaimed facility produces Class A reclaimed water for irrigation and toilet flushing at the Brightwater Environmental Education Community Center and for irrigation, industrial, and commercial uses at various locations in the Sammamish Valley. Ecology issued the previous permit for this facility on June 10, 2011. Ecology based requirements in the previous permit on its interim Water Reclamation and Reuse Standards, developed in collaboration with the Department of Health in 1997.

The proposed permit imposes requirements contained in the Reclaimed Water Rule, Chapter 173-219 WAC. The proposed permit includes limits on 5-day Biochemical Oxygen Demand (BOD₅), Total Suspended Solids (TSS), pH, turbidity, and total coliform that are based on the performance standards for Class A reclaimed water. It also includes requirements related to the distribution and use of the water that are developed to maintain public health protection.

Table of Contents

I.	<i>Introduction.....</i>	4
II.	<i>Background Information.....</i>	5
A.	Reclaimed water project description	5
	History	5
	Source water	7
	Reclaimed water treatment process	8
	Operator certification	9
	Residual solids	9
	Distribution system	9
	Authorized beneficial uses	10
	Water rights protection	11
B.	Source water characterization	11
C.	Reclaimed water characterization.....	12
D.	Permit status and compliance summary	14
E.	State environmental policy act (SEPA) compliance	15
III.	<i>Proposed Permit Limits.....</i>	15
A.	Design criteria	16
B.	Limits based on reclaimed water performance standards.....	16
C.	Distribution system limits.....	18
D.	Comparison of reclaimed water limits with the previous permit issued June 10, 2011	18
IV.	<i>Monitoring Requirements.....</i>	19
A.	Lab accreditation	20
B.	Reclaimed water monitoring.....	20
V.	<i>Other Permit Conditions.....</i>	20
A.	Reporting and record keeping	20
B.	Reclaimed water distribution and use.....	20
C.	Prevention of facility overloading.....	21
D.	Operations and maintenance	21
E.	Pretreatment and source control	22
F.	Solid wastes.....	22
J.	General conditions	22
VI.	<i>Permit Issuance Procedures</i>	22
A.	Permit modifications.....	22

B.	Proposed permit issuance.....	23
VII.	References for Text and Appendices	24
	Appendix A--Public Involvement Information	25
	<i>Appendix B--Your Right to Appeal</i>	26
	<i>Appendix C--Glossary</i>	27
	<i>Appendix D--Monitoring Data</i>	35
	<i>Appendix E--Process Flow Diagram</i>	41
	<i>Appendix F--Response to Comments</i>	43
Table 1.	General facility information	5
Table 2.	Agencies tributary to Brightwater WWTP	7
Table 3.	Authorized reclaimed water uses	10
Table 4.	Wastewater influent characterization	12
Table 5.	Reclaimed water prior to disinfection – monitored at the Membrane Effluent Box	12
Table 6.	Reclaimed water for RW demo system – monitored at the Disinfection Building	12
Table 7.	Reclaimed water for RWHP – monitored at the Influent Pump Station	13
Table 8.	Metals detected in Brightwater Reclaimed Water.....	13
Table 9.	Numeric limit violations.....	14
Table 10.	Reclaimed water design criteria for RW demo system	16
Table 11.	Reclaimed water design criteria for Brightwater RWHP	16
Table 12.	Minimum biological oxidation standards.....	16
Table 13.	Class A turbidity and disinfection standards	17
Table 14.	Comparison of previous and proposed limits.....	19
Figure 1.	Facility location map	6

I. Introduction

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 State Reclaimed Water permit program and in response to a complete and accepted permit application, 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. (See **Appendix A--Public Involvement Information** for more detail about the public notice and comment procedures). After the public comment period ends, Ecology may make changes to the draft State Reclaimed Water permit in response to comment(s). Ecology will summarize the responses to comments and any changes to the permit in **Appendix F**.

II. Background Information

Table 1. General facility information

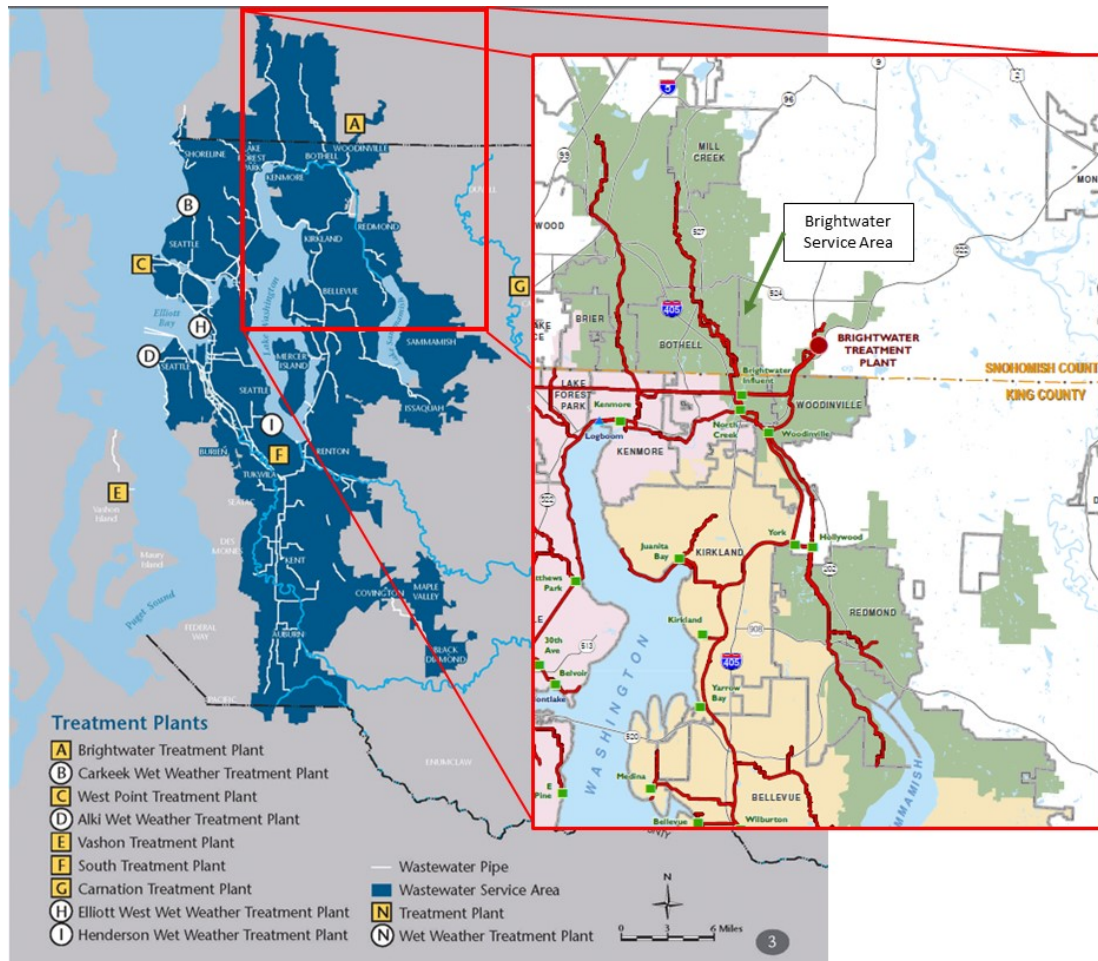
Facility Information	
Applicant	King County Dept. of Natural Resources & Parks Wastewater Treatment Division 201 S. Jackson Street Seattle, WA 98104-3855
Facility Name and Address	Brightwater Reclaimed Water Treatment Plant 22509 SR 9 SE Woodinville, WA 98072-6010
Responsible Official	Name: Christie True Title: Director, Dept. of Natural Resources & Parks Address: 201 S. Jackson Street Seattle, WA 98104-3855 Telephone #: (206) 296-6500
Reclaimed Water Contact	Name: Kristina Westbrook Title: Recycled Water Program Manager Telephone #: (206) 477-5522
Permit Administration Contact	Name: Jeff Lafer Title: NPDES Permit Administrator Telephone #: (206)477-6315
Facility Operations Contact	Name: Andy Strehler Title: Wastewater Treatment Supervisor Telephone #: (206) 263-9450
Facility Location (NAD83/WGS84 reference datum)	Latitude: 47.790397 Longitude: -122.141487
Type of Treatment	Membrane Bioreactor with chlorine disinfection
Highest class of water produced	Class A
Approved beneficial uses	Indoor uses, industrial and commercial uses, and irrigation

A. Reclaimed water project description

History

The Wastewater Treatment Division of King County's Department of Natural Resources and Parks (DNRP) oversees the administration and operation of the King County's conveyance and treatment systems. King County's regional system serves approximately 1.6 million people in a 424 square mile area of western King County (County) and portions of southwest Snohomish and northwest Pierce counties. In 1999 the King County Council adopted the Regional Wastewater Services Plan (RWSP), which identified the need to construct a new 36- to 54-million gallon per day (mgd) wastewater treatment plant and conveyance system in north King County or south Snohomish County by 2010. A wide range of factors influenced the decision to build a third regional wastewater treatment plant, known as the Brightwater Treatment Plant. Factors included population growth, economic development, requirements for urban services, environmental and public health protection, capacity constraints within the County's existing treatment plants and conveyance facilities, and prevention of sanitary sewer overflows to Lake Washington.

Figure 1. Facility location map



Ecology approved the original Brightwater Regional Wastewater Treatment System Facilities Plan in 2005. The facilities plan described treatment facilities necessary to provide service through 2040 and beyond. As part of its evaluation of wastewater treatment options, the facilities plan examined the feasibility of producing and distributing reclaimed water for a variety of beneficial uses. It recommended that the new facility include provisions for producing reclaimed water for irrigation and toiled uses at the treatment plant site. It also recommended off-site distribution for irrigation and other commercial and industrial uses throughout the Sammamish Valley. Although the facilities plan evaluated the feasibility of using reclaimed water for groundwater recharge in the Brightwater service area, it concluded that groundwater recharge was infeasible.

In 2006 the County submitted the Brightwater Reclaimed Water System Engineering Report to Ecology and Washington Department of Health (DOH) for review and approval. That engineering report provided further technical details on the County's proposed production of reclaimed water at the new Brightwater facility and distribution for irrigation, commercial, and industrial uses at the Brightwater facility and at off site locations in the Sammamish Valley. Ecology and DOH approved this document in November 2006.

Construction of the Brightwater WWTP began in 2005. The County completed construction of the treatment plant in 2011 and began producing Class A reclaimed water in December of that year. The County limited initial reclaimed water distribution to uses at the Brightwater facility. In June 2013, after completing a project to clean and disinfect an old sewer main to repurpose it as a reclaimed water distribution main, the County began distributing Class A reclaimed water to off-site uses.

Source water

The Brightwater wastewater treatment plant (WWTP) serves 67 square miles in the northeast portion of the regional service area stretching from the north end of Lake Sammamish to the City of Mill Creek in Snohomish County. The facility treats domestic sewage from a residential population of about 205,000 as well as wastewater from commercial, light industrial, and major industrial facilities. Table 2 lists the local sewer agencies that contribute flow to the Brightwater WWTP.

Table 2. Agencies tributary to Brightwater WWTP

City or Sewer/Utility Districts	Percent of Agency Area in Brightwater Service Area	Calculated Residential Population in Brightwater Service Area (2015)
Alderwood Water And Wastewater District	71%	74,265
City of Bellevue	7%	9,779
City of Bothell	36%	4,086
City of Brier	31%	2,012
Cross Valley Water District	97%	86
Northeast Sammamish Sewer And Water District	100%	13,291
Northshore Utility District	1%	810
City of Redmond	96%	58,172
Silver Lake Water and Sewer District	12%	568
Woodinville Water District	90%	15,964

The Brightwater WWTP treats all wastewater through an advanced membrane bioreactor (MBR) treatment system, as described below. Treated water leaving the MBR system enters a splitter box that diverts a portion of the treated wastewater for disinfection and distribution as Class A reclaimed water. The NPDES permit for the Brightwater WWTP authorizes the County to divert a portion of the flow through the Brightwater WWTP around the MBR system during wet weather when flows exceed the available treatment capacity of the membranes. This diverted flow, which receives chemically enhanced primary treatment (CEPT) prior to disinfection and blending with MBR-treated water, does not enter into reclaimed water production. As shown in the process flow diagram in **Appendix E**, the CEPT and MBR flow streams recombine downstream of the reclaimed water diversion point.

Reclaimed water treatment process

Raw wastewater enters the Brightwater WWTP at the Influent Pump Station (IPS), located approximately 2.5 miles southwest of the WWTP along 195th Street in Bothell. The IPS pumps sewage collected from the Brightwater service area through dual raw sewage lines to the headworks at the treatment plant site. The influent lines discharge into the influent distribution channel, which evenly distributes flow to 10 mm screens for coarse screening.

Screened influent flows move directly to aerated grit tanks that remove sand, grit and other heavy particles. Each grit tank has two cells; one receiving high-volume airflow that provides high turbulence and the other receiving low volume airflow with low turbulence. Each aerated grit tank is directly connected to a primary clarifier basin. Flow from the grit chambers enters the primary clarifiers for primary solids removal. Primary effluent then passes through 2 mm screens to protect the membranes in the secondary process from damage from fine particles (hairs and fibers) that were not removed by the coarse screens or primary clarifiers.

The Brightwater WWTP uses a membrane bioreactor (MBR) system for secondary treatment. The MBR system consists of three aeration basins and eight membrane basins. The aeration basins provide for biological treatment of the wastewater. The membranes allow treated liquids to discharge from the system while retaining solids. Each membrane basin contains 20 cassettes of hollow-fiber membranes that have a design flux rate ranging between 10 to 17 gallons per square foot of membrane surface area per day. The membrane system is designed to operate with a nominal monthly average flow capacity of 30 MGD and a peak hour flow capacity of 44 MGD. MBR systems remove nearly all of the BOD₅ and TSS from the wastewater and achieves greater removal of dissolved pollutants (metals and toxic organic pollutants) than conventional secondary systems.

Membrane effluent is pumped to the Membrane Effluent Box in the Disinfection Building. The Membrane Effluent Box splits flow into the following three separate flow streams: onsite reuse, the reclaimed water distribution system, and plant effluent discharged to Puget Sound under NPDES Permit No. WA0032247. A portion of the onsite reuse flow stream diverts into a dedicated disinfection system to provide Class A reclaimed water for the “Reclaimed Water Demonstration System”. A pump diverts onsite reuse water at a rate of 10 gallons per minute from the Membrane Effluent Box through a dedicated disinfection system. A dose of 12.5% sodium hypochlorite is added ahead of a serpentine run of pipe that provides the necessary disinfection contact time for Class A reclaimed water prior to discharge into a storage tank. The system includes continuous monitoring of pH, turbidity and residual chlorine with valves that automatically divert flow to plant effluent if quality does not comply with Class A reclaimed water requirements. Plant staff collect grab samples prior to the storage tank to monitor total coliform levels.

Membrane effluent diverted into the reclaimed water distribution system enters a dedicated 27-inch pipe that conveys flow by gravity from the Membrane Effluent Box to the Influent Pump Station in Bothell. Sodium hypochlorite is added to the flow at the Membrane Effluent Box, and the pipeline provides sufficient contact time to meet disinfection requirements for Class A reclaimed water. The system includes continuous monitoring of pH, turbidity, and chlorine residual with automated diversions to return flow back to the plant influent at the Influent Pump Station if water quality does not comply with Class A reclaimed water

requirements. Plant staff collect grab samples at the Influent Pump Station to monitor total coliform levels. Water meeting reclaimed water standards is conveyed through the Reclaimed Water High Pressure Pipeline to uses in the Sammamish Valley.

Operator certification

Chapter 173-219-250 WAC requires an operator certified by Ecology under WAC 173-230 to operate reclaimed water treatment facilities. Guidance in Ecology's *Permit Writer's Manual* and WAC 173-230 classify the treatment system at the Brightwater facility as a Class IV 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 IV operator. An operator certified for at least a Group III facility must be in charge of each scheduled shift at the facility. The Brightwater facility's assistant manager and operations supervisor each hold Group IV certifications. In addition, the facility employs 9 operators certified at Group IV and Group III levels along with two process analysts certified at Group IV and Group III levels.

In addition, WAC 173-219-250 requires the use of an operator or consultant certified under DOH's Waterworks Operator Certification program (chapter 246-292) to perform certain tasks associated with the distribution of reclaimed water. At a minimum, producers and distributors of reclaimed water must use a Certified Cross-Connection Control Specialist to develop and oversee a cross-connection control program. KC-WTD does not currently comply with this requirement and has asked for additional time to fulfill the requirement. In addition, Ecology has not yet completed guidance necessary to define the levels of certification needed for distribution systems. Therefore, the proposed permit delays implementation of this requirement until the end of the permit term.

Residual solids

The Brightwater WWTP removes solids during the treatment at various locations. Solids removed by coarse screens at the headworks, fine screens after the primary clarifiers and grit removed by the aerated grit tanks are dewatered and disposed of as solid waste along with incidental solids (rags, scum, and other debris) removed as part of the routine maintenance of the equipment. Primary sludge mixes with waste activated sludge and scum from secondary basins (aeration and membrane basins) in a raw sludge blend tank. Blended sludge is thickened with gravity belt thickeners then sent to digestion in anaerobic digesters along with scum from the primary clarifiers. After digestion the biosolids are dewatered using centrifuges and land applied under permits in King, Snohomish, Douglas, Yakima, Benton, and Klickitat counties.

Distribution system

KC-WTD distributes Class A reclaimed water through the following two independent systems: The Reclaimed Water Demonstration System and the Reclaimed Water High Pressure Pipeline.

Reclaimed Water Demonstration System:

The County can convey up to 14,000 gallons per day of Class A reclaimed water for use at the Brightwater WWTP for non-process purposes through the "Reclaimed Water Demonstration" (RW Demo) system. Floats control the diversion of Class A reclaimed water to a storage tank at the Brightwater Environmental Education and Community Center (EECC). Dual pumps convey water from the storage tank to a hydropneumatic pressure tank to supply water under pressure for toilet/urinal flushing and irrigation. A high-level outlet from the storage tank also allows reclaimed water to flow under gravity to an outdoor sculpture at the entrance to the Brightwater facility.

Reclaimed Water High Pressure Pipeline:

Class A reclaimed water enters the Reclaimed Water High Pressure Pipeline (RWHP) distribution system at the Influent Pump Station. Water initially flows by gravity through a 2,200 foot-long, 27-inch pipeline from the Influent Pump Station to King County's North Creek Pump Station. A hypochlorite injection system at the Influent Pump Station adds sodium hypochlorite to adjust the chlorine residual concentration. Reclaimed water then transfers to a 30-inch pipeline and is pumped over five miles to the York Pump Station. A chlorine residual analyzer monitors chlorine concentrations at the York Pump Station and a chlorine injection system at that location can provide additional sodium hypochlorite, if necessary, to maintain an appropriate chlorine residual further downstream. From the York Pump Station, water enters 20-inch and 18-inch pipelines to convey Class A reclaimed water to use locations near Redmond.

At present, the RWHP distribution system extends to use locations in the Sammamish River Valley in and near the City of Redmond. Future expansions of the system may extend south to Marymoor Park and east to the City of Kenmore. The system will have the capability of distributing up to 21 MGD of Class A reclaimed water to multiple use locations. A map of the existing reclaimed water distribution system is located in **Appendix E**.

Authorized beneficial uses

The Brightwater Reclaimed facility produces Class A reclaimed water for the following beneficial use categories identified in WAC 173-219-390: indoor uses for toilet/urinal flushing; commercial, industrial, and institutional uses; and land application or irrigation. Table 3 identifies locations with existing agreements to use reclaimed water along with the authorized uses at those locations and the amount of water typically used.

Table 3. Authorized reclaimed water uses

Water Use Site	Site Location	Authorized Uses	Annual Use ¹ (MG/yr)
Brightwater Environmental Education Community Center ²	22509 State Route 9 #101 Woodinville, WA 98072	Toilet/urinal flushing irrigation (turf, landscaping, and food crops)	0.41
Brightwater WWTP Entrance ²	22509 State Route 9 #101 Woodinville, WA 98072	Water supply to sculpture at facility entrance	
Brightwater Influent Pump Station	11711 NE 195th Street Bothell, WA 98011	Turf and landscape irrigation	0.22
King County North Creek Pump Station	18707 North Creek Parkway Bothell, WA 98011	Landscape irrigation	0.2
King County York Pump Station	14120 NE 124th Street Redmond, WA 98052	Landscape irrigation	0.01
King County York Truck Fill Station	14120 NE 124th Street Redmond, WA 98052	Fill station for tank trucks to transport reclaimed water for remote irrigation and other industrial or commercial uses	0.006
King County Hollywood Pump Station	14815 NE 124th Street Redmond, WA 98052	Landscape irrigation	0.04
Willows Run Golf Complex	10402 Willows Road NE Redmond, WA 98052	Turf irrigation	58.8

Water Use Site	Site Location	Authorized Uses	Annual Use ¹ (MG/yr)
King County Sixty Acres Park	15200 NE 116th Street Redmond, WA 98052	Turf irrigation	3.1
King County Department of Natural Resources and Parks - Sammamish River Landscaping Strip ³	West bank of Sammamish River between NE 124th Street and NE 100th Court Redmond, WA 98052	Turf and landscape irrigation	0
Buttonwood Tree Farm	14500 NE 116th Street Redmond, WA 98052	Tree irrigation	0.033
¹ Annual use based on estimates from 2017 Annual Water Use Report.			
² Annual use estimates for the Brightwater Environmental Education Community Center and treatment plant entrance sculpture are the combined total for water distributed through the Reclaimed Water Demonstration System.			
³ Although KC-WTD has identified the Sammamish River Landscaping Strip as an authorized use are, No reclaimed water has been distributed to the site to date.			

The proposed permit allows KC-WTD 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 unless the permit applicant demonstrates compliance with water rights protection.

Domestic wastewater generated in the Brightwater service area has not historically discharged to any freshwater location. Prior to the construction of the Brightwater WWTP, all treated wastewater discharged to Puget Sound through King County's West Point or South treatment plants. The Brightwater WWTP also discharges treated wastewater to Puget Sound. Therefore, the distribution of Class A reclaimed water from the Brightwater facility does not impair a downstream water right and complies with the water rights protection requirement of the Reclaimed Water Use law.

B. Source water characterization

KC-WTD reported in discharge monitoring reports (DMRs) the concentration of pollutants detected in wastewater influent and membrane effluent at the Brightwater WWTP. As described above, the Brightwater WWTP treats raw domestic sewage through an advanced MBR treatment system prior to either diversion to disinfection and distribution as Class A reclaimed water or disinfection and disposal to Puget Sound. Table 4 summarizes the characteristics of the raw influent to the Brightwater WWTP based on discharge monitoring reports submitted under NPDES permit WA0032247 between September 2011 and February 2018. Although the summary below includes data during months in which the Brightwater facility did not produce and distribute reclaimed water, Ecology considers the values representative of typical influent characteristics at the plant during reclaimed production.

Table 4. Wastewater influent characterization

Parameter	Units	Average monthly value for period	Maximum monthly value for period
Flow	MGD	16.5	26.5
5-day Biochemical Oxygen Demand (BOD ₅)	mg/L	312	513
BOD ₅	lbs/day	41,411	53,292
Total Suspended Solids (TSS)	mg/L	277	709
TSS	lbs/day	36,923	67,305

C. Reclaimed water characterization

KC-WTD reported in the permit application and DMRs concentrations of key water quality parameters identified in the final Class A reclaimed water produced at the Brightwater Reclaimed Facility. Tables 5-7 summarize water quality data related to the required performance standards for Class A reclaimed water. Values in the tables represent monitoring data reported on DMRs for reclaimed water produced and distributed between December 2011 and January 2018. Appendix D includes detailed summaries of water quality data reported during the permit term.

Table 5. Reclaimed water prior to disinfection – monitored at the Membrane Effluent Box

Parameter	Average Value	95 th Percentile Value	Required Value
Minimum Monthly Dissolved Oxygen	1.57 mg/L	0.36 mg/L	>0.2 mg/L
Monthly Average BOD ₅ ^a	<1.3 mg/L	<2.4 mg/L	<30 mg./L
Weekly Average BOD ₅ ^a	<1.6 mg/L	<3.3 mg/L	<45 mg./L
Monthly Average TSS ^a	<2.1 mg/L	<2.4 mg/L	<30 mg./L
Weekly Average TSS ^a	<2.2 mg/L	<3.0mg/L	<45mg./L
Monthly Average Turbidity	0.08 NTU	0.11 NTU	<0.2 NTU
Maximum Monthly Turbidity	0.15 NTU	0.29 NTU	<0.5 NTU

^a Results for BOD₅ and TSS were typically below detection limits.

Table 6. Reclaimed water for RW demo system – monitored at the Disinfection Building

Parameter	Average Value	95 th Percentile Value ^a	Required Value
Monthly Average Flow	1,799 GPD	3,889 GPD	N/A
Minimum Monthly pH	6.4	6.0	>6.0
Maximum Monthly pH	7.1	7.7	<9.0
Maximum Monthly Total Coliform – Single Sample	1.1 /100 mL	5.8 /100 mL	<23 /100mL
Maximum Monthly Total Coliform – 7-day Median	0.1 /100 mL	1.0 /100 mL	<2.2 /100mL
Minimum Total Chlorine Residual	1.3 mg/L	1.0 mg/L	>1.0 mg/L

^a The 95th percentile for minimum pH and chlorine residual are the lower 95th percentile value – 95% of reported data was above the value shown.

Table 7. Reclaimed water for RWHP – monitored at the Influent Pump Station

Parameter	Average Value	95 th Percentile Value ^a	Required Value
Monthly Average Flow	0.38 MGD	0.65 MGD	<21 MGD
Minimum Monthly pH	6.2	6.0	>6.0
Maximum Monthly pH	7.4	8.1	<9.0
Maximum Monthly Total Coliform – Single Sample	2.2 /100 mL	8.1 /100 mL	<23 /100mL
Maximum Monthly Total Coliform – 7-day Median	0 /100 mL	0 /100 mL	<2.2 /100mL
Minimum Total Chlorine Residual in Distribution, monitored at York PS	0.51 mg/L	0.50 mg/L	>0.5 mg/L

^a The 95th percentile for minimum pH and chlorine residual are the lower 95th percentile value – 95% of reported data was above the value shown.

In addition to the water quality parameters listed above, KC-WTD reported in the reclaimed water permit application concentrations of metals and other pollutants detected in the membrane effluent from the Brightwater Reclaimed facility. Parameters listed in table 8 represent the quality of membrane effluent at the Membrane Effluent Box (prior to disinfection and distribution as reclaimed water). Samples in this category were collected during periods when the facility was producing and distributing reclaimed water. Ecology included in the table numeric criteria for Human Health protection, as promulgated by Washington State in the state's surface water quality standards (WAC 173-201A-240) and the Maximum Contaminant Levels listed in the state's Drinking Water Standards (WAC 246-290-310) for reference purposes only.

Table 8. Metals detected in Brightwater Reclaimed Water

Parameter	Units	# of Samples	Average Value	Maximum Value	Human Health Criteria ¹	Drinking Water Standards ²
Barium	µg/L	4	5.2	5.93	N/A	2000
Cadmium ³	µg/L	7	<0.05	0.11	N/A	5
Copper ⁴	µg/L	13	9.64	13.3	1300	**
Iron	µg/L	4	62.5	71.4	N/A	300
Lead ⁴	µg/L	13	0.19	0.57	N/A	**
Mercury ⁵	µg/L	4	0.00084	0.00116	0.14	2
Selenium ⁶	µg/L	7	<0.1	<0.1	120	50
Silver ⁶	µg/L	7	<0.04	<0.04	N/A	100
Zinc	µg/L	13	35.8	52.5	1000	5000

¹ Human Health Criteria for consumption of water and organisms, as promulgated by Washington State in WAC 173-201A-240. Values may differ from those promulgated by EPA for use in NPDES permitting.

² Primary and secondary MCLs listed in Washington's Drinking Water Standards, WAC 246-290-310.

³ Cadmium was detected in two of seven samples; all other samples did not have detectable concentrations.

⁴ The State Board of Health has not established MCLs for copper or lead, but has recognized that there is sufficient public health significance to the parameters.

⁵ The Human Health Criteria for mercury is from 40 CFR 131.36.

⁶ Silver and Selenium were not detected in any samples.

D. Permit status and compliance summary

Ecology issued the previous permit for this facility on June 10, 2011, with an effective date of August 1, 2011. KC-WTD submitted an application for permit renewal on January 26, 2016, and Ecology accepted it as complete on March 30, 2016. The permit was set to expire on July 31, 2016, but was administratively extended. The previous permit placed reclaimed water limits on BOD₅, TSS, Turbidity (prior to disinfection), Total Coliform, pH, and Total Residual Chlorine. The permit included two sets of turbidity limits: one set for water distributed to the RW Demo system and the second for water distributed through the RWHP. The permit also contained multiple limits on total residual chlorine: one limit for post-disinfection of water to the RW Demo system, one post-disinfection limit at the Influent Pump Station for water distributed to the RWHP, and a distribution system-based residual limit for the RWHP at the York Pump Station.

KC-WTD generally complied with the reclaimed water limits and permit conditions throughout the duration of the permit issued on June 10, 2011. Ecology assessed compliance based on its review of the facility's discharge monitoring reports (DMRs) and on inspections conducted by Ecology. KC-WTD reported violations of numeric limits for residual chlorine concentrations, as shown in Table 9. The water distributed in the RWHP did not meet the requirement for total chlorine residual at the York Pump Station for three days in August 2013. In addition, water distributed to the RWHP did not meet the required disinfection-based limit of 1.0 mg/L of total residual chlorine at the Influent Pump Station for a total of seven days during May and June 2014. Although the water did not meet the numeric limit, operational records indicate that the contact time during the seven days was sufficient to achieve adequate disinfection.

Table 9. Numeric limit violations

Monitoring Point	Monitoring Month	Parameter	Units	Reported Value	Limit
York PS	Aug. 2013	Minimum Chlorine Residual	mg/L	0.12	0.50
IPS	May 2014	Minimum Chlorine Residual	mg/L	0.55	1.00
IPS	June 2014	Minimum Chlorine Residual	mg/L	0.50	1.00

In addition to not meeting the numeric limits listed above, KC-WTD,

- Missed required sampling of the RW Demo system for total coliform bacteria on two days in June 2014.
- Submitted an incomplete DMR in June 2013 (missing summary data for 7-day median of total coliform monitored at the Influent Pump Station and total chlorine residual at the York Pump Station).
- Submitted DMRs for December 2011, May 2012, September 2012, and February 2015 late.
- Submitted the cross-connection control annual reports for 2012 and 2014 late.

E. State environmental policy act (SEPA) compliance

Ecology must ensure that its decision to reissue the proposed reclaimed water permit is consistent with the State Environmental Policy Act, Chapter 43.21C RCW. The SEPA Rules, WAC 197-11-600, allow Ecology to use existing environmental documents to satisfy this requirement. Environmental reviews were completed between 2005 and 2011 on various aspects of the Brightwater Reclaimed Water system regulated by the proposed permit. Past reviews include:

- Final Supplemental Environmental Impact Statement for the Brightwater Regional Wastewater Treatment System, issued by King County on July 19, 2005.
- SEPA Environmental Checklist and Determination of Non-Significance for the Brightwater Reclaimed Water System – South Section, issued by King County on July 26, 2007.
- City of Redmond (lead) issues a SEPA Environmental Checklist and Determination of Non-Significance for the connection of Willows Run to the Brightwater Reclaimed Water System, issued by the City of Redmond on December 7, 2011.

Ecology has reviewed the documents and determinations and has adopted the findings for the reissuance of the proposed permit.

III. Proposed Permit 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. Design criteria

Under WAC 173-219-240, flows and waste loadings must not exceed approved design criteria. Ecology approved design criteria for reclaimed water production at the Brightwater facility in the Brightwater Reclaimed Water System Engineering Report dated October 2006 and prepared by Carollo Engineers. Tables 10 and 11 below summarize the approved design criteria for reclaimed water production. NPDES permit WA0032247 regulates the untreated influent flow and waste loading to the Brightwater facility.

Table 10. Reclaimed water design criteria for RW demo system

Parameter	Design Quantity
Maximum Pumping Capacity	14,400 GPD (10 GPM)
Maximum Design Flow – Disinfection System	2.5 MGD
Design Chlorine Residual	1.0 mg/L
Chlorine Contact Time @ design flow	30 min.

Table 11. Reclaimed water design criteria for Brightwater RWHP

Parameter	Design Quantity
Maximum Design Flow	7.0 MGD
Design Chlorine Residual	1.0 mg/L
Chlorine Contact Time @ design flow	90 min.

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 12.

Table 12. Minimum biological oxidation standards

Parameter	Average Monthly Limit	Average Weekly Limit
Dissolved Oxygen	Must be measurably present (minimum of 0.2 mg/L)	
BOD ₅ concentration	30 mg/L	45 mg/L
TSS concentration	30 mg/L	45 mg/L
	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 Brightwater Reclaimed facility is at the Membrane Effluent Box, prior to disinfection.

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.

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. KC-WTD must ensure Class A reclaimed water from the permitted facility complies with following standards prior to distribution.

Table 13. Class A turbidity and disinfection standards

Parameter	Average Monthly Limit	Sample Maximum Limit
Turbidity	0.2 NTU	0.5 NTU
	7-day median limit	Sample Maximum Limit
Total Coliform	2.2 CFU/100 mL	23 CFU/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 membrane 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.

The previous permit applied a turbidity limit at the Membrane Effluent Box (prior to disinfection) and at the Influent Pump Station (after disinfection of water supplied to the RWHP). Since the purpose of the turbidity limit is to ensure that the reclaimed water filtration process is properly operating prior to disinfection, applying the limit at the Influent Pump Station is not appropriate. Therefore, the proposed permit does not retain the turbidity limit at the Influent Pump Station. It does, however, retain the limit at the Membrane Effluent Box.

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. The proposed permit requires KC-WTD to properly operate and maintain all reclaimed water treatment processes according to the approved design and operations and maintenance manual to maintain compliance with the performance standards.

The previous permit included the following limit on total residual chlorine for disinfection purposes: “A minimum of at least 1 mg/L after an effective contact time of at least 30 minutes is required”. Monitoring to assess compliance with these limits occurred at the Disinfection Building (for the RW Demo system) and at the IPS (for the RWHP system). The Reclaimed Water Rule states that all Class A reclaimed water facilities using chlorine for disinfection must be designed to meet this standard at the peak day flow condition for the facility (WAC 173-219-340). Since the rule treats the requirement as a design standard, Ecology and DOH agreed that it is not appropriate to include the requirement as a permit limit. Therefore, the proposed permit does not retain this limit. Setting permit limits on total coliform is sufficient for demonstrating the reclaimed water is adequately disinfected. In addition, facilities using chlorine for disinfection must still use continuous monitoring of chlorine residual for disinfection process control purposes and have automated diversions that prevent the distribution of reclaimed water if the chlorine residual after disinfection falls below a specific set point identified in the facility’s O&M manual.

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.

The proposed permit requires KC-WTD to maintain a minimum total chlorine residual of 0.5 mg/L throughout the RWHP distribution system. The permit specifies a compliance point at the York Pump station for this limit. Consistent with allowances for drinking distribution systems that require systems to demonstrate that 95% of samples taken during a given month to comply with the minimum residual requirement, the proposed permit allows for brief periods where the chlorine residual may be below the limit of 0.5 mg/L. The permit allows the residual to fall below the limit for a total duration of one hour and twelve minutes over each day reclaimed water is distributed. One hour and twelve minutes equates to five percent of a 24-hour period.

Since the RW Demo system is located at the production facility and held in a storage tank prior to use, a requirement to maintain a chlorine residual in the distribution is not meaningful. The permit will require KC-WTD to monitor and report the chlorine residual attained after disinfection, but will not impose a limit for this part of the distribution system.

D. Comparison of reclaimed water limits with the previous permit issued June 10, 2011

The following table compares the reclaimed water limits in the proposed permit with the limits in the previous permit, issued on June 10, 2011.

Table 14. Comparison of previous and proposed limits

Parameter	Compliance Point	Previous Limits		Proposed Limits	
		Average Monthly	Average Weekly	Average Monthly	Average Weekly
BOD ₅	Membrane Effluent Box	30 mg/L	45 mg/L	30 mg/L	45 mg/L
TSS	Membrane Effluent Box	30 mg/L	45 mg/L	30 mg/L	45 mg/L
		Average Monthly	Instantaneous Maximum	Average Monthly	Instantaneous Maximum
Turbidity ¹	Membrane Effluent Box	0.2 NTU	0.5 NTU	0.2 NTU	0.5 NTU
		7-Day Median	Sample Maximum	7-Day Median	Sample Maximum
Total Coliform (RW Demo System)	Disinfection Building	2.2 CFU/100 mL	23 CFU/100 mL	2.2 CFU/100 mL	23 CFU/100 mL
Total Coliform, RWHP System	Influent Pump Station	2.2 CFU/100 mL	23 CFU/100 mL	2.2 CFU/100 mL	23 CFU/100 mL
		Minimum	Maximum	Minimum	Maximum
Dissolved Oxygen	Membrane Effluent Box	0.2 mg/L	N/A	0.2 mg/L	N/A
pH	Membrane Effluent Box	6.0 standard units	9.0 standard units	6.0 standard units	9.0 standard units
Total Chlorine Residual (RW Demo Disinfection)	Disinfection Building	1.0 mg/L	N/A	N/A	N/A
Total Chlorine Residual (RWHP Disinfection)	Influent Pump Station	1.0 mg/L	N/A	N/A	N/A
Total Chlorine Residual (RWHP Distribution)	York Pump Station	0.5 mg/L	N/A	0.5 mg/L	N/A
¹ The previous permit included turbidity limits at both the Membrane Effluent Box and the Influent Pump Station. The proposed permit only retains the limit at the Membrane Effluent Box.					

IV. Monitoring Requirements

Chapter 173-219-260 WAC authorizes Ecology to require monitoring, recording, and reporting in reclaimed water permits as reasonably necessary to verify that the production, distribution or storage of reclaimed water complies with the terms and conditions of the permit. All sampling and analytical methods used for compliance monitoring must conform to the following:

- Guidelines Establishing Test Procedures for the Analysis of Pollutants contained in 40 CFR Part 136.
- Monitoring and Analytical Requirements in the National Primary Drinking Water Regulations, 40 CFR Part 141.
- Standard Methods for the Examination of Water and Wastewater (APHA).

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. Lab accreditation

Ecology requires that facilities 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). KC-WTD uses the accredited lab at their South WWTP for most compliance monitoring. Ecology accredited the laboratory at the South WWTP (Accreditation #W687) for general chemistry and microbiology parameters in non-potable water. The facility is also accredited for some general chemistry parameters in solid and chemical materials. Priority pollutant testing is conducted by King County's Environmental Lab (#G656). Complete lists of accredited parameters and methods for both labs are available through Ecology's searchable Lab Accreditation database at the following web addresses.

South WWTP:

<https://fortress.wa.gov/ecy/laboratorysearch/SearchLabName.aspx?CompanyID=687>

King County Environmental Lab:

<https://fortress.wa.gov/ecy/laboratorysearch/SearchLabName.aspx?CompanyID=656>

B. Reclaimed water monitoring

Reclaimed Water Condition R2.A in the proposed permit lists the detailed monitoring requirements for the Brightwater Reclaimed facility. 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) large (>5.0 MGD) activated sludge plants and with other KC-WTD treatment plants.

V. Other Permit Conditions

A. Reporting and record keeping

Ecology based Reclaimed Water Condition R3 on its authority to specify appropriate reporting and recordkeeping requirements to verify that the production, distribution and storage of reclaimed water complies with the terms and conditions WAC 173-219 and the reclaimed water permit.

B. 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 KC-WTD to expand the use of reclaimed water produced at the Brightwater Reclaimed facility to areas not listed in the permit without modifying the permit.

The condition also specifies that KC-WTD 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 KC-WTD 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, KC-WTD must ensure such approval has been granted before it may provide water to the use location.

C. Prevention of facility overloading

Chapter 173-219-240 states that “where design criteria have been established, the generator must not allow flows or waste loadings to exceed approved design criteria”. Ecology includes design criteria as enforceable conditions in the reclaimed water permit to ensure KC-WTD operates the permitted facility within the approved design capacity. Reclaimed water condition R5 requires KC-WTD 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 pollutant loadings.

Reclaimed Water Condition R5 restricts the amount of flow.

D. Operations and maintenance

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 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.

KC-WTD developed an O&M manual for the Brightwater Reclaimed Water System in 2011, consistent with the requirement of WAC 173-240-080. The proposed permit requires KC-WTD 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 May 1, 2023. Once the manual is updated, KC-WTD 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.

E. Pretreatment and source control

Chapter 173-219-300 requires KC-WTD to implement source water controls that prevent the presence of substances that may affect the reclaimed water quality or the ability to generate reclaimed water. Reclaimed water condition R7 includes requirements KC-WTD must follow to control the quality of source water to the reclaimed water production facility. The proposed permit requires KC-WTD to follow the Pretreatment Condition in NPDES permit WA0032247 for the regulation of non-domestic wastewater flowing to the wastewater treatment facility that provides the source water to the permitted reclaimed water facility.

F. Solid wastes

To prevent water quality problems the facility is required 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. Ecology includes requirements related to solids waste management at the facility in NPDES Permit No. WA0032247.

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 Snohomish County Health Department.

Requirements for monitoring sewage sludge and record keeping are included in NPDES Permit No. WA0032247. KC-WTD, in consultation with Ecology, will use this information, required under 40 CFR 503, to develop or update local limits.

J. General conditions

Ecology bases the standardized general conditions on state laws and regulations. They are included in all reclaimed water permits issued by Ecology.

VI. Permit Issuance Procedures

A. Permit modifications

Ecology may modify this permit to impose numerical limits, if necessary, to comply with reclaimed water performance standards or water quality standards for groundwaters, based on new information from sources such as inspections, reclaimed water quality monitoring, or groundwater studies.

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

B. Proposed permit issuance

This proposed permit meets all statutory requirements for Ecology to authorize a beneficial use of reclaimed water. The permit includes limits and conditions necessary to protect public health and the environment and to implement applicable state laws and regulations governing the production, distribution, and use of reclaimed water. Ecology proposes to issue this permit for a term of 5 years.

VII. References for Text and Appendices

King County.

July 2007. *Environmental Checklist for the Brightwater Reclaimed Water System – South* (supplement to the 2006 engineering report).

October 2006. *Brightwater Reclaimed Water System Engineering Report*.

May 2005. *Facilities Plan: Brightwater Regional Wastewater Treatment System*.

Washington State Department of Ecology.

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>)

Revised August 2008. *Criteria for Sewage Works Design*. Publication Number 98-37.
<https://fortress.wa.gov/ecy/publications/summarypages/9837.html>

December 2018. *Permit Writer's Manual*. Publication Number 92-109
(<https://fortress.wa.gov/ecy/publications/summarypages/92109.html>)

Washington State Department of Health.

February 1994. *Design Criteria for Municipal Wastewater Land Treatment Systems for Public Health Protection*.
http://ibis.geog.ubc.ca/courses/geob370/students/class06/vicsewage/References_files/municipal_land_treatment_design_criteria.pdf

Appendix A--Public Involvement Information

Ecology proposes to reissue a permit to King County Department of Natural Resources and Parks, Wastewater Treatment Division. The permit includes reclaimed water limits and other conditions for the Brightwater Reclaimed water facilities. This fact sheet describes the facility and Ecology's reasons for requiring permit conditions.

Ecology will place a Public Notice of Draft on November 9, 2018, in the *Everett Herald* to inform the public and to invite comment on the proposed draft State Reclaimed Water 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.
- Urges people to submit their comments, in writing, before the end of the Comment Period.
- Tells how to request a public hearing of comments about the proposed state reclaimed water permit.
- Explains the next step(s) in the permitting process.

Ecology has published a document entitled *Frequently Asked Questions about Effective Public Commenting*, which is available on our website at:

<https://fortress.wa.gov/ecy/publications/documents/0307023.pdf>.

You may obtain further information from Ecology by telephone, 425-649-7201 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 Shawn McKone, PE.

Appendix B--Your Right to Appeal

You have a right to appeal this permit to the Pollution Control Hearing Board (PCHB) within 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

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).

Aquifer -- Geologic formation, group of formations, or part of a formation capable of yielding a significant amount of groundwater to wells or springs.

Augmentation -- The intentional addition of water to rivers and streams of the state or other surface water bodies through the zone of saturation or to the surface water.

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

Average monthly 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 BOD₅ 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.

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).

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

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.

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 173-219-210 and 173-240-060.

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.

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.

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.

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

Groundwater recharge -- Introduction of reclaimed water to groundwater aquifers for beneficial purposes. Groundwater recharge may be through indirect means where reclaimed water is introduced to groundwater through surface or subsurface infiltration or percolation through an unsaturated vadose zone before it enters groundwater aquifer. Recharge may also be through direct release into a groundwater aquifer through injection wells or other means.

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 month design flow (MMDF) -- The largest volume of flow anticipated to occur during a continuous 30-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.

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

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 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.

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.

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.

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 or a multiple of the method detection limit. The Permittee must ensure that the analytical lab derives QLs for each analyte according to the procedures documented in the specific analytical method used by the lab.

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).

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.

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 BOD₅ -- 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 BOD₅ 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 BOD₅ 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 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.

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.

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.

Appendix D--Monitoring Data

The following tables summarize the reclaimed water quality data reported to Ecology in monthly Discharge Monitoring Reports (DMRs) between December 2011 and January 2018.

Reclaimed Water Monitoring Data, 2011-2018

Facility: King County - Brightwater Reclaimed Water Facility

Permit No: ST0045498

Monitoring Point: Membrane Effluent Box

Description : Reclaimed water prior to disinfection (continued)

Monitoring Month	Minimum Dissolved Oxygen mg/L	Monthly Average BOD ₅ mg/L	Highest Weekly Average BOD ₅ mg/L	Monthly Average Total Suspended Solids mg/L	Highest Weekly Average Total Suspended Solids mg/L	Average Turbidity NTU	Maximum Turbidity NTU
December-11	1.30	1.0	1.0	2.0	2.0	0.10	0.11
February-12	0.70	1.0	1.0	2.0	2.0	0.06	0.11
March-12	0.48	1.0	1.3	2.0	2.0	0.05	0.06
May-12	0.38	1.1	1.2	2.0	2.0	0.05	0.07
June-12	0.60	1.0	1.0	2.0	2.0	0.06	0.28
July-12	0.44	1.0	1.0	2.0	2.0	0.08	0.13
August-12	0.54	1.3	3.1	2.0	2.0	0.12	0.29
September-12	0.35	2.0	3.2	2.0	2.0	0.10	0.28
October-12	0.28	1.4	1.6	2.0	3.0	0.10	0.28
June-13	0.38	1.7	2.3	2.3	2.3	0.08	0.12
July-13	0.36	1.6	3.3	2.2	3.0	0.07	0.20
August-13	2.14	1.5	2.0	3.0	4.0	0.08	0.32
September-13	1.53	1.3	1.4	2.2	2.5	0.08	0.17
October-13	1.43	1.0	1.0	2.0	2.0	0.10	0.15
November-13	1.25	1.1	1.3	2.0	2.0	0.09	0.12
December-13	3.01	1.0	1.1	2.0	2.0	0.11	0.11
January-14	2.33	1.0	1.4	2.0	2.0	0.09	0.10
February-14	4.21	1.0	1.4	2.0	2.0	0.06	0.08
March-14	3.28	1.0	1.4	2.0	2.0	0.10	0.25
April-14	1.83	1.1	1.3	2.0	2.0	0.07	0.13
May-14	2.01	1.1	1.2	2.0	2.0	0.07	0.12
June-14	2.25	1.1	1.1	2.0	2.0	0.08	0.23
July-14	0.77	1.2	1.3	2.0	2.1	0.07	0.20
August-14	1.63	1.7	2.1	2.3	2.4	0.07	0.19
September-14	2.15	1.1	1.4	2.1	2.2	0.07	0.35
October-14	2.51	1.1	1.3	2.0	2.1	0.07	0.13
November-14	4.17	1.0	1.3	2.0	2.0	0.08	0.11
December-14	1.31	1.0	1.1	2.0	2.0	0.07	0.11
January-15	2.96	1.1	1.2	2.3	2.1	0.12	0.13
February-15	5.47	1.1	1.1	2.0	2.0	0.06	0.10
March-15	3.29	1.1	1.4	2.0	2.0	0.09	0.16
April-15	0.00	1.0	1.0	2.0	2.1	0.06	0.11

Fact Sheet for Reclaimed Water Permit No. ST0045498

King County Brightwater Reclaimed Water Facilities

Effective Date: XX XX, 20XX

Page 37 of 43

Monitoring Month	Minimum Dissolved Oxygen mg/L	Monthly Average BOD ₅ mg/L	Highest Weekly Average BOD ₅ mg/L	Monthly Average Total Suspended Solids mg/L	Highest Weekly Average Total Suspended Solids mg/L	Average Turbidity NTU	Maximum Turbidity NTU
May-15	1.05	1.0	1.1	2.1	2.1	0.08	0.15
June-15	2.12	1.4	1.6	2.2	2.3	0.06	0.14
July-15	2.03	1.2	1.7	2.4	2.8	0.08	0.15
August-15	1.18	1.1	1.2	2.1	2.1	0.07	0.14
September-15	0.85	1.0	1.1	2.0	2.0	0.10	0.16
October-15	0.95	1.0	1.1	2.0	2.0	0.07	0.19
November-15	3.40	1.0	1.0	2.0	2.0	0.07	0.13
December-15	0.78	1.0	1.0	2.0	2.0	0.06	0.11
January-16	1.42	1.0	1.0	2.0	2.0	0.13	0.14
February-16	1.05	1.1	1.1	2.3	2.2	0.05	0.09
March-16	2.40	1.0	1.0	2.0	2.1	0.07	0.12
April-16	0.60	1.1	1.1	2.0	2.0	0.07	0.12
May-16	0.67	1.0	1.1	2.0	2.2	0.07	0.13
June-16	0.66	1.1	1.2	2.1	2.2	0.09	0.13
July-16	0.66	1.2	1.3	2.3	2.7	0.07	0.13
August-16	0.64	1.1	1.2	2.0	2.0	0.09	0.15
September-16	0.61	1.1	1.3	2.0	2.0	0.09	0.17
October-16	0.58	2.0	3.1	2.0	2.0	0.11	0.38
November-16	0.81	1.0	1.0	2.0	2.0	0.10	0.12
December-16	0.80	1.0	1.0	2.0	2.0	0.10	0.19
January-17	0.73	1.0	1.0	2.0	2.0	0.08	0.09
February-17	1.70	1.0	1.0	2.0	2.0	0.08	0.09
March-17	0.77	1.0	1.0	2.0	2.0	0.08	0.09
April-17	1.06	1.0	1.0	2.0	2.0	0.07	0.12
May-17	0.71	1.1	1.2	2.0	2.0	0.09	0.14
June-17	0.59	1.4	1.5	2.0	2.2	0.06	0.11
July-17	0.57	2.5	2.8	2.2	2.3	0.09	0.15
August-17	1.70	2.0	2.5	2.5	3.2	0.09	0.26
September-17	1.97	2.8	6.1	2.2	2.4	0.07	0.23
October-17	2.55	3.9	4.0	2.0	2.0	0.08	0.12
November-17	2.83	3.2	4.9	2.1	2.6	0.08	0.09
December-17	3.55	1.6	2.6	2.9	5.7	0.08	0.08
January-18	4.79	1.9	1.9	2.0	2.0	0.09	0.09
<i>Statistics</i>							
Min	0.00	1.0	1.0	2.0	2.0	0.05	0.06
Max	5.47	3.9	6.1	3.0	5.7	0.13	0.38
Average	1.57	1.3	1.6	2.1	2.2	0.08	0.15
Median	1.18	1.1	1.2	2.0	2.0	0.08	0.13
95th Percentile	0.36	2.4	3.3	2.4	3.0	0.11	0.29
Limits	>0.2	30	45	30	45	0.2	0.5

Reclaimed Water Monitoring Data, 2011-2018

Facility: King County - Brightwater Reclaimed Water Facility

Permit No: ST0045498

Monitoring Point: Disinfection Building

Description: Reclaimed Water to Brightwater Environmental Center

	Average Monthly Flow	Maximum Monthly Flow	Minimum Daily pH	Maximum Daily pH	Total Coliforms, Single-sample Maximum	Total Coliforms, Highest 7-day median for period	Minimum Total Residual Chlorine
Monitoring Month	gpd	gpd	Standard Units	Standard Units	#/100ml	#/100ml	mg/L
December-11	1083	1735	6.2	6.4	0.0	0.0	1.3
February-12	878	878	6.6	6.8	0.0	0.0	2.9
March-12	551	758	6.0	6.6	0.0	0.0	1.2
May-12	4351	11605	6.0	6.6	1.0	0.0	1.8
June-12	2541	9253	6.0	6.7	0.0	0.0	1.8
July-12	1963	6796	6.0	7.5	0.7	0.2	1.1
August-12	2567	6531	6.0	7.6	3.7	0.7	1.3
September-12	1644	2599	6.3	7.5	2.0	0.2	1.6
October-12	928	2392	6.0	7.1	0.0	0.0	1.3
July-13	3489	4160	6.1	6.6	0.0	0.0	1.5
August-13	4777	11421	6.1	6.8	0.0	0.0	1.0
September-13	2687	4937	6.1	6.8	12.0	0.6	1.0
October-13	2178	3307	6.0	7.1	0.0	0.2	1.0
November-13	2502	3783	6.1	7.7	5.0	0.4	1.0
December-13	1095	1095	6.7	6.7	0.0	0.0	1.1
January-14	634	943	6.6	6.7	0.0	0.0	2.3
February-14	1280	1555	6.5	6.6	0.0	0.0	2.2
March-14	5164	7574	6.1	6.8	0.0	0.0	1.0
April-14	1163	2050	6.1	7.6	0.0	0.0	1.0
May-14	1274	2329	6.1	7.2	0.0	0.1	1.0
June-14	2875	3834	6.2	7.1	0.0	0.1	1.1
July-14	2669	3806	6.1	7.3	0.0	0.0	1.1
August-14	3161	3841	6.2	7.4	0.0	0.0	1.0
September-14	1633	2855	6.1	7.7	6.0	0.0	1.0
October-14	12.04	2385	6.2	7.3	0.0	0.0	1.0
November-14	1047	1061	6.6	7.3	3.0	0.0	1.3
December-14	952	999	6.5	7.2	0.0	0.0	2.1
January-15	969	1007	6.7	7.1	3.3	0.2	1.5
February-15	1041	1084	6.6	7.1	4.3	0.0	1.2
March-15	1431	2450	6.4	6.9	1.0	0.1	1.0
April-15	1901	2616	6.0	7.0	0.7	0.1	1.0

Fact Sheet for Reclaimed Water Permit No. ST0045498

King County Brightwater Reclaimed Water Facilities

Effective Date: XX XX, 20XX

Page 39 of 43

	Average Monthly Flow	Maximum Monthly Flow	Minimum Daily pH	Maximum Daily pH Daily	Total Coliforms, Single-sample Maximum	Total Coliforms, Highest 7-day median for period	Minimum Total Residual Chlorine
Monitoring Month	gpd	gpd	Standard Units	Standard Units	#/100ml	#/100ml	mg/L
May-15	2375	5518	6.3	6.9	0.0	0.0	1.0
June-15	3223	6726	6.5	7.0	0.0	0.0	1.0
July-15	2901	4828	6.2	7.2	0.0	0.0	1.2
August-15	1691	3113	6.4	7.1	0.0	0.0	1.1
September-15	943	1215	6.1	9.0	0.0	0.0	2.5
October-15	981	1599	6.4	7.2	0.0	0.0	1.3
November-15	1036	1125	6.5	7.0	0.0	0.0	1.2
December-15	992	1038	6.5	6.9	0.0	0.0	1.0
January-16	931	943	6.6	6.9	0.0	0.0	2.0
February-16	944	956	6.5	6.9	0.0	0.0	1.4
March-16	981	1081	6.7	7.0	0.0	0.0	1.5
April-16	1256	2095	6.6	7.0	0.0	0.0	1.0
May-16	1109	1813	6.5	7.3	0.7	0.0	1.0
June-16	1488	2999	6.5	7.0	0.0	0.0	1.0
July-16	2725	5395	6.5	6.9	3.0	0.2	1.0
August-16	3960	5799	6.5	7.0	0.0	0.0	1.0
September-16	2271	4184	6.5	7.0	0.0	0.0	1.0
October-16	1706	2662	6.6	7.3	0.0	0.0	1.1
November-16	1035	1117	6.5	7.0	0.0	0.0	1.2
December-16	1001	1052	6.6	6.9	0.0	0.0	1.2
January-17	1049	1144	6.6	6.9	0.0	0.0	1.1
February-17	954	998	6.7	6.9	0.0	0.0	1.0
March-17	961	993	6.7	6.9	9.0	0.0	1.0
April-17	627	962	6.6	6.9	0.0	0.0	1.0
May-17	1899	4883	6.6	7.3	10.0	0.0	1.0
June-17	2523	4179	6.7	7.3	0.0	0.0	1.0
July-17	3152	4975	6.8	7.3	0.7	0.1	1.0
August-17	3396	6555	6.9	8.5	0.0	0.0	1.0
September-17	2098	423	6.8	7.5	0.0	0.0	1.1
October-17	1141	1266	6.7	7.3	1.0	1.0	1.3
November-17	1114	1194	6.7	7.0	1.0	1.0	1.7
December-17	1117	1192	6.7	7.0	1.0	1.0	1.2
January-18	1147	1147	7.0	7.1	1.0	1.0	1.4
<i>Summary</i>							
<i>Statistics</i>							
Min	12.04	423	6.0	6.4	0.0	0.0	1.0
Max	5164	11605	7.0	9.0	12.0	1.0	2.9
Average	1799	3075	6.4	7.1	1.1	0.1	1.3
Median	1277	2357	6.5	7.0	0.0	0.0	1.1
95th Percentile	3889	7457	6.0	7.7	5.8	1.0	1.0
Limits			6.0	9.0	23.0	2.2	1.0

Fact Sheet for Reclaimed Water Permit No. ST0045498

King County Brightwater Reclaimed Water Facilities

Effective Date: XX XX, 20XX

Page 40 of 43

Reclaimed Water Monitoring Data, 2011-2018

Facility: King County - Brightwater Reclaimed Water Facility

Permit No: ST0045498

Monitoring Point: Influent Pump Station

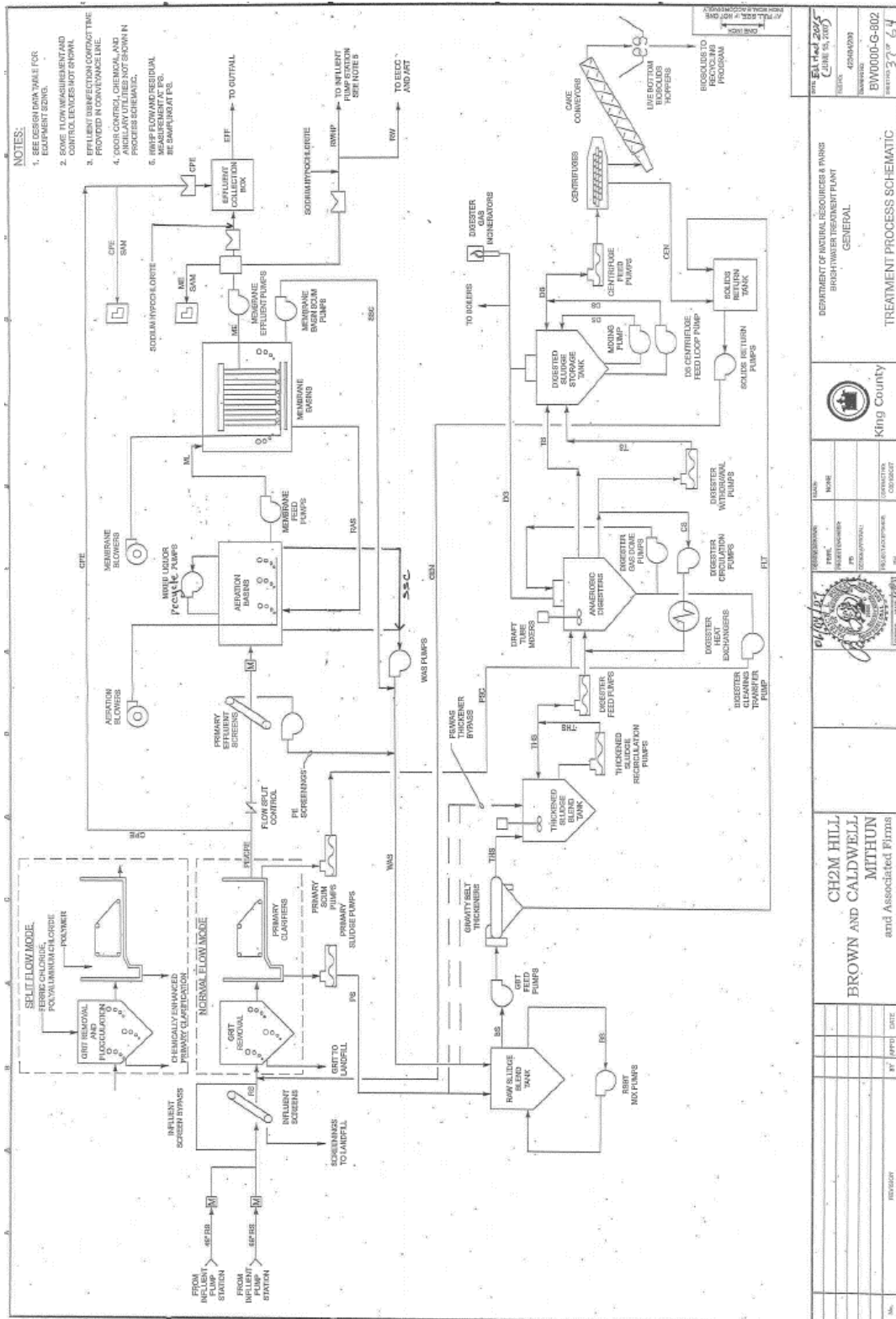
Description: Reclaimed water to distribution system

	Average Monthly Flow	Maximum Monthly Flow	Maximum Daily pH	Minimum Daily pH	Total Coliforms, Single-sample Maximum	Total Coliforms, Highest 7-day median for period	Minimum Total Residual Chlorine	Average Turbidity	Maximum Turbidity	Minimum Total Residual Chlorine at York Pump Station
Monitoring Month	MGD	MGD	Standard Units	Standard Units	#/100ml	#/100ml	mg/L	NTU	NTU	mg/L
June-13	0.354	0.951	7.1	6.0	0.0	e	1.00	0.00	0.06	e
July-13	0.558	1.014	7.0	6.0	0.0	0.0	1.00	0.05	0.30	0.52
August-13	0.412	1.000	7.5	6.0	21.5	0.0	1.00	0.04	0.19	0.12
September-13	0.134	0.000	7.8	6.1	0.0	0.0	1.01	0.05	0.16	0.52
May-14	0.531	1.000	7.5	6.1	0.0	0.0	0.55	0.08	0.24	0.70
June-14	0.341	1.000	7.2	6.2	0.7	0.0	0.50	0.05	0.21	0.50
July-14	0.491	1.000	7.3	6.1	0.3	0.0	1.00	0.05	0.49	0.50
August-14	0.418	1.000	7.4	6.1	1.0	0.0	1.00	0.05	0.30	0.50
September-14	0.275	0.000	7.9	6.2	0.0	0.0	1.00	0.04	0.38	0.50
December-14	0.025	0.000	7.1	6.4	0.3	0.0	1.40	0.04	0.07	0.60
May-15	0.357	1.190	7.0	6.3	0.0	0.0	1.00	0.07	0.40	0.53
June-15	0.485	1.000	7.5	6.2	0.0	0.0	1.00	0.04	0.18	0.60
July-15	0.514	1.000	6.9	6.3	8.7	0.0	1.00	0.05	0.45	0.50
August-15	0.415	1.000	7.7	6.1	0.0	0.0	1.00	0.04	0.10	0.50
September-15	0.187	0.000	7.1	6.4	0.7	0.0	1.00	0.04	0.15	0.50
October-15	0.098	0.000	8.1	6.1	0.0	0.0	1.00	0.05	0.30	0.60
May-16	0.324	0.763	7.5	6.0	4.7	0.0	1.00	0.08	0.50	0.50
June-16	0.373	0.965	7.0	6.5	7.0	0.0	1.00	0.10	0.48	0.50
July-16	0.398	0.764	7.5	6.4	0.3	0.0	1.00	0.06	0.48	0.50
August-16	0.530	1.083	7.0	6.3	0.0	0.0	1.00	0.06	0.49	0.50
September-16	0.074	0.771	7.0	6.4	7.0	0.0	1.00	0.04	0.43	0.50
October-16	c	c	7.2	6.2	0.7	c	c	c	c	c
May-17	0.650	0.842	6.8	6.1	0.3	0.0	1.00	0.09	0.50	0.50
June-17	0.343	0.758	7.3	6.7	0.0	0.0	1.00	0.05	0.31	0.50
July-17	0.654	1.144	7.2	6.4	6.0	0.0	1.00	0.08	0.50	0.50
August-17	0.513	0.800	8.0	6.3	0.0	0.0	1.00	0.05	0.50	0.50
September-17	0.647	1.057	7.7	6.5	0.0	0.0	1.00	0.07	0.45	0.50
October-17	0.217	0.472	8.2	6.4	1.0	1.0	1.10	0.04	0.09	0.50
Statistics										
Min	0.025	0.000	6.8	6.0	0.0	0.0	0.50	0.00	0.06	0.12
Max	0.654	1.190	8.2	6.7	21.5	1.0	1.40	0.10	0.50	0.70
Average	0.382	0.762	7.4	6.2	2.2	0.0	0.98	0.05	0.32	0.51
Median	0.398	0.965	7.3	6.2	0.3	0.0	1.00	0.05	0.31	0.50
95th Percentile	0.649	1.126	8.1	6.0	8.1	0.0	1.07	0.09	0.50	0.50
Limits	21.0		6.0	9.0	23	2.2	1.0			0.5

e = monitoring not conducted

c = no discharge

Appendix E--Process Flow Diagram

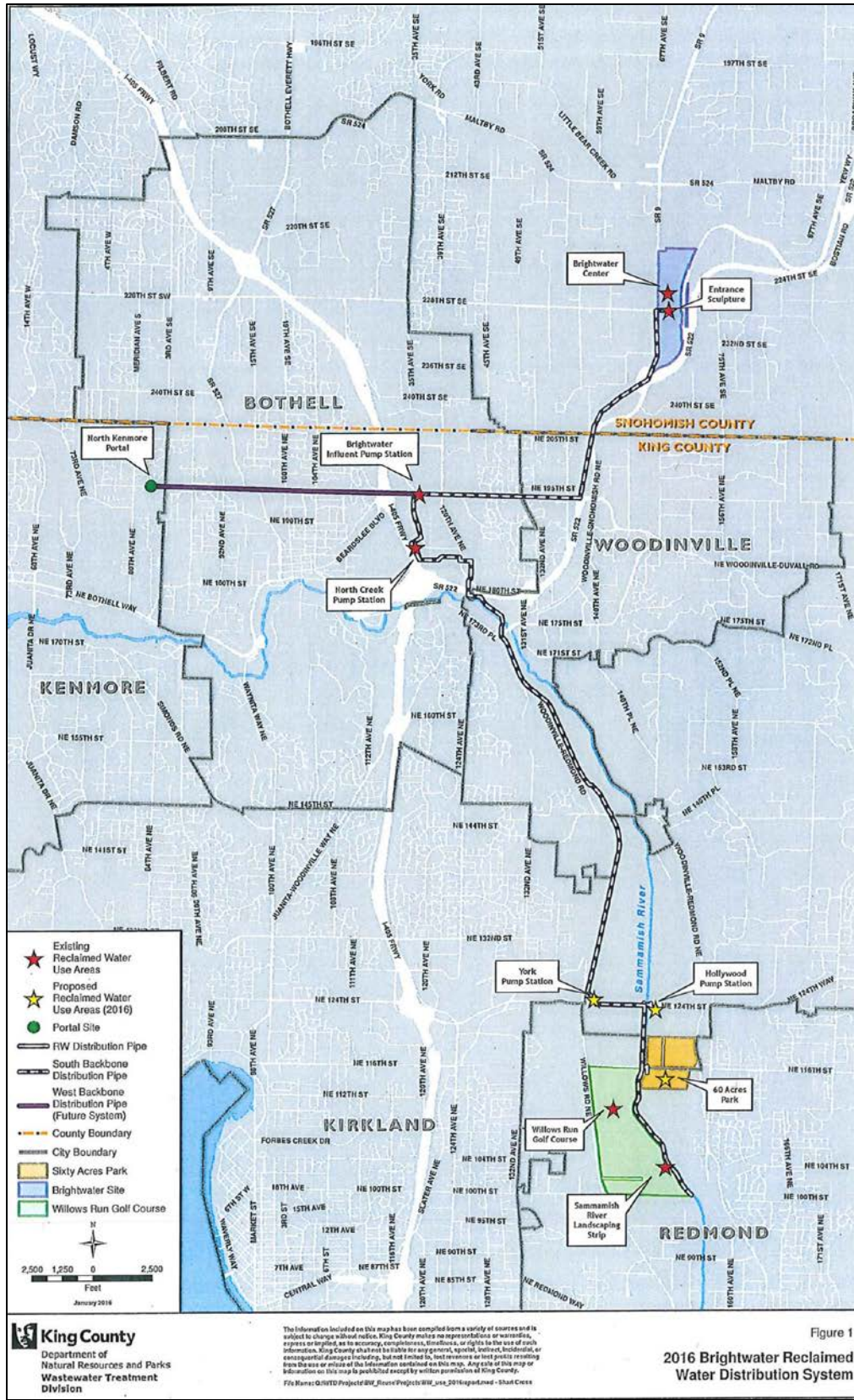


Fact Sheet for Reclaimed Water Permit No. ST0045498

King County Brightwater Reclaimed Water Facilities

Effective Date: XX XX, 20XX

Page 42 of 43



Appendix F--Response to Comments

This section will be completed after the Public Notice of Draft comment period.