



Fact Sheet

Public Comment Start Date: September 6, 2016
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**United States Environmental Protection Agency (EPA)
Proposed Issuance of a National Pollutant Discharge Elimination System
(NPDES) Permit to Discharge Pollutants Pursuant to the Provisions
of the Clean Water Act**

to

Paradise Wastewater Treatment Facility

in

Mount Rainier National Park

and the

**State of Washington
Department of Ecology
CWA § 401 Certification**

EPA Proposes NPDES Permit Re-issuance

EPA proposes to reissue a *National Pollutant Discharge Elimination System* (NPDES) permit for the facility referenced above. The draft permit places conditions on the discharge of pollutants from the wastewater treatment plant to waters of the United States in order to ensure protection of water quality and human health. The permit places limits on the types and amounts of pollutants that can be discharged from the facility.

This Fact Sheet includes:

- information on public comment, public hearing, and appeal procedures
- a listing of proposed effluent limitations and other conditions for the facility
- a map and description of the discharge location
- technical material supporting the conditions in the permit

Clean Water Act (CWA) § 401 Certification.

EPA has requested that the Washington Department of Ecology (Ecology) certify the NPDES permit pursuant to Clean Water Act (CWA) section 401 (CWA § 401), 33 U.S.C. § 1341. EPA may not issue the NPDES permit until the State has granted, denied or waived certification.

On August 23, 2016, Ecology provided EPA with a draft CWA § 401 Certification that can be found in Appendix B.

Comments regarding Ecology's draft certification should be submitted directly to the Department of Ecology as indicated in the Public Comment section below. For more information, please contact Greg Zentner at (360) 407-6368.

Public Comment

Persons wishing to comment on, or request a Public Hearing for the draft permit for this facility may do so in writing by the expiration date of the Public Comment period. A request for a Public Hearing must state the nature of the issues to be raised as well as the requester's name, address and telephone number. All comments and requests for Public Hearings must be in writing and should be submitted to EPA as described in the Public Comments Section of the attached Public Notice.

Persons wishing to comment on the State Certification may do so in writing no later than the public notice expiration date to:

Greg Zentner
Washington Department of Ecology
Southwest Regional Office, Water Quality Program
PO Box 47600
Olympia, WA 98504-7600

or via email to the following address: GZEN461@ecy.wa.gov

After the public comment period expires and all significant comments are considered, EPA's regional Director of the Office of Water and Watersheds will make a final decision regarding permit issuance. If no comments request a change in the draft permit, the tentative conditions become final, and the permit will become effective upon issuance. If comments are submitted, EPA will prepare a response to comments document, and, if necessary, will make changes to the draft permit. After making any necessary changes, EPA will obtain a final CWA § 401 certification from Ecology and issue the permit with a response to comments. The permit will become effective no earlier than 33 days after the issuance date, unless the permit is appealed to the Environmental Appeals Board within 30 days, pursuant to 40 CFR § 124.19.

Documents are Available for Review

The Administrative Record for the draft Permit primarily consists of the permit application, draft Permit, Fact Sheet and the documents referenced in this Fact Sheet. These are available upon request by contacting Cindi Godsey at (206) 553-1676 or godsey.cindi@epa.gov, or at the above Seattle address. The draft NPDES permit and related documents can be reviewed or obtained by visiting or contacting EPA's Regional Office in Seattle between 8:30 a.m. and 4:00 p.m., Monday through Friday.

United States Environmental Protection Agency
Region 10
1200 Sixth Avenue, Suite 900 OWW-191
Seattle, Washington 98101
(206) 553-0523 or
1-800-424-4372 (within Alaska, Idaho, Oregon and Washington)

The Draft permit and Fact Sheet can be found by visiting the Region 10 website at www.epa.gov/r10earth/water.htm.

The fact sheet and draft permit are also available at:

Washington Department of Ecology
Southwest Regional Office, Water Quality Program
300 Desmond Drive
Lacey, WA 98503

For technical questions regarding the draft permit or fact sheet, contact Cindi Godsey at (206) 553-1676 or godsey.cindi@epa.gov. Services can be made available to persons with disabilities by contacting Audrey Washington at washington.audrey@epa.gov or (206) 553-0523.

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Acronyms

AML	Average Monthly Limit
AWL	Average Weekly Limit
BOD ₅	Biochemical oxygen demand, five-day
°C	Degrees Celsius
CFR	Code of Federal Regulations
CV	Coefficient of Variation
CWA	Clean Water Act
DMR	Discharge Monitoring Report
DO	Dissolved oxygen
EPA	U.S. Environmental Protection Agency
HUC	Hydrologic Unit Code
lbs/day	Pounds per day
LTA	Long Term Average
mg/L	Milligrams per liter
ML	Minimum Level
µg/L	Micrograms per liter
mgd	Million gallons per day
MDL	Maximum Daily Limit or Method Detection Limit
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
O&M	Operations and maintenance
QAP	Quality assurance plan
RP	Reasonable Potential
TBEL	Technology-based Effluent Limitation
TMDL	Total Maximum Daily Load
TRC	Total Residual Chlorine
TSD	Technical Support Document for Water Quality-based Toxics Control (EPA/505/2-90-001)
TSS	Total suspended solids
USGS	United States Geological Survey
WET	Whole Effluent Toxicity
WQBEL	Water quality-based effluent limit
WQS	Water Quality Standards
WWTP	Wastewater treatment plant

I. Applicant

A. General Information

This fact sheet provides information on the draft NPDES permit for the following entity:

Paradise Wastewater Treatment Facility
Mount Rainier National Park
NPDES Permit # WA0025569

Physical Address:
1 Wastewater Drive
Paradise Developed Area, Mount Rainier National Park

Mailing Address:
55210 238th Ave East
Ashford, WA 98304

Contact:
James Minor
Chief of Maintenance
360-569-6712

B. Permit History

The Paradise Wastewater Treatment Plant (WWTP) was first issued a permit in 1974. This permit expired on January 31, 1976, and the facility has operated without permit coverage since that time. In a letter dated August 29, 1979, the EPA notified the National Park Service (NPS) that the facility's application had been received but that the EPA was unable to issue a permit in the near future due to budget constraints. The letter laid out specific effluent limitations for BOD, TSS, Ammonia, and Total Coliform.

A Federal Facility Compliance Agreement (FFCA) (CWA-10-2012-0096) between the U.S. Department of the Interior and the EPA was put into place in June 2012 and required NPS to submit an updated and complete NPDES application no later than September 30, 2012. It also specified treatment, monitoring, and various other requirements for the facility to follow until an NPDES permit was issued. An updated NPDES application for permit issuance was submitted by September 30, 2012. The EPA requested additional information which was submitted on January 17, 2013, and on April 2, 2015. In a letter dated April 29, 2015, the application was deemed complete as of April 2, 2015.

II. Facility Information

A. Treatment Plant Description

The NPS owns, operates, and maintains the Paradise WWTP located in Mount Rainier National Park, Washington. The WWTP receives raw sewage from Park facilities, primarily the Paradise Inn. The treatment process includes both

primary and secondary treatment, as well as chlorine disinfection and dechlorination.

The plant was rebuilt in 1994 with extensions to the building and a major upgrade of treatment capability. The plant currently consists of a comminuter at the influent pipe, followed by a flow measuring flume. This leads to a 30,000 gallon sub-surface equalization tank, a 72,000 gallon (three section) aeration basin, two parallel 16,000 gallon secondary clarifiers, a 21,000 gallon surge tank, a 3,800 gallon sand filter, a 3,120 gallon chlorine contact chamber, and finally a dechlorination tank. The WWTP discharges treated wastewater to a man-made ditch that conveys the effluent to the Nisqually River.

The collection system has no combined sewers or industrial users. The facility serves a seasonal tourist population with a maximum of approximately 4,000 people per day in the summer months and 800 people per day in the winter months. The design flow of the facility is 0.09 million gallons per day (mgd). According to the permit application, the average daily flow rate has been 0.02 or 0.03 mgd for the previous three years, but maximum daily flow above the design flow, ranging from 0.13 to 0.16 mgd, has been documented during that same period.

See Appendix A for Facility Maps and Diagrams.

B. Background Information

Effluent Characterization

In order to determine pollutants of concern for further analysis, EPA evaluated the application form, additional discharge data, and the nature of the discharge. The wastewater treatment process for this facility includes both primary and secondary treatment, as well as chlorination and dechlorination. The following pollutants are typical of a sewage treatment plant disinfecting with chlorine and would be expected in the discharge:

5-day Biochemical Oxygen Demand	Temperature
Total Suspended Solids	Ammonia
Fecal Coliform	Nitrogen
Total Residual Chlorine	Phosphorus
pH	Dissolved Oxygen

The concentrations of pollutants in the discharge reported in the NPDES application and additional monitoring data provided by the facility were used in determining reasonable potential for several parameters (see Appendix C).

Facility Compliance

In August 2011, the facility released as much as 200,000 gallons of minimally treated sewage due to the plant operator failing to stop the build-up of solid waste in the WWTP. The filters became clogged and the advanced treatment portion of the plant stopped operating properly. The operator used a bypass around the advanced treatment and surge storage tank. As a result, minimally

treated sewage was dumped directly into the drainage ditch and flowed into the waterfall and Nisqually River between August 27 and August 30, 2011. Some mitigation occurred on August 30, 2011 to reduce flow and provide chlorination.

The United States Public Health Service (USPHS) had inspected the facility on August 18, 2011, and noted some process deficiencies, such as leaving sewage for holding and not aerating, and sewage bulking up over the weir into the filtration system. EPA conducted an inspection of the facility on September 7, 2011, and did not find any significant problems with plant operations at that time.

EPA issued a Notice of Violation to NPS on November 21, 2011, for discharges of pollutants not authorized under the CWA. The facility was required to submit a written response describing the efforts that had or would be made to obtain authorization to discharge under the CWA and prevent discharges such as those that occurred in August 2011.

The facility reported upsets on an older permit application due to infiltration during precipitation or snowmelt, as well as greater than anticipated use in summer months. The plant was rebuilt in 1994 with extensions to the current building and a major upgrade of its treatment capability, but has still experienced repeated effluent violations for TSS, as well a few violations for ammonia, based on limits set in the FFCA.

The facility believes TSS violations occur because the plant receives higher flows than it was designed to manage. The hydraulic overloading reduces retention and treatment time, thereby reducing settling and clarification time, and resulting in increased suspended solids. The facility has made efforts to adjust their process to deal with high flows, but has also begun the process to obtain funding for plant upgrades.

The facility noted that low organic loads during the summer months make nutrient removal challenging leading to the possible ammonia violations. However, measurements may not have been completely accurate due to use of the Nessler reagent color wheel for testing. The facility is exploring different testing methodologies.

In reviewing the reports submitted for 2015, EPA found no violations of TSS or the percent removal requirements. All values for ammonia were below the required value in the FFCA.

III. Receiving Water

The WWTP discharges on the slope of the Nisqually Vista at 121° 45' 1.3"W, 46° 47' 8.8"N. From there, the discharge flows around 1000 feet in its own channel roughly parallel to Deadhorse Creek and into the Nisqually River, within Mount Rainier National Park. The outfall in the Nisqually River is located just below the Nisqually Glacier, about 35 miles upstream of Alder Dam.

A. Low Flow Conditions

The *Technical Support Document for Water Quality-Based Toxics Control* (hereafter referred to as the TSD) (EPA, 1991) and the Washington Water

Quality Standards (WQS) recommend flow conditions for use in calculating water quality-based effluent limitations (WQBELs) using steady-state modeling.

The location of the discharge to the Nisqually River is very near the headwaters, with a drainage area of only 5.25 square miles¹. The stream is primarily fed by glacial melt and in the winter, flows are frozen or nonexistent. Because of this, the critical low flow condition for this permit is considered to be zero in developing the draft permit effluent limitations. As such, no mixing zone is authorized for the discharge.

B. Water Quality Standards

Overview

CWA § 301(b)(1)(C) requires the development of limitations in permits necessary to meet WQS. Federal regulations at 40 CFR 122.4(d) require that conditions in NPDES permits ensure compliance with the WQS of all affected States. A State's WQS are composed of use classifications, numeric and/or narrative water quality criteria and an anti-degradation policy.

The use classification system designates the beneficial uses that each water body is expected to achieve, such as drinking water supply, contact recreation, and aquatic life. The numeric and narrative water quality criteria are the criteria deemed necessary by the State to support the beneficial use classification of each water body. The anti-degradation policy represents a three-tiered approach to maintain and protect various levels of water quality and uses.

Designated Beneficial Uses

This facility discharges to the Nisqually River in the Nisqually Basin (HUC 17110015). The Nisqually River above Tahoma Creek is protected for the following designated uses (WAC 173-201A-600):

- Char Spawning/Rearing
- Extraordinary Primary Contact Recreation

Additionally, the Washington WQS state that all waters within National Parks are protected as core summer salmonid habitat and that all non-marine waters of the State of Washington are protected for domestic, industrial, and agricultural water supply, stock watering, wildlife habitat, harvesting, commerce and navigation; boating, and aesthetic values.

Surface Water Quality Criteria

The criteria are found in the following sections of the Washington WQS:

- The narrative criteria applicable to all surface waters of the State are found at WAC 173-201A-240, WAC 173-201A-250, and WAC 173-201A-260

¹ Determined using USGS Washington StreamStats

- The numeric criteria for toxic substances for the protection of aquatic life and primary contact recreation are found at WAC 173-201A-240
- Additional numeric criteria necessary for the protection of aquatic life, water supply, and recreation uses can be found at WAC 173-201A-200

C. Water Quality Limited Waters

Some tributaries in the lower Nisqually watershed are water quality limited and a Total Maximum Daily Load (TMDL) has been prepared. However, the Nisqually River at the point of discharge has not been assessed for impairments. As such, there is no applicable TMDL to incorporate into the draft permit.

IV. Effluent Limitations

A. Basis for Effluent Limitations

In general, the CWA requires that the effluent limitations for a particular pollutant be the more stringent of either technology-based effluent limitations (TBELs) or WQBELs. TBELs are set according to the level of treatment that is achievable using available technology. A WQBEL is designed to ensure that the WQS applicable to a waterbody are being met and may be more stringent than TBELs. The basis for the effluent limitations proposed in the draft permit is provided in Appendix C.

B. Proposed Effluent Limitations

Below are the proposed effluent limitations that are in the draft permit.

Narrative limitation to protect Washington's narrative criteria for toxics and aesthetics

The permittee must not discharge toxic, radioactive, or deleterious material in concentrations that have the potential, either singularly or cumulatively, to adversely affect characteristic water uses, cause acute or chronic conditions to the most sensitive biota dependent upon those waters, or adversely affect public health.

Aesthetic values shall not be impaired by the presence of materials or their effects, excluding those of natural origin, which offend the senses of sight, smell, touch, or taste, as a result of discharge from the facility.

Narrative secondary treatment percent removal requirements

Removal Requirements for 5-Day Biochemical Oxygen Demand (BOD₅) and Total Suspended Solids (TSS): Percent removal of BOD₅ and TSS must be reported on the Discharge Monitoring Reports (DMRs). For each parameter, the monthly average percent removal must be calculated from the arithmetic mean of the influent values and the arithmetic mean of the effluent values for that month. Influent and effluent samples must be taken over approximately the same time period.

Table 1 presents the proposed average monthly, average weekly, and maximum daily effluent limitations.

Table 1: Proposed Effluent Limitations				
Parameter	Units	Effluent Limitations¹		
		Average Monthly Limit	Average Weekly Limit	Maximum Daily Limit
BOD ₅	mg/L	10	15	—
	lb/day	7.5	11.3	—
	% removal	—	—	—
TSS	mg/L	10	15	—
	lb/day	7.5	11.3	—
	% removal	—	—	—
pH ¹	s.u.	6.5 - 8.5		
Fecal Coliform Bacteria ²	#/100 ml	50	—	100
Total Residual Chlorine ³	ug/L	9.1	—	19.0
	lb/day	0.007	—	0.014
Total Ammonia as N	mg/L	1.8	—	3.5
	lb/day	1.4	—	2.6

1. No human-caused variation within the above range of 0.2 units or more.
2. Geometric monthly mean, and, in addition, no more than 10 percent of the samples obtained for calculating the geometric mean density shall exceed 100 colonies/100 ml.
3. For purposes of calculating monthly averages for TRC, see Permit Parts I.B.7. and 8. The resulting average value is compared to the compliance level, the ML of 50 ug/L (0.04 lbs/day), to determine compliance.

C. Limitation Changes from the Federal Facility Compliance Agreement

Most limitations remain the same as required under the FFCA and none are less stringent.

Fecal Coliform is used in place of Total Coliform and the limitations are more stringent than under the FFCA based on the state WQS requirements for waters with the designated use of extraordinary primary contact recreation.

It was unclear in the FFCA whether the ammonia limit was a Daily Maximum or Average Weekly limitation. Appendix C includes the assumptions and calculations used in determining the ammonia criteria and developing effluent limitations.

40 CFR 122.45(d)(1) states that limitations for continuous discharges for a Publically Owned Treatment Work (POTW) must be expressed as average weekly and average monthly values. Even though the Paradise WWTP is not a POTW, the discharges are essentially the same as is the treatment required. Therefore, any subsequent reference to a POTW requirement is based on this similarity in discharge composition and treatment requirements. Average Weekly Limitations (AWLs) are added for BOD₅ and TSS using the Average Monthly Limitation (AML) and a conversion factor of 1.5 to be consistent with ratio utilized in the secondary treatment requirements (40 CFR § 133).

Limitations are added for pH and total residual chlorine based on Washington's WQS and policies.

See Appendix C for a discussion of final effluent limitations, as well as anti-backsliding related to the final limitations.

D. Permit Modifications

This permit may be modified, revoked and reissued, or terminated for cause as specified in 40 CFR 122.62, 122.63, 122.64 according to the requirements of 40 CFR 124.5.

V. Monitoring Requirements

A. Basis for Effluent Monitoring

CWA § 308 and federal regulation at 40 CFR 122.44(i) require monitoring in permits to determine compliance with effluent limitations. Monitoring may also be required to gather effluent and surface water data to determine if additional effluent limitations are required and/or to monitor effluent impacts on receiving water quality.

The effluent monitoring required by the permit will suffice for the completion of NPDES Form 2A when reapplication is required.

The permittee is responsible for conducting the monitoring and for reporting results on Discharge Monitoring Reports (DMRs) or the renewal application, as appropriate, to the EPA.

B. Effluent Monitoring

Monitoring frequencies are based on the nature and effect of the pollutant, as well as a determination of the minimum sampling necessary to adequately monitor the facility's performance. Permittees have the option of taking more frequent samples than are required by the permit. These samples must be used for averaging if they are conducted using EPA-approved test methods (generally found in 40 CFR 136) or as specified in the permit.

Table 2, below, presents the proposed effluent monitoring requirements for the Paradise WWTP. The sampling location for the effluent must be after the last treatment unit and prior to discharge to the receiving water. These samples must also be representative of the volume and nature of the monitored discharge. If no discharge occurs during the reporting period, "no discharge" shall be reported on the DMR.

The permittee must also visually inspect the effluent once a month for any conditions violating the narrative criteria listed in Section IV.B of this fact sheet and report the result on DMRs.

Table 2: Effluent Monitoring Requirements				
Parameter	Units	Sample Location	Sample Frequency	Sample Type
Flow	mgd	Effluent	Continuous	Recording

Table 2: Effluent Monitoring Requirements				
Parameter	Units	Sample Location	Sample Frequency	Sample Type
BOD₅	mg/L	Influent & Effluent	1/week	24-hour composite
	lb/day	Influent & Effluent	1/week	Calculation ¹
	% Removal	--	--	Calculation ²
TSS	mg/L	Influent & Effluent	1/week	24-hour composite
	lb/day	Influent & Effluent	1/week	Calculation ¹
	% Removal	--	--	Calculation ²
pH	standard units	Effluent	1/day	Grab
Fecal coliform³	#/100 ml	Effluent	1/week	Grab
Total Residual Chlorine³	µg/L	Effluent - before & after dechlorination	1/week	Grab
	lb/day	Effluent - before & after dechlorination		Calculation ¹
Total Ammonia as N	mg/L	Effluent	1/week	Grab
	lb/day	Effluent		Calculation ¹
Temperature	°C	Effluent	1/day	Grab

Notes:

1. Loading is calculated by multiplying the concentration in mg/L by the flow in mgd and a conversion factor of 8.34. If the concentration is measured in µg/L, the conversion factor is 0.00834. The flow used is the daily flow for the day the sample was taken.
2. The monthly average percent removal must be calculated from the arithmetic mean of the influent values and the arithmetic mean of the effluent values for that month. Influent and effluent samples must be taken over approximately the same time period.
3. Reporting is required within 24 hours of a maximum daily limit or instantaneous maximum limit violation. See Permit Parts I.B.2 and III.G.

Monitoring Changes from the Federal Facility Compliance Agreement

Monitoring for flow was added because it is needed to calculate mass-based values for some monitored parameters. Monitoring of Total Coliform was replaced by Fecal Coliform to agree with Washington WQS and the monitoring frequency was increased from monthly to weekly. Monitoring for pH was required for influent and effluent in the FFCA, but is only required for the effluent in the draft permit. BOD₅ monitoring frequency was increased from monthly to weekly and monitoring frequency for ammonia and chlorine have been reduced from daily to weekly. These frequencies are adequate to assess compliance with effluent limitations.

C. Reporting

During the period between the effective date of the permit and the submission of the October 2016 DMR, the permittee must either submit monitoring data and other reports in paper form, or must report electronically using NetDMR, a web-based tool that allows permittees to electronically submit DMRs and other required reports via a secure internet connection.

Beginning with the submission of the November DMR (due December 20, 2016), the permittee must submit monitoring data and other reports electronically using NetDMR.

VI. Sludge (Biosolids) Requirements

EPA Region 10 separates wastewater and sludge permitting. EPA has authority under the CWA to issue separate sludge-only permits for the purposes of regulating biosolids. EPA may issue a sludge-only permit to each facility at a later date, as appropriate.

Until issuance of a sludge-only permit, sludge management and disposal activities are subject to the national sewage sludge standards at 40 CFR Part 503 and any requirements of the State's biosolids program under Chapter 173-308 WAC Biosolids Management. The Part 503 regulations are self-implementing, which means that facilities must comply with them whether or not a permit has been issued.

VII. Other Permit Conditions

A. Quality Assurance Plan (QAP)

The federal regulation at 40 CFR 122.41(e) requires the permittee to develop procedures to ensure that the monitoring data submitted is accurate and to explain data anomalies if they occur. The Paradise WWTP is required to develop or update a QAP within 180 days of the effective date of the final permit. The QAP shall consist of standard operating procedures the permittee must follow for collecting, handling, storing and shipping samples, laboratory analysis, and data reporting. The QAP shall be retained on site and be made available to the EPA and/or Ecology upon request.

B. Operation and Maintenance Plan

The permit requires the Paradise WWTP to properly operate and maintain all facilities and systems of treatment and control. Proper operation and maintenance is essential to meeting effluent limitations, monitoring requirements, and all other permit requirements at all times. The permittee is required to develop and implement an operation and maintenance plan for their facility within 180 days of the effective date of the final permit. The plan shall be retained on site and made available to EPA and/or Ecology upon request.

C. Sanitary Sewer Overflows and Proper Operation and Maintenance of the Collection System

Untreated or partially treated discharges from separate sanitary sewer systems are referred to as sanitary sewer overflows (SSOs). SSOs may present serious risks of human exposure when released to certain areas, such as streets, private property, basements, and receiving waters used for drinking water, fishing and shellfishing harvesting, or contact recreation. Untreated sewage contains pathogens and other pollutants, which are toxic. SSOs are not authorized under this permit. Pursuant to the NPDES regulations, discharges from separate

sanitary sewer systems authorized by NPDES permits must meet effluent limitations that are based upon secondary treatment. Further, discharges must meet any more stringent effluent limitations that are established to meet EPA-approved state WQS.

The permit contains language to address SSO reporting and public notice as well as operation and maintenance of the collection system. The permit requires identification of SSO occurrences and their causes. In addition, the permit establishes reporting, record keeping and third party notification about SSOs. Finally, the permit requires proper operation and maintenance of the collection system. The following specific permit conditions apply:

Immediate Reporting – The permittee is required to notify the EPA of an SSO within 24 hours of the time the permittee becomes aware of the overflow. (See 40 CFR 122.41(l)(6))

Written Reports – The permittee is required to provide the EPA a written report within five days of the time it became aware of any overflow that is subject to the immediate reporting provision. (See 40 CFR 122.41(l)(6)(i)).

Third Party Notice – The permit requires that the permittee establish a process to notify specified third parties of SSOs that may endanger health due to a likelihood of human exposure; or unanticipated bypass and upset that exceeds any effluent limitation in the permit or that may endanger health due to a likelihood of human exposure. The permittee is required to develop, in consultation with appropriate authorities at the local, county, tribal and/or state level, a plan that describes how, under various overflow (and unanticipated bypass and upset) scenarios, the public, as well as other entities, would be notified of overflows that may endanger health. The plan should identify all overflows that would be reported and to whom, and the specific information that would be reported. The plan should include a description of lines of communication and the identities of responsible officials. (See 40 CFR 122.41(l)(6)).

Record Keeping – The permittee is required to keep records of SSOs. The permittee must retain the reports submitted to the EPA and other appropriate reports that could include work orders associated with investigation of system problems related to a SSO that describes the steps taken or planned to reduce, eliminate, and prevent reoccurrence of the SSO. (See 40 CFR 122.41(j)).

Proper Operation and Maintenance – The permit requires proper operation and maintenance of the collection system. (See 40 CFR 122.41(d) and (e)). SSOs may be indicative of improper operation and maintenance of the collection system. The permittee may consider the development and implementation of a capacity, management, operation and maintenance (CMOM) program.

The permittee may refer to the Guide for Evaluating Capacity, Management, Operation, and Maintenance (CMOM) Programs at Sanitary Sewer Collection Systems (EPA 305-B-05-002). This guide identifies some of the criteria used by EPA inspectors to evaluate a collection system's management, operation and maintenance program activities. Owners/operators can review their own systems

against the checklist (Chapter 3) to reduce the occurrence of sewer overflows and improve or maintain compliance.

D. Environmental Justice

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, directs each federal agency to “make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities.” EPA is striving to enhance the ability of overburdened communities to participate fully and meaningfully in the permitting process for EPA-issued permits, including NPDES permits. “Overburdened” communities can include minority, low-income, tribal, and indigenous populations or communities that potentially experience disproportionate environmental harms and risks. As part of an agency-wide effort, EPA Region 10 will consider prioritizing enhanced public involvement opportunities for EPA-issued permits that may involve activities with significant public health or environmental impacts on already overburdened communities. For more information, please visit <http://www2.epa.gov/ejscreen>.

As part of the permit development process, EPA Region 10 conducted an “EJSCREEN” to determine whether a permit action could affect overburdened communities. EJSCREEN is a nationally consistent geospatial tool that contains demographic and environmental data for the United States at the census block group level. As a pre-decisional tool, EJSCREEN is used to highlight permit candidates for additional review where enhanced outreach may be warranted.

The EPA also encourages permittees to review (and to consider adopting, where appropriate) Promising Practices for Permit Applicants Seeking EPA-Issued Permits: Ways To Engage Neighboring Communities (see <https://www.gpo.gov/fdsys/pkg/FR-2013-05-09/pdf/2013-10945.pdf>). Examples of promising practices include: thinking ahead about community’s characteristics and the effects of the permit on the community, engaging the right community leaders, providing progress or status reports, inviting members of the community for tours of the facility, providing informational materials translated into different languages, setting up a hotline for community members to voice concerns or request information, follow up, etc.

EPA’s EJSCREEN tool did not identify any potentially overburdened communities because the WWTP discharges within the boundaries of a National Park. During the screening process, EPA considered specific case-by-case circumstances, and EPA concluded that there is no indication that the issuance of this permit would trigger significant environmental justice concerns.

E. Standard Permit Provisions

Permit Parts III, IV and V contain standard regulatory language that must be included in all NPDES permits. The standard regulatory language covers requirements such as monitoring, recording, and reporting requirements, compliance responsibilities, and other general requirements.

VIII. Other Legal Requirements

A. Endangered Species Act

EPA requested and received an ESA list through the USFWS website (<https://ecos.fws.gov/ipac/>) on February 18, 2016. The list included the following species:

Birds	Marbled murrelet (<i>Brachyramphus marmoratus</i>) Northern Spotted owl (<i>Strix occidentalis caurina</i>) Yellow-Billed Cuckoo (<i>Coccyzus americanus</i>)
Conifers and Cycads	Whitebark pine (<i>Pinus albicaulis</i>)
Fishes	Bull Trout (<i>Salvelinus confluentus</i>)
Flowering Plants	Golden Paintbrush (<i>Castilleja levisecta</i>) Marsh Sandwort (<i>Arenaria paludicola</i>)
Mammals	Canada Lynx (<i>Lynx canadensis</i>) Gray wolf (<i>Canis lupus</i>)

The whitebark pine is a candidate species, the Marsh sandwort and gray wolf are endangered and the rest are threatened.

The EPA determined that the discharge of wastewater will have no effect on the plant or terrestrial species.

Treated wastewater released into the Nisqually River has the potential to impair bull trout behavior but the rarity of bull trout in the Nisqually River (one USFWS Fact Sheet stated that bull trout have been extirpated in the Nisqually) makes it extremely unlikely that bull trout will experience effects from the release of effluent. In addition, treatment of effluent prior to release will further minimize the potential for effects to bull trout by reducing the area affected. Therefore, due to the unlikelihood of presence and lack of measureable effects, the EPA has determined that there will be no effect on bull trout.

The La Grande and Alder dams were constructed on the Nisqually River without fish passage capability due to a natural fish barrier that existed in the La Grande Gorge prior to dam construction. It is unlikely that any ESA species under the jurisdiction of NMFS would be above these dams (~ 35 miles below the discharge). Therefore, EPA has determined that the issuance of this permit will not affect ESA species under the jurisdiction of NMFS.

B. Essential Fish Habitat

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) requires federal fishery management plans to describe the habitat essential to the fish being managed and describe threats to that habitat from both fishing and non-fishing activities. In addition, in order to protect this Essential Fish Habitat (EFH), federal agencies are required to consult with NMFS on activities that may adversely affect EFH.

The Pacific Fishery Management Council manages the fisheries for coho, chinook, and Puget Sound Pink Salmon and has defined EFH for these three

species. Salmon EFH includes all those streams, lakes, ponds, wetlands, and other water bodies currently or historically accessible to salmon in Washington, Oregon, Idaho, and California. Salmon EFH excludes areas upstream of longstanding naturally impassible barriers.

The La Grande and Alder dams were constructed on the Nisqually River without fish passage capability due to a natural fish barrier that existed in the La Grande Gorge prior to dam construction. Therefore, EPA has determined that the issuance of this permit will not affect EFH in the vicinity of the discharge.

C. State Certification

CWA § 401 requires EPA to seek State certification before issuing a final permit. As a result of the certification, the State may require more stringent permit conditions or additional monitoring requirements to ensure that the permit complies with water quality standards or treatment standards established pursuant to any State law or regulation.

D. Permit Expiration

The permit will expire five years from the effective date.

IX. References

Application package dated April 2, 2015.

NPDES Permit Writer's Manual. EPA, Office of Water, Office of Wastewater Management, Permits Division. Washington, DC. 20460; EPA-833-K-10-001, September 2010, 269pp.

Technical Support Document for Water Quality-based Toxics Control. Office of Water Enforcement and Permits, Office of Water Regulations and Standards. Washington, DC. March 1991. EPA/505/2-90-001.

Guidance Manual for Developing Best Management Practices (BMP). 833-B-93-004. October 1993.

40 CFR 122 – EPA administered permit programs: the National Pollutants Discharge Elimination System.

40 CFR 124 – Procedures for Decisionmaking

40 CFR 136 – Guidelines establishing test procedures for the analysis of pollutants

40 CFR 403 - General Pretreatment Regulations for Existing and New Sources of Pollution

40 CFR 503 - Standards for the Use or Disposal of Sewage Sludge

Water Quality Standards for Surface Waters of the State of Washington. Chapter 173-201A WAC. Amended May 9, 2011

Water Quality Program Guidance Manual: Supplemental Guidance on Implementing Tier II Antidegradation. State of Washington Department of Ecology. September 2011. Publication no. 11-10-073.

Federal Water Pollution Control Act (or the Clean Water Act). 33 U.S.C. §§1251-1387.

Guide for Evaluating Capacity, Management, Operation, and Maintenance (CMOM) Programs at Sanitary Sewer Collection Systems. Office of Enforcement and Compliance Assurance, Washington, DC. January 2005. EPA 305-B-05-002.

Executive Order 12898. February 11, 1994. Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations.

Promising Practices for Permit Applicants Seeking EPA-Issued Permits: Ways to Engage Neighboring Communities. 78 Federal Register 27220, May 9, 2013.

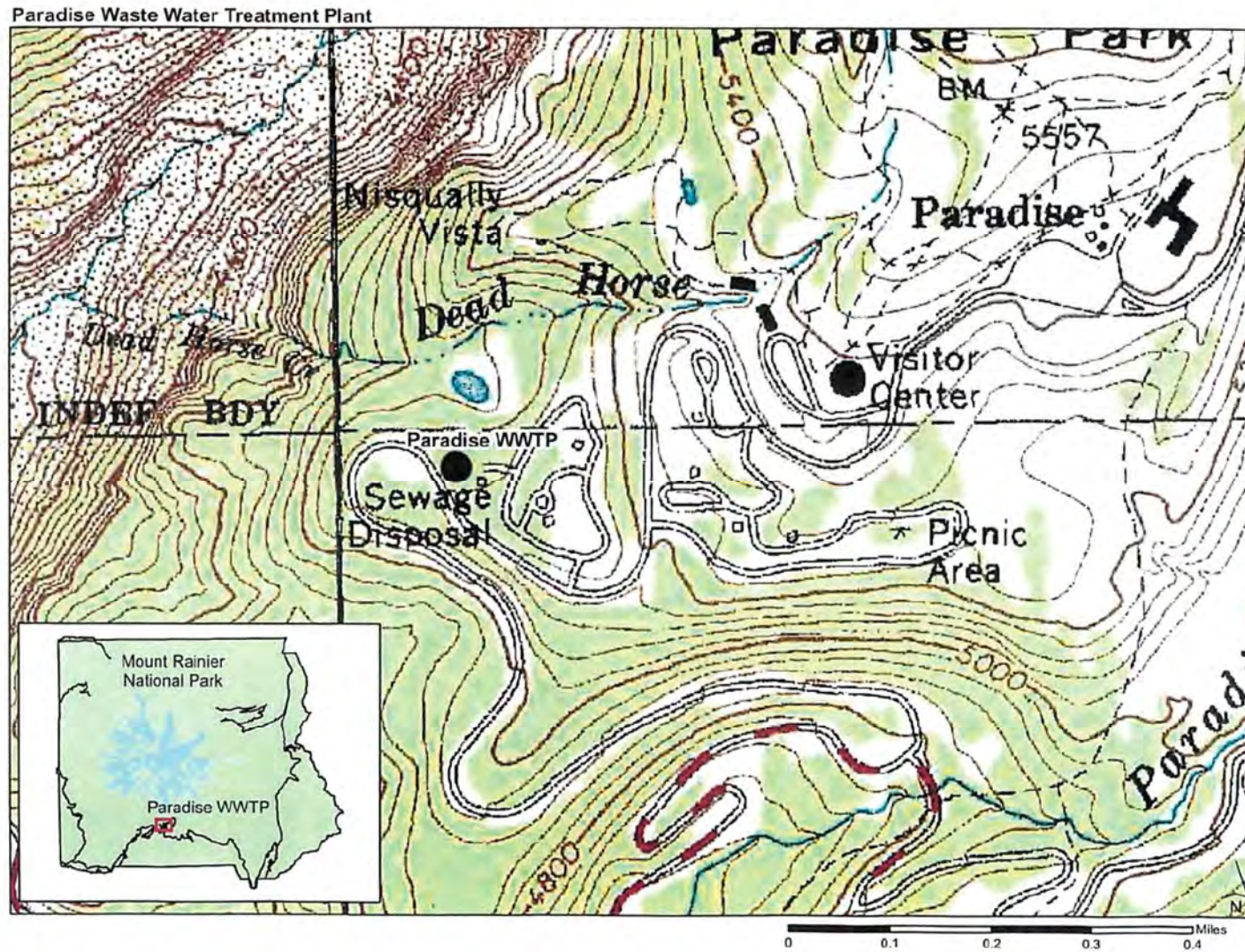
USFWS List of threatened and endangered species that may occur in your proposed project: Paradise WWTP. February 22, 2016. Consultation Code: 01EWF00-2016-SLI-0472.

Paradise WWTP *IPaC Trust Resource Report*. Generated February 22, 2016

Tacoma Public Utilities Nisqually River Project. Accessed February 22, 2016.
<http://www.mytpu.org/tacomapower/fish-wildlife-environment/nisqually-river-project/>

Federal Facilities Compliance Agreement between Department of the Interior, National Park Service and United States Environmental Protection Agency, Region 10. Docket No.: CWA-10-2012-0096. June 2012.

Appendix A: Facility Maps and Diagrams



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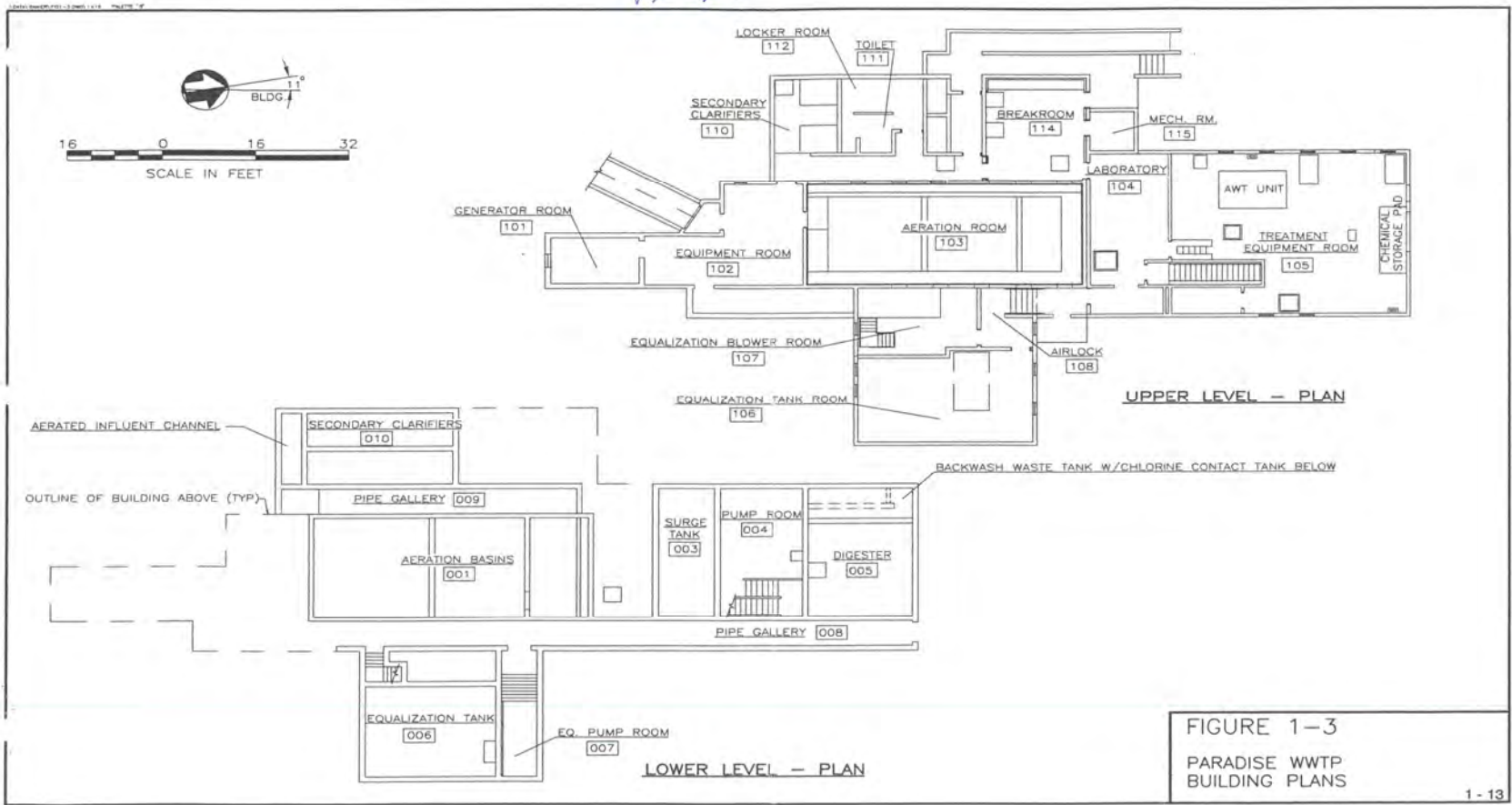
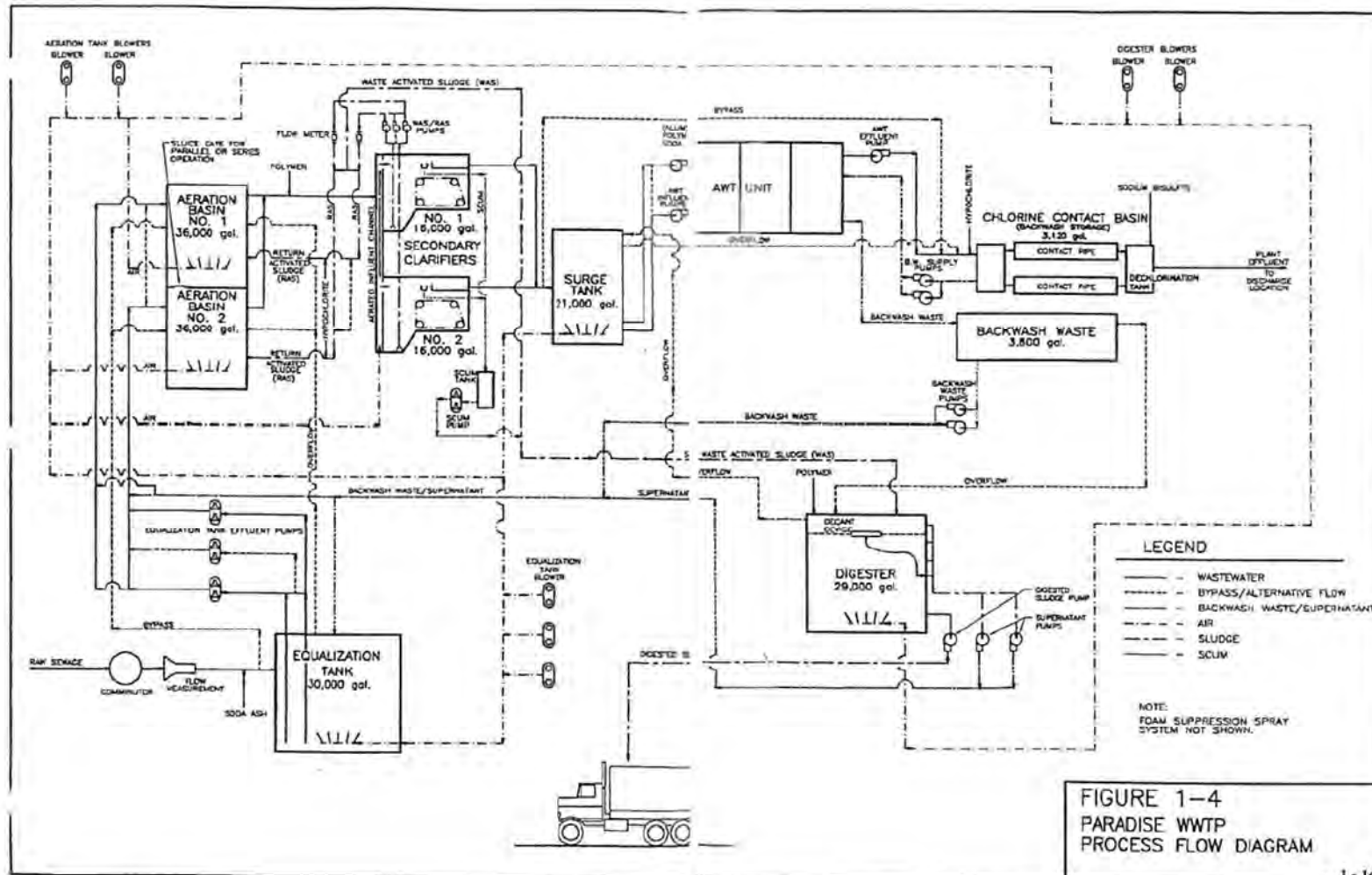


FIGURE 1-3
PARADISE WWP
BUILDING PLANS

1 - 13



Appendix B: Draft CWA § 401 Certification



STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
PO Box 47775 • Olympia, Washington 98504-7775 • (360) 407-6300

August 23, 2016

Mr. Michael J. Lidgard
US EPA Region 10
NPDES Permits Unit
1200 Sixth Avenue, Suite 900
Seattle, WA 98101

Re: CWA § 401 Certification for Mount Rainier National Park, Paradise Wastewater Treatment Plant, NPDES Permit No. WA0025569

Mr Lidgard:

We have reviewed the draft NPDES permit that EPA has prepared for issuance to Mount Rainier National Park for the Paradise Wastewater Treatment Plant.

The Paradise Wastewater Treatment Plant (the facility) is located within Mount Rainier National Park. The facility provides treatment of the wastewater generated by the Paradise Lodge and adjacent buildings, including the Henry M. Jackson Visitor Center. The treatment facility includes flow equalization, advanced secondary treatment (extended aeration activated sludge) filtration and disinfection. The design flow rate is 0.09 MGD. We understand that effluent is discharged to a seasonal drainage channel near a steep embankment above the Nisqually River.

The permit contains effluent limits for:

- 5-Day biochemical oxygen demand (BOD₅) and total suspended solids (TSS) that reflect the advanced treatment process;
- Fecal coliform bacteria based upon meeting state standards for extraordinary primary contact recreation;
- Ammonia and residual chlorine to meet state water-quality criteria for toxics; and
- pH

The permit does not authorize a mixing zone.

This letter is our certification that the discharge as permitted will comply with the Chapter 173-201A of the Washington Administrative Code (Water Quality Standards for Surface Waters of the State of Washington).



Mr. Michael J. Lidgard
August 23, 2016
Page 2

If you have any questions regarding this certification, please call Gregory Zentner, Supervisor,
Municipal Operations Unit at (360) 407-6368.

Sincerely,

Richard Doenges,
Southwest Region Manager
Water Quality Program

DRAFT

Appendix C: Basis for Effluent Limitations

The following discussion explains the derivation of TBELs and WQBELs. These were compared to determine the effluent limitations proposed in the draft permit. Part A discusses TBELs, Part B discusses WQBELs, Part C discusses anti-backsliding provisions, and Part D presents a summary of the proposed effluent limitations.

A. Technology-Based Effluent Limitations

The Paradise WWTP has been limited to 10 mg/L for BOD₅ and TSS with 95% removal since 1979 when EPA determined that these were the appropriate TBELs. The FCAA carried these limitations forward with a slight change requiring less than 10 mg/L or 95% removal. According to the quarterly reports submitted under the FCAA, the facility has been in compliance with these requirements since at least early 2015. In order to account for more dilute, lower flows in the winter, the permit is requiring that percent removal be reported but not limited. EPA will re-evaluate the need for a percent removal limitation during permit reissuance.

Mass-Based Limitations

The federal regulation at 40 CFR 122.45(f) requires that effluent limitations be expressed in terms of mass, if possible. The regulation at 40 CFR 122.45(b) requires that effluent limitations for POTWs be calculated based on the design flow of the facility. The technology-based mass based limitations, expressed in pounds per day, would be calculated as follows:

$$\text{Mass based limit (lb/day)} = \text{concentration limit (mg/L)} \times \text{design flow (mgd)} \times 8.34$$

Where 8.34 is a conversion factor with units (lb × L)/(mg × gallon × 10⁶)

Since the design flow for this facility is 0.09 mgd, the technology based mass limitations for BOD₅ and TSS are calculated as follows:

$$\text{Average Monthly Limit} = 10 \text{ mg/L} \times 0.09 \text{ mgd} \times 8.34 = 7.5 \text{ lbs/day}$$

$$\text{Average Weekly Limit} = 15 \text{ mg/L} \times 0.09 \text{ mgd} \times 8.34 = 11.3 \text{ lbs/day}$$

Chlorine

Chlorine is often used to disinfect sanitary and domestic wastewater prior to discharge. The Paradise WWTP uses chlorine disinfection.

A 0.5 mg/L average monthly limit for chlorine is derived from standard operating practices. The Water Pollution Control Federation's *Chlorination of Wastewater* (1976) states that a properly designed and maintained wastewater treatment plant can achieve adequate disinfection if a 0.5 mg/L chlorine residual is maintained after 15 minutes of contact time. Therefore, a wastewater treatment plant that provides adequate chlorine contact time can meet a 0.5 mg/L total residual chlorine limit on a monthly average basis. In addition to average monthly limitations (AMLs), NPDES regulations require effluent limitations for POTWs to be expressed as average weekly limitations (AWLs) unless impracticable. The AWL is calculated to be 1.5 times the AML, consistent with the secondary treatment limitations for BOD₅ and TSS. This results in an AWL for chlorine of 0.75 mg/L.

Since the federal regulations at 40 CFR 122.45 (b) and (f) require effluent limitations to be expressed as mass based limitations using the design flow of the facility, mass based limitations are calculated as follows:

Monthly average Limit= 0.5 mg/L x 0.09 mgd x 8.34 = 0.38 lbs/day

Weekly average Limit = 0.75 mg/L x 0.09 mgd x 8.34 = 0.56 lbs/day

Fecal Coliform

Washington Administrative Code (WAC 173-221-040) includes a TBEL for fecal coliform in secondary treated effluent. Fecal coliform is not to exceed a monthly geometric mean of 200 organisms per 100 mL and a weekly mean of 400 organisms per 100 mL.

B. Water Quality-based Effluent Limitations

Statutory and Regulatory Basis

CWA § 301(b)(1)(C) requires the development of limitations in permits necessary to meet water quality standards. Discharges to State waters must also comply with limitations imposed by the State as part of its certification of NPDES permits under CWA § 401. Federal regulations at 40 CFR 122.4(d) prohibit the issuance of an NPDES permit that does not ensure compliance with the WQS of all affected States.

The NPDES regulation (40 CFR 122.44(d)(1)) implementing CWA § 301(b)(1)(C) requires that permits include limits for all pollutants or parameters which are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any State or Tribal water quality standard, including narrative criteria for water quality, and that the level of water quality to be achieved by limits on point sources is derived from and complies with all applicable WQS.

The regulations require the permitting authority to make this evaluation using procedures which account for existing controls on point and nonpoint sources of pollution, the variability of the pollutant in the effluent, species sensitivity (for toxicity), and where appropriate, dilution in the receiving water. The limits must be stringent enough to ensure that WQS are met, and must be consistent with any available wasteload allocation.

Reasonable Potential Analysis

When evaluating the effluent to determine if the pollutant parameters in the effluent are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any State/Tribal water quality criterion, the EPA projects the receiving water concentration (downstream of where the effluent enters the receiving water) for each pollutant of concern. The EPA uses the concentration of the pollutant in the effluent and receiving water and, if appropriate, the dilution available from the receiving water, to project the receiving water concentration. If the projected concentration of the pollutant in the receiving water exceeds the numeric criterion for that specific pollutant, then the discharge has the reasonable potential to cause or contribute to an excursion above the applicable WQS, and a WQBEL is required.

Sometimes it may be appropriate to allow a small area of the receiving water to provide dilution of the effluent. These areas are called mixing zones. There is no mixing zone proposed for this draft permit due to the very low flow (considered zero for calculation purposes) of the receiving water during certain times of the year.

The following describes the process EPA has used to determine if the discharge authorized in the draft permit has the reasonable potential to cause or contribute to a violation of Washington's federally approved WQS. Pollutants of concern were determined using the facility application and monitoring data (see Section II.B.), as well as considering the applicable WQS for the receiving water.

The Nisqually River is protected for char spawning and rearing, which means that a 7-day average of the daily maximum temperatures cannot be over 12°C. Because of the lengthy distance the effluent flows in a channel before reaching the point of discharge, it is unlikely that the facility has reasonable potential to cause an excursion of this WQS. Monitoring has been included for temperature verify this determination.

Also, to protect the use of char spawning and rearing, WA WQS establish criteria for pH that are slightly more stringent than secondary treatment requirements. Due to the nature of the discharge, EPA determined there is reasonable potential for this parameter.

Additionally, there are dissolved oxygen (DO), turbidity, and total dissolved gas criteria for the designated use of char spawning and rearing. The criteria list the one-day minimum DO level as 9.5 mg/L, maximum turbidity of 5 NTU over background when the background is 50 NTU or less or a 10 percent increase in turbidity when the background turbidity is more than 50 NTU, and maximum total dissolved gas of 110 percent of saturation at any point of sample collection. Due to the nature of the discharge and the extended distance the effluent flows before being discharged to the receiving water, it is determined that there is no reasonable potential for the effluent to cause exceedances of these WQS.

Dechlorination and the anticipated chlorine reduction due to dissipation as the discharge flows through the ditch and over the waterfall will result in chlorine levels well below detection levels at the point of discharge to the Nisqually River. Therefore, there is no reasonable potential for the discharge to violate WQS.

EPA has carried over the reasonable potential determinations for fecal coliform bacteria due to the nature of the discharge and because this parameter has been detected and limited under the FFCA.

Procedure for Deriving Water Quality-based Effluent Limitations (WQBEL)

The first step in developing a WQBEL is to develop a wasteload allocation (WLA) for the pollutant. A WLA is the concentration or loading of a pollutant that may be discharged to the receiving water without causing or contributing to an excursion above the WQS. The WLA are determined by using the criterion as the WLA since there is no TMDL and no mixing zone has been authorized. Establishing the criterion as the WLA ensures that the effluent discharge will not contribute to an exceedance of the criterion.

Once the WLA has been developed, EPA applies the statistical permit limit derivation approach described in Chapter 5 of the TSD to obtain monthly average, and weekly average or daily maximum permit limits. This approach takes into account effluent variability, sampling frequency, and WQS.

Proposed Water Quality-Based Effluent Limitations

The Nisqually River is protected for the following designated uses (WAC 173-201A-600):

- Char Spawning/Rearing
- Extraordinary Primary Contact Recreation

Additionally, the Washington WQS state that all waters within National Parks are protected as core summer salmonid habitat and that all non-marine waters of the State of Washington are protected for domestic, industrial, and agricultural water supply, stock watering, wildlife habitat, harvesting, commerce and navigation; boating, and aesthetic values.

This section summarizes the proposed WQBELs for this permit. EPA has carried over monitoring and in some cases the numeric limitations from the FFCA due to the nature of the discharge and because these parameters were detected and limited under the FFCA.

Fecal Coliform

According to WA WQS, waters designated for extraordinary primary contact recreation are not to contain fecal coliform organisms, used as indicators of human pathogens, in concentrations exceeding a geometric mean of fifty (50) organisms per one hundred (100) ml, with not more than 10 percent of all samples (or any single sample when less than ten sample points exist) obtained for calculating the geometric mean value exceeding 100 colonies/100 mL. The criteria are applied end of pipe as the average monthly limit due to the lack of available dilution in the receiving water. The maximum daily limit was determined using the TSD multipliers for calculating short-term limits from the average monthly limit. A default CV of 0.6 was used because, although the FFCA requires sampling for total coliform, it is unknown whether the coefficient of variation for the total coliform data would be equal to that of fecal coliform as required by the WQS. The number of samples per month used to determine the multiplier was four due to the weekly sampling requirement. This results in a multiplier of 2.01 so the limitations meet both requirements of the WQS.

pH

The Nisqually River is also protected for char spawning and rearing, for which WA WQS specify pH must be within the range of 6.5 to 8.5, with human-caused variation within the above range of less than 0.2 units. This range has been included in the draft permit.

Chlorine

The Paradise WWTP uses chlorine disinfection followed by dechlorination. Anticipated chlorine reduction due to dechlorination and dissipation as the discharge flows through the man-made ditch and over the waterfall will result in chlorine levels well below detection levels at the point of discharge to the Nisqually

River. Therefore, there is no reasonable potential for the discharge to violate WQS, however because there is a TBEL applicable to this type of discharge, the parameter has to be limited in the permit. The effluent limitation has to be the more stringent of the WQBEL or TBEL. The WQBEL calculation is as follows:

There is no mixing zone so the criteria become the wasteload allocations (WLAs). The chronic WLA is 11.0 ug/L and the acute WLA is 19.0 ug/L.

The next step is to determine the chronic and acute Long Term Averages:

$$LTA = WLA * \exp[0.5\sigma^2 - z\sigma]$$

Where: $z = 2.326$ for 99th percentile probability basis (per the TSD)

$$CV = 1.5$$

$$\text{Acute: } \sigma^2 = \ln(CV^2 + 1) = \ln[(1.5)^2 + 1] = 1.18 \quad \sigma = 1.09$$

$$\text{Chronic: } \sigma^2 = \ln(CV^2/4 + 1) = \ln[(1.5)^2/4 + 1] = 0.46 \quad \sigma = 0.67$$

$$LTA_a = 19.0 * e^{[(0.5*1.18) - (2.326*1.09)]} = 2.7$$

$$LTA_c = 11.0 * e^{[(0.5*0.46) - (2.326*0.67)]} = 2.9$$

The most stringent LTA is 2.7 ug/L for the acute criteria. It is used to develop the WQBELs for the protection of aquatic life.

The LTA concentration is converted to an MDL and an AML using the following equation:

$$MDL, AML = LTA * \exp[z\sigma - 0.5 \sigma^2]$$

$$\text{Where, } \sigma^2 = 1.18$$

$$\sigma = 1.09$$

For the MDL: $z = 2.326$ for 99th percentile probability basis (per the TSD)

For the AML: $z = 1.645$ for 95th percentile probability basis (per the TSD)

$$MDL = 2.7 * e^{[(2.326*1.09) - 0.5*1.18]} = 19.0$$

$$AML = 2.7 * e^{[(1.645*1.09) - (0.5*1.18)]} = 9.1$$

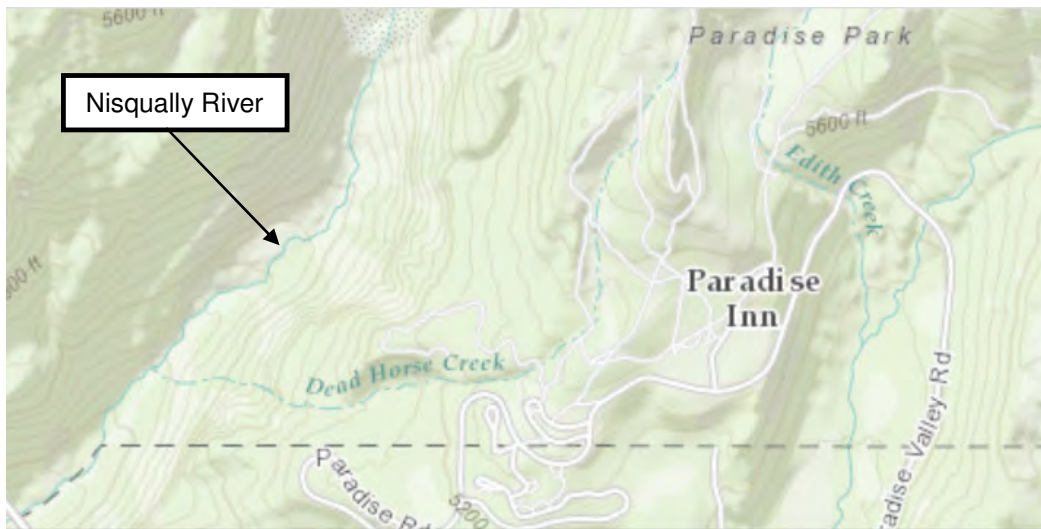
The effluent limitations for chlorine of 19.0 and 9.1 ug/L are further translated into loading limitations by converting them to mg/L and multiplying by the design flow (0.09 mgd) and a conversion factor of 8.34. This results in a maximum daily and average monthly loading requirement of 0.014 and 0.007 lbs/day, respectively.

However, the numeric values of the chlorine effluent limitations cannot be measured with current laboratory methodology. EPA has adopted a compliance level of 50 ug/L which is equal to the Minimum Level for analytical purposes. The translation into a loading limitation results in a value of 0.04 lbs/day. Therefore, if the average monthly and daily maximum effluent limitations are less than 50 ug/L and the loading is less than 0.04 lbs/day, the permittee will be considered in compliance with the chlorine effluent limitations of the permit.

Ammonia

The WQS contain acute criterion for total ammonia and chronic criteria for unionized ammonia for waters where salmonid habitat is an existing or designated use. Unionized ammonia is that portion of total ammonia which is most bioavailable to organisms. Although it is unlikely that salmon occupy the upper reaches of the Nisqually River due to the two dams downstream that lack fish passage capabilities, the WQS designate all waters within National Parks as core summer salmonid habitat. The ammonia criteria is dependent on the temperature and pH of the receiving water.

Due to the inaccessibility of the receiving water at the discharge point, the facility has not collected pH or temperature data in the Nisqually River. However, the facility does collect pH and temperature data for the potable water intake from Edith Creek. The map below shows the proximity of Edith Creek to the Nisqually River:



EPA utilized daily data collected from January 2015 through May 2016 to determine the 90th percentile for pH and temperature for use in the ammonia criteria equations. The pH value used is 7.3 standard units (su) and the temperature value is 11°C.

Acute Criterion: Although the water is protected for summer core salmonid habitat, the acute criterion is only dependent upon whether salmon are absent or present. The following criterion equation is for salmonids absent due to the lack of fish passage at downstream dams:

$$WLAa = 0.411/(1 + 10^{(7.204 - \text{pH})}) + 58.4/(1 + 10^{(\text{pH} - 7.204)})$$

$$WLAa = 0.411/(1 + 10^{(7.204 - 7.3)}) + 58.4/(1 + 10^{(7.3 - 7.204)}) = 26.2 \text{ mg/L}$$

Chronic Criterion: The unionized chronic ammonia concentration is applicable to waters where salmonid habitat is an existing or designated use:

$$0.80/((\text{FT})(\text{FPH})(\text{Ratio}))$$

$$\text{Where } \text{Ratio} = 13.5; 7.7 \leq \text{pH} \leq 9$$

$$\text{Ratio} = (20.25 * 10^{(7.7-\text{pH})}) / (1 + 10^{(7.4-\text{pH})}); 6.5 \leq \text{pH} \leq 7.7$$

$$\text{FT} = 1.4; 15 \leq T \leq 30$$

$$\text{FT} = 10^{[0.03(20-T)]}; 0 \leq T \leq 15$$

$$\text{FPH} = 1; 8 \leq \text{pH} \leq 9$$

$$\text{FPH} = (1 + 10^{(7.4-\text{pH})}) / 1.25; 6.5 \leq \text{pH} \leq 8$$

Using a pH of 7.3 su and temperature of 11°C: -

$$\text{Ratio} = (20.25 * 10^{(7.7-7.3)}) / (1 + 10^{(7.4-7.3)}) = 22.5$$

$$\text{FT} = 10^{[0.03(20-11)]} = 1.9$$

$$\text{FPH} = (1 + 10^{(7.4-7.3)}) / 1.25 = 1.8$$

Therefore, the unionized chronic criterion is:

$$0.8 / (22.5)(1.9)(1.8) = 0.01 \text{ mg/L}$$

EPA has developed a relationship between the two forms, total and unionized ammonia, that varies with pH and temperature:

$$\text{Fraction of unionized ammonia } (f_{\text{NH}_3}) = 1 / (1 + 10^{(\text{pK}-\text{pH})})$$

$$\text{Where: } \text{pK} = 0.09018 + (2729.92 / (273.2 + T))$$

$$T = \text{temperature, } ^\circ\text{C}$$

The total ammonia level would be the unionized criterion divided by f_{NH_3} or multiplied by the reciprocal.

$$0.01 * (1 + 10^{((0.09018 + (2729.92 / (273.2 + 11)) - 7.3)}) = 2.5$$

To further refine the criterion, the total ammonia criterion is translated into total ammonia as nitrogen. This calculation determines the percentage of nitrogen in total ammonia of NH_3 . The molecular weights of nitrogen (N) is 14.007 and hydrogen (H) is 1.008.

$$14.007 / (14.007 + 3 * 1.008) = 0.82$$

The total ammonia criterion is 82% N so the total ammonia as N is:

$$2.5 * 0.82 = 2.1$$

There is no mixing zone so the criteria become the WLAs. The chronic WLA is 2.1 mg/L and the acute WLA is 26.2 ug/L.

The next step is to determine the chronic and acute LTAs:

$$\text{LTA} = \text{WLA} * \exp[0.5\sigma^2 - z\sigma]$$

$$\text{Where: } z = 2.326 \text{ for } 99^{\text{th}} \text{ percentile probability basis (per the TSD)}$$

$$\text{CV} = 0.54$$

$$\text{Acute: } \sigma^2 = \ln(\text{CV}^2 + 1) = \ln[(0.54)^2 + 1] = 0.256 \quad \sigma = 0.506$$

$$\text{Chronic: } \sigma^2 = \ln(\text{CV}^2/4 + 1) = \ln[(0.54)^2/4 + 1] = 0.070 \quad \sigma = 0.265$$

$$\text{LTA}_a = 26.2 * e^{[(0.5 * 0.256) - (2.326 * 0.506)]} = 9.18$$

$$LTA_c = 2.1 * e^{[(0.5*0.07) - (2.326*0.265)]} = 1.17$$

The most stringent LTA is 1.17 ug/L for the chronic criteria. It is used to develop the WQBELs for the protection of aquatic life.

The LTA concentration is converted to an MDL and an AML. The following equation is used for both only if the AML does not exceed the WLA:

$$MDL, AML = LTA * \exp[z\sigma - 0.5 \sigma^2]$$

$$\text{Where, } \sigma^2 = 0.256$$

$$\sigma = 0.506$$

For the MDL: $z = 2.326$ for 99th percentile probability basis (per the TSD)

For the AML: $z = 1.645$ for 95th percentile probability basis (per the TSD)

$$MDL = 1.17 * e^{[(2.326*0.506) - 0.5*0.256]} = 3.5$$

$$AML = 1.17 * e^{[(1.645*0.506) - (0.5*0.256)]} = 2.3$$

Since the AML exceeds the WLA, the AML equation needs to use the statistics for the chronic criteria and not the acute. It becomes:

$$AML = 1.17 * e^{[(1.645*0.265) - (0.5*0.07)]} = 1.8$$

The draft permit proposes an average monthly total ammonia limitation of 1.8 mg/L and a daily maximum effluent limitation of 3.5 mg/L with associated loading limitations of 1.4 and 2.7 lbs/day, respectively. The facility has been limited to 3 mg/L under the FFCA for ammonia. The highest monthly average for three quarters during 2015 was 0.782 mg/L and the maximum was 2.88 mg/L.

C. Antidegradation

The EPA is required under CWA § 301(b)(1)(C) and implementing regulations (40 CFR 122.4(d) and 122.44(d)) to establish conditions in NPDES permits that ensure protection of State WQS, including antidegradation requirements. EPA has prepared an antidegradation analysis consistent with Ecology's antidegradation implementation procedures. EPA referred to Washington's antidegradation policy (WAC 173-201A-300) and Ecology's 2011 Supplemental Guidance on Implementing Tier II Antidegradation (<http://www.ecy.wa.gov/biblio/1110073.html>).

The purpose of Washington's Antidegradation Policy is to:

- Restore and maintain the highest possible quality of the surface waters of Washington.
- Describe situations under which water quality may be lowered from its current condition.
- Apply to human activities that are likely to have an impact on the water quality of surface water.
- Ensure that all human activities likely to contribute to a lowering of water quality, at a minimum, apply all known, available, and reasonable methods of prevention,

control, and treatment (AKART).

- Apply three tiers of protection (described below) for surface waters of the state.
 - o Tier I ensures existing and designated uses are maintained and protected and applies to all waters and all sources of pollution as described in WAC 173-201A-310.
 - o Tier II ensures that waters of a higher quality than the criteria assigned are not degraded unless such lowering of water quality is necessary and in the overriding public interest. Tier II applies only to new or expanded actions described in WAC 173-201A-320(2).
 - o Tier III prevents the degradation of waters formally listed as "outstanding resource waters," and applies to all sources of pollution. Tier III is described in WAC 173-201A-330.

The receiving water from the outfall is the Nisqually River and the anti-degradation analysis was completed for this receiving water body. Accordingly, EPA will use the designated criteria for this water body in the draft permit. The discharges proposed in this draft permit should not cause a loss of beneficial uses because the facility is unchanged from the previous permit and all beneficial uses are intact.

In consideration of the anti-degradation analysis in the Nisqually River, the facility is considered an existing facility because it was first permitted in 1974, and there have not been any changes in the process of the facility, and there is no change in the design flow. Therefore, EPA concludes that the discharge does not trigger the need for any further anti-degradation analysis beyond Tier I Protection.

Tier I Protection – Protection and maintenance of existing and designated uses

According to Washington's antidegradation policy, WAC 172-210A-310, a facility must first meet Tier I requirements. Existing and designated uses must be maintained and protected. No degradation may be allowed that would interfere with, or become injurious to, existing or designated uses, except as provided for in WAC 173-201A-612. The waters of the Nisqually River at the point of discharge has the following designated beneficial uses:

- Char Spawning/Rearing
- Extraordinary Primary Contact Recreation
- Core summer salmonid habitat (all National Parks)
- Water Supply: domestic, industrial, and agricultural, stock watering
- Misc. Uses: wildlife habitat, harvesting, commerce and navigation; boating, and aesthetic values

The effluent limits in the draft permit ensure compliance with applicable numeric and narrative water quality criteria. The numeric and narrative water quality criteria are set at levels that ensure protection of the designated uses. As there is no information indicating the presence of existing beneficial uses other than those that are designated, the draft permit ensures a level of water quality necessary to protect the designated uses and, in compliance with WAC 173-201A-310 and 40 CFR

131.12(a)(1), also ensures that the level of water quality necessary to protect existing uses is maintained and protected.

If EPA receives information during the public comment period demonstrating that there are existing uses for which the Nisqually River is not designated, EPA will consider this information before issuing a final permit and will establish additional or more stringent permit conditions if necessary to ensure protection of existing uses.

Tier II Protection – Protection of waters of higher quality than the standards

EPA determined that analysis for a Tier II Protection is not necessary because the facility is not a new or expanded action that has the potential to cause measurable degradation to existing water quality.

According to WAC 173-210A-320(2), a facility must prepare a Tier II analysis when the facility is planning a new or expanded action that has the potential to cause measurable degradation to the physical, chemical, or biological quality of the water body. A Tier II analysis consists of an evaluation of whether or not the proposed degradation of water quality that would be associated with a new or expanded action would be both necessary and in the overriding public interest. A Tier II analysis focuses on evaluating feasible alternatives that would eliminate or significantly reduce the level of degradation. The analysis also includes a review of the benefits and costs associated with the lowering of water quality. New discharges and facility expansions are prohibited from lowering water quality without providing overriding public benefits.

The effluent from the Paradise WWTP is not considered a new discharge and therefore is not considered a new or expanded source of pollution. Accordingly, EPA determined that a Tier II antidegradation analysis would not be necessary.

Tier III Protection – Protection of Outstanding Resource Waters

EPA determined that a Tier III antidegradation analysis is not necessary because the receiving water not meet the conditions as an Outstanding Resource Waters pertaining to WAC 173-201A-330(1).

D. Anti-backsliding Provisions

CWA § 402(o) and federal regulations at 40 CFR §122.44(l) prohibit the renewal, reissuance or modification of an existing NPDES permit that contains effluent limitations, permit conditions, or standards that are less stringent than those established in the previous permit (i.e., anti-backsliding).

After calculating the applicable TBELs and WQBELs, the permit writer must determine the final effluent limitations that will be included in the NPDES permit for each pollutant. For reissued permits, that determination must also include an assessment of whether the revised effluent limitations or conditions are consistent with CWA requirements and NPDES regulations related to anti-backsliding.

Backsliding is not technically applicable to this permit due to the fact that the facility has been discharging under an FFCA (i.e., not an NPDES permit); however, all effluent limitations in this permit are as stringent or more stringent than those in the previous permit, so there is no backsliding.

E. Determining Final Effluent Limitations

Table C-2 summarizes the numeric effluent limitations that are in the proposed permit. The final limits are the more stringent of technology treatment requirements, water quality based limitations or limits retained as the result of anti-backsliding analysis or to meet the State's anti-degradation policy.

Table C-2: Proposed Effluent Limitations				
Parameter	Units	Effluent Limitations		
		Average Monthly Limit	Average Weekly Limit	Maximum Daily Limit
BOD₅	mg/L	10	15	—
	lb/day	7.51	11.3	—
	% removal	—	—	—
TSS	mg/L	10	15	—
	lb/day	7.51	11.3	—
	% removal	—	—	—
pH¹	s.u.	6.5 - 8.5		
Fecal Coliform²	#/100 ml	50	—	100
TRC³	ug/L	9.1	—	19.0
	lb/day	0.007	—	0.014
Total Ammonia as N	mg/L	1.8	—	3.5
	lb/day	1.4	—	2.7

1. No human-caused variation within the above range of 0.2 units or more.
 2. Geometric monthly mean, and, in addition, no more than 10 percent of the samples obtained for calculating the geometric mean density shall exceed 100 colonies/100 ml.
 3. The limits for chlorine are not quantifiable using EPA-approved analytical methods. The minimum level (ML) for chlorine is 50 µg/L. The EPA will use 50 µg/L as the compliance evaluation level for this parameter. The permittee will be compliance with the total residual chlorine limitations if the average monthly and maximum daily concentrations are less than 50 µg/L and the average monthly and maximum daily mass loadings are less than 0.04 lbs/day.

pH

The WQBEL for the protection of char spawning and rearing is more stringent than the secondary treatment requirements for pH and is therefore included in the draft permit.

Five-Day Biochemical Oxygen Demand (BOD₅) and Total Suspended Solids (TSS)

The effluent limitations from the FFCA have been carried forward in the draft permit. The FFCA contained BOD₅ and TSS limitations of 10 mg/L.

Fecal Coliform Bacteria

The WQBELs based on WQS for the protection of extraordinary primary contact recreation are more stringent than the technology based requirement included in WAC and are therefore included in the draft permit.

Total Residual Chlorine

EPA determined there is reasonable potential for the discharge to violate water quality standards because the highest measured value exceeds the WQS. Because there is also a TBEL applicable to this type of discharge, the parameter has to be limited by the more stringent of the two. The WQBEL is more stringent than the TBEL.

Ammonia

It is unlikely that ammonia would be present in detectable amounts at the point of discharge due to dissipation as the discharge flows through the ditch and over the waterfall before meeting the Nisqually River. However, the maximum ammonia value measured in 2015 (2.88 mg/L) exceeded the calculated criteria so reasonable potential exists and effluent limitations are included in the draft permit.