Fact Sheet

The U.S. Environmental Protection Agency (EPA)
Proposes to Reissue a National Pollutant Discharge Elimination System (NPDES) Permit to Discharge Pollutants Pursuant to the Provisions of the Clean Water Act (CWA) to:

Facility	**NPDES Permit Number**
City of Orofino Water Treatment Plant	ID0001058
Riverside Water and Sewer District Water Treatment Plant	ID0021237

Public Comment Start Date: June 1, 2017.
Public Comment Expiration Date: July 3, 2017.

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The EPA Proposes To Reissue NPDES Permit

The EPA proposes to reissue the NPDES permits for the facilities referenced above. The draft permits place conditions on the discharge of pollutants from the water treatment plants to waters of the United States. In order to ensure protection of water quality and human health, the permits place limits on the types and amounts of pollutants that can be discharged from the facilities.

This Fact Sheet includes:

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

State Certification

The City of Orofino and the Riverside Water and Sewer District WTPs are located on the Nez Perce Reservation; therefore the EPA will certify the permits.

Public Comment

Persons wishing to comment on, or request a Public Hearing for the draft permits proposed for one or both of these facilities 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 the EPA as described in the Public

Comments Section of the attached Public Notice.

After the Public Notice expires, and all comments have been considered, the EPA's regional Director for the Office of Water and Watersheds will make a final decision regarding permit issuance. If no substantive comments are received, the tentative conditions in the draft permits will become final, and the permits may become effective upon issuance. If substantive comments are received, the EPA will address the comments and issue the permits. The permits will become effective no less than 30 days after the issuance date, unless an appeal is submitted to the Environmental Appeals Board within 30 days pursuant to 40 CFR 124.19.

Documents are Available for Review

The draft NPDES permits and related documents can be reviewed or obtained by visiting or contacting the EPA's Regional Office in Seattle between 8:30 a.m. and 4:00 p.m., Monday through Friday at the address below. The draft permits, fact sheet, and other information can also be found by visiting the Region 10 NPDES website at "http://EPA.gov/r10earth/waterpermits.htm"

US EPA Region 10
Suite 900
1200 Sixth Avenue, OWW-191
Seattle, Washington 98101
(206) 553-0523 or
Toll Free 1-800-424-4372 (within Alaska, Idaho, Oregon and Washington)

The fact sheet and draft permits are also available at:

United States Environmental Protection Agency Region 10
Idaho Operations Office
950 W Bannock, Suite 900
Boise, ID 83702
(208) 378-5746

Acronyms

1Q10	1 day, 10 year low flow
7Q10	7 day, 10 year low flow
AML	Average Monthly Limit
APA	Administrative Procedures Act
AWL	Average Weekly Limit
BAT	Best Available Technology Economically Achievable
BCT	Best Conventional Pollutant Control Technology
BE	Biological Evaluation
BMP	Best Management Practices
BPJ	Best Professional Judgment
BPT	Best Practicable Technology Currently Available
°C	Degrees Celsius
CFR	Code of Federal Regulations
CFS	Cubic Feet per Second
COD	Chemical Oxygen Demand
CV	Coefficient of Variation
CWA	Clean Water Act
DMR	Discharge Monitoring Report
DO	Dissolved oxygen
EA	Environmental Assessment
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
ELGs	Effluent Limitations Guidelines
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FR	Federal Register
GP	General Permits
gpd	Gallons per day
gpm	Gallon per minute
HUC	Hydrologic Unit Code
IDEQ	Idaho Department of Environmental Quality
lbs/day	Pounds per day
LTA	Long Term Average
mg/L	Milligrams per liter
ml	Milliliters
ML	Minimum Level

µg/L	Micrograms per liter
Mgd	Million gallons per day
MDL	Maximum Daily Limit
NPDES	National Pollutant Discharge Elimination System
OWW	Office of Water and Watersheds
O&M	Operations and maintenance
POTW	Publicly owned treatment works
QAP	Quality assurance plan
RP	Reasonable Potential
RPM	Reasonable Potential Multiplier
SDWIS	Safe Drinking Water Information System
SIC	Standard Industrial Classification
SS	Suspended Solids
s.u.	Standard Units
TMDL	Total Maximum Daily Load
TSD	Technical Support Document for Water Quality-based Toxics Control (EPA/505/2-90-001)
TSS	Total suspended solids
THMs	Trihalomethanes
TTHMs	Total Trihalomethanes
USFWS	U.S. Fish and Wildlife Service
USGS	United States Geological Survey
WLA	Wasteload allocation
WQBEL	Water quality-based effluent limit
WQS	Water Quality Standards
WTPs	Water Treatment Plants

I. Background Information

A. General Information

This fact sheet provides information on the draft NPDES permits for the following entities:

Table 1. General Facility Information

NPDES Permit #:	ID0001058
Applicant:	City of Orofino Water Treatment Plant
Type of Ownership	Municipal
Physical Address:	709 Main Street Orofino, Idaho 83544
Mailing Address:	P.O. Box 312 Orofino, ID 83544
Facility Contact:	Michael Martin Water/Wastewater Supervisor Orofinowwtp@yahoo.com (208)476-5051
Operator Name:	Michael Martin
Facility Location:	46º 28' 26" N or 46.474 º N 116º 15' 8" W or 116.252 º W

NPDES Permit #:	ID0021237
Applicant:	Riverside Water and Sewer District Water Treatment Plant
Type of Ownership	Municipal
Physical Address:	10460 Highway 12 Orofino, Idaho 83544
Mailing Address:	10460 Highway 12 Orofino, Idaho 83544
Facility Contact:	Emmett Bonner Administrator RWSD.EBonner@Frontier.com (208) 476-3613
Operator Name:	Emmett Bonner
Facility Location:	46º 29' 36" N or 46.4933 º N 116º 17' 12" W or 116.287 º W

B. Permit History

The most recent NPDES permits for the City of Orofino Water Treatment Plant ("Orofino WTP") and the Riverside Independent Water District Water Treatment Plant ("Riverside WTP") were issued on September 25, 2006, became effective on November 1, 2006, and expired on October 31, 2011. NPDES applications for permit reissuance were submitted by the Orofino WTP on June 8, 2011; and, on June 13, 2011 for the Riverside WTP. The EPA determined that the applications were timely and complete. Therefore, pursuant to 40 CFR

122.6., the permits have been administratively extended and remain fully effective and enforceable. Since the issuance of the most recent permit, the Riverside Independent Water District has been renamed, the “Riverside Water and Sewer District.”

II. Facility Information

A. Drinking Water Treatment Plant (WTP) Description

Service Area

The City of Orofino owns and operates the Orofino WTP located at 709 Main Street, Orofino, Idaho. The facility is a water treatment plant that serves a resident population of approximately 2,140.

Riverside Water and Sewer District owns and operates the Riverside WTP located at 10460 Highway 12, Orofino, Idaho. The facility is a water treatment plant that serves a resident population of approximately 1,800.

Treatment Process

According to permit applications, schematics show that the facilities normally discharge an average 0.035 mgd, and 0.043 mgd, respectively at the Orofino WTP and the Riverside WTP. Both facilities discharge to the Clearwater River.

Schematics of the wastewater treatment processes and a map showing the location of the treatment facility and discharge are included in Appendix A. Because of the relatively small volume discharged, the facilities are considered minor facilities.

Starting in August 2014, the Orofno WTP was upgraded and currently operates using a membrane filtration system. The Orofino WTP recycles its backwash, and in its normal operational process, it no longer discharges to the River. The facility retains its permit in the event that an unscheduled discharge becomes necessary in the future. The effluent for such a discharge would not contain chorine as the facility would only flush its membrane filters with raw river water without adding chlorine.

The Riverside WTP operates like a traditional WTP except that its treatment process does not use alum or any other additives that contain aluminum. Treatment process include settlement of suspended solids and evaporation of Total Residual Chlorine in their facility’s settlement basin prior to discharge through their outfall.

B. Description of WTP Processes

The traditional water treatment plant is used to remove turbidity and pathogenic organisms. WTPs may also be used to remove color, taste, odor, iron, manganese, hardness, total dissolved solids, nitrates, arsenic, and radionuclides. With some exceptions, the National Primary Drinking Water Regulations (40 CFR Part 141) require public water systems using a surface water source or a ground water source under the direct influence of surface water to provide treatment consisting of filtration and disinfection.

The specific water treatment processes used vary depending on the quality of the source water as well as other factors such as the size of the system, technical complexity, costs, etc. Common unit processes include pre-sedimentation, coagulation/flocculation, sedimentation/precipitation, filtration, membrane separation, and oxidation. “Conventional filtration plant" refers to a treatment train of chemical feed, rapid mix, flocculation, sedimentation, and filtration. Common variations of filtration include direct filtration or in-line filtration.

Pre-sedimentation is often used with raw waters that contain relatively high concentrations of suspended solids such as sand and silt. Pre-sedimentation basins provide adequate detention time to allow the coarser particles to settle. Most pre-sedimentation basins are designed either for continuous sludge removal or have provisions for frequent sludge removal. The solids may be disposed of separately as a solid waste or may be washed into the same wastestream as the backwash.

Coagulation and flocculation followed by sedimentation and filtration are used to separate fine particles and colloidal materials from water. Colloids or fine particles in suspension either have or acquire electrical charges on their surfaces. In the process of coagulation, coagulants are added to destabilize the colloidal state of suspended particles through "charge neutralization" allowing the particles to adhere to each other. During flocculation, the chemically treated water is sent into a basin where the suspended particles can collide and form heavier particles called floc. The most common coagulant is aluminum sulfate (alum), $Al_2(SO_4)_3 \cdot 14H_2O$. Another coagulant is ferric chloride, $FeCl_3$. Other additives may include compounds to adjust pH (e.g. soda ash and sodium hydroxide) and polymers to enhance coagulation, flocculation, and filtration.

In sedimentation, the velocity of water is decreased so that suspended material (including flocculated particles) can settle out of the water stream by gravity. Once settled, the particles combine to form a sludge that is later removed from the clarified supernatant (the liquid removed from settled sludge).

Filtration is the process of removing suspended solids from water by passing the water through a permeable fabric or porous bed of materials. Slow sand filtration is a commonly used water treatment process which involves passage of raw water through a bed of sand at low velocity (generally less than 0.4 m/h) resulting in substantial particulate removal by physical and biological mechanisms. Common filtration methods used in the water treatment industry in Idaho include:

- Conventional filtration – Conventional filtration includes chemical coagulation, rapid mixing, and flocculation, followed by floc removal via sedimentation (or flotation). The clarified water is then filtered. Common filter media designs include sand, dual-media, and trimedia.
- Direct filtration – A variation of conventional filtration, used with influent water with less turbidity, the coagulation and flocculation step is followed immediately by filtration.
- In-line filtration – Same as direct filtration, but also omits the flocculation step.

Oxidation is a common process used for iron and manganese removal. The oxidant chemically oxidizes the iron or manganese, forming a particle. The filter then removes the iron or manganese particles. Before iron and manganese can be filtered, they need to be oxidized to a state in which they can form insoluble complexes. The most common chemical oxidants in water treatment are chlorine, chlorine dioxide, potassium permanganate, and ozone.

In addition to its use as an oxidant, chlorine is frequently added after filtration for disinfection purposes, producing the "finished water" for distribution as drinking water. This chlorinated finish water is typically used to backflush the filters.

C. Generation of Wastestreams

The principle wastewaters produced in filtration water treatment plants include filter backwash, filter-to-waste, thickener supernatant, and liquids from dewatering processes. Filter backwash and filter-to-waste account for most of the volume of wastewater discharged.

Filter Backwash

Filter media is usually cleaned by flushing with water in the reverse direction to normal flow, with sufficient force to separate particles from the media. A typical backwashing operation lasts for 10 to 25 minutes with maximum rates of 15 to 20 gallons per minute (gpm) per square foot. Because a high water flow is used, a large volume of filter backwash water is produced in a relatively short amount of time. Small plants may produce spent filter backwash sporadically; but larger plants with numerous filters may produce backwash continuously as filters are rotated for backwashing. Spent filter backwash can comprise 2 to 10 percent of the total plant production of finished water. The quality of spent filter backwash varies from plant to plant. Filter backwash may contain chlorine, if the facility backwashes with chlorinated water. Relative to raw water, spent backwash shows higher concentrations of *Giardia lamblia* and *Cryptosporidium*, dissolved organic carbon, zinc, total trihalomethanes (TTHMs), turbidity, total organic carbon (TOC) and total suspended solids (TSS). In addition, filter backwash may have higher concentrations of aluminum and iron (from aluminum and iron based coagulants). The average TSS concentrations of spent filter backwash typically fall within the range of 50 to 400 mg/L.

Filter-to-Waste

Filter-to-waste is generated by filters immediately after being placed back on-line following backwashing. The filter-to-waste is not considered to be of a quality that can be sent directly into the water distribution system, but is a fairly clean waste stream. It amounts to approximately 0.5 percent of the total amount of water filtered. At some WTPs, the filter-to-waste is returned to the head of the plant. Since the last permit cycle, the Riverside WTP has changed its filter-to-waste process, and has reduced the volume of flushing by an average of 0.011 mgd.

Thickener Overflows (Supernatant)

Thickener supernatant results from gravity thickening of solids in sedimentation basins, backwash holding tanks, lagoons, and other similar units. After settling, the clarified or decant water that exits the unit is called thickener supernatant. The quantity of sedimentation basin thickener supernatant is approximately 75 to 95 percent of the volume of sludge produced; and sludge volumes are typically 0.1 to 3 percent of the plant flow. Thickener supernatant may be recycled or discharged at a frequency that depends on the quantity of sludge produced. Microbial, inorganic, and organic contaminants that concentrate in the sludges can remain in the supernatant, if sludge is not properly settled, treated, and/or removed.

Decant Water

Some filtration plants prepare waste solids for disposal by concentrating solids to remove excess water thereby reducing the volume of waste for disposal. Such processes concentrate sludges as high as 50 percent solids content. Liquids from dewatering processes are produced from a lagoon or sludge drying bed as decant and underflow, or as filtrate or centrate from mechanical processes. Small, intermittent wastewater streams are produced as a result of the dewatering process. Such waste streams can contain elevated levels of turbidity, TOC, TTHMs (if chlorine is used), as well as aluminum, iron, and manganese, if flocculants are used.

Outfall Description

The outfalls from both facilities discharge into the Clearwater River within the Nez Perce Reservation boundary.

Effluent Characterization

The effluent quality is summarized in Table 2.

Table 2 Effluent Characterization

Orofino WTP Discharge Monitoring Report Data (January 2011 to October 2016) No discharge has occurred from August 6, 2014 to present due to process changes.			
Parameter	**Maximum**	**Minimum**	**Notes**
Flow	0.143 mgd Max. Daily	0.013 mgd Average Monthly	2011 – 2016 data
Temperature	24.44 ºC	1.11 ºC	2011 – 2016 data
Turbidity	34.4 NTU	0.54 NTU	2011 – 2016 data
pH	7.2 s.u.	6.0 s.u.	2011 – 2016 data
Alkalinity	27 mg/l	6 mg/l	2011 – 2016 data
Total Suspended Solids	810 mg/l Max Daily	2 mg/l Max Daily	2011 – 2016 data
	603 mg/l Average Monthly	1 mg/l Average Monthly	2011 – 2016 data
Total Residual Chlorine	0.17 mg/l Max Daily	0.02 mg/l Max Daily	2011 – 2016 data
	0.1 mg/l Average Monthly	0.004 mg/l Average Monthly	2011 – 2016 data
Aluminum	2180 µg/l	2 µg/l	2007 – 2016 data
Antimony	2 µg/l	< 2 µg/l	2007 – 2009 data
Arsenic	4 µg/l	0.0007 µg/l	2007 – 2009 data
Beryllium	2 µg/l	0.6 µg/l	2007 - 2009 data
Cadmium	< 5 µg/l	0.7 µg/l	2007 - 2009 data
Chromium	7 µg/l	< 2 µg/l	2007 - 2009 data
Copper	10 µg/l	< 10 µg/l	2007 - 2009 data
Lead	4 µg/l	0.0014 µg/l	2007 - 2009 data
Nickel	3 µg/l	< 3 µg/l	2007 – 2009 data
Selenium	5 µg/l	< 5 µg/l	2007 - 2009 data
Silver	12 µg/l	< 2 µg/l	2007 - 2009 data
Thallium	10 µg/l	< 10 µg/l	2007 - 2009 data
Zinc	17 µg/l	0.008 µg/l	2007 - 2009 data
Total Trihalomethane	1.7 µg/l	1.7 µg/l	2010 data

Riverside WTP Discharge Monitoring Report Data (January 2011 to October 2016)			
Parameter	**Maximum**	**Minimum**	**Notes**
Flow	0.576 mgd Max. Daily	0.022 mgd Average Monthly	2011 – 2016 data
Temperature	27.7 ºC	2.1 ºC	2011 – 2016 data
Turbidity	3.33 NTU Max. Daily	0.11 NTU Max. Daily	2011 – 2016 data
pH	8.04 s.u.	6.0 s.u.	2011 – 2016 data
Alkalinity	29 mg/l Max. Daily	3 mg/l Max. Daily	2011 – 2016 data
Total Suspended Solids	45 mg/l Max. Daily	1 mg/l Max. Daily	2011 – 2016 data
	30 mg/l Average Monthly	1 mg/l Average Monthly	2011 – 2016 data
Total Residual Chlorine	0.5 mg/l Max. Daily	0 mg/l Max. Daily	2011 – 2016 data
	0.3 mg/l Average Monthly	0 mg/l Average Monthly	2011 – 2016 data
Antimony	< 0.001 µg/l	0 µg/l	2007 – 2009 data
Arsenic	0.001 µg/l	0 µg/l	2007 – 2009 data
Beryllium	<0.001 µg/l	0 µg/l	2007 - 2009 data
Cadmium	< 0.001 µg/l	0 µg/l	2007 - 2009 data
Chromium	< 0.001 µg/l	0 µg/l	2007 - 2009 data
Copper	0.00179 µg/l	< 0.001 µg/l	2007 - 2009 data
Lead	< 0.001 µg/l	0 µg/l	2007 - 2009 data
Nickel	<0.001 µg/l	0 µg/l	2007 – 2009 data
Selenium	< 0.001 µg/l	0 µg/l	2007 - 2009 data
Silver	<0.001 µg/l	0 µg/l	2007 - 2009 data
Thallium	< 0.001 µg/l	0 µg/l	2007 - 2009 data
Zinc	0.00288 µg/l	0.00175 µg/l	2007 - 2009 data
Total Trihalomethane	0.66 µg/l	0 µg/l	2008 – 2010 data
Note: Riverside WTP did not use alum or any product that contain aluminum in its treatment process, therefore monitoring for aluminum was not required during the last permit cycle.			

Compliance History

The EPA reviewed the last five years of effluent monitoring data (January 2011 – October 2016) from the discharge monitoring report (DMR) from the EPA database. For the Orofino WTP, there were 32 reporting violations and 102 effluent limit violations. For the Riverside WTP, there were 13 reporting violations, and 26 effluent limit violations.

For the Orofino WTP, IDEQ conducted an inspection on June 20, 2011. On November 14, 2011, EPA issued a Notice of Violation and Information Request to the facility pertaining to their existing NPDES permit. In a letter dated June 3, 2011, the City of Orofino was in the process of building a new treatment facility that would be operational in 2013. The City has reported that there has been no discharge from the Orofino WTP since August 6, 2014, when the upgraded plant went into operation.

For the Riverside WTP, IDEQ conducted an inspection on June 21, 2011. On February 21, 2012, EPA issued a Notice of Violation to the facility pertaining to their existing NPDES

Permit. On February 27, 2012, the facility responded to EPA regarding its Notice of Violation.

III. Receiving Water

A. Receiving Water

Both facilities discharge into the receiving waters of the Clearwater River from their respective outfalls. The Orofino WTP has an outfall that is upstream from the Riverside WTP outfall. Both outfalls are located within the Nez Pierce Reservation. The Clearwater River, a substantially sized waterbody, is a tributary to the Snake River. On February 15, 2017, EPA contacted the Nez Perce Tribe by letter concerning the proposed permit.

B. Designated Beneficial Uses

Concerning the NPDES permitting program, the Nez Perce Tribe has not applied for the status of Treatment as a State (TAS) from the EPA for purposes of the Clean Water Act. When the Nez Perce Tribe is granted TAS, and when it has Water Quality Standards (WQS) approved by EPA, those tribal WQS will be used for determining effluent limitations. Meanwhile, in the absence of EPA-approved tribal WQS, the Idaho WQS were used as reference for setting permit limits, and to protect downstream uses in the State of Idaho. The distance from the points of discharge on the Clearwater River to the Idaho state boundary downstream is approximately 36 miles for the Orofino WTP, and 34 miles for the Riverside WTP respectively.

These facilities discharge to the Clearwater River in the Clearwater Subbasin. At the point of discharge, the Clearwater River is protected for the following designated uses:

- cold water aquatic life, salmonid spawning
- primary contact recreation
- domestic water supply
- industrial and agricultural water supply
- wildlife habitats
- aesthetics

Existing Uses

Tier 1 protection under the Antidegradation Policy applies to all water bodies under the CWA. It requires the protection of existing uses and requires that the water quality necessary to protect those uses be maintained and protected. (See federal regulations at 40 CFR Section 131.12(a)(1)). Under the antidegradation regulations, the EPA must include permit conditions in the NPDES permit sufficient to protect and maintain the existing uses in that water body.

Surface Water Quality Criteria

The reference criteria are found in the following sections of the Idaho Water Quality Standards:

- The narrative criteria applicable to all surface waters of the State are found at IDAPA 58.01.02.200 (General Surface Water Quality Criteria).

- The numeric criteria for toxic substances for the protection of aquatic life and primary contact recreation are found at IDAPA 58.01.02.210 (Numeric Criteria for Toxic Substances for Waters Designated for Aquatic Life, Recreation, or Domestic Water Supply Use).

- Additional numeric criteria for the protection of aquatic life can be found at IDAPA 58.01.02.250 (Surface Water Quality Criteria for Aquatic Life Use Designations).

- Numeric criteria for the protection of recreation uses can be found at IDAPA 58.01.02.251 (Surface Water Quality Criteria for Recreation Use Designations).

- Water quality criteria for agricultural water supply can be found in the EPA's *Water Quality Criteria 1972*, also referred to as the "Blue Book" (EPA R3-73-033)

The numeric and narrative water quality criteria used as a reference for the Clearwater River at the points of discharge are provided in Appendix B of this fact sheet.

Antidegradation

In setting permit conditions, EPA must consider the State's and Tribe's antidegradation policy. This policy is designed to protect existing water quality when the existing quality is better than that required to meet the standard and to prevent water quality from being degraded below the standard when existing quality just meets the standard. For high quality waters, antidegradation requires that the State and Tribe finds that allowing lower water quality is necessary to accommodate important economic or social development before any degradation is authorized. This means that, if water quality is better than necessary to meet the water quality standards, increased permit limits can be authorized only if they do not cause degradation, or if the EPA makes the determination that more stringent limits are necessary.

Since EPA evaluated the discharge by referencing Idaho's water quality standards, EPA utilized IDEQ's antidegradation implementation methods as guidance.

C. Water Quality

The water quality for the receiving water is summarized in Table 3.

Table 3. Receiving Water Quality Data

Parameter	Units	Percentile	Value	Source
Temperature	°C	95^{th}	25	USGS
pH	Standard units	5^{th} – 95^{th}	7.71 – 7.89	USGS
Hardness	mg/L	5^{th} – 95^{th}	No Data	none
Ammonia	mg/L	maximum	0.117	USGS
Source: USGS Station # 13340000, Clearwater River at Orofino, Idaho				

D. Water Quality Limited Waters

Any waterbody for which the water quality does not, and/or is not expected to meet, applicable water quality standards is defined as a "water quality limited segment."

Section 303(d) of the CWA requires states to develop a Total Maximum Daily Load (TMDL) management plan for water bodies determined to be water quality limited segments. A TMDL is a detailed analysis of the water body to determine its assimilative capacity. The assimilative capacity is the loading of a pollutant that a water body can assimilate without causing or contributing to a violation of water quality standards. Once the assimilative capacity of the water body has been determined, the TMDL will allocate that capacity among point and non-point pollutant sources, taking into account natural background levels and a margin of safety. Allocations for non-point sources are known as "load allocations" (LAs). The allocations for point sources, known as "waste load allocations" (WLAs), are implemented through effluent limitations in NPDES permits. Effluent limitations for point sources must be consistent with applicable TMDL allocations.

The portion of the Clearwater River where these WTPs discharge is not water quality limited, thus, a TMDL does not exist for the waterbody.

E. Low Flow Conditions

The *Technical Support Document for Water Quality-Based Toxics Control* (hereafter referred to as the TSD) (EPA, 1991) and the Idaho Water Quality Standards (WQS) recommend the flow conditions for use in calculating water quality-based effluent limits (WQBELs) using steady-state modeling. The TSD and the Idaho WQS state that WQBELs intended to protect aquatic life uses should be based on the lowest seven-day average flow rate expected to occur once every ten years (7Q10) for chronic criteria and the lowest one-day average flow rate expected to occur once every ten years (1Q10) for acute criteria.

EPA used flow data available from USGS Station #33400000 and the DFLOW computer program to calculate the critical low flows of the Clearwater River at Orofino, Idaho. In the Fact Sheet for the exisiting 2006 permit, the 7Q10 was calculated at 771 cfs and the Dilution Factors for Orofino WTP was 2,445 (Acute Criteron) and 3,195 (Chronic Criteron); for the Riverside WTP, the Dilution Factors were 1,403 (Acute Criteron) and 1,833 (Chronic Criteron).

Using updated data, EPA used daily flow data available from USGS Station 13340000 (located at Lat. 46° 28' 42"N, Long. 116° 15' 27" W) to calculate the critical low flows of Clearwater River at Orofino, Idaho. The updated calculated low flows are: 1Q10 is 500 cfs, and the 7Q10 is 594 cfs. EPA used the same updated low flows to calculate dilution factors for reasonable potential analysis because the close proximity of both WTPs to this USGS Station would provide a reasonably good estimate of receiving water flow conditions relative to the respective small discharge volumes.

IV. Effluent Limitations and Monitoring

Table 5 below presents the existing effluent limits and monitoring requirements in the 2006 Permit. Table 6, below, presents the proposed effluent monitoring requirements in the draft permit.

Table 4. Existing Permit Effluent Limitations and Monitoring Requirements					
Parameter	Units	Effluent Limitations		Monitoring Requirements	
		Average Monthly	Maximum Daily	Sample Frequency	Sample Type
Total Suspended Solids (TSS)	mg/l	30	45	1/Month	Grab
	lbs/day	Footnote 1	Footnote 1		
Total Residual Chlorine (TRC)	mg/l	0.3	0.5	1/Week	Grab
	lbs/day	Footnote 2	Footnote 2		
pH	standard units	Within the range of 6.0 to 9.0		1/Week	Grab
Flow	gpd	--	--	1/Day	Estimate
Alkalinity	mg/l as $CaCO_3$	--	--	1/Month	Grab
Aluminum	µg/L	Footnote 3	Footnote 3	1/Year	Grab
Metals[4,6]	µg/L	--	--	1/Year	Grab
Temperature	˚C	--	--	1/Week	Grab
Total Trihalomethanes (TTHMs)[5,6]	µg/L	--	--	1/Year	Grab
Turbidity	NTUs	--	--	1/Month	Grab

1. TSS loading limits for Orofino WTP: AML = 25 lbs/day; MDL = 38 lbs/day.
   TSS loading limits for Riverside WTP: AML = 38 lbs/day; MDL = 56 lbs/day.
2. TRC loading limits for Orofino WTP: AML = 0.25 lbs/day; MDL = 0.42 lbs/day.
   TRC loading limits for Riverside WTP: AML = 0.38 lbs/day; MDL = 0.63 lbs/day.
3. Monitoring for Aluminum is required for Orofino WTP only.
   Riverside WTP did not use alum or any product that contain aluminum in its treatment process, therefore monitoring for aluminum was not required during the last permit cycle.
4. Metals include: antimony, arsenic, beryllium, cadmium, total chromium, copper, lead, nickel, selenium, silver, thallium, and zinc. These parameters must be measured and reported as total recoverable.
5. For TTHMs – Analysis for chloroform, chlorodibromomethane, dichlorobromomethane, and bromoform.
6. Sampling required during first three years of permit only.

Table 5. Proposed Effluent Limits and Monitoring Requirements for both Orofino WTP and Riverside WTP					
Parameter	Units	Effluent Limitations		Monitoring Requirements	
		Average Monthly	Maximum Daily	Sample Frequency	Sample Type
Total Suspended Solids (TSS)	mg/L	30	45	1/Month	Grab
Total Residual Chlorine[1] (for Riverside WTP only)	mg/L	0.3	0.5	1/Week	Grab
pH	standard units	Within the range of 6.5 to 9.0		1/Week	Grab
Flow[2]	gpd	--	--	1/Day	Estimate
Hardness[3]	mg/l as $CaCO_3$	--	--	1/Month	Grab
Aluminum[4] (for Orofino WTP only)	µg/L	--	--	1/Year	Grab
Metals[5]	µg/L	--	--	1/Year	Grab

Temperature	˚C	--	--	1/Week	Grab
Trihalomethanes (THMs)[6] (for Riverside WTP only)	µg/L	--	--	1/Quarter	Grab
Turbidity	NTUs	--	--	1/Month	Grab

1. Effluent limits and monitoring for TRC is only for the Riverside WTP. The Orofino WTP has no TRC effluent limits and no TRC monitoring requirements, but it is not allowed to discharge TRC.
2. Flow estimate based on facility operation (i.e. backwash volume and frequency, etc.). Report average monthly and maximum daily gpd.
3. Hardness shall be sampled at the same time metal samples are collected.
4. Monitoring not required for Riverside WTP because alum or any product containing aluminum are used.
5. Metals include: antimony, arsenic, beryllium, cadmium, total chromium, copper, lead, nickel, selenium, silver, thallium, and zinc. These parameters must be measured and reported as total recoverable.
6. For THMs – Monitoring not required for Orofino WTP. Quarterly monitoring, with a minimum of 10 samples required within 5 years. Analysis for chloroform, chlorodibromomethane, dichlorobromomethane, and bromoform. Each of the triholomethanes must be reported separately. Quarters are defined as: January to March; April to June; July to September; and, October to December.
7. TSS loading limits for Orofino WTP: AML = 25 lbs/day; MDL = 38 lbs/day.
   TSS loading limits for Riverside WTP: AML = 38 lbs/day; MDL = 56 lbs/day.
   TRC loading limits for Riverside WTP: AML = 0.38 lbs/day; MDL = 0.63 lbs/day.

<u>Differences in monitoring and effluent limitation requirements between proposed permit and the existing permit.</u>

a. TRC concentration effluent limits for Orofino WTP have been eliminated. The facility does not use chlorine in the treatment process. The facility is not authorized to discharge TRC.
b. pH effluent limits have been changed from the range of 6.0 – 9.0, to the range of 6.5 -9.0. This new pH range is consistent with the present Idaho WQS at IDAPA 58.01.02.250.
c. Measurement for effluent hardness is added to determine toxicity of metals during the next permit cycle.
d. Measurement for effluent alkalinity is no longer required and has been replaced by hardness measurement.
e. Loading limits for TRC for Orofino WTP have been eliminated due to process changes at the plant that would not cause a discharge of TRC. The facility is not authorized to discharge TRC.
f. Monitoring for THMs is proposed to be increased from a minimum of 3 sampling events to a minimum of 10 sampling events during the permit cycle. This monitoring is only required for the Riverside WTP, and not required for the Orofino WTP. THMs are a byproduct of chlorination, because the Orofino WTP does not use chlorine in the process, THMs are not a pollutant of concern for the facility.
g. For Riverside WTP only, monitoring for each of the 4 triholomethane compounds (for chloroform, chlorodibromomethane, dichlorobromomethane, and bromoform) must be analyzed and reported separately. Reporting the concentrations separately for each compound will enable EPA to perform individual reasonable potential analysis.

V. Rationale for Effluent Limitations and Standards

A. Statutory Requirements for Determining Effluent Limitations

Section 301(a) of the CWA, 33 USC § 1311(a), prohibits the discharge of pollutants to waters of the U.S. unless the discharge is authorized pursuant to an NPDES permit. Section 402 of the CWA, 33 USC § 1342, authorizes the EPA, or an approved state NPDES program, to issue an NPDES permit authorizing discharges subject to limitations and requirements imposed pursuant to CWA Sections 301, 304, 306, 401 and 403, 33 USC §§ 1311, 1314, 1316, 1341 and 1343.

In general, the CWA requires that the limits for a particular pollutant be the more stringent of either technology-based effluent limits (TBELs) or water quality-based effluent limits (WQBELs). TBELs are set according to the level of treatment that is achievable using available technology. WQBELs are designed to ensure that the state adopted, EPA approved, WQS of a waterbody are being met and they may be more stringent than TBELs. Because the receiving water is within the boundary of Nez Perce Reservation that does not have EPA-approved WQS, EPA is using Idaho WQS to protect both the tribal water and the downstream waters of the State of Idaho.

EPA first determines which TBELs apply to a discharge in accordance with applicable national effluent limitation guidelines (ELGs) and standards. EPA further determines which WQBELs apply to a discharge based upon an assessment of the pollutants discharged and a review of state WQS. Monitoring requirements must also be included in the permit to determine compliance with effluent limitations. Effluent and ambient monitoring may also be required to gather data for future effluent limitations or to monitor effluent impacts on receiving water quality.

Technology-based Effluent Limitations

Section 301(b) of the CWA, 33 USC § 1311(b), requires technology-based controls on effluents. All NPDES permits must contain effluent limitations which: (a) control toxic pollutants and nonconventional pollutants through the use of “best available technology economically achievable” (BAT), and (b) control conventional pollutants through the use of “best conventional pollutant control technology” (BCT). In no case may BAT or BCT be less stringent than the “best practical control technology currently achievable” (BPT), which is the minimum level of control required by Section 301(b)(1)(A) of the CWA, 33 USC § 1311(b)(1)(A).

The intent of a TBEL is to require a minimum level of treatment for industrial point sources based on currently available treatment technologies while allowing a discharger to choose and use any available control technique to meet the limitations. Accordingly, every individual member of a discharge class or category is required to operate their water pollution control technologies according to industry-wide standards and accepted engineering practices.

Note that, EPA has selected the “drinking water treatment point source category” as a candidate for effluent guidelines rulemaking. At this time, EPA has made no decisions about whether any discharge controls are necessary for residuals produced by drinking water treatment facilities. Additional information on this rulemaking may be found at: http://www.epa.gov/waterscience/guide/dw/

Where EPA has not yet developed effluent limitation guidelines, pursuant to Section 301(b) of the CWA, for a particular industry or a particular pollutant, TBELs must be established using best professional judgment (BPJ) (40 CFR § 122.43, 12.44, and 125.3). Because there are no ELGs developed by EPA for discharges from the water treatment industry, EPA established TBELs based on BPJ for TSS and total residual chlorine.

Total Suspended Solids

For the discharge authorized by the permit, EPA is establishing TSS effluent limits of 30 mg/l (average monthly limit) and 45 mg/l (maximum daily limit). EPA is establishing these TBELs in the permit utilizing BPJ to meet the requirements of BCT/BAT.

Existing individual permits for water treatment plants in Idaho have limits of 30 mg/l and 45 mg/l (monthly average and daily maximum). The facilities have been in compliance with these limits. In establishing the TSS limitations for this permit, EPA is also relying on research performed for the EPA in 1987 (SAIC, Model Permit Package for the Water Supply Industry, EPA Contract No. 68-01-7043). This study considered sedimentation lagoons as the model treatment for BCT based on a finding that 76 percent of WTPs surveyed had used this technology for wastewater treatment. Analysis of 76 individual NPDES permits for WTPs determined that limitations of 30 mg/l and 45 mg/l were representative of current permitting practice for average monthly and daily maximum TSS limits, respectively. And, analysis of monitoring data for sedimentation lagoons within the industry resulted in calculation of 95th percent occurrence (monthly average) and 99th percent occurrence (daily maximum) levels of treatment of 28.1 mg/l and 44.4 mg/l, respectively. These levels of treatment performance were considered Best Practicable Technology Currently Available (BPT), and subsequent analysis determined that BPT was equal to BCT. The study identified 30 mg/l and 45 mg/l to be the monthly average and daily maximum TSS limits for a model NPDES permit.

Total Residual Chlorine

There are no applicable ELGs for total residual chlorine in discharges from water treatment plants. The EPA established TBELs for total residual chlorine based on BPJ in individual permits of 0.5 mg/l (maximum daily limit) and 0.3 mg/l (average monthly limit). EPA established chlorine limits in the DWGP based on these TBELs when mixing zones are granted. The results of the analysis show that the TBEL for Total Residual Chlorine would cause a violation of Idaho Water Quality Standards if a mixing zone is not granted. This indicates that a WQBEL is necessary when a mixing zone is not granted. However, the Riverside WTP discharges into the Clearwater River which affords sufficient dilution for the facility to be granted a mixing zone. The Orofino WTP no longer discharges chlorine due to changes in its processes.

B. Water Quality-based Effluent Limitations for pH

Section 301(b)(1)(C) of the CWA and implementing regulations at 40 CFR § 122.44(d) require permits to include limits for all pollutants or parameters which are or may be discharged at a level which will cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality. If such WQBELs are necessary, they must be stringent enough to ensure that water quality standards are met, and they must be consistent with any available waste load allocation. For pollutants with TBELs, EPA must also determine whether a TBEL will be protective of the corresponding water quality criteria.

The draft permit includes WQBELs for pH. Appendix C provides a discussion of the steps for an evaluation of whether WQBELs for total residual chlorine are necessary. Reasonable potential analyses show that WQBELs are not necessary for either facility.

pH

The Idaho WQS at IDAPA 58.01.02.250, require pH values of the river to be within the range of 6.5 to 9.0. To assure protection of the applicable water quality criteria, the pH range of 6.5 to 9.0 is being established as an end of pipe discharge limitation by the draft permit.

Table 7 Proposed Effluent Limitations

Parameter	Units	AML	MDL	Designated Use in Idaho WQS Linked to Specific Water Quality Criteria Used as Basis for Limits or BPJ
TSS	mg/L	30	45	BPJ
Total Residual Chlorine (TRC)	mg/L	0.3	0.5	TBEL
pH	standard units	Not less than 6.5 or greater than 9.0 standard units (s.u.)		Water Quality Based

C. Antibacksliding and Antidegradation

Section 402(o) of the Clean Water Act and federal regulations at 40 CFR §122.44 (l) generally prohibit the renewal, reissuance or modification of an existing NPDES permit that contains effluent limits, permit conditions or standards that are less stringent than those established in the previous permit (i.e., anti-backsliding) but provides limited exceptions. For explanation of the antibacksliding exceptions refer to Chapter 7 of the Permit Writers Manual *Final Effluent Limitations and Anti-backsliding*.

An anti-backsliding and antidegradation analysis was done for the Orofino WTP and Riverside WTP. Due to changes in production processes from the plant upgrade, the Orofino WTP no longer discharges chlorine, therefore, TRC effluent limits have been eliminated for the Orofino WTP. The Orofino WTP is not authorized to discharge TRC. All other proposed concentration effluent limits are as stringent as in the existing permit; therefore, the proposed permit is in compliance with antibacksliding and antidegradation provisions.

D. Minimum Levels

The water quality based effluent limits for total residual chlorine are not quantifiable using the most sensitive method for analysis under 40 CFR Part 136.

The Minimum Level (ML) for Total Residual Chlorine is 50 μg/l. The ML represents the lowest concentration at which an analyte can be measured with a known level of confidence.

E. Mixing Zone Considerations

A mixing zone is an allocated impact zone where state WQS can be exceeded so long as acutely toxic conditions are prevented. It is a defined area or volume of the receiving water adjacent to or surrounding a wastewater discharge where the receiving water, as a result of the discharge, may not meet all applicable water quality criteria. Mixing zones should be as small as practicable. A mixing zone is considered a place where wastewater mixes with receiving water and is based upon the dilution available and the assimilative capacity of the receiving water. Mixing zones were not used to determine effluent limits in these permits.

VI. Monitoring and Reporting Requirements

A. Basis for Effluent and Surface Water Monitoring

Section 308 of the CWA and the federal regulation found 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 Permittee is responsible for conducting the monitoring and for reporting results on DMRs or on the application for renewal, as appropriate, to the EPA. Permittees must analyze water samples using a sufficiently sensitive EPA approved analytical method.

B. Monitoring Location(s)

Discharges authorized by this permit must be monitored at each outfall.

C. Monitoring Frequencies

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 under the permit. These samples must be used for averaging if they are conducted using the EPA-approved test methods (generally found in 40 CFR 136) or as specified in the permit. Monitoring frequencies are shown in Table 5, above.

D. Electronic Submission of Discharge Monitoring Reports

The draft permit requires that the permittee submit DMR data electronically using NetDMR. NetDMR is a national web-based tool that allows DMR data to be submitted electronically via a secure Internet application.

The EPA currently conducts free training on the use of NetDMR. Further information about NetDMR, including upcoming trainings and contacts, is provided on the following website: https://netdmr.com. The permittee may use NetDMR after requesting and receiving permission from EPA Region 10.

VII. Other Permit Conditions

A. Quality Assurance Plan

Federal regulations at 40 CFR §122.41(e) require Permittees to properly operate and maintain their facilities, including "adequate laboratory controls and appropriate quality assurance procedures." In order to implement this requirement, the draft permits, require that the Permittees develop or update a QAP that ensures that the monitoring data submitted to EPA are complete, accurate, and representative of the environmental or effluent conditions and to explain data anomalies if they occur. The permittees are required to complete the QAP (or update an existing QAP) within 180 days of the effective dates of their permits. The QAP must include standard operating procedures the permittee must follow for collecting, handling, storing and shipping samples, laboratory analysis, and data reporting. The plan must be retained on site and be made available to the EPA and the Nez Perce Tribe upon request.

B. Best Management Practices (BMP) Plan

The EPA regulations at 40 CFR §122.44(k) provide for requirements to include best management practices (BMPs) in NPDES permits to control or abate the discharge of pollutants whenever necessary to achieve effluent limitations and standards or to carry out the purposes and intent of the CWA.

The Draft Permits, require the development and implementation of a BMP Plan, which prevents or minimizes the generation and potential release of pollutants from the facilities to the waters of the United States through BMPs. This includes, but is not limited to, material storage areas, site runoff, storm water, in-plant transfer, process and material handling areas, loading or unloading operations, spillage or leaks, sludge and waste disposal, or drainage from raw material storage. The BMP Plan should incorporate elements of pollution prevention as set forth in the Pollution Prevention Act of 1990 (42 U.S.C. § 13101).

The Permittees must develop or revise their BMP Plan within 90 days of the effective date of their permit and certify to EPA and the Nez Perce Tribe in writing, in accordance with Part III.B, the development and implementation of the BMP Plan. The BMP Plan must be amended whenever there is a change in the facility or in the operation of the facility which materially increases the potential for an increased discharge of pollutants. The BMP Plan is an enforceable condition of a permit; therefore, a violation of the BMP Plan is a violation of the Permit.

C. Environmental Justice

As part of the permit development process, EPA Region 10 conducted a screening analysis to determine whether this permit action could affect overburdened communities. "Overburdened" communities can include minority, low-income, tribal and indigenous populations, or communities that potentially experience disproportionate environmental harms and risks. The EPA used a nationally consistent geospatial tool that contains demographic and environmental data for the United States at the Census block group level. This tool is used to identify permits for which enhanced outreach may be warranted.

Both the Orofino WTP and Riverside WTP are located within or near a Census block group that is potentially overburdened. In order to ensure that individuals near the facility are able to participate meaningfully in the permit process, the EPA has offered Tribal Consultation with the Nez Perce Tribe.

Regardless of whether a facility is located near a potentially overburdened community, the EPA 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.federalregister.gov/articles/2013/05/09/2013-10945/epa-activities-to-promote-environmental-justice-in-the-permit-application-process#p-104). 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.

For more information, please visit http://www.epa.gov/compliance/ej/plan-ej/ and Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*,

Standard Permit Provisions

Sections III, IV and V of the draft permits 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

The Endangered Species Act requires federal agencies to consult with National Oceanic and Atmospheric Administration Fisheries (NOAA Fisheries) and the U.S. Fish and Wildlife Service (USFWS) if their actions could beneficially or adversely affect any threatened or endangered species. A review of the threatened and endangered species located in Idaho finds that the permitted discharges would have no effect on threatened or endangered species. See Appendix D for a more detailed ESA discussion.

B. Essential Fish Habitat

Essential fish habitat (EFH) is the waters and substrate (sediments, etc.) necessary for fish to spawn, breed, feed, or grow to maturity. The Magnuson-Stevens Fishery Conservation and Management Act (January 21, 1999) requires the EPA to consult with NOAA Fisheries when a proposed discharge has the potential to adversely affect EFH (i.e., reduce quality and/or quantity of EFH).

The EFH regulations define an adverse effect as any impact which reduces quality and/or quantity of EFH and may include direct (e.g. contamination or physical disruption), indirect (e.g. loss of prey, reduction in species' fecundity), site specific, or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions. The EPA has prepared an EFH assessment in Appendix D.

The EPA has determined that issuance of these permits would have no effect on EFH in the vicinity of the discharges. The EPA has provided NOAA Fisheries with copies of the draft permits and this fact sheet during the public notice period. Any comments received from NOAA Fisheries regarding EFH will be considered prior to reissuance of the permits.

C. Section 401 Certification

Since this permit authorizes the discharge into Nez Perce tribal waters, EPA will provide Section 401 certification under the Clean Water Act.

D. Permit Expiration

The permit will expire five years from the effective date.

IX. References

EPA. 1991. *Technical Support Document for Water Quality-based Toxics Control.* US Environmental Protection Agency, Office of Water, EPA/505/2-90-001.

Water Pollution Control Federation. Subcommittee on Chlorination of Wastewater. *Chlorination of Wastewater.* Water Pollution Control Federation. Washington, D.C. 1976.

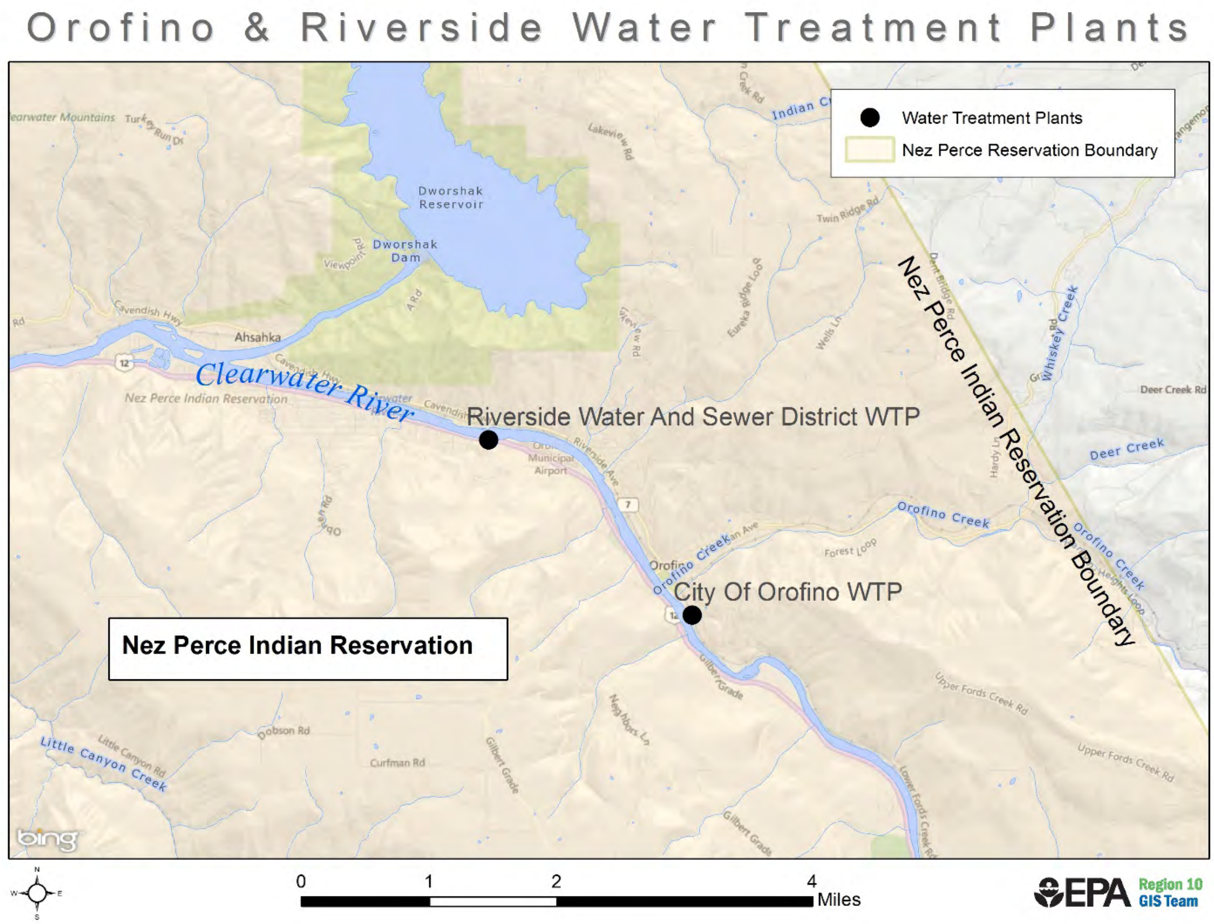
EPA. 2010. *NPDES Permit Writers' Manual.* Environmental Protection Agency, Office of Wastewater Management, EPA-833-K-10-001.

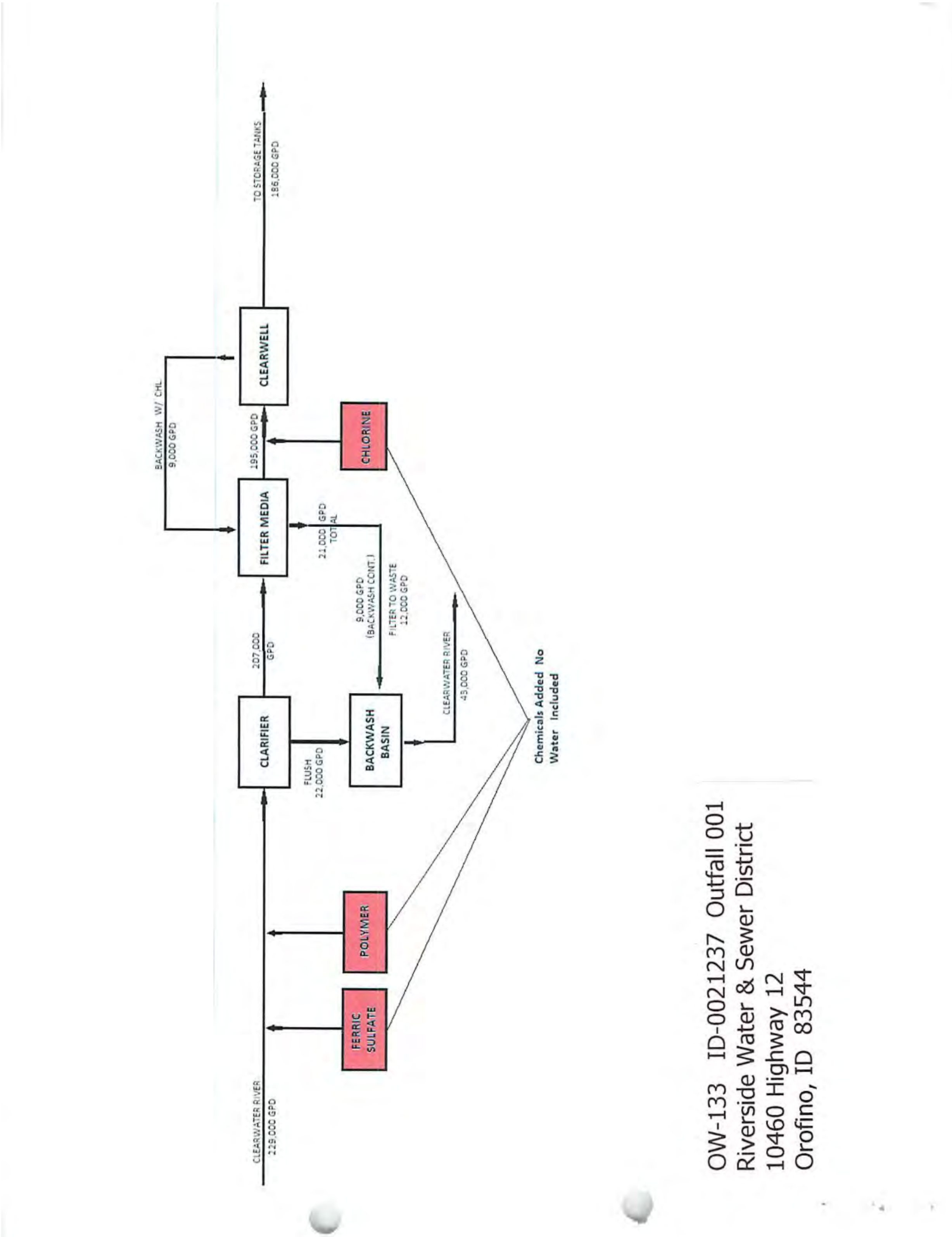
EPA, 2007. *EPA Model Pretreatment Ordinance*, Office of Wastewater Management/Permits Division, January 2007.

EPA, 2011. *Introduction to the National Pretreatment Program*, Office of Wastewater Management, EPA 833-B-11-011, June 2011.

Appendix A. Facility Information

Map and Schematics of the Orofino and Riverside Water Treatment Plants




CLEARWATER RIVER
229,000 GPD
FERRIC SULFATE
POLYMER
CLARIFIER
207,000 GPD
FLUSH
22,000 GPD
BACKWASH BASIN
CLEARWATER RIVER
43,000 GPD
FILTER MEDIA
21,000 GPD TOTAL
9,000 GPD
(BACKWASH CONT.)
FILTER TO WASTE
12,000 GPD
195,000 GPD
CHLORINE
BACKWASH W/ CHL
9,000 GPD
CLEARWELL
TO STORAGE TANKS
186,000 GPD
Chemicals Added No Water Included
OW-133 ID-0021237 Outfall 001
Riverside Water & Sewer District
10460 Highway 12
Orofino, ID 83544

Schematic of City of Orofino Water Treatment Plant

Appendix B. Water Quality Data

A. Treatment Plant Effluent Data

Orofino WTP **Discharge Monitoring Report Data (January 2011 to October 2016)** **Due to plant upgrades, the Orofino WTP no longer discharges on a regular basis as wastewaters are recycled.** **There has been no discharge from August 6, 2014 to October 2016.**			
Parameter	**Maximum**	**Minimum**	**Notes**
Flow	0.143 mgd Max. Daily	0.013 mgd Average Monthly	2011 – 2016 data
Temperature	24.44 ºC	1.11 ºC	2011 – 2016 data
Turbidity	34.4 NTU	0.54 NTU	2011 – 2016 data
pH	7.2 s.u.	6.0 s.u.	2011 – 2016 data
Alkalinity	27 mg/l	6 mg/l	2011 – 2016 data
Total Suspended Solids	810 mg/l Max Daily	2 mg/l Max Daily	2011 – 2016 data
Total Suspended Solids	603 mg/l Average Monthly	1 mg/l Average Monthly	2011 – 2016 data
Total Residual Chlorine	0.17 mg/l Max Daily	0.02 mg/l Max Daily	2011 – 2016 data
Total Residual Chlorine	0.1 mg/l Average Monthly	0.004 mg/l Average Monthly	2011 – 2016 data
Aluminum	2180 µg/l	2 µg/l	2007 – 2016 data
Antimony	2 µg/l	< 2 µg/l	2007 – 2009 data
Arsenic	4 µg/l	0.0007 µg/l	2007 – 2009 data
Beryllium	2 µg/l	0.6 µg/l	2007 - 2009 data
Cadmium	< 5 µg/l	0.7 µg/l	2007 - 2009 data
Chromium	7 µg/l	< 2 µg/l	2007 - 2009 data
Copper	10 µg/l	< 10 µg/l	2007 - 2009 data
Lead	4 µg/l	0.0014 µg/l	2007 - 2009 data
Nickel	3 µg/l	< 3 µg/l	2007 – 2009 data
Selenium	5 µg/l	< 5 µg/l	2007 - 2009 data
Silver	12 µg/l	< 2 µg/l	2007 - 2009 data
Thallium	10 µg/l	< 10 µg/l	2007 - 2009 data
Zinc	17 µg/l	0.008 µg/l	2007 - 2009 data
Trihalomethane	1.7 µg/l	1.7 µg/l	2010 data

Riverside WTP **Discharge Monitoring Report Data (January 2011 to October 2016)**			
Parameter	**Maximum**	**Minimum**	**Notes**
Flow	0.576 mgd Max. Daily	0.022 mgd Average Monthly	2011 – 2016 data
Temperature	27.7 ºC	2.1 ºC	2011 – 2016 data
Turbidity	3.33 NTU Max. Daily	0.11 NTU Max. Daily	2011 – 2016 data
pH	8.04 s.u.	6.0 s.u.	2011 – 2016 data
Alkalinity	29 mg/l Max. Daily	3 mg/l Max. Daily	2011 – 2016 data
Total Suspended Solids	45 mg/l Max. Daily	1 mg/l Max. Daily	2011 – 2016 data
Total Suspended Solids	30 mg/l Average Monthly	1 mg/l Average Monthly	2011 – 2016 data

Riverside WTP Discharge Monitoring Report Data (January 2011 to October 2016)			
Parameter	**Maximum**	**Minimum**	**Notes**
Total Residual Chlorine	0.5 mg/l Max. Daily	0 mg/l Max. Daily	2011 – 2016 data
Total Residual Chlorine	0.3 mg/l Average Monthly	0 mg/l Average Monthly	2011 – 2016 data
Antimony	< 0.001 µg/l	0 µg/l	2007 – 2009 data
Arsenic	0.001 µg/l	0 µg/l	2007 – 2009 data
Beryllium	<0.001 µg/l	0 µg/l	2007 - 2009 data
Cadmium	< 0.001 µg/l	0 µg/l	2007 - 2009 data
Chromium	< 0.001 µg/l	0 µg/l	2007 - 2009 data
Copper	0.00179 µg/l	< 0.001 µg/l	2007 - 2009 data
Lead	< 0.001 µg/l	0 µg/l	2007 - 2009 data
Nickel	<0.001 µg/l	0 µg/l	2007 – 2009 data
Selenium	< 0.001 µg/l	0 µg/l	2007 - 2009 data
Silver	<0.001 µg/l	0 µg/l	2007 - 2009 data
Thallium	< 0.001 µg/l	0 µg/l	2007 - 2009 data
Zinc	0.00288 µg/l	0.00175 µg/l	2007 - 2009 data
Trihalomethane	0.066 µg/l	0 µg/l	2008 – 2010 data
Note: Riverside WTP did not use alum or any product that contain aluminum in its treatment process, therefore monitoring for aluminum was not required during the last permit cycle.			

B. Receiving Water Data

Parameter	Units	Percentile	Value	Source
Temperature	°C	95^{th}	25	USGS
pH	Standard units	5^{th} – 95^{th}	7.71 – 7.89	USGS
Hardness	mg/L	5^{th} – 95^{th}	No Data	none
Ammonia	mg/L	maximum	0.117	USGS
Source: USGS Station # 13340000, Clearwater River at Orofino, Idaho				

Appendix C: Pollutant Specific Analysis of Effluent Limitations and Reasonable Potential Analysis

A. Pollutant Specific Analysis

This Section provides a brief discussion of the individual pollutants that are included in the Draft Permits, the proposed effluent limitations, and the rationale for these limits. A summary of the effluent limitations for each pollutant, along with the bases for the limits is provided below.

Effluent limits for TSS and TRC have been retained for the Riverside WTP.
Effluent limits for TSS have been retained for the Orofino WTP.
Effluent limits for TRC have been eliminated for the Orofino WTP due to process changes that cause the facility not to discharge TRC.

Total Suspended Solids (TSS)
Solids are considered a "conventional pollutant" (as opposed to toxic). Suspended materials in water can cause turbidity, discoloration, interruption of light passage for aquatic growth, coating of fish gills, and sedimentation on stream bottoms interfering with egg laying and feeding.

EPA is establishing technology-based effluent limits (TBELs) of 30 mg/l (average monthly limit) and 45 mg/l (maximum daily limit) for TSS utilizing BPJ to meet the requirements of BCT/BAT. Existing individual permits for water treatment plants in Idaho have limits of 30 mg/l and 45 mg/l (monthly average and daily maximum). The facilities have been in compliance with these limits. In establishing the TSS limitations for the permits, EPA is relying on research performed for the EPA in 1987. (SAIC, Model Permit Package for the Water Supply Industry, EPA Contract No. 68-01-7043). This study considered sedimentation lagoons as the model treatment for BCT based on a finding that 76 percent of WTPs surveyed had used this technology for treatment of process wastewaters. Analysis of 76 individual NPDES permits for WTPs determined that limitations of 30 mg/l and 45 mg/l were representative of current permitting practice for average monthly and daily maximum TSS limits, respectively. And, analysis of monitoring data for sedimentation lagoons within the industry resulted in calculation of 95th percent occurrence (monthly average) and 99th percent occurrence (daily maximum) levels of treatment of 28.1 mg/l and 44.4 mg/l, respectively. These levels of treatment performance were considered BPT, and subsequent analysis determined that BPT was equal to BCT. The study identified 30 mg/l and 45 mg/l to be the monthly average and daily maximum TSS limits for a model NPDES permit.

Total Residual Chlorine (TRC)
EPA has established a technology-based effluent limit for TRC in discharges from water treatment plants: Average Monthly Limit of 0.3 mg/l; and, Maximum Daily Limit of 0.5 mg/l. The State of Idaho has water quality criteria of 19 µg/l and 11 µg/l total chlorine residual for acute and chronic concentrations, respectively, for the protection of aquatic life.

As shown by reasonable potential analyses below, there is no reasonable potential for either the Orofino WTP, or the Riverside WTP to exceed the Idaho WQS.

Orofino WTP no longer uses chlorine in its processes, therefore, there is no reasonable potential to exceed criteria for TRC. Orofino WTP also did not have reasonable potential to exceed criteria for TRC during the last permit cycle.

Riverside WTP continues to use chlorine, but has no reasonable potential to exceed Idaho WQS if it is in compliance with its technology-based effluent limits. Accordingly, Riverside WTP's technology-based effluent limits are retained: Average Monthly Limit of 0.3 mg/l; and, Maximum Daily Limit of 0.5 mg/l.

pH

There are no applicable technology-based effluent guidelines for pH in discharges from water treatment plants. The Idaho WQS at IDAPA 58.01.02.250, require pH values of the river to be within the range of 6.5 to 9.0. To assure protection of the applicable water quality criteria, the pH range of 6.5 to 9.0 is being established as an end of pipe discharge limitation by the draft permit.

Trihalomethanes

There are no applicable technology-based effluent guidelines for trihalomethanes in discharges from water treatment plants. The State of Idaho has established the following applicable water quality criteria for protection of human health for each of the four common trihalomethanes.

Table C- 1 Trihalomethanes Human Health Criteria

Human Health Criteria (IDAPA 58.01.02.210)		
Trihalomethane	**Consumption of Water and Organisms – µg/l**	**Consumption of Water Only – µg/l**
Chloroform	5.7	470
Chlorodibromomethane	0.41	34
Dichlorobromomethane	0.27	22
Bromoform	4.3	360

Although chlorine is commonly used for disinfection in water treatment plants, and literature suggests that trihalomethanes (THMs) can be elevated in water treatment plant residuals, reported levels are widely variable, and there are limited actual data available for a determination of reasonable potential. Therefore, the permits do not include effluent limitations for THMs, but do require monitoring for the Riverside WTP because its effluent contains TRC. The Orofino WTP does not use chlorinated water for backwash, therefore no THMs are expected. The Riverside WTP reported the maximum total THMs of 0.66 ug/l. From studies of WTPs, approximately half or more of THMs found are in the form of chloroform. Therefore, the observed maximum THMs of 0.66 ug/l is below the combined and individual compounds of the Human Health Criteria for the Consumption of Water and Organisms as shown in Table C-1; accordingly, no effluent limits are necessary. For the next permit cycle, EPA requires that Riverside WTP conduct separate analysis for each of the four trihalomethane compounds for comparison. This information will be used to conduct reasonable potential analysis for THMs during development of the next permit.

Turbidity

There are no applicable technology-based effluent guidelines for turbidity in discharges from water treatment plants. Idaho WQS (IDAPA 58.01.02.252) have water quality criteria for turbidity for waters designated for domestic water supply, that prohibits increases of 5 NTUs or more in receiving waters that have background turbidity of 50 NTUs or less, and increases of 10 percent above background (not to exceed 25 NTUs) are prohibited, when background turbidity is greater than 50 NTUs.

EPA has determined that limitations applied to TSS in discharges from WTPs will also control, to a great extent, the levels of turbidity in these discharges. In addition, because no data is available describing turbidity levels in discharges from the WTPs for a determination of reasonable potential, the draft permits do not include effluent limitations for turbidity, but require monitoring. This information will be used to conduct reasonable potential analysis for turbidity during development of the next permit.

Aluminum

There are no applicable technology-based guidelines or State water quality criteria for aluminum. To evaluate the need for effluent limitations for aluminum, EPA has considered the EPA National Recommended Water Quality Criteria, 2002 (EPA-822-R-02-047), which recommends maximum concentrations of 87 µg/l and 750 µg/l as chronic and acute concentrations, respectively, for the protection of freshwater aquatic life. Idaho WQS has a chronic criteria of 750 µg/l. In addition, there are narrative water quality criterion for toxic substances, which states that surface waters of the State must be free of toxic substances in concentrations that impair designated beneficial uses. EPA conducted RP for aluminum for the Orofino WTP, and determined that it had no reasonable potential to exceed WQS. Specifically, During the last permit cycle, Orofino WTP reported the highest effluent concentration of aluminum at 2,180 µg/l. Based on its dilution factor in the receiving water of 566 for the Acute Criteron, and 672 in the Chronic Criteron, EPA determined that there is no reasonable potential to exceed Idaho WQS at the edge of the mixing zone. Therefore there are no effluent limits for Aluminum is warrented for Orofino WTP.

A review of the literature regarding water treatment plant residuals suggests that aluminum concentrations in water treatment plant residuals can be elevated, particularly when aluminum salts are used to enhance coagulation. However, there is no RP for aluminum at the Orofino WTP, and aluminum based material are not used in Riverside WTP, therefore, the draft permit does not include effluent limitations for aluminum, but does require monitoring. This monitoring is limited to Orofino WTP which uses alum in the treatment process. Riverside WTP does not use aluminum products, therefore no elevated levels of aluminum is expected. Accordingly, monitoring for aluminum at Riverside WTP is not necessary. Aluminum monitoring data collected at Orofino WTP will be used to conduct reasonable potential analysis for aluminum during development of the next permit.

Metals

There are no applicable technology-based limits for metals, however, there are applicable Idaho WQS that contain water quality criteria. In addition, there is a narrative water quality criterion for toxic substances, which states that surface waters of the State must be free of toxic substances in concentrations that impair designated beneficial uses.

A review of the literature regarding water treatment plant residuals suggests that metals may be present in discharges from drinking water treatment plants. In developing limitations and conditions for the permit, however, EPA had limited data available to determine if these pollutants may cause or contribute to a water quality standard violation. Therefore, the draft permits require effluent monitoring for metals. In addition, monitoring for hardness in the discharge is also required pursuant to Idaho WQS to determine the toxicity of metals. The list of metal analysis is based partially from the National Toxics Rule at 40 CFR § 131.36. The parameters that are required to be monitored are: antimony, arsenic, beryllium, cadmium, total chromium, copper, lead, nickel, selenium, silver, thallium, and zinc. These data will be used to determine if additional limits are needed for the effluent discharges for the next permit.

B. Reasonable Potential Analysis and Water Quality-Based Effluent Limit Calculations

This appendix explains the process the EPA has used to conduct the reasonable potential analysis (RPA) and develop water quality-based effluent limitations (WQBELs). The permits do not include WQBELs for total residual chlorine because there is no reasonable potential to exceed WQS.

Reasonable Potential Analysis

The EPA uses the process described in the *Technical Support Document for Water Quality-based Toxics Control* (EPA, 1991) to determine reasonable potential. To determine if there is reasonable potential for the discharge to cause or contribute to an exceedance of water quality criteria for a given pollutant, the EPA compares the maximum projected receiving water concentration to the water quality criteria for that pollutant. If the projected receiving water concentration exceeds the criteria, there is reasonable potential, and a WQBEL must be included in the permit. The following section discusses how the maximum projected receiving water concentration is determined.

Mass Balance

For discharges to flowing water bodies, the maximum projected receiving water concentration is determined using the following mass balance equation:

$$C_d Q_d = C_e Q_e + C_u Q_u \qquad \text{Equation 1}$$

where,

C_d = Receiving water concentration downstream of the effluent discharge (that is, the concentration at the edge of the mixing zone)
C_e = Maximum projected effluent concentration
C_u = 95th percentile measured receiving water upstream concentration
Q_d = Receiving water flow rate downstream of the effluent discharge = Q_e+Q_u
Q_e = Effluent flow rate (set equal to the design flow of the WWTP)
Q_u = Receiving water low flow rate upstream of the discharge (1Q10, 7Q10 or 30B3)

When the mass balance equation is solved for C_d, it becomes:

$$C_d = \frac{C_e \times Q_e + C_u \times Q_u}{Q_e + Q_u} \qquad \text{Equation 2}$$

The above form of the equation is based on the assumption that the discharge is rapidly and completely mixed with 100% of the receiving stream.

If a mixing zone is authorized and the mixing zone is based on less than complete mixing with the receiving water, the equation becomes:

$$C_d = \frac{C_e \times Q_e + C_u \times (Q_u \times \%MZ)}{Q_e + (Q_u \times \%MZ)} \qquad \text{Equation 3}$$

Where:

% MZ = the percentage of the receiving water flow available for mixing.

If a mixing zone is not allowed, dilution is not considered when projecting the receiving water concentration and,

$$C_d = C_e \qquad \text{Equation 4}$$

A dilution factor (D) can be introduced to describe the allowable mixing. Where the dilution factor is expressed as:

$$D = \frac{Q_e + Q_u \times \%MZ}{Q_e} \qquad \text{Equation 5}$$

After the dilution factor simplification, the mass balance equation becomes:

$$C_d = \frac{C_e - C_u}{D} + C_u \qquad \text{Equation 6}$$

If the criterion is expressed as dissolved metal, the effluent concentrations are measured in total recoverable metal and must be converted to dissolved metal as follows:

$$C_d = \frac{CF \times C_e - C_u}{D} + C_u \qquad \text{Equation 7}$$

Where C_e is expressed as total recoverable metal, C_u and C_d are expressed as dissolved metal, and CF is a conversion factor used to convert between dissolved and total recoverable metal.

The above equations for C_d are the forms of the mass balance equation which were used to determine reasonable potential and calculate wasteload allocations.

Maximum Projected Effluent Concentration

When determining the projected receiving water concentration downstream of the effluent discharge, the EPA's Technical Support Document for Water Quality-based Toxics Controls (TSD, 1991) recommends using the maximum projected effluent concentration (C_e) in the mass balance calculation (see equation 3, page C-5). To determine the maximum projected effluent concentration (Ce) the EPA has developed a statistical approach to better characterize the effects of effluent variability. The approach combines knowledge of effluent variability as estimated by a coefficient of variation (CV) with the uncertainty due to a limited number of data to project an estimated maximum concentration for the effluent. Once the CV for each pollutant parameter has been calculated, the reasonable potential multiplier (RPM) used to derive the maximum projected effluent concentration (Ce) can be calculated using the following equations:

First, the percentile represented by the highest reported concentration is calculated.

$$p_n = (1 - \text{confidence level})^{1/n} \qquad \text{Equation 8}$$

where,

p_n = the percentile represented by the highest reported concentration
n = the number of samples
confidence level = 99% = 0.99

and

$$RPM = \frac{C_{99}}{C_{P_n}} = \frac{e^{Z_{99} \times \sigma - 0.5 \times \sigma^2}}{e^{Z_{P_n} \times \sigma - 0.5 \times \sigma^2}} \qquad \text{Equation 9}$$

Where,

σ^2 = $\ln(CV^2 + 1)$
Z_{99} = 2.326 (z-score for the 99th percentile)
Z_{Pn} = z-score for the P_n percentile (inverse of the normal cumulative distribution function at a given percentile)
CV = coefficient of variation (standard deviation ÷ mean)

The maximum projected effluent concentration is determined by simply multiplying the maximum reported effluent concentration by the RPM:

$$C_e = (RPM)(MRC) \qquad \text{Equation 10}$$

where MRC = Maximum Reported Concentration

Maximum Projected Effluent Concentration at the Edge of the Mixing Zone

Once the maximum projected effluent concentration is calculated, the maximum projected effluent concentration at the edge of the acute and chronic mixing zones is calculated using the mass balance equations presented previously.

Results of Reasonable Potential Calculations

It was determined that total residual chlorine has no reasonable potential to cause or contribute to an exceedance of water quality criteria. Therefore, there are no WQBELs for TRC.

WQBEL Calculations

The following calculations demonstrate how the water quality-based effluent limits (WQBELs) in the draft permit were calculated. The draft permit does not include WQBELs for TRC. The following discussion presents the general equations used to calculate the water quality-based effluent limits.

Calculate the Wasteload Allocations (WLAs)

Wasteload allocations (WLAs) are calculated using the same mass balance equations used to calculate the concentration of the pollutant at the edge of the mixing zone in the reasonable potential analysis (Equations 3 and 6). To calculate the wasteload allocations, C_d is set equal to the acute or chronic criterion and the equation is solved for C_e. The calculated C_e is the acute or chronic WLA. Equation 11 is rearranged to solve for the WLA, becoming:

$$C_e = WLA = D \times (C_d - C_u) + C_u \qquad \text{Equation 11}$$

Idaho's water quality criteria for some metals are expressed as the dissolved fraction, but the Federal regulation at 40 CFR §122.45(c) requires that effluent limits be expressed as total recoverable metal. Therefore, the EPA must calculate a wasteload allocation in total recoverable metal that will be protective of the dissolved criterion. This is accomplished by dividing the WLA expressed as dissolved by the criteria translator, as shown in Equation 7. The criteria translator (CT) is equal to the conversion factor, because site-specific translators are not available for this discharge, leading to the following equation:

$$C_e = WLA = \frac{D \times (C_d - C_u) + C_u}{CT} \quad \text{Equation 12}$$

The next step is to compute the "long term average" concentrations which will be protective of the WLAs. This is done using the following equations from the EPA's *Technical Support Document for Water Quality-based Toxics Control* (TSD):

$$LTA_a = WLA_a \times e^{(0.5\sigma^2 - z\,\sigma)} \quad \text{Equation 13}$$

$$LTA_c = WLA_c \times e^{(0.5\sigma_4^2 - z\sigma_4)} \quad \text{Equation 14}$$

where,

σ^2 = $\ln(CV^2 + 1)$
Z_{99} = 2.326 (z-score for the 99th percentile probability basis)
CV = coefficient of variation (standard deviation ÷ mean)
σ_4^2 = $\ln(CV^2/4 + 1)$

The LTAs are compared and the more stringent is used to develop the daily maximum and monthly average permit limits as shown below.

Derive the maximum daily and average monthly effluent limits

Using the TSD equations, the MDL and AML effluent limits are calculated as follows:

$$MDL = LTA \times e^{(z_m \sigma - 0.5\sigma^2)} \quad \text{Equation 15}$$

$$AML = LTA \times e^{(z_a \sigma_n - 0.5\sigma_n^2)} \quad \text{Equation 16}$$

where σ, and σ^2 are defined as they are for the LTA equations above, and,

σ_n^2 = $\ln(CV^2/n + 1$
z_a = 1.645 (z-score for the 95th percentile probability basis)
z_m = 2.326 (z-score for the 99th percentile probability basis)
N = number of sampling events required per month. With the exception of ammonia, if the AML is based on the LTA_c, i.e., $LTA_{minimum} = LTA_c$), the value of ''n'' should is set at a minimum of 4.

Based on the maximum daily flow from the WTPs from January 2011 to October 2016, Orofino WTP has a dilution factor of 566 (Acute) and 672 (Chronic); and, Riverside WTP has a dilution factor of 141 (Acute) and 168 (Chronic). Accordingly, EPA also concludes that the Riverside WTP has sufficient dilution in the receiving water that the TBELs for TRC are appropriate.

For the Orofino WTP, the analysis below show that during there is no reasonable potential to exceed the WQS for aluminum, therefore no effluent limits for aluminum is necessary. In addition, there is no reasonable potential to exceed WQS for TRC even when the existing permit Maximum Daily effluent limit of 0.5 mg/l is applied. The Orofino WTP was upgraded in 2014, and no longer discharges TRC due to process changes, therefore no TRC effluent limits for Orofino WTP are currently necessary.

For the Riverside WTP, the analysis below show that there is no reasonable potential to exceed the WQS for TRC even when the draft permit's Maximum Daily effluent limit of 0.5 mg/l is applied. Therefore, Riverside WTP's existing TBELs for TRC are appropriate and are retained in the draft permit:
Average Monthly Effluent Limit (TRC) of 0.3 mg/l; and,
Maximum Daily Effluent Limit (TRC) of 0.5 mg/l.

Reasonable Potential Analysis (RPA) and Water Quality Effluent Limit (WQBEL) Calculations

Facility Name	Orofino WTP
Facility Flow (mgd)	0.14
Facility Flow (cfs)	0.22

Critical River Flows	(IDAPA 58.01.02 03. b)	Annual Crit. Flows	Annual Crit. Flows
Aquatic Life - Acute Criteria - Criterion Max. Concentration (CMC)	1Q10	500.0	500.0
Aquatic Life - Chronic Criteria - Criterion Continuous Concentration (CCC)	7Q10 or 4B3	594.0	594.0
Ammonia	30B3/30Q10 (seasonal)	982.0	982.0
Human Health - Non-Carcinogen	30Q5	1,039.0	1,039.0
Human Health - carcinogen	Harmonic Mean Flow	3,025.0	3,025.0

Receiving Water Data		Notes:
Hardness, as mg/L $CaCO_3$	*** Enter Hardness on WQ Criteria tab ***	5th % at critical flows
Temperature, °C	Temperature, °C	95th percentile
pH, S.U.	pH, S.U.	95th percentile

Pollutants of Concern			CHLORINE (Total Residual)	ALUMINUM, total recoverable, pH 6.5-9.0
Effluent Data	Number of Samples in Data Set (n)		260	5
	Coefficient of Variation (CV) = Std. Dev./Mean (default CV = 0.6)		0.6	0.6
	Effluent Concentration, µg/L (Max. or 95th Percentile) - (C_e)		500	2160
	Calculated 50th % Effluent Conc. (when n>10), Human Health Only			
Receiving Water Data	90th Percentile Conc., µg/L - (C_u)			
	Geometric Mean, µg/L, Human Health Criteria Only			
Applicable Water Quality Criteria	Aquatic Life Criteria, µg/L	Acute	19.	750.
	Aquatic Life Criteria, µg/L	Chronic	11.	--
	Human Health Water and Organism, µg/L		--	--
	Human Health, Organism Only, µg/L		--	--
	Metals Criteria Translator, decimal (or default use Conversion Factor)	Acute	--	--
		Chronic	--	--
	Carcinogen (Y/N), Human Health Criteria Only		--	N
Percent River Flow Default Value = 25%	Aquatic Life - Acute	1Q10	25%	25%
	Aquatic Life - Chronic	7Q10 or 4B3	25%	25%
	Ammonia	30B3 or 30Q10	25%	25%
	Human Health - Non-Carcinogen	30Q5	25%	25%
	Human Health - carcinogen	Harmonic Mean	25%	25%
Calculated Dilution Factors (DF) (or enter Modeled DFs)	Aquatic Life - Acute	1Q10	566.0	566.0
	Aquatic Life - Chronic	7Q10 or 4B3	672.3	672.3
	Ammonia	30B3 or 30Q10	1,110.7	1,110.7
	Human Health - Non-Carcinogen	30Q5	1,175.2	1,175.2
	Human Health - carcinogen	Harmonic Mean	3,419.5	3,419.5

Aquatic Life Reasonable Potential Analysis

σ	σ^2=ln(CV^2+1)		0.555	0.555
P_n	=(1-confidence level)$^{1/n}$, where confidence level	99%	0.982	0.398
Multiplier (TSD p. 57)	=exp(zσ-0.5σ²)/exp[normsinv(P_n)-0.5σ²], where	99%	1.1	4.2
Statistically projected critical discharge concentration (C_e)			564.65	9054.86
Predicted max. conc.(ug/L) at Edge-of-Mixing Zone		Acute	1.00	0.00
(note: for metals, concentration as dissolved using conversion factor as translator)		Chronic	0.84	13.47
Reasonable Potential to exceed Aquatic Life Criteria			NO	NO

Reasonable Potential Analysis (RPA) and Water Quality Effluent Limit (WQBEL) Calculations

Facility Name	Riverside WTP
Facility Flow (mgd)	0.58
Facility Flow (cfs)	0.89

Critical River Flows	(IDAPA 58.01.02 03. b)	Annual Crit. Flows	Annual Crit. Flows
Aquatic Life - Acute Criteria - Criterion Max. Concentration (CMC)	1Q10	500.0	500.0
Aquatic Life - Chronic Criteria - Criterion Continuous Concentration (CCC)	7Q10 or 4B3	594.0	594.0
Ammonia	30B3/30Q10 (seasonal)	982.0	982.0
Human Health - Non-Carcinogen	30Q5	1,039.0	1,039.0
Human Health - carcinogen	Harmonic Mean Flow	3,025.0	3,025.0

Receiving Water Data		Notes:
Hardness, as mg/L $CaCO_3$	*** Enter Hardness on WQ Criteria tab ***	5^{th} % at critical flows
Temperature, °C	Temperature, °C	95^{th} percentile
pH, S.U.	pH, S.U.	95^{th} percentile

Pollutants of Concern			CHLORINE (Total Residual)
Effluent Data	Number of Samples in Data Set (n)		260
	Coefficient of Variation (CV) = Std. Dev./Mean (default CV = 0.6)		0.6
	Effluent Concentration, µg/L (Max. or 95th Percentile) - (C_e)		500
	Calculated 50^{th} % Effluent Conc. (when n>10), Human Health Only		
Receiving Water Data	90^{th} Percentile Conc., µg/L - (C_u)		
	Geometric Mean, µg/L, Human Health Criteria Only		
Applicable Water Quality Criteria	Aquatic Life Criteria, µg/L	Acute	19.
	Aquatic Life Criteria, µg/L	Chronic	11.
	Human Health Water and Organism, µg/L		--
	Human Health, Organism Only, µg/L		--
	Metals Criteria Translator, decimal (or default use Conversion Factor)	Acute	--
		Chronic	--
	Carcinogen (Y/N), Human Health Criteria Only		--
Percent River Flow Default Value = 25%	Aquatic Life - Acute	1Q10	25%
	Aquatic Life - Chronic	7Q10 or 4B3	25%
	Ammonia	30B3 or 30Q10	25%
	Human Health - Non-Carcinogen	30Q5	25%
	Human Health - carcinogen	Harmonic Mean	25%
Calculated Dilution Factors (DF) (or enter Modeled DFs)	Aquatic Life - Acute	1Q10	141.3
	Aquatic Life - Chronic	7Q10 or 4B3	167.7
	Ammonia	30B3 or 30Q10	276.5
	Human Health - Non-Carcinogen	30Q5	292.5
	Human Health - carcinogen	Harmonic Mean	849.7

Aquatic Life Reasonable Potential Analysis

σ	σ^2=ln(CV^2+1)		0.555
P_n	=(1-confidence level)$^{1/n}$, where confidence level	99%	0.982
Multiplier (TSD p. 57)	=exp(zσ-0.5σ^2)/exp[normsinv(P_n)-0.5σ^2], where	99%	1.1
Statistically projected critical discharge concentration (C_e)			564.65
Predicted max. conc.(ug/L) at Edge-of-Mixing Zone		Acute	4.00
(note: for metals, concentration as dissolved using conversion factor as translator)		Chronic	3.37
Reasonable Potential to exceed Aquatic Life Criteria			NO

Dilution Factor Calculation

The Idaho *Water Quality Standards* at IDAPA 58.01.02.060 allow for the authorization of mixing zones within the receiving water to be used for dilution for aquatic life criteria. The flows used to evaluate compliance with the criteria are:

- The 1 day, 10 year low flow (1Q10) of 500 cfs. This flow is used to protect aquatic life from acute effects. It represents the lowest daily flow that is expected to occur once in 10 years.

- The 7 day, 10 year low flow (7Q10) of 594 cfs. This flow is used to protect aquatic life from chronic effects. It is the lowest 7 day average flow expected to occur once in 10 years.

The following dilution factors were calculated using the highest flows reported on the DMRs from January 2011, assuming a 25% mixing zone:

System name	NPDES Permit Number	Calculated Dilution Factors	
		Acute	Chronic
City of Orofino WTP	ID0001058	566	672
Riverside Water and Sewer District WTP	ID0021237	141	168

Critical Low Flow Conditions

The low flow conditions of a water body are used to determine water quality-based effluent limits. In general, Idaho's water quality standards require criteria be evaluated at the following low flow receiving water conditions (See IDAPA 58.01.02.210.03) as defined below:

Acute aquatic life	1Q10 or 1B3
Chronic aquatic life	7Q10 or 4B3
Non-carcinogenic human health criteria	30Q5
Carcinogenic human health criteria	harmonic mean flow
Ammonia	30B3 or 30Q10

1. The 1Q10 represents the lowest one day flow with an average recurrence frequency of once in 10 years.
2. The 1B3 is biologically based and indicates an allowable exceedence of once every 3 years.
3. The 7Q10 represents lowest average 7 consecutive day flow with an average recurrence frequency of once in 10 years.
4. The 4B3 is biologically based and indicates an allowable exceedance for 4 consecutive days once every 3 years.
5. The 30Q5 represents the lowest average 30 consecutive day flow with an average recurrence frequency of once in 5 years.
6. The 30Q10 represents the lowest average 30 consecutive day flow with an average recurrence frequency of once in 10 years.
7. The harmonic mean is a long-term mean flow value calculated by dividing the number of daily flow measurements by the sum of the reciprocals of the flows.

Appendix D. Endangered Species Act and Essential Fish Habitat Assessment

ENDANGERED SPECIES ACT

As discussed in Section VIII of this fact sheet, Section 7 of the Endangered Species Act requires federal agencies to consult with the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS) if there are potential affects a federal action may have on threatened and endangered species. EPA has determined that there is no effect to threatened and endangered species based on the the discharge from the Orofino and Riverside WTPs. On December 30, 2016, EPA referred to U.S. Fish and Wildlife website (IPaC Information for Planning and Conservation) at https://ecos.fws.gov/ipac/. Below are descriptions of the species found in the vicinity of the water treatment plants.

I. Threatened and Endangered Species

According to the USFWS species list, the following federally-listed species are in the vicinity of the discharge (for Idaho County and Lewis County). The species denoted by a * are under the jurisdiction of NMFS:

Endangered Species:
Sockeye salmon (*Oncorhynchus nerka)*

Threatened Species:
Bull Trout (*Salvelinus confluentus*)
MacFarlane's Four-O'clock (*Mirabilis macfarlanei)*
Chinook Salmon (*Oncorhynchus tshawytscha*)*
Steelhead (*Oncorhynchus mykiss*)*
Spalding's catchfly *(Silene spaldingii)*
Canada Lynx (*Lynx canadensis*)
Northern Idaho Ground Squirrel (*Urocitellus brunneus*)

Proposed Threatened Species:
North American Wolverine (*Gulo gulo luscus*)

II. Potential Effects for Species

A. Sockeye Salmon (*Oncorhynchus nerka)* - Endangered
The sockeye salmon is the third most abundant of the seven species of Pacific salmon, after pink salmon (*O. gorbuscha*) and chum salmon. Sockeye contributed about 17 percent by weight and 14 percent in numbers to the total salmon catch in the North Pacific Ocean and adjacent waters during the period 1952 to 1976 (Burgner 2003).

Sockeye salmon exhibit a greater variety of life history patterns than other member of the genus *Oncorhynchus* and characteristically make more use of lake rearing habitat in juvenile stages. Although sockeye are primarily anadromous, there are distinct populations called kokanee that mature, spawn, and die in fresh water without a period of sea life. Typically, but not universally, juvenile anadromous sockeye utilize lake rearing areas for one to three years after emergence from the gravel; however, some populations utilize stream areas for rearing and may migrate to sea soon after emergence. Anadromous sockeye may spend from one to four years in the ocean before returning to freshwater to spawn and die in late summer and autumn. The sockeye also shows a wide variety of racial adaptations to specialized spawning and rearing habitat combinations (Burgner 2003).

The primary spawning grounds of sockeye salmon in North America extend from tributaries of the Columbia River to the Kuskokwim River in western Alaska, and, on the Asian side, the spawning areas are found mainly on the Kamchatka Peninsula of Russia. During their feeding and maturation phase in the ocean, sockeye range throughout the North Pacific Ocean, Bering Sea, and eastern Sea of Okhotsk north of 40E N. There is considerable intermingling of Asian and North American populations from Bering Sea and Gulf of Alaska streams. Maturing sockeye return to their respective spawning rivers at different times varying from late spring to midsummer. Spawning time range from late July through January, but are primarily from midsummer until late autumn (Burgner 2003).

Analysis of Potential Impacts to Sockeye Salmon

In consideration of all factors pertaining to the Sockeye Salmon and the discharges from the WTPs, it is predicted that there will be no impact to the Sockeye Salmon. The discharges do not contribute to the factors responsible for the bull trout's decline as described above. The characteristics of the discharge and permit conditions will not cause any harmful or beneficial effects to the Sockeye Salmon. The Sockeye Salmon is a highly mobile species, discharge is not from a major facility, and the effluent is treated, as well as meeting State Water Quality Standards; therefore, no measurable impacts are predicted. **No effect** is predicted on the Sockeye Salmon from the discharge.

B. Bull Trout (*Salvelinus confluentus*) - Threatened

The bull trout is a member of the char family (*Salvelinus*) and is represented by different life history forms, including river-resident populations, lacustrine populations, and sea-run populations. The latter appear to be relatively rare (Behnke 2002).

The stream-resident form is subdivided into two basic types: one lives its entire life in small headwater streams, often isolated above waterfalls; the other typically spawns in smaller tributary streams but spends most of its time foraging in larger rivers. This second form, often called "fluvial," occurs only in relatively larger river basins that contain a network of headwater spawning tributaries connected to larger riverine habitat, allowing bull trout to undertake movements of more than 100 miles (Behnke 2002).

The northernmost distribution of bull trout occurs in the headwaters of the Yukon and Mackenzie River basins of Alaska and Canada. In Pacific Coast drainages, they occur in rivers of British Columbia southward to around Puget Sound. Bull trout are not native to Vancouver Island or other islands off the Pacific Coast of and Canada and southern Alaska. Native distribution includes the upper parts of the North and South Saskatchewan River drainages of Alberta, Canada (Behnke 2002).

To the south, a few bull trout populations persist in cold headwater tributary streams in the Upper Klamath Lake basin of Oregon. The southernmost population of bull trout once occurred in the McCloud River of California. However, those bull trout declined rapidly in the 1940s after construction of Shasta Dam (Behnke 2002).

Columbia Basin Bull Trout

Status

The CR bull trout distinct population segment (DPS) was listed as threatened on June 10, 1998 (62 FR 32268). The following information on bull trout was taken from 63 FR 31647-31674 and USFWS 2002a).

Geographic Range and Spatial Distribution

The Columbia River population segment is from the northwestern United States and British Columbia, Canada. This population segment is comprised of 386 bull trout populations in Idaho, Montana, Oregon, and Washington with additional populations in British Columbia. The Columbia River population segment includes the entire Columbia River basin and all its tributaries, excluding the isolated bull trout populations found in the Jarbridge River in Nevada. Bull trout populations within the Columbia River population segment have declined from historic levels and are generally considered to be isolated and remnant.

Critical Habitat

Critical habitat has been designated for Columbia River Basin bull trout on September 26, 2005 (70 FR 56213). The critical habitat proposal for bull trout in the Columbia River basin calls for a total of 3,828 miles of streams in Oregon, Washington, Idaho, and Montana to be designated as critical bull trout habitat, along with 143,218 acres of lakes and reservoirs in those four states.

Life History

Bull trout are seldom found in waters where temperatures are warmer than 15EC to 17.8EC. Besides very cold water, bull trout require stable stream channels, clean spawning gravel, complex and diverse cover, and unblocked migration routes (USFWS 2002a). Because bull trout life history patterns include migratory and resident forms, both adults and juveniles are present in the streams throughout the year. Bull trout adults may begin to migrate from feeding to spawning grounds in the spring and migrate slowly throughout the summer (Pratt 1992).

Bull trout eggs incubate from 100 to 145 days, usually in winter, after which the alevins require 65 to 90 days to absorb their yolk sacs (Pratt 1992). They remain within the interstices of the streambed as fry for up to three weeks before filling their air bladder, reaching lengths of 25-28 mm, and emerging from the streambed in late April (McPhail and Murry 1979, Pratt 1992).

Population Trends and Risks

The Columbia River population segment includes bull trout residing in portions of Oregon, Washington, Idaho and Montana. Bull trout are estimated to have once occupied about 60 percent of the Columbia River basin; they presently are known or predicted to occur in less than half of watersheds in the historical range (Quigley and Arbelbide 1997), which amounts to approximately 27 percent of the basin (67 FR 71239). Another evaluation of the distribution and status of bull trout within the Columbia River and Klamath River basins indicates that bull trout are present in about 36 percent of the watersheds in their potential range and are estimated to have strong populations in only 6-12 percent of the potential range (Rieman et al. 1997). Among the many factors that contributed to the decline of the bull trout in the Columbia River and Klamath River basins, the following three factors seem to be particularly significant. First, fragmentation and isolation of local populations due to the proliferation of dams and water diversions which have eliminated habitat, altered water flow and temperature regimes and impeded migratory movements (Rieman and McIntyre 1993, Dunham and Rieman 1999). Second, degradation of spawning and rearing habitat in upper watershed areas, particularly alterations in sedimentation rates and water termperature resulting from past forest and rangeland management practices and intensive development of roads (Fraley and Shepard 1989). Thirdly, the introduction and spread of nonnative species particularly brook trout, and lake trout, which compete with bull trout for limited resources (Ratliff and Howell 1992, Leary et al. 1993).

Analysis of Potential Impacts to Bull Trout

In consideration of all factors pertaining to the Bull Trout and the discharge from the WTPs, it is predicted that there will be no impact to the Bull Trout. The discharges do not contribute to the factors responsible for the bull trout's decline as described above. The characteristics of the discharge and permit conditions will not cause any harmful or beneficial effects to the Bull Trout. The bull trout is a highly mobile species, discharge is not from a major facility, and the effluent is treated, as well as meeting State Water Quality Standards; therefore, no measurable impacts are predicted. **No effect** is predicted on the bull trout from the discharges.

C. MacFarlane's Four-O'clock (*Mirabilis macfarlanei*) - Threatened

On October 26, 1979, the MacFarlane's Four-o'clock was designated as endangered in its entire range (USFWS 1979). Since that time, additional populations were discovered, and populations on Federal lands were being actively managed and monitored. As a result of these ongoing recovery efforts, the MacFarlane's Four-o'clock was downlisted to threatened status in March 1996 (USFWS 1996).

Range of Species

Within the area covered by this listing, this species is endemic to portions of the Snake, Salmon and Imnaha River canyons in Wallowa County in northeast Oregon, and adjacent Idaho County in Idaho (Moseley 1993).

Critical Habitat

Critical habitat has not been designated for this species.

Life History

MacFarlane's four-o'clock is a member of the four-o'clock family (Nyctaginaceae). It is a perennial plant with a stout, deep-seated taproot. Flowering is from early May to early June, with mid-May usually being the peak flowering period. Known MacFarlane's four-o'clock locations include Cottonwood Landing, Island Gulch, Kurry Creek, Kurry Creek-West Creek divide, Mine Gulch, Tyron Bar, and West Creek. *Mirabilis macfarlanei* is found on talus slopes in canyon land corridors where the climate is regionally warm and dry, with precipitation occurring mostly in a winter-to-spring period. If *M. macfarlanei* originated in northern areas during a warmer period and its path of retreat with cooling climate was cut off by less favorable conditions, the warmer climate would explain the restricted distribution of the species.

Population Trends and Risks

Twelve years of recovery efforts for the MacFarlane's Four-o'clock, have removed this species from the brink of extinction. As a result, on March 15, 1996, USFWS reclassified the plant from endangered to the less critical category of threatened in 1996 (USFWS 1996). Improved livestock grazing management, research, the discovery of additional plant locations on public lands, and the stable condition of existing populations led the USFWS to conclude that the status of MacFarlane's Four-o'clock has substantially improved. MacFarlane's Four-o'clock is currently found in eleven populations in Idaho and Oregon. The amount of occupied habitat located in Idaho and Oregon since the species' listing represents a three-fold increase due to new discoveries.

Habitat destruction due to vehicular travel along with surface disturbance associated with mining could contribute to degradation of MacFarlane's four-o'clock habitat. Livestock damage may also minimally impact the species, and weedy invasion in areas of previous grazing activity may be a threat (Mancuso and Moseley 1991). Increased collecting pressure is a foreseeable problem if the specie's location becomes known. Mule deer prefer forbs and some utilization of *Mirabilis macfarlanei* has also been observed.

Insect depredation has been shown to be detrimental to MacFarlane's four-o'clock. Past indiscriminate herbicide spraying has also had adverse effects on the small number of *Mirabilis macfarlanei* plants. In addition, using insecticides for insect control is detrimental to many of the known pollinators of this species, including several genera of bees.

Analysis of Potential Impacts to MacFarlane's Four-O'clock

In consideration of all factors pertaining to the plant MacFarlane's Four O'clock and the discharges from the WTPs, it is predicted that there will be no impact to the MacFarlane's Four O'clock. The discharges do not contribute to the factors responsible for this plant's decline as described above. The characteristics of the discharges and permit conditions will not cause any harmful or beneficial effects to this plant because the MacFarlane's Four O'clock is found on talus slopes in canyon land corridors where the climate is regionally warm and dry. The discharge is into the Clearwater River, not where this plant is found. Therefore, no measurable impacts are predicted. **No effect** is predicted on the MacFarlane's Four O'clock from the discharge.

D. Chinook Salmon (*Oncorhynchus tshawytscha)* - Threatened

(The following summary is taken from 63 FR 11481, 3/9/98).

Chinook salmon are easily distinguished from other *Oncorhynchus* species by their large size. Adults weighing over 120 pounds have been caught in North American waters. Chinook salmon are very similar to coho salmon in appearance while at sea (blue-green back with silver flanks), except for their large size, small black spots on both lobes of the tail, and black pigment along the base of the teeth. Chinook salmon are anadromous and semelparous. This means that as adults, they migrate from a marine environment into the freshwater streams and rivers of their birth (anadromous) where they spawn and die (semelparous). Adult female Chinook will prepare a spawning bed, called a redd, in a stream area with suitable gravel composition, water depth and velocity. Redds will vary widely in size and in location within the stream or river. The adult female Chinook may deposit eggs in four to five "nesting pockets" within a single redd. After laying eggs in a redd, adult Chinook will guard the redd from four to 25 days before dying. Chinook salmon eggs will hatch, depending upon water temperatures, between 90 to 150 days after deposition. Stream flow, gravel quality, and silt load all significantly influence the survival of developing Chinook salmon eggs. Juvenile Chinook may spend from three months to two years in freshwater after emergence and before migrating to estuarine areas as smolts, and then into the ocean to feed and mature.

Among Chinook salmon two distinct races have evolved. One race, described as a "stream-type" Chinook, is found most commonly in headwater streams. Stream-type Chinook salmon have a longer freshwater residency and perform extensive offshore migrations before returning to their natal streams in the spring or summer months. The second race is called the "ocean-type" Chinook, which is commonly found in coastal steams in North America. Ocean-type Chinook typically migrate to sea within the first three months after emergence, but they may spend up to a year in freshwater prior to emigration. They also spend their ocean life in coastal waters. Ocean-type Chinook salmon return to their natal streams or rivers as spring, winter, fall, summer, and late-fall runs, but summer and fall runs predominate. The difference between these life history types is also physical, with both genetic and morphological foundations.

Juvenile stream- and ocean-type Chinook salmon have adapted to different ecological niches. Ocean-type Chinook salmon tend to utilize estuaries and coastal areas more extensively for juvenile rearing. The brackish water areas in estuaries also moderate physiological stress during parr-smolt transition. The development of the ocean-type life history strategy may have been a response to the limited carrying capacity of smaller stream systems and glacially scoured, unproductive, watersheds, or a means of avoiding the impact of seasonal floods in the lower portion of many watersheds.

Stream-type juveniles are much more dependent on freshwater stream ecosystems because of their extended residence in these areas. A stream-type life history may be adapted to those watersheds, or parts of watersheds, that are more consistently productive and less susceptible to dramatic changes in water flow or which have environmental conditions that would severely limit the success of sub-yearling smolts. At the time of saltwater entry, stream-type (yearling) smolts are much larger, averaging 73-134 mm depending on the river system, than their ocean-type (sub-yearling) counterparts and are, therefore, able to move offshore relatively quickly.

Coast wide, Chinook salmon remain at sea for one to six years (more common, two to four years), with the exception of a small proportion of yearling males, called jack salmon, which mature in freshwater or return after two or three months in salt water. Ocean- and steam-type Chinook salmon are recovered differentially in coastal and mid-ocean fisheries, indicating divergent migratory routes. Ocean-type Chinook salmon tend to migrate along the coast, while stream-type Chinook salmon are found far from the coast in the central North Pacific. Differences in the ocean distribution of specific stocks may be indicative of resource partitioning and may be important to the success of the species as a whole.

There is a significant genetic influence to the freshwater component of the returning adult migratory process. A number of studies show that Chinook salmon return to their natal streams with a high degree of fidelity. Salmon may have evolved this trait as a method of ensuring an adequate incubation and rearing habitat. It also provides a mechanism for reproductive isolation and local adaptation. Conversely, returning to a stream other than that of one's origin is important in colonizing new areas and responding to unfavorable or perturbed conditions at the natal stream.

Chinook salmon stocks exhibit considerable variability in size and age of maturation, and at least some portion of this variation is genetically determined. The relationship between size and length of migration may also reflect the earlier timing of river entry and the cessation of feeding for Chinook salmon stocks that migrate to the upper reaches of river systems. Body size, which is correlated with age, may be an important factor in migration and redd construction success. Under high density conditions on the spawning ground, natural selection may produce stocks with exceptionally large-sized returning adults.

Early researchers recorded the existence of different temporal "runs" or modes in the migration of Chinook salmon from the ocean to freshwater. Freshwater entry and spawning timing are believed to be related to local temperature and water flow regimes. Seasonal "runs" (i.e., spring, summer, fall, or winter) have been identified on the basis of when adult Chinook salmon enter freshwater to begin their spawning migration. However, distinct runs also differ in the degree of maturation at the time of river entry, the thermal regime and flow characteristics of their spawning site, and their actual time of spawning. Egg deposition must occur at a time to ensure that fry emerge during the following spring when the river or estuary productivity is sufficient for juvenile survival and growth.

Pathogen resistance is another locally adapted trait. Chinook salmon from the Columbia River drainage were less susceptible to *Ceratomyxa shasta*, an endemic pathogen, than stocks from coastal rivers where the disease is not known to occur. Alaskan and Columbia River stocks of Chinook salmon exhibit different levels of susceptibility to the infectious hematopoietic necrosis virus (IHNV).

The preferred temperature range for Chinook salmon has been variously described as 12.2-13.9 degrees C (Brett 1952), 10-15.6 degrees C (Burrows 1963), or 13-18 degrees C (Theurer et al. 1985). Temperatures for optimal egg incubation are 5.0-14.4 degrees C (Bell 1986). The upper lethal temperature limit is 25.1 degrees C (Brett 1952) but may be lower depending on other water quality factors (Ebel et al. 1971). Variability in temperature tolerance between populations is likely due to selection for local conditions; however, there is little information on the genetic basis of this trait.

Dissolved oxygen concentrations of 5.0 mg/L or greater are needed for successful egg development in redds for water temperatures between 4-14 degrees C (Reiser and Bjornn 1979, as cited in NMFS 1996). Freshwater juveniles avoid water with dissolved oxygen concentrations below 4.5 mg/L at 20 degrees C (Whitmore et al. 1960). Migrating adults will pass through water with dissolved oxygen levels as low as 3.5-4.0 mg/L (Fujioka 1970; Alabaster 1988, 1989).

Snake River Fall Chinook Salmon

Status

This ESU was listed as threatened on April 22, 1992. The 11/2/94 Emergency Rule (59 FR 54840), reclassifying Snake River Chinook from threatened to endangered, expired on May 26, 1995.

Geographic Range and Spatial Distribution

The Snake River Basin includes an area of approximately 280,000 km^2 and incorporates a range of vegetative life zones, climatic regions, and geological formations. The Snake River ESU includes the mainstem of the river and all tributaries, from their confluence with the Columbia River to the Hells Canyon Dam complex. Because genetic analyses indicate that fall-run chinook salmon in the Snake River are distinct from the spring-summer-run in the Snake River Basin (Waples and Johnson 1991a, as cited in Meyers et al. 1998), Snake River fall-run Chinook salmon are considered separately from the other two forms. They are also considered separately from those assigned to the Upper Columbia River summer- and fall-run ESU because of considerable differences in habitat characteristics and adult ocean distribution and less definitive, but still significant, genetic differences. There is, however, some concern that recent introgression from Columbia River hatchery strays is causing the Snake River population to lose the qualities that made it distinct for ESA purposes.

Critical Habitat

The critical habitat for the Snake River fall Chinook salmon was listed on December 28, 1993 (58 FR 68543) and modified on March 9, 1998 (63 FR 11515) to include the Deschutes River. A 1995 status review found that the Deschutes River fall-run Chinook salmon population should be considered part of the Snake River fall-run ESU. Populations from Deschutes River and the Marion Drain (tributary of the Yakima River) show a greater genetic affinity to Snake River ESU fall Chinook than to the Upper Columbia River summer-fall-run Chinook (March 9, 1998, 63 FR 11490). The designated critical habitat (63 FR 11515, March 9, 1998) for the Snake River fall Chinook salmon includes all river reaches accessible to Chinook salmon in the Columbia River from The Dalles Dam upstream to the confluence with the Snake River in Washington (inclusive). Critical habitat in the Snake River includes its tributaries in Idaho, Oregon, and Washington (exclusive of the upper Grande Ronde River and the Wallowa River in Oregon, the Clearwater River above its confluence with Lolo Creek in Idaho, and the Salmon River upstream of its confluence with French Creek in Idaho). Also included are river reaches and estuarine areas in the Columbia River from a straight line connecting the west end of the Clatsop jetty (south jetty, Oregon side) and the west end of the Peacock jetty (north jetty, Washington side) upstream to The Dalles Dam. Excluded are areas above specific dams identified in Table 17 (see March 9, 1998, 63 FR 11519) or above longstanding, naturally impassable barriers (e.g., natural waterfalls in existence for at least several hundred years).

Historical Information

Snake River fall-run Chinook salmon remained stable at high levels of abundance through the first part of the 20th century, but then declined substantially. Although the historical abundance of fall-run Chinook salmon in the Snake River is difficult to estimate, adult returns appear to have declined by three orders of magnitude since the 1940s and perhaps by another order of magnitude from pristine levels. Irving and Bjornn (1981) estimated that the mean number of fall-run Chinook salmon returning to the Snake River declined from 72,000 during the period 1938 to 1949, to 29,000 during the 1950s. Further declines occurred upon completion of the Hells Canyon Dam complex, which blocked access to primary production areas in the late 1950s. Estimated returns of naturally produced adults from 1985 through 1993 range from 114 to 742 fish (USEPA 1998).

Life History

Fall-run Chinook salmon in this ESU are ocean-type. Ocean-type Chinook typically migrate to sea within 3 months of emergence but may spend up to a year in freshwater prior to emigration. Adults return to the Snake River at ages 2 through 5, with age 4 most common at spawning (Chapman et al. 1991, as cited in Meyers et al. 1998). Spawning, which takes place in late fall, occurs in the mainstem and in the lower parts of major tributaries (NWPPC 1989, Bugert et al. 1990). Juvenile fall-run Chinook salmon move seaward slowly as subyearlings, typically within several weeks of emergence (Chapman et al. 1991, as cited in Meyers et al. 1998). Based on modeling by the Chinook Technical Committee, the Pacific Salmon Commission estimates that a significant proportion of the Snake River fall-run Chinook (about 36 percent) are taken in Alaska and Canada, indicating a far-ranging ocean distribution. In recent years, only 19 percent were caught off Washington, Oregon, and California, with the balance (45 percent) taken in the Columbia River (Simmons 2000).

Habitat and Hydrology

With hydrosystem development, the most productive areas of the Snake River Basin are now inaccessible or inundated. The upper reaches of the mainstem Snake River were the primary areas used by fall-run Chinook salmon, with only limited spawning activity reported downstream from river kilometer (Rkm) 439. The construction of Brownlee Dam (1958; Rkm 459), Oxbow Dam (1961; Rkm 439), and Hells Canyon Dam (1967; Rkm 397) eliminated the primary production areas of Snake River fall-run Chinook salmon. There are now 12 dams on the mainstem Snake River, and they have substantially reduced the distribution and abundance of fall-run Chinook salmon (Irving and Bjornn 1981).

Hatchery Influence

The Snake River has contained hatchery-reared fall-run Chinook salmon since 1981 (Busack 1991). The hatchery contribution to Snake River escapement has been estimated at greater than 47 percent (Meyers et al. 1998). Artificial propagation is recent, so cumulative genetic changes associated with it may be limited. Wild fish are incorporated into the brood stock each year, which should reduce divergence from the wild population. Release of sub-yearling fish may also help minimize the differences in mortality patterns between hatchery and wild populations that can lead to genetic change (Waples 1999).

Population Trends and Risks

Almost all historical Snake River fall-run Chinook salmon spawning habitat in the Snake River Basin was blocked by the Hells Canyon Dam complex; other habitat blockages have also occurred in Columbia River tributaries. The ESU's range has also been affected by agricultural water withdrawals, grazing, and vegetation management. The continued straying by nonnative hatchery fish into natural production areas is an additional source of risk. Assessing extinction risk to the newly configured ESU is difficult because of the geographic discontinuity and the disparity in the status of the two remaining populations. The relatively recent extirpation of fall-run Chinook in the John Day, Umatilla, and Walla Walla Rivers is also a factor in assessing the risk to the overall ESU. Long-term trends in abundance for specific tributary systems are mixed. For the Snake River fall-run Chinook salmon ESU, NOAA Fisheries estimates that the median population growth rate (lambda) over a base period from 1980 through 1998 ranges from 0.94 to 0.86, decreasing as the effectiveness of hatchery fish spawning in the wild increases compared with that of fish of wild origin (McClure et al. 2000). The Snake River component of the fall Chinook run has been increasing during the past few years as a result of hatchery and supplementation efforts in the Snake and Clearwater River Basins. In 2002, more than 15,200 fall chinook were counted past the two lower dams on the Snake River, with about 12,400 counted above Lower Granite Dam. These adult returns are about triple the 10-year average at these Snake River projects (FPC 2003).

Analysis of Potential Impacts to the Chinook Salmon

In consideration of all factors pertaining to the Chinook Salmon and the discharges from the WTPs, it is predicted that there will be no impact to the Chinook Salmon. The discharges do not contribute to the factors responsible for the Chinook Salmon's decline as described above. The characteristics of the discharge and permit conditions will not cause any harmful or beneficial effects to the Chinook Salmon. The Chinook Salmon is a highly mobile species, discharges are not from a major facility, and the effluent is treated, as well as meeting State Water Quality Standards; therefore, no measurable impacts are predicted. **No effect** is predicted on the Chinook Salmon from the discharges.

E. Steelhead (*Oncorhynchus mykiss*) - Threatened

The steelhead is the anadromous form of the rainbow trout (*O. mykiss*), which occurs in two subspecies, *O. mykiss irideus* and *O. mykiss gaidneri*. Whereas stream-resident rainbow trout may complete their life cycle in a limited area of a small stream and attain a length of only 8 inches or so, steelhead may spend half their lives at sea, roaming for thousands of miles in the North Pacific Ocean. Steelhead return to spawn at sizes ranging from about 24 inches and 5 pounds to about 36 to 40 inches or more and 20 pounds or more (Behnke 2002).

Biologically, steelhead can be divided into two reproductive ecotypes, based on their state of sexual maturity at the time of river entry. These two ecotypes are termed "stream-maturing" and "ocean-maturing". Stream-maturing steelhead enter fresh water in a sexually immature condition and require from several months to a year to mature and spawn. These fish are often referred to as "summer run" steelhead. Ocean-maturing steelhead enter fresh water with well-developed gonads and spawn shortly after river entry. These fish are commonly referred to as "winter-run" steelhead. In the Columbia River basin, essentially all steelhead that return to streams east of the Cascade Mountains are stream-maturing. Ocean-maturing fish are the predominate ecotype in coastal streams and lower Columbia River tributaries (ACOE 2000b).

All but one of the *O. m. gairdneri* steelhead populations migrating east of the Cascade Range are characterized as summer-run steelhead (entering the Columbia River from May into the early fall in October); the one exception is a winter-run steelhead spawning in Fifteenmile Creek, which drains the eastern side of the Cascades in Oregon. The genetic traits of Fifteenmile Creek steelhead make it intermediate between the subspecies *irideus* and *gairdneri*. Steelhead of the subspecies *irideus* are mainly winter-run fish, but *irideus* also has summer runs. Considering the entire range of *irideus* from California to Alaska, steelhead can be found entering one river or another in every month of the year (Behnke 2002).
Native steelhead in California generally spawn earlier than those to the north with spawning beginning in December. Washington populations begin spawning in February or March. Native steelhead spawning in Oregon and Idaho is not well documented. In the Clackamas River in Oregon, winter-run steelhead spawning begins in April and continues into June. In the Washougal River, Washington, summer-run steelhead spawn from March into June whereas summer-run fish in the Kalama River, Washington, spawn from January through April. Among inland steelhead, Columbia River populations from tributaries upstream of the Yakima River spawn later than most downstream populations.

Depending on water temperature, fertilized steelhead eggs may incubate in redds for 1.5 to 4 months before hatching as "alevins". Following yolk sac absorption, young juveniles or "fry" emerge from the gravel and begin active feeding. Juveniles rear in fresh water for 1 to 4 years, then migrate to the ocean as smolts. Downstream migration of wild steelhead smolts in the lower Columbia River begins in April, peaks in mid-May, and is essentially complete by the end of June (ACOE 2000b). Previous studies of the timing and duration of steelhead downstream migration indicate that they typically move quickly through the lower Columbia River estuary with an average daily movement of about 21 kilometers (ACOE 2000b).

Juvenile steelhead generally spend two years in freshwater before smolting and migrating to the ocean at lengths of about 6 to 8 inches. After about 15 to 30 months of ocean life, most steelhead return to their natal rivers to spawn. Unlike Pacific salmon, steelhead do not all die soon after spawning, but the rate of survival to repeat spawning is generally low - about 10 percent (Behnke 2002).

Snake River Steelhead

Status

The SR steelhead ESU was listed as threatened on August 18, 1997 (62FR43937).

Geographic Range and Spatial Distribution

This inland steelhead ESU occupies the Snake River Basin of southeast Washington, northeast Oregon and Idaho. The Snake River flows through terrain that is warmer and drier on an annual basis than the upper Columbia Basin or other drainages to the north. Geologically, the land forms are older and much more eroded than most other steelhead habitat. Collectively, the environmental factors of the Snake River Basin result in a river that is warmer and more turbid, with higher pH and alkalinity than is found elsewhere in the range of inland steelhead. In many Snake River tributaries, spawning occurs at a higher elevation (up to 2,000 m) than for steelhead in any other geographic region.

Critical Habitat

The critical habitat for SR steelhead was initially designated on February 16, 2000 (65FR7764), but was withdrawn in April 2002 and is currently under development.. The initial designated habitat consisted of all river reaches accessible to listed steelhead in the Snake River and its tributaries in Idaho, Oregon, and Washington. Also included were river reaches and estuarine areas in the Columbia River from a straight line connecting the west end of the Clatsop jetty (south jetty, Oregon side) and the west end of the Peacock jetty (north jetty, Washington side) upstream to the confluence with the Snake River. Excluded were areas above the Hells Canyon and Dworshak Dams and areas above longstanding, naturally impassable barriers (i.e., Napias Creek Falls and other natural waterfalls in existence for at least several hundred years). The revised habitat designation included numerous watersheds throughout the Clearwater and South Fork Clearwater basins as well as other watersheds throughout Washington, Idaho and Oregon. Habitat was also excluded for four watersheds including Agency Creek, Flat Creek, Lower Palouse River and Upper Orofino Creek.

Historical Information

The longest consistent indicator of steelhead abundance in the Snake River basin is derived from counts of natural-origin steelhead at the uppermost dam on the lower Snake River. According to these estimates, the abundance of summer steelhead has declined from a 4-year average of 58,300 in 1964 to a 4-year average of 8,300 ending in 1998 (NMFS 2000). In general, steelhead abundance declined sharply in the early 1970's, rebounded moderately from the mid 1970's through the 1980's, and declined again during the 1990's.

Life History

Fish in this ESU are summer steelhead. They enter freshwater from June to October and spawn during the following March to May. Two groups are identified, based on migration timing, ocean-age, and adult size. A-run steelhead, thought to be predominately age-1-ocean, enter freshwater during June through August. B-run steelhead, thought to be age-2-ocean, enter freshwater during August through October. B-run steelhead are typically 75 to 100 mm longer at the same age. Both groups usually smolt as 2- or 3-year-olds (Whitt 1954, BPA 1992, Hassemer 1992). All steelhead are iteroparous, capable of spawning more than once before death.

Habitat and Hydrology

Hydrosystem projects create substantial habitat blockages in this ESU; the major ones are the Hells Canyon Dam complex (mainstem Snake River) and Dworshak Dam (North Fork Clearwater River). Minor blockages are common throughout the region. Steelhead spawning areas have been degraded by overgrazing, as well as by historical gold dredging and sedimentation due to poor land management. Habitat in the Snake River basin is warmer and drier and often more eroded than elsewhere in the Columbia River basin or in coastal areas.

Hatchery Influence

Hatchery fish are widespread and stray to spawn naturally throughout the region. In the 1990s, on average, 86 percent of adult steelhead passing Lower Granite Dam were of hatchery origin. Hatchery contribution to naturally spawning populations varies, however, across the region. Hatchery fish dominate some stocks, but do not contribute to others.

Population Trends and Risks

For the SR steelhead ESU as a whole, NMFS (2000) estimates that the median population growth rate (lambda) over a base period from 1990 through 1998 ranges from 0.91 to 0.70, decreasing as the effectiveness of hatchery fish spawning in the wild increases compared to that of fish of wild origin (Tables B-2a and B-2b in McClure et al. 2000). The main contributor of steelhead in the Columbia River basin is the Snake River. In 2002, the tributary into the Snake River was about 210,000, 71 percent of the total counted at McNary Dam (286,805). The 2002 Snake River steelhead count was about twice the 10-year average. The numbers of wild steelhead (non-clipped adipose fin) increased to about an average of 55,000 in the Snake River in 2002 (FPC 2003).

Analysis of Potential Impacts to the Steelhead

In consideration of all factors pertaining to the Steelhead and the discharge from the WTPs, it is predicted that there will be no impact to the Steelhead. The discharges do not contribute to the factors responsible for the Steelhead's decline as described above. The characteristics of the discharge and permit conditions will not cause any harmful or beneficial effects to the Steelhead. The Steelhead is a highly mobile species, discharge is not from a major facility, and the effluent is treated to Federal Secondary Treatment Standards, as well as meeting State Water Quality Standards; therefore, no measurable impacts are predicted. **No effect** is predicted on the Steelhead from the discharges.

F. Spalding's catchfly *(Silene spaldingii)* - Threatened

On October 10, 2001, the Spalding's catchfly was designated as threatened in its entire range (USFWS 2001).

Range of Species

When Spalding's catchfly was listed in 2001 there were a total of 58 populations. Since it's listing in 2001, increased survey efforts have resulted in the discovery of an additional 39 populations. Currently there are 22 populations in Idaho, 10.33 in Montana, 17 in Oregon, 49 in Washington, and 0.66 in British Columbia, Canada (USFWS 2007).

Critical Habitat

Critical habitat was proposed for Spalding's catchfly on April 24, 2000 (USFWS 2000d).

Life History

Spalding's catchfly is a long-lived perennial herb in the carnation family. It has four to seven pairs of lance-shaped leaves and small greenish-white flowers. The plant is distinguished by it very sticky foliage and petals that are shallowly lobed. Spalding's catchfly may range from 8 to 24 inches in height, and it flowers from July through early August. Fruit and seed maturation occurs in August, with seed dispersal taking place in late August to early September (Lorain 1991). Rosettes are formed the first year and flowering may occur during or after the second season. The bumblebee, *Bombus fervidus*, appears to be the only significant pollination vector for Spalding's catchfly throughout its range (Lesica 1991). At least in some populations, Spalding's catchfly appears to be subject to pollinator limitations, inbreeding depression, and a large genetic load (Lesica 1991 and 1993).

<u>Population Trends and Risks</u>

Spalding's catchfly is presently known from a total of 99 populations, 22 populations in Idaho, 10.33 in Montana, 17 in Oregon, 49 in Washington, and 0.66 in British Columbia, Canada (USFWS 2007). Spalding's catchfly is a serious conservation concern in all four states where it occurs. Just over half of the known populations of this plant occur on private land, much of which is slated for development, including areas near Redbird Ridge in Idaho, and Wallowa Lake in Oregon.

Throughout its range, much of the Paillasse Prairie grassland habitat of Spalding's catchfly has been converted to crop agriculture or pastureland. Although probably once widespread in the Paillasse region, Spalding's catchfly is now found mainly in small, fragmented sites on the periphery of its former range. Threats to this species may include livestock grazing, herbicide spraying, noxious weed infestation, recreation, road construction and maintenance, conversion of prairie into farmland, fire suppression and urban development (Gamon 1991, Lorain 1991, Heidel 1995, Schassberger 1988 and USFWS 2007).

<u>Analysis of Potential Impacts to the Spalding's Catchfly</u>

In consideration of all factors pertaining to the plant Spalding's Catchfly and the discharges from the WTPs, it is predicted that there will be no impact to the Spalding's Catchfly. The discharges do not contribute to the factors responsible for this plant's decline as described above. The characteristics of the discharge and permit conditions will not cause any harmful or beneficial effects to this plant because the Spalding's Catchfly's habitat is on land, such as grasslands. The discharge is into the Clearwater River, not where this plant is found. Therefore, no measurable impacts are predicted. **No effect** is predicted on the Spalding's Catchfly from the discharge.

G. Canada Lynx *(Lynx canadensis)* - Threatened

<u>Status</u>

The U.S. lower 48 lynx population segment was designated as threatened under the Endangered Species Act on in 1998 (USFWS 1998a). This listing was extended in 1999 (for not more than six months) to include the contiguous United States lynx population segment. This extension allowed time to resolve a dispute over the status of the U.S. lower 48 lynx population (USFWS 1998b). In 2000, USFWS determined threatened status for the contiguous U.S. distinct population segment of the Canada lynx (USFWS 2000a).

<u>Geographical Range and Spatial Distribution</u>

Within the area covered by this listing, the Canada lynx is known to currently occur in Alaska, Arizona, Colorado, Idaho, Indiana, Iowa, Maine, Massachusetts, Michigan, Minnesota, Montana, Nevada, New Hampshire, New York, North Dakota, Ohio, Oregon, Pennsylvania, Washington and Wyoming.

The Canada lynx is currently found throughout Alaska and Canada (except arctic islands), south through the Rocky Mountains, northern Great Lakes region, and northern New England. The Canada Lynx was considered historically resident in 16 states represented by five ecologically distinct regions: Cascade Range (Washington, Oregon); northern Rocky Mountains (northeastern Washington, southeastern Oregon, Idaho, Montana, western Wyoming, northern Utah); southern Rocky Mountains (southeastern Wyoming, Colorado); northern Great Lakes (Minnesota, Wisconsin, Michigan); and northern New England (Maine, New Hampshire, Vermont, New York, Pennsylvania, Massachusetts). Resident populations currently exist only in Maine, Montana, Washington, and possibly Minnesota. The lynx is considered extant but no longer sustaining self-support populations in Wisconsin, Michigan, Oregon, Idaho, Wyoming, Utah, and Colorado, and assumed to be extirpated from New Hampshire, Vermont, New York, Pennsylvania, and Massachusetts (USFWS 1998a).

Critical Habitat

Critical habitat has been proposed but not designated for Idaho, Maine, Minnesota, Montana and Washington.

Life History

The Canada lynx, a medium-sized cat, breeds in late winter or early spring in North America. Gestation lasts 62-74 days, with litter size averaging 3-4 and adult females producing one litter every 1-2 years. Young lynx stay with their mother until the next mating season or longer. Some females give birth as yearlings, but their pregnancy rate is lower than that of older females (Brainerd 1985). Prey scarcity suppresses breeding and may result in mortality of nearly all young (Brand and Keith 1979). Lynx are mainly nocturnal, being most active from 2 hours after sunset to one hour after sunrise (Banfield 1974). Canada lynx primarily feed on small mammals and birds, particularly snowshoe hare, (*Lepus americanus*). Occasionally lynx may feed on squirrels, small mammals, beaver, deer, moose, muskrat, and birds, some of which are taken as carrion. Lynx have been known to cache food for later use. When prey is scarce, lynx home range increases, and individuals may become nomadic (Ward and Krebs 1985, Saunders 1963, Mech 1980). Male home range (average often about 15-30 sq km, but up to hundreds of sq km in Alaska and Minnesota) is larger than that of females. Long distance dispersal movements of up to several hundred kilometers have been recorded. Population density usually is less than 10 (locally up to 20) per 100 sq km, depending on prey availability. Mean densities range between 2 and 9 per 100 sq km (McCord and Cardoza 1982).

Canada lynx generally occur in boreal and montane regions dominated by coniferous or mixed forest with thick undergrowth, but they may also enter open forest, rocky areas, and tundra to forage for abundant prey. When inactive or birthing, lynx occupy dens typically located in hollow trees, under stumps, or in thick brush. Den sites tend to be in mature or old growth stands with a high density of logs (Koehler 1990).

Population Trends and Risks

In the contiguous U.S., overall numbers and range of the Canada lynx are substantially reduced from historical levels. At present, lynx numbers have not recovered from overexploitation by both regulated and unregulated harvest that occurred in the 1970s and 1980s. Forest management practices that result in the loss of diverse age structure, fragmentation, increased roads, urbanization, agriculture, recreational developments, and unnatural fire frequencies have altered suitable habitat in many areas. As a result, many states may have insufficient habitat quality and/or quantity to sustain lynx or their prey (USFWS 1998a). Human access into habitat has increased dramatically over the last few decades contributing to direct and indirect mortality and displacement from suitable habitat. Although legal take is highly restricted, existing regulatory mechanisms may be inadequate to protect small, remnant populations or to conserve habitat. Competition with bobcats and coyotes may also be a concern in some areas.

Current population size of the Canada lynx in the contiguous U.S. is unknown, but probably numbers less than 2,000 individuals. The Washington lynx population probably numbers fewer than 100 individuals (Stinson 2001). It has been suggested that since lynx occurrence throughout much of the contiguous U.S. is on the southern periphery of the species' range, the presence of lynx is solely a consequence of dispersal from Canada, and that most of the U.S. may never have supported self-sustaining, resident populations over time (USFWS 1998a)

For the Pacific Northwest, U.S. Forest Service et al. (1993) recommended the following actions within known lynx range: (1) minimizing road construction, closing unused roads, and maintaining roads to the minimum standard possible; (2) using prescribed fire to maintain forage for snowshoe hare in juxtaposition with hunting cover for lynx; (3) designating areas to be closed to kill trapping of any furbearer to avoid incidental lynx mortality to maintain population refugia for lynx in key areas; (4) planning for kill-trapping closure on a wider basis if data indicate a declining lynx population as a result of incidental trapping mortality; and (5) developing and implementing a credible survey and monitoring strategy to determine the distribution of lynx throughout its potential range. U.S. Forest Service et al. (1993) listed three primary habitat components for lynx in the Pacific Northwest: (1) foraging habitat (15-35 year-old lodgepole pine) to support snowshoe hare and provide hunting cover; (2) den sites (patches of >200-year-old spruce and fir, generally less than 5 acres; and (3) dispersal/travel cover (variable in vegetation composition and structure).

The major limiting factor is abundance of snowshoe hare, which in turn is limited by availability of winter habitat (in the Pacific Northwest, primarily early successional lodgepole pine with trees at least 6 feet tall) (U.S. Forest Service et al. 1993). In general, the future of the lynx looks more promising than for many other felids. Quinn and Parker (1987) do not believe that habitat alteration has had significant impact on lynx populations, although in the southern portions of its range optimal habitat for snowshoe hares is more patchily distributed (Wolff 1980). Modified logging, leaving interspersing areas of good tree cover, can actually benefit both lynx and their prey. However, suppression of forest fires limits early successional growth favored by hares and may ultimately reduce hare abundance.

Analysis of Potential Impacts to the Canada Lynx

In consideration of all factors pertaining to the Canada Lynx and the discharge from the WTPs, it is predicted that there will be no impact to the Canada Lynx. The discharges do not contribute to the factors responsible for this animal’s decline as described above. The characteristics of the discharge and permit conditions will not cause any harmful or beneficial effects to this animal because the Canada Lynx is a terrestrial species. Therefore, no measurable impacts are predicted. **No effect** is predicted on the Canada Lynx from the discharge.

H. North American Wolverine (Proposed Threatened: *Gulo gulo luscus*) and Northern Idaho Ground Squirrel (Threatened: *Urocitellus brunneus)*

Analysis of Potential Impacts to the North American Wolverine and the Northern Idaho Ground Squirrel

Similar to the Canada Lynx, no effect is predicted on the North American Wolverine and the Northern Idaho Ground Squirrel as these are also terrestrial species that would not be impacted by the discharge from these two WTPs.

III. Summary of Potential Imacts Pursuant to ESA

After analyzing potential impacts to each species above, EPA has determined that the requirements contained in the draft permit will have **no effect** on the threatened or endangered species in the vicinity of the discharge. The issuance of an NPDES permit to the Orofino and Riverside WTPs will not be expected to result in habitat destruction, nor will it be expected to result in changes in population that could result in increased habitat destruction.

IV. ESSENTIAL FISH HABITAT

Essential Fish Habitat

Essential fish habitat (EFH) includes the waters and substrate (sediments, etc.) necessary for fish to spawn, breed, feed, or grow to maturity. The Magnuson-Stevens Fishery Conservation and Management Act (January 21, 1999) requires EPA to consult with NOAA Fisheries when a proposed discharge has the potential to adversely affect (reduce quality and/or quantity of) EFH. The EFH regulations define an adverse effect as any impact which reduces quality and/or quantity of EFH and may include direct (e.g. contamination or physical disruption), indirect (e.g. loss of prey, reduction in species' fecundity), site specific, or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions. It is predicted that the Kamiah WWTP would not cause any of the above adverse effects to fish habitat.

The EPA's approach to aquatic life protection is outlined in detail in the *Technical Support Document for Water Quality-based Toxics Control* (EPA/505/2-90-001, March 1991). The EPA and states evaluate toxicological information from a wide range of species and life stages in establishing water quality criteria for the protection of aquatic life.

The NPDES program evaluates a wide range of chemical constituents (as well as whole effluent toxicity testing results) to identify pollutants of concern with respect to the criteria values. When a facility discharges a pollutant at a level that has a "reasonable potential" to exceed, or to contribute to an exceedance of, the water quality criteria, permit limits are established to prevent exceedances of the criteria in the receiving water (outside any authorized mixing zone).

Due to the nature of this relatively small water treatment plants in comparison with the large volume of water at the Clearwater River (7Q10 low flow of 594 cfs), in addition to many factors such as the low-polluting nature of discharges from water treatment plants, and required to be in compliance with State of Idaho Water Quality Standards, the circumstances discussed indicate that there is no measurable impact. Therefore EPA has determined that the re-issuance of this permit has **no effect** on EFH in the vicinity of the discharge.