Fact Sheet

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United States Environmental Protection Agency
Proposed Reissuance of a National Pollutant Discharge Elimination System (NPDES) Permit to Discharge Pollutants Pursuant to the Provisions of the Clean Water Act (CWA)

City of Payette, Idaho
Wastewater Treatment Plant
NPDES Permit No. ID0020672

EPA Proposes To Reissue NPDES Permit ID0020672

EPA proposes to reissue the NPDES permit for the City of Payette Wastewater Treatment Plant (WWTP). The draft permit places conditions on the discharge of pollutants from the wastewater treatment plant to waters of the United States. In order to ensure protection of water quality and human health, the permit places limits on the types and amounts of pollutants that can be discharged from the facility.

This Fact Sheet includes:

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

State Certification

EPA is requesting that the Idaho Department of Environmental Quality (IDEQ) certify the NPDES permit for this facility, under Section 401 of the Clean Water Act. Comments regarding the certification should be directed to:

Regional Administrator
Idaho Department of Environmental Quality
1445 North Orchard St.
Boise, Idaho 83706
(208) 373-0550

Public Comment

Persons wishing to comment on, or request a Public Hearing for, the draft permit for this facility may do so in writing by the expiration date of the Public Comment period. A request for a

Public Hearing must state the nature of the issues to be raised as well as the requester's name, address, and telephone number. All comments and requests for Public Hearings must be in writing and should be submitted to EPA as described in the Public Comments Section of the attached Public Notice.

After the Public Notice expires, and all comments have been considered, 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 permit will become final, and the permit will become effective upon issuance. If substantive comments are received, EPA will address the comments and issue the permit. The permit 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 Available for Review

The draft NPDES permit and related documents can be reviewed or obtained by visiting or contacting EPA's Regional Office in Seattle between 8:30 a.m. and 4:00 p.m., Monday through Friday 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."

EPA Region 10
1200 Sixth Avenue, OWW-130
Seattle, Washington 98101
(206) 553-0523

The fact sheet and draft permits are also available at:

EPA Idaho Operations Office
950 West Bannock
Suite 900
Boise, Idaho 83702
(208) 378-5746

Idaho DEQ Boise Regional Office
1445 North Orchard St.
Boise, Idaho 83706
(208) 373-0550

Acronyms

1Q10	1 day, 10 year low flow
7Q10	7 day, 10 year low flow
30B3	Biologically-based design flow intended to ensure an excursion frequency of less than once every three years, for a 30-day average flow.
30Q10	30 day, 10 year low flow
ACR	Acute-to-Chronic Ratio
AML	Average Monthly Limit
ASR	Alternative State Requirement
AWL	Average Weekly Limit
BA	Biological Assessment
BAT	Best Available Technology Economically Achievable
BCT	Best Conventional Pollutant Control Technology
BE	Biological Evaluation
BO or BiOp	Biological Opinion
BOD_5	Biochemical oxygen demand, five-day
BOD_u	Biochemical oxygen demand, ultimate
BMPs	Best Management Practices
BPT	Best Practicable Control Technology Currently Available
°C	Degrees Celsius
CBOD	Carbonaceous Biochemical Oxygen Demand
CFR	Code of Federal Regulations
cfs	Cubic Feet per Second
COD	Chemical Oxygen Demand
CSO	Combined Sewer Overflow
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

EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FDF	Fundamentally Different Factor
FR	Federal Register
gpd	Gallons per day
HUC	Hydrologic Unit Code
IC	Inhibition Concentration
ICIS	Integrated Compliance Information System
IDEQ	Idaho Department of Environmental Quality
I/I	Infiltration and Inflow
LA	Load Allocation
LC	Lethal Concentration
LC_{50}	Concentration at which 50% of test organisms die in a specified time period
LD_{50}	Dose at which 50% of test organisms die in a specified time period
LOEC	Lowest Observed Effect Concentration
LTA	Long Term Average
LTCP	Long Term Control Plan
mg/L	Milligrams per liter
Ml	milliliters
ML	Minimum Level
µg/L	Micrograms per liter
mgd	Million gallons per day
MDL	Maximum Daily Limit or Method Detection Limit
MF	Membrane Filtration
MPN	Most Probable Number
NEPA	National Environmental Policy Act
NOAA	National Oceanic and Atmospheric Administration
NOEC	No Observable Effect Concentration
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NSPS	New Source Performance Standards
O&M	Operations and maintenance

POTW	Publicly owned treatment works
PSES	Pretreatment Standards for Existing Sources
PSNS	Pretreatment Standards for New Sources
QAP	Quality assurance plan
RP	Reasonable Potential
RPM	Reasonable Potential Multiplier
RWC	Receiving Water Concentration
SIC	Standard Industrial Classification
SS	Suspended Solids
SSO	Sanitary Sewer Overflow
s.u.	Standard Units
TKN	Total Kjeldahl Nitrogen
TMDL	Total Maximum Daily Load
TOC	Total Organic Carbon
TRC	Total Residual Chlorine
TRE	Toxicity Reduction Evaluation
TSD	Technical Support Document for Water Quality-based Toxics Control (EPA/505/2-90-001)
TSS	Total suspended solids
TU_a	Toxic Units, Acute
TU_c	Toxic Units, Chronic
USFWS	U.S. Fish and Wildlife Service
USGS	United States Geological Survey
UV	Ultraviolet
WET	Whole Effluent Toxicity
WLA	Wasteload allocation
WQBEL	Water quality-based effluent limit
WQS	Water Quality Standards
WWTP	Wastewater treatment plant

I. Applicant

A. General Information

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

City of Payette Wastewater Treatment Plant
NPDES Permit # ID0020672

Physical Address:
522 River Street
Payette, Idaho 83661

Mailing Address:
700 Central Avenue
Payette, Idaho 83661

Contact:
Doug Argo, P.E.
City Engineer-Payette
(208) 642-3304
doug@holladayengineering.com

B. Permit History

The most recent NPDES permit for the City of Payette was issued on November 28, 2001, became effective on December 31, 2001, and expired on January 2, 2007. An NPDES application for permit reissuance was submitted by the permittee on September 21, 2006**.** EPA determined that the application was timely and complete. Therefore, pursuant to 40 CFR 122.6., the permit has been administratively extended and remains fully effective and enforceable.

II. Facility Information

A. Treatment Plant Description

The City of Payette owns, operates, and maintains the City of Payette wastewater treatment plant (WWTP) located in Payette, Idaho. The secondary treatment plant discharges treated municipal wastewater to the Payette River. The facility currently treats sanitary sewage from the City of Payette, as well as wastewater from an existing canned vegetable and soup manufacturer. The facility serves a resident population of 7,487. The design flow of the facility is 2.88 mgd.

Seneca Foods Corporation is a significant industrial user (SIU) for this WWTP and produces canned vegetables and vegetable soups. The SIU's process wastewater flows continuously into the collection system at an average daily volume of 63,100 gallons per day, and the non-process wastewater flows intermittently at 2,500 gallons per day.

Details about the wastewater treatment process and maps showing the location of the treatment facility and discharge are included in Appendices A and B, respectively.

B. Background Information

Effluent Characterization

In order to determine pollutants of concern for further analysis, EPA evaluated the application form, additional discharge data, and the nature of the discharge. The wastewater treatment process for this facility includes both primary and secondary treatment, as well as disinfection with chlorination. Pollutants typical of a sewage treatment plant treating with chlorine would be expected in the discharge, including five-day biochemical oxygen demand (BOD_5), total suspended solids (TSS), E. coli bacteria, total residual chlorine (TRC), pH, ammonia, temperature, phosphorus, and dissolved oxygen (DO). Additionally, the expanded effluent testing submitted with the application showed levels of dichlorobromomethane and chloroform that are higher than the associated human health criteria. Based on this analysis, pollutants of concern are as follows:

- BOD_5
- TSS
- E. coli bacteria
- TRC
- pH
- Temperature
- Ammonia
- Nitrogen
- Nitrate-Nitrite
- Phosphorus
- Orthophosphorus
- DO
- Dichlorobromomethane
- Chloroform

The concentrations of pollutants in the discharge were reported in the NPDES application and in DMRs and were used in determining reasonable potential for several parameters (see Appendix D).

Facility Compliance

EPA conducted an inspection of the WWTP in 2009 and found that the facility Quality Assurance Plan (QAP) was inadequate. The WWTP has revised its QAP to include all mandatory elements. Also, according to DMR information, the WWTP exceeded TRC limits 10 times in 2004 and once in 2011. Otherwise, the facility has generally been in compliance with its permit effluent limits.

III. Receiving Water

The City of Payette WWTP discharges to the Payette River with the discharge located at 44°4’51.1” N, 116°56’57.2”W. The outfall is located upstream of the Snake River and less than 1 mile from the Oregon border.

A. 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.

For ammonia, one of the pollutants of concern, the chronic criterion is a 30-day average concentration not to be exceeded more than once every three years. For ammonia, EPA has used the 30B3 for the chronic ammonia criterion instead of the 7Q10. The 30B3 is a biologically-based flow rate designed to ensure an excursion frequency of no more than once every three years for a 30-day average flow rate. For human health criteria, the Idaho WQS recommend the 30Q5 flow rate for non-carcinogens, and the harmonic mean flow rate for carcinogens.

The critical flow levels for the receiving water are as follows:

Table 1. Critical Low Flows in the Payette River at the Point of Discharge (CFS)

1Q10	7Q10	30B3	30Q5	30Q10	Harmonic Mean
217	282	356	480	397	1380

These critical flows are lower than those used in the existing permit (1Q10 of 333 cfs, 7Q10 of 450 cfs). There have been significant changes in the receiving water due to dams and irrigation since the 1990s and only data after these changes took place were used to calculate the critical low flows used for this draft permit. These flows are expected to be more representative of actual low flow conditions in the river than the flows from the existing permit.

B. Water Quality Standards

Overview

Section 301(b)(1)(C) of the CWA requires the development of limitations in permits necessary to meet water quality standards. Federal regulations at 40 CFR 122.4(d) require that the conditions in NPDES permits ensure compliance with the water quality standards of all affected States. A State's WQS are composed of use classifications, numeric and/or narrative water quality criteria, and an anti-degradation policy. The use classification system designates the beneficial uses (such as drinking water supply, contact recreation, and aquatic life) that each water body is expected to achieve. The numeric and/or narrative water quality criteria are the criteria deemed necessary by the State to support the beneficial use classification of each water body. The anti-degradation policy represents a three-tiered approach to maintain and protect various levels of water quality and uses.

This facility discharges to the Payette River in the Payette subbasin (USGS HUC 17050122). At the point of discharge, the Payette River is designated for the following uses (IDAPA 58.01.02.140.16):

- cold water aquatic life habitat

- salmonid spawning
- primary contact recreation
- domestic water supply

In addition, the Idaho WQS state that all waters of the State of Idaho are protected for industrial and agricultural water supply (Section 100.03.b and c.), wildlife habitats (100.04), and aesthetics (100.05). Idaho's WQS also contain narrative criteria stating that all surface waters of the state shall be free from hazardous materials; toxic substances; deleterious materials; radioactive materials; floating, suspended or submerged matter; excess nutrients; oxygen-demanding materials; and sediment in concentrations which would impair beneficial uses.

The City of Payette WWTP discharges to the Payette River at mile 0.5, and the Payette River then flows into the Snake River. The midpoint of the Snake River is the boundary between the states of the Idaho and Oregon. Therefore, Oregon's water quality standards must be considered when developing effluent limits.

The *Oregon Water Quality Standards and Beneficial Uses* (Oregon Administrative Code 340-041) classify this section of the Snake River for the following beneficial uses:

- public and private drinking water supply
- industrial water supply
- irrigation
- livestock watering
- salmonid fish rearing (trout)
- salmonid fish spawning (trout)
- resident fish (warm water)
- aquatic life
- wildlife and hunting
- fishing
- boating
- water contact recreation
- aesthetic quality

In general, the Idaho water quality criteria are protective of the beneficial uses established by Oregon. In most cases the Idaho criteria are as stringent as or more stringent than the Oregon criteria, with the following exceptions: Oregon's water quality standard for pH is more stringent, and its designation of salmonid spawning as a beneficial use of the river requires more stringent dissolved oxygen and temperature criteria. However, for these parameters, the dilution that occurs before the effluent reaches the Snake River is sufficient so that the effluent will not affect attainment of the Oregon water quality standards. Therefore, only Idaho water quality standards have been considered when developing effluent limits.

Surface Water Quality Criteria

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

- 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 necessary 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 necessary 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) (See IDAPA 58.01.02.252.02)

C. Water Quality Limited Waters

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

The Payette River is listed as water quality limited for bacteria and temperature. A TMDL was developed in 1999 establishing waste load allocations for fecal coliform, which at the time were consistent with ID WQS. In 2000, ID revised the state WQS to replace fecal coliform with E. coli for determining attainment of the primary and secondary recreation uses. In 2003, the TMDL Implementation Plan and Addendum changed the TMDL to replace fecal coliform with E. coli allocations and monitoring. A temperature TMDL is not planned due to the fact that the impairment is due almost solely to habitat and flow modifications and not to any particular point or non-point sources.

Additionally, the draft permit takes into consideration that the downstream Snake River has a TMDL for several pollutants, including nutrients. This is discussed further in Appendix D.

IV. Effluent Limitations

A. Basis for Effluent Limitations

In general, the CWA requires that the effluent limits for a particular pollutant be the more stringent of either technology-based limits or water quality-based limits. Technology-based limits are set according to the level of treatment that is achievable using available technology. A water quality-based effluent limit is designed to ensure that the water quality standards applicable to a waterbody are being met and may be more stringent than technology-based effluent limits. The basis for the effluent limits proposed in the draft permit is provided in Appendix C. The following summarizes the proposed effluent limitations that are in the draft permit.

B. Proposed Effluent Limitations

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

Narrative limitations to implement Idaho's narrative criteria for floating, suspended, or submerged matter:

The permittee must not discharge floating, suspended, or submerged matter of any kind in concentrations causing nuisance or objectionable conditions or that may impair designated beneficial uses.

Numeric Limitations

Table 2 (below) presents the proposed average monthly, average weekly, and maximum daily effluent limits.

Table 2. Proposed Effluent Limits

Parameter	Units	Effluent Limits		
		Average Monthly Limit (AML)	Average Weekly Limit (AWL)	Maximum Daily Limit (MDL)
Five-Day Biochemical Oxygen Demand (BOD_5)[1,2]	mg/L	30	45	—
	lbs/day	721	1081	—
	% removal	85% (min)	—	—
Total Suspended Solids (TSS)[1,2]	mg/L	30	45	—
	lbs/day	721	1081	—
	% removal	85% (min)	—	—
***E. coli* Bacteria[3]**	#/100 ml	126[2]	—	406 instantaneous max limit
pH	s.u.	6.5-9.0		
Total Residual Chlorine (TRC)	mg/L	0.122	—	0.250
	lbs/day	2.93	—	6.00
Total Phosphorus	lbs/day	78.2	149	—

1. Loading (in lbs/day) is calculated by multiplying the concentration (in mg/L) by the corresponding flow (in mgd) for the day of sampling and a conversion factor of 8.34. For more information on calculating, averaging, and reporting loads and concentrations see the *NPDES Self-Monitoring System User Guide* (EPA 833-B-85-100, March 1985).
2. Percent Removal. The monthly average percent removal must be calculated from the arithmetic mean of the influent values and the arithmetic mean of the effluent values for that month using the following equation:

   (average monthly influent concentration – average monthly effluent concentration) ÷ average monthly influent concentration x 100. Influent and effluent samples must be taken over approximately the same time period.
3. The permittee must report the geometric mean *E. coli* concentration.

C. Changes in Limits from the Existing Permit

Table 2 illustrates the changes in effluent limits from the existing permit. As discussed in the Statutory Prohibitions on Backsliding section below, fecal coliform limits are being removed in the draft permit. Fecal coliform was replaced by E. coli in Idaho's WQS and applicable

TMDLs. The existing E. coli limits are retained and are protective of the receiving water, therefore the fecal coliform limits are no longer necessary.

Also, total phosphorus limits are included in the draft permit. Based on monitoring required in the existing permit and downstream impairments, it was determined that limits for this parameter were necessary. See Appendix D for additional details.

Additionally, there was a slight error in the calculation of average monthly mass limits for BOD_5 and TSS in the existing permit and that was corrected in the draft permit. The same concentration limits and facility flows were used to calculate the mass limits in the draft permit as were used in the existing permit.

TRC limits are lower in the draft permit than in the existing permit. This is due to the use of lower receiving water critical flows. The flows used are a more accurate representation of current low flow conditions in the receiving water. Note also that the TRC limits are expressed in mg/L instead of µg/L as in the existing permit in an effort to be more consistent with other limited parameters.

See Appendix C for a discussion of anti-backsliding and antidegradation related to final effluent limits.

Table 3. Changes in Permit Effluent Limits

Parameter	Existing Permit	Draft Permit
Fecal Coliform	May 1- September 30 • 50/100ml AML • 200/100ml AWL	No limit
	October 1-April 30 • 200/100ml AWL	No limit
Total Phosphorus	No limits	78.2 lbs/day AML
		149 lbs/day AWL
BOD_5	728.4 lbs/day AML	721 lbs/day AML
TSS	728.4 lbs/day AML	721 lbs/day AML
TRC	280µg/L (5.6 lbs/day) AML	0.122 mg/L (2.93 lbs/day) AML
	445µg/L (8.9 lbs/day) MDL	0.250 mg/L (6.00 lbs/day) MDL

Clean Water Act Section 402(o)(3) Requirements

Because the E. coli limits apply current water quality criteria at the end-of-pipe, the effluent limits are derived from and comply with water quality standards for E. coli. The Idaho Department of Environmental Quality has stated in its draft Clean Water Act Section 401 certification that the deletion of the fecal coliform limits and the inclusion of *E. coli* limits complies with State water quality standards. Secondary treatment requirements do not include effluent limits for bacteria. Because the effluent limits will continue to ensure that water quality standards are met and do not violate the secondary treatment effluent limits, the limits comply with the antibacksliding requirements of Section 402(o)(3) of the CWA.

D. Permit Modifications

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

V. Monitoring Requirements

A. Basis for Effluent and Surface Water Monitoring

Section 308 of the CWA and federal regulation 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 permit also requires the permittee to perform effluent monitoring required by parts B.6 and D of the NPDES Form 2A application, so that these data will be available when the permittee applies for a renewal of its NPDES permit.

The permittee is responsible for conducting the monitoring and for reporting results on DMRs or on the application for renewal, as appropriate, to EPA and the State of Idaho.

B. Effluent Monitoring

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

Table 4, below, presents the proposed effluent monitoring requirements in the City of Payette WWTP draft permit**.** The effluent sampling location must be after the last treatment unit and prior to discharge to the receiving water. The samples must be representative of the volume and nature of the monitored discharge. If no discharge occurs during the reporting period, "no discharge" shall be reported on the DMR.

In addition to the monitoring in Table 4, below, the facility must complete all monitoring described in Application Form 2A prior to application for reissuance, including expanded effluent testing.

Table 4. Influent and Effluent Monitoring Requirements [1, 2]

Parameter	Units	Sample Location	Sample Frequency	Sample Type
Flow	Mgd	Effluent	continuous	Recording
BOD_5	mg/L	Influent & effluent	1/week	24-hr composite
	lbs/day	Effluent	1/week	Calculation[3]
	% Removal	Influent & effluent	--	Calculation[4]
TSS	mg/L	Influent & effluent	1/week	24-hr composite
	lbs/day	Effluent	1/week	Calculation[3]
	% Removal	Influent & effluent	--	Calculation[4]
pH	s.u.	Effluent	5/week[5]	Grab
E. Coli Bacteria	#/100 ml	Effluent	5/month[6]	Grab
Temperature	°C	Effluent	continuous	Recording
TRC	mg/L	Effluent	daily	Grab
	lbs/day	Effluent		Grab
Total Phosphorus	lbs/day	Effluent	1/week	24-hr composite
Total Ammonia as N	mg/L	Effluent	1/quarter	Grab
Dissolved Oxygen	mg/L	Effluent	1/quarter	Grab
Total Kjeldahl Nitrogen	mg/L	Effluent	1/quarter	24-hr composite

Parameter	Units	Sample Location	Sample Frequency	Sample Type
Orthophosphorus	mg/L	Effluent	1/quarter	24-hr composite
Nitrate-Nitrite	mg/L	Effluent	1/quarter	24-hr composite
Mercury	mg/L	Effluent	1/quarter	24-hr composite
Whole Effluent Toxicity (WET)[7]	TU_C	Effluent	1/year	24-hour composite

1. The permittee must visually inspect the effluent once a month for any conditions violating the narrative criteria in Section IV B of the fact sheet.
2. All monitoring required only during periods of discharge by the permittee. If there is no discharge, the permittee must report no discharge on the DMR.
3. Loading is calculated by multiplying the concentration in mg/L by the flow in mgd and a conversion factor of 8.34.
4. Percent removal for concentration is calculated using the following equation:
   (average monthly influent – average monthly effluent) ÷ average monthly influent
5. Samples must be taken on different days
6. Geometric Mean Criterion. Waters designated for primary or secondary contact recreation are not to contain E. coli bacteria in concentrations exceeding a geometric mean of one hundred twenty-six (126) E. coli organisms per one hundred (100) ml based on a minimum of five (5) samples taken every three (3) to seven (7) days over a thirty (30) day period. (IDAPA 58.01.02.251.01.a)
7. See monitoring requirements described in Section I.C. of the permit.

C. Whole Effluent Toxicity Testing Requirements.

Regulations at 40 CFR 122.21(j)(5) require that all POTWs with design rates equal to or greater than 1 mgd submit whole effluent toxicity test results with the application renewal. Therefore, the permit requires that the permittee conduct annual whole effluent toxicity testing, changing the quarter each year, as described in the draft permit.

Monitoring Changes from the Previous Permit

Table 5 below, summarizes the changes in monitoring requirements in the draft permit compared to the existing permit.

Table 5. Changes in Permit Effluent Monitoring

Parameter	Existing Permit	Draft Permit
Total Kjeldahl Nitrogen	1/quarter until 12 samples are collected and analyzed	1/quarter for the duration of the permit
Orthophosphorus	1/quarter until 12 samples are collected and analyzed	1/quarter for the duration of the permit
Nitrate/Nitrite	1/quarter until 12 samples are collected and analyzed	1/quarter for the duration of the permit
E coli	1/month	5/month
Temperature	1/quarter grab	Continuous recording
Total Phosphorus	1/quarter until 12 samples are collected and analyzed	1/week
Whole Effluent Toxicity	1/quarter in the last year of the permit	1/year, alternating quarters for the duration of the permit

Total Kjeldahl Nitrogen, orthophosphorus, and nitrate/nitrite will continue to be monitored once per quarter, but the limitation to 12 samples is removed in the draft permit. Having data for the entire duration of the permit will aid in data analysis at the time of the next permit

reissuance. E. coli monitoring has been changed from once per month to five times per month. This is in order to more easily calculate a geometric mean, as required by the permit.

Temperature monitoring was changed from a once per quarter grab sample to continuous monitoring. This has become standard practice where there are temperature impairments in the receiving water. Total phosphorus is newly limited in the draft permit, so monitoring has been increased in order to better determine compliance with that limit.

Whole effluent toxicity monitoring was changed from once per quarter in the last year of the permit to once per year, changing the quarter each to perform the monitoring during the subsequent quarter. Monitoring must continue for the duration of the permit. This spreads monitoring over the permit term and provides additional data to aid the permit writing process at reissuance.

D. Surface Water Monitoring

Table 6 presents the proposed surface water monitoring requirements for the draft permit. The City of Payette WWTP should continue receiving water monitoring at the established locations. Surface water monitoring results must be submitted with the DMR. Some changes were made from the existing permit, including continuous temperature monitoring and the addition of fish tissue monitoring as described in Section E below.

Table 6. Surface Water Monitoring Requirements[1]

Parameter	Units	Sample Location	Sample Frequency	Sample Type
Flow	mgd	Upstream of treatment plant outfall	1/month	Recordings
pH	s.u.	Upstream and downstream of treatment plant outfall	1/quarter	Grab
Temperature	°C	Upstream and downstream of treatment plant outfall	continuous	Recording
Total Ammonia as N	mg/L	Upstream	1/quarter	Grab
Total Phosphorus as P	mg/L	Upstream	1/quarter	Grab
Dissolved Oxygen	mg/L	Upstream	1/quarter	Grab
Mercury	µg/L	Upstream	1/month	Grab

1. Monitoring must be conducted under flow conditions typical for the quarter when sampling occurs. Samples should not be collected immediately after storm events. If there is no flow in the receiving water during the quarter, use the no discharge code on the DMR to report that there was no stream flow during that quarter.

E. Monitoring and Reporting

The draft permit requires that the permittee submit DMR data electronically using NetDMR within six months of the effective date of the permit. NetDMR is a national web-based tool that allows DMR data to be submitted electronically via a secure Internet application. NetDMR allows participants to discontinue mailing in paper forms under 40 CFR 122.41 and 403.12. Under NetDMR, all reports required under the permit are submitted to EPA as an electronic attachment to the DMR. Once a permittee begins submitting reports using NetDMR, it is no longer required to submit paper copies of DMRs or other reports to EPA.

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:

http://www.epa.gov/netdmr. The permittee may use NetDMR after requesting and receiving permission from EPA Region 10.

VI. Sludge (Biosolids) Requirements

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

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

VII. Other Permit Conditions

A. Quality Assurance Plan

In order to ensure compliance with the federal regulation at 40 CFR 122.41(e) for proper operation and maintenance, the draft permit requires the permittee to develop procedures to ensure that the monitoring data submitted is accurate and to explain data anomalies if they occur**.** The City of Payette WWTP is required to update the Quality Assurance Plan within 180 days of the effective date of the final permit. The Quality Assurance Plan shall consist of standard operating procedures the permittee must follow for collecting, handling, storing and shipping samples, laboratory analysis, and data reporting.

B. Operation and Maintenance Plan

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

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

Untreated or partially treated discharges from separate sanitary sewer systems are referred to as sanitary sewer overflows (SSOs). SSOs may present serious risks of human exposure when released to certain areas, such as streets, private property, basements, and receiving waters used for drinking water, fishing and shellfishing, or contact recreation. Untreated sewage contains pathogens and other pollutants, which are toxic. SSOs are not authorized under this permit. Pursuant to the NPDES regulations, discharges from separate sanitary sewer systems authorized by NPDES permits must meet effluent limitations that are based upon secondary treatment. Further, discharges must meet any more stringent effluent limitations that are established to meet EPA-approved state water quality standards.

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

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

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

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

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

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

The permittee may refer to the Guide for Evaluating Capacity, Management, Operation, and Maintenance (CMOM) Programs at Sanitary Sewer Collection Systems (EPA 305-B-05-002). This guide identifies some of the criteria used by EPA inspectors to evaluate a collection system's management, operation and maintenance program activities. Owners/operators can review their own systems against the checklist (Chapter 3) to reduce the occurrence of sewer overflows and improve or maintain compliance.

D. Design Criteria

The permit retains the design criteria requirements from the previous permit. This provision requires the permittee to compare influent flow and loading to the facility's design flow and loading and prepare a facility plan for maintaining compliance with NPDES permit effluent

limits when the annual average flow or loading exceeds 85% of the design criteria values for three consecutive months.

E. Environmental Justice

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

As part of the permit development process, the EPA Region 10 conducted a screening analysis to determine whether this permit action could affect overburdened communities. 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.

The community around the Payette WWTP is potentially overburdened because of the existence of the treatment plant. 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.

F. Industrial Waste Management Requirements

The EPA implements and enforces the National Pretreatment Program regulations of 40 CFR 403, per authority from sections 208(b)(2)(C)(iii), 301(b)(1)(A)(ii), 301(b)(2)(A)(ii), 301(h)(5) and 301(i)(2), 304(e) and (g), 307, 308, 309, 402(b), 405, and 501(a) of the Federal Water Pollutant Control Act as amended by the CWA of 1977. Since Idaho does not have an approved state pretreatment program per 40 CFR 403.10, the EPA is the Approval Authority for Idaho POTWs. Since the City of Payette, ID does not have an approved POTW pretreatment program per 40 CFR 403.8, EPA is also the Control Authority of industrial users that might introduce pollutants into the City of Payette POTW.

Per 40 CFR 122.44(j)(1), all POTWs need to identify, in terms of character and volume of pollutants, any significant industrial users (SIUs) discharging into the POTW. This condition is included as Special Condition D.1 of the permit with a due date 180 days following the effective date of the POTW permit.

Since the City of Payette does not have an approved pretreatment program, Special Condition D.2 of the permit reminds the City that it cannot authorize discharges which may violate the national specific prohibitions of the General Pretreatment Program, which are applicable to all industrial users introducing pollutants into a publicly owned treatment works (40 CFR 403.5(b)).

The Permittee has already identified that Seneca Foods Corporation is a SIU discharging conventional pollutants to the POTW. A multisystem search using EPA's Envirofacts yielded 19 EPA-Regulated facilities with a Payette, ID, mailing address. The 19 EPA-Regulated facilities include: 8 facilities with air emissions permits, 3 facilities with water discharges (including this permit), 7 facilities reporting information regarding potential hazardous waste or material information ("RCRA") information, and 1 facility reporting to the Toxic Release Inventory (TRI) :
http://iaspub.epa.gov/enviro/efservice/multisystem/minLatitude/44.059466/maxLatitude/44.089065/minLongitude/-116.966629/maxLongitude/-116.906548/rows/1:500

Consequently, Special Condition D.5 requires that the Permittee develop legal authority enforceable in Federal, State or local courts which authorizes or enables the POTW to apply and to enforce the requirement of sections 307 (b) and (c) and 402(b)(8) of the Clean Water Act, as described in 40 CFR 403.8(f)(1). The draft legal authority must be submitted to the EPA for review and comment, and then shall be adopted and enforced by the POTW.

G. Standard Permit Provisions

Sections III, IV, and V of the draft permit 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 there are no threatened or endangered species located in vicinity of the discharge, therefore ESA consultation is not required.

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). A review of the Essential Fish Habitat documents shows that there is no EFH in the vicinity of the discharge.

C. State Certification

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

D. Permit Expiration

The permit will expire five years from the effective date.

IX. References

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.

Appendix A: Wastewater Treatment Process Details

The City of Payette wastewater treatment plant receives raw sewage from homes and businesses in the community. The facility's treatment process includes both primary and secondary treatment, as well as disinfection with chlorination. The process includes the following:

- Step Screen Grit Removal
- Oxidation Ditch
- Clarifier
- Flow Meter
- Chlorine Contact Chamber
- Dechlorination
- Aerobic Sludge Holding Tank
- Sludge Drying Beds
- Solids Dewatering Facility

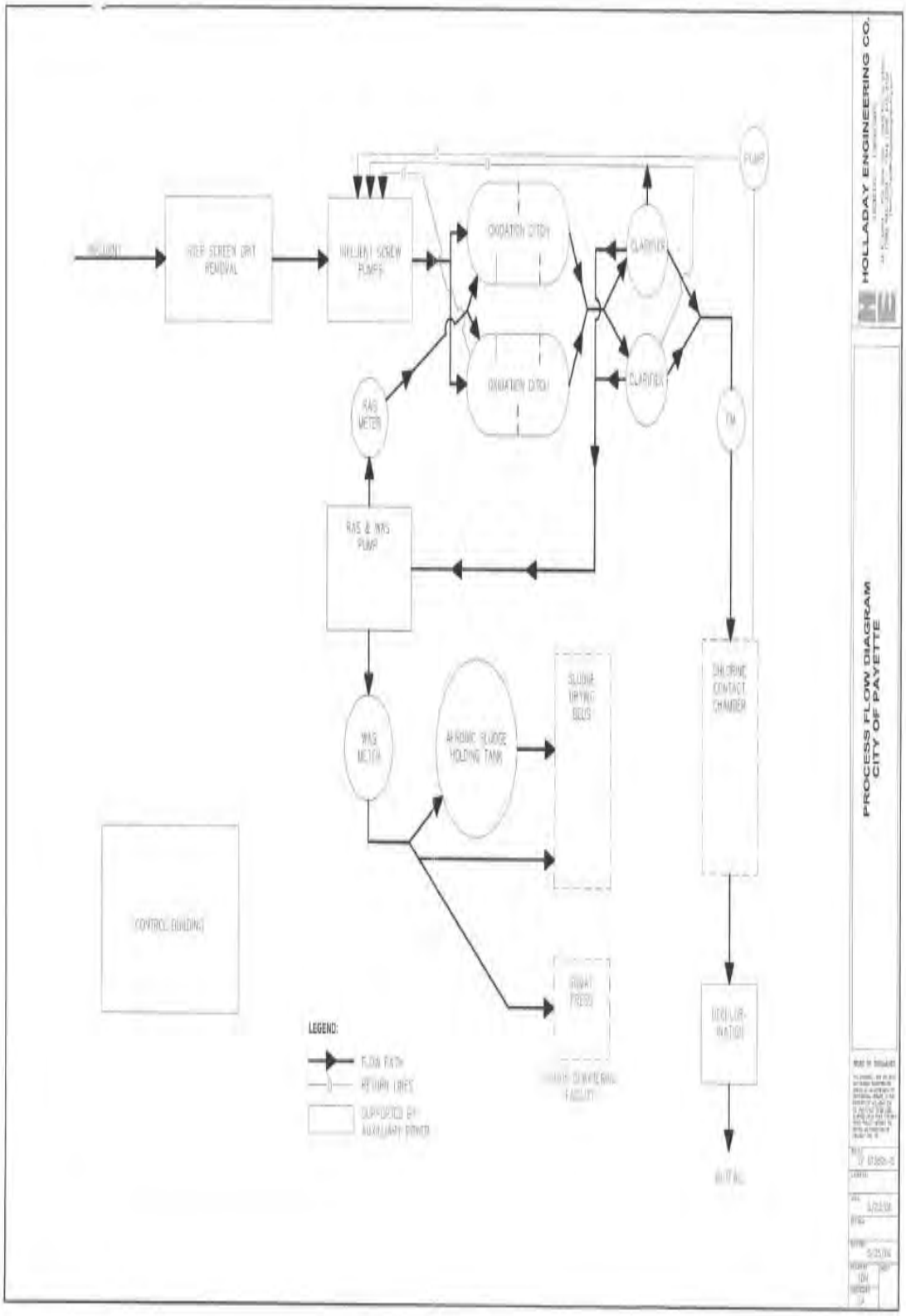
The influent flow enters the facility and passes through a screw press and bar screens and then through a grit classifier and grit vortex chamber. Screening debris and grit are hauled to the local municipal landfill.

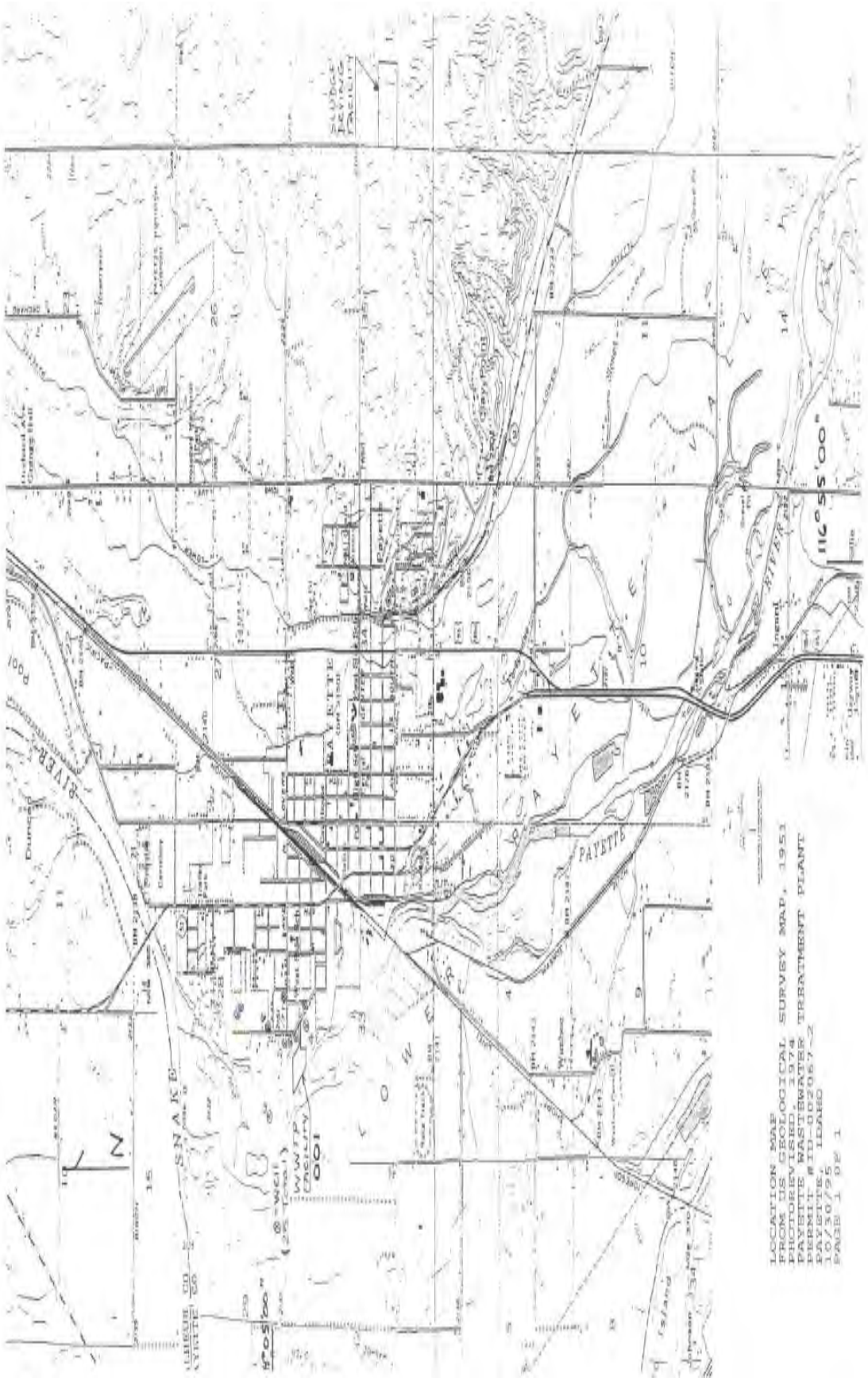
The influent then flows through a splitter box to the oxidation ditches where biological treatment occurs. From the oxidation ditches the wastewater flows to one of three secondary clarifiers. At the time of last permit issuance, the facility had only two clarifiers, but a third clarifier was added in 2010. Chlorine is injected into the wastewater along the outer rim of the secondary clarifiers and then flows into the chlorine contact chamber. This method of chlorine injection allows more time for disinfection. After passing through the chlorine contact chamber the effluent enters the pipe for discharge. The effluent sampling point is at the final manhole after the chlorine contact chamber.

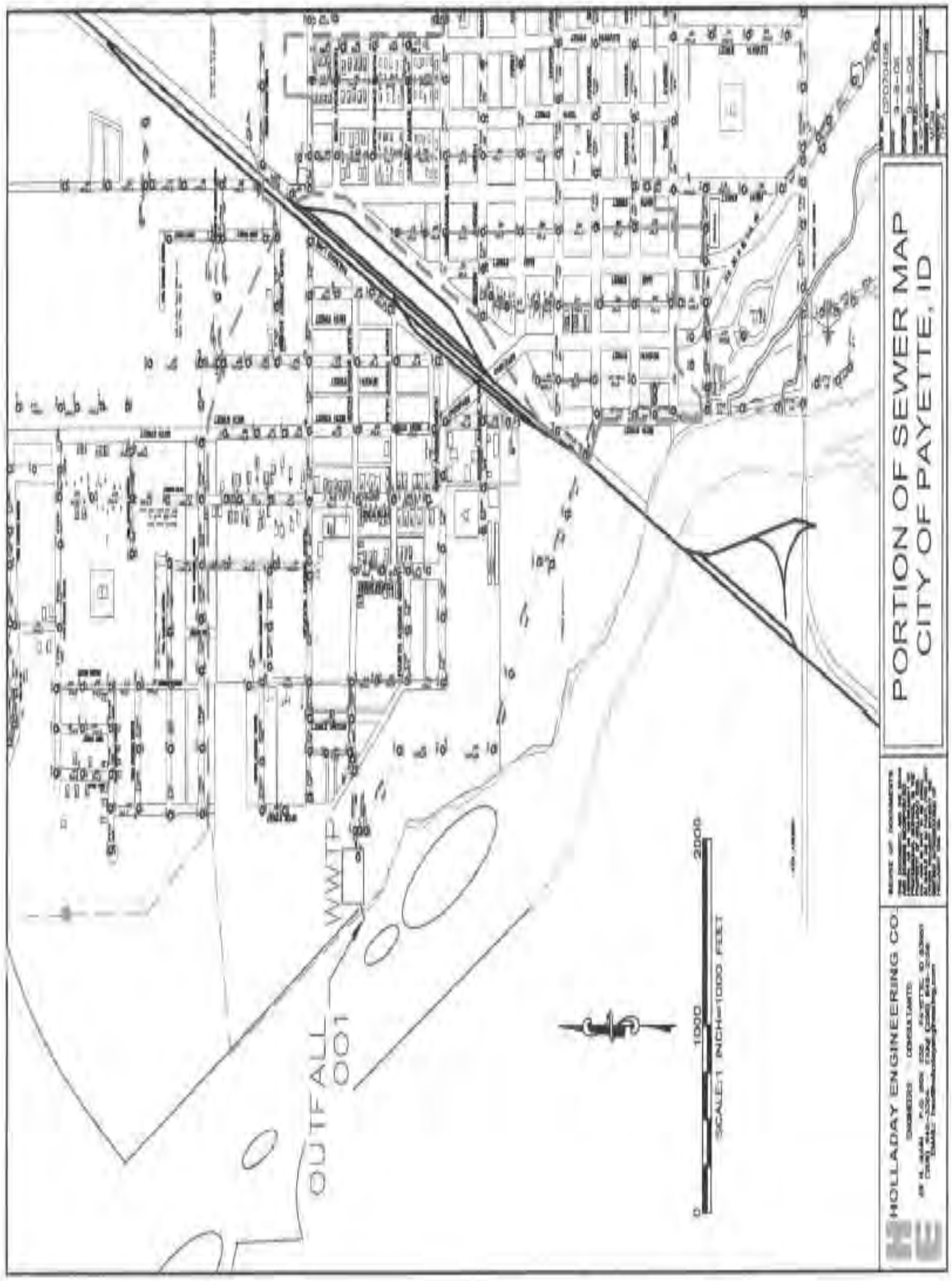
The outfall pipe is on the bank at the edge of the river. The outfall pipe is not submerged and can be observed from the bank above. There is no diffuser.

The only known SIU for this facility is Seneca Foods Corporation, which operates under the standard industrial classification (SIC) codes 2032 (canned specialties), 2033 (canned fruits, vegetables, preserves, jams, and jellies), 2034 (Dried and Dehydrated Fruits, Vegetables, and Soup Mixes), 2035 (Pickled Fruits and Vegetables, Vegetable Sauces and Seasonings, and Salad Dressings), and 2037 (Frozen Fruits, Fruit Juices, and Vegetables). At the time of the last permit issuance, this facility was owned and operated by a different company producing different food products. The current company has recently developed an onsite system that allows a more regular flow to the City of Payette WWTP.

Appendix B: Facility Maps




LOCATION MAP
FROM GEOLOGICAL SURVEY MAP, 1951
PHOTOREVISED 1974
PAYETTE WASTEWATER TREATMENT PLANT
PERMIT #ID-002067-2
PAYETTE, IDAHO
10/30/95
PAGE 1 OF 1
PAYETTE
SNAKE
RIVER
001
N
116°55'00"


PORTION OF SEWER MAP
CITY OF PAYETTE, ID
HOLLADAY ENGINEERING CO
WWTP
OUTFALL
001
SCALE:1 INCH=1000 FEET
1000
2000


N
Payette Outfall
© 2012 Google
Google earth
Imagery Date: 8/31/2011
1994
44°04'52.29" N 116°56'52.53" W elev 2145 ft
Eye alt 3302 ft


8/31/2011
Payette Outfall
Payette Facility Address
© 2012 Google
Seneca Foods
Google earth
Imagery Date: 8/31/2011
1994
44°04'40.27" N 116°56'36.03" W elev 2154 ft
Eye alt 6227 ft

Appendix C: Basis for Effluent Limits

The following discussion explains in more detail the derivation of the technology- and water quality-based effluent limits in the draft permit. Part A discusses technology-based effluent limits, Part B discusses water quality-based effluent limits in general, Part C discusses anti-backsliding provisions, Part D discusses the effluent limits imposed due to the State's anti-degradation policy, and Part E presents a summary of the facility-specific limits.

A. Technology-Based Effluent Limits

Federal Secondary Treatment Effluent Limits

The CWA requires POTWs to meet performance-based requirements based on available wastewater treatment technology. Section 301 of the CWA established a required performance level, referred to as "secondary treatment," which POTWs were required to meet by July 1, 1977. EPA has developed and promulgated "secondary treatment" effluent limitations, which are found in 40 CFR 133.102. These technology-based effluent limits apply to certain municipal WWTPs and identify the minimum level of effluent quality attainable by application of secondary treatment in terms of BOD_5, TSS, and pH. The federally promulgated secondary treatment effluent limits are listed in Table C-1.

Table C-1: Secondary Treatment Effluent Limits (40 CFR 133.102)

Parameter	Average Monthly Limit	Average Weekly Limit	Range
BOD_5	30 mg/L	45 mg/L	---
TSS	30 mg/L	45 mg/L	---
Removal Rates for BOD_5 and TSS	85% (minimum)	---	---
pH*	---	---	6.0 - 9.0 s.u.

See Water Quality-based Effluent Limits Section below

EPA has additionally established effluent limitations (40 CFR 133.105) that are considered "equivalent to secondary treatment" which apply to facilities meeting certain conditions established under 40 CFR 133.101(g). The permittee does not fit these requirements and so must meet secondary treatment standards.

Mass-Based Limits

The federal regulation at 40 CFR 122.45(f) requires that effluent limits be expressed in terms of mass, except under certain conditions. The regulation at 40 CFR 122.45(b) requires that effluent limitations for POTWs be calculated based on the design flow of the facility. The mass based limits are expressed in pounds per day and are calculated as follows:

$$\textit{Mass based limit (lbs/day)} = \textit{concentration limit (mg/L)} \times \textit{design flow (mgd)} \times 8.34^{[1]}$$

[1] 8.34 is a conversion factor with units $(\text{lbs} \times \text{L})/(\text{mg} \times \text{gallon} \times 10^6)$

Since the design flow for this facility is 2.88 mgd, the technology-based mass limits for BOD_5 and TSS are calculated as follows:

Average Monthly Limit = 30 mg/L × 2.88 mgd × 8.34 = 721 lbs/day

Average Weekly Limit = 45 mg/L × 2.88 mgd × 8.34 = 1081 lbs/day

Use of Technology-based Effluent Limits in the Draft Permit

The concentration and removal rate limits for BOD_5 and TSS are the technology-based effluent limits of 40 CFR 133.102. As explained below, EPA has determined that more-stringent water quality-based effluent limits are necessary for pH, as well as E. coli, TRC, and phosphorus, in order to ensure compliance with water quality standards

B. Water Quality-based Effluent Limits

Statutory and Regulatory Basis

Section 301(b)(1)(C) of the CWA requires the development of limitations in permits necessary to meet water quality standards by July 1, 1977. The permittee must also comply with any additional requirements incorporated into this permit as a result of the certification process under 401 of the CWA. Federal regulations at 40 CFR 122.4(d) prohibit the issuance of an NPDES permit that does not ensure compliance with the water quality standards of all affected States. The NPDES regulation (40 CFR 122.44(d)(1)) implementing Section 301(b)(1)(C) of the CWA requires that permits include limits for all pollutants or parameters which are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any State or Tribal water quality standard, including narrative criteria for water quality, and that the level of water quality to be achieved by limits on point sources is derived from and complies with all applicable WQS.

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

Reasonable Potential Analysis

When evaluating the effluent to determine if water quality-based effluent limits are needed, based on numeric criteria, EPA projects the receiving water concentration (downstream of where the effluent enters the receiving water) for each pollutant of concern. EPA uses the concentration of the pollutant in the effluent and receiving water and, if appropriate, the dilution available from the receiving water, to project the receiving water concentration. If the projected concentration of the pollutant in the receiving water exceeds the numeric criterion for that specific chemical, then the discharge has the reasonable potential to cause or contribute to an exceedance of the applicable water quality standard, and a water quality-based effluent limit is required.

Sometimes it may be appropriate to allow a small area of the receiving water to provide dilution of the effluent. These areas are called mixing zones. Mixing zone allowances will allow for an increase to the mass loadings of the pollutant to the water body and will decrease treatment

requirements. Mixing zones may be used only when there is adequate receiving water flow volume and the concentration of the pollutant in the receiving water is less than the criterion necessary to protect the designated uses of the water body.

Mixing zones must be authorized by the State. The Idaho WQS limit mixing zones to 25% of the receiving water flow (IDAPA 58.01.02.060.01) for total residual chlorine

If IDEQ does not grant the mixing zones in its final certification of this permit, the water quality-based effluent limits will be recalculated such that the criteria are met before the effluent is discharged to the receiving water.

Procedure for Deriving Water Quality-based Effluent Limits

The first step in developing a water quality-based effluent limit is to develop a wasteload allocation (WLA) for the pollutant. A wasteload allocation is the concentration or loading of a pollutant that the permittee may discharge without causing or contributing to an exceedance of water quality standards in the receiving water.

WLAs are determined in one of the following ways:

1. TMDL-based WLA

Where the receiving water quality does not meet WQS, the WLA is generally based on a TMDL developed by the state, if one has been developed. A TMDL is a determination of the amount of a pollutant from point, non-point, and natural background sources that may be discharged to a water body without causing the water body to exceed the criterion for that pollutant. Any loading above this capacity risks violating WQS.

There is a TMDL for bacteria in the Payette River. Accordingly, E. coli effluent limits are included in the draft permit. These limits are retained from the existing permit. Fecal coliform limits have been removed, as E. coli has replaced fecal coliform in both Idaho's WQS and the applicable TMDL and these limits are sufficient to protect the receiving water designated uses.

Also, there is a downstream impairment for nutrients, for which the Snake River-Hells Canyon TMDL was developed. A phosphorus load allocation was given to the mouth of the Payette River. Therefore, phosphorus limits are included in the draft permit.

2. Mixing zone-based WLA

When the State authorizes a mixing zone for the discharge, the WLA is calculated by using a simple mass balance equation. The equation takes into account the available dilution provided by the mixing zone, and the background concentrations of the pollutant.

The WLAs for TRC were derived using a mixing zone, for which, according to the ID WQS Mixing Zone Policy Section 060.01(e)(iv), "the mixing zone is not to include more than twenty-five (25%) percent of the volume of the stream flow."

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

In cases where a mixing zone is not authorized, either because the receiving water already exceeds the criterion, the receiving water flow is too low to provide dilution, or the State does not authorize one, the criterion becomes the WLA. Establishing the criterion as the wasteload allocation ensures that the permittee will not cause or contribute to an exceedance of the criterion. The following discussion details the specific water quality-based effluent limits in the draft permit.

Once a WLA is developed, EPA calculates effluent limits that are protective of the WLA using statistical procedures described in Appendix E.

Additionally, Idaho's WQS require the pH of the receiving water to be in the range of 6.5 to 9.0 to protect aquatic life. As is standard practice, EPA is applying these WQS directly at the end of pipe without consideration of mixing.

Proposed Water Quality-Based Effluent Limits

Table C-2 summarizes the proposed WQBELs for this permit. EPA has carried over the reasonable potential determination for E. coli bacteria and TRC from the existing permit due to the nature of the discharge and because they were detected and limited under the existing permit.

The Payette River is protected for the following designated uses (IDAPA 58.01.02.140.16):

- cold water aquatic life habitat
- salmonid spawning
- primary contact recreation
- domestic water supply

According to ID WQS, waters designated for recreation are not to contain E. coli bacteria, used as indicators of human pathogens, in concentrations exceeding a geometric mean of one hundred twenty-six (126) E. coli organisms per one hundred (100) ml based on a minimum of five (5) samples taken every three (3) to seven (7) days over a thirty (30) day period. Because the receiving water is designated as primary contact recreation, a single sample maximum of four hundred six (406) E. coli organisms per one hundred (100) ml is required.

The Payette River is also protected for cold water aquatic life and in ID WQS the criterion for this designation for pH is 6.5 to 9.0 s.u.

Chlorine is often used to disinfect municipal wastewater prior to discharge. The City of Payette WWTP uses chlorine disinfection. WLAs were calculated to determine the Long Term Averages (LTAs). Using the LTAs, the average monthly and maximum daily limits were calculated using the TSD (See Appendix E).

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

Average Monthly Limit= 0.104 mg/L x 2.88 mgd x 8.34 = 0.0090 lbs/day
Maximum Daily Limit = 0.212 mg/L x 2.88 mgd x 8.34 = 0.018 lbs/day

Phosphorus limits are also needed due to the downstream nutrient impairment in the Snake River. To be consistent with the assumptions of the TMDL, a mass limit was developed to cap phosphorus loadings at current levels for this facility as discussed in Appendix D.

Table C-2: Proposed Water Quality-Based Effluent Limits

Parameter	Units	Effluent Limits		
		Average Monthly Limit	Average Weekly Limit	Maximum Daily Limit
pH	standard units (s.u.)	6.5-9.0		
E. Coli Bacteria[1]	#/100 ml	126	—	406 instantaneous max limit
TRC [2,3]	mg/L	0.122	—	0.250
	lbs/day	2.93	—	6.00
Total Phosphorus	lbs/day	78.2	149	—

1. The permittee must report the geometric mean E. coli concentration.
2. For purposes of calculating monthly averages for TRC, zero may be assigned for values less than the method detection limit (MDL) of 0.01 mg/L, the numeric value of the MDL, 0.01 mg/L, and may be assigned for values between the MDL and the minimum level (ML) of 0.05 mg/L. If the average value is less than the MDL, the permittee must report "less than 0.01 mg/L" and if the average value is less than the ML, the permittee must report "less than 0.05 mg/L." If a value is equal to or greater than the ML, the permittee must report and use the actual value. The resulting average value must be compared to the compliance level, the ML, in assessing compliance.
3. Any sample analyzed in accordance with a method having the appropriate MDL and ML and found to be below the ML will be considered in compliance with the permit limits unless other monitoring information indicates a violation.

Narrative Requirements

The Idaho WQS require that general water quality criteria apply to all surface waters of the state, in addition to the water quality criteria set forth for specifically designated waters. Therefore, EPA has included a narrative limitation prohibiting the discharge of floating, suspended, or submerged matter of any kind in concentrations causing nuisance or objectionable conditions or that may impair designated beneficial uses. Additionally, EPA has included narrative limitations prohibiting the discharge of excess nutrients that cause visible slime growth or other nuisance aquatic growths impairing designated beneficial uses, as well as the discharge of oxygen-demanding materials in concentrations that would result in anaerobic water conditions and sediment in excess quantities. The permittee must visually inspect the effluent for these conditions once per month.

C. Anti-backsliding Provisions

Section 402(o) of the CWA and 40 CFR 122.44(l) 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 existing permit, unless certain exceptions are met.

All effluent limits in this permit are either identical to or more stringent than those in the existing permit, expect for fecal coliform as discussed below.

Fecal Coliform

The draft permit proposes to delete the fecal coliform limits in the previous permit, while retaining the E. coli limits from the previous permit. The Payette River at the point of discharge has been listed on Idaho's "303(d) list" as not attaining water quality standards for bacteria. A TMDL was developed in 1999 establishing waste load allocations for fecal coliform, which at the time were consistent with ID WQS. In 2000, ID revised the state WQS to replace fecal coliform with E. coli for determining attainment of the primary and secondary recreation uses. In 2003, the TMDL Implementation Plan and Addendum changed the TMDL to replace fecal coliform with E. coli allocations and monitoring.

Consistent with the changes to the WQS and TMDL, the draft permit proposes to delete the fecal coliform limits from the permit but retain the E. coli limits.

The draft permit, like the existing permit, includes "criteria end-of-pipe" effluent limits for bacteria, in order to protect contact recreation beneficial uses in the receiving water. In 1986, EPA updated its criteria to protect recreational use of water recommending an E. coli criterion as a better indicator of bacteria levels that may cause gastro-intestinal distress in swimmers than fecal coliform. IDEQ subsequently changed its bacteria criterion from fecal coliform to E. coli in 2000. The new water quality criteria and effluent limits simply use the indicator organism currently specified in the Idaho water quality standards (E. coli). E. coli is a better indicator of bacteria levels that may cause gastro-intestinal distress in swimmers, and the new E. coli limits provide the same level of protection for the beneficial use of primary contact recreation as was provided by the fecal coliform effluent limits in the previous permit. Because the change from fecal coliform limits to E. coli limits will not allow lower water quality relative to the 2001 permit, this change is consistent with Idaho's antidegradation policy (IDAPA 58.01.02.051).

D. Antidegradation

The proposed issuance of an NPDES permit triggers the need to ensure that the conditions in the permit ensure that Tier I, II, and III of the State's antidegradation policy are met. According to ID's antidegradation policy, the Payette River is a Tier I waterbody for both contact recreation and aquatic life. For Tier I waterbodies, the existing in stream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected. The conditions of the draft permit are protective of both Tier I and II waterbodies, as it does not authorize an increased discharge.

E. Determining Final Limits

Table C-3 below summarizes the numeric effluent limits that are in the proposed permit. The final limits are the more stringent of technology treatment requirements, water quality based limits, or limits retained as the result of anti-backsliding analysis or to meet the State's anti-degradation policy. The rationale for each limit is explained below.

Table C-3: Proposed Effluent Limits					
Parameter	**Units**	**Effluent Limits**			**Basis**
		Average Monthly Limit	**Average Weekly Limit**	**Maximum Daily Limit**	
BOD_5	mg/L	30	45	—	TBEL
	lbs/day	721	1081		
	% removal	85% (min)	—	—	
TSS	mg/L	30	45		TBEL
	lbs/day	721	1081		
	% removal	85% (min)	—	—	
pH	s.u.	6.5-9.0			WQBEL
E. Coli Bacteria	#/100 ml	126	—	406 instantaneous max limit	WQBEL
TRC	mg/L	0.122	—	0.250	WQBEL
	lbs/day	2.93	—	6.00	
Total Phosphorus	lbs/day	78.2	149	—	WQBEL

Five-Day Biochemical Oxygen Demand (BOD_5)

Where secondary treatment standards apply, the permit should include effluent limitations in the permit consistent with secondary treatment standards and regulatory requirements in 122.45(d)(2).

Total Suspended Solids (TSS)

Where secondary treatment standards apply, the permit should include effluent limitations in the permit consistent with secondary treatment standards and regulatory requirements in 122.45(d)(2).

E. Coli Bacteria

Because there are no applicable TBELs for E. coli and it was determined that there is reasonable potential for this parameter, WQBELs are included in the permit.

pH

Based on the ID WQS, the most stringent water quality criterion for pH is for the protection of aquatic life. The pH range to protect that use is 6.5-9.0 s.u., which is more stringent than the TBEL of 6.0-9.0 s.u. required under secondary treatment standards. Therefore, the WQBEL is included in the permit.

Total Residual Chlorine

Because there are no applicable TBELs for TRC and it was determined that there is reasonable potential for this parameter, WQBELs are included in the permit.

Total Phosphorus

Because there is a TMDL for downstream nutrient impairment, WQBELs are included in the permit.

Appendix D: Reasonable Potential Determinations

Federal regulations at 40 CFR 122.44(d)(1) require that permits contain limits when a discharge causes or has reasonable potential to cause or contribute to an excursion of a narrative or numeric water quality standard. The following describes the process EPA has used to determine if the discharge authorized in the draft permit has the reasonable potential to cause or contribute to a violation of Idaho's federally approved water quality standards. Pollutants of concern were determined using the facility application and DMR data (see Section II.B.).

EPA has carried over the reasonable potential determinations for E. coli bacteria and TRC due to the nature of the discharge, Payette River TMDL for bacteria, and because both parameters are detected and limited under the existing permit.

It was also determined that phosphorus limits are needed. Although the receiving waterbody is not impaired for nutrients, the downstream Snake River is impaired for this parameter and the Snake River-Hells Canyon TMDL was developed in 2003 (revised 2004) for several parameters, including phosphorus. In this TMDL, a general load allocation is given to the mouth of the Payette River. At the time the TMDL was written (2003), it was determined that a 30% reduction in phosphorus loadings from the Payette River was needed. However, since that time, significant effort has gone into reducing phosphorus loading from non-point sources and only 14% reduction is still needed according to the Lower Payette River TMDL Five-Year Review (HUC 170150122). In discussions with the IDEQ TMDL developers, it was made clear that the vast majority of the phosphorus loadings in the Payette River are from non-point sources and the discharge from Payette is not a significant contributor to the downstream impairment. However, in an effort to maintain progress toward the necessary phosphorus reductions, the phosphorus loadings for this facility are capped at current levels in the draft permit. Orthophosphorus will be addressed through the limitation on total phosphorus, so a separate limit is not needed.

For total Kjeldahl nitrogen and nitrate/nitrate levels in the effluent are such that they will not cause impairments to the receiving water, especially considering available dilution. However, given downstream impairments monitoring for these parameters will be continued. Mercury has not been detected in limited monitoring of the effluent. However, because the WWTP is a major facility, the permit contains monitoring to further assess effluent mercury concentrations. Additionally, dissolved oxygen levels in the effluent are within an acceptable range and there is no indication the discharge would exert an oxygen demand on the receiving water.

While the receiving water is impaired for temperature, the sources of the impairment are flow alteration and habitat modification not related to point source discharges. Additionally, the critical time period for salmonid spawning is in the spring timeframe when temperatures are not likely to be elevated. Monitoring only will be included for temperature.

Idaho water quality standards at IDAPA 58.01.02.200.02 state that surface waters of the state must be free from toxic substances in concentrations that impair designated beneficial uses. The City of Payette conducted four Whole Effluent Toxicity (WET) tests in accordance with the existing permit. These tests were valid and found no evidence of toxicity at concentrations less than or equal to 100% effluent. Thus, effluent limits are not needed at this time, but monitoring is required in accordance with the regulations at 40 CFR 122.21(j)(5).

The expanded effluent testing showed almost entirely non-detects or values well below water quality criteria. Dichlorobromomethane and chloroform were above the method detection level

and human health criteria for consumption of water and organisms. However, given the available dilution and volatile nature of these compounds, there will not be an impact on the receiving waters designated use as a drinking water source.

A reasonable potential analysis was done for ammonia using available discharge data, as shown below. The results of this analysis show that an effluent limit is not needed at this time.

In order to do the reasonable potential analysis for ammonia, EPA used the process described in the *Technical Support Document for Water Quality-based Toxics Control* (EPA, 1991). EPA uses a steady state model, which calculates WLAs at critical conditions that are usually a combination of reasonable worst-case assumptions of receiving water flow, effluent pollutant concentrations, and receiving water concentrations. To determine if there is reasonable potential for a given pollutant, 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 water quality-based effluent limit must be included in the permit.

Sections A, B, and C below discuss in general how the reasonable potential calculations are done, and gives specific calculations for ammonia.

A. Mass Balance

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

$$C_dQ_d = C_eQ_e + C_uQ_u \qquad \text{(Equation D-1)}$$

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:

$$C_d = \frac{C_eQ_e + C_uQ_u}{Q_e + Q_u} \qquad \text{(Equation D-2)}$$

The above form of the equation is based on the assumption that the discharge is rapidly and completely mixed with the receiving stream. If the mixing zone is based on less than complete mixing with the receiving water, the equation becomes:

$$C_d = \frac{C_eQ_e + C_u(Q_u \times MZ)}{Q_e + (Q_u \times MZ)} \qquad \text{(Equation D-3)}$$

- where MZ is the fraction of the receiving water flow available for dilution. In this case, the mixing zone is based on complete mixing of the effluent and the receiving water, and MZ is

equal to 1. Therefore, in this case, the solution for Equation D-3 is equal to the solution for Equation D-2.

B. Maximum Projected Effluent Concentration

To calculate the maximum projected effluent concentration, EPA has used the procedure described in section 3.3 of the TSD, "Determining the Need for Permit Limits with Effluent Monitoring Data." In this procedure, the 99th percentile of the effluent data is the maximum projected effluent concentration in the mass balance equation.

Since there are a limited number of data points available, the 99th percentile is calculated by multiplying the maximum reported effluent concentration by a "reasonable potential multiplier" (RPM). The RPM is the ratio of the 99th percentile concentration to the maximum reported effluent concentration. The RPM is calculated from the coefficient of variation (CV) of the data and the number of data points. The CV is defined as the ratio of the standard deviation of the data set to the mean. When fewer than 10 data points are available, the TSD recommends making the assumption that the CV is equal to 0.6, but in the case of ammonia for the City of Payette, there are 14 data points available from discharge monitoring reports.

Using the equations in section 3.3.2 of the TSD, the reasonable potential multiplier (RPM) is calculated based on the CV and the number of samples in the data set as follows. The following discussion presents the equations used to calculate the RPM, and also works through the calculations for the RPM for ammonia as an example.

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

$$p_n = (1 - \text{confidence level})^{1/n} \quad \text{(Equation D-4)}$$

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

The data set contains 14 ammonia samples collected from the effluent, therefore:

$$p_n = (1\text{-}0.99)^{1/14}$$
$$p_n = 0.720$$

This means that we can say, with 99% confidence, that the maximum reported effluent ammonia concentration is greater than the 72nd percentile.

The reasonable potential multiplier (RPM) is the ratio of the 99th percentile concentration (at the 99% confidence level) to the maximum reported effluent concentration. This is calculated as follows:

$$RPM = C_{99}/C_p \quad \text{(Equation D-5)}$$

Where,

$$C = e^{(z\sigma - 0.5\sigma 2)} \quad \text{(Equation D-6)}$$

Where,

$\sigma^2 = \ln(CV^2 + 1)$ (Equation D-7)
$\sigma = \sqrt{\sigma^2}$
CV = coefficient of variation = standard deviation/mean
z = the inverse of the normal cumulative distribution function at a given percentile

In the case of ammonia:

CV = coefficient of variation = 0.480
$\sigma^2 = \ln(CV^2 + 1) = 0.207$
$\sigma = \sqrt{\sigma^2} = 0.455$
z = 2.326 for the 99th percentile = 0.583 for the 72nd percentile

$C_{99} = e^{(2.326 \times 0.455 - 0.5 \times 0.207)} = 2.60$
$C_{91} = e^{(0.583 \times 0.455 - 0.5 \times 0.207)} = 1.18$

RPM = C_{99}/C_{91} = 2.60/1.18
RPM = 2.2

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

C_e = (RPM)(MRC) (Equation D-8)

where MRC = Maximum Reported Concentration

In the case of ammonia,

C_e = (2.2)(0.14 mg/L) = 0.308 mg/L

C. Maximum Projected Receiving Water Concentration

The discharge has reasonable potential to cause or contribute to an exceedance of water quality criteria if the maximum projected concentration of the pollutant at the edge of the mixing zone exceeds the most stringent criterion for that pollutant. The maximum projected receiving water concentration is calculated from Equation D-3:

$$C_d = \frac{C_e Q_e + C_u(Q_u \times MZ)}{Q_e + (Q_u \times MZ)}$$ (Equation D-3)

In the case of ammonia:

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 = 0.308 mg/L
C_u = 95th percentile measured receiving water upstream concentration = 0.100 mg/L
Q_d = Receiving water flow rate downstream of the effluent discharge = $Q_e + Q_u$ = 360.46 cfs
Q_e = Effluent flow rate (set equal to the design flow of the WWTP) = 4.46 cfs

Q_u = Receiving water low flow rate upstream of the discharge (30B3) = 356 cfs
MZ = Mixing zone allowance

The acute and chronic water quality criteria for this parameter must be calculated based on ambient water temperature and pH. The 95th percentile value of the ambient monitoring data submitted by the facility was used for pH and temperature.

Acute

$$CMC = \frac{0.275}{1 + 10^{7.204 - pH}} + \frac{39.0}{1 + 10^{pH - 7.204}}$$

$$= \frac{0.275}{1 + 10^{7.204 - 8.05}} + \frac{39.0}{1 + 10^{8.05 - 7.204}} = 5.11 \text{ mg/L}$$

Chronic

$$CCC = \frac{0.0577}{1 + 10^{7.688 - pH}} + \frac{2.487}{1 + 10^{pH - 7.688}} \times MIN(2.85, 1.45 \times 10^{0.028(25-T)})$$

$$CCC = \frac{0.0577}{1 + 10^{7.688 - 8.05}} + \frac{2.487}{1 + 10^{8.05 - 7.688}} \times MIN(2.85, 1.45 \times 10^{0.028(25-24)}) = 1.23 \text{ mg/L}$$

Comparing the maximum projected effluent concentration of 0.308 mg/ directly to the water quality criteria above shows that that concentrations of ammonia discharged from the facility are lower than the criteria. There is no reasonable potential to exceed the water quality criteria even without a mixing zone and no water quality based effluent limits are needed for ammonia.

Appendix E: WQBEL Calculations

The following calculations demonstrate how the water quality-based effluent limits (WQBELs) in the draft permit were calculated. The discussion in Section A below presents the general equations used to calculate the water quality-based effluent limits and works through the calculations for the Total Residual Chlorine WQBEL as an example. Section B describes the process used to determine limits for Total Phosphorus.

A. Total Residual Chlorine Calculation

Idaho's WQS provide both acute and chronic aquatic life criteria for TRC, as well as an allocation of up to 25% of the stream flow for mixing zones, assuming zero background concentration. Using these values, an effluent limit was determined using the following calculations.

Step 1- Determine the WLA

The acute and chronic aquatic life criteria are converted to acute and chronic waste load allocations (WLA_{acute} or $WLA_{chronic}$) for the receiving waters based on the following mass balance equation:

$$Q_dC_d = Q_eC_e + Q_uC_u$$

where,
Q_d = downstream flow = $Q_u + Q_e$
C_d = aquatic life criteria that cannot be exceeded downstream
$C_{d(acute)}$ = 19 µg/L
$C_{d(chronic)}$ = 11 µg/L
Q_e = effluent design flow = 4.46 cfs
C_e = concentration of pollutant in effluent = WLA_{acute} or $WLA_{chronic}$
Q_u = upstream flow = 282 cfs (7Q10), 217 cfs (1Q10)
C_u = upstream background concentration of pollutant = 0 (no data available therefore, assume there is no background concentration)

Rearranging the above equation to determine the effluent concentration (C_e) or the wasteload allocation (WLA) results in the following:

$$C_e = WLA = \frac{Q_dC_d - Q_uC_u}{Q_e}$$

when a mixing zone is allowed, this equation becomes:

$$C_e = WLA = \frac{C_d(Q_u \times \%MZ)}{Q_e} + \frac{C_dQ_e - Q_uC_u(\%MZ)}{Q_e}$$

where, %MZ is the mixing zone allowable by the state standards. The Idaho water quality standards at IDAPA 58.01.02060 allow twenty-five percent (25%) of the receiving water to be used for dilution for aquatic life criteria. The effluent limits have been derived using Idaho's

guidelines for mixing zone. However, establishing a mixing zone is a State discretionary function, if the State does not certify a mixing zone in the 401 certification process the effluent limits will be recalculated without a mixing zone.

$$WLA_{acute} = \frac{C_d(Q_u \times \%MZ) + C_dQ_e}{Q_e} - \frac{Q_uC_u(\%MZ)}{Q_e}$$

$$= \frac{19(217 \times .25) + (19 \times 4.46)}{4.46} - \frac{217 \times 0\ (.25)}{4.46} = 250.1\ \mu g/L$$

$$WLA_{chronic} = \frac{11(282 \times .25) + (11 \times 4.46)}{4.46} - \frac{282 \times 0\ (.25)}{4.46} = 184.9\ \mu g/L$$

Step 2 - Determine the LTA

The acute and chronic WLAs[2] are then converted to Long Term Average concentrations (LTA_{acute} and $LTA_{chronic}$) using the following equations:

$$LTA_{acute} = WLA_{acute} \times e^{[0.5\,\sigma^2 - z\,\sigma]}$$

where,
$\sigma^2 = \ln(CV^2 + 1)$
$z = 2.326$ for 99th percentile probability basis
CV = coefficient of variation = 0.5

$= 250.1\ \mu g/L \times 0.373 = 93.3\ \mu g/L$

$$LTA_{chronic} = WLA_{chronic} \times e^{[0.5\,\sigma_4^2 - z\,\sigma_4]}$$

where,
$\sigma^2 = \ln(CV^2/4 + 1)$
$z = 2.326$ for 99th percentile probability basis
CV = 0.5

$=184.9\ \mu g/L \times 0.581 = 107.4\ \mu g/L$

Step 3

To protect a waterbody from both acute and chronic effects, the more limiting of the calculated LTA_{acute} and $LTA_{chronic}$ is used to derive the effluent limitations. The TSD recommends using the

[2] WLA multipliers were determined using Table 5-1 Back Calculations of Long Term Average from the TSD, using the 99th percentile and 0.5 CV for acute and chronic criteria

95th percentile for the Average Monthly Limit (AML) and the 99th percentile for the Maximum Daily Limit (MDL). The LTA_{acute} is lower than the $LTA_{chronic}$ and will be used to determine permit limits in Step 4 below.

Step 4 - Determine the Permit Limits

1. The maximum daily limit (MDL) and the average monthly limit (AML) would be calculated as follows[3]:

$MDL = LTA_{acute} \times e^{[z\,\sigma - 0.5\,\sigma^2]}$

where,
$\sigma^2 = \ln(CV^2 + 1)$
$z = 2.326$ for 99th percentile probability basis
$CV = 0.5$

$MDL = 93.3\ \mu g/L \times 2.68 = 250.0\ \mu g/L$

$AML = LTA_{acute} \times e^{[z\,\sigma_n - 0.5\,\sigma_n^2]}$

where,
$\sigma^2 = \ln(CV^2/n + 1)$
$z = 1.645$ for 95th percentile probability basis
CV = coefficient of variation = standard deviation/mean
n = number of sampling events required per month for chlorine = 30

$AML = 93.3\ \mu g/L \times 1.31 = 122.2\ \mu g/L$

B. Total Phosphorus Calculation

Because of a downstream TMDL, the draft permit includes limits capping total phosphorus loads from this facility based on current discharge levels. The following calculations were done to determine average weekly and average monthly limits derived from the existing performance data for the facility.

Based on discharge monitoring report data from the City of Payette WWTP, EPA calculated the following summary statistics using actual reported flows and phosphorus concentrations:

[3] LTA multipliers determined using Table 5-2 Calculation of Permit Limits from the TSD, using the 99th percentile and 0.5 CV for maximum daily limit and using the 95th percentile and 0.5 CV for average monthly limit

Table E-1: City of Payette WWTP Total Phosphorus Loading Summary	
Statistic	**Load (lbs/day)**
Average	52.4
Maximum	104.1
Standard Deviation	28.3
Coefficient of Variation	0.54

Average Monthly Limit

Using the calculated average loading, the formula for calculating the average monthly effluent limit (AML) is as follows (see the Technical Support Document for Water Quality-based Toxics Control at Table 5-2).

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

Where:

$\sigma_n^2 = \ln(CV^2/n + 1)$

$\sigma_n = \sqrt{\sigma_n^2}$

z_a = 1.645 for 95th percentile probability basis

n = number of sampling events required per month (4 in this case)

The coefficient of variation (CV) is the standard deviation of the data set divided by the mean. In this case it is:

28.3/52.4 = 0.540

Thus, using the actual average discharge as the long term average yields the following performance-based average monthly effluent limit:

$\sigma_n^2 = \ln(0.540^2/4 + 1) = 0.0704$

$\sigma_n = 0.265$

$AML = 52.4 \text{ lbs/day} \times e^{(1.645 \times 0.265 - 0.5 \times 0.0704)}$

$= 52.4 \text{ lbs/day} \times 1.49$

$= 78.2 \text{ lbs/day}$

Average Weekly Limit

The equation for the average weekly limit (AWL) is the same as for the average monthly limit; the only difference is that "n" is set equal to the number of samples per week (one sample in this case) instead of the number of samples per month.

Thus:

$\sigma_n^2 = \ln(0.540^2/1 + 1) = 0.256$

$\sigma_n = 0.506$

$AWL = 54.2 \text{ lbs/day} \times e^{(2.326 \times 0.506 - 0.5 \times 0.256)}$

$= 54.2 \text{ lbs/day} \times 2.85$

$= 149 \text{ lbs/day}$