# 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:**

## City of Dover
## Wastewater Treatment Plant

Public Comment Start Date: April 6, 2018
Public Comment Expiration Date: May 7, 2018

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**The EPA Proposes To Reissue NPDES Permit**
The EPA proposes to reissue the NPDES permit for the facility referenced above. The draft permit places conditions on the discharge of pollutants from the wastewater treatment plant to waters of the United States. In order to ensure protection of water quality and human health, the permit places limits on the types and amounts of pollutants that can be discharged from the facility.

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

**State Certification**
Upon the EPA's request, the Idaho Department of Environmental Quality (IDEQ) has provided a draft certification of the 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
Coeur d'Alene Regional Office
2110 Ironwood Parkway
Coeur d'Alene, ID 83814

**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 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 permit will become final, and the permit will become effective upon issuance. If substantive comments are received, the 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 are Available for Review**
The draft NPDES permit 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:

EPA Idaho Operations Office
950 W. Bannock Street, Suite 900
Boise, ID 83702
(206) 378-5746

IDEQ Coeur d'Alene Regional Office
2110 Ironwood Parkway
Coeur d'Alene, ID 83814
(208) 769-1422

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## 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 |
| AML | Average Monthly Limit |
| AWL | Average Weekly Limit |
| BE | Biological Evaluation |
| $BOD_5$ | Biochemical oxygen demand, five-day |
| °C | Degrees Celsius |
| CFR | Code of Federal Regulations |
| CFS | Cubic Feet per Second |
| CSO | Combined Sewer Overflow |
| CV | Coefficient of Variation |
| CWA | Clean Water Act |
| DMR | Discharge Monitoring Report |
| DO | Dissolved oxygen |
| EFH | Essential Fish Habitat |
| EPA | U.S. Environmental Protection Agency |
| ESA | Endangered Species Act |
| Gpd | Gallons per day |
| HUC | Hydrologic Unit Code |
| ICIS | Integrated Compliance Information System |
| IDEQ | Idaho Department of Environmental Quality |
| I/I | Infiltration and Inflow |
| LA | Load Allocation |
| 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 or Method Detection Limit |
| MF | Membrane Filtration |
| N | Nitrogen |
| NOAA | National Oceanic and Atmospheric Administration |
| NOI | Notice of Intent |
| 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 |
| SS | Suspended Solids |
| SSO | Sanitary Sewer Overflow |
| s.u. | Standard Units |
| TKN | Total Kjeldahl Nitrogen |
| TMDL | Total Maximum Daily Load |
| TRC | Total Residual Chlorine |
| TSD | Technical Support Document for Water Quality-based Toxics Control (EPA/505/2-90-001) |
| TSS | Total suspended solids |
| 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. Background Information

## A. General Information

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

### Table 1. General Facility Information

| | |
|---|---|
| NPDES Permit #: | ID0027693 |
| Applicant: | City of Dover |
| Type of Ownership | Municipal POTW |
| Physical Address: | 805 Railroad Ave<br>Dover, Idaho 83825 |
| Mailing Address: | P.O. Box 115<br>Dover, Idaho 83825 |
| Facility Contact: | Bob Hansen<br>Water Systems Management<br>208-265-4270<br>wsmibob@aol.com |
| Operator Name: | Mike Wade<br>City of Dover Wastewater Treatment Plant Operator<br>208-290-1562 |
| Facility Location: | 48.251417<br>-116.624179 |
| Receiving Water | Pend Oreille River |
| Facility Outfall | 48.250000<br>-116.641667 |

## B. Permit History

The most recent NPDES permit for the City of Dover was issued on November 30th, 2001, became effective on January 5th, 2002, and expired on January 5th, 2007. An NPDES application for permit issuance was submitted by the permittee on September 29th, 2006. The 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. Idaho NPDES Authorization

In 2014, the Idaho Legislature revised Idaho Code to direct IDEQ to seek EPA authorization for a state-operated pollutant discharge elimination system permitting program. IDEQ submitted an application that adheres to the CWA and 40 CFR 123 to the EPA on August 31, 2016. The goal of the Idaho Pollutant Discharge Elimination System (IPDES), like NPDES, is to address water pollution by regulating point sources that discharge pollutants to waters of the United States.

IDEQ is seeking authorization for a phased NPDES permit program that would begin July 1, 2018. Assuming that IDEQ's request for authorization is approved, IDEQ would obtain permitting for POTWs on July 1, 2018. At that point in time, all documentation required by the permit would be sent to IDEQ rather than to EPA and any decision under the permit stated to be made by EPA or jointly between EPA and IDEQ will be made solely by IDEQ. Permittees will be notified by IDEQ when this transition occurs.

# III. Facility Information

## A. Treatment Plant Description

### *Service Area*

The City of Dover owns and operates the City of Dover Wastewater Treatment Plant (WWTP) located in Dover, Idaho. The collection system has no combined sewers. The facility treats sewage collected from residential and commercial septic systems from a resident population of 556. There are no major industries discharging to the facility. The facility does not have an approved pretreatment program.

### *Treatment Process*

The design flow of the facility is 0.18 mgd. The facility completed construction to increase its design flow from 0.06 mgd to 0.18 mgd in 2006 when it converted from a sequence batch reactor to a membrane bioreactor. The improvements plans were approved by IDEQ. The actual flow as a Monthly Average from June 2012 – Jun 2017 is 0.15 mgd. The treatment process consists of membrane bioreactor followed by chlorine disinfection. A schematic of the wastewater treatment process and a map showing the location of the treatment facility and discharge are included in Appendix A. Because the design flow is less than 1 mgd, the facility is considered a minor facility.

### *Outfall Description*

Effluent flows via a closed pipeline approximately one mile west of Outfall 001, which discharges directly into the Pend Oreille River.

### *Effluent Characterization*

To characterize the effluent, the EPA evaluated the facility's application form, discharge monitoring report (DMR) data, and additional data provided by the City of Dover. The effluent quality is summarized in Table 2. Data are provided in Table 2.

### Table 2 Effluent Characterization

| Parameter | Maximum | Minimum | Notes |
|---|---|---|---|
| Nitrogen, Ammonia | 10.4 mg/L | ND | Daily Max |
| *E. coli* | 130 #/100mL | 0 #/100mL | Instantaneous Max |
| pH | 7.6 SU | 6.5 SU | Daily Max / Min |
| Temperature | 21 ºC | 7.3 ºC | Monthly Average |
| $BOD_5$ | 14 mg/L | ND | Weekly Average |
| Solids, Total Suspended | 10 mg/L | ND | Weekly Average |

Source: City of Dover DMRs from June 2012 – June 2017

***Compliance History***

The IDEQ, on behalf of the EPA, conducted an inspection of the facility on October 5th, 2016. The inspection encompassed the wastewater treatment process, records review, operation and maintenance, and the collection system. The inspection identified previous permit violations, which were included in a Notice of Violation, dated April 2017. The Notice of Violation set forth permit limit exceedances for $BOD_5$ and Total Residual Chlorine in April 2012 and May 2012, respectively. Violations were also noted for late DMR submittals and inadequacies found during the October 2016 inspection, as outlined in Table 3.

Additional compliance information for this facility, including compliance with other environmental statutes, is available on Enforcement and Compliance History Online (ECHO). The ECHO web address for this facility is: https://echo.epa.gov/detailed-facility-report?fid=110010026514

### Table 3. Summary of Effluent Violations

| Parameter | Limit | Units | Number of Instances | Violation Type |
|---|---|---|---|---|
| $BOD_5$ | Monthly Average | lb/day | 1 | Exceedence |
| Chlorine, total residual | Weekly Average | mg/L | 1 | Exceedence |
| $BOD_5$ | Monthly Average | lb/day | 1 | Late Submittal |
| Nitrogen, Ammonia | N/A | mg/L | 2 | Late Submittal |

*March 2012 – Jun 2017 monitoring data accessed on ECHO on 11/21/2017*

## IV. Receiving Water

In drafting permit conditions, the EPA must analyze the effect of the facility's discharge on the receiving water. The details of that analysis are provided later in this Fact Sheet. This section summarizes characteristics of the receiving water that impact that analysis.

### A. Receiving Water

This facility discharges to the Pend Oreille River in the City of Dover, Idaho. The outfall is located a half mile downstream of the City of Dover. The Washington and Idaho border is approximately 20 miles from the outfall.

### B. Designated Beneficial Uses

This facility discharges to the Pend Oreille River in the Pend Oreille Subbasin (HUC 17010214), Water Body Unit P-2. At the point of discharge, the Pend Oreille River is protected for the following designated uses (IDAPA 58.01.02.110.05):

- cold water aquatic life
- primary contact recreation
- domestic water supply

In addition, Water Quality Standards state that all waters of the State of Idaho are protected for industrial and agricultural water supply, wildlife habitats and aesthetics (IDAPA 58.01.02.100.03.b and c, 100.04 and 100.05).

### C. Water Quality

The water quality for the receiving water is summarized in Table 4.

## Table 4. Receiving Water Quality Data

| Parameter | Units | Percentile | Value | Source |
|---|---|---|---|---|
| Temperature | °C | 95th | 21 | USGS |
| pH | Standard units | 5th – 95th | 7.8 – 8.4 | USGS |
| Hardness | mg/L | 5th – 95th | 70 - 82 | USGS |
| Ammonia | mg/L | maximum | 0.14 | USGS |
| Source: USGS Monitoring Station 12395500 from October 1975 – August 1996 at Newport, WA, approximately 20 mi downstream of Dover | | | | |

### D. Water Quality Limited Waters

The State of Idaho's 2014 Integrated Report Section 5 (section 303(d)) lists the Pend Oreille River, from Pend Oreille Lake to the Priest River, as impaired for Dissolved Gas Supersaturation and Temperature, water.

To date, IDEQ has not prepared a TMDL for this section of the Pend Oreille River (from Pend Oreille Lake to the Priest River). The draft permit proposes temperature monitoring to assist with the development of a temperature TMDL. Dissolved gas supersaturation is not a pollutant typical of wastewater treatment plants, therefore no monitoring is recommended. However nutrients are a known constituent which may contribute to dissolved gas supersaturation. A reasonable potential analysis was performed for total phosphorus, a limiting nutrient typically found in wastewater treatment plant discharges. No reasonable potential for total phosphorus was found. See Section V.D.

### E. Low Flow Conditions

Critical low flows for the receiving water are summarized in Table 5. Critical Flows in Receiving Water.

## Table 5. Critical Flows in Receiving Water

| Flows | Annual Flow (cfs) | Seasonal Low Flows (August - April) | Seasonal High Flows (May - July) |
|---|---|---|---|
| 1Q10 | 3020 | 3020 | 6413 |
| 7Q10 | 3326 | 3326 | 6956 |
| 30B3 | 5650 | 5650 | 10723 |
| 30Q5 | 5650 | 5650 | 6413 |
| Harmonic Mean | 16498 | 11980 | 30243 |
| Sources: USGS station 12395500 & USGS station 12395000 located approximately 20 miles downstream of Outfall 001. | | | |

Critical low flows were calculated by subtracting daily flows from USGS station 12395000 at Priest River, ID (a major tributary to the Pend Oreille River) from flows measured at USGS station 12395500 at Newport, WA, to obtain estimated daily river flows for the Pend Oreille River at Dover, ID. Low flows are defined in Appendix D, Part C.

## V. Effluent Limitations and Monitoring

Table 6 below presents the existing effluent limits and monitoring requirements in the existing permit.

### Table 6. Existing Permit - Effluent Limits and Monitoring Requirements

| PARAMETER | EFFLUENT LIMITATIONS | | | MONITORING REQUIREMENTS | | |
|---|---|---|---|---|---|---|
| | Average Monthly Limit | Average Weekly Limit | Instantaneous Maximum Limit | Sample Location | Sample Frequency | Sample Type |
| Flow, MGD | --- | --- | --- | Effluent | Continuous | recording |
| Biochemical Oxygen Demand ($BOD_5$) | 30 mg/l | 45 mg/l | --- | Influent and Effluent | 1/week | 8-hour composite |
| | 15 lb/day | 23 lb/day | --- | | | |
| Total Suspended Solids (TSS) | 30 mg/l | 45 mg/l | --- | Influent and Effluent | 1/week | 8-hour composite |
| | 15 lb/day | 23 lb/day | --- | | | |
| E. coli Bacteria[1] | 126/100 ml | --- | 406/100 ml | Effluent | 5/month | grab |
| Temperature, °C | — | --- | — | Effluent | 1/week | recording |
| Total Ammonia, mg/l | --- | --- | --- | Effluent | 1/month | 8-hour composite |
| Total Residual Chlorine[2] | 0.5 mg/L | 0.75 mg/L | --- | Effluent | 5/week (Mon-Fri) | grab |

[1] The average monthly E. coli counts must not exceed a geometric mean of 126/100 ml based on a minimum of five samples taken every three to five days over a thirty day period. See Part I.C. for definition of geometric mean.
[2] The facility is only required to monitor for total residual chlorine when the back-up chlorine disinfection system is being used.

Additional permit conditions in the 2001 Permit include:

1. The pH range shall be between 6.5 - 9.0 standard units. The Permittee shall monitor for pH five times per week (Monday through Friday). Sample analysis shall be conducted on a grab sample from the effluent.

2. There shall be no discharge of floating solids, visible foam, or oil and grease in other than trace amounts.

3. For any month, the monthly average effluent concentration of $BOD_5$ shall not exceed 15 percent of the monthly average influent concentration of $BOD_5$. For any month, the monthly average effluent concentration of TSS shall not exceed 21 percent of the monthly average influent concentration of TSS.

Table 7, below, presents the proposed effluent limits and monitoring requirements in the draft permit.

## Table 7. Draft Permit - Effluent Limits and Monitoring Requirements

| Parameter | Units | Effluent Limitations | | | Monitoring Requirements | | |
|---|---|---|---|---|---|---|---|
| | | Average Monthly | Average Weekly | Maximum Daily | Sample Location | Sample Frequency | Sample Type |
| Parameters With Effluent Limits | | | | | | | |
| Biochemical Oxygen Demand ($BOD_5$) | mg/L | 30 | 45 | -- | Influent and Effluent | 1/week | 8-hour composite |
| | lbs/day | 15 | 23 | -- | | | Calculation[1] |
| $BOD_5$ Percent Removal | % | 85 (minimum) | -- | -- | -- | 1/month | Calculation[2] |
| Total Suspended Solids (TSS) | mg/L | 30 | 45 | -- | Influent and Effluent | 1/week | 8-hour composite |
| | lbs/day | 15 | 23 | -- | | | Calculation[1] |
| TSS Percent Removal | % | 85 (minimum) | -- | -- | -- | 1/month | Calculation[2] |
| *E. coli* [3] | CFU/ 100 ml | 126 | -- | 406 (instant. max) [4] | Effluent | 5/month[5] | Grab |
| Total Residual Chlorine | µg/L | 500 | 750 | -- | Effluent | 5/week[5] | Grab |
| | lbs/day | 0.75 | 1.12 | -- | | | Calculation[1] |
| pH | std units | Between 6.5 – 9.0 | | | Effluent | 5/week[5] | Grab or Meter |
| Floating, Suspended, or Submerged Matter | -- | See Paragraph I.B.2. of this permit | | | | 1/month | Visual Observation |
| | | Report Parameters | | | | | |
| Flow | mgd | Report | -- | Report | Effluent | continuous | Meter |
| Temperature | ºC | -- | Report | Report | Effluent | 1/week | Grab |
| Total Phosphorus | mg/L | Report | -- | Report | Effluent | 2x/month[5,7] | Grab |
| Effluent Testing for Permit Renewal | | | | | | | |
| Permit Application Effluent Testing Data[6] | | -- | | | Effluent | 1/year | -- |

| Parameter | Units | Effluent Limitations | | | Monitoring Requirements | | |
|---|---|---|---|---|---|---|---|
| | | Average Monthly | Average Weekly | Maximum Daily | Sample Location | Sample Frequency | Sample Type |

Notes

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 average monthly *E. coli* bacteria counts must not exceed a geometric mean of 126/100 ml based on a minimum of five samples taken every 3 - 7 days within a calendar month. See Part VI of this permit for a definition of geometric mean.
4. Reporting is required within 24 hours of a maximum daily limit or instantaneous maximum limit violation. See Paragraph I.B.3. and Part III.G. of this permit.
5. Samples must be taken on different days.
6. Effluent Testing Data - See NPDES Permit Application Form 2A, Part B.6 for the list of pollutants to be included in this testing. The Permittee must use sufficiently sensitive analytical methods in accordance with Part I.B.7. of this permit.
7. Monitoring required beginning ***4 years*** from effective date of permit and ending ***5 years*** from effective date of a permit, for a total of twelve months.

***Effluent Limit Changes from Previous Permit:***

New Total Residual Chlorine Average Monthly Load Limit of 0.75 lbs/day.

New Total Residual Chlorine Average Weekly Load Limit of 1.12 lbs/day.

TSS Percent Removal requirement increased from a minimum of 79% to a minimum of 85%.

***Monitoring Changes from Previous Permit:***

Ammonia monitoring removed.

## A. Basis for Effluent Limits

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.

## B. Pollutants of Concern

Pollutants of concern are those that either have technology-based limits or may need water quality-based limits. The EPA identifies pollutants of concern for the discharge based on those which:

- Have a technology-based limit
- Have an assigned wasteload allocation (WLA) from a TMDL
- Had an effluent limit in the previous permit
- Are present in the effluent monitoring. Monitoring data are reported in the application and DMR and any special studies

- Are expected to be in the discharge based on the nature of the discharge

The wastewater treatment process for this facility includes a membrane bioreactor as well as disinfection with chlorination. Pollutants expected in the discharge from a facility with this type of treatment, include but are not limited to: 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).

Based on this analysis, pollutants of concern are as follows:

- $BOD_5$
- TSS
- *E. coli* bacteria
- Total Residual Chlorine (TRC)
- pH
- Ammonia
- Temperature
- Phosphorus

### C. 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. The 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 8. For additional information and background refer to Part 5.1 *Technology Based Effluent Limits for POTWs* in the Permit Writers Manual.

Table 8. Secondary Treatment Effluent Limits

| Parameter | 30-day average | 7-day average |
|---|---|---|
| $BOD_5$ | 30 mg/L | 45 mg/L |
| TSS | 30 mg/L | 45 mg/L |
| Removal for $BOD_5$ and TSS (concentration) | 85% (minimum) | --- |
| pH | within the limits of 6.0 - 9.0 s.u. | |
| Source: 40 CFR 133.102 | | |

#### *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 design flow for the City of Dover increased from 0.06 mgd to 0.18 mgd during the previous

permit term. The mass based limits are expressed in pounds per day and are calculated as follows:

*Mass based limit (lb/day) = concentration limit (mg/L) × design flow (mgd) × 8.34*[1]

Since the design flow for this facility is 0.18 mgd, the technology based mass limits for $BOD_5$ and TSS are calculated as follows:

Average Monthly Limit (AML) = 30 mg/L × 0.18 mgd × 8.34 = 45 lbs/day

Average Weekly Limit (AWL) = 45 mg/L × 0.18 mgd × 8.34 = 67.5 lbs/day

The existing permit contained $BOD_5$ and TSS mass based limits based on the previous design flow of 0.06 mgd. The existing permit contains $BOD_5$ and TSS AMLs of 15 lbs/day and $BOD_5$ and TSS AWLs of 23 lbs/day. From June 2012 through June 2017, a period of 61 months, the City of Dover met their current $BOD_5$ and TSS mass based limits for every month. Therefore the EPA has retained the mass based limits for $BOD_5$ and TSS from the existing permit in the draft permit.

***Percent Removal Limits***

The NPDES regulations provides for alternative percent removal requirements for $BOD_5$ and TSS where: (1) the concentration limits can consistently be met, (2) the 85 percent removal efficiency cannot be achieved, and (3) excessive infiltration/inflow is not the cause of the problem. (*See* 40 CFR 133.103(d)).

The previous issuance of the City of Dover permit met these three requirements for the TSS percent removal requirement. The removal requirement was set to 79% in the previous permit.

As part of the permit reissuance, the EPA has reevaluated the applicability of continuing the alternative percent removal requirement for TSS.

Requirement 1: The concentration limits can consistently be met. The City of Dover has consistently met concentration limits for TSS. ECHO reported no recent TSS concentration violations for the facility.

Requirement 2: The 85 percent removal efficiency cannot be achieved. To evaluate the second requirement the EPA reviewed how often the City of Dover WWTP could not achieve an 85 percent removal efficiency. From June 2012 through June 2017, a period of 61 months, the City of Dover achieved an 85 percent removal efficiency all but 1 time. This occurred in December of 2012. With nearly 5 years of greater than or equal to 85 percent TSS removal, the EPA has determined that the City of Dover can meet the 85 percent TSS removal efficiency.

The City of Dover does not meet all three of the alternative percent removal requirements, therefore, the facility does not quality for an alternative percent removal efficiency.

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

***Chlorine***

Chlorine is often used to disinfect municipal wastewater prior to discharge. The City of Dover uses chlorine disinfection. A 0.5 mg/L average monthly limit for chlorine is derived from standard operating practices. The Water Pollution Control Federation's *Chlorination of Wastewater* (1976) states that a properly designed and maintained wastewater treatment plant can achieve adequate disinfection if a 0.5 mg/L chlorine residual is maintained after 15 minutes of contact time. Therefore, a wastewater treatment plant that provides adequate chlorine contact time can meet a 0.5 mg/L total residual chlorine limit on a monthly average basis. In addition to average monthly limits (AMLs), NPDES regulations require effluent limits for POTWs to be expressed as average weekly limits (AWLs) unless impracticable. For technology-based effluent limits, the AWL is calculated to be 1.5 times the AML, consistent with the "secondary treatment" limits for $BOD_5$ and TSS. This results in an AWL for chlorine of 0.75 mg/L.

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

Monthly average Limit= 0.5 mg/L x 0.18 mgd x 8.34 = 0.75 lbs/day

Weekly average Limit = 0.75 mg/L x 0.18 mgd x 8.34 = 1.12 lbs/day

Mass limits for chlorine are a new limit for the permittee. However, they are ineligible for a compliance schedule because they are based on technology based effluent limitations. Only water quality-based effluent limitations are eligible for a compliance schedule.

## D. 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. Discharges to State or Tribal waters must also comply with limitations imposed by the State or Tribe as part of its certification of NPDES permits under section 401 of the CWA. 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. Effluent limits must also meet the applicable water quality requirements of affected States other than the State in which the discharge originates, which may include downstream States (40 CFR 122.4(d), 122.44(d)(4), see also CWA Section 401(a)(2)).

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 waste load allocation for the discharge in an approved TMDL. If there are no approved TMDLs that specify waste load allocations for this discharge; all of the water quality-based effluent limits are calculated directly from the applicable water quality standards.

***Reasonable Potential Analysis and Need for Water Quality-Based Effluent Limits***

The EPA uses the process described in the *Technical Support Document for Water Quality-based Toxics Control* (*TSD*) 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 water quality-based effluent limit must be included in the permit.

In some cases, a dilution allowance or mixing zone is permitted. A mixing zone is a limited area or volume of water where initial dilution of a discharge takes place and within which certain water quality criteria may be exceeded (EPA, 2014). While the criteria may be exceeded within the mixing zone, the use and size of the mixing zone must be limited such that the waterbody as a whole will not be impaired, all designated uses are maintained and acutely toxic conditions are prevented.

The Idaho Water Quality Standards at IDAPA 58.01.02.060 provides Idaho's mixing zone policy for point source discharges. In the State 401 Certification, the IDEQ proposes to authorize mixing zones. The proposed mixing zones are summarized in Table 9. The EPA also calculated dilution factors for year round and seasonal critical low flow conditions. All dilution factors are calculated with the effluent flow rate set equal to the design flow of 0.18 mgd.

## Table 9. Mixing zones

| Criteria Type | Critical Low Flow (cfs) | Mixing Zone (% of Critical Low Flow) | Dilution Factor |
|---|---|---|---|
| Acute Aquatic Life | 3020 | 5% | 543 |
| Chronic Aquatic Life (except ammonia) | 3326 | 5% | 598 |
| Chronic Aquatic Life (ammonia) | 5650 | 5% | 1015 |
| Human Health Noncarcinogen | 5650 | 5% | 1015 |
| Human Health Carcinogen | 16498 | 5% | 2963 |

The reasonable potential analysis and water quality-based effluent limit calculations were based on mixing zones shown in Table 9. If IDEQ revises the allowable mixing zone in its final certification of this permit, reasonable potential analysis and water quality-based effluent limit calculations will be revised accordingly.

The equations used to conduct the reasonable potential analysis and calculate the water quality-based effluent limits are provided in Appendix D.

***Reasonable Potential and Water Quality-Based Effluent Limits***

The reasonable potential and water quality-based effluent limit for specific parameters are summarized below. The calculations are provided in Appendix D.

Ammonia

Ammonia criteria are based on a formula which relies on the pH and temperature of the receiving water, because the fraction of ammonia present as the toxic, un-ionized form increases with increasing pH and temperature. Therefore, the criteria become more stringent

as pH and temperature increase. The table below details the equations used to determine water quality criteria for ammonia.

## Table 10 Ammonia Criteria

Total ammonia nitrogen criteria (mg N/L):
Seasonal Basis - LOW Flow
Based on IDAPA 58.01.02

| INPUT | |
|---|---|
| 1. Receiving Water Temperature (deg C): | 21.0 |
| 2. Receiving Water pH: | 8.40 |
| 3. Is the receiving water a cold water designated use | Yes |
| 4. Are non-salmonid early life stages present or abse | Present |
| **OUTPUT** | |
| **Total ammonia nitrogen criteria (mg N/L):** | |
| **Acute Criterion (CMC)** | **2.59** |
| **Chronic Criterion (CCC)** | **0.85** |

**Acute Criteria Equation: Cold Water**

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

**Acute Criteria Equation: Warm Water**

$$CMC = \frac{0.411}{1+10^{7.204-pH}} + \frac{58.4}{1+10^{pH-7.204}}$$

**Chronic Criteria: Cold Water, Early Life Stages Present**

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

**Chronic Criteria: Cold Water, Early Life Stages Absent**

$$CCC = \left(\frac{0.0577}{1+10^{7.688-pH}} + \frac{2.487}{1+10^{pH-7.688}}\right) \bullet 1.45 \cdot 10^{0.028(25-T)})$$

Total ammonia nitrogen criteria (mg N/L):
Seasonal Basis - HIGH Flow
Based on IDAPA 58.01.02

| INPUT | |
|---|---|
| 1. Receiving Water Temperature (deg C): | 22.0 |
| 2. Receiving Water pH: | 8.30 |
| 3. Is the receiving water a cold water designated use | Yes |
| 4. Are non-salmonid early life stages present or abse | Present |
| **OUTPUT** | |
| **Total ammonia nitrogen criteria (mg N/L):** | |
| **Acute Criterion (CMC)** | **3.15** |
| **Chronic Criterion (CCC)** | **0.94** |

**Acute Criteria Equation: Cold Water**

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

**Acute Criteria Equation: Warm Water**

$$CMC = \frac{0.411}{1+10^{7.204-pH}} + \frac{58.4}{1+10^{pH-7.204}}$$

**Chronic Criteria: Cold Water, Early Life Stages Present**

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

**Chronic Criteria: Cold Water, Early Life Stages Absent**

$$CCC = \left(\frac{0.0577}{1+10^{7.688-pH}} + \frac{2.487}{1+10^{pH-7.688}}\right) \bullet 1.45 \cdot 10^{0.028(25-T)})$$

A reasonable potential calculation showed that the City of Dover discharge would not have the reasonable potential to cause or contribute to a violation of the water quality criteria for ammonia during high flow month nor during low flow months. Therefore, the draft permit does not contain a water quality-based effluent limit for ammonia. The draft permit requires that the permittee monitor its effluent and the receiving water for ammonia, pH, and temperature in order to determine the applicable ammonia criteria for the next permit reissuance. See Appendices D and F for reasonable potential and effluent limit calculations for ammonia.

pH

The Idaho water quality standards at IDAPA 58.01.02.250.01.a, require pH values of the river to be within the range of 6.5 to 9.0. Mixing zones are generally not granted for pH, therefore the most stringent water quality criterion must be met before the effluent is discharged to the receiving water. Effluent pH data were compared to the water quality criteria and were found to be within the water quality standards, with a minimum pH of 6.5 and a maximum pH of 7.6 between June 2012 and July 2017. Because the minimum pH reported is equivalent to the minimum pH required by Idaho water quality standards, a water quality-based effluent limit for pH is recommended. The draft permit contains end of pipe limits requiring an effluent pH of 6.5 to 9.0.

Dissolved Oxygen (DO) and $BOD_5$

The Idaho state water quality standards require the level of DO in a receiving water to exceed 5 mg/L at all times when the water body is protected for aquatic life us.

The permit includes limits for $BOD_5$. Compliance with $BOD_5$ will be protective of DO in the receiving water.

Phosphorus

The Idaho water quality standards at IDAPA 58.01.02.200.06 has a narrative water quality criterion which reads "surface waters of the state shall be free from excess nutrients that can cause visible slime growths or other nuisance aquatic growths impairing designated beneficial uses." Currently the receiving water is not listed as impaired due to excess nutrients.

*Phosphorus Data*

There are no effluent phosphorus data available to evaluate reasonable potential. The Permit Writers' Manual recommends a qualitative approach when determining reasonable potential without effluent data for the pollutant of concern (Permit Writers' Manual 6.3.3). The manual recommends evaluating pollutant variability, existing treatment technologies, in-stream data, and/or dilution information.

*Qualitative Reasonable Potential Analysis*

Phosphorus is a nutrient which contributes directly to nuisance algal growth, and has been shown to be the limiting nutrient upstream of the City of Dover WWTP discharge in Lake Pend Oreille (Tetra Tech 2002). Due to its proximity to Lake Pend Oreille and the fact that phosphorus is generally the limiting nutrient in freshwaters, it is most likely that phosphorus is the limiting nutrient in the Pend Oreille River.

The City of Dover WWTP has a membrane bioreactor which treats its effluent prior to discharge into the Pend Oreille River. The permit does not currently require treatment of phosphorus, therefore any treatment of phosphorus would be ancillary to the treatment of pollutants currently regulated by the permit such as $BOD_5$ and TSS. Membrane bioreactors can be set up for enhanced biological phosphorus removal, but the present system at the City of Dover WWTP does not include this level of treatment. Therefore, it is likely that effluent phosphorus levels are similar to influent phosphorus levels with minimal removal.

The City of Dover WWTP has a design flow of 0.18 mgd and discharges to the Pend Oreille River. As phosphorus contributes to algal growth it is proper to use a chronic averaging period for the critical low flows of the receiving water. Therefore, the 30Q10 was selected (the lowest 30 day average in a 10 year period). As stated in Section IV.E. of this Fact Sheet, The Pend Oreille River has a 30Q10 of 5650 cfs. Cfs can be converted to mgd using the following equation:

$$cfs * 0.646 = mgd$$

$$5650\ cfs * 0.646 = 3650\ mgd$$

Given a mixing zone of 5%, the following equation calculates the theoretical dilution factor for phosphorus:

$$\text{Dilution Factor} = \frac{(Effluent\ Flow + Receiving\ Water\ Flow) * \%\ Mixing\ Zone}{Effluent\ Flow}$$

$$\text{Dilution Factor} = \frac{(0.18\ mgd + 3650\ mgd) * 0.05}{0.18\ mgd}$$

$$\text{Dilution Factor} = 1014$$

*Conclusion*

It is highly unlikely that the City of Dover WWTP discharges would cause or contribute to an excursion above the water quality criteria for phosphorus due to the high amount of dilution available with a 5% mixing zone. This is supported by the fact that the receiving water is not listed for nutrients. No phosphorus limit been included in the draft permit. Effluent monitoring has been included to collect phosphorus data prior to the next reissuance of the permit. Monitoring is required twice monthly for 12 months, beginning 4 years from the effective date of the permit and ending 5 years from the effective date of the permit.

*E. coli*

The Idaho water quality standards state that waters of the State of Idaho, that are designated for recreation, are not to contain *E. coli* bacteria in concentrations exceeding 126 organisms per 100 ml based on a minimum of five samples taken every three to seven days over a thirty-day period. A mixing zone is not appropriate for bacteria for waters designated for contact recreation. Therefore, the draft permit contains a monthly geometric mean effluent limit for *E. coli* of 126 organisms per 100 ml (IDAPA 58.01.02.251.01.a.).

The Idaho water quality standards also state that a water sample that exceeds certain "single sample maximum" values indicates a likely exceedance of the geometric mean criterion, although it is not, in and of itself, a violation of water quality standards. For waters designated for primary contact recreation, the "single sample maximum" value is 406 organisms per 100 ml (IDAPA 58.01.02.251.01.b.ii.).

The goal of a water quality-based effluent limit is to ensure a low probability that water quality standards will be exceeded in the receiving water as a result of a discharge, while considering the variability of the pollutant in the effluent. Because a single sample value exceeding 406 organisms per 100 ml indicates a likely exceedance of the geometric mean criterion, the EPA has imposed an instantaneous (single grab sample) maximum effluent limit for *E. coli* of 406 organisms per 100 ml, in addition to a monthly geometric mean limit of 126 organisms per 100 ml, which directly implements the water quality criterion for *E. coli*. This will ensure that the discharge will have a low probability of exceeding water quality standards for *E. coli*.

Regulations at 40 CFR 122.45(d)(2) require that effluent limitations for continuous discharges from POTWs be expressed as average monthly and average weekly limits, unless impracticable. Additionally, the terms "average monthly limit" and "average weekly limit" are defined in 40 CFR 122.2 as being arithmetic (as opposed to geometric) averages. It is impracticable to properly implement a 30-day geometric mean criterion in a permit using monthly and weekly arithmetic average limits. The geometric mean of a given data set is equal to the arithmetic mean of that data set if and only if all of the values in that data set are equal. Otherwise, the geometric mean is always less than the arithmetic mean. In order to ensure that the effluent limits are "derived from and comply with" the geometric mean water quality criterion, as required by 40 CFR

122.44(d)(1)(vii)(A), it is necessary to express the effluent limits as a monthly geometric mean and an instantaneous maximum limit.

Chlorine

The Idaho state water quality standards at IDAPA 58.01.02.210 establish an acute criterion of 19 µg /L, and a chronic criterion of 11 µg/L for the protection of aquatic life. A reasonable potential calculation showed that the discharge from the facility would not have the reasonable potential to cause or contribute to a violation of the water quality criteria for chlorine. Therefore, the draft permit does not contain a water quality-based effluent limit for chlorine. See Appendix D.

Temperature

The Idaho water quality standards require ambient water temperatures of 22ºC with maximum daily average temperature of 19 ºC for cold waters (See IDAPA 58.01.02.250). Currently, this segment of the Pend Oreille River is impaired for Temperature.

The EPA has not approved a temperature TMDL for the Pend Oreille River. A reasonable potential calculation showed that the disch

arge from the facility would not have the reasonable potential to cause or contribute to a violation of the water quality criteria for temperature. Therefore, the draft permit does not contain a water quality-based effluent limit. The draft permit requires effluent temperature monitoring.

| | Cold Water Critera | |
|---|---|---|
| **INPUT** | | Data Source |
| Chronic Dilution Factor at Mixing Zone Boundary | 3326.0 | 7Q10 Low River Flow |
| Ambient Temperature (T) (Upstream Background) | 21.0 °C | 95th Percentile based on permittee or USGS data |
| Effluent Temperature | 20.1 °C | 95th Percentile of **monthly daily max effluent** based on daily max per DMR data |
| Aquatic Life Temperature WQ Criterion in Fresh Water | 19.0 °C | Lowest daily max criteria |
| **OUTPUT** | | |
| Mass Balance Final RW Temperature: | 21.0 °C | Mass balance |
| Incremental Temperature Increase or decrease: | 0.0 °C | WQS 401.c - allow for maximum of 0.3°C rise in receiving water temperature. |

Residues

The Idaho water quality standards require that surface waters of the State be free from floating, suspended or submerged matter of any kind in concentrations impairing designated beneficial uses. The draft permit contains a narrative limitation prohibiting the discharge of such materials.

## E. Antibacksliding

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*.

The draft permit does not contain effluent limits less stringent than the existing permit.

# VI. 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 the EPA.

## B. Effluent Monitoring

Monitoring frequencies are based on the nature and effect of the pollutant, as well as a determination of the minimum sampling necessary to adequately monitor the facility's performance. Permittees have the option of taking more frequent samples than are required 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 Changes from the Previous Permit*

Ammonia effluent monitoring has been removed from the draft permit. The previous permit required effluent ammonia monitoring in order to gather data for a reasonable potential analysis. A reasonable potential analysis was performed and found that the facility does not have the reasonable potential to cause or contribute to an excursion of the water quality criteria for ammonia. In it is unlikely the facility would have reasonable potential for either acute or chronic ammonia criteria due to the high amount of dilution available at current facility flows. The draft permit recommends no effluent monitoring for ammonia except for the ammonia monitoring required for reapplication, as outlined in the permit application form 2A Section B.6.

## C. Surface Water Monitoring

In general, surface water monitoring may be required for pollutants of concern to assess the assimilative capacity of the receiving water for the pollutant. In addition, surface water monitoring may be required for pollutants for which the water quality criteria are dependent and to collect data for TMDL development if the facility discharges to an impaired water body. Table 11 presents the proposed surface water monitoring requirements for the draft permit. Surface water monitoring results must be submitted with the DMR.

Flow receiving water monitoring can be required if limited or no flow data is available. The USGS operates two gauging stations downstream of the city's discharge, one on the Pend Oreille River at Newport, WA (USGS Station 12395500) and one on the Priest River, a major tributary for the Pend Oreille River (USGS Station 12395000). Subtracting the Priest River flows from the Pend Oreille River flows provided a reliable estimate for the flows

upstream in Dover, ID. In addition, flow monitoring is required in the draft permit for Sandpoint, ID, which will provide flow estimates 2 miles upstream of Dover, ID. Therefore receiving water flow monitoring is not recommended in the draft permit.

The Pend Oreille River is impaired for Dissolved Gas Supersaturation and Temperature. Temperature monitoring is recommended to assist with the development of a future TMDL. Dissolved Gas Supersaturation is not a pollutant typical of a wastewater treatment plant, therefore no surface water monitoring is recommended.

Surface water monitoring is a new requirement in the draft permit. The draft permit allows a period of 1 year for the City of Dover to establish a monitoring location, with IDEQ approval. Monitoring requirements begin 1 year after the effective date of the permit.

### Table 11. Surface Water Monitoring in Draft Permit

| Parameter | Units | Frequency | Sample Type |
|---|---|---|---|
| Temperature | ºC | Continuous | Meter |
| Notes:<br>1. Monitoring required beginning ***1 year after permit effective date***.<br>2. Monitoring is only required from ***1 year after permit effective date*** through ***2 years after permit effective date***.<br>3. Report Daily Maximum. | | | |

#### 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.epa.gov. The permittee may use NetDMR after requesting and receiving permission from EPA Region 10.

## VII. Sludge (Biosolids) Requirements

The EPA Region 10 separates wastewater and sludge permitting. The EPA has authority under the CWA to issue separate sludge-only permits for the purposes of regulating biosolids. The 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.

# VIII. Other Permit Conditions

## A. Quality Assurance Plan

The City of Dover is required to update the Quality Assurance Plan within 180 days of the effective date of the final permit. The Quality Assurance Plan must include of 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 IDEQ upon request.

## B. Operation and Maintenance Plan

The permit requires the City of Dover 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 their facility within 180 days of the effective date of the final permit. The plan must be retained on site and made available to the EPA and the IDEQ upon request.

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

SSOs are not authorized under this permit. 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 of SSOs. Finally, the permit requires proper operation and maintenance of the collection system.

The following specific permit conditions apply:

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

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

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

**Record Keeping** – The permittee is required to keep records of SSOs. The permittee must retain the reports submitted to the EPA and other appropriate reports that could include work orders associated with investigation of system problems related to a SSO, that describes the

steps taken or planned to reduce, eliminate, and prevent reoccurrence of the SSO. (See 40 CFR 122.41(j)).

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

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

### D. Environmental Justice

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. "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.

The City of Dover WWTP is not located within or near a Census block group that is potentially overburdened. The draft permit does not include any additional conditions to address environmental justice.

Regardless of whether a WWTP 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*,

### E. Design Criteria

The permit includes design criteria requirements. 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 flow or loading exceeds 85% of the design criteria values for three consecutive months.

### F. Pretreatment Requirements

Idaho does not have an approved state pretreatment program per 40 CFR 403.10, thus, EPA is the Approval Authority for Idaho POTWs. Since the City of Dover does not have an approved POTW pretreatment program per 40 CFR 403.8, the EPA is also the Control Authority of industrial users that might introduce pollutants into the Pend Oreille River.

Special Condition II.D. of the permit reminds the Permittee that it cannot authorize discharges which may violate the national specific prohibitions of the General Pretreatment Program.

Although, not a permit requirement, the Permittee may wish to consider developing the 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). Where the POTW is a municipality, legal authority is typically through a sewer use ordinance, which is usually part of the city or county code. The EPA has a Model Pretreatment Ordinance for use by municipalities operating POTWs that are required to develop pretreatment programs to regulate industrial discharges to their systems (EPA, 2007). The model ordinance should also be useful for communities with POTWs that are not required to implement a pretreatment program in drafting local ordinances to control nondomestic dischargers within their jurisdictions.

Background on the pretreatment program may be found at Introduction to the National Pretreatment Program (EPA, 2011).

### 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.

## IX. 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 listed in Idaho by the USFWS (as of 11/22/17) and NOAA finds that the Bull Trout (*Salvelinus confluentus*) is a threatened species in the vicinity of the discharge.

A biological assessment conducted in September 2001 for the existing permit found discharges from the City of Dover WWTP had no effect on bull trout. The previous permit included a no effect determination. However, since 2001 the City of Dover WWTP's design flow has increase from 0.06 MGD to 0.18 MGD.

The EPA prepared a biological evaluation (BE) for the City of Sandpoint WWTP (Sandpoint) in 2016, which found that Sandpoint may affect, but is not likely to adversely affect, bull trout. Sandpoint is classified as a major with a design flow of 5.0 mgd. The BE included an assessment on cumulative effects, which included all WWTPs along the Pend

Oreille River. "Due to their small size, the effects, if any, of the Priest River, Dover, and Albeni Falls WWTPs on listed species will be less than those of the Sandpoint WWTP." (EPA 2016). This evaluation included Dover's upgraded design flow.

The current NPDES permits for the Priest River WWTP (0.5 mgd design flow) and the Albeni Falls WWTP (0.0018 mgd design flow) contain a no effect determination for bull trout, based on the previous BE and on the permits requirements for compliance with Idaho Water Quality Standards.

The draft permit for the City of Dover WWTP requires compliance with Idaho Water Quality Standards to protect for bull trout. After review of the 2001 BE, the 2016 BE for Sandpoint, the EPA has determined that the issuance of this permit will have no effect on the endangered species in the vicinity of the discharge.

### 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 no EFH species are present in the vicinity of the discharge.

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 determined that issuance of this permit will not affect EFH in the vicinity of the discharge. The EPA has provided NOAA Fisheries with copies of the draft permit and fact sheet during the public notice period. Any comments received from NOAA Fisheries regarding EFH will be considered prior to reissuance of this permit.

### C. State Certification

Section 401 of the CWA requires the 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. A copy of the draft 401 certification is provided in Appendix G.

### D. Antidegradation

The IDEQ has completed an antidegradation review which is included in the draft 401 certification for this permit. (*See* Appendix XX) The EPA has reviewed this antidegradation analysis and finds that it is consistent with the State's water quality standards and the State's antidegradation implementation procedures. Comments on the 401 certification including the antidegradation review can be submitted to the IDEQ as set forth above (see State Certification on Page 1 of this Fact Sheet).

### E. Permit Expiration

The permit will expire five years from the effective date.

## X. References

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https://www3.epa.gov/npdes/pubs/owm0264.pdf

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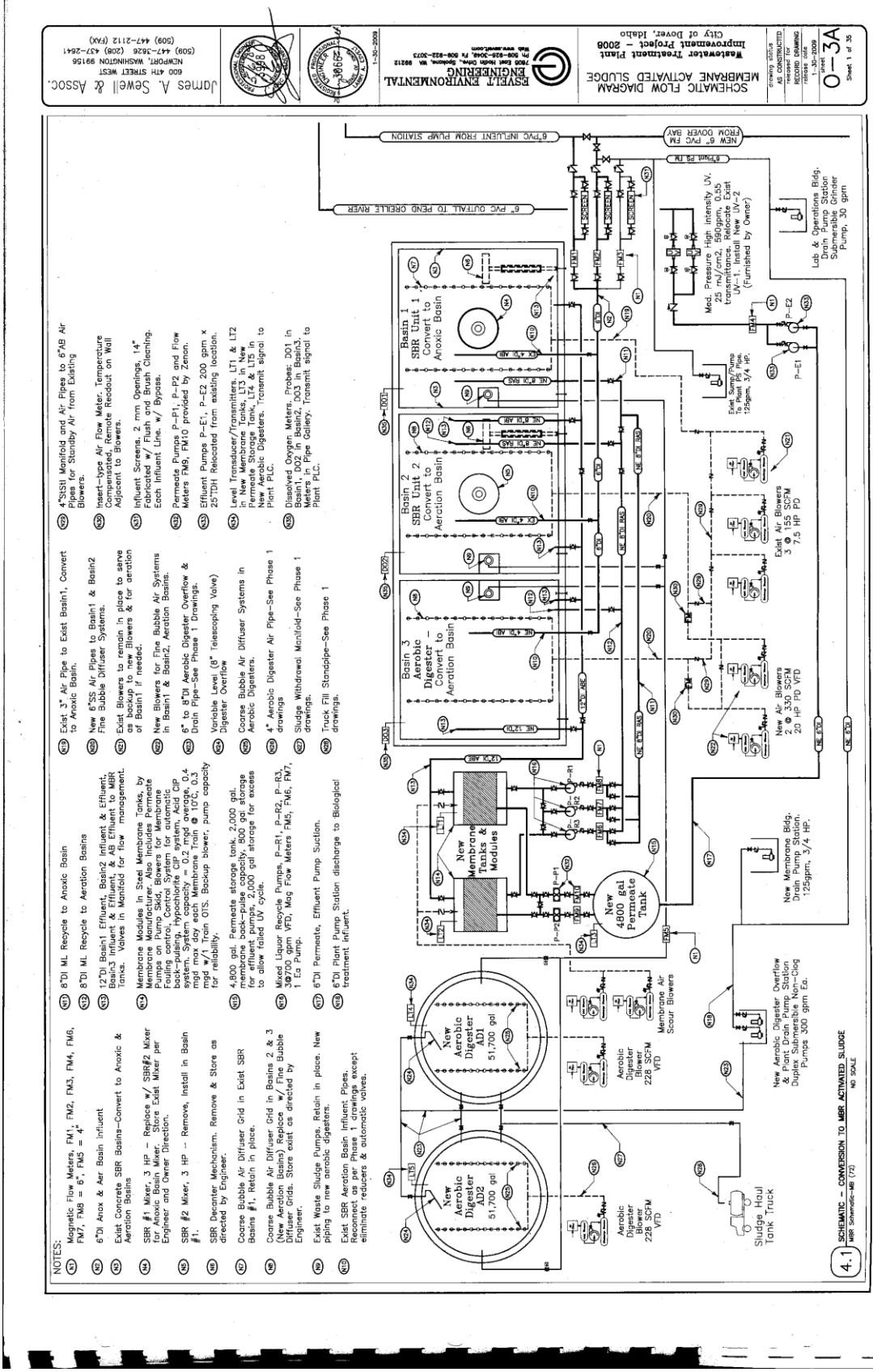
EPA. 2010. *NPDES Permit Writers' Manual*. Environmental Protection Agency, Office of Wastewater Management, EPA-833-K-10-001. September 2010. https://www3.epa.gov/npdes/pubs/pwm_2010.pdf

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.

EPA. 2014. Water Quality Standards Handbook Chapter 5: General Policies. Environmental Protection Agency. Office of Water. EPA 820-B-14-004. September 2014. https://www.epa.gov/sites/production/files/2014-09/documents/handbook-chapter5.pdf

# Appendix A. Facility Information


SCHEMATIC FLOW DIAGRAM
MEMBRANE ACTIVATED SLUDGE
Wastewater Treatment Plant
Improvement Project – 2008
City of Dover, Idaho
PSPLT ENVIRONMENTAL ENGINEERING
James A. Sewell & Assoc.
O–3A
Basin 1 SBR Unit 1 Convert to Anoxic Basin
Basin 2 SBR Unit 2 Convert to Aeration Basin
Basin 3 Aerobic Digester – Convert to Aeration Basin
New Membrane Tanks & Modules
New 4800 gal Permeate Tank
New Aerobic Digester No.1 51,700 gal
New Aerobic Digester No.2 51,700 gal
Sludge Haul Tank Truck
Lab & Operations Bldg. Drain Pump Station Submersible Grinder Pump, 30 gpm
6" PVC OUTFALL TO PEND OREILLE RIVER
NEW 6" PVC FM FROM DOVER BAY
6"PVC INFLUENT FROM PUMP STATION
NOTES:

# Appendix B. Water Quality Data

## A. Treatment Plant Effluent Data

| | Effluent Gross | Effluent Gross | Effluent Gross | Effluent Gross | Effluent Gross | Effluent Gross | Effluent Gross | Effluent Gross | Effluent Gross | Effluent Gross | Effluent Gross | Effluent Gross | Effluent Gross | Effluent Gross | Effluent Gross | Effluent Gross | Effluent Gross | Percent Removal | Percent Removal | Raw Sewage Influent | Raw Sewage Influent |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | DAILY MX | INST MAX | MAXIMUM | MINIMUM | MO AVG | MO AVG | MO AVG | MO AVG | MO AVG | MO AVG | MO AVG | MO GEO | WKLY AVG | WKLY AVG | WKLY AVG | WKLY AVG | WKLY AVG | MN % RMV | MN % RMV | MO AVG | MO AVG |
| | Nitrogen, ammonia total [as N] | E. coli, MTEC-MF | pH | pH | BOD, 5-day, 20 deg. C | BOD, 5-day, 20 deg. C | Chlorine, total residual | Flow, in conduit or thru treatment plant | Solids, total suspended | Solids, total suspended | Temperature, water deg. centigrade | E. coli, MTEC-MF | BOD, 5-day, 20 deg. C | | Chlorine, total residual | Solids, total suspended | Solids, total suspended | BOD, 5-day, percent removal | Solids, suspended percent removal | BOD, 5-day, 20 deg. C | Solids, total suspended |
| Row Labels | mg/L | #/100mL | SU | SU | lb/d | mg/L | mg/L | MGD | lb/d | mg/L | deg C | #/100mL | lb/d | mg/L | mg/L | lb/d | mg/L | % | % | mg/L | mg/L |
| 6/30/2012 | | 2 | 7.5 | 7 | 10 | 10 | 0.4 | 0.087291 | 4 | 5 | 14.5 | 2 | 7 | 14 | 0.5 | 4 | 6 | 93 | 92 | 151 | 60 |
| 7/31/2012 | 0.059 | 2 | 7.4 | 7.4 | 4 | 6 | 0.3 | 0.071849 | 5 | 8 | 18.3 | 2 | 4 | 6 | 0.5 | 5 | 10 | 93 | 92 | 185 | 53 |
| 8/31/2012 | | 2 | 7.1 | 7 | 5 | 6 | 0.3 | 0.066983 | 5 | 5 | 19.8 | 2 | 3 | 8 | 0.5 | 3 | 9 | 97 | 91 | 213 | 57 |
| 9/30/2012 | 0.1 | 2 | 7.2 | 7.1 | 4 | 6 | 0.3 | 0.61615 | 2 | 4 | 17.9 | 2 | 3 | 7 | 0.4 | 2 | 3 | 97 | 95 | 209 | 65 |
| 10/31/2012 | | 2 | 7.2 | 7.2 | 7 | 7 | 0.3 | 0.061485 | 5 | 6 | 15.1 | 2 | 4 | 14 | 0.3 | 3 | 9 | 96 | 86 | 193 | 42 |
| 11/30/2012 | | 2 | 7.4 | 7.1 | 4 | 4 | 0.4 | 0.075016 | 4 | 3 | 11.8 | 2 | 3 | 6 | 0.5 | 2 | 6 | 97 | 92 | 115 | 37 |
| 12/31/2012 | | 2 | 7.4 | 7.2 | 2 | 2 | 0.3 | 0.079073 | 3 | 4 | 9.5 | 4 | 1 | 3 | 0.5 | 4 | 6 | 98 | 79 | 126 | 19 |
| 1/31/2013 | 0.059 | 2 | 7.5 | 6.9 | 3 | 4 | 0.3 | 0.079542 | 4 | 3 | 8 | 3 | 3 | 5 | 0.5 | 2 | 6 | 97 | 94 | 136 | 46 |
| 2/28/2013 | | 4 | 7.5 | 7 | 5 | 4 | 0.3 | 0.08732 | 7 | 4 | 7.9 | 2 | 4 | 7 | 0.5 | 4 | 10 | 98 | 91 | 154 | 44 |
| 3/31/2013 | | 2 | 7.4 | 7.2 | 5 | 5 | 0.4 | 0.089538 | 2 | 2 | 8 | 2 | 4 | 7 | 0.5 | 2 | 2 | 96 | 96 | 132 | 52 |
| 4/30/2013 | | 4 | 7.4 | 7.2 | 5 | 5 | 0.4 | 0.082447 | 3 | 3 | 9.1 | 2 | 3 | 7 | 0.6 | 3 | 5 | 96 | 92 | 142 | 38 |
| 5/31/2013 | | 2 | 7.3 | 6.8 | 6 | 5 | 0.4 | 0.083035 | 3 | 2 | 13.1 | 2 | 4 | 8 | 0.5 | 1 | 4 | 98 | 94 | 190 | 56 |
| 6/30/2013 | 0.168 | 17 | 7 | 7 | 6 | 8 | 0.3 | 0.069467 | 5 | 4 | 16.3 | 8 | 5 | 11 | 0.5 | 2 | 8 | 96 | 92 | 187 | 48 |
| 7/31/2013 | | 50 | 7.1 | 6.9 | 4 | 5 | 0.2 | 0.66433 | 6 | 2 | 19.5 | 8 | 3 | 7 | 0.5 | 1 | 10 | 97 | 97 | 174 | 76 |
| 8/31/2013 | 0.059 | 2 | 6.9 | 6.9 | 1 | 2 | 0.3 | 0.055217 | 1 | 2 | 20.5 | 2 | 1 | 2 | 0.5 | 1 | 1 | 97 | 96 | 96 | 51 |
| 9/30/2013 | | 8 | 6.9 | 6.8 | 1 | 2 | 0.3 | 0.046502 | 1 | 2 | 19.1 | 3 | 1 | 1 | 0.4 | 1 | 1 | 98 | 95 | 95 | 43 |
| 10/31/2013 | | 23 | 6.9 | 6.5 | 0 | 2 | 0.3 | 0.043192 | 0 | 2 | 13.7 | 9 | 0 | 1 | 0.4 | 0 | 1 | 99 | 98 | 126 | 55 |
| 11/30/2013 | | 2 | 7 | 6.5 | 0 | 2 | 0.3 | 0.042541 | 0 | 2 | 11.2 | 2 | 0 | 1 | 0.4 | 0 | 1 | 100 | 99 | 93 | 101 |
| 12/31/2013 | | 8 | 7.1 | 6.6 | 0 | 1 | 0.3 | 0.04414 | 0 | 1 | 8.9 | 5 | 1 | 3 | 0.4 | 0 | 1 | 99 | 98 | 123 | 63 |
| 1/31/2014 | | 17 | 7.3 | 6.6 | 0 | 1 | 0.4 | 0.059665 | 0 | 1 | 8.3 | 6 | 0 | 1 | 0.4 | 0 | 1 | 99 | 99 | 70 | 31 |
| 2/28/2014 | | 23 | 7 | 6.7 | 0 | 1 | 0.3 | 0.058124 | 0 | 1 | 7.5 | 8 | 0 | 1 | 0.4 | 0 | 1 | 99 | 99 | 111 | 37 |
| 3/31/2014 | | 79 | 7.1 | 6.9 | 0 | 1 | 0.3 | 0.104169 | 0 | 1 | 7.7 | 23 | 0 | 1 | 0.4 | 0 | 1 | 99 | 99 | 42 | 17 |
| 4/30/2014 | | 13 | 7.2 | 6.9 | 0 | 1 | 0.3 | 0.060281 | 0 | 1 | 9.7 | 7 | 0 | 1 | 0.4 | 0 | 1 | 99 | 99 | 36 | 22 |
| 5/31/2014 | | 13 | 7.5 | 7.2 | 0 | 1 | 0.3 | 0.55493 | 0 | 1 | 12.8 | 6 | 0 | 1 | 0.4 | 0 | 1 | 99 | 99 | 88 | 153 |
| 6/30/2014 | 0.089 | 8 | 7.4 | 6.9 | 0 | 0 | 0.3 | 0.43934 | 0 | 1 | 16.3 | 3 | 0 | 0 | 0.4 | 0 | 1 | 99 | 99 | 145 | 85 |
| 7/31/2014 | | 79 | 7.1 | 6.6 | 0 | 0 | 0.3 | 0.48272 | 0 | 1 | 19.3 | 0 | 0 | 0 | 0.4 | 0 | 1 | 99 | 99 | 123 | 67 |
| 8/31/2014 | | 5 | 6.9 | 6.6 | 0 | 0 | 0.3 | 0.53453 | 0 | 0 | 20.1 | 1 | 0 | 0 | 0.4 | 0 | 0 | 99 | 99 | 112 | 79 |
| 9/30/2014 | | 5 | 7 | 6.6 | 0 | 0 | 0.3 | 0.38164 | 0 | 0 | 18 | 1 | 0 | 0 | 0.4 | 0 | 0 | 99 | 99 | 134 | 70 |
| 10/31/2014 | | 2 | 7 | 6.5 | 0 | 0 | 0.3 | 0.029319 | 0 | 0 | 15.9 | 2 | 0 | 0 | 0.4 | 0 | 0 | 99 | 99 | 118 | 58 |
| 11/30/2014 | 0.233 | 130 | 6.8 | 6.5 | 0 | 0 | 0.3 | 0.035479 | 1 | 1 | 11.7 | 26 | 0 | 0 | 0.3 | 1 | 1 | 99 | 99 | 114 | 58 |
| 12/31/2014 | 0.082 | 13 | 7.3 | 6.5 | 0 | 0 | 0.3 | 0.044956 | 1 | 1 | 9.7 | 7 | 0 | 0 | 0.3 | 1 | 1 | 99 | 99 | 66 | 39 |
| 1/31/2015 | | 79 | 7.5 | 7.1 | 0 | 0 | 0.3 | 0.055208 | 1 | 1 | 8.9 | 16 | 0 | 0 | 0.3 | 1 | 1 | 99 | 99 | 58 | 92 |
| 2/28/2015 | 0 | 4.5 | 7.3 | 7 | 0 | 0 | 0.5 | 0.08 | 1 | 1 | 8.5 | 2 | 0 | 0 | 0.3 | 1 | 1 | 100 | 98 | 41 | 46 |
| 3/31/2015 | 0 | 0 | 7.5 | 7.1 | 0 | 0 | 0.4 | 0.046 | 0 | 0 | 10.2 | 0 | 0 | 0 | 0.4 | 0 | 0 | 100 | 100 | 73 | 39 |
| 4/30/2015 | 0.114 | 0 | 7.4 | 7.1 | 0 | 0 | 0.3 | 0.0396 | 0 | 0 | 7.3 | 0 | 0 | 0 | 0.3 | 0 | 0 | 100 | 100 | 98 | 46 |
| 5/31/2015 | 0.117 | 0 | 7.4 | 7.1 | 0 | 0 | 0.3 | 0.03 | 1 | 4 | 14.1 | 0 | 0 | 0 | 0.3 | 0.87 | 3.5 | 100 | 87 | 76 | 70 |
| 6/30/2015 | 0 | 0 | 7.6 | 7.4 | 0 | 0 | 0.25 | 0.035 | 0 | 0 | 21 | 0 | 0 | 0 | 0.39 | 0 | 0 | 100 | 100 | 90.2 | 74.1 |
| 7/31/2015 | 10.4 | 4 | 7.5 | 7.3 | 0.07 | 0.22 | 0.3 | 0.39 | 0.009 | 0.03 | 19.8 | 2 | 0.65 | 2 | 0.3 | 0.32 | 1 | 98 | 99 | 110 | 102 |
| 8/31/2015 | 8.61 | 2 | 7.4 | 7.3 | 0.07 | 0.25 | 0.3 | 0.38 | 0.01 | 0.06 | 20.4 | 0 | 0.63 | 2 | 0.3 | 0.31 | 1 | 97.3 | 99.5 | 76 | 226 |
| 9/30/2015 | 0.09 | 0 | 7.4 | 7.2 | 0 | 0 | 0.3 | 0.028 | 0.23 | 1 | 17.4 | 0 | 0 | 0 | 0.29 | 0.17 | 0.75 | 100 | 98.9 | 92 | 92 |
| 10/31/2015 | 0 | 0 | 7.4 | 6.8 | 0 | 0 | 0.2 | 0.026 | 0.21 | 1 | 15.8 | 0 | 0 | 0 | 0.22 | 0.16 | 0.75 | 100 | 99 | 55 | 62 |
| 11/30/2015 | 0 | 26 | 7 | 6.8 | 0.021 | 0.13 | 0.2 | 0.02 | 0.005 | 0.03 | 12.8 | 5 | 0.166 | 1 | 0.13 | 0.041 | 0.25 | 95 | 96 | 70 | 28 |
| 12/31/2015 | 0 | 0 | 7.1 | 6.7 | 0.129 | 0.43 | 0.3 | 0.036 | 0 | 0 | 10.3 | 0 | 0.975 | 3.25 | 0.13 | 0 | 0 | 96 | 100 | 88 | 49 |
| 1/31/2016 | 0.089 | 1 | 7.2 | 6.8 | 0.24 | 0.46 | 0.2 | 0.064 | 0 | 0 | 9.4 | 0 | 1.8 | 3.5 | 0.3 | 0 | 0 | 96.2 | 100 | 87 | 27 |
| 2/29/2016 | 0 | 1 | 7.3 | 7.1 | 0.22 | 0.44 | 0.3 | 0.06 | 0.03 | 0.06 | 8.8 | 0 | 1.5 | 3 | 0.3 | 0.5 | 1 | 93.18 | 94.7 | 44 | 19 |
| 3/31/2016 | 0 | 0 | 7.3 | 7.1 | 0.22 | 0.43 | 0.2 | 0.06 | 0.1 | 0.2 | 9.3 | 0 | 1.5 | 3 | 0.2 | 0.5 | 1 | 96 | 96 | 64 | 26 |
| 4/30/2016 | 0 | 0 | 7.4 | 7.1 | 0.13 | 0.43 | 0.01 | 0.036 | 0.03 | 0.1 | 11.3 | 0 | 0.9 | 3 | 0.2 | 0.3 | 1 | 95 | 97 | 71 | 38 |
| 5/31/2016 | 0.094 | 0 | 7.2 | 6.7 | 1.68 | 0.2 | 0.15 | 1.01 | 0.5 | 0.06 | 14.8 | 0 | 12.6 | 1.5 | 0.2 | 16.8 | 2 | 94 | 98 | 2 | 75 |
| 6/30/2016 | 0.096 | 0 | 7 | 6.9 | 0.02 | 0.1 | 0.01 | 0.032 | 0.05 | 0.2 | 17.3 | 0 | 0.8 | 3 | 0.2 | 0.53 | 2 | 97 | 96 | 101 | 51 |
| 7/31/2016 | 0 | 0 | 7 | 6.9 | 0 | 0 | 0.2 | 0.04 | 0 | 0 | 18.8 | 0 | 0 | 0 | 0.2 | 0 | 0 | 100 | 100 | 121 | 157 |
| 8/31/2016 | 0 | 0 | 7.2 | 6.9 | 0 | 0 | 0.2 | 0.04 | 0.33 | 1 | 19.6 | 0 | 0 | 0 | 0.2 | 0.41 | 1.25 | 100 | 99 | 136 | 168 |
| 9/30/2016 | 0 | 1 | 7.2 | 7 | 0 | 0 | 0.2 | 0.032 | 0.25 | 1 | 18.1 | 1 | 0 | 0 | 0.2 | 0.25 | 1 | 100 | 98 | 79 | 91 |
| 10/31/2016 | 0.132 | 0 | 7.3 | 7 | 0 | 0 | 0.2 | 0.038 | 0 | 0 | 15 | 0 | 0 | 0 | 0.2 | 0 | 0 | 100 | 100 | 66 | 51 |
| 11/30/2016 | 0 | 2 | 7.3 | 7.1 | 0 | 0 | 0.01 | 0.052 | 0 | 0 | 13.3 | 1 | 0 | 0 | 0.2 | 0 | 0 | 100 | 100 | 46 | 31 |
| 12/31/2016 | 0 | 0 | 7.4 | 6.8 | 0 | 0 | 0.2 | 0.044 | 0 | 0 | 9.7 | 0 | 0 | 0 | 0.2 | 0 | 0 | 100 | 100 | 70 | 36 |
| 1/31/2017 | 0.122 | 0 | 7 | 6.7 | 0 | 0 | 0.2 | 0.036 | 0.3 | 1 | 8.4 | 0 | 0 | 0 | 0.2 | 0.3 | 1 | 100 | 97 | 79 | 37 |
| 2/28/2017 | 0 | 6 | 7.5 | 7 | 0 | 0 | 0.2 | 0.72 | 0 | 0 | 8.2 | 2 | 0 | 0 | 0.2 | 0 | 0 | 100 | 100 | 56 | 21 |
| 3/31/2017 | 0 | 1 | 7.3 | 6.9 | 0 | 0 | 0.2 | 0.108 | 0 | 0 | 7.7 | 0 | 0 | 0 | 0.2 | 0 | 0 | 100 | 100 | 33 | 19 |
| 4/30/2017 | 0 | 0 | 7.5 | 7 | 0 | 0 | 0.2 | 59931 | 0 | 0 | 9.2 | 0 | 0 | 0 | 0.2 | 0 | 0 | 100 | 100 | 49 | 26 |
| 5/31/2017 | 0 | 2 | 7.2 | 7 | 0 | 0 | 0.2 | 0.043 | 0.02 | 0.5 | 11.6 | 1 | 0 | 0 | 0.2 | 0.04 | 1 | 100 | 98 | 96 | 52 |
| 6/30/2017 | 0 | 3 | 7.2 | 7 | 0 | 0 | 0.05 | 0.041 | 0.17 | 0.5 | 15 | 1 | 0 | 0 | 0.2 | 0.34 | 1 | 100 | 98 | 89 | 69 |
| Average | 0.559810811 | 10.77868852 | 7.242622951 | 6.929508197 | 1.226229508 | 1.542459016 | 0.26852459 | 982.6205259 | 1.102360656 | 1.40557377 | 13.29836066 | 3.032786885 | 1.23804918 | 2.430327869 | 0.338688525 | 1.079360656 | 2.12295082 | 98.14229508 | 96.80491803 | 101.8885246 | 59.70655738 |
| Minimum | 0 | 0 | 6.8 | 6.5 | 0 | 0 | 0.01 | 0.02 | 0 | 0 | 7.3 | 0 | 0 | 0 | 0.13 | 0 | 0 | 93 | 79 | 2 | 17 |
| Maximum | 10.4 | 130 | 7.6 | 7.4 | 10 | 10 | 0.5 | 59931 | 7 | 8 | 21 | 26 | 12.6 | 14 | 0.6 | 16.8 | 10 | 100 | 100 | 213 | 226 |
| Count | 37 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 |
| Std Dev | 2.17885932 | 23.90197422 | 0.200382149 | 0.234054312 | 2.277787723 | 2.418703961 | 0.094812729 | 7673.359364 | 1.832689581 | 1.742071109 | 4.411896486 | 5.009880947 | 2.19183663 | 3.470750143 | 0.120491707 | 2.385700792 | 2.878303519 | 1.982117045 | 4.018350666 | 46.48718138 | 38.28349457 |
| CV | 3.892135124 | 2.217521563 | 0.027667069 | 0.033776468 | 1.85755416 | 1.568083129 | 0.353087696 | 7.809077016 | 1.662513599 | 1.239402119 | 0.331762433 | 1.651906691 | 1.770395446 | 1.428099553 | 0.355759637 | 2.210290674 | 1.355803202 | 0.020196359 | 0.041509778 | 0.45625532 | 0.641194138 |
| 95th Percer | 1.9084 | 79 | 7.5 | 7.3 | 6 | 6 | 0.4 | 0.66433 | 5 | 5 | 20.1 | 9 | 4 | 8 | 0.5 | 4 | 9 | 100 | 100 | 190 | 153 |
| 5th Percent | 0 | 0 | 6.9 | 6.5 | 0 | 0 | 0.05 | 0.029319 | 0 | 0 | 7.7 | 0 | 0 | 0 | 0.2 | 0 | 0 | 94 | 91 | 41 | 19 |

## B. Receiving Water Data

| Date | Parameter | Result | Units | Date | Parameter | Result | Units | Date | Parameter | Result | Units | Date | Parameter | Result | Units | Date | Parameter | Result | Units |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11/7/1994 | Hardness, Ca, Mg | 82.2 | mg/l CaCO3 | 10/18/1988 | Ammonia | 0.009 | mg/L as N | 11/26/1990 | pH | 7.9 | std units | 10/7/1975 | Temperature | 13.5 | C | 3/19/1990 | Temperature | 4 | C |
| 9/14/1993 | Hardness, Ca, Mg | 79.3 | mg/l CaCO3 | 11/1/1988 | Ammonia | 0.011 | mg/L as N | 11/26/1990 | pH | 8.2 | std units | 10/20/1975 | Temperature | 11.8 | C | 4/2/1990 | Temperature | 9 | C |
| 3/10/1993 | Hardness, Ca, Mg | 83 | mg/l CaCO3 | 11/14/1988 | Ammonia | 0.034 | mg/L as N | 1/9/1991 | pH | 8.1 | std units | 11/10/1975 | Temperature | 9.7 | C | 4/9/1990 | Temperature | 8 | C |
| 5/12/1993 | Hardness, Ca, Mg | 68.1 | mg/l CaCO3 | 11/28/1988 | Ammonia | 0.009 | mg/L as N | 3/15/1991 | pH | 8 | std units | 11/17/1975 | Temperature | 6.5 | C | 4/13/1990 | Temperature | 8.5 | C |
| 9/17/1991 | Hardness, Ca, Mg | 78 | mg/l CaCO3 | 12/13/1988 | Ammonia | 0.006 | mg/L as N | 3/15/1991 | pH | 8.1 | std units | 12/8/1975 | Temperature | 5.1 | C | 4/16/1990 | Temperature | 11 | C |
| 3/15/1991 | Hardness, Ca, Mg | 81.8 | mg/l CaCO3 | 12/28/1988 | Ammonia | 0.015 | mg/L as N | 5/14/1991 | pH | 8.2 | std units | 12/15/1975 | Temperature | 4.4 | C | 4/23/1990 | Temperature | 9 | C |
| 5/14/1991 | Hardness, Ca, Mg | 71 | mg/l CaCO3 | 1/10/1989 | Ammonia | 0.006 | mg/L as N | 5/14/1991 | pH | 8.1 | std units | 1/5/1976 | Temperature | 3.4 | C | 4/30/1990 | Temperature | 10.5 | C |
| 11/23/1992 | Hardness, Ca, Mg | 76 | mg/l CaCO3 | 1/23/1989 | Ammonia | 0.041 | mg/L as N | 7/24/1991 | pH | 8.2 | std units | 1/20/1976 | Temperature | 4.5 | C | 5/7/1990 | Temperature | 12 | C |
| 9/6/1995 | Hardness, Ca, Mg | 80.5 | mg/l CaCO3 | 2/6/1989 | Ammonia | 0.022 | mg/L as N | 9/17/1991 | pH | 8.3 | std units | 2/2/1976 | Temperature | 3 | C | 5/14/1990 | Temperature | 10 | C |
| 5/4/1995 | Hardness, Ca, Mg | 71 | mg/l CaCO3 | 2/21/1989 | Ammonia | 0.01 | mg/L as N | 9/17/1991 | pH | 8.2 | std units | 2/23/1976 | Temperature | 2.9 | C | 5/21/1990 | Temperature | 10 | C |
| 3/28/1995 | Hardness, Ca, Mg | 71.4 | mg/l CaCO3 | 3/20/1989 | Ammonia | 0.017 | mg/L as N | 1/14/1992 | pH | 8.1 | std units | 3/8/1976 | Temperature | 2 | C | 5/30/1990 | Temperature | 12 | C |
| 11/26/1990 | Hardness, Ca, Mg | 82.2 | mg/l CaCO3 | 4/4/1989 | Ammonia | 0.044 | mg/L as N | 11/23/1992 | pH | 8.5 | std units | 3/22/1976 | Temperature | 2.4 | C | 6/1/1990 | Temperature | 11 | C |
| | | | | 4/10/1989 | Ammonia | 0.033 | mg/L as N | 11/23/1992 | pH | 8.1 | std units | 4/12/1976 | Temperature | 7.1 | C | 6/4/1990 | Temperature | 13 | C |
| | | | | 4/17/1989 | Ammonia | 0.017 | mg/L as N | 1/14/1993 | pH | 8.1 | std units | 4/26/1976 | Temperature | 6.9 | C | 6/11/1990 | Temperature | 12 | C |
| | | | | 4/25/1989 | Ammonia | 0.061 | mg/L as N | 3/10/1993 | pH | 8.3 | std units | 5/10/1976 | Temperature | 9.5 | C | 6/18/1990 | Temperature | 13 | C |
| | | | | 5/1/1989 | Ammonia | 0.011 | mg/L as N | 3/10/1993 | pH | 8.1 | std units | 5/24/1976 | Temperature | 11 | C | 6/25/1990 | Temperature | 18.5 | C |
| | | | | 5/8/1989 | Ammonia | 0.015 | mg/L as N | 5/12/1993 | pH | 8.2 | std units | 6/7/1976 | Temperature | 14.5 | C | 7/9/1990 | Temperature | 17.5 | C |
| | | | | 5/15/1989 | Ammonia | 0.022 | mg/L as N | 5/12/1993 | pH | 8 | std units | 6/22/1976 | Temperature | 13 | C | 7/23/1990 | Temperature | 21.5 | C |
| | | | | 5/22/1989 | Ammonia | 0.022 | mg/L as N | 7/9/1993 | pH | 8.2 | std units | 7/12/1976 | Temperature | 17.2 | C | 8/7/1990 | Temperature | 23 | C |
| | | | | 5/30/1989 | Ammonia | 0.013 | mg/L as N | 9/14/1993 | pH | 8.1 | std units | 7/26/1976 | Temperature | 21 | C | 8/13/1990 | Temperature | 21 | C |
| | | | | 6/5/1989 | Ammonia | 0.026 | mg/L as N | 9/14/1993 | pH | 7.9 | std units | 8/9/1976 | Temperature | 20 | C | 8/20/1990 | Temperature | 21 | C |
| | | | | 6/12/1989 | Ammonia | 0.022 | mg/L as N | 11/7/1994 | pH | 8.3 | std units | 8/23/1976 | Temperature | 18.8 | C | 9/4/1990 | Temperature | 18.5 | C |
| | | | | 6/19/1989 | Ammonia | 0.018 | mg/L as N | 11/7/1994 | pH | 7.8 | std units | 9/13/1976 | Temperature | 16.4 | C | 9/17/1990 | Temperature | 21 | C |
| | | | | 6/26/1989 | Ammonia | 0.01 | mg/L as N | 1/13/1995 | pH | 7.8 | std units | 9/27/1976 | Temperature | 17.5 | C | 9/26/1990 | Temperature | 19 | C |
| | | | | 7/11/1989 | Ammonia | 0.009 | mg/L as N | 3/28/1995 | pH | 7.8 | std units | 11/18/1976 | Temperature | 4.5 | C | 10/15/1990 | Temperature | 10 | C |
| | | | | 8/7/1989 | Ammonia | 0.037 | mg/L as N | 3/28/1995 | pH | 7.8 | std units | 1/6/1977 | Temperature | 0 | C | 10/29/1990 | Temperature | 10 | C |
| | | | | 8/21/1989 | Ammonia | 0.057 | mg/L as N | 5/4/1995 | pH | 7.8 | std units | 3/2/1977 | Temperature | 2.5 | C | 11/15/1990 | Temperature | 8.2 | C |
| | | | | 9/5/1989 | Ammonia | 0.011 | mg/L as N | 5/4/1995 | pH | 8 | std units | 4/11/1977 | Temperature | 9.5 | C | 11/26/1990 | Temperature | 6.5 | C |
| | | | | 9/19/1989 | Ammonia | 0.006 | mg/L as N | 7/11/1995 | pH | 8.4 | std units | 4/14/1977 | Temperature | 12 | C | 12/10/1990 | Temperature | 4.5 | C |
| | | | | 10/5/1989 | Ammonia | 0.013 | mg/L as N | 9/6/1995 | pH | 8.4 | std units | 6/1/1977 | Temperature | 13.5 | C | 12/26/1990 | Temperature | 0 | C |
| | | | | 10/17/1989 | Ammonia | 0.014 | mg/L as N | 9/6/1995 | pH | 7.9 | std units | 7/22/1977 | Temperature | 23 | C | 1/9/1991 | Temperature | 0 | C |
| | | | | 10/30/1989 | Ammonia | 0.013 | mg/L as N | | | | | 11/3/1977 | Temperature | 8.5 | C | 1/23/1991 | Temperature | 2.5 | C |
| | | | | 11/13/1989 | Ammonia | 0.027 | mg/L as N | | | | | 12/22/1977 | Temperature | 2.5 | C | 2/4/1991 | Temperature | 3 | C |
| | | | | 11/27/1989 | Ammonia | 0.001 | mg/L as N | | | | | 2/15/1978 | Temperature | 0.5 | C | 2/19/1991 | Temperature | 4 | C |
| | | | | 12/11/1989 | Ammonia | 0.023 | mg/L as N | | | | | 4/5/1978 | Temperature | 6 | C | 3/15/1991 | Temperature | 2.5 | C |
| | | | | 12/26/1989 | Ammonia | 0.029 | mg/L as N | | | | | 5/15/1978 | Temperature | 10.5 | C | 4/1/1991 | Temperature | 6.5 | C |
| | | | | 1/2/1990 | Ammonia | 0.016 | mg/L as N | | | | | 7/20/1978 | Temperature | 16 | C | 4/8/1991 | Temperature | 7.5 | C |
| | | | | 1/22/1990 | Ammonia | 0.016 | mg/L as N | | | | | 8/30/1978 | Temperature | 17.5 | C | 4/14/1991 | Temperature | 3 | C |
| | | | | 2/5/1990 | Ammonia | 0.015 | mg/L as N | | | | | 10/13/1978 | Temperature | 11 | C | 4/15/1991 | Temperature | 6.5 | C |
| | | | | 2/20/1990 | Ammonia | 0.001 | mg/L as N | | | | | 11/28/1978 | Temperature | 3 | C | 4/23/1991 | Temperature | 4 | C |
| | | | | 3/5/1990 | Ammonia | 0.068 | mg/L as N | | | | | 3/7/1979 | Temperature | 3 | C | 5/1/1991 | Temperature | 8.6 | C |
| | | | | 3/19/1990 | Ammonia | 0.14 | mg/L as N | | | | | 4/12/1979 | Temperature | 7.5 | C | 5/7/1991 | Temperature | 9 | C |
| | | | | 4/2/1990 | Ammonia | 0.005 | mg/L as N | | | | | 6/20/1979 | Temperature | 13.5 | C | 5/14/1991 | Temperature | 9.8 | C |
| | | | | 4/9/1990 | Ammonia | 0.015 | mg/L as N | | | | | 8/31/1979 | Temperature | 20.5 | C | 5/21/1991 | Temperature | 10.2 | C |
| | | | | 4/13/1990 | Ammonia | 0.021 | mg/L as N | | | | | 10/30/1979 | Temperature | 9.5 | C | 5/28/1991 | Temperature | 11.5 | C |
| | | | | 4/16/1990 | Ammonia | 0.005 | mg/L as N | | | | | 12/12/1979 | Temperature | 3 | C | 5/31/1991 | Temperature | 12 | C |
| | | | | 4/23/1990 | Ammonia | 0.005 | mg/L as N | | | | | 2/6/1980 | Temperature | 0.5 | C | 6/10/1991 | Temperature | 14.5 | C |
| | | | | 4/30/1990 | Ammonia | 0.029 | mg/L as N | | | | | 4/17/1980 | Temperature | 16 | C | 6/18/1991 | Temperature | 12.6 | C |
| | | | | 5/7/1990 | Ammonia | 0.019 | mg/L as N | | | | | 6/6/1980 | Temperature | 13.5 | C | 6/24/1991 | Temperature | 14.5 | C |
| | | | | 5/14/1990 | Ammonia | 0.014 | mg/L as N | | | | | 7/31/1980 | Temperature | 22 | C | 7/8/1991 | Temperature | 21 | C |
| | | | | 5/21/1990 | Ammonia | 0.012 | mg/L as N | | | | | 12/9/1980 | Temperature | 2.5 | C | 7/24/1991 | Temperature | 20.5 | C |
| | | | | 5/30/1990 | Ammonia | 0.005 | mg/L as N | | | | | 2/12/1981 | Temperature | 1.5 | C | 8/5/1991 | Temperature | 20.5 | C |
| | | | | 6/4/1990 | Ammonia | 0.014 | mg/L as N | | | | | 5/27/1981 | Temperature | 11.5 | C | 8/19/1991 | Temperature | 20.8 | C |
| | | | | 6/11/1990 | Ammonia | 0.005 | mg/L as N | | | | | 7/22/1981 | Temperature | 22 | C | 9/3/1991 | Temperature | 21 | C |
| | | | | 6/18/1990 | Ammonia | 0.023 | mg/L as N | | | | | 11/12/1981 | Temperature | 9 | C | 9/17/1991 | Temperature | 18.5 | C |
| | | | | 6/25/1990 | Ammonia | 0.032 | mg/L as N | | | | | 6/3/1982 | Temperature | 11.5 | C | 9/30/1991 | Temperature | 16 | C |
| | | | | 7/9/1990 | Ammonia | 0.005 | mg/L as N | | | | | 8/6/1982 | Temperature | 20 | C | 10/15/1991 | Temperature | 14 | C |
| | | | | 7/23/1990 | Ammonia | 0.015 | mg/L as N | | | | | 10/25/1982 | Temperature | 11 | C | 11/12/1991 | Temperature | 6.8 | C |
| | | | | 8/13/1990 | Ammonia | 0.006 | mg/L as N | | | | | 12/16/1982 | Temperature | 2 | C | 11/26/1991 | Temperature | 5.6 | C |
| | | | | 8/20/1990 | Ammonia | 0.107 | mg/L as N | | | | | 2/16/1983 | Temperature | 5.5 | C | 12/9/1991 | Temperature | 5 | C |
| | | | | 9/4/1990 | Ammonia | 0.027 | mg/L as N | | | | | 4/6/1983 | Temperature | 5.5 | C | 12/23/1991 | Temperature | 1.5 | C |
| | | | | 9/17/1990 | Ammonia | 0.023 | mg/L as N | | | | | 6/7/1983 | Temperature | 15.5 | C | 1/6/1992 | Temperature | 3 | C |
| | | | | 10/15/1990 | Ammonia | 0.018 | mg/L as N | | | | | 7/29/1983 | Temperature | 19 | C | 1/7/1992 | Temperature | 3 | C |
| | | | | 10/29/1990 | Ammonia | 0.009 | mg/L as N | | | | | 10/4/1983 | Temperature | 13.5 | C | 1/14/1992 | Temperature | 1 | C |
| | | | | 11/15/1990 | Ammonia | 0.004 | mg/L as N | | | | | 2/1/1984 | Temperature | 2 | C | 1/21/1992 | Temperature | 1.5 | C |
| | | | | 11/26/1990 | Ammonia | 0.013 | mg/L as N | | | | | 4/4/1984 | Temperature | 7.5 | C | 2/3/1992 | Temperature | 4 | C |
| | | | | 11/26/1990 | Ammonia | 0.03 | mg/L as N | | | | | 6/6/1984 | Temperature | 12 | C | 2/18/1992 | Temperature | 5 | C |
| | | | | 12/10/1990 | Ammonia | 0.056 | mg/L as N | | | | | 8/15/1984 | Temperature | 21.5 | C | 3/2/1992 | Temperature | 7.5 | C |
| | | | | 12/26/1990 | Ammonia | 0.033 | mg/L as N | | | | | 10/12/1984 | Temperature | 12.5 | C | 3/30/1992 | Temperature | 6.7 | C |
| | | | | 1/9/1991 | Ammonia | 0.007 | mg/L as N | | | | | 12/6/1984 | Temperature | 0.5 | C | 4/27/1992 | Temperature | 11 | C |
| | | | | 1/9/1991 | Ammonia | 0.02 | mg/L as N | | | | | 5/22/1985 | Temperature | 13.5 | C | 5/11/1992 | Temperature | 8 | C |
| | | | | 1/23/1991 | Ammonia | 0.008 | mg/L as N | | | | | 7/23/1985 | Temperature | 22 | C | 5/26/1992 | Temperature | 15.5 | C |
| | | | | 2/4/1991 | Ammonia | 0.015 | mg/L as N | | | | | 9/18/1985 | Temperature | 13 | C | 6/15/1992 | Temperature | 18.5 | C |
| | | | | 2/19/1991 | Ammonia | 0.042 | mg/L as N | | | | | 11/21/1985 | Temperature | 4 | C | 6/22/1992 | Temperature | 27 | C |
| | | | | 3/15/1991 | Ammonia | 0.01 | mg/L as N | | | | | 1/24/1986 | Temperature | 2.5 | C | 7/28/1992 | Temperature | 18.5 | C |
| | | | | 3/15/1991 | Ammonia | 0.016 | mg/L as N | | | | | 6/10/1986 | Temperature | 16.5 | C | 8/10/1992 | Temperature | 19.2 | C |
| | | | | 4/1/1991 | Ammonia | 0.018 | mg/L as N | | | | | 7/31/1986 | Temperature | 21 | C | 8/21/1992 | Temperature | 11.2 | C |
| | | | | 4/8/1991 | Ammonia | 0.015 | mg/L as N | | | | | 10/24/1986 | Temperature | 11 | C | 8/24/1992 | Temperature | 18 | C |
| | | | | 4/15/1991 | Ammonia | 0.027 | mg/L as N | | | | | 1/8/1987 | Temperature | 2 | C | 9/21/1992 | Temperature | 16 | C |
| | | | | 4/23/1991 | Ammonia | 0.013 | mg/L as N | | | | | 3/20/1987 | Temperature | 8 | C | 10/5/1992 | Temperature | 17 | C |
| | | | | 5/1/1991 | Ammonia | 0.019 | mg/L as N | | | | | 5/14/1987 | Temperature | 13 | C | 10/5/1992 | Temperature | 17 | C |
| | | | | 5/7/1991 | Ammonia | 0.019 | mg/L as N | | | | | 7/8/1987 | Temperature | 23 | C | 10/21/1992 | Temperature | 11.2 | C |
| | | | | 5/14/1991 | Ammonia | 0.01 | mg/L as N | | | | | 9/17/1987 | Temperature | 18.5 | C | 11/2/1992 | Temperature | 9.5 | C |
| | | | | 5/14/1991 | Ammonia | 0.012 | mg/L as N | | | | | 11/19/1987 | Temperature | 7.5 | C | 11/16/1992 | Temperature | 8.5 | C |
| | | | | 5/21/1991 | Ammonia | 0.013 | mg/L as N | | | | | 2/10/1988 | Temperature | 0.5 | C | 11/23/1992 | Temperature | 6 | C |
| | | | | 5/28/1991 | Ammonia | 0.034 | mg/L as N | | | | | 4/6/1988 | Temperature | 6 | C | 11/30/1992 | Temperature | 2.5 | C |
| | | | | 6/3/1991 | Ammonia | 0.057 | mg/L as N | | | | | 6/9/1988 | Temperature | 13 | C | 12/14/1992 | Temperature | 2 | C |
| | | | | 6/10/1991 | Ammonia | 0.003 | mg/L as N | | | | | 8/9/1988 | Temperature | 21 | C | 12/30/1992 | Temperature | 0 | C |
| | | | | 6/18/1991 | Ammonia | 0.008 | mg/L as N | | | | | 10/18/1988 | Temperature | 14 | C | 1/14/1993 | Temperature | 1 | C |
| | | | | 6/24/1991 | Ammonia | 0.009 | mg/L as N | | | | | 11/1/1988 | Temperature | 10.4 | C | 1/25/1993 | Temperature | 7 | C |
| | | | | 7/8/1991 | Ammonia | 0.009 | mg/L as N | | | | | 11/14/1988 | Temperature | 7 | C | 2/9/1993 | Temperature | 4 | C |
| | | | | 7/24/1991 | Ammonia | 0.004 | mg/L as N | | | | | 11/28/1988 | Temperature | 5 | C | 3/10/1993 | Temperature | 2.5 | C |
| | | | | 7/24/1991 | Ammonia | 0.02 | mg/L as N | | | | | 12/13/1988 | Temperature | 4.5 | C | 3/10/1993 | Temperature | 2.5 | C |
| | | | | 8/5/1991 | Ammonia | 0.015 | mg/L as N | | | | | 12/14/1988 | Temperature | 4.5 | C | 4/13/1993 | Temperature | 6.9 | C |
| | | | | 8/19/1991 | Ammonia | 0.002 | mg/L as N | | | | | 12/28/1988 | Temperature | 0.5 | C | 4/20/1993 | Temperature | 7 | C |
| | | | | 9/3/1991 | Ammonia | 0.007 | mg/L as N | | | | | 1/10/1989 | Temperature | 2.5 | C | 5/12/1993 | Temperature | 13.3 | C |
| | | | | 9/17/1991 | Ammonia | 0.01 | mg/L as N | | | | | 1/23/1989 | Temperature | 2 | C | 7/9/1993 | Temperature | 16 | C |
| | | | | 9/17/1991 | Ammonia | 0.034 | mg/L as N | | | | | 2/6/1989 | Temperature | 0 | C | 9/14/1993 | Temperature | 16 | C |
| | | | | 10/15/1991 | Ammonia | 0.008 | mg/L as N | | | | | 2/21/1989 | Temperature | 0.5 | C | 10/14/1993 | Temperature | 14 | C |
| | | | | 10/28/1991 | Ammonia | 0.025 | mg/L as N | | | | | 3/6/1989 | Temperature | 3 | C | 11/29/1993 | Temperature | 1 | C |
| | | | | 11/12/1991 | Ammonia | 0.066 | mg/L as N | | | | | 3/7/1989 | Temperature | 10 | C | 1/11/1994 | Temperature | 4 | C |
| | | | | 11/26/1991 | Ammonia | 0.002 | mg/L as N | | | | | 3/20/1989 | Temperature | 6 | C | 2/23/1994 | Temperature | 4 | C |
| | | | | 12/9/1991 | Ammonia | 0.011 | mg/L as N | | | | | 4/4/1989 | Temperature | 5 | C | 11/7/1994 | Temperature | 5.5 | C |
| | | | | 12/23/1991 | Ammonia | 0.013 | mg/L as N | | | | | 4/10/1989 | Temperature | 7 | C | 1/13/1995 | Temperature | 0.9 | C |
| | | | | 1/6/1992 | Ammonia | 0.002 | mg/L as N | | | | | 4/17/1989 | Temperature | 8.5 | C | 3/28/1995 | Temperature | 5.3 | C |
| | | | | 1/21/1992 | Ammonia | 0.012 | mg/L as N | | | | | 4/25/1989 | Temperature | 9 | C | 5/4/1995 | Temperature | 9 | C |
| | | | | 2/3/1992 | Ammonia | 0.009 | mg/L as N | | | | | 5/1/1989 | Temperature | 11 | C | 7/11/1995 | Temperature | 19.2 | C |
| | | | | 2/18/1992 | Ammonia | 0.008 | mg/L as N | | | | | 5/8/1989 | Temperature | 9 | C | 9/6/1995 | Temperature | 19.5 | C |
| | | | | 3/19/1992 | Ammonia | 0.002 | mg/L as N | | | | | 5/15/1989 | Temperature | 12 | C | 10/3/1995 | Temperature | 16.5 | C |
| | | | | 3/30/1992 | Ammonia | 0.003 | mg/L as N | | | | | 5/22/1989 | Temperature | 10 | C | 11/9/1995 | Temperature | 8 | C |
| | | | | 4/6/1992 | Ammonia | 0.008 | mg/L as N | | | | | 5/30/1989 | Temperature | 11.5 | C | 2/21/1996 | Temperature | 3 | C |
| | | | | 4/20/1992 | Ammonia | 0.008 | mg/L as N | | | | | 6/5/1989 | Temperature | 15 | C | 4/23/1996 | Temperature | 7 | C |
| | | | | 4/27/1992 | Ammonia | 0.012 | mg/L as N | | | | | 6/12/1989 | Temperature | 16 | C | 6/7/1996 | Temperature | 13 | C |
| | | | | 5/4/1992 | Ammonia | 0.005 | mg/L as N | | | | | 6/19/1989 | Temperature | 16 | C | 8/22/1996 | Temperature | 19.5 | C |
| | | | | 5/11/1992 | Ammonia | 0.002 | mg/L as N | | | | | 6/26/1989 | Temperature | 18 | C | | | | |
| | | | | 5/18/1992 | Ammonia | 0.002 | mg/L as N | | | | | 7/11/1989 | Temperature | 20 | C | | | | |
| | | | | 6/1/1992 | Ammonia | 0.011 | mg/L as N | | | | | 7/24/1989 | Temperature | 21 | C | | | | |
| | | | | 6/15/1992 | Ammonia | 0.002 | mg/L as N | | | | | 8/7/1989 | Temperature | 21 | C | | | | |
| | | | | 6/22/1992 | Ammonia | 0.004 | mg/L as N | | | | | 8/21/1989 | Temperature | 19 | C | | | | |
| | | | | 6/29/1992 | Ammonia | 0.004 | mg/L as N | | | | | 9/5/1989 | Temperature | 20 | C | | | | |
| | | | | 7/13/1992 | Ammonia | 0.005 | mg/L as N | | | | | 9/19/1989 | Temperature | 21 | C | | | | |
| | | | | 7/28/1992 | Ammonia | 0.018 | mg/L as N | | | | | 10/3/1989 | Temperature | 15 | C | | | | |
| | | | | 8/10/1992 | Ammonia | 0.002 | mg/L as N | | | | | 10/5/1989 | Temperature | 15 | C | | | | |
| | | | | 8/24/1992 | Ammonia | 0.007 | mg/L as N | | | | | 10/17/1989 | Temperature | 11 | C | | | | |
| | | | | 9/8/1992 | Ammonia | 0.016 | mg/L as N | | | | | 10/30/1989 | Temperature | 10 | C | | | | |
| | | | | 9/21/1992 | Ammonia | 0.016 | mg/L as N | | | | | 11/13/1989 | Temperature | 8 | C | | | | |
| | | | | 10/5/1992 | Ammonia | 0.01 | mg/L as N | | | | | 11/27/1989 | Temperature | 6 | C | | | | |
| | | | | 10/21/1992 | Ammonia | 0.007 | mg/L as N | | | | | 12/11/1989 | Temperature | 5 | C | | | | |
| | | | | 11/2/1992 | Ammonia | 0.003 | mg/L as N | | | | | 12/26/1989 | Temperature | 4 | C | | | | |
| | | | | 11/16/1992 | Ammonia | 0.02 | mg/L as N | | | | | 1/2/1990 | Temperature | 4 | C | | | | |
| | | | | 11/23/1992 | Ammonia | 0.01 | mg/L as N | | | | | 1/22/1990 | Temperature | 2 | C | | | | |
| | | | | 11/30/1992 | Ammonia | 0.026 | mg/L as N | | | | | 2/5/1990 | Temperature | 2 | C | | | | |
| | | | | 12/14/1992 | Ammonia | 0.002 | mg/L as N | | | | | 3/5/1990 | Temperature | 4 | C | | | | |

Surface Water Data obtained from USGS Gauging Station 12395500.

# Appendix C. Reasonable Potential and Water Quality-Based Effluent Limit Formulae

## A. 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 water quality-based effluent limit must be included in the permit.

### *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 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 (Ce) 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,

$\sigma^2$ = $\ln(CV^2 + 1)$
$Z_{99}$ = 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.

***Reasonable Potential***

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.

**B. WQBEL Calculations**

***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. 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 6 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 __. As discussed in Appendix ___, the criteria translator (CT) is equal to the conversion factor, because site-specific translators are not available for this discharge.

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

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):

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

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

where,

$\sigma^2$ = $\ln(CV^2 + 1)$

$Z_{99}$ = 2.326 (z-score for the 99th percentile probability basis)
CV = coefficient of variation (standard deviation ÷ mean)
$\sigma_4^2$ = $\ln(CV^2/4 + 1)$

For ammonia, because the chronic criterion is based on a 30-day averaging period, the Chronic Long Term Average (LTAc) is calculated as follows:

$$LTA_c = WLA_c \times e^{(0.5\sigma_{30}^2 - z\sigma_{30})} \quad \text{Equation 15}$$

where,

$\sigma_{30}^2$ = $\ln(CV^2/30 + 1)$

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:

$$MDL = LTA \times e^{(z_m\sigma - 0.5\sigma^2)} \quad \text{Equation 16}$$

$$AML = LTA \times e^{(z_a\sigma_n - 0.5\sigma_n^2)} \quad \text{Equation 17}$$

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

$\sigma_n^2$ = $\ln(CV^2/n + 1$
$z_a$ = 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. For ammonia, In the case 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 30.

## C. 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.<br>2. The 1B3 is biologically based and indicates an allowable exceedence of once every 3 years.<br>3. The 7Q10 represents lowest average 7 consecutive day flow with an average recurrence frequency of once in 10 years.<br>4. The 4B3 is biologically based and indicates an allowable exceedance for 4 consecutive days once every 3 years.<br>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. Reasonable Potential and Water Quality-Based Effluent Limit Calculations

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

| | |
|---|---|
| **Facility Name** | City of Dover WWTP |
| **Facility Flow (mgd)** | 0.18 |
| **Facility Flow (cfs)** | 0.28 |

| **Critical River Flows** | (IDAPA 58.01.02 03. b) | Annual Crit. Flows | Seasonal Low Flow | Seasonal High Flow | Annual Crit. Flows |
|---|---|---|---|---|---|
| Aquatic Life - Acute Criteria - Criterion Max. Concentration (CMC) | **1Q10** | 3020 | 3020 | 6413 | 3,020.0 |
| Aquatic Life - Chronic Criteria - Criterion Continuous Concentration (CCC) | **7Q10 or 4B3** | 3326 | 3326 | 6956 | 3,326.0 |
| Ammonia | **30B3/30Q10** (seasonal) | 5650 | 5650 | 10723 | 5,650.0 |
| Human Health - Non-Carcinogen | **30Q5** | 5650 | 5650 | 6413 | 5,650.0 |
| Human Health - carcinogen | **Harmonic Mean Flow** | 16498 | 11980 | 30243 | 16,498.0 |

| **Receiving Water Data** | | Notes: | Annual Crit. Flows | Seasonal Low Flow | Seasonal High Flow |
|---|---|---|---|---|---|
| Hardness, as mg/L $CaCO_3$ | = 70 mg/L | 5th % at critical flows | | | |
| Temperature, °C | Temperature, °C | 95th percentile | 21 | 21 | 22 |
| pH, S.U. | pH, S.U. | 95th percentile | 8.4 | 8.4 | 8.3 |

| Pollutants of Concern | | | AMMONIA, default: cold water, fish early life stages | AMMONIA, default: cold water, fish early life stages | AMMONIA, default: cold water, fish early life stages | CHLORINE (Total Residual) |
|---|---|---|---|---|---|---|
| Effluent Data | **Number of Samples in Data Set (n)** | | 37 | 26 | 11 | 61 |
| | **Coefficient of Variation (CV) = Std. Dev./Mean (default CV = 0.6)** | | 1.06 | 4.51 | 3.11 | 0.36 |
| | **Effluent Concentration, µg/L (Max. or 95th Percentile) - ($C_e$)** | | 1,900 | 207 | 5,284 | 500 |
| | **Calculated 50th % Effluent Conc. (when n>10), Human Health Only** | | | | | |
| Receiving Water Data | **90th Percentile Conc., µg/L - ($C_u$)** | | 34 | 34 | 34 | 0 |
| | **Geometric Mean, µg/L, Human Health Criteria Only** | | | | | |
| Applicable Water Quality Criteria | Aquatic Life Criteria, µg/L | Acute | 2,593.359 | 2,593.359 | 3,149.089 | 19 |
| | Aquatic Life Criteria, µg/L | Chronic | 849.269 | 849.269 | 940.802 | 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** | 5% | 5% | 5% | 5% |
| | Aquatic Life - Chronic | 7Q10 or 4B3 | -- | -- | -- | 5% |
| | Ammonia | 30B3 or 30Q10 | 5% | 5% | 5% | 5% |
| | Human Health - Non-Carcinogen | 30Q5 | -- | -- | -- | 5% |
| | Human Health - carcinogen | Harmonic Mean | -- | -- | -- | 5% |
| Calculated Dilution Factors (DF) (or enter Modeled DFs) | Aquatic Life - Acute | 1Q10 | 543.3 | 543.3 | 1,152.5 | 543.3 |
| | Aquatic Life - Chronic | 7Q10 or 4B3 | | | | 598.2 |
| | Ammonia - Chronic | 30B3 or 30Q10 | 1,015.5 | 1,015.5 | 1,926.4 | 1,015.5 |
| | Human Health - Non-Carcinogen | 30Q5 | | | | 1,015.5 |
| | Human Health - carcinogen | Harmonic Mean | | | | 2,963.4 |

## Aquatic Life Reasonable Potential Analysis

| | | | | | | |
|---|---|---|---|---|---|---|
| σ | $\sigma^2=\ln(CV^2+1)$ | | 0.868 | 1.749 | 1.539 | 0.349 |
| $P_n$ | $=(1\text{-confidence level})^{1/n}$, where confidence level = | **99%** | 0.883 | 0.838 | 0.658 | 0.927 |
| Multiplier (TSD p. 57) | $=\exp(z\sigma-0.5\sigma^2)/\exp[\text{normsinv}(P_n)\sigma-0.5\sigma^2]$, where | **99%** | 2.7 | 10.5 | 19.2 | 1.4 |
| Statistically projected critical discharge concentration ($C_e$) | | | 5093.83 | 2163.36 | 101318.49 | 677.55 |
| Predicted max. conc.(ug/L) at Edge-of-Mixing Zone | | Acute | 43.31 | 37.92 | 121.88 | 1.25 |
| (note: for metals, concentration as dissolved using conversion factor as translator) | | Chronic | 38.98 | 36.10 | 86.58 | 1.13 |
| Reasonable Potential to exceed Aquatic Life Criteria | | | **NO** | **NO** | **NO** | **NO** |

## Aquatic Life Effluent Limit Calculations

| | | | | | | |
|---|---|---|---|---|---|---|
| **Number of Compliance Samples Expected per month (n)** | | | | | | |
| n used to calculate AML (if chronic is limiting then use min=4 or for ammonia min=30) | | | -- | -- | -- | -- |
| LTA Coeff. Var. (CV), decimal | (Use CV of data set or default = 0.6) | | -- | -- | -- | -- |
| Permit Limit Coeff. Var. (CV), decimal | (Use CV from data set or default = 0.6) | | -- | -- | -- | -- |
| Acute WLA, ug/L | $C_d$ = (Acute Criteria x $MZ_a$) - $C_u$ x ($MZ_a$-1) | Acute | -- | -- | -- | -- |
| Chronic WLA, ug/L | $C_d$ = (Chronic Criteria x $MZ_c$) - $C_u$ x ($MZ_c$-1) | Chronic | -- | -- | -- | -- |
| Long Term Ave (LTA), ug/L | WLAc x $\exp(0.5\sigma^2-z\sigma)$, Acute | **99%** | -- | -- | -- | -- |
| (99th % occurrence prob.) | WLAa x $\exp(0.5\sigma^2-z\sigma)$; ammonia n=30, Chronic | **99%** | -- | -- | -- | -- |
| Limiting LTA, ug/L | used as basis for limits calculation | | -- | -- | -- | -- |
| Applicable Metals Criteria Translator (metals limits as total recoverable) | | | -- | -- | -- | -- |
| Average Monthly Limit (AML), ug/L | , where % occurrence prob = | **95%** | -- | -- | -- | -- |
| Maximum Daily Limit (MDL), ug/L | , where % occurrence prob = | **99%** | -- | -- | -- | -- |
| Average Monthly Limit (AML), mg/L | | | -- | -- | -- | -- |
| Maximum Daily Limit (MDL), mg/L | | | -- | -- | -- | -- |
| Average Monthly Limit (AML), lb/day | | | -- | -- | -- | -- |
| Maximum Daily Limit (MDL), lb/day | | | -- | -- | -- | -- |

## Human Health Reasonable Potential Analysis

| | | |
|---|---|---|
| σ | $\sigma^2=\ln(CV^2+1)$ | |
| $P_n$ | $=(1\text{-confidence level})^{1/n}$ where confidence level = | **95%** |
| Multiplier | $=\exp(2.326\sigma-0.5\sigma^2)/\exp[\text{invnorm}(P_N)\sigma-0.5\sigma^2]$, prob. = | **50%** |
| Dilution Factor (for Human Health Criteria) | | |
| Max Conc. at edge of Chronic Zone, ug/L ($C_d$) | | |
| Reasonable Potential to exceed HH Water & Organism | | |
| Reasonable Potential to exceed HH Organism Only | | |

## Human Health, Water + Organism, Effluent Limit Calculations

| | |
|---|---|
| **Number of Compliance Samples Expected per month (n)** | |
| Average Monthly Effluent Limit, ug/L | equals wasteload allocation |
| Maximum Daily Effluent Limit, ug/L | TSD Multiplier, Table 5-3, using 99th and 95th % |
| Average Monthly Limit (AML), lb/day | |
| Maximum Daily Limit (MDL), lb/day | |

## Human Health, Organism Only, Effluent Limit Calculations

| | |
|---|---|
| **Number of Compliance Samples Expected per month (n)** | |
| Average Monthly Effluent Limit, ug/L | equals wasteload allocation |
| Maximum Daily Effluent Limit, ug/L | TSD Multiplier, Table 5-3, using 99th and 95th % |
| Average Monthly Limit (AML), lb/day | |
| Maximum Daily Limit (MDL), lb/day | |

**References:** Idaho Water Quality Standards http://adminrules.idaho.gov/rules/current/58/0102.pdf
Technical Support Document for Water Quality-based Toxics Control, US EPA, March 1991, EPA/505/2-90-0 http://www.epa.gov/npdes/p

# Appendix E. CWA 401 State Certification

STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

2110 Ironwood Parkway • Coeur d'Alene, Idaho 83814 • (208) 769-1422
www.deq.idaho.gov

C.L. "Butch" Otter, Governor
John H. Tippets, Director

March 23, 2018

Ms. Susan Poulsom
US Environmental Protection Agency, Region 10
1200 6th Avenue, OWW-191
Seattle, WA 98101-3140

RE: Draft §401 Water Quality Certification for the Draft NPDES Permit No. ID-0027693 for the City of Dover Wastewater Treatment Plant

Dear Ms. Poulsom:

The State of Idaho Department of Environmental Quality (DEQ) received a preliminary draft NPDES permit for Dover dated January 4, 2018. After review of the draft permit and fact sheet, DEQ submits the enclosed draft §401 water quality certification which includes a narrative description of our antidegradation review for this permit and conditions necessary to meet these rules. After the public comment period ends, DEQ will address any comments, review the proposed final permit and issue a final certification decision.

Please direct any questions to June Bergquist at 208.666.4605 or june.bergquist@deq.idaho.gov .

Sincerely,

Daniel Redline
Regional Administrator
Coeur d'Alene Regional Office

Enclosure

C: Loren Moore, DEQ State Office
David Brick, EPA Region 10, Seattle
City of Dover P.O. Box 115 Dover, ID 83825

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Idaho Department of Environmental Quality

# Draft §401 Water Quality Certification

March 23, 2018

**NPDES Permit Number(s):** ID0027693; City of Dover Wastewater Treatment Plant (Dover WWTP)

**Receiving Water Body:** Pend Oreille River

Pursuant to the provisions of Section 401(a)(1) of the Federal Water Pollution Control Act (Clean Water Act), as amended; 33 U.S.C. Section 1341(a)(1); and Idaho Code §§ 39-101 et seq. and 39-3601 et seq., the Idaho Department of Environmental Quality (DEQ) has authority to review National Pollutant Discharge Elimination System (NPDES) permits and issue water quality certification decisions.

Based upon our review of the above-referenced permit and associated fact sheet, DEQ certifies that if the permittee complies with the terms and conditions imposed by the permit along with the conditions set forth in this water quality certification, then there is reasonable assurance the discharge will comply with the applicable requirements of Sections 301, 302, 303, 306, and 307 of the Clean Water Act, the Idaho Water Quality Standards (WQS) (IDAPA 58.01.02), and other appropriate water quality requirements of state law.

This certification does not constitute authorization of the permitted activities by any other state or federal agency or private person or entity. This certification does not excuse the permit holder from the obligation to obtain any other necessary approvals, authorizations, or permits.

## Antidegradation Review

The WQS contain an antidegradation policy providing three levels of protection to water bodies in Idaho (IDAPA 58.01.02.051).

- Tier I Protection. The first level of protection applies to all water bodies subject to Clean Water Act jurisdiction and ensures that existing uses of a water body and the level of water quality necessary to protect those existing uses will be maintained and protected (IDAPA 58.01.02.051.01; 58.01.02.052.01). Additionally, a Tier I review is performed for all new or reissued permits or licenses (IDAPA 58.01.02.052.07).
- Tier II Protection. The second level of protection applies to those water bodies considered high quality and ensures that no lowering of water quality will be allowed unless deemed necessary to accommodate important economic or social development (IDAPA 58.01.02.051.02; 58.01.02.052.08).
- Tier III Protection. The third level of protection applies to water bodies that have been designated outstanding resource waters and requires that activities not cause a lowering of water quality (IDAPA 58.01.02.051.03; 58.01.02.052.09).

DEQ is employing a water body by water body approach to implementing Idaho's antidegradation policy. This approach means that any water body fully supporting its beneficial uses will be considered high quality (IDAPA 58.01.02.052.05.a). Any water body not fully supporting its beneficial uses will be provided Tier I protection for that use, unless specific circumstances warranting Tier II protection are met (IDAPA 58.01.02.052.05.c). The most recent federally approved Integrated Report and supporting data are used to determine support status and the tier of protection (IDAPA 58.01.02.052.05).

## Change in Treatment Technology

In 2006, Dover WWTP increased their design flow from 0.06 million gallons per day (mgd) to 0.18 mgd. The facility upgraded their design from a sequence batch reactor to a membrane bioreactor (MBR).

## Pollutants of Concern

The Dover WWTP discharges the following pollutants of concern: $BOD_5$, total suspended solids (TSS), *E. coli* bacteria, total residual chlorine, pH, ammonia, temperature and phosphorus. Effluent limits have been developed for $BOD_5$, TSS, *E. coli* bacteria, total residual chlorine, mercury and pH. No effluent limits are proposed for mercury, ammonia, temperature and phosphorus.

## Receiving Water Body Level of Protection

The Dover WWTP discharges to the Pend Oreille River within the Pend Oreille Lake Subbasin assessment unit (AU) 17010214PN002_08 (Pend Oreille Lake to Priest River). This AU has the following designated beneficial uses: cold water aquatic life, primary contact recreation, and domestic water supply. In addition to these uses, all waters of the state are protected for agricultural and industrial water supply, wildlife habitat, and aesthetics (IDAPA 58.01.02.100).

According to DEQ's 2014 Integrated Report, this AU is not fully supporting its aquatic life use. Causes of impairment include dissolved gas supersaturation (total dissolved nitrogen gas) and excess temperature. As such, DEQ will provide Tier 1 protection (IDAPA 58.01.02.051.01) for the aquatic life use. The contact recreation beneficial use is unassessed. DEQ must provide an appropriate level of protection for the primary contact recreation use using information available at this time (IDAPA 58.01.02.052.05.c). Fecal coliform and *E. coli* monitoring from a USGS monitoring station near Newport, WA and the Sandpoint Water Treatment Plant indicate this use is fully supported; therefore, DEQ will provide Tier II protection in addition to Tier I, for the recreation beneficial use (IDAPA 58.01.02.051.01 and 58.01.02.051.02).

## Protection and Maintenance of Existing Uses (Tier I Protection)

A Tier I review is performed for all new or reissued permits or licenses, applies to all waters subject to the jurisdiction of the Clean Water Act, and requires demonstration that existing and designated uses and the level of water quality necessary to protect existing and designated uses shall be maintained and protected. In order to protect and maintain existing and designated beneficial uses, a permitted discharge must comply with narrative and numeric criteria of the Idaho WQS, as well as other provisions of the WQS such as Section 055, which addresses water

quality limited waters. The numeric and narrative criteria in the WQS are set at levels that ensure protection of existing and designated beneficial uses. The effluent limitations and associated requirements contained in the Dover WWTP permit are set at levels that ensure compliance with the narrative and numeric criteria in the WQS.

Water bodies not supporting existing or designated beneficial uses must be identified as water quality limited, and a total maximum daily load (TMDL) must be prepared for those pollutants causing impairment. A central purpose of TMDLs is to establish wasteload allocations for point source discharges, which are set at levels designed to help restore the water body to a condition that supports existing and designated beneficial uses. Discharge permits must contain limitations that are consistent with wasteload allocations in the approved TMDL. The Pend Oreille River does not yet have an approved TMDL for temperature or total dissolved nitrogen gas.

Prior to the development of the TMDL, the WQS require the application of the antidegradation policy and implementation of provisions to maintain and protect uses (IDAPA 58.01.02.055.04). As previously stated, the cold water aquatic life use in this Pend Oreille River AU is not fully supported due to excess total dissolved nitrogen gas and temperature. The existing permit does not contain effluent limits for temperature. A reasonable potential analysis using effluent temperature collected by Dover and the 7Q10 low flow of the river indicates that the proposed discharge has no reasonable potential to exceed WQS (it also does not measurably increase temperature of the river see Fact Sheet section V.D. page 21). Dissolved nitrogen gas is not a pollutant found in municipal discharges. As such, the City of Dover's discharge does not violate Idaho WQS or impair beneficial uses in the Pend Oreille River and therefore complies with IDAPA 58.01.02.054.04.

The proposed permit for Dover WWTP includes new mass limits for chlorine and $BOD_5$ and a higher percent removal for TSS (Table 1). The percent removal requirement for TSS was increased from 79% to 85% due to the ability of the facility to meet this technology based limit. A mass based limit was added to the technology based limit for chlorine to meet NDPES permit requirements for publically owned treatment works. The chlorine and TSS limits in the proposed permit reflect a maintenance or improvement in water quality from current conditions. Other pollutants of concern either have effluent limits that ensure compliance with WQS or there is no reasonable potential to exceed WQS.

In summary, the effluent limitations and associated requirements contained in the Dover WWTP permit are set at levels that ensure compliance with the narrative and numeric criteria in the WQS. Therefore, DEQ has determined the permit will protect and maintain existing and designated beneficial uses in the Pend Oreille River in compliance with the Tier I provisions of Idaho's WQS (IDAPA 58.01.02.051.01 and 58.01.02.052.07).

## *High-Quality Waters (Tier II Protection)*

The Pend Oreille River is considered high quality for primary contact recreation uses. As such, the water quality relevant to primary contact recreation uses of the Pend Oreille River must be maintained and protected, unless a lowering of water quality is deemed necessary to accommodate important social or economic development.

To determine whether degradation will occur, DEQ must evaluate how the permit issuance will affect water quality for each pollutant that is relevant to primary contact recreation uses of the

Pend Oreille River (IDAPA 58.01.02.052.05). These include the following: mercury, *E. coli* and phosphorus. Effluent limits are set in the proposed and existing permit for *E. coli*. Mercury and phosphorus do not have limits in either the existing permit or the proposed permit (discussion below). The Dover WWTP current permit was issued in 2002. In 2006, Dover increased their design flow from 0.06 mgd to 0.18 mgd. At the same time, the permittee also improved their treatment system by replacing a sequence batch reactor with a membrane bioreactor (MBR).

For a reissued permit or license, the effect on water quality is determined by looking at the difference in water quality that would result from the activity or discharge as authorized in the current permit and the water quality that would result from the activity or discharge as proposed in the reissued permit or license (IDAPA 58.01.02.052.06.a). For a new permit or license, the effect on water quality is determined by reviewing the difference between the existing receiving water quality and the water quality that would result from the activity or discharge as proposed in the new permit or license (IDAPA 58.01.02.052.06.a).

If degradation occurs, DEQ must determine whether the degradation is significant. A Tier II analysis is not required for insignificant degradation. If the discharge will cause a cumulative decrease in assimilative capacity that is equal to or less than 10% from conditions in the Pend Oreille River as of July 1, 2011, then DEQ may determine the degradation is insignificant, taking into consideration the size and character of the discharge and the magnitude of its effect on the receiving water (IDAPA 58.01.02.052.08.a).

### Pollutants with Limits in the Current and Proposed Permit: *E. coli*

For pollutants that are currently limited and will have limits under the reissued permit, the current discharge quality is based on the limits in the current permit or license (IDAPA 58.01.02.052.06.a.i), and the future discharge quality is based on the proposed permit limits (IDAPA 58.01.02.052.06.a.ii). For the Dover WWTP permit, this means determining the permit's effect on water quality based upon the limits for *E. coli* in the current and proposed permits. Table 1 provides a summary of the current permit limits and the proposed or reissued permit limits. Given the new MBR technology in use at this facility, the concentration of *E. coli* in the effluent is greatly reduced from the previous treatment system in use at this facility. The membranes form a physical barrier that filters out most bacteria so it is highly effective in significantly reducing *E. coli* in the effluent. Therefore, even though the design flow has been increased by 0.12 mgd, due to the type of treatment, there has been no lowering of water quality.

### Pollutants with No Limits

There are two pollutants of concern, phosphorus and mercury, relevant to Tier II protection of recreation that currently are not limited and for which the proposed permit also contains no limit (Table 1). For such pollutants, a change in water quality is determined by reviewing whether changes in production, treatment, or operation that will increase the discharge of these pollutants are likely (IDAPA 58.01.02.052.06.a.ii). With respect to phosphorus, there was an increase in design flow by 0.12 mgd in 2006. This change was also accompanied by a significant upgrade in treatment process but there is no data on phosphorus concentrations to determine if the upgrade improved phosphorus removal. The amount of assimilative capacity for phosphorus in this AU of the Pend Oreille River is limited, as discussed in Appendix A and the 2017 final certification for the City of Sandpoint's WWTP permit (Appendix B). A simple mixing calculation approach was

selected to examine the effect of Dover's design flow increase and the effects of additional phosphorus. Results indicate no significant lowering of assimilative capacity. DEQ made total phosphorus monitoring a condition of this certification to better determine the effects of this discharge.

Mercury is a cause of impairment in Pend Oreille Lake and therefore a pollutant of concern in the Pend Oreille River. There is no monitoring data to determine if Dover's discharge contains mercury. The proposed permit requires Dover to develop and maintain a master list of industrial users that introduce certain pollutants to the publically owned treatment works (POTW). DEQ has added a requirement to the Industrial Waste Management section II.D of the permit to include all potential sources of mercury from nondomestic users of the POTW. This will provide information for the next permit cycle to determine if effluent monitoring for mercury might be appropriate. An internet search indicates that presently Dover does not have businesses or industries that are typically associated with the use or handling of mercury. Therefore, at this time there is no reason to believe that Dover is a significant discharger of mercury.

Because the proposed permit does not allow for any increased water quality impacts from these pollutants, DEQ has concluded that the proposed permit should not cause a lowering of water quality for pollutants with no limits. As such, the proposed permit should maintain the existing high water quality in Pend Oreille River.

**In summary, DEQ concludes that this discharge permit complies with the Tier II provisions of Idaho's WQS (IDAPA 58.01.02.051.02 and IDAPA 58.01.02.052.06).Table 1. Comparison of current and proposed permit limits for pollutants of concern relevant to uses receiving Tier II protection.[b]**

| Pollutant | Units | Current Permit | | | Proposed Permit | | | Change[a] |
|---|---|---|---|---|---|---|---|---|
| | | Average Monthly Limit | Average Weekly Limit | Single Sample Limit | Average Monthly Limit | Average Weekly Limit | Single Sample Limit | |
| **Pollutants with limits in both the current and proposed permit** | | | | | | | | |
| Five-Day BOD | mg/L | 30 | 45 | — | 30 | 45 | — | D |
| | lb/day | 15 | 23 | — | 12 | 23 | — | |
| | % removal | 85% | — | — | 85% | — | — | |
| TSS | mg/L | 30 | 45 | — | 30 | 45 | — | D |
| | lb/day | 15 | 23 | — | 12 | 23 | — | |
| | % removal | 79% | — | — | 85% | — | — | |
| pH | standard units | 6.5–9.0 all times | | | 6.5–9.0 all times | | | NC |
| *E. coli* | no./100 mL | 126 | | 406 | 126 | | 406 | NC[c] |
| Total Residual Chlorine | mg/L | 0.5 | 0.75 | — | 0.5 | 0.75 | — | NC[d] |
| | lb/day | — | — | — | 0.75 | 1.12 | — | |
| **Pollutants with no limits in both the current and proposed permit** | | | | | | | | |
| Total Phosphorus | lb/day (May–Sept) | — | — | Report | — | — | — | NC[c] |
| Temperature | °C | — | — | Report | — | — | Report | NC[d] |
| | Btu (million)/day | — | — | — | — | — | — | |
| Total Ammonia | mg/L | — | — | Report | — | — | Report | NC[d] |
| Mercury | ng/L | — | — | — | — | — | — | NC |

[a] NC = no change, I = increase, D = decrease.
[b] Table 1 is for comparative purposes only.
[c] Refer to High Quality Waters (Tier II) section for discussion
[d] Refer to Protection and Maintenance of Existing Uses (Tier I) section for discussion

# Conditions Necessary to Ensure Compliance with Water Quality Standards or Other Appropriate Water Quality Requirements of State Law

### *Industrial Waste Management*

List any nondomestic users that may be sources of mercury that contribute to discharge concentrations. Report this information as directed under permit section II.D (IDAPA 58.01.02.052.08.a.ii).

### *Phosphorus Monitoring*

Monitor effluent for total phosphorus twice per month for twelve months beginning four (4) years from the effective date of the permit. Sampling shall use a grab sample technique and monitoring procedures described in section III.C of the final permit (IDAPA 58.01.02.052.08.a.ii).

## Mixing Zones

Pursuant to IDAPA 58.01.02.060, DEQ authorizes a mixing zone that utilizes 5% of the 30Q10 critical flow volume (5,650 cfs) of Pend Oreille River for phosphorus, ammonia, and chlorine.

## Other Conditions

This certification is conditioned upon the requirement that any material modification of the permit or the permitted activities—including without limitation, any modifications of the permit to reflect new or modified TMDLs, wasteload allocations, site-specific criteria, variances, or other new information—shall first be provided to DEQ for review to determine compliance with Idaho WQS and to provide additional certification pursuant to Section 401.

## Right to Appeal Final Certification

The final Section 401 Water Quality Certification may be appealed by submitting a petition to initiate a contested case, pursuant to Idaho Code § 39-107(5) and the "Rules of Administrative Procedure before the Board of Environmental Quality" (IDAPA 58.01.23), within 35 days of the date of the final certification.

Questions or comments regarding the actions taken in this certification should be directed to June Bergquist, Coeur d'Alene Regional Office at 208-666-4605 or via email at june.bergquist@deq.idaho.gov.

DRAFT

Daniel Redline
Regional Administrator
Coeur d'Alene Regional Office

# Appendix A

Dover Phosphorus Significance Test

Background

The Pend Oreille River is considered high quality for recreational uses and therefore, receives Tier 2 protection. Excess nutrients in a waterbody can create visible slime growths or other nuisance aquatic growths, impairing designated uses such as contact recreation. Pend Oreille River has a designated use for primary contact recreation. Phosphorus is likely the limiting nutrient for the growth of algae and other aquatic plants. To prevent the lowering of water quality with respect to total phosphorus (TP), DEQ must ensure that the design flow increase proposed by the Dover WWTP draft permit does not cumulatively (taking into account other dischargers) decrease the remaining assimilative capacity of the river by more than ten percent, without first examining alternatives and determining if the degradation is socioeconomically justified. To examine this design flow increase, DEQ looked at historical phosphorus data and the modeling work that was done for the City of Sandpoint's wastewater treatment plant discharge.

In the DEQ 2008 Integrated Report, total phosphorus was added as a cause of impairment to the Pend Oreille River (the 31.8 mile long segment from Pend Oreille Lake to Priest River). After collection of data throughout this river length in 2009, DEQ concluded that the river was not impaired due to this nutrient and phosphorus was removed as a pollutant in the 2010 Integrated Report. DEQ also concluded at that time that the Pend Oreille River has little or no remaining assimilative capacity for phosphorus (10 µg/L TP is the numeric interpretation of Idaho's narrative nutrient criterion for the Pend Oreille River as discussed in Appendix E of the 2016 Sandpoint NPDES Fact Sheet; 7.3 µg/L is the estimated upstream concentration from Pend Oreille Lake (*Montana and Idaho Border Nutrient Agreement Technical Guidance*, January 2001) which leaves 2.7µg/L of remaining assimilative capacity before considering any of the three municipal dischargers into the Pend Oreille River.). Ten percent of 2.7 µg/L is only a 0.27 µg/L of phosphorus that can be increased without an approved alternatives analysis and socioeconomic justification.

Very little phosphorus effluent data exists for the City of Sandpoint and there is no TP data for the City of Dover. Fortunately, a CE-QUAL-W2 model that examines far field effects of a proposed discharge or series of discharges was developed by the Army Corps of Engineers to examine temperature changes due to the Albeni Falls dam on the Pend Oreille River. This model was revised in 2011 by Portland State University to investigate various phosphorus scenarios in the river. In 2015, it was used by EPA to investigate the consequences of a design flow increase for the City of Sandpoint.

The selected Sandpoint modeling scenario used a 5 mgd design flow and limited phosphorus discharge during the July-September timeframe to 61 lbs/day of phosphorus loading (1.46 average monthly concentrations). Results of this scenario were contrasted with baseline conditions determined by an intensive river monitoring campaign in 2009 and determined to be acceptable after an adjustment of the summer time period (June – September). The modeling

included a phosphorus load from Dover at their currently permitted design flow of 0.06 mgd and an average phosphorus concentration of 4.275 mg/L. Because Dover's design flow increase was not included in the Sandpoint modeling scenario, DEQ examined this increase in phosphorus by using a mass balance equation as described below. The mass balance equation is a more conservative estimate of the effects of the increased phosphorus from Dover because it does not take into account assimilation of the nutrient as it moves down the river as does the model. The CE-QUAL-W2 Sandpoint modeling scenario is recommended to be rerun in the future for the renewal of Priest River and Sandpoint NPDES permits to give an overall updated view of the river phosphorus contributions from municipal dischargers.

Formula used to calculate mixed concentrations in the attached spreadsheet:

$$Cr = \frac{Qs \times Cs + Qd \times Cd}{Qs + Qd} \times 100$$

Cr = Mixed Concentration downstream (ug/L)
Cs= Upstream concentration (mg/L)
Cd = Discharge concentration (mg/L)
Qs = Upstream flow (cfs)
Qd = Discharge flow (cfs)

The conclusion, as shown in Figure 1 is that the difference in phosphorus concentrations from the currently permitted design flow to the proposed design flow is not significant. The design flow increase does not significantly decrease assimilative capacity of the river for phosphorus.

**Calculation of loss of assimilative capacity, due to increased discharge of phosphorus Dover WWTP**

| | Upstream Critical[a] Flow (cfs) | Upstream Pollutant Conc[b] | Water Quality Criterion | | Remaining Assimilative Capacity[c] | 10% of RAC | RAC= remaining assimilative capacity |
|---|---|---|---|---|---|---|---|
| | | | 10 | | 2.7 | 0.27 | |
| Condition Upstream of Discharge #1-Sandpoint | 6640 | 7.3 | | 6,640 cfs is the 30Q10 river flow | | | |
| Discharge #1 | | | | | | | |
| Permitted Design Discharge | 7.74 | 1460 | | Effluent Limit in Current Permit | | | |
| Proposed Design Discharge | 7.74 | 1460 | | Effluent Limit in Current Permit | | | |

| Downstream WQ | | Downstream Pollutant Concentration | Change in WQ (lowering +) (improvement -) | Percent Degradation | | |
|---|---|---|---|---|---|---|
| Permitted Design Discharge | | 9.0 | | | | |
| Proposed Design Discharge | | 9.0 | 0.0 | 0.0% Insignificant | | |
| Condition Upstream of Discharge #2[d] | 6647.74 | 9.0 | | | 1.0 | 0.10 |
| Discharge #2 Dover | | | | | | |
| Permitted Design Discharge | 0.093 | 2480 | 2480 is the average of Sandpoint's TP data because Dover has no TP data | | | |
| Proposed Increased Design Discharge | 0.278 | 2480 | | | | |

| Downstream WQ | Mixed WQ | Change in WQ | % Loss of Assimilative Capacity | |
|---|---|---|---|---|
| Permitted Design Discharge | 9.03 | | | |
| Proposed Design Discharge | 9.09 | 0.07 | 6.8% Insignificant | 10% or less is considered insignificant (IDAPA 58.01.02.052.08.a.i) |
| Cumulative change in potential downstream WQ with both proposed discharges | | 0.07 | 6.8% Insignificant | |

**Notes:**

Input cells are shaded, output cells are not. Worksheet is protected, but there is no password

[a] Critical upstream flow should be appropriate to the parameter of interest. See Idaho WQS at IDAPA 58.01.02.210.03.b for toxic substances. For bacteria and nutrients it is recommended that a 30Q10 be used.

[b] Units on effluent quality, stream quality and criterion do not matter, AS LONG AS THEY ARE THE SAME

[c] Under the 2011 antidegradation implementation rule the existing or baseline water quality and thus remaining assimilative capacity are as of July 1, 2011. Input data should reflect this.

[d] For this simple calculation the pollutant is assumed to be 100% conservative, i.e. undergo no transformations or loss from the stream. This assumption means there is a conservative (i.e. high side) estimation of downstream quality, assuming no other sources of added load. If this is not a close approximation of reality then fate and transport modeling should be employed.

This example Worksheet was prepared by Don A. Essig, Idaho DEQ, 1410 N. Hilton, Boise Idaho 83706. Phone: 208-373-0119. E-mail: Don.Essig@DEQ.Idaho.gov

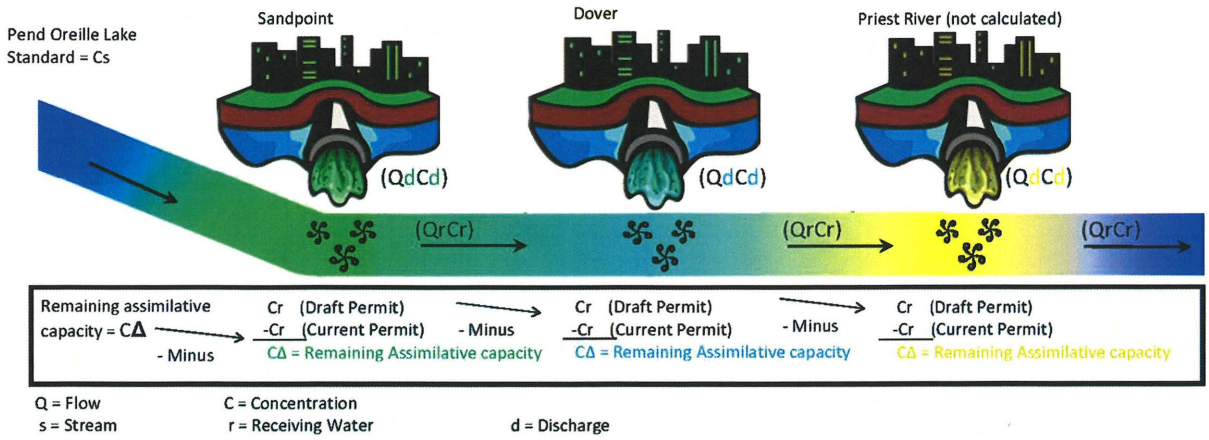


Figure 1

**Excerpt from the February 3, 2017 Final Certification for the City of Sandpoint:**

# Appendix B

## CE-QUAL-W2 Phosphorus Modeling for Sandpoint WWTP

Background

In the 2008 Integrated Report, total phosphorus was added as a cause of impairment to the Pend Oreille River (the 31.8 mile long segment from Pend Oreille Lake to Priest River). After collection of data throughout this river length in 2009, DEQ concluded that the river was not impaired due to this nutrient and phosphorus was removed as a pollutant in the 2010 Integrated Report. DEQ also concluded at that time that the Pend Oreille River has little or no remaining assimilative capacity for phosphorus (2.7µg/L before considering any of the three municipal discharges into the Pend Oreille River.). Ten percent of 2.7ug/L is only a 0.027ug/L of phosphorus that can be increased without an approved alternatives analysis and socioeconomic justification.

DEQ also recognizes that effluent limits for phosphorus in the proposed permit are based on very little effluent data. The current permit only requires quarterly monitoring. The quarters are based on the calendar year and the phosphorus monitoring data is reported on the last day of each quarter. The discharge monitoring reports (DMRs) do not indicate the day the actual samples were collected or the effluent flow associated with that timeframe. These factors can create a wide margin of error.

Additional examination of the phosphorus monitoring data show that it is widely distributed (effluent flow 1 to 6.7mgd and concentrations from 0.8 to 5.33mg/L). Reasons for this spread are not clear since there are not enough data to determine correlations. Determining exactly what amount of phosphorus is currently being discharged to ensure no further loss of assimilative capacity is problematic given this data. For this and the above reasons, DEQ and EPA have approached the new effluent limits for phosphorus cautiously using the CE-QUAL-WE modeling scenarios to look at effects downriver of the proposed phosphorus effluent limits. Although the DMR data is limited, there were some seasonal differences which allowed development of seasonal limits that reflect discharge amounts as reported on DMRs. These seasonal limits were used for the CE-QUAL-W-2 modeling scenarios.

Modeling Approach

Fortunately, a CE-QUAL-W-2 model that examines far field effects of a proposed discharge had been developed by the Army Corps of Engineers to examine temperature changes due to the Albeni Falls dam on the Pend Oreille River. This model was revised in 2011by Portland State University to investigate various phosphorus scenarios in the river. In 2015 it was used by EPA to investigate the consequences of the proposed phosphorus permit limits for Sandpoint.

The initial modeling scenario examined the consequence of a 5mgd phosphorus discharge during the July-September timeframe of 61 lbs/day (1.46 average monthly concentrations) contrasted with baseline conditions determined in 2009. Results of the model run were largely satisfactory except for periphyton biomass during the month of June. During this timeframe, periphyton

biomass significantly departed from the existing condition. To improve the outcome of this timeframe, the month of June was included in the summertime seasonal timeframe with a limit of 61 lbs/day. This reduced the load of phosphorus in June from 96 lbs/day to 61 lbs/day. The model was re-run and the outcome was satisfactory and the effluent limits revised to reflect this change.

Conclusion

The amount of phosphorus coming from Sandpoint's discharge is approximately 25% of the phosphorus load upstream of this discharge. Thus Sandpoint's discharge can have significant water quality effects for the entire river. As we have stated, current amounts of phosphorus discharged from the facility are an approximation due to lack of a robust dataset. The proposed permit requires the collection of an adequate number of phosphorus samples to correct this problem. To compensate for the lack of data, modeling was completed and compared to a baseline of river water quality data collected in 2009. As a result of the modeling, effluent limits and critical flows were adjusted to provide an acceptable outcome.