Fact Sheet for IPDES Permit No. IDG380000

Idaho Department of Environmental Quality (DEQ) Proposes to Reissue an Idaho Pollutant Discharge Elimination System (IPDES) Permit to Discharge Pollutants Pursuant to the Provisions of IDAPA 58.01.25 to:

Drinking Water Treatment Facility General Permit

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Purpose of this Fact Sheet

This fact sheet explains and documents the decisions DEQ made in drafting the proposed IPDES permit for the Drinking Water General Permit.

This fact sheet complies with IDAPA 58.01.25.108.02 of the Idaho Administrative Code, which requires DEQ to prepare a draft permit and accompanying fact sheet for public evaluation before issuing an IPDES permit.

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Acronyms, Abbreviations, and Symbols

µg	microgram
AML	average monthly limit
CF	conversion factor
Ce	effluent concentration
CFR	Code of Federal Regulations
CV	coefficient of variation
CWA	Clean Water Act
DEQ	Idaho Department of Environmental Quality
DMR	discharge monitoring report
DWGP	Drinking Water Treatment Facilities General Permit
EPA	US Environmental Protection Agency
IDAPA	numbering designation for all administrative rules in Idaho per the Idaho Administrative Procedure Act
IPDES	Idaho Pollutant Discharge Elimination System
L	liter
lb	pound
LTA	long-term average
MDL	maximum daily limit
mg	milligram
mgd	million gallons per day
ML	minimum level
MOEC	maximum observed effluent concentration
NOI	notice of intent
NPDES	National Pollutant Discharge Elimination System
RPMF	reasonable potential multiplier factor
TMDL	total maximum daily load
TSS	total suspended solids
USC	United States Code
WLA	wasteload allocation
WQBEL	water quality-based effluent limit

1 Introduction

This Drinking Water General Permit (DWGP) applies to backwash water, reject water, and miscellaneous wastewater disposal from drinking water treatment facilities that discharge to waters of the United States within Idaho.

Potable water treatment operations eligible for coverage under the DWGP include filtration treatment systems, such as conventional direct filtration, slow sand filtration, and membrane filtration. Wastewater discharge from potable water treatment operations that are covered by the DWGP are filter backwash, filter-to-waste, thickener overflows (supernatant), decant water, and the miscellaneous waste streams defined in section 1 of the permit.

Potable water treatment facilities not covered by this DWGP include batch regenerated potassium permanganate iron removal, sodium zeolite softening, and ion exchange or reverse osmosis units.

Discharges from other treatment systems not specifically listed in the DWGP that can meet the requirements of the permit may also be eligible for coverage under the DWGP upon approval by the Idaho Department of Environmental Quality (DEQ). Nondrinking water treatment operations are not eligible for coverage under this DWGP.

1.1 General Permits

The Clean Water Act (CWA) § 301(a), 33 USC § 1311(a), provides that the discharge of pollutants to waters of the United States is unlawful except according to the terms and conditions of a National Pollutant Discharge Elimination System (NPDES) permit. Idaho's "Water Quality Standards" (IDAPA 58.01.25.130) authorize the issuance of general permits to categories of discharges.

IDAPA 58.01.25.130 authorizes DEQ's director to issue a general permit to numerous facilities when the facilities comply with the following:

- Located within the same geographic area
- Involve the same or substantially similar types of operations
- Discharge the same types of waste
- Require the same effluent limits or operating conditions
- Require the same or similar treatment technologies or monitoring requirements
- In DEQ's opinion are more appropriately controlled under a general permit rather than an individual permit.

DEQ issues a DWGP for drinking water treatment facilities discharging to waters of the United States in Idaho pursuant to DEQ's authority under IDAPA 58.01.25 The DWGP meets the criteria for general permits as follows:

1.1.1 Geographic Area

All of the discharges authorized by the DWGP will be into waters of the United States within Idaho, unless located in Indian Country.

1.1.2 Involves the Same or Substantially Similar Types of Operations

All facilities covered by this DWGP are water treatment filtration facilities. The typical drinking water treatment plant uses conventional or direct filtration treatment to manufacture potable water, including slow sand filtration processes and disinfection. The primary processes include presedimentation; coagulation and flocculation; filtration; oxidation; and chlorination. Process changes are necessary depending on site-specific characteristics of varying water sources; however, removing sediments and disinfection are the primary goals. To remove sediments, the typical water treatment plant employs presedimentation and filtration. To disinfect the potable water for delivery, chlorination is commonly used. However, discharge of untreated raw water (without pollutants) that overflowed would not require permit coverage. Overflow water that has been treated or which contains pollutants requires permit coverage. Discharge from the typical water treatment plant is derived from activities that mainly involve the equipment rinses, and from filter backwashing. Discharge of raw water does not require permit coverage when the raw water does not contain pollutants.

1.1.3 Discharge the Same Types of Waste

The facilities covered by this permit discharge the same type of waste, namely, total suspended solids (TSS) from removing sediments from the source water by settlement and filtration, and total residual chlorine, which is added to the finished product for disinfection. Minor amounts of additives used for coagulation and flocculation may also be present in the waste stream. Facilities covered by this DWGP are encouraged to conduct operationally effective best practices that use the minimum quantities of additives.

1.1.4 Require Same Effluent Limits or Operating Conditions

The draft DWGP proposes the same effluent limits, monitoring requirements, and other operating conditions for all drinking water treatment facilities that have similar mixing zone authorizations. An individual facility covered under the DWGP could have effluent limits based on a mixing zone allowance, where applicable.

1.1.5 Require Same or Similar Treatment Technologies

Although the draft DWGP does not propose using specific treatment technologies, most conventional filtration plants use a settling pond to allow quiescent settling before discharge; other treatments of wastewater include mechanical clarification/sludge thickening and dewatering.

1.1.6 Require Same Monitoring Requirements

The DWGP includes the same monitoring requirements for all facilities with similar treatment processes.

1.1.7 Appropriateness

Because of the factors discussed above, DEQ determined most of the drinking water treatment plants in Idaho are more appropriately controlled under a general permit than under individual Idaho Pollutant Discharge Elimination System (IPDES) permits. The similarity of the operations and treatment resulting in the discharge of similar waste streams prompted DEQ to issue this DWGP.

2 Background Information

The DWGP applies to facilities that produce potable water or industrial water (primary treatment or settled water) where the treatment and distribution of water is the primary function of the facility. The discharge from these facilities includes backwash water, overflow water and/or reject water disposal, and other wastewaters from drinking water treatment facilities that discharge to surface waters. Backwashing a drinking water treatment system involves reversing and increasing the water's flow to flush out debris and particles that have accumulated in the drinking water treatment facility. Backwashing is a typical operation of the treatment facility and is regularly performed at water treatment facilities.

For this DWGP, drinking water treatment facilities fall into one of three categories:

- Conventional or direct or slow sand filtration treatment
- Membrane filtration units
- Ion exchange units

Only facilities that use conventional or direct or slow sand filtration treatment and membrane filtration units are covered by this DWGP; water treatment plants using ion exchange units are ineligible for coverage under this permit.

2.1 Water Treatment Facility Operations

2.1.1 Conventional and Direct Filtration Treatment

DEQ anticipates that many facilities initially covered by the DWGP are facilities that use conventional or direct filtration treatment. A surface water treatment system initially passes raw water through a grate or screen, which removes the largest floating matter (e.g., leaves, limbs, and paper). A coagulant (e.g., alum, ferric chloride, ferric sulfate, sodium aluminate, or polymer) is rapidly stirred into the water where it reacts forming positively charged, sticky floc. These coagulant particles typically enter a slow mixing zone where the negatively charged colloidal particles adhere to the floc (flocculation). If it is conventional filtration, the flocculated particles flow into the sedimentation basins and precipitate out of the water column. The

supernate is then drawn off the top of the sedimentation basins and sent to filtration. If it is direct filtration, the flocculated particles flow directly to filtration. The filter bed is typically composed of a sequence of fine sand, coarse sand, and possibly granulated activated carbon. This activated carbon is typically used when taste and odor need to be controlled. The filter may also remove bacteria and protozoa. The final step in conventional filtration is disinfection. Chlorine, ozone, or ultraviolet light are added and used to provide final protection from biological pathogens. Chlorine can provide residual protection during distribution. Specific processes associated with conventional treatment systems are more fully explained below.

Granular Media Filters

Granular media filters remove suspended solids by adsorption and straining. Single media or multimedia beds may be used. The flow pattern through the bed may be up or down flow. Multimedia beds may consist of two or more media. The most common dual media filters use ground anthracite and silica sand. A three-media filter may also include very fine grain size garnet.

Cleaning the media bed is always up flow (backwash) but at a greater flow rate lifting the media and washing out any accumulated particulates. As the high backwash flow decreases at the end of the cleaning operation, the filter media will classify according to size with the smallest particles at the top. The dual and triple media filters provide extended filtration capacity by using larger grain size material with lower specific gravity and very small grain size material with higher specific gravity. This causes the larger material to be deposited on the top and the very small material to be deposited on the bottom.

2.1.2 Slow Sand Filtration

Slow sand filtration is a commonly used water treatment process. The process involves passing raw water through a bed of sand at low application rates (0.2 to 0.4 cubic meters per square meter per hour [m^3/m^2-hr]), equivalent to 4.9–9.8 gallons per square foot per hour [gal/ft^2-hr]). Slow sand filtration is a biological process, relying on the attached biological film, called the hypogeal layer or Schmutzdecke, in the top few millimeters of the fine sand layer. This Schmutzdecke naturally grows on the substrate quickly, typically within the first 20 days of operation in new systems. This biofilm contains bacteria, fungi, protozoa, rotifer, and some aquatic insect larvae. This biofilm provides the filtration and constituent metabolism resulting in excellent quality water with 90% to 99% bacterial cell count reduction.

Slow sand filters require multiple cells to continue delivery of water to customers if storage is not used. Slow sand filters must be maintained because the product delivery rate reduces as the biofilm ages and grows in thickness. Periodically, the biofilm must be either scraped off the top layer of fine sand, or the bed lifted and biofilm and attached fine sand discharge to waste. Slow sand filters may be from 3 to 12 feet thick, composed of pebbles at the base, on which coarse gravel is placed. Sand is placed on the gravel, and a thick layer of fine sand placed as the upper most layer. When a slow sand filter cell enters its maintenance cycle, other cells must be

present to provide a continuous source of drinking water if storage is not available to offset the water not produced.

2.1.3 Ion Exchange or Reverse Osmosis Units

Discharges to surface water of wastewaters produced from ion exchange, or reverse osmosis water treatment processes, are excluded from coverage under this permit and may be required to apply for an individual permit.

Ion exchange is an exchange of ions through a resin such that undesirable or unhealthy ions are exchanged for desirable ions. Demineralizers are ion exchange units that use acids, bases, or salts to regenerate the exchange resins. Sodium or potassium cycle ion exchange units are used to "soften" hard water. Sodium chloride or potassium chloride is used to regenerate the resins from these types of systems. The regeneration waste from these processes may require additional treatment or alternate disposal methods before discharge to receiving water, such as metered disposal to a domestic wastewater treatment system.

The hydrogen-ion exchangers have cation-exchange resins that can be regenerated with sulfuric or hydrochloric acid. The hydroxide-ion exchangers have anion resins that can be regenerated with sodium hydroxide, sodium carbonate, or ammonia. The regeneration waste from these two exchangers may require additional treatment or alternate disposal methods, such as metered disposal to a domestic wastewater treatment system. Additional treatment could include capture in a neutralization tank, where final pH would be adjusted before discharge.

The pollutants of concern from ion exchange units may include high pH wastewater, sodium hydroxide, sodium carbonate, and ammonia. Because the waste stream from a facility with ion exchange units have waste streams that include other pollutants not found in a conventional plant or a drinking water treatment plant that use membrane filtration units, DEQ concludes the waste stream from facilities that use ion exchange units are substantially different and are NOT covered by this DWGP.

2.1.4 Membrane Filtration Facility

Membrane filtration uses semipermeable membranes to separate particulates, ions, salts, or other substances from water. Water is forced across the membrane by a driving force (i.e., water pressure) leaving particulates behind on the membrane or in solution as a concentrate. The types of substances removed depend on the membrane type, pore size, pressure, and quality of the raw water. The waste concentrate is regularly discharged, and the membrane is flushed off with air and water. Periodically, the membrane is chemically washed with various chemical solutions in differing concentrations and orders dependent upon the material to be removed from the membranes. The chemical solution used, and the wastewater could include caustic soda, citric acid, chlorine, sodium tripolyphosphate, surfactants, and sodium metabisulfite. The wastewater may be of a somewhat higher pH from the chemicals used and is likely of a lower pH than an ion exchange facility because the differences in chemicals used. Discharges of this concentrate and cleaning wastes that meet the requirements of the DWGP may be discharged after treatment.

Some membrane filters are shut down for extended periods of time, and the membranes are placed in storage solutions. Disposal of all storage solution must meet the requirements of the DWGP and authorization or alternate methods of disposal of the storage solution must occur. Approval is required before discharging a storage solution to a domestic wastewater treatment system.

Microfilters may use chlorine to control biological growth during extended periods of shutdown. The chlorine residual of the storage solution may be above 50 milligrams per liter (mg/L) free chlorine. This solution may be recharged monthly with more chlorine, or a new storage solution is mixed, and the old solution disposed in an authorized method.

Nanofilters can use a storage solution that may be generated once and recycled for the entire shutdown period. Sodium metabisulfate is one of the commonly used chemicals to create storage solutions for certain nanofilter systems.

The DWGP may provide coverage for a membrane filtration facility with a waste stream similar to the conventional or direct filtration facility.

2.2 Wastewaters Generated

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

2.2.1 Filter Backwash

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

2.2.2 Filter-to-Waste

Filter-to-waste is generated by filters immediately after being placed back online following backwashing. The filter-to-waste is of a quality that cannot be sent directly into the water

distribution system but is a fairly clean waste stream. It amounts to approximately 0.5% of the total amount of water filtered. At some drinking water treatment plants, the filter-to-waste is returned to the head of the plant.

2.2.3 Thickener Overflows (Supernatant)

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

2.2.4 Decant Water

Some filtration plants prepare waste solids for disposal by concentrating solids to remove excess water, reducing the volume of waste for disposal. Such processes concentrate sludge as high as 50% solids content. Liquids from dewatering processes are produced from a lagoon or sludge-drying bed as decant and underflow, or as filtrate or centrate from mechanical processes. Small, intermittent wastewater streams are produced because of the dewatering process. Such waste streams can contain elevated levels of turbidity, total organic carbon, total trihalomethanes, aluminum, iron, and manganese.

2.2.5 Miscellaneous Wastewaters

Miscellaneous waste sources may include, but are not limited to, overflow water, processed potable water, contact and noncontact cooling water, dehumidifier water, sump drainage water, disinfection of water supply pipelines and tanks, hydraulic valve operator water, and/or pump seal water.

3 Applicability and Coverage

3.1 Facilities Eligible for Coverage

The DWGP provides coverage for discharges of treated wastewater from drinking water treatment processes (filter backwash, sedimentation/presedimentation washdown, sedimentation/clarification, or filter-to-waste), and their delivery systems to surface water of the state. Process flows contributing to the discharge include filter backwash, filtration reject, decanted sludge dewatering, influent screen backwash and/or miscellaneous waste sources associated with potable water facility operation. Miscellaneous waste sources may include, but are not limited to, processed potable water, disinfection of water supply pipelines, tanks, and holding tanks of treated water.

3.2 Facilities Ineligible for Coverage

1. Potable water treatment facilities not covered by this DWGP include the following:
   a. Batch regenerated potassium permanganate iron removal
   b. Sodium zeolite softening
   c. Reverse osmosis
2. Any facility that discharges to receiving waters with an US Environmental Protection Agency (EPA)-approved total maximum daily load (TMDL) is ineligible for coverage unless that facility is identified in Appendix A of the DWGP.
3. New discharges are not eligible for coverage under this permit to discharge to a water body listed as "impaired" on the most recent federally approved Idaho Integrated Report unless:
   a. In advance of submitting a notice of intent (NOI), the permit applicant provides data sufficient to demonstrate that the discharge of the pollutant, for which the water body is impaired, will meet instream water quality criteria for the pollutant at the point of discharge to the water body. The applicant must receive written confirmation from DEQ that the discharge will not contribute to the existing impairment; or,
   b. These facilities are excluded from coverage unless such facilities are identified in the DWGP, Appendix A, "List of Facilities Discharging to Impaired Waters." New facilities may be included in Appendix A of the DWGP after DEQ determines that permit coverage is appropriate, and the public comment period has been completed. New facilities identified in Appendix A of the DWGP may be subject to additional conditions and/or limitations due to TMDLs in receiving waters.

3.3 Facilities Requesting an Individual IPDES Permit

Per IDAPA 58.01.25.130.05.c, DEQ may determine that providing coverage under a general permit is inappropriate for some facilities and may require such facilities to apply for an individual IPDES permit.

IDAPA 58.01.25.130.05.d states that if a facility is eligible for coverage under an IPDES general permit and then decides an individual permit is desired, the facility may request to be excluded from the coverage under the general permit by applying for an individual IPDES permit.

The owner or operator must submit the appropriate IPDES permit application forms to DEQ, justifying the request for an individual IPDES permit, no later than 180 days before the anticipated start date of the discharge. The request for an individual IPDES permit will be reviewed and processed according to IDAPA 58.01.25.106, 107, 108, and 109 once the application is deemed timely and complete. The request will be granted by issuing an individual IPDES permit if the reasons cited by the owner or operator clearly demonstrate that inclusion under the general permit is inappropriate.

DEQ may also require any entity granted discharge authorization under this general permit to apply for and obtain an individual permit. Per IDAPA 58.01.25.130.05.e, the applicability of the general permit is automatically terminated on the effective date of the individual permit.

3.4 Pollutants Authorized by this General Permit

The DWGP will authorize discharges of specified pollutants in limited amounts to the waters of the United States within Idaho. Appendix A of this fact sheet contains a detailed discussion of the pollutants limited by the DWGP.

3.5 Pollutants Not Authorized by this General Permit

The DWGP does not authorize the discharge of any waste streams, including spills and other unintentional or nonroutine discharges of pollutants, that are not part of normal facility operations as disclosed in the permit application and/or NOI. In instances where discharges include chemicals other than the pollutants covered by the DWGP, the owner/operator may need to submit an application for an individual IPDES permit. This requirement does not include chemicals used in cleaning.

3.6 Receiving Waters Covered by this Permit

This DWGP authorizes discharges of specified pollutants in limited amounts to waters of the United States within Idaho except for waters within reservations or Indian Country.

3.7 Receiving Waters Excluded from Permit Coverage

Although the conditions in the DWGP were developed to meet DEQ water quality criteria for protecting aquatic life and human health uses, certain protected, special, or at-risk water resources within Idaho are excluded from DWGP coverage. The DWGP does not authorize discharges to the following protected, special, or at-risk receiving waters:

1. Receiving waters not supporting their designated uses as identified within the most recent federally approved Idaho Integrated Report, where the discharges to that receiving water contain the pollutants for which the water body is impaired and contributes to the impairments. For new dischargers, section 1.2 of the permit requires the discharger to demonstrate its ability to comply with IDAPA 58.01.25.103.07 (prohibiting the issuance of permits to new dischargers that will cause or contribute to the violation of water quality standards) before coverage under the permit.
2. “Outstanding Resource Waters” (IDAPA 58.01.02) provides for designation of waters or river segments by the Idaho Legislature after nomination of waters by the public and review of those nominations by the Idaho Board of Environmental Quality (IDAPA 58.01.02.052.09). The Board gives special consideration to stream segments “generally recognized as constituting an outstanding national resource …, or of

exceptional recreational or ecological significance." Outstanding resource water (i.e., Tier 3) designations constitute outstanding national or state resources that require protection from point and nonpoint source activities that may lower water quality (IDAPA 58.01.02.051).

3. Receiving waters 100 yards or less upstream of Indian Country.
4. Receiving waters that flow into other states or Canada 100 yards or less upstream from the relevant state or international boundary.
5. Receiving waters designated under the Wild and Scenic Rivers Act.

3.8 Continuation of Permit Coverage

Under IDAPA 58.01.25.101.01.a, IPDES permits are effective for a fixed term not to exceed 5 years. This DWGP will expire 5 years from the effective date of the final permit. If the DWGP is not reissued before the expiration date, it may be eligible for an administrative extension of coverage according to IDAPA 58.01.25.101.03 and will remain in full force. However, DEQ cannot provide coverage under this general permit to any permittee who submits the NOI for administrative continuance of coverage to DEQ after the permit expiration date.

Any permittee granted coverage under the DWGP before the expiration date that submits an NOI for administrative continuance of coverage within the proper time frame, and receives notice from DEQ that the NOI is deemed timely and complete, will remain covered by this DWGP until the following occurs:

- Authorization for coverage under reissuance or replacement of this DWGP following timely and appropriate submittal of a complete NOI requesting authorization to discharge under the new permit and compliance with requirements of the new permit. IDAPA 58.01.25.101.03.
- Permittee's submittal of a notice of termination IDAPA 58.01.25.203.01.
- Issuance of an individual IPDES permit, IDAPA 58.01.25.130.05.e., or
- A formal permit decision by the director not to reissue this general permit, at which time the permittee must seek coverage under an alternative general or individual permit. IDAPA 58.01.25.102.01.a.

4 Effluent Limits and Monitoring Requirements

4.1 Effluent Limits and additional effluent monitoring

Table 1 below presents the proposed effluent limits for permittees that are not granted a mixing zone. Mixing zones will be granted on a case-by-case basis.

Table 1. Effluent limits and monitoring requirements for a facility without a mixing zone.

Parameter	Units	Effluent Limitations		Monitoring Requirements	
		Average Monthly	Maximum Daily	Sample Frequency	Sample Type
Total Suspended Solids (TSS)	mg/L	30	45	1/Month	Grab
Total Residual Chlorine[a]	mg/L	0.011	0.019	1/Week	Grab
pH	standard units	Within the range of 6.5 to 9.0		1/Week	Grab
Flow[b]	gpd	--	--	1/Day	Estimate
Hardness [c]	mg/L as CaCO3	--	--	1/Month	Grab
Aluminum[d]	µg/L	--	--	Once every five quarters	Grab
Antimony	µg/L	--	--	Once every five quarters	Grab
Arsenic	µg/L	--	--	Once every five quarters	Grab
Beryllium	µg/L	--	--	Once every five quarters	Grab
Cadmium	µg/L	--	--	Once every five quarters	Grab
Total Chromium	µg/L	--	--	Once every five quarters	Grab
Copper	µg/L	--	--	Once every five quarters	Grab
Lead	µg/L	--	--	Once every five quarters	Grab
Nickel	µg/L	--	--	Once every five quarters	Grab
Selenium	µg/L	--	--	Once every five quarters	Grab
Silver	µg/L	--	--	Once every five quarters	Grab
Thallium	µg/L	--	--	Once every five quarters	Grab
Zinc	µg/L	--	--	Once every five quarters	Grab
Temperature	˚C	--	--	1/Week	Grab
Total Trihalomethanes (TTHMs)[e]	µg/L	--	--	1/Quarter	Grab
Turbidity	NTUs	--	--	1/Month	Grab

Notes:

a. The limits for chlorine are not quantifiable using EPA-approved analytical methods. The minimum level (ML) for chlorine is 50 µg/L for this parameter. DEQ will use 50 µg/L as the compliance evaluation level for this parameter. The permittee will be compliance with the total residual chlorine limits if the average monthly and maximum daily concentrations are less than 50 µg/L.

b. Flow estimate based on facility operation (i.e., backwash volume and frequency). Report average monthly and maximum daily gpd.

c. Hardness must be sampled at the same time metal samples are collected.

d. Monitoring only required where alum is used in the drinking water treatment process.

e. For TTHMs—Quarterly monitoring, with a minimum of 10 samples required within 5 years. Analyze for chloroform, chlorodibromomethane, dichlorobromomethane, and bromoform. Quarters are defined as January to March; April to June; July to September; and October to December.

4.1.1 Rational for Effluent Limits

Below are the rationales for the individual pollutants except for metals which have been grouped together.

4.1.1.1 Total Suspended Solids

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

4.1.1.2 Total Residual Chlorine

The Idaho WQS in Table 1 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. An RPA showed that the discharge from the facility would result in RPTE. See Appendix A for the reasonable potential and effluent limit calculations for chlorine.

4.1.1.3 pH

The Idaho WQS at IDAPA 58.01.02.250.01.a require pH values of the receiving water to be within the range of 6.5 to 9.0. Mixing zones are generally not granted for pH; therefore, the most stringent WQC must be met before the effluent is discharged to the receiving water.

4.1.1.4 Trihalomethanes

There are no applicable technology-based effluent guidelines for trihalomethanes in discharges from WTPs. Trihalomethanes have an increased potential to be discharged from WTPs when compared to Waste Water Treatment Plants (WWTP) that use chlorine disinfection due to the WWTPs increased nutrient loads. Table 2 below shows the State of Idaho's established applicable water quality criteria for protection of human health for each of the four common trihalomethanes.

Table 2. Water Quality Criteria for Select Trihalomethanes.

Trihalomethane	Consumption of Water and Fish – µg/l	Consumption of Fish only – µg/l
Chloroform	61	730
Chlorodibromomethane	7.4	67
Dichlorobromomethane	8.8	86
Bromoform	62	380

4.1.1.5 Turbidity

Idaho WQS require that discharges not exceed 50 NTU above the background turbidity at any time, and that they not exceed 25 NTU over background turbidity on average for a 10-day period (IDAPA 58.01.02.250.02.e). The DWGP requires that sites monitor for turbidity to determine compliance with the WQS.

4.1.1.6 Aluminum

There are no applicable technology-based guidelines or State WQC for aluminum. In 2002, EPA released recommendations for aluminum WQC and then updated the recommendations in 2018. Since Idaho DEQ has not adopted the updated criteria and no limits for aluminum have been developed, the DWGP will require monitoring only for facilities only if aluminum salts are being used to enhance coagulation.

4.1.1.7 Metals

There are no applicable technology-based limits for metals. DEQ, however, has established applicable WQC for certain metals. In addition, DEQ has established a narrative water quality criterion for toxic substances, which states that surface waters of the State must be free of toxic substances in concentrations that impair designated beneficial uses. A review of the literature regarding WTP residuals suggests that metals may be present in discharges from drinking WTPs.

In the previous permit, EPA did not require metals monitoring of the receiving water upstream of the discharge. Since background levels of metals were not sampled, DEQ cannot perform an accurate RPA to determine if limits for metals are warranted. Monitoring will only be required in this permit with the addition of receiving water monitoring upstream of the permitted discharge.

4.2 Receiving Water Monitoring

Table 2 below list the receiving water requirements for all permittees covered under this general permit. The purpose of this sampling is to gather data so during the next permit development a reasonable potential analysis can be done.

Table 3. Receiving water monitoring requirements for all facilities.

Parameter	Units	Monitoring Requirements	
		Sample Frequency	Sample Type
pH	standard units	Once every five quarters	Grab
Hardness [3]	mg/L as $CaCO_3$	Once every five quarters	Grab
Aluminum[4]	µg/L	Once every five quarters	Grab
Antimony	µg/L	Once every five quarters	Grab
Arsenic	µg/L	Once every five quarters	Grab
Beryllium	µg/L	Once every five quarters	Grab
Cadmium	µg/L	Once every five quarters	Grab
Total Chromium	µg/L	Once every five quarters	Grab
Copper	µg/L	Once every five quarters	Grab
Lead	µg/L	Once every five quarters	Grab
Nickel	µg/L	Once every five quarters	Grab
Selenium	µg/L	Once every five quarters	Grab
Silver	µg/L	Once every five quarters	Grab
Thallium	µg/L	Once every five quarters	Grab
Zinc	µg/L	Once every five quarters	Grab
Temperature	˚C	Once every five quarters	Grab
Total Trihalomethanes (TTHMs)[5]	µg/L	1/Quarter	Grab
Turbidity	NTUs	Once every five quarters	Grab

Notes:
1. See ML in Appendix D of the permit
2. Flow estimate based on facility operation (i.e., backwash volume and frequency). Report average monthly and maximum daily gpd.
3. Hardness must be sampled at the same time metal samples are collected.
4. Monitoring only required where alum is used in the drinking water treatment process.
5. For TTHMs—Quarterly monitoring, with a minimum of 10 samples required within 5 years. Analyze for chloroform, chlorodibromomethane, dichlorobromomethane, and bromoform. Quarters are defined as January to March; April to June; July to September; and October to December.

5 Notification Requirements

New dischargers seeking coverage under this DWGP must submit to DEQ a written NOI requesting permit coverage. Per IDAPA 58.01.25.130.05.b.i, a discharger who fails to submit a timely and complete NOI under the terms of a general permit is not authorized to discharge. A complete and timely NOI fulfills the permit application requirements of IDAPA 58.01.25.101 and 40 CFR 122.21.

When a drinking water treatment facility is owned by one person or company, and is operated by another person or company, it is the operator's responsibility to apply for and obtain permit coverage as specified in IDAPA 58.01.102.02. For owners/operators of multiple facilities, a separate NOI must be completed for each facility.

The facilities in Table 4 have already submitted the necessary and required information to determine eligibility for DWGP coverage. Each of the facilities has submitted an NOI for reissuance of coverage under this general permit.

Table 4. Drinking water treatment facilities currently covered.

Drinking Water Treatment Plants	IPDES Number
City of Bonners Ferry	IDG380002
City of Sandpoint Sand Creek	IDG380005
Laclede Water District	IDG380006
City of Lewiston	IDG380003
City of Pierce	IDG380007
Wilderness Ranch Water	IDG380004

5.1 Notice of Intent

Any discharger seeking coverage under the DWGP must submit an NOI to DEQ through the IPDES E-Permitting System. Depending on the information provided, additional time may be necessary for DEQ to authorize a discharge. The NOI must include certain information to receive DEQ authorization to discharge under this IPDES permit. The NOI requirements are found in the DWGP, section 1.10.

Request for Mixing Zone

This section applies to a new permittee who is requesting a mixing zone. If a facility requests DEQ consider a mixing zone for one or more pollutants required to be limited by the category, the following additional information must be included in the NOI:

1. A request, in writing, that DEQ consider a mixing zone.
2. The analytical results from a minimum of one representative ambient background sample for each pollutant for which a mixing zone is requested, collected from the receiving water at a location immediately upstream of the outfall.
3. If additional data are available on the pollutants included in the mixing zone request, submit it with the NOI information.

5.2 Authorization to Discharge

Applicants will be authorized to discharge as of the date of the written notification that DEQ has granted coverage under the DWGP.

5.3 Basis for Effluent and Receiving Water Monitoring

IDAPA 58.01.02 and 58.01.25 require that monitoring be included in permits to determine compliance with effluent limits and other permit restrictions. Monitoring may also be required to gather data to assess the need for future effluent limits or to monitor effluent impacts on receiving water quality. Permittees are responsible for conducting the monitoring and reporting the results on monthly discharge monitoring report (DMRs) and in annual reports.

6 Permit Expiration or Modification

The permit will expire 5 years from the effective date.

DEQ may modify a permit before its expiration date only for causes specified in IDAPA 58.01.25.201. A modification other than a *minor modification* requires preparing a draft permit that incorporates the proposed changes, preparing a fact sheet, and conducting a public review period. Only the permit conditions subject to the modification will be reopened when a permit is modified. All other conditions of the existing permit will remain in effect. Modifying a permit does not change the expiration date of the original permit.

7 Standard Conditions

Section 3 of the permit contains standard regulatory documents and conditions that must be included in all IPDES permits. DEQ bases the Standard Conditions on state and federal laws and regulations. The regulatory language covers general requirements such as monitoring, recording, reporting, and compliance responsibilities.

7.1 Quality Assurance Project Plan

Under IDAPA 58.01.25.300.05, permittees are required to develop procedures to ensure that the monitoring data submitted is accurate and explain data anomalies if they occur. The permittee is required to develop, maintain, and implement a plan for sampling quality assurance. The quality assurance project plan consists of standard operating procedures for collecting, handling, storing, and shipping samples, laboratory analysis, and data reporting. The plan must be retained on site and made available to DEQ upon request.

7.2 Operation and Maintenance Manual

The DWGP requires drinking water facilities to properly operate and maintain all facilities and conveyance, treatment, and control systems. Proper operation and maintenance are essential to meeting discharge limits, monitoring requirements, and all other permit requirements at all times. The permittee is required to maintain, update, develop, and implement an operation and maintenance plan for their facility. The plan must be retained on site and made available to DEQ upon request.

8 Antidegradation

DEQ's antidegradation policy provides three levels of protection to water bodies in Idaho subject to CWA jurisdiction (IDAPA 58.01.02.051).

- Tier I of antidegradation protection is designed to ensure that existing uses and the water quality necessary to protect those uses is maintained and protected (IDAPA 58.01.02.051.01; 58.01.02.052.01). A Tier I review is performed for all new or reissued permits or licenses (IDAPA 58.01.02.052.07).
- Tier II protection applies to any water bodies considered to be high quality waters (where the water quality exceeds levels necessary to support propagation of fish, shellfish, wildlife, and recreation in and on the water) and provides that water quality will be maintained and protected unless allowing for lower water quality is deemed by the state as necessary to accommodate important economic or social development in the area. In allowing any lowering of water quality, DEQ must ensure adequate water quality to protect existing uses fully and must ensure that the highest statutory and regulatory requirements are achieved for all new and existing point sources (IDAPA 58.01.02.051.02; 58.01.02.052.08).
- Tier III protection applies to water bodies that have been designated by the Idaho Legislature as outstanding national resource waters and provides that water quality is to be maintained and protected (IDAPA 58.01.02.051.03; 58.01.02.052.09).

DEQ employs 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 Idaho Integrated Report and supporting data are used to determine support status and the tier of protection (IDAPA 58.01.02.052.05).

8.1 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 CWA, and requires demonstration that existing uses and the level of water quality necessary to protect existing uses will be maintained and protected. To protect and maintain existing and designated beneficial uses, a permitted discharge must comply with narrative and numeric criteria of Idaho's water quality standards, as well as other provisions of the standards.

Water bodies not supporting existing or designated beneficial uses must be identified as water quality limited, and a TMDL must be prepared for those pollutants causing impairment. The TMDLs 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 limits that are consistent with wasteload allocations in the approved TMDL.

8.2 High-Quality Waters (Tier II Protection)

For a reissued permit 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 previous permit and the water quality that would result from the activity or discharge as proposed in the reissued permit (IDAPA 58.01.02.052.06.a). For a new permit, 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 (IDAPA 58.01.02.052.06.a).

The limits in this permit are the same as the limits in the previous permit so there is no degradation expected with the issuance of this permit.

8.3 Antibacksliding

CWA § 402(o) and IDAPA 58.01.25.200 generally prohibit the renewal, reissuance, or modification of an existing IPDES permit that contains effluent limits, permit conditions, or standards that are less stringent than those established in the previous permit (i.e., antibacksliding) but provides limited exceptions. Antibacksliding exceptions covered in *Effluent Limit Development Guidance,* section 4.1 (DEQ 2017).

Since the effluent limits in the 2021 permit are the same as the previous permit, there is no backsliding.

9 Definitions

7Q10 flow (7-day, 10-year low flow)—The lowest 7-day consecutive mean daily stream flow with a recurrence interval of 10 years.

Average monthly discharge limitation—The highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month. It may also be referred to as the monthly average limit (IDAPA 58.01.25.010.06).

Bypass—The intentional diversion of waste streams from any portion of a treatment facility. (IDAPA 58.01.25.010.12).

Chemical Abstract Service (CAS) registration number—The number assigned by the CAS to uniquely identify a chemical.

Code of Federal Regulations (CFR)—The official annual compilation of all regulations and rules promulgated during the previous year by the agencies of the US government, combined with all the previously issued regulations and rules of those agencies that are still in effect.

Composite sample—A flow-proportioned mixture of not less than four discrete representative samples collected at the same discharge point within the same 24 hours.

Conventional filtration treatment—A series of processes including coagulation, flocculation, sedimentation, and filtration resulting in substantial particulate removal.

Filtration treatment—A filtration process that includes slow sand filtration using filtration media and filters that separate suspended materials from water during the treatment train of a drinking water treatment facility.

Conventional pollutant—Biochemical oxygen demand, total suspended solids (TSS), bacteria, oil and grease, and pH.

Continuous discharge—A discharge that occurs without interruption throughout the operating hours of the facility, except for infrequent shutdowns for maintenance, process changes, or other similar activities (IDAPA 58.01.25.010.20).

Clean Water Act (CWA)—United States Code (USC) (formerly referred to as the Federal Water Pollution Control Act or Federal Water Pollution Control Act Amendments of 1972) Public Law 92-500, as amended by Public Law 95-217, Public Law 95-576, Public Law 96-483, and Public Law 97¬117, 33 USC 1251 et seq. (IDAPA 58.01.25.010.15).

Daily discharge—The discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants with limits expressed as mass, daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurement, the daily discharge is calculated as the average measurement of the pollutant over the day (IDAPA 58.01.25.010.21).

Designated use—Beneficial uses assigned to identified waters in Idaho Department of Environmental Quality's "Water Quality Standards" (IDAPA 58.01.02.110–160), whether or not the uses are being attained (IDAPA 58.01.02.010.24).

Director—The Director of the State of Idaho Department of Environmental Quality or an authorized representative. (IDAPA 58.01.25.010.25).

Direct filtration—A series of processes including coagulation and filtration but excluding sedimentation that results in substantial particulate removal.

Discharge – when used without qualification means the discharge of a pollutant. (IDAPA 58.01.25.010.27).

Discharge monitoring report (DMR)— The facility or activity report containing monitoring and discharge quality and quantity information and data required to be submitted periodically, as defined in the discharge permit. These reports must be submitted to the Department on a Department-approved format. (IDAPA 58.01.25.010.26).

Discharge of a pollutant—Addition of any pollutant or combination of pollutants to waters of the United States from any point source. This definition includes additions of pollutants into waters of the United States from: surface runoff which is collected or channeled by man;

discharges through pipes, sewers, or other conveyances owned by a state, municipality, or other person which do not lead to a treatment works; and discharges through pipes, sewers, or other conveyances, leading into privately owned treatment works. This term does not include an addition of pollutants by any indirect discharger. (IDAPA 58.01.25.010.28).

Draft permit—A document prepared under IDAPA 58.01.25 indicating the director's tentative decision to issue or deny, modify, revoke and reissue, terminate, or reissue a permit. (IDAPA 58.01.25.010.29).

Effluent limitation—Any restriction imposed by the department on quantities, discharge rates, and concentrations of pollutants which are discharged from point sources into waters of the United States, in accordance with these rules and Clean Water Act. (IDAPA 58.01.25.010.31).

Effluent limitation guidelines—A regulation published by the EPA under CWA § 304(b) to adopt or revise effluent limitations (IDAPA 58.01.25.010.32).

Excluded waters or prohibited waters—Water bodies not authorized as receiving waters to be covered under this permit.

Facility—Any point source or any other facility or activity (including land or appurtenances) that is subject to regulation under the IPDES Program. (IDAPA 58.01.25.010.38).

Filtration—A process for removing particulate matter from water by passage through porous media. Flocculation means a process to enhance agglomeration or collection of smaller floc particles into larger, more easily settleable particles through gentle stirring by hydraulic or mechanical means.

General permit—An IPDES permit issued under 58.01.25.130 (General Permits) authorizing a category of discharges under the CWA within a geographical area (IDAPA 58.01.25.010.40).

Grab sample—A single water sample or measurement of water quality taken at a specific time.

Hazardous material—A material or combination of materials that, when discharged in any quantity into state waters, presents a substantial present or potential hazard to human health, public health, or the environment (IDAPA 58.01.02.010.46). In 40 CFR 122.2 it is defined as any substance designated in 40 CFR 116, pursuant to CWA § 311.

Idaho Pollutant Discharge Elimination System (IPDES). Idaho's program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under 58.01.25 and the Clean Water Act sections 307, 402, 318, and 405. (IDAPA 58.01.25.010.42).

Indian Country— (a) All land within the limits of any Indian reservation under the jurisdiction of the United States Government, notwithstanding the issuance of any patent, and, including rights-of-way running through the reservation, (b) All dependent Indian communities within the borders of the United States whether within the original or subsequently acquired territory thereof, and whether within or without the limits of a state, and, (c) All Indian allotments, the

Indian titles to which have not been extinguished, including rights-of-way running through the same. (IDAPA 58.01.25.010.43).

Ion exchange treatment—Use of ion exchange (a reversible process in which an ion in solution in contact with a crystal replaces an ion in the lattice of that crystal) for water softening or other water-treatment processes.

Indian tribe—Any Indian tribe, band, group, or community recognized by the Secretary of the Interior and exercising governmental authority over a federal Indian reservation (IDAPA 58.01.25.010.44).

Influent—Water from upstream that enters the facility.

Maximum—The highest measured discharge or pollutant in a waste stream during the time period of interest.

Maximum daily discharge limitation—The highest allowable daily discharge (IDAPA 58.01.25.010.52).

Membrane filtration—A pressure- or vacuum-driven separation process in which particulate matter larger than 1 micrometer is rejected by an engineered barrier, primarily through a size-exclusion mechanism, and has a measurable removal efficiency of a target organism that can be verified through by applying a direct integrity test. This term includes the common membrane technologies of microfiltration, ultrafiltration, nanofiltration, and reverse osmosis (40 CFR 141.2). Reverse osmosis units are not covered by this general permit.

Mixing zone—A defined area or volume of the receiving water surrounding or adjacent to a wastewater discharge where the receiving water, as a result of the discharge, may not meet all applicable water quality criteria or standards. It is considered a place where wastewater mixes with receiving water and not as a place where effluents are treated (IDAPA 58.01.02.010.61). Mixing zones will be applied according to the water quality standards in IDAPA 58.01.02.060.

Monthly average limit—The average of daily discharges over a monitoring month, calculated as the sum of all daily discharges measured during a monitoring month divided by the number of daily discharges measured during that month (40 CFR 122.2).

National Pollutant Discharge Elimination System (NPDES)—The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under CWA §§ 307, 402, 318, and 405 (40 CFR 122.2).

Nonconventional pollutants—All pollutants that are not included in the list of conventional or toxic pollutants in 40 CFR 401. This term includes pollutants such as total residual chlorine, ammonia, chemical oxygen demand, nitrogen, and phosphorous.

Notice of intent (NOI)—A request, or application, to be authorized to discharge under a general NPDES or IPDES permit.

Nuisance—Anything that is injurious to public health or an obstruction to the free use, in the customary manner, of any waters of the state (IDAPA 58.01.02.010.67).

Outstanding resource water—A high quality water, such as water of national and state parks and wildlife refuges and water of exceptional recreational significance, that has been designated by the legislature and subsequently listed in IDAPA 58.01.02. The designation constitutes an outstanding national or state resource requiring protection from point and nonpoint source activities that may lower water quality (IDAPA 58.01.02.010.72).

Pollutant—Dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials (except those regulated under the Atomic Energy Act of 1954, as amended [42 USC 2011 et seq.]), heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water (IDAPA 58.01.25.010.68).

Quarterly monitoring—Monitoring during the following quarters: January to March; April to June; July to September; and October to December.

Services—The US Fish and Wildlife Service and/or the National Oceanic and Atmospheric Administration-National Marine Fisheries Service (NOAA Fisheries or NMFS).

Slow sand filtration—A process involving passage of raw water through a bed of sand at low velocity (generally less than 0.4 m/h) resulting in substantial particulate removal by physical and biological mechanisms.

Sorption—Adhesion or release of molecules or ions on a particle surface including all processes associated with adsorption or absorption.

Technology-based effluent limitation (TBEL)—Treatment requirements under CWA § 301(b) that represent the minimum level of control that must be imposed in a permit issued under CWA § 402. (IDAPA 58.01.25.010.99). EPA is required to promulgate technology-based limitations and standards that reflect pollutant reductions that can be achieved by categories, or subcategories of industrial point sources using specific technologies that EPA identifies as meeting the statutorily prescribed level of control under the authority of CWA §§ 301, 304, 306, 307, 308, 402, and 501 (33 USC §§ 1311, 1314,1316,1318,1342, and 1361).

Total maximum daily load (TMDL)—The sum of the individual wasteload allocations (WLAs) for point sources, load allocations for nonpoint sources, and natural background when allocating pollutant loading to a particular water body. Such load will be established at a level necessary to implement the applicable water quality standards with seasonal variations and a margin of safety that accounts for any lack of knowledge concerning the relationship between effluent limitations and water quality (IDAPA 58.012.02.010.100).

Upset—An exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by

operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive, or careless or improper operation. (IDAPA 58.01.25.010.105).

Appendix A. Technical Calculations

A. Technology-Based Effluent Limits

EPA selected the "drinking water treatment point source category" as a candidate for effluent guidelines rulemaking. At this time, EPA has made no decisions about whether any discharge controls are necessary for residuals produced by drinking water treatment facilities. Additional information on drinking water treatment facilities can be found at https://www.epa.gov/eg/drinking-water-treatment-residuals-management. Where EPA has not yet developed effluent limitation guidelines, pursuant to the CWA § 301(b), for a particular industry or a particular pollutant, technology-based limitations must be established using best professional judgment (40 CFR 122.43, 12.44, and 125.3). Because there are no effluent limitation guidelines developed by EPA for discharges from the water treatment industry, EPA established technology-based effluent limitations based on best professional judgment for TSS and total residual chlorine.

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

DEQ uses the process in the *Effluent Limit Development Guidance* (DEQ 2017) to determine reasonable potential. After characterizing the effluent and receiving water, DEQ compares the projected receiving water concentration after the effluent is discharged to the water quality criteria for the pollutant of concern. If the projected concentration exceeds the criterion, there is reasonable potential and an effluent limit is developed.

If DEQ chooses to authorize a mixing zone, the water quality criteria must still be met at the edge of the mixing zone. If after the analysis of the mixing zone, water quality criteria are not met, the facility will receive an effluent limit that identifies both the size of the mixing zone and the final effluent limit.

Mass-Balance

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

$$C_d = \frac{(C_e Q_e) + \lfloor C_u (Q_u \times \%MZ) \rfloor}{Q_e + (Q_u \times \%MZ)}$$

Equation 1. Simple mass-balance equation.

Where:

C_d = downstream receiving water concentration	Calculated value
Q_e = critical effluent flow	From discharge flow data
Q_u = critical upstream flow (1Q10 acute criterion, 7Q10 chronic, or harmonic mean)	From water quality standards

%MZ = percent of critical low flow provided by mixing zone	From mixing zone analysis
C_u = critical upstream pollutant concentration (90th to 95th percentile)	From receiving water data
C_e = critical effluent pollutant concentration	Calculated value using

A dilution factor (D) can be introduced to describe the allowable mixing. A dilution factor represents the ratio of the receiving water body low flow percentage (i.e., the low-flow design discharge conditions) to the effluent discharge volume and is expressed as:

$$Dilution\ Factor = D_f = \frac{(Q_S \times P + Q_e)}{Q_e} = \frac{(Q_s \times P)}{Q_e} + 1$$

Equation 2. Dilution factor calculation.

Where: D_f = Dilution factor

Q_s = Receiving water low-flow condition (cfs)

P = Mixing zone percentage

Q_e = Effluent discharge flow (cfs)

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

Critical Effluent Pollutant Concentration

When determining the projected receiving water concentration downstream of the effluent discharge, DEQ's *Effluent Limit Development Guidance* (DEQ 2017) recommends using the critical effluent pollutant concentration (C_e) in the mass balance calculation (see Equation 1). To determine the C_e DEQ has adopted EPA's statistical approach that accounts for day-to-day variability in effluent quality by identifying the number of samples, calculating the coefficient of variation (CV) (Equation 7, below), and selecting a reasonable potential multiplying factor (RPMF) from the tables in the *Effluent Limit Development Guidance* (DEQ 2017).

$$CV = \frac{Standard\ Deviation}{Mean}$$

Equation 3. CV calculation.

$$C_e = MOEC\ x\ RPMF$$

Equation 4. C_e calculation.

If the C_e exceeds water quality criteria, then a reasonable potential analysis is conducted.

Reasonable Potential Analysis

The discharge has reasonable potential to cause or contribute to an exceedance of WQC, referred to as a reasonable potential to exceed (RPTE), if the critical concentration of the pollutant at the end of pipe exceeds the most stringent WQC for that pollutant. This RPTE may

result in end-of-pipe limits or may be accommodated if the receiving water has sufficient low flows to provide a mixing zone and the POC does not have acute toxicity attributes. Other conditions may also be applicable that may restrict the use of a mixing zone for the POC.

C. WQBEL Calculations

The following calculations demonstrate how the WQBELs in the permit were calculated. The permit includes WQBELs for TRC. The following discussion presents the general equations used to calculate the WQBELs.

Calculate the Wasteload Allocations (WLAs)

WLAs are calculated using the same mass-balance equations used to calculate the concentration of the pollutant at the mixing zone boundary in the RPA. WLAs must be calculated for both acute and chronic criteria. To calculate the WLAs, C_d is set equal to the appropriate criterion and the equation is solved for C_e. The calculated C_e is the WLA. Equation 5 is rearranged to solve for the WLA:

Equation 5. Simple mass-balance equation for calculating WLA for flowing water.

$$C_e = WLA_{(a\ or\ c)} = \frac{WQC_{(a\ or\ c)}[Q_e + (Q_u \times \%MZ)] - [C_u \times (Q_u \times \%MZ)]}{Q_e}$$

Where:

$WQC_{(a\ or\ c)}$ = Pollutant water quality criterion (acute or chronic)	Calculated value
Q_e = Critical effluent flow	From discharge flow data (design flow for POTW)
Q_u = Critical upstream flow (1Q10 acute criterion or 7Q10 chronic)	From water quality standards
%MZ = Percent of critical low flow provided by mixing zone	From mixing zone analysis
C_u = Critical upstream pollutant concentration (90th to 95th percentile)	From receiving water data
$C_e = WLA_{(a\ or\ c)}$ = wasteload allocation (acute or chronic)	Calculated from Equation 4

Idaho's WQC for some metals are expressed as the dissolved fraction. The rules regulating the IPDES program (IDAPA 58.01.25.303.03 – Metals.) require that effluent limits be expressed as total recoverable metal unless standards have been promulgated allowing limits specified in dissolved, valent, or total forms. A case-by-case basis has been established for limits specified in dissolved, valent, or total form, or all approved analytical methods for the metal inherently measure only its dissolved form. Therefore, the permit writer should calculate a WLA 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 discussed in *Guidance Document on Dynamic Modeling and Translators* (EPA 1993), the criteria translator (CT) is equal to the conversion factor when site-specific translators are not available. Conversion factors for

metals criteria are listed in DEQ's Water Quality Standards (WQS) at IDAPA 58.01.02.210.02. The WQS also lists several guidance documents at IDAPA 58.01.02.210.04 that are recommended for the development of site-specific translators.

The next step is to compute the acute and chronic long-term average ($LTA_{(a\ or\ c)}$) concentrations, which will be derived from the acute and chronic WLAs. This is done using the following equations from the *Effluent Limit Development Guidance* (DEQ 2017):

$$LTA_a = WLA_a \times e^{(0.5\sigma^2 - z_{99}\sigma)}$$ **Equation 6. Acute LTA for toxics.**

Where:

LTA_a = Acute long-term average	Calculated value
WLA_a = Acute wasteload allocation	Calculated value. See Equation 5.
e = Base of natural log	Approximately 2.718
σ = Square root of σ^2	
$\sigma^2 = Ln(CV^2+1)$	Ln is the natural log
CV = Coefficient of variation	Calculated using field data. If 10 or less samples available, use default value of 0.6. See Equation 3
Z_{99} = z score of the 99th percentile of the normal distribution	2.326

$$LTA_c = WLA_c \times e^{(0.5\sigma_n^2 - z_{99}\sigma_n)}$$ **Equation 7. Chronic LTA average for toxics.**

Where:

LTA_c = Chronic long-term average	Calculated value
WLA_c = Chronic wasteload allocation	Calculated value. See Equation 5.
e = Base of natural log	Approximately 2.718
σ_n = Square root of σ_n^2	
$\sigma_n^2 = Ln[(CV^2)/n + 1)]$	Ln is the natural log
CV = Coefficient of variation	Calculated using field data. If 10 or less, samples available use default value of 0.6. See Equation 3.
Z_{99} = z score of the 99th percentile of the normal distribution	2.326
n = Averaging period for the chronic water quality criterion (typically 4 days)	Varies

The acute and chronic LTAs are compared, and the more stringent of the two is used to calculate the maximum daily and average monthly limits.

Derive the Maximum Daily and Average Monthly Effluent Limits

Using the *Effluent Limit Development Guidance* (DEQ 2017) equations, the maximum daily limit (MDL) and average monthly limit (AML) are calculated as follows:

$$Maximum\ Daily\ Limit = LTA_m \times e^{(z_{99}\sigma - 0.5\sigma^2)}$$ **Equation 8. Maximum daily limit for toxics.**

Where:

LTA_m = Minimum long-term average value	Lesser value calculated from Equation 6 and Equation 7
e = Base of natural log	Approximately 2.718
σ = Square root of σ^2	
$\sigma^2 = Ln(CV^2+1)$	Ln is the natural log of base e
Z_{99} = z score of the 99th percentile of the normal distribution	2.326
CV = Coefficient of variation	See Equation 3.

$$AML = LTA_m \times e^{(z_{95}\sigma_n - 0.5\sigma_n^2)}$$ **Equation 9. Average monthly limit for toxics.**

Where:

LTA_m = Minimum long-term average	Lesser value calculated from Equation 6 and Equation 7
AML = Average monthly limit	Calculated value
e = Base of natural log	Approximately 2.718
σ_n = Square root of σ_n^2	
$\sigma_n^2 = Ln[(CV^2)/n + 1]$	Ln is the natural log of base e
Z_{95} = z score of the 95th percentile of the normal distribution	1.645
n = Number of sample specified in the permit to be analyzed each month	Typically n = 1, 2, 4, 10, or 30.
CV = Coefficient of variation	See Equation 3

Details the calculations for WQBELs for the three facilities that requested mixing zones can be found below.

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

Facility Name	Laclede Water District
Facility Flow (mgd)	0.5300
Facility Flow (cfs)	0.81991

Fill "Yes" or "No"

Does the Receiving Water have Domestic Water Supply Ben yes

List any criteria for which you edited the criteria tab to incorporate site specific criteria

Critical River Flows

	(IDAPA 58.01.02 03. b)	Annual Crit. Flows	Units
Aquatic Life - Acute Criteria - Criterion Max. Concentration (CMC)	**1Q10**	3617.30000	cfs
Aquatic Life - Chronic Criteria - Criterion Continuous Concentration (CCC)	**7Q10 or 4B3**	4752.50000	cfs
Ammonia	**30B3/30Q10** (seasonal)	8075.40000	cfs
Human Health - Non-Carcinogen	**30Q5**	7057.60000	cfs
Human Health - carcinogen	**Harmonic Mean Flow**	16328.00000	cfs

Receiving Water Data

	Notes:	Annual
Hardness, as mg/L $CaCO_3$	Hardness, as mg/L $CaCO_3$ 5th prctile at critical flow	
Temperature, °C	Temperature, °C 90th - 95th percentile	
pH, S.U.	pH, S.U. 90th - 95th percentile	

min. hardness 25 mg/L except for Cadmium. Cd min. hardness is 10 mg/L. Maximum hardness for use in e

Input hardness on the WQ Criteria Tab for Hardness Dependent criteria

Pollutants of Concern			CHLORINE (Total Residual)	CHLOROFORM	BROMOFORM	DICHLOROBROMO METHANE	CHLORODIBR OMOMETHANE					
Effluent Data	**Number of Samples in Data Set (n)**		77	17	17	17	17					
	Coefficient of Variation (CV) = Std. Dev./Mean (default CV = 0.6)		0.649825	0.6	0.6	0.6	0.6					
	Effluent Concentration, µg/L (Max. or 95th Percentile) - (C_e)		200	25.3	0	1.61	0					
	Calculated 50th prctile Effluent Conc. (when n>10), Human Health Only		50	10.5	0	1.23	0					
Receiving Water Statistics	**90th Percentile Conc., µg/L - (C_u)**		0	0	0	0	0					
	Geometric Mean, µg/L, Human Health Criteria Only		0	0	0	0	0					
Applicable Water Quality Criteria	Aquatic Life Criteria, µg/L	Acute	19.	--	--	--	--	--	--	--	--	--
	Aquatic Life Criteria, µg/L	Chronic	11.	--	--	--	--	--	--	--	--	--
	Human Health Water and Organism, µg/L		--	61.	62.	8.8	7.4	--	--	--	--	--
	Human Health, Organism Only, µg/L		--	730.	380.	86.	67.	--	--	--	--	--
	Metals Criteria Translator, decimal (or default use Conversion Factor)	Acute	--	--	--	--	--	--	--	--	--	--
		Chronic	--	--	--	--	--	--	--	--	--	--
	Carcinogen (Y/N), Human Health Criteria Only		N	Y	Y	Y	Y	--	--	--	--	--
Assign Percent Mixing	Use this row to set the mixing zone size instead of letting it auto-calculate			0.00%	0.00%	0.00%	0.00%					
Percent River Flow	Aquatic Life - Acute	1Q10	0.35%	0.00%	0.00%	0.00%	0.00%	--	--	--	--	--
	Aquatic Life - Chronic	7Q10 or 4B3	0.47%	0.00%	0.00%	0.00%	0.00%	--	--	--	--	--
		30B3 or 30Q10	--	0.00%	0.00%	0.00%	0.00%	--	--	--	--	--
	Human Health - Non-Carcinogen and Chronic Ammonia	Harmonic Mean	--	0.00%	0.00%	0.00%	0.00%	--	--	--	--	--
	Human Health - Carcinogen	Harmonic Mean	--	0.00%	0.00%	0.00%	0.00%	--	--	--	--	--
Calculated Dilution Factors (DF) (or enter Modeled DFs)	Aquatic Life - Acute	1Q10	16.48	1.00	1.00	1.00	1.00	--	--	--	--	--
	Aquatic Life - Chronic	7Q10 or 4B3	28.46	1.00	1.00	1.00	1.00	--	--	--	--	--
		30B3 or 30Q10	--	1.00	1.00	1.00	1.00	--	--	--	--	--
	Human Health - Non-Carcinogen and Chronic Ammonia	Harmonic Mean	--	1.00	1.00	1.00	1.00	--	--	--	--	--
	Human Health - Carcinogen	Harmonic Mean	--	1.00	1.00	1.00	1.00	--	--	--	--	--

Aquatic Life Reasonable Potential Analysis

σ	$\sigma^2=\ln(CV^2+1)$		0.594	0.555	0.555	0.555	0.555	--	--	--	--	--
P_n	=(1-confidence level)$^{1/n}$, where confidence level =	**99%**	0.942	0.763	0.763	0.763	0.763	--	--	--	--	--
Multiplier (TSD p. 57)	=exp(zσ-0.5σ^2)/exp[normsinv(P_n)σ-0.5σ^2], where	**99%**	1.6	2.4	2.4	2.4	2.4	--	--	--	--	--
Statistically projected critical discharge concentration (C_e)			313.07	61.83	0.00	3.93	0.00	--	--	--	--	--
Predicted max. conc.(ug/L) at Edge-of-Mixing Zone		Acute	19.00	61.83	0.00	3.93	0.00	--	--	--	--	--
(note: for metals, concentration as dissolved using conversion factor as translator)		Chronic	11.00	61.83	0.00	3.93	0.00	--	--	--	--	--
Reasonable Potential to exceed Aquatic Life Criteria			**No**	**n/a**	**n/a**	**n/a**	**n/a**	--	--	--	--	--

Aquatic Life Effluent Limit Calculations

Number of Compliance Samples Expected per month (n)			4	4								
n used to calculate AML (if chronic is limiting then use min=4 or for ammonia min=30)			4	4	--	--	--	--	--	--	--	--
LTA Coeff. Var. (CV), decimal	(Use CV of data set or default = 0.6)		0.650	0.600	0.600	0.600	0.600	--	--	--	--	--
Permit Limit Coeff. Var. (CV), decimal	(Use CV from data set or default = 0.6)		0.650	0.600	0.600	0.600	0.600	--	--	--	--	--
Acute WLA, ug/L	C_d = (Acute Criteria x MZ_a) - C_u x (MZ_a-1)	Acute	313.1	--	--	--	--	--	--	--	--	--
Chronic WLA, ug/L	C_d = (Chronic Criteria x MZ_c) - C_u x (MZ_c-1)	Chronic	313.1	--	--	--	--	--	--	--	--	--
Long Term Ave (LTA), ug/L	WLAc x exp(0.5σ^2-zσ), Acute	**99%**	93.9	--	--	--	--	--	--	--	--	--
(99th % occurrence prob.)	WLAa x exp(0.5σ^2-zσ); ammonia n=30, Chronic	**99%**	157.5	--	--	--	--	--	--	--	--	--
Limiting LTA, ug/L	used as basis for limits calculation		93.9	--	--	--	--	--	--	--	--	--
Applicable Metals Criteria Translator (metals limits as total recoverable)			--	--	--	--	--	--	--	--	--	--
Average Monthly Limit (AML), ug/L	, where % occurrence prob =	**95%**	**150**	**0**	--	--	--	--	--	--	--	--
Maximum Daily Limit (MDL), ug/L	, where % occurrence prob =	**99%**	**313**	**0**	--	--	--	--	--	--	--	--
Average Monthly Limit (AML), mg/L			**0.150**	**0.000**	--	--	--	--	--	--	--	--
Maximum Daily Limit (MDL), mg/L			**0.313**	**0.000**	--	--	--	--	--	--	--	--
Average Monthly Limit (AML), lb/day			**0.664**	--	--	--	--	--	--	--	--	--
Maximum Daily Limit (MDL), lb/day			**1.384**	--	--	--	--	--	--	--	--	--

Human Health Reasonable Potential Analysis

σ	$\sigma^2=\ln(CV^2+1)$		0.594	0.555	0.555	0.555	0.555	--	--	--	--	--
P_n	=(1-confidence level)$^{1/n}$ where confidence level =	**95%**	0.962	0.838	0.838	0.838	0.838	--	--	--	--	--
Multiplier	=exp(2.326σ-0.5σ^2)/exp[invnorm(P_Nσ-0.5σ^2], prob. =	**50%**	0.349	0.578	0.578	0.578	0.578	--	--	--	--	--
Statistically projected critical discharge concentration			0.0	0.0	0.0	0.0	0.0	--	--	--	--	--
Dilution Factor (for Human Health Criteria)			--	1.000	1.000	1.000	1.000	--	--	--	--	--
Max Conc. at edge of Chronic Zone, ug/L (C_d)			--	6.1	0.0	0.7	0.0	--	--	--	--	--
Reasonable Potential to exceed HH Water & Organism			NO	NO	NO	NO	NO	--	--	--	--	--
Reasonable Potential to exceed HH Organism Only			NO	NO	NO	NO	NO	--	--	--	--	--

Human Health, Water + Organism, Effluent Limit Calculations

Number of Compliance Samples Expected per month (n)			4	4	4	4	4			4		
Average Monthly Effluent Limit, ug/L		equals wasteload allocation	--	**61.00**	**62.00**	**8.80**	**7.40**	--	--	--	--	--
Maximum Daily Effluent Limit, ug/L		TSD Multiplier, Table 5-3, using 99th and 95th percentile	**#VALUE!**	**122.38**	**124.38**	**17.65**	**14.85**	--	--	--	--	--
Average Monthly Limit (AML), lb/day			--	**0.270**	**0.274**	**0.039**	**0.033**	--	--	--	--	--
Maximum Daily Limit (MDL), lb/day			--	**0.541**	**0.550**	**0.078**	**0.066**	--	--	--	--	--

Human Health, Organism Only, Effluent Limit Calculations

Number of Compliance Samples Expected per month (n)			4	4	4	4	4			4		
Average Monthly Effluent Limit, ug/L		equals wasteload allocation	--	**730.00**	**380.00**	**86.00**	**67.00**	--	--	--	--	--
Maximum Daily Effluent Limit, ug/L		TSD Multiplier, Table 5-3, using 99th and 95th percentile	--	**1464.52**	**762.35**	**172.53**	**134.41**	--	--	--	--	--
Average Monthly Limit (AML), lb/day			--	**3.227**	**1.680**	**0.380**	**0.296**	--	--	--	--	--
Maximum Daily Limit (MDL), lb/day			--	**6.473**	**3.370**	**0.763**	**0.594**	--	--	--	--	--

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/505/2-90-001 http://www.epa.gov/npdes/pubs/owm0264.pdf

Filename: C:\Users\jdrygas\Desktop\Permits\Drinking Water\Facility DMRs\Laclede\[Laclede Water District RPA Workbook.XLSX]3.RP and Limits **Version Date:** 8/27/2017

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

Facility Name	City of Lewiston DWP
Facility Flow (mgd)	0.2090
Facility Flow (cfs)	0.32332

Fill "Yes" or "No"

Does the Receiving Water have Domestic Water Supply Beneficial Use? yes

List any criteria for which you edited the criteria tab to incorporate site specific criteria

Critical River Flows

	(IDAPA 58.01.02 03. b)	Annual Crit. Flows	Units
Aquatic Life - Acute Criteria - Criterion Max. Concentration (CMC)	**1Q10**	2233.00000	cfs
Aquatic Life - Chronic Criteria - Criterion Continuous Concentration (CCC)	**7Q10 or 4B3**	2479.00000	cfs
Ammonia	**30B3/30Q10** (seasonal)	3081.70000	cfs
Human Health - Non-Carcinogen	**30Q5**	2980.70000	cfs
Human Health - carcinogen	**Harmonic Mean Flow**	7608.80000	cfs

Receiving Water Data

		Notes:	Annual
Hardness, as mg/L $CaCO_3$	Hardness, as mg/L $CaCO_3$	5th prctile at critical flow	
Temperature, °C	Temperature, °C	90th - 95th percentile	
pH, S.U.	pH, S.U.	90th - 95th percentile	

min. hardness 25 mg/L except for Cadmium. Cd min. hardness is 10 mg/L. Maximum hardness for use in equations is 400 m

Input hardness on the WQ Criteria Tab for Hardness Dependent criteria

Pollutants of Concern			CHLORINE (Total Residual)	CHLOROFORM	DICHLOROBROMOMETHANE	CHLORODIBROMOMETHANE						
Effluent Data	**Number of Samples in Data Set (n)**		221	9	9	9						
	Coefficient of Variation (CV) = Std. Dev./Mean (default CV = 0.6)		0.67	0.6	0.6	0.6						
	Effluent Concentration, µg/L (Max. or 95th Percentile) - (C_e)		200	23.4	5.4	1.68						
	Calculated 50th prctile Effluent Conc. (when n>10), Human Health Only		80	14.3	3.78	0.89						
Receiving Water Statistics	**90th Percentile Conc., µg/L - (C_u)**		0	0	0	0						
	Geometric Mean, µg/L, Human Health Criteria Only		0	0	0	0						
Applicable Water Quality Criteria	Aquatic Life Criteria, µg/L	Acute	19.	--	--	--	--	--	--	--	--	--
	Aquatic Life Criteria, µg/L	Chronic	11.	--	--	--	--	--	--	--	--	--
	Human Health Water and Organism, µg/L		--	61.	8.8	7.4	--	--	--	--	--	--
	Human Health, Organism Only, µg/L		--	730.	86.	67.	--	--	--	--	--	--
	Metals Criteria Translator, decimal (or default use Conversion Factor)	Acute	--	--	--	--	--	--	--	--	--	--
		Chronic	--	--	--	--	--	--	--	--	--	--
	Carcinogen (Y/N), Human Health Criteria Only		N	Y	Y	Y	--	--	--	--	--	--
Assign Percent Mixing	Use this row to set the mixing zone size instead of letting it auto-calculate			0.00%	0.00%	0.00%						
Percent River Flow	Aquatic Life - Acute	1Q10	0.17%	0.00%	0.00%	0.00%	--	--	--	--	--	--
	Aquatic Life - Chronic	7Q10 or 4B3	0.27%	0.00%	0.00%	0.00%	--	--	--	--	--	--
		30B3 or 30Q10	--	0.00%	0.00%	0.00%	--	--	--	--	--	--
	Human Health - Non-Carcinogen and Chronic Ammonia	Harmonic Mean	--	0.00%	0.00%	0.00%	--	--	--	--	--	--
	Human Health - Carcinogen	Harmonic Mean	--	0.00%	0.00%	0.00%	--	--	--	--	--	--
Calculated Dilution Factors (DF) (or enter Modeled DFs)	Aquatic Life - Acute	1Q10	12.52	1.00	1.00	1.00	--	--	--	--	--	--
	Aquatic Life - Chronic	7Q10 or 4B3	21.63	1.00	1.00	1.00	--	--	--	--	--	--
		30B3 or 30Q10	--	1.00	1.00	1.00	--	--	--	--	--	--
	Human Health - Non-Carcinogen and Chronic Ammonia	Harmonic Mean	--	1.00	1.00	1.00	--	--	--	--	--	--
	Human Health - Carcinogen	Harmonic Mean	--	1.00	1.00	1.00	--	--	--	--	--	--
Aquatic Life Reasonable Potential Analysis												
σ	$\sigma^2=\ln(CV^2+1)$		0.609	0.555	0.555	0.555	--	--	--	--	--	--
P_n	=(1-confidence level)$^{1/n}$, where confidence level =	**99%**	0.979	0.599	0.599	0.599	--	--	--	--	--	--
Multiplier (TSD p. 57)	=exp(zσ-0.5σ^2)/exp[normsinv(P_n)σ-0.5σ^2], where	**99%**	1.2	3.2	3.2	3.2	--	--	--	--	--	--
Statistically projected critical discharge concentration (C_e)			237.94	73.92	17.06	5.31	--	--	--	--	--	--
Predicted max. conc.(ug/L) at Edge-of-Mixing Zone		Acute	19.00	73.92	17.06	5.31	--	--	--	--	--	--
(note: for metals, concentration as dissolved using conversion factor as translator)		Chronic	11.00	73.92	17.06	5.31	--	--	--	--	--	--
Reasonable Potential to exceed Aquatic Life Criteria			**No**	**n/a**	**n/a**	**n/a**	--	--	--	--	--	--
Aquatic Life Effluent Limit Calculations												
Number of Compliance Samples Expected per month (n)			4	1	1	1						
n used to calculate AML (if chronic is limiting then use min=4 or for ammonia min=30)			4	4	4	4	--	--	--	--	--	--
LTA Coeff. Var. (CV), decimal	(Use CV of data set or default = 0.6)		0.670	0.600	0.600	0.600	--	--	--	--	--	--
Permit Limit Coeff. Var. (CV), decimal	(Use CV from data set or default = 0.6)		0.670	0.600	0.600	0.600	--	--	--	--	--	--
Acute WLA, ug/L	C_d = (Acute Criteria x MZ_a) - C_u x (MZ_a-1)	Acute	237.9	--	--	--	--	--	--	--	--	--
Chronic WLA, ug/L	C_d = (Chronic Criteria x MZ_c) - C_u x (MZ_c-1)	Chronic	237.9	--	--	--	--	--	--	--	--	--
Long Term Ave (LTA), ug/L	WLAc x exp(0.5σ^2-zσ), Acute	**99%**	69.5	--	--	--	--	--	--	--	--	--
(99th % occurrence prob.)	WLAa x exp(0.5σ^2-zσ); ammonia n=30, Chronic	**99%**	117.5	--	--	--	--	--	--	--	--	--
Limiting LTA, ug/L	used as basis for limits calculation		69.5	--	--	--	--	--	--	--	--	--
Applicable Metals Criteria Translator (metals limits as total recoverable)			--	--	--	--	--	--	--	--	--	--
Average Monthly Limit (AML), ug/L , where % occurrence prob =		**95%**	**113**	**0**	**0**	**0**	--	--	--	--	--	--
Maximum Daily Limit (MDL), ug/L , where % occurrence prob =		**99%**	**238**	**0**	**0**	**0**	--	--	--	--	--	--
Average Monthly Limit (AML), mg/L			**0.113**	**0.000**	**0.000**	**0.000**	--	--	--	--	--	--
Maximum Daily Limit (MDL), mg/L			**0.238**	**0.000**	**0.000**	**0.000**	--	--	--	--	--	--
Average Monthly Limit (AML), lb/day			**0.196**	--	--	--	--	--	--	--	--	--
Maximum Daily Limit (MDL), lb/day			**0.415**	--	--	--	--	--	--	--	--	--
Human Health Reasonable Potential Analysis												
σ	$\sigma^2=\ln(CV^2+1)$		0.609	0.555	0.555	0.555	--	--	--	--	--	--
P_n	=(1-confidence level)$^{1/n}$ where confidence level =	**95%**	0.987	0.717	0.717	0.717	--	--	--	--	--	--
Multiplier	=exp(2.326σ-0.5σ^2)/exp[invnorm(P_N)σ-0.5σ^2], prob. =	**50%**	0.260	0.728	0.728	0.728	--	--	--	--	--	--
Statistically projected critical discharge concentration			0.0	0.0	0.0	0.0	--	--	--	--	--	--
Dilution Factor (for Human Health Criteria)			--	1.000	1.000	1.000	--	--	--	--	--	--
Max Conc. at edge of Chronic Zone, ug/L (C_d)			--	10.4	2.8	0.6	--	--	--	--	--	--
Reasonable Potential to exceed HH Water & Organism			NO	NO	NO	NO	--	--	--	--	--	--
Reasonable Potential to exceed HH Organism Only			NO	NO	NO	NO	--	--	--	--	--	--
Human Health, Water + Organism, Effluent Limit Calculations												
Number of Compliance Samples Expected per month (n)			4	1	1	1						
Average Monthly Effluent Limit, ug/L		equals wasteload allocation	--	**61.00**	**8.80**	**7.40**	--	--	--	--	--	--
Maximum Daily Effluent Limit, ug/L	TSD Multiplier, Table 5-3, using 99th and 95th percentile		**#VALUE!**	**88.99**	**12.84**	**10.80**	--	--	--	--	--	--
Average Monthly Limit (AML), lb/day			--	**0.106**	**0.015**	**0.013**	--	--	--	--	--	--
Maximum Daily Limit (MDL), lb/day			--	**0.155**	**0.022**	**0.019**	--	--	--	--	--	--
Human Health, Organism Only, Effluent Limit Calculations												
Number of Compliance Samples Expected per month (n)			4	1	1	1						
Average Monthly Effluent Limit, ug/L		equals wasteload allocation	--	**730.00**	**86.00**	**67.00**	--	--	--	--	--	--
Maximum Daily Effluent Limit, ug/L	TSD Multiplier, Table 5-3, using 99th and 95th percentile		--	**1064.93**	**125.46**	**97.74**	--	--	--	--	--	--
Average Monthly Limit (AML), lb/day			--	**1.272**	**0.150**	**0.117**	--	--	--	--	--	--
Maximum Daily Limit (MDL), lb/day			--	**1.856**	**0.219**	**0.170**	--	--	--	--	--	--

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/505/2-90-001 http://www.epa.gov/npdes/pubs/owm0264.pdf

Filename: C:\Users\jdrygas\Desktop\Permits\Drinking Water\Facility DMRs\City of Lewiston\[City of Lewiston RPA Workbook.XLSX]3.RP and **Version Date:** 8/27/2017

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

Facility Name	Wilderness Ranch
Facility Flow (mgd)	0.0011
Facility Flow (cfs)	0.00169

Fill "Yes" or "No"

Does the Receiving Water have Domestic Water Supply Beneficial Use? yes

List any criteria for which you edited the criteria tab to incorporate site specific criteria

Critical River Flows

	(IDAPA 58.01.02 03. b)	Annual Crit. Flows	Units
Aquatic Life - Acute Criteria - Criterion Max. Concentration (CMC)	**1Q10**	12.11800	cfs
Aquatic Life - Chronic Criteria - Criterion Continuous Concentration (CCC)	**7Q10 or 4B3**	12.68000	cfs
Ammonia	**30B3/30Q10** (seasonal)	24.08800	cfs
Human Health - Non-Carcinogen	**30Q5**		cfs
Human Health - carcinogen	**Harmonic Mean Flow**		cfs

Receiving Water Data

		Notes:	Annual
Hardness, as mg/L $CaCO_3$	Hardness, as mg/L $CaCO_3$	5th prctile at critical flow	
Temperature, °C	Temperature, °C	90th - 95th percentile	
pH, S.U.	pH, S.U.	90th - 95th percentile	

min. hardness 25 mg/L except for Cadmium. Cd min. hardness is 10 mg/L. Maximum hardness for use in equations is 400 m

Input hardness on the WQ Criteria Tab for Hardness Dependent criteria

Pollutants of Concern			CHLORINE (Total Residual)									
Effluent Data	**Number of Samples in Data Set (n)**		26									
	Coefficient of Variation (CV) = Std. Dev./Mean (default CV = 0.6)		0.52									
	Effluent Concentration, µg/L (Max. or 95th Percentile) - (C_e)		262.5									
	Calculated 50th prctile Effluent Conc. (when n>10), Human Health Only		115									
Receiving Water Statistics	**90th Percentile Conc., µg/L - (C_u)**		0									
	Geometric Mean, µg/L, Human Health Criteria Only		0									
Applicable Water Quality Criteria	Aquatic Life Criteria, µg/L	Acute	19.	--	--	--	--	--	--	--	--	--
	Aquatic Life Criteria, µg/L	Chronic	11.	--	--	--	--	--	--	--	--	--
	Human Health Water and Organism, µg/L		--	--	--	--	--	--	--	--	--	--
	Human Health, Organism Only, µg/L		--	--	--	--	--	--	--	--	--	--
	Metals Criteria Translator, decimal (or default use Conversion Factor)	Acute	--	--	--	--	--	--	--	--	--	--
		Chronic	--	--	--	--	--	--	--	--	--	--
	Carcinogen (Y/N), Human Health Criteria Only		N	--	--	--	--	--	--	--	--	--
Assign Percent Mixing	Use this row to set the mixing zone size instead of letting it auto-calculate											
Percent River Flow	Aquatic Life - Acute	1Q10	0.36%	--	--	--	--	--	--	--	--	--
	Aquatic Life - Chronic	7Q10 or 4B3	0.60%	--	--	--	--	--	--	--	--	--
		30B3 or 30Q10	--	--	--	--	--	--	--	--	--	--
	Human Health - Non-Carcinogen and Chronic Ammonia	Harmonic Mean	--	--	--	--	--	--	--	--	--	--
	Human Health - Carcinogen	Harmonic Mean	--	--	--	--	--	--	--	--	--	--
Calculated Dilution Factors (DF) (or enter Modeled DFs)	Aquatic Life - Acute	1Q10	26.63	--	--	--	--	--	--	--	--	--
	Aquatic Life - Chronic	7Q10 or 4B3	46.00	--	--	--	--	--	--	--	--	--
		30B3 or 30Q10	--	--	--	--	--	--	--	--	--	--
	Human Health - Non-Carcinogen and Chronic Ammonia	Harmonic Mean	--	--	--	--	--	--	--	--	--	--
	Human Health - Carcinogen	Harmonic Mean	--	--	--	--	--	--	--	--	--	--

Aquatic Life Reasonable Potential Analysis

σ	$\sigma^2=\ln(CV^2+1)$		0.489	--	--	--	--	--	--	--	--	--
P_n	=(1-confidence level)$^{1/n}$, where confidence level =	**99%**	0.838	--	--	--	--	--	--	--	--	--
Multiplier (TSD p. 57)	$=\exp(z\sigma-0.5\sigma^2)/\exp[\text{normsinv}(P_n)\sigma-0.5\sigma^2]$, where	**99%**	1.9	--	--	--	--	--	--	--	--	--
Statistically projected critical discharge concentration (C_e)			505.97	--	--	--	--	--	--	--	--	--
Predicted max. conc (ug/L) at Edge-of-Mixing Zone		Acute	19.00	--	--	--	--	--	--	--	--	--
(note: for metals, concentration as dissolved using conversion factor as translator)		Chronic	11.00	--	--	--	--	--	--	--	--	--
Reasonable Potential to exceed Aquatic Life Criteria			**No**	--	--	--	--	--	--	--	--	--

Aquatic Life Effluent Limit Calculations

Number of Compliance Samples Expected per month (n)			4	4								
n used to calculate AML (if chronic is limiting then use min=4 or for ammonia min=30)			4	--	--	--	--	--	--	--	--	--
LTA Coeff. Var. (CV), decimal	(Use CV of data set or default = 0.6)		0.520	--	--	--	--	--	--	--	--	--
Permit Limit Coeff. Var. (CV), decimal	(Use CV from data set or default = 0.6)		0.520	--	--	--	--	--	--	--	--	--
Acute WLA, ug/L	C_d = (Acute Criteria x MZ_a) - C_u x (MZ_a-1)	Acute	506.0	--	--	--	--	--	--	--	--	--
Chronic WLA, ug/L	C_d = (Chronic Criteria x MZ_c) - C_u x (MZ_c-1)	Chronic	506.0	--	--	--	--	--	--	--	--	--
Long Term Ave (LTA), ug/L	WLAc x $\exp(0.5\sigma^2-z\sigma)$,	**99%**	182.7	--	--	--	--	--	--	--	--	--
(99th % occurrence prob.)	WLAa x $\exp(0.5\sigma^2-z\sigma)$; ammonia n=30,	Chronic **99%**	288.4	--	--	--	--	--	--	--	--	--
Limiting LTA, ug/L	used as basis for limits calculation		182.7	--	--	--	--	--	--	--	--	--
Applicable Metals Criteria Translator (metals limits as total recoverable)			--	--	--	--	--	--	--	--	--	--
Average Monthly Limit (AML), ug/L , where % occurrence prob =		**95%**	**269**	--	--	--	--	--	--	--	--	--
Maximum Daily Limit (MDL), ug/L , where % occurrence prob =		**99%**	**506**	--	--	--	--	--	--	--	--	--
Average Monthly Limit (AML), mg/L			**0.269**	--	--	--	--	--	--	--	--	--
Maximum Daily Limit (MDL), mg/L			**0.506**	--	--	--	--	--	--	--	--	--
Average Monthly Limit (AML), lb/day			**0.002**	--	--	--	--	--	--	--	--	--
Maximum Daily Limit (MDL), lb/day			**0.005**	--	--	--	--	--	--	--	--	--

Human Health Reasonable Potential Analysis

σ	$\sigma^2=\ln(CV^2+1)$		0.489	--	--	--	--	--	--	--	--	--
P_n	=(1-confidence level)$^{1/n}$ where confidence level =	**95%**	0.891	--	--	--	--	--	--	--	--	--
Multiplier	$=\exp(2.326\sigma-0.5\sigma^2)/\exp[\text{invnorm}(P_N)\sigma-0.5\sigma^2]$, prob. =	**50%**	0.547	--	--	--	--	--	--	--	--	--
Statistically projected critical discharge concentration			0.0	--	--	--	--	--	--	--	--	--
Dilution Factor (for Human Health Criteria)			--	--	--	--	--	--	--	--	--	--
Max Conc. at edge of Chronic Zone, ug/L (C_d)			--	--	--	--	--	--	--	--	--	--
Reasonable Potential to exceed HH Water & Organism			**NO**	--	--	--	--	--	--	--	--	--
Reasonable Potential to exceed HH Organism Only			**NO**	--	--	--	--	--	--	--	--	--

Appendix B. Public Involvement Information

DEQ proposes to reissue/issue a general permit for drinking water facilities. The permit includes wastewater discharge limits and other conditions. This fact sheet describes the facility and DEQ's reasons for requiring permit conditions.

DEQ placed a Public Notice of Application on date and date in name of publication to inform the public about the submitted application and to invite comment on the reissuance/issuance of this permit.

DEQ will place/placed a Public Notice of Draft on date in name of publication to inform the public and to invite comment on the draft Idaho Pollutant Discharge Elimination System permit and fact sheet.

The notice:

- Tells where copies of the draft permit and fact sheet are available for public evaluation (a local public library, the closest regional or field office, posted on our website).
- Offers to provide the documents in an alternate format to accommodate special needs.
- Asks people to tell us how well the draft permit would protect the receiving water.
- Invites people to suggest fairer conditions, limits, and requirements for the permit.
- Invites comments on DEQ's determination of compliance with antidegradation rules.
- Urges people to submit their comments, in writing, before the end of the comment period.
- Tells how to request a public hearing about the draft IPDES permit.
- Explains the next step(s) in the permitting process.

Appendix C. Your Right to Appeal

Persons aggrieved, as specified in IDAPA 58.01.25.204.01.a., have a right to appeal the final permit decision. A Petition for Review must be filed with DEQ's Hearing Coordinator within 28 days after the department serves notice of the final permit decision under IDAPA 58.01.25.107 (Decision Process).

All documents concerning actions governed by these rules must be filed with the Hearing Coordinator at the following address:

Hearing Coordinator, Idaho Department of Environmental Quality, 1410 N. Hilton St., Boise, ID 83706-1255.

Documents may also be filed by FAX at (208) 373-0481 or may be filed electronically. The originating party is responsible for retaining proof of filing by FAX. The documents are deemed to be filed on the date received by the Hearing Coordinator. Upon receipt of the filed document, the Hearing Coordinator will provide a conformed copy to the originating party. Additional requirements for appeals of IPDES final permit decisions are found in IDAPA 58.01.25.204.

Appendix D. Public Comments and Response to Comments

DEQ only received one comment from EPA during the public comment period. The comments and DEQ responses are below.

EPA Comments

Comment 1:

Fact Sheet:

There is a typo in Section 2.2.1 **(correct section is 2.1.1)**, on Page 7. "Positively charges" should read "positively *charged*."

DEQ Response 1:

Change made to the language in 2.1.1.

Comment 2:

Fact Sheet:

Section 2.2.2 on Page 10 states, "The filter-to-waste is of a quality that can be sent directly into the water distribution system but is a fairly clean waste stream." This should state that the filter-to-waste water cannot be sent to the distribution system.

DEQ Response 2:

Correction made.

Comment 3:

Fact Sheet:

In Table 1 and Table 3, nickel is misspelled as “nickle.”

DEQ Response 3:

Correction made.

Comment 4:

Fact Sheet:

In Section 4.1.1.6, on Page 17, please note that although Idaho has not adopted the 2018 aluminum 304(a) criteria, those criteria could be used to interpret the state's narrative criterion for toxic substances (IDAPA 58.01.02.200.02). See 40 CFR 122.44(d)(1)(vi)(B) and 58.01.25.302.06.a.(vi)(2).

DEQ Response 4:

No changes have been made in response to this comment.

Aluminum does not appear on the toxic pollutants list under 40 CFR 401.15 nor does is appear on EPA's Priority Pollutant list (40 CFR Part 423 Appendix A). DEQ has a rigorous and extensive process for enacting Water Quality Standards including EPA approval. Since DEQ has not adopted the 2018 304(a) criteria at this time and does not currently have a water quality standard for aluminum, setting a limit based on the 2018 304(a) criteria would circumvent the DEQ process. DEQ has included monitoring for those facilities that use aluminum compounds in their treatment process.

Comment 5:

Permit:

In Tables B-1, B-2, B-3, B-4, B-5, B-6, and C-1, nickel is misspelled as "nickle"

DEQ Response 5:

Correction made.

Comment 6:

Permit:

Appendix A: Please consider adding known unpermitted drinking water treatment plant discharges to impaired waters to this list. For example, when I was working on the wastewater permit for the City of Juliaetta in 2018, they had an unpermitted discharge from their water treatment plant, but we couldn't cover it under the general permit because there was an impairment in the receiving water.

DEQ Response 6:

No changes have been made in response to this comment.

DEQ can add additional waters to Appendix A on a case-by-case basis. The new permit (Section 1.2) includes language allowing DEQ to cover any facility, if they meet the qualifications conditions, and DEQ can add waterbodies to Appendix A, "List of Facilities Discharging to Impaired Waters." Prior to any coverage authorization, DEQ will hold a public comment period for any proposed changes to Appendix A.