Region 10, NPDES Permits Unit
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Seattle, WA 98101

Fact Sheet

Public Comment Start Date: March 14, 2012
Public Comment Expiration Date: April 13, 2012

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

The Meadows
Sewage Treatment Plant

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

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

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

Idaho Department of Environmental Quality
1363 Fillmore St.
Twin Falls, ID 83301
(208) 736-2190

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

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

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

United States Environmental Protection Agency
Region 10
1200 Sixth Avenue, OWW-130
Seattle, Washington 98101
(206) 553-0523 or
Toll Free 1-800-424-4372 (within Alaska, Idaho, Oregon and Washington)

The fact sheet and draft permits are also available at:

US EPA Region 10
1435 N. Orchard
Boise, ID 83706
(208) 378-5746

Idaho Department of Environmental Quality
1363 Fillmore St.
Twin Falls, ID 83301
(208) 736-2190

Table of Contents

Acronyms

1Q10	1 day, 10 year low flow
7Q10	7 day, 10 year low flow
30Q10	30 day, 10 year low flow
30B3	Biologically-based design flow intended to ensure an excursion frequency of less than once every three years, for a 30-day average flow.
AML	Average Monthly Limit
AWL	Average Weekly Limit
BOD_5	Biochemical oxygen demand, five-day
BMP	Best Management Practices
ºC	Degrees Celsius
CFR	Code of Federal Regulations
CFS	Cubic Feet per Second
CV	Coefficient of Variation
CWA	Clean Water Act
DMR	Discharge Monitoring Report
DO	Dissolved oxygen
EFH	Essential Fish Habitat
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
HUC	Hydrologic Unit Code
IDEQ	Idaho Department of Environmental Quality
I/I	Infiltration and Inflow
lbs/day	Pounds per day
LTA	Long Term Average
mg/L	Milligrams per liter
ML	Minimum Level
µg/L	Micrograms per liter
mgd	Million gallons per day
MDL	Maximum Daily Limit or Method Detection Limit
N	Nitrogen
NOAA	National Oceanic and Atmospheric Administration

NPDES	National Pollutant Discharge Elimination System
OWW	Office of Water and Watersheds
O&M	Operations and maintenance
POTW	Publicly owned treatment works
QAP	Quality assurance plan
RP	Reasonable Potential
RPM	Reasonable Potential Multiplier
RWC	Receiving Water Concentration
SS	Suspended Solids
s.u.	Standard Units
TKN	Total Kjeldahl Nitrogen
TMDL	Total Maximum Daily Load
TRC	Total Residual Chlorine
TSD	Technical Support Document for Water Quality-based Toxics Control (EPA/505/2-90-001)
TSS	Total suspended solids
USFWS	U.S. Fish and Wildlife Service
USGS	United States Geological Survey
WQBEL	Water quality-based effluent limit
WQS	Water Quality Standards
WWTP	Wastewater treatment plant

I. Applicant

A. General Information

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

The Meadows, LLC

Physical Address:
24 Peregrine Drive
Hailey, ID 83333

Mailing Address:
P.O. Box 475
Sun Valley, Idaho 83353

Contact: George Kirk, Property Manager

II. Facility Information

A. Treatment Plant Description

The Meadows owns, operates, and has maintenance responsibility for a facility that treats domestic wastewater from approximately 250 local residents. The facility receives no commercial or industrial wastes.

The permit application indicates the design flow of the facility to be 100,000 gallons per day or 0.10 million gallons per day (mgd). Actual flow at the plant from 2000 through 2011 has averaged 0.029 mgd, with a maximum monthly average flow rate of 0.073 mgd. The treatment system consists of a dry well, bar screen, communitor, clarifier with scum trough, ultraviolet light disinfection and sludge holding tank.

B. Background Information

The most recent NPDES permit for this facility was issued on October 28, 1999, became effective on November 30, 1999 and expired on November 30, 2004. An NPDES application for permit reissuance was submitted by the permittee on May 23, 2007. The first NPDES permit was issued to this facility in November 1975.

A map has been included in Appendix A which shows the location of the treatment plant.

III. Receiving Water

This facility discharges to the Big Wood River.

A. Low Flow Conditions

The *Technical Support Document for Water Quality-Based Toxics Control* (hereinafter referred to as the TSD) (EPA, 1991) and Section 210 of the Idaho Water Quality Standards (WQS) recommend the flow conditions for use in calculating water quality-based effluent limits (WQBELs) using steady-state modeling. The TSD and the WQS state that WQBELs intended to

protect aquatic life uses should be based on the lowest seven-day average flow rate expected to occur once every ten years (7Q10) for chronic criteria and the lowest one-day average flow rate expected to occur once every ten years (1Q10) for acute criteria. Because the chronic criterion for ammonia is a 30-day average concentration not to be exceeded more than once every three years, EPA has used the 30B3 for the chronic ammonia criterion instead of the 7Q10. The 30B3 is a biologically-based flow rate designed to ensure an excursion frequency of no more than once every three years for a 30-day average flow rate. For human health criteria, the Idaho water quality standards recommend the 30Q5 flow rate for non-carcinogens, and the harmonic mean flow rate for carcinogens.

The USGS flow gauging station closest to the discharge (Big Wood River at Gimlet, Idaho, station #13138500) has limited flow data. EPA therefore developed a correlation between the flow at this station and the flow at USGS station #13139510, Big Wood River at Hailey, Idaho, which has enough flow data to allow direct calculation of the critical low flow rates. EPA has estimated critical low flow rates for the Big Wood River at Gimlet based on the correlation and the directly calculated critical low flows at Hailey. The estimated 1Q10, 7Q10, 30B3, 30Q5, and harmonic mean flows for the Big Wood River at Gimlet, Idaho are 78, 97, 106, 121 and 224 CFS, respectively.

B. Water Quality Standards

Overview

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

This facility discharges to the Big Wood River (hydrologic unit code 17040219). In this reach, the receiving water is designated for the uses of cold water aquatic life, salmonid spawning, primary contact recreation, and domestic water supply, and is also designated a special resource water (IDAPA 58.01.02.056, 58.01.02.150.21). Water quality criteria designed to protect these beneficial uses appear in Sections 210, 250, and 251 of the Idaho Water Quality Standards. Restrictions on point source discharges to special resource waters appear in Section 400.01.b of the Standards.

In addition, the Idaho Water Quality Standards state that all waters of the State of Idaho are protected for industrial and agricultural water supply (Section 100.03.b and c), wildlife habitats (100.04) and aesthetics (100.05). The WQS state, in Sections 252.02, 252.03, and 253 that these uses are to be protected by narrative criteria which appear in Section 200. These narrative criteria state that all surface waters of the State shall be free from hazardous materials; toxic substances; deleterious materials; radioactive materials; floating, suspended or submerged matter; excess nutrients; oxygen-demanding materials; and sediment in concentrations which

would impair beneficial uses. The WQS also state, in Section 252.02 that the criteria from *Water Quality Criteria 1972* (EPA-R3-73-033), also referred to as the "Blue Book," can be used to determine numeric criteria for the protection of the agricultural water supply use.

Idaho's Antidegradation Policy

The EPA is required under Section 301(b)(1)(C) of the Clean Water Act (CWA) and implementing regulations (40 CFR 122.4(d) and 122.44(d)) to establish conditions in NPDES permits that ensure compliance with State water quality standards, including antidegradation requirements. The antidegradation analysis is conducted as part of the State's CWA Section 401 certification (see Appendix G).

IV. Effluent Limitations

A. Basis for Effluent Limitations

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

B. Proposed Effluent Limitations

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

1. The permittee must not discharge floating, suspended, or submerged matter of any kind in amounts causing nuisance or objectionable conditions or that may impair designated beneficial uses.
2. Removal Requirements for BOD_5 and TSS: The monthly average effluent concentration must not exceed 15 percent of the monthly average influent concentration. Percent removal of BOD_5 and TSS must be reported on the Discharge Monitoring Reports (DMRs). For each parameter, the monthly average percent removal must be calculated from the arithmetic mean of the influent values and the arithmetic mean of the effluent values for that month. Influent and effluent samples must be taken over approximately the same time period.

Table 1 (below) presents the proposed numeric effluent limits.

Table 1: Proposed Effluent Limits				
Parameter	**Units**	**Effluent Limits**		
		Average Monthly Limit	**Average Weekly Limit**	**Maximum Daily Limit**
Five-Day Biochemical Oxygen Demand (BOD_5)	mg/L	30	45	—
	lb/day	25	38	—
	% removal	85% (min.)	—	—
Total Suspended Solids (TSS)	mg/L	30	45	—
	lb/day	8.3	12.5	—
	% removal	85% (min.)	—	—
E. Coli	#/100 ml	126[1]	—	406[2]
	CFU/day	0.48 billion[1]	—	—
pH	s.u.	6.0 – 9.0 at all times		
Total Phosphorus	lb/day	2.3	—	3.8

Notes:
1. Geometric mean.
2. Instantaneous/single sample maximum.

Basis for Deleting Fecal Coliform Limits and Relaxing pH Limits

The draft permit proposes to delete the previous permit's effluent limits for fecal coliform and to make the lower pH limit less stringent relative to the prior permit. Effluent limitations for all other pollutants are as stringent as or more stringent than those in the current permit.

Statutory Prohibitions on Backsliding

Section 402(o) of the Clean Water Act (CWA) generally prohibits the establishment of effluent limits in a reissued NPDES permit that are less stringent than the corresponding limits in the previous permit, but provides limited exceptions. Section 402(o)(1) of the CWA states that a permit may not be reissued with less-stringent limits established based on Sections 301(b)(1)(C), 303(d) or 303(e) (i.e. water quality-based limits or limits established in accordance with State treatment standards) except in compliance with Section 303(d)(4). Section 402(o)(1) also prohibits backsliding on technology-based effluent limits established using best professional judgment (i.e. based on Section 402(a)(1)(B)), but in this case, the effluent limits being revised are water quality-based effluent limits (WQBELs).

Section 303(d)(4) of the CWA states that, for water bodies where the water quality meets or exceeds the level necessary to support the water body's designated uses, WQBELs may be revised as long as the revision is consistent with the State's antidegradation policy. For water bodies where the applicable water quality standard has not yet been attained, any effluent limitation based on a total maximum daily load or other waste load allocation may be revised only if the cumulative effect of all such revised effluent limitations will assure the attainment of such water quality standard, or the designated use which is not being attained is removed in accordance with 40 CFR 131(g). Additionally, Section 402(o)(2) contains exceptions to the general prohibition on backsliding in 402(o)(1). According to the *U.S. EPA NPDES Permit Writers' Manual* (EPA-833-B-96-003) the 402(o)(2) exceptions are applicable to WQBELs (except for 402(o)(2)(B)(ii) and 402(o)(2)(D)) and are independent of the requirements of 303(d)(4). Therefore, WQBELs may be relaxed as long as either the 402(o)(2) exceptions or the requirements of 303(d)(4) are satisfied.

Even if the requirements of Sections 303(d)(4) or 402(o)(2) are satisfied, Section 402(o)(3) prohibits backsliding which would result in violations of water quality standards or effluent limit guidelines. An effluent limit guideline is a regulation published by the EPA under section 304(b) of CWA to adopt or revise effluent limitations (40 CFR 122.2).

Fecal Coliform

The draft permit proposes to delete the fecal coliform limits in the previous permit, replacing them with effluent limits for E. coli. In 2002, IDEQ completed and EPA approved a total maximum daily load or TMDL called the *Big Wood River Watershed Management Plan*. In 2011, IDEQ amended the *Big Wood River Watershed Management Plan* in order to correct calculation errors made in the original document. The E. coli effluent limits in the draft permit are based upon the *Errata to the Big Wood River Watershed Management Plan (aka TMDL) of 2002*, which was adopted by IDEQ in November 2011 and approved by EPA in February 2012.

For waters where standards have not yet been attained, Section 303(d)(4)(A) of the Act states that "any effluent limitation based on a total maximum daily load or other waste load allocation established under this section may be revised only if (i) the cumulative effect of all such revised effluent limitations based on such total maximum daily load or waste load allocation will assure the attainment of such water quality standard, or (ii) the designated use which is not being attained is removed in accordance with regulations established under this section."

The EPA-approved TMDL, as modified by the errata, has load and wasteload allocations for all known sources of bacteria to the Big Wood River. The permit includes an effluent limit of 0.48 billion (0.48×10^9) colony-forming units per day, which is consistent with the wasteload allocation for the discharge in the *Big Wood River Watershed Management Plan*, as modified by the errata. The cumulative effect of all of the load and wasteload allocations in the modified TMDL will assure the attainment of water quality standards for bacteria in the receiving water. Therefore, the removal of the fecal coliform effluent limits meets the antibacksliding exception at Section 303(d)(4)(A).In addition, the draft permit, like the previous permit, includes "criteria end-of-pipe" concentration effluent limits for bacteria, in order to protect contact recreation beneficial uses in the receiving water. The new water quality criteria and effluent limits simply use the indicator organism currently specified in the Idaho water quality standards (E. coli) to provide the same level of protection for the beneficial use of primary contact recreation as was provided by the fecal coliform effluent limits.

pH

EPA has determined, based on ambient pH and alkalinity data and literature values for effluent alkalinity, that the permittee can discharge wastewater at the technology-based minimum effluent limit of 6.0 standard units (40 CFR 133.102(c)) and the pH at the edge of a mixing zone encompassing 25% of the 1Q10 flow rate of the receiving water would be in compliance with Idaho's water quality criteria for pH (see Appendix E). This revised effluent limit is consistent with the State of Idaho's antidegradation policy and implementation methods (IDAPA 58.01.02.051 and 052). Therefore, the revised minimum effluent limit for pH is consistent with the antibacksliding exception of Section 303(d)(4)(B) of the Clean Water Act.

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

Because the E. coli limits apply current water quality criteria at the end-of-pipe and are consistent with the assumptions and requirements of the wasteload allocation for this discharge in the modified *Big Wood River Watershed Management Plan*, the effluent limits will ensure compliance with water quality standards for E. coli. As explained above, EPA has determined that a minimum pH limit of 6.0 standard units will ensure compliance with Idaho's water quality criteria for pH at the edge of a mixing zone. There are no effluent limit guidelines for facilities of this type.

Because the revised effluent limits will continue to ensure that water quality standards are met in the receiving water and do not violate any effluent limit guidelines, the proposed revised limits comply with Section 402(o)(3) of the CWA.

EPA is requesting that IDEQ certify that the effluent limits for pH and bacteria are protective of Idaho's water quality standards under Section 401 of the CWA.

V. Monitoring Requirements

A. Basis for Effluent and Surface Water Monitoring

Section 308 of the CWA and federal regulation 40 CFR 122.44(i) require monitoring in permits to determine compliance with effluent limitations. Monitoring may also be required to gather effluent and surface water data to determine if additional effluent limitations are required and/or to monitor effluent impacts on receiving water quality. The permit also requires the permittee to perform effluent monitoring required by part B.6 of the NPDES Form 2A application, so that these data will be available when the permittee applies for a renewal of its NPDES permit.

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

B. Effluent Monitoring

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

Table 2, below, presents the proposed effluent monitoring requirements for The Meadows. The sampling location must be after the last treatment unit and prior to discharge to the receiving water. If no discharge occurs during the reporting period, "no discharge" shall be reported on the DMR.

Monitoring Changes from the Previous Permit

For the purpose of developing monitoring requirements, EPA has considered this facility to be substantially similar to a publicly owned treatment works (POTW). EPA proposes twice-per-year monitoring for all parameters listed in Part B.6 of the application form for POTWs (EPA Form 3510-2A, revised 1-99, see also Appendix J to 40 CFR Part 122) that are not subject to

effluent limitations, except for total residual chlorine, which may be deleted because the facility does not use chlorine for disinfection.[1]

The monitoring frequency for BOD_5 has been reduced, relative to the previous permit. The reduction in monitoring frequency is based on EPA's *Interim Guidance for Performance-based Reduction of NPDES Permit Monitoring Frequencies* (April 19, 1996). The average effluent concentration of BOD_5 is 6.7 mg/L, which is only 22% of the effluent limit (30 mg/L). The guidance supports a reduction in monitoring frequency, under these circumstances.

C. Surface Water Monitoring

EPA proposes to delete the surface water monitoring requirements from this permit. Previous surface water monitoring shows that the facility has a very small impact upon receiving water quality.

Table 2: Effluent Monitoring Requirements

Parameter	Units	Sample Location	Sample Frequency	Sample Type
Flow	mgd	Effluent	5/week	recording
BOD_5	mg/L	Influent & Effluent	1/month	8-hour composite
	lb/day	Influent & Effluent		calculation[1]
	% Removal	% Removal	1/month	calculation[2]
TSS	mg/L	Influent & Effluent	1/week	8-hour composite
	lb/day	Influent & Effluent		calculation[1]
	% Removal	% Removal	1/month	calculation[2]
pH	standard units	Effluent	5/week	grab
E. Coli	#/100 ml	Effluent	5/month	grab
Total Dissolved Solids	mg/L	Effluent	2/year	8-hour composite
Total Ammonia as N	mg/L	Effluent	1/month	8-hour composite
Total Phosphorus	mg/L	Effluent	1/month	8-hour composite
	lb/day			calculation[1]
Alkalinity	mg/L as $CaCO_3$	Effluent	2/year	8-hour composite
Dissolved Oxygen	mg/L	Effluent	1/month	grab
Nitrate + Nitrite	mg/L	Effluent	2/year	8-hour composite
Oil and Grease	mg/L	Effluent	2/year	grab
Temperature	ºC	Effluent	1/week	grab
Total Ammonia as N	mg/L	Effluent	2/year	8-hour composite
Total Dissolved Solids	mg/L	Effluent	2/year	8-hour composite
Total Kjeldahl Nitrogen	mg/L	Effluent	2/year	8-hour composite

Notes:
1. Loading is calculated by multiplying the concentration in mg/L by the flow in mgd and a conversion factor of 8.34. If the concentration is measured in µg/L, the conversion factor is 0.00834.
2. Percent removal is calculated using the following equation:
(average monthly influent – average monthly effluent) ÷ average monthly influent.

[1] See 40 CFR 122.21(j)(4)(iii)

VI. Sludge (Biosolids) Requirements

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

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

VII. Other Permit Conditions

A. Quality Assurance Plan

The federal regulation at 40 CFR 122.41(e) requires the permittee to develop procedures to ensure that the monitoring data submitted is accurate and to explain data anomalies if they occur. The permittee is required to update the Quality Assurance Plan for the wastewater treatment plant within 180 days of the effective date of the final permit. The Quality Assurance Plan shall consist of standard operating procedures the permittee must follow for collecting, handling, storing and shipping samples, laboratory analysis, and data reporting.

B. Operation and Maintenance Plan

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

C. Design Criteria

The permit retains the design criteria requirements from the previous permit. This provision requires the permittee to compare the annual average influent flow and influent BOD_5 loading to the facility's design flow and influent BOD_5 loading, and to prepare a facility plan for maintaining compliance with NPDES permit effluent limits when the annual average flow or BOD_5 loading exceeds 85% of these design criteria.

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

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

Further, discharges must meet any more stringent effluent limitations that are established to meet EPA-approved state water quality standards.

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

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

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

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

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

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

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

E. Standard Permit Provisions

Sections III, IV, and V of the draft permit contain standard regulatory language that must be included in all NPDES permits. Because these requirements are based directly on NPDES regulations, they cannot be challenged in the context of an NPDES permit action. The standard

regulatory language covers requirements such as monitoring, recording, and reporting requirements, compliance responsibilities, and other general requirements.

VIII. Other Legal Requirements

A. Endangered Species Act

The Endangered Species Act requires federal agencies to consult with National Oceanic and Atmospheric Administration Fisheries (NOAA Fisheries) and the U.S. Fish and Wildlife Service (USFWS) if their actions could beneficially or adversely affect any threatened or endangered species. EPA has determined that the issuance of this NPDES permit will have no effect on threatened or endangered species. Therefore, consultation is not required for this action. However, EPA will notify USFWS and NOAA Fisheries of the issuance of this draft permit and will consider any comments made by the Services prior to issuance of a final permit. See Appendix F of this fact sheet for more information.

B. Essential Fish Habitat

Essential fish habitat (EFH) is the waters and substrate (sediments, etc.) necessary for fish to spawn, breed, feed, or grow to maturity. The Magnuson-Stevens Fishery Conservation and Management Act (January 21, 1999) requires EPA to consult with NOAA Fisheries when a proposed discharge has the potential to adversely affect (reduce quality and/or quantity of) EFH. EPA has determined that the discharge from The Meadows will not affect any EFH species in the vicinity of the discharge, therefore consultation is not required for this action.

C. State Certification

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

D. Permit Expiration

The permit will expire five years from the effective date.

IX. References

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

EPA. 1996. *Interim Guidance for Performance-based Reduction of NPDES Monitoring Frequencies.* April 19, 1996.

IDEQ. 2002. *The Big Wood River Watershed Management Plan*. Idaho Department of Environmental Quality.

IDEQ. 2011. *Errata to the Big Wood River Watershed Management Plan (TMDL) of 2002*. November 2011.

Appendix A: Facility Information

General Information

NPDES ID Number:	ID0024422
Physical Address:	24 Peregrine Drive Hailey, ID 83333
Mailing Address:	P.O. Box 475 Sun Valley, Idaho 83353
Facility Background:	The most recent NPDES permit for this facility was issued on October 28, 1999, became effective on November 30, 1999 and expired on November 30, 2004. An NPDES application for permit reissuance was submitted by the permittee on May 23, 2007. The first NPDES permit was issued to this facility in November 1975.

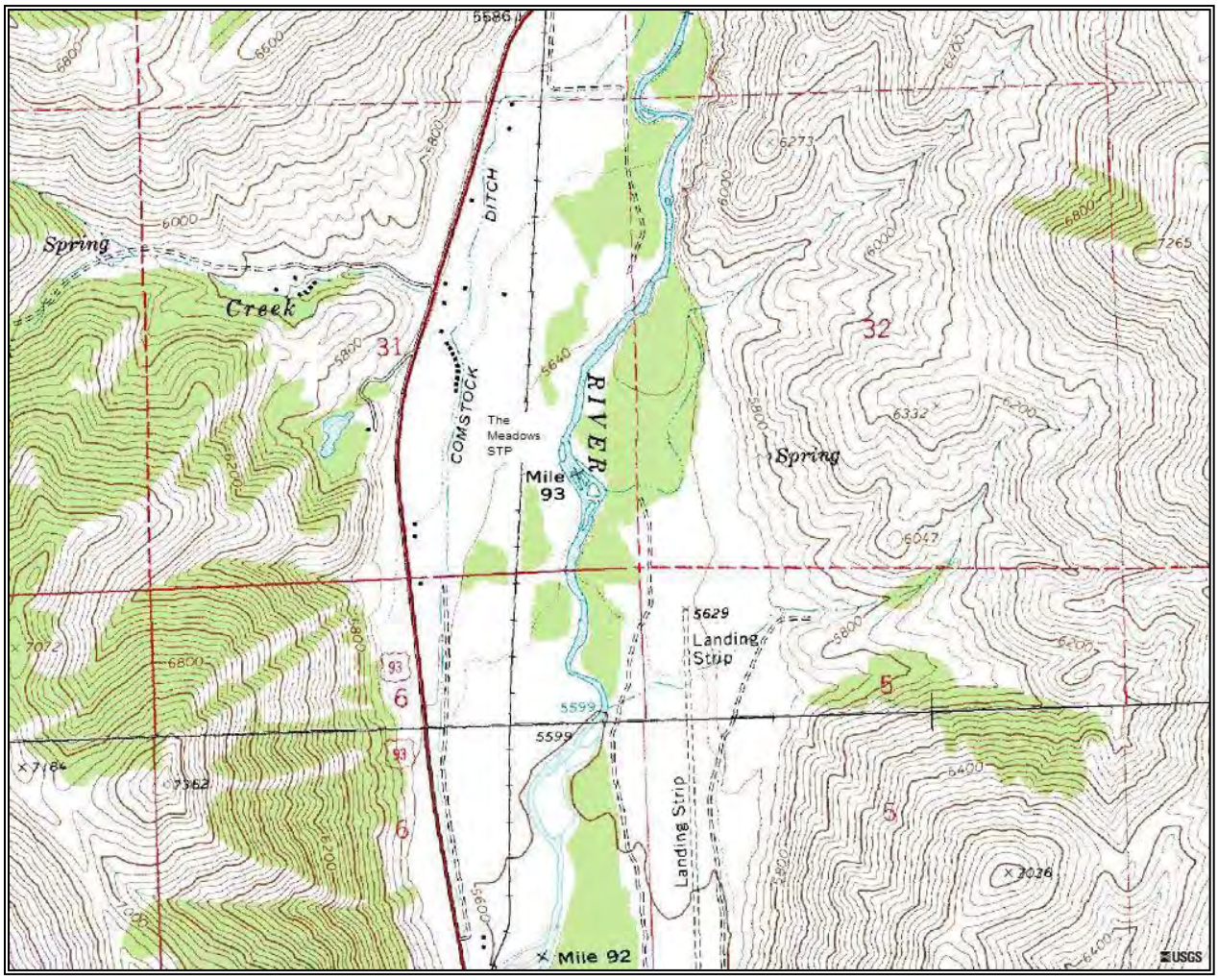
Facility Information

Type of Facility:	Treatment works treating domestic sewage (TWTDS)
Treatment Train:	The treatment system consists of a dry well, bar screen, communitor, clarifier with scum trough, ultraviolet light disinfection and sludge holding tank.
Flow:	Design flow is 0.1 mgd
Outfall Location:	latitude 43º 37’ 59” N; longitude 114º 20’ 59” W

Receiving Water Information

Receiving Water:	Big Wood River
Watershed:	Big Wood (HUC 17040219)
Beneficial Uses:	Cold water aquatic life, salmonid spawning, primary contact recreation, domestic water supply, special resource water, industrial and agricultural water supply, wildlife habitats, and aesthetics

Appendix B: Facility Map



Appendix C: Basis for Effluent Limits

The following discussion explains in more detail the statutory and regulatory basis for the technology and water quality-based effluent limits in the draft permit. Part A discusses technology-based effluent limits, Part B discusses water quality-based effluent limits in general, and Part C discusses facility specific water quality-based effluent limits.

A. Technology-Based Effluent Limits

Best Professional Judgment

The Meadows is privately owned treatment works treating domestic sewage (TWTDS). Technology-based effluent limitations may be based on two general approaches: (1) using national effluent limitations guidelines (ELGs) or (2) using Best Professional Judgment (BPJ) on a case-by-case basis in the absence of ELGs. National ELGs have not been promulgated for TWTDS and, as such, technology-based effluent limits based on Best Professional Judgment have been incorporated into the draft permit. The authority for BPJ is contained in Section 402(a)(1) of the Clean Water Act.

One of the ways in which BPJ may be applied is to apply effluent limit guidelines for a similar source to the source being permitted (see *U.S. EPA NPDES Permit Writer's Manual*, EPA-833-B-96-003, at Page 71). The Meadows wastewater treatment plant is very similar in its design and purpose to a publicly owned treatment works (POTW). Therefore, EPA proposes to apply the secondary treatment technology-based effluent limits for POTWs (40 CFR 133.102), under the authority of Section 402(a)(1) of the Clean Water Act.

In general, NPDES regulations require that effluent limitations for point sources other than POTWs that discharge continuously be expressed as average monthly and maximum daily discharge limitations, unless impracticable (40 CFR 122.45(d)(1)). Because, in this case, the technology-based effluent limits for BOD_5 and TSS are expressed as maximum 30-day and 7-day averages, it is impracticable to express effluent limits for BOD_5 and TSS as maximum daily limits. Therefore, for BOD_5 and TSS, effluent limits will be expressed as average monthly and average weekly limits.

The secondary treatment effluent limits are listed in Table C-1.

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

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

Chlorine

The Meadows uses UV disinfection; therefore, no technology-based effluent limits for chlorine are applicable to this facility.

Mass Limits

Technology-based mass effluent limits for BOD_5 and TSS are calculated by multiplying the technology-based concentration limits in Table C-1 by the design capacity of the treatment plant (0.1 mgd) and the density of water (8.34 lb/gallon). The technology-based mass limits for BOD and TSS are an average monthly limit of 25 lb/day and an average weekly limit of 38 lb/day.

Use of Technology-based Effluent Limits in the Draft Permit

The technology-based effluent limits for BOD_5 and pH are stringent enough to ensure compliance with water quality standards and have been proposed in the draft permit. The concentration effluent limits for TSS are also technology-based.

More stringent water quality-based mass limits are proposed for TSS, as explained below.

B. Water Quality-based Effluent Limits

Statutory and Regulatory Basis

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

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

Reasonable Potential Analysis

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

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

zones can be used only when there is adequate receiving water flow volume and when the receiving water meets the criteria necessary to protect the designated uses of the water body. Mixing zones must be authorized by IDEQ.

Based on the previous permit, EPA's *Water Quality Standards Handbook: Second Edition*, and the draft certification, EPA has evaluated the discharge's potential to cause or contribute to excursions above water quality standards using a mixing zone, as explained in Appendix D.

C. Facility-Specific Water Quality-based Limits

Ammonia

The Idaho water quality standards contain criteria for the protection of aquatic life from the toxic effects of ammonia. Because the Big Wood River is designated for salmonid spawning, EPA has applied ammonia criteria which are protective of salmonids, including early life stages. The criteria are dependent on pH and temperature, because the fraction of ammonia present as the toxic, un-ionized form increases with increasing pH and temperature. Therefore, the criteria become more stringent as pH and temperature increase. The following table details the equations used to determine water quality criteria for ammonia, and the values of these equations at the 95th percentile pH, which is 8.40 standard units, and the 95th percentile temperature observed in the river upstream from the discharge, which is 13.7 ºC.

Table C-2: Water Quality Criteria for Ammonia

	Acute Criterion	Chronic Criterion
Equations:	$\frac{0.275}{1+10^{7.204-pH}}+\frac{39}{1+10^{pH-7.204}}$	$\left(\frac{0.0577}{1+10^{7.688-pH}}+\frac{2.487}{1+10^{pH-7.688}}\right)\times MIN\left(2.85,1.45\times10^{0.028\times(25-T)}\right)$
Results	2.59	1.29

As shown in Appendix D, EPA has determined that this discharge does not have the reasonable potential to cause or contribute to excursions above Idaho's water quality criteria for ammonia. Therefore, no water quality-based effluent limits are proposed for ammonia in the draft permit.

Nitrates

Among the receiving water's designated uses is domestic water supply. The State of Idaho does not have numeric criteria for nitrates. EPA's Clean Water Act Section 304(a) recommended criterion for nitrates, for the protection of human health for consumption of water and organisms, is 10 mg/L (see *Quality Criteria for Water 1986*). EPA has used this value to interpret Idaho's narrative criterion for toxic substances (IDAPA 58.01.02.200.02). Consistent with Section 210.03 of the Idaho WQS, EPA has used the human health 30Q5 stream flow rate (30Q5) and the associated dilution factor for the reasonable potential calculation for nitrate. As shown in Appendix D, EPA has determined that the discharge does not have the reasonable potential to cause or contribute to excursions above water quality standards for nitrates. Therefore, water quality-based effluent limits for nitrates are not proposed in the draft permit.

E. Coli

Concentration Limits

The Idaho water quality standards state that waters of the State of Idaho that are designated for recreation are not to contain E. coli bacteria in concentrations exceeding a geometric mean of

126 organisms per 100 ml based on a minimum of five samples taken every three to seven days over a thirty day period. Therefore, the draft permit contains a monthly geometric mean effluent limit for E. coli of 126 organisms per 100 ml, and a minimum sampling frequency of five grab samples per month (IDAPA 58.01.02.251.01.a.).

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

The goal of a water quality-based effluent limit is to ensure a low probability that water quality standards will be exceeded in the receiving water as a result of a discharge, while considering the variability of the pollutant in the effluent (see TSD at Section 5.3.1). Because a single sample value exceeding 406 organisms per 100 ml indicates a likely exceedance of the geometric mean criterion, EPA has imposed an instantaneous (single grab sample) maximum effluent limit for E. coli of 406 organisms per 100 ml, in addition to a monthly geometric mean limit of 126 organisms per 100 ml, which directly implements the water quality criterion for E. coli. This will ensure that the discharge will have a low probability of exceeding water quality standards for E. coli.

Regulations at 40 CFR 122.45(d)(2) require that effluent limitations for continuous discharges from POTWs be expressed as average monthly and average weekly limits, unless impracticable. The terms "average monthly limit" and "average weekly limit" are defined in 40 CFR 122.2 as being arithmetic (as opposed to geometric) averages. It is impracticable to properly implement a 30-day geometric mean criterion in a permit using monthly and weekly arithmetic average limits. The geometric mean of a given data set is equal to the arithmetic mean of that data set if and only if all of the values in that data set are equal. Otherwise, the geometric mean is always less than the arithmetic mean. In order to ensure that the effluent limits are "derived from and comply with" the geometric mean water quality criterion, as required by 40 CFR 122.44(d)(1)(vii)(A), it is necessary to express the effluent limits as a monthly geometric mean and an instantaneous maximum limit.

CFU/Day Limits

Federal regulations require that "effluent limits developed to protect a narrative water quality criterion, a numeric water quality criterion, or both, are consistent with the assumptions and requirements of any available wasteload allocation for the discharge" in a total maximum daily load (TMDL) that has been prepared by the State and approved by EPA. The *Big Wood River Watershed Management Plan* is a TMDL that has an E. coli wasteload allocation for this discharge. The TMDL was approved by EPA on May 15, 2002. In 2011, IDEQ issued the *Errata to the Big Wood River Watershed Management Plan (TMDL) of 2002*, which corrects calculation errors which were made in the original TMDL. In the errata, the wasteload allocation for E. coli for this discharge is 0.48 billion (0.48×10^9) CFU/day.

The E. coli effluent limits in the draft permit are based upon the *Errata to the Big Wood River Watershed Management Plan (aka TMDL) of 2002*, which was adopted by IDEQ in November 2011 and approved by EPA in February 2012.

In the TMDL, the loading capacity was calculated using the annual average river flow and the maximum monthly geometric mean in-stream target of 126 CFU/100 ml total phosphorus (see the TMDL at Page 63). Therefore, it is consistent with the assumptions and requirements of the wasteload allocation to establish a monthly geometric mean effluent limit equal to the wasteload allocation.

pH

Idaho's water quality criterion for pH, for aquatic life uses, is a range of 6.5 – 9.0 standard units (IDAPA 58.01.02.250.01.a.). EPA has determined that the technology-based effluent limits for pH (a range of 6.0 – 9.0 standard units) are adequate to ensure compliance with this water quality criterion. See appendix E.

Total Suspended Solids

The TSS mass limits are water quality-based effluent limits which are more stringent than the technology-based effluent limits, and have been included for consistency with the *Big Wood River Watershed Management Plan* (IDEQ 2002), which is a TMDL that was prepared by Idaho DEQ and approved by EPA. NPDES permits must contain water quality-based effluent limits that are consistent with the assumptions and requirements of any available wasteload allocation in an EPA-approved TMDL (40 CFR 122.44(d)(1)(vii)(B)). The wasteload allocation for TSS in the Watershed Management Plan is 0.6 tons per year (see the Watershed Management Plan at Table BBB). On a daily basis, the wasteload allocation is equivalent to 3.3 lb/day.

The goal of a water quality-based effluent limit is to ensure a low probability that water quality standards will be exceeded in the receiving water as a result of a discharge, while considering the variability of the pollutant in the effluent (see TSD at Section 5.3.1). The average monthly and average weekly loading limits for TSS are calculated based on the annual total wasteload allocation as well as the variability of the effluent TSS load, using the relationship shown in Table 5-2 of the TSD.

The average monthly limit is 8.3 lb/day, which is calculated as 2.5 times the wasteload allocation converted to a daily load. The monthly average effluent limits will nonetheless ensure that the facility will have a low probability of exceeding its 0.6 ton-per-year wasteload allocation because facilities must generally operate below their average monthly limits most of the time in order to ensure consistent compliance (see TSD at figure 5-3). Therefore, the TSS effluent limits are consistent with the assumptions and requirements of the wasteload allocation.

The draft permit also proposes an average weekly limit equal to 12.5 lb/day, which is 1.5 times the average monthly limit (consistent with the technology-based concentration limits). Thus, the monthly and weekly effluent limits for TSS are consistent with the assumptions and requirements of the wasteload allocation in the *Big Wood River Watershed Management Plan,* as required by 40 CFR 122.44(d)(1)(vii)(B).

The maximum monthly average TSS load reported by the permittee between February 2000 and August 2011 was 5.36 lb/day. This is 65% of the proposed average monthly limit in the draft permit. Therefore, the permittee can comply with the new water quality-based effluent limits for TSS immediately upon the effective date of the final permit and no compliance schedule may be authorized for TSS.

Total Phosphorus as P

The *Big Wood River Watershed Management Plan* includes a phosphorus wasteload allocation for this facility. NPDES permits must contain water quality-based effluent limits that are consistent with the assumptions and requirements of any available wasteload allocation in an EPA-approved TMDL (40 CFR 122.44(d)(1)(vii)(B)). The wasteload allocation is 2.3 lb/day (see the Watershed Management Plan at Table FFF).

NPDES regulations require that effluent limitations for dischargers other than POTWs that discharge continuously be expressed as average monthly and maximum daily discharge limitations, unless impracticable (40 CFR 122.45(d)(1)). The in-stream phosphorus target that the TMDL is designed to achieve is a monthly average of < 50 µg/L TP (See the Watershed Management Plan at Page 55). Therefore, the 2.3 lb/day wasteload allocation has been included in the draft permit directly as an average monthly limit.

The draft permit also proposes a maximum daily limit of 3.8 lb/day. The maximum daily limit is based on Table 5-3 of the *Technical Support Document for Water Quality-based Toxics Control* (EPA 1991). Based on effluent data, the coefficient of variation for phosphorus, for this discharge, is 0.4. According to Table 5-3 of the TSD, the ratio between the maximum daily and the average monthly permit limit, for a sampling frequency of four samples per month, using the 95th percentile for the average monthly limit and the 99th percentile for the maximum daily limit and a CV of 0.4, is 1.67:1. Multiplying the average monthly limit of 2.3 lb/day by the ratio of 1.67:1 yields a maximum daily limit of 3.8 lb/day.

EPA has estimated the facility's current effluent phosphorus loads by multiplying the measured effluent concentrations of phosphorus by the monthly average effluent flows and the density of water. The estimated maximum monthly effluent total phosphorus load is 1.03 lb/day, which is less than half the proposed water quality-based effluent limit. Therefore the facility can comply with the new water quality-based effluent limits for total phosphorus immediately upon the effective date of the final permit, and no compliance schedule may be authorized for the new total phosphorus effluent limits.

Floating, Suspended and Submerged Matter

The State of Idaho has a narrative water quality criterion which reads "Surface waters of the state shall be free from floating, suspended, or submerged matter of any kind in concentrations causing nuisance or objectionable conditions or that may impair designated beneficial uses (IDAPA 58.01.02.200.05)." This criterion has been included in the permit as a narrative effluent limit.

Temperature

EPA has determined that the discharge will increase the receiving water temperature to an extremely small and immeasurable extent at the edge of a mixing zone encompassing 25% of the critical low flow rates of the receiving water (< 0.05 °C under critical conditions). Therefore, the discharge does not have the reasonable potential to cause or contribute to excursions above water quality standards for temperature and no effluent limits are proposed for temperature.

D. Summary of Effluent Limit Bases

The following table summarizes the general statutory and regulatory bases for the limits in the draft permit.

Table C-3 Summary of Effluent Limit Bases	
Limited Parameter	**Basis for Limit**
BOD_5 concentration, mass, and removal rate, TSS concentration and removal rate, and pH	Clean Water Act (CWA) Section 402(a)(1)(B) (technology-based, best professional judgment)
TSS mass	CWA Section 301(b)(1)(C), 40 CFR 122.44(d)(1)(vii)(B) (water quality-based, TMDL)
Phosphorus	CWA Section 301(b)(1)(C), 40 CFR 122.44(d)(1)(vii)(B) (water quality-based, TMDL)
Floating, Suspended or Submerged Matter	CWA Section 301(b)(1)(C), 40 CFR 122.44(d), IDAPA 58.01.02.200.05 (water quality-based)
E. Coli Concentration	CWA Section 301(b)(1)(C), 40 CFR 122.44(d), IDAPA 58.01.02.251.01 (water quality-based)
E. Coli CFU/day	CWA Section 301(b)(1)(C), 40 CFR 122.4(d)(1)(vii)(B) (water quality-based, TMDL)

E. References

EPA. 1986. *Quality Criteria for Water 1986*. EPA 440/5-86-001.

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

IDEQ. 2002. *The Big Wood River Watershed Management Plan*. Idaho Department of Environmental Quality.

IDEQ. 2011. *Errata to the Big Wood River Watershed Management Plan (TMDL) of 2002*. November 2011.

Appendix D: Reasonable Potential Calculations

The following describes the process EPA has used to determine if the discharge authorized in the draft permit has the reasonable potential to cause or contribute to a violation of Idaho's federally approved water quality standards. EPA uses the process described in the *Technical Support Document for Water Quality-based Toxics Control* (EPA, 1991) to determine reasonable potential.

To determine if there is reasonable potential for the discharge to cause or contribute to an exceedance of water quality criteria for a given pollutant, EPA compares the maximum projected receiving water concentration to the water quality criteria for that pollutant. If the projected receiving water concentration exceeds the criteria, there is reasonable potential, and a water quality-based effluent limit must be included in the permit. This section discusses how the maximum projected receiving water concentration is determined.

A. Mass Balance

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

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

where,

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

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

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

The above form of the equation is based on the assumption that the discharge is rapidly and completely mixed with the receiving stream, and 100% of the stream flow is available for mixing, under the State's mixing zone policies. If the mixing zone is based on less than complete mixing with the receiving water, the equation becomes:

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

Where MZ is the fraction of the receiving water flow available for dilution. The Idaho water quality standards generally limit mixing zones to 25% of the volume of the stream flow. EPA has used 25% of the flow for mixing.

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

$$C_d = C_e \qquad \text{(Equation D-4)}$$

Equation D-2 can be simplified by introducing a "dilution factor,"

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

There are five values for the dilution factor: One based on the 1Q10 flow rate in the receiving stream and used to determine reasonable potential and wasteload allocations for acute aquatic life criteria, one based on the 7Q10 flow rate to determine reasonable potential and wasteload allocations chronic aquatic life criteria (except for ammonia) and conventional pollutants, one based on the 30B3 flow rate to determine reasonable potential and wasteload allocations for the chronic ammonia criterion, one based on the 30Q5 flow rate and used to determine reasonable potential and wasteload allocations for human health criteria for non-carcinogens, and one based on the harmonic mean flow rate and used to determine reasonable potential and wasteload allocations for human health criteria for carcinogens. All dilution factors are calculated with the effluent flow rate set equal to the design flow of 0.155 CFS (0.100 mgd). The dilution factors are listed in Table D-1, below.

Table D-1: Dilution Factors

Acute Dilution Factor	Chronic Dilution Factor	Chronic Ammonia Criterion Dilution Factor	Human Health Non-Carcinogen Dilution Factor	Human Health Carcinogen Dilution Factor
127	158	172	197	363

After the dilution factor simplification, Equation D-2 becomes:

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

Equation D-6 is the form of the mass balance equation which were used to determine reasonable potential and calculate wasteload allocations.

B. Maximum Projected Effluent Concentration

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

Since there are a limited number of data points available, the 99th percentile is calculated by multiplying the maximum reported effluent concentration by a "reasonable potential multiplier" (RPM). The RPM is the ratio of the 99th percentile concentration to the maximum reported effluent concentration. The RPM is calculated from the coefficient of variation (CV) of the data and the number of data points.

The CV is defined as the ratio of the standard deviation of the data set to the mean, but when fewer than 10 data points are available, the TSD recommends making the assumption that the CV is equal to 0.6 (see TSD at Page 53).

Using the equations in section 3.3.2 of the TSD, the reasonable potential multiplier (RPM) is calculated based on the CV and the number of samples in the data set as follows. The following discussion presents the equations used to calculate the RPM, and also works through the calculations for the RPM for ammonia as an example. Reasonable potential calculations for all pollutants can be found in Table D-2.

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

$$p_n = (1 - \text{confidence level})^{1/n} \quad \text{(Equation D-7)}$$

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

The data set contains 50 ammonia samples collected from the effluent, therefore:

$$p_n = (1 - 0.99)^{1/50}$$
$$p_n = 0.912$$

This means that we can say, with 99% confidence, that the maximum reported effluent copper concentration is greater than the 91st percentile.

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

$$RPM = C_{99}/C_p \quad \text{(Equation D-8)}$$

Where,
$$C = \exp(z\sigma - 0.5\sigma^2) \quad \text{(Equation D-9)}$$

Where,
$$\sigma^2 = \ln(CV^2 + 1) \quad \text{(Equation D-10)}$$
$$\sigma = \sqrt{\sigma^2}$$

CV = coefficient of variation = (standard deviation) ÷ (mean)
z = the inverse of the normal cumulative distribution function at a given percentile

In the case of ammonia:

CV = coefficient of variation = 1.156
$\sigma^2 = \ln(CV^2 + 1) = 0.849$
$\sigma = \sqrt{\sigma^2} = 0.921$
z = 2.326 for the 99th percentile = 1.353 for the 91st percentile

$$C_{99} = \exp(2.326 \times 0.921 - 0.5 \times 0.849) = 5.58$$

C_{91} = exp (1.353 × 0.918 - 0.5 × 0.843) = 2.28

RPM = C_{99}/C_{91} = 5.58/2.28
RPM = 2.45

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

C_e = (RPM)(MRC) (Equation D-11)

where MRC = Maximum Reported Concentration

In the case of ammonia,

C_e = (2.45)(0.79 mg/L) = **1.94 mg/L**

C. Maximum Projected Receiving Water Concentration

The discharge has reasonable potential to cause or contribute to an exceedance of water quality criteria if the maximum projected concentration of the pollutant at the edge of the mixing zone exceeds the most stringent criterion for that pollutant. The maximum projected receiving water concentration is calculated from Equation D-6:

$$C_d = \frac{C_e - C_u}{D} + C_u \quad \text{(Equation D-6)}$$

For ammonia, the acute receiving water concentration is, in milligrams per liter:

$$C_d = \left[\frac{1.94 - 0}{127}\right] + 0 = 0.015$$

For ammonia, the chronic receiving water concentration is, in milligrams per liter:

$$C_d = \left[\frac{1.94 - 0}{172}\right] + 0 = 0.011$$

The acute and chronic water quality criteria are 2.59 and 1.29 mg/L, respectively. Because the maximum projected receiving water concentration is less than the criteria, the facility does not have the reasonable potential to cause or contribute to excursions above water quality standards for ammonia, and no effluent limits are required for ammonia.

Table D-2, below, summarizes the reasonable potential calculations for ammonia and nitrate.

Table D-2: Reasonable Potential Calculations

Effluent Percentile value	99%																
		State Water Quality Standard		Max concentration at edge of...													
Parameter	Ambient Concentration (metals as dissolved)	Acute	Chronic	Acute Mixing Zone	Chronic Mixing Zone	LIMIT REQ'D?	Pn	Max effluent conc. measured (metals as total recoverable)	Coeff Variation	s	# of samples	Multiplier	Acute Dil'n Factor	Chronic Dil'n Factor	COMMENTS	Metal Criteria Translator as decimal	Metal Criteria Translator as decimal
	ug/L	*ug/L*	*ug/L*	*ug/L*	*ug/L*		*Pn*	*ug/L*	*CV*	*s*	*n*					Acute	Chronic
Ammonia, mg/L		2.59	1.29	0.015	0.011	**NO**	0.912	0.79	1.156	0.921	50	2.45	127.0	172.3	25% Mixing Zone	1.00	1.00
Nitrate + Nitrite, mg/L	0.15		10.0		0.31	**NO**	0.912	24.00	0.282	0.277	50	1.31		197	25% Mixing Zone	1.00	1.00

Appendix E: Effluent Limit Calculations for pH

The following table demonstrates how appropriate effluent limitations were determined for pH.

Table E-1: Effluent Limit Calculations for the Low pH Critical Condition	
INPUT	
DILUTION FACTOR AT MIXING ZONE BOUNDARY	127
UPSTREAM/BACKGROUND CHARACTERISTICS	
Temperature (deg C):	6.84
pH:	7.10
Alkalinity (mg CaCO3/L):	72.3
EFFLUENT CHARACTERISTICS	
Temperature (deg C):	18
pH:	**6.0**
Alkalinity (mg CaCO3/L):	200
OUTPUT	
1. IONIZATION CONSTANTS	
Upstream/Background pKa:	6.49
Effluent pKa:	6.40
2. IONIZATION FRACTIONS	
Upstream/Background Ionization Fraction:	0.80
Effluent Ionization Fraction:	0.29
3. TOTAL INORGANIC CARBON	
Upstream/Background Total Inorganic Carbon (mg CaCO3/L):	90.25
Effluent Total Inorganic Carbon (mg CaCO3/L):	698.3
CONDITIONS AT MIXING ZONE BOUNDARY	
Temperature (deg C):	6.93
Alkalinity (mg CaCO3/L):	73.31
Total Inorganic Carbon (mg CaCO3/L):	95.04
pKa:	6.49
pH at Mixing Zone Boundary:	**7.02**

Appendix F: Endangered Species Act

Section 7 of the Endangered Species Act (ESA) requires federal agencies to request a consultation with the National Oceanic and Atmospheric Administration (NOAA) Fisheries and the US Fish and Wildlife Service (USFWS) regarding potential effects that a federal action may have on listed endangered and threatened species.

In an e-mail dated January 21, 2009, NOAA Fisheries stated that there are no threatened or endangered species under NOAA's jurisdiction in the Snake River drainage upstream of the Hells Canyon Dam, which is located at river mile 247.5. The Meadows discharge is to the Big Wood River, which is a tributary to the Malad River, which is a tributary to the Snake River. The Malad River flows into the Snake River at river mile 571, about 324 miles upstream from the nearest occurrence of threatened or endangered species under NOAA's jurisdiction. Therefore, the reissuance of this permit will have no effect on any listed threatened or endangered species under NOAA's jurisdiction.

The subject discharge is located in Blaine County, Idaho. The USFWS county species list for Fremont County lists the following threatened and endangered species:

- Bull trout (*Salvelinus confluentus*) Listed Threatened
- Canada lynx (*Lynx canadensis*) Listed Threatened

Discharges of pollutants to surface waters have the potential to directly affect aquatic species such as bull trout.

According to *The Big Wood River Watershed Management Plan* (IDEQ 2002, Page 8), bull trout are not present in the Big Wood River subbasin. Therefore, the discharge will have no effect on bull trout.

EPA has also determined that the reissuance of an NPDES permit to The Meadows will have no effect on Canada lynx. The Canada lynx is a terrestrial species, which is generally not susceptible to the water quality impacts that may result from the reissuance of an NPDES permit.

The primary causes of the Canada lynx's decline are habitat destruction, overutilization for commercial, recreational, scientific, or educational purposes, and climate change (USFWS 2005). Reissuance of an NPDES permit to The Meadows will have no effect on habitat destruction, overutilization for commercial, recreational, scientific, or educational purposes, or climate change. Therefore, the issuance of this permit will have no effect on the Canada lynx.

References

IDEQ. 2002. *The Big Wood River Watershed Management Plan.*

US Fish and Wildlife Service. 2005. "Recovery Outline for the Contiguous United States Distinct Population Segment of the Canada Lynx."

Appendix G: Clean Water Act Section 401 Certification and Antidegradation Review

Idaho Department of Environmental Quality

DRAFT §401 Water Quality Certification

January 26, 2012

NPDES Permit Number: **ID-0024422** The Meadows LLC Wastewater Treatment Plant

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Pursuant to the provisions of Section 401(a)(1) of the Federal Water Pollution Control Act (Clean Water Act), as amended, 33 USC Section 1341 (a)(1), the Idaho Department of Environmental Quality (DEQ) has authority to review National Pollution Discharge Elimination System (NPDES) permits and issue a water quality certification decision.

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

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

Wasteload Allocations for Total Phosphorus and Total Suspended Solids

The current permit does not have wasteload allocations for total phosphorus (TP); instead monthly effluent monitoring included TP as a parameter. The Big Wood River TMDL (DEQ 2002) set TP as a wasteload allocation of 2.3 lb/day as an average monthly. The proposed permit contains limits that are consistent with the TMDL. An EPA analysis indicates that the facility can comply with these limits upon the effective date of this permit. (See Appendix C, EPA Fact Sheet.)

Additionally, the Big Wood River TMDL (DEQ 2002) set total suspended solids (TSS) at 0.6 ton/year (or 8.3 lb/day average monthly). This is a reduction from 25 lb/day average monthly in the current permit. The proposed permit contains limits that are consistent with the TMDL. An EPA analysis indicates that the facility can comply with these limits upon the effective date of this permit. (See Appendix C, EPA Fact Sheet.)

Mixing Zones

Pursuant to IDAPA 58.01.02.060, the DEQ authorizes a mixing zone that utilizes 25% of the flow volumes of the Big Wood River for ammonia or nitrate + nitrite. Using a 25% mixing, EPA determined that the facility did not have a reasonable potential to cause or contribute to excursions of WQS for either pollutant. (See Appendix D of the Fact Sheet.)

Antidegradation

The Idaho water quality standards (WQS) provide that existing uses and the water quality necessary to protect the existing uses shall be maintained and protected (IDAPA 58.01.02.051.01). In addition, where water quality exceeds levels necessary to support uses, that quality shall be maintained and protected unless the Department finds, after intergovernmental coordination and public participation, that allowing lower water quality is necessary to accommodate important economic or social development in the area in which the waters are located (IDAPA 58.01.02.051.02). The Big Wood River is afforded tier 1 protection only, and therefore, existing uses must be maintained and protected.

The limits in the proposed new permit for The Meadows Wastewater Treatment Plant are set at levels which ensure the state's numeric and narrative criteria will be met. The numeric and narrative criteria are set at levels which protect and maintain applicable designated and existing uses. In addition, the permit is consistent with the approved Big Wood River TMDL. Therefore, in accordance with IDAPA 58.01.02.051.01, the limits in the proposed new permit protect and maintain designated and existing uses in the Big Wood River. (Please see attached Antidegradation Review for more detailed analysis.)

Additional Conditions

This water quality certification is conditioned upon the requirement that any material modification of the permit or the permitted activities, including without limitation, any modifications of the permit to reflect new or modified total maximum daily loads (TMDLs), wasteload allocations, site-specific criteria, variances, or other new information, shall first be provided to DEQ for review to determine compliance with state Water Quality Standards and to provide additional certification pursuant to Section 401. DEQ authorizes pollutant trading set out in the draft permit pursuant to IDAPA 58.01.02.054.06.

Questions regarding the actions taken in this certification should be directed to Dave Anderson or Balthasar Buhidar, DEQ (Twin Falls Regional Office) at (208) 736-2190 or by email at Balthasar.buhidar@deq.idaho.gov.

DRAFT

Bill Allred
Regional Administrator
DEQ Twin Falls Regional Office

ANTIDEGRADATION REVIEW

NPDES Permit # ID-0020281 "The Meadows" Wastewater Treatment Facility

Idaho Department of Environmental Quality

Antidegradation

In March 2011, Idaho incorporated new provisions addressing antidegradation implementation in the Idaho Code. The new antidegradation provisions are in Idaho Code § 39-3603. At the same time, Idaho adopted antidegradation implementation procedures in the Idaho water quality standards (WQS). The Idaho Department of Environmental Quality (DEQ) submitted the antidegradation implementation procedures to the US Environmental Protection Agency (EPA) for approval on April 15, 2011. On August 18, 2011, EPA approved the implementation procedures.

The WQS contain an antidegradation policy providing three levels of protection to water bodies in Idaho (IDAPA 58.01.02.051). The first level of protection applies to all water bodies subject to Clean Water Act jurisdiction and ensures that existing uses of a water body and the level of water quality necessary to protect the existing uses will be maintained and protected (Tier 1 protection) (IDAPA 58.01.02.051.01; 58.01.02.052.01). Additionally, a Tier 1 review is performed for all new or reissued permits or licenses (IDAPA 58.01.02.052.05). The second level of protection applies to those water bodies considered high quality and ensures that no lowering of water quality will be allowed unless deemed necessary to accommodate important economic or social development (Tier 2 protection) (IDAPA 58.01.02.051.02; 58.01.02.052.06). The third level of protection applies to water bodies that have been designated outstanding resource waters and requires activities to not cause a lowering of water quality (Tier 3 protection) (IDAPA 58.01.02.051.03; 58.01.02.052.07).

DEQ is employing a water body by water body approach to implementing Idaho's antidegradation policy. This approach means that any water body fully supporting its beneficial uses will be considered high quality (Idaho Code § 39-3603(2)(b)(i)). Any water body not fully supporting its beneficial uses will be provided Tier 1 protection for that use, unless specific circumstances warranting Tier 2 protection are met (Idaho Code § 39-3603(2)(b)(iii)). The most recent federally approved Integrated Report (IR) and supporting data are used to determine support status and the tier of protection (Idaho Code § 39-3603(2)(b)).

Pollutants of Concern

The Meadows Wastewater Treatment Facility ("The Meadows" LLC) is a wastewater treatment facility that treats domestic wastewater from approximately 250 local residents. The facility receives no commercial or industrial waste. The Meadows discharges the following pollutants of concern: temperature, biological oxygen demand (BOD), total suspended solids (TSS), *E. coli*, pH, ammonia, phosphorus, nitrogen, alkalinity, dissolved oxygen, nitrite plus nitrate, oil and grease, and total dissolved solids. Effluent limits have been developed for BOD, TSS, E. coli, pH, and total phosphorus. Effluent limits were not developed for the following pollutants: temperature, alkalinity, dissolved oxygen, total ammonia, nitrite plus nitrate, oil and grease, total dissolved solids and total Kjeldahl nitrogen; however, additional monitoring is necessary to determine the necessity to develop limits in future permits.

Receiving Water Body Level of Protection
The Meadows discharges to the Big Wood River assessment units (AUs) ID17040219SK007_05 and ID17040219SK004_05. The original Big Wood River TMDL (DEQ 2002) showed segment-of-concern of the Big Wood River to be from Trail Creek to the Glendale Diversion. The 2010 Integrated Report indicates the segment to be from North Fork Big Wood River to Seamans Creek. Therefore, these two AUs must be considered in terms of the level of protection for the receiving water. The Big Wood River has been designated for the following beneficial uses: cold water aquatic life; salmonid spawning; primary contact recreation; domestic, industrial, and agricultural water supply; wildlife habitats; and aesthetics. There is no other information indicating the presence of existing beneficial uses beyond those uses already designated. According to the federally-approved 2010 Integrated Report, the Big Wood River is not meeting its cold water aquatic life and salmonid spawning use designations as a result of flow alterations, sedimentation/siltation, and total phosphorus. Therefore, The Big Wood River will receive Tier 1 protection only for those uses.

While recreational uses of this AU have not been assessed, *E. coli* data have been collected. The data show that the Big Wood River has elevated levels of *E. coli*. Therefore, DEQ will provide Tier 1 protection for all designated and existing beneficial uses of the Big Wood River (Idaho Code §39-3603(2)(b)(i)).

Protection and Maintenance of Existing Uses
As noted above, a Tier 1 review is performed for all new or reissued permits or licenses, applies to all waters subject to the jurisdiction of the CWA, and requires a showing that existing uses and the level of water quality necessary to protect existing uses shall be maintained and protected. In order to protect and maintain designated and existing beneficial uses, a permitted discharge must comply with the Idaho WQS, which contain narrative and numeric criteria as well as other provisions of the WQS such as Section 055, which addresses water quality limited waters.

Water bodies not supporting existing or designated beneficial uses must be identified as water quality limited, and a watershed management plan, also known as a total maximum daily load (TMDL), must be prepared for any water quality limited water body. A central purpose of TMDLs is to establish wasteload allocations for point source discharges, which are set at levels designed to help restore the water body to a condition that supports existing and designated beneficial uses. Discharge permits must contain limitations that comply with the approved TMDL.

The EPA-approved *Big Wood River Watershed Management Plan* (DEQ 2002) addresses phosphorus, *E. coli* and sediment for the Big Wood River. The proposed permit for The Meadows contains effluent limits for *E. coli*, total phosphorus and sediment (TSS) that are consistent with the TMDL (Table 1). The phosphorus effluent limits have wasteload limits that are consistent with the TMDL. The sediment effluent limits have been reduced; but a review of the facility's DMRs indicates they can easily meet this limit. DEQ does not develop TMDLs for flow alteration because it is not a pollutant.

The existing permit contains effluent limitations for fecal coliform as well as *E. coli*. The *E. coli* limits were in the permit to reflect the bacteria criterion that DEQ adopted to protect the contact recreation beneficial use (IDAPA 58.01.02.251.01). The fecal coliform limit was in the current permit because at the time the permit was issued, IDAPA 58.01.02.420.05 established a disinfection requirement for sewage wastewater treatment plant effluent. This requirement specified fecal coliform concentrations not exceed a geometric mean of 200/100 mL fecal based on a minimum of five samples in one week. This section of Idaho WQS was revised in 2002 to reflect an earlier change in the bacteria criterion from fecal coliform to *E. coli*. As such, the proposed reissuance permit for The Meadows removes the fecal coliform limits. The *E. coli* limits are as or more protective of water quality than the old fecal coliform limits. In 1986, EPA updated its criteria to protect recreational use of water recommending an *E. coli* criterion as a better indicator of bacteria levels that may cause gastro-intestinal distress in swimmers than fecal coliform. DEQ changed its bacteria criterion from fecal coliform to *E. coli*, which as indicated earlier, is reflected in the current permit for The Meadows. The proposed permit contains *E. coli* effluent limitations that comply with numeric criteria at the "end-of-pipe;" therefore, DEQ believes this discharge will not cause or contribute to a violation of the bacteria criteria in the Big Wood River. All other effluent limitations and associated requirements contained in the permit are set at levels that ensure compliance with the narrative and numeric criteria in the WQS.

Table 1. Comparison of proposed permit limits with current permit limits for "The Meadows".

		Proposed Permit			**Current Permit**		
Parameter	Units	Average Monthly Limit	Average Weekly Limit	Maximum Daily Limit	Average Monthly Limit	Average Weekly Limit	Maximum Daily Limit
Temperature	°C	Report	-	Report	Report	-	-
Five-Day BOD	mg/L	30	45	-	30	45	-
	lb/day	25	38	-	25	38	-
	removal	85%	-	-	85%	-	-
TSS	mg/L	30	45	-	30	45	-
	lb/day	8.3	12.5	-	25	38	-
	removal	85%	-	-	85%	-	-
pH	s.u.	6.5 – 9.0 all times			6.5 – 9.0 all times		
Alkalinity, Total	mg/L as $CaCO_3$	Report	-	Report	-	-	-
Dissolved Oxygen	mg/L	Report	-	Report	-	-	-
E. coli	#/100 mL	126 (geometric mean)	-	406 (instantaneous maximum)	50 cfu/100 mL FC[1]	200 cfu/100 mL FC[1]	500 cfu/100 mL FC[1]
					200 cfu/100 mL FC[1]	200 cfu/100 mL FC[1]	800 cfu/100 mL FC[1]
	CFU/day	0.48×10^9 (geometric mean)	-	-	-	-	-
Total Ammonia	mg/L	Report	-	Report	Report	-	-
Total Phosphorus (final)	mg/L	Report	-	Report	1.0	1.5	-
	lb/day	2.3	-	3.8	-	-	-

Nitrate + Nitrite	mg/L	Report	-	Report	Report[2]	-	-
Total Kjeldahl Nitrogen	mg/L	Report	Report	-	Report	Report	-
Oil & Grease	mg/L	Report	-	Report	-	-	-
Total Dissolved Solids	mg/L	Report	-	Report	-	-	-

1. FC = Fecal coliform. The 50, 200 and 500 cfu/100 mL is associated with the period from May to September. The 200, 200 and 800 cfu/100 mL is associated with the period from October to April.
2. Nitrate + Nitrite was reported in the current permit as Nitrate as N and Nitrite as N.

In sum, the effluent limitations and associated requirements contained in the Meadows permit are set at levels that ensure compliance with the numeric and narrative criteria in the WQS, and are also consistent with the wasteload allocations in the Big Wood River TMDL. Therefore, DEQ has determined the permit will protect and maintain existing and designated uses in the Big Wood River.