Region 10, NPDES Permits Unit
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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)

City of Ketchum
Wastewater 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

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:

City of Ketchum
Ketchum/Sun Valley Wastewater Treatment Plant

Physical Address:
110 A River Ranch Road
Ketchum, Idaho 83340

Mailing Address:
P.O. Box 2315
Ketchum, Idaho 83340

Contact: Michael Herrera, Plant Superintendent

II. Facility Information

A. Treatment Plant Description

The City of Ketchum owns, operates, and has maintenance responsibility for a facility which treats domestic sewage from local residents and commercial establishments.

The facility consists of screening and grit removal followed by biological treatment using an extended aeration activated sludge process. Alum and polymers are added prior to secondary clarification for phosphorous removal. The facility uses ultraviolet disinfection. Sludge from the facility is treated by aerobic digestion and is disposed of at a landfill site.

The design flow of the POTW is 4.0 million gallons per day (mgd).

B. Background Information

The most recent NPDES permit for the wastewater treatment plant was issued on May 9, 2001, became effective on June 11, 2001 and expired on June 12, 2006. The first NPDES permit was issued to this facility in June 1975. EPA received a timely and complete application for renewal of this NPDES permit on June 7, 2006. According to 40 CFR 122.6, when EPA receives a timely and complete application for renewal of an NPDES permit, the conditions of the expired permit continue in force until the effective date of a new permit.

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

III. Receiving Water

This facility discharges to the Big Wood River.

A. Low Flow Conditions

Appendix D to the *Technical Support Document for Water Quality-Based Toxics Control* (hereinafter referred to as the TSD) (EPA, 1991) and Section 210.03 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 Ketchum, Idaho, station #13136000) 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 Ketchum based on the correlation and the directly calculated critical low flows at Hailey.

The estimated critical low flow rates of the Big Wood River at Ketchum are shown in Table 1, below.

Table 1: Critical Low Flow Rates of the Big Wood River in CFS

Season	1Q10	7Q10	30B3	30Q5	Harmonic Mean
Year – Round	43.2	54.1	59.2	67.8	127

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 H).

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, E, and F.

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 2 (below) presents the proposed numeric effluent limits.

Table 2: 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	505	760	—
	% removal	85% (min.)	—	—
Total Suspended Solids (TSS)	mg/L	30	45	—
	lb/day	275	413	—
	% removal	85% (min.)	—	—
E. coli	#/100 ml	126[1]	—	406[2]
	CFU/day	19.07 billion[1]	—	—
pH	s.u.	6.2 – 9.0 at all times		
Total Phosphorus	mg/L	1.0	1.5	—
	lb/day	9.9	14.9	—
Copper, Total Recoverable	µg/L	19.2	—	35.1
	lb/day	0.64	—	1.17

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

Basis for Deleting Fecal Coliform and Total Residual Chlorine Effluent Limits

The draft permit proposes to delete the previous permit's effluent limits for fecal coliform and total residual chlorine. 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.

Fecal Coliform

The draft permit proposes to delete the fecal coliform limits in the previous permit. 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 19.07 billion 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 effluent limits for bacteria may be revised to remove the effluent limits for fecal coliform and retain effluent limits for E. coli.

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. As explained above, the deletion of the fecal coliform limits and retention of limits for E. coli do not violate the Act's antibacksliding provisions. Also, this limit complies with the antidegradation provisions of the Idaho Water Quality Standards (see Appendix H).

Total Residual Chlorine

The chlorine disinfection system at the Ketchum wastewater treatment plant was removed and replaced with an ultraviolet (UV) disinfection system in 2005. Water quality-based effluent limits may be made less stringent than the comparable effluent limitations in the previous permit if material and substantial alterations or additions to the permitted facility occurred after permit

issuance, which justify the application of a less-stringent effluent limitation (CWA Section 402(o)(2)(A)).

The removal of the chlorine disinfection system, which was the source of residual chlorine in the effluent, represents a material and substantial alteration to the permitted facility. Since the facility no longer uses chlorine for disinfection, the facility no longer has the reasonable potential to cause or contribute to excursions above water quality standards for chlorine, nor is the facility subject to any technology-based effluent limits for chlorine. Because there is no longer a source of residual chlorine in the discharge, the deletion of the total residual chlorine effluent limits will not allow lower water quality. Therefore, effluent limits are not necessary for chlorine (40 CFR 122.44(d)(1)(i – iii)). The effluent limits for total residual chlorine have therefore been deleted from the draft permit.

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

Because the E. coli limits apply current water quality criteria at the end-of-pipe, the effluent limits are derived from and comply with water quality standards for E. coli. As explained above, the facility does not have the reasonable potential to cause or contribute to excursions above water quality standards for chlorine. The secondary treatment technology-based effluent limits do not include effluent limits for bacteria or chlorine. Because the effluent limits will continue to ensure that water quality standards are met and do not violate the secondary treatment effluent limits, the limits proposed limits comply with Section 402(o)(3) of the CWA.

EPA is requesting that IDEQ certify that the effluent limits for 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 parts B.6 and D of the NPDES Form 2A application, so that these data will be available when the permittee applies for a renewal of its NPDES permit.

The permittee is responsible for conducting the monitoring and for reporting results on 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 3, below, presents the proposed effluent monitoring requirements for the City of Ketchum WWTP. 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

The monitoring frequencies for TSS and total phosphorus have been increased from once per week to twice per week in order to better determine compliance with the more-stringent water quality-based TSS and total phosphorus limits that are proposed in the draft permit. The draft permit also proposes monthly monitoring of orthophosphate, in order to better characterize the facility's phosphorus discharges, although only total phosphorus is subject to effluent limits. The draft permit proposes weekly monitoring for copper in order to determine compliance with the new water quality-based effluent limits for copper. The draft permit proposes continuous monitoring for effluent temperature from April - October in order to determine whether the discharge has the reasonable potential to cause or contribute to excursions above water quality standards for temperature.

The draft permit proposes to require monitoring at a frequency of quarterly for all parameters listed in Part B.6 of the application form for POTWs (EPA Form 3510-2A, revised 1-99) 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] EPA also proposes quarterly monitoring of the effluent for cadmium, mercury, and zinc.

The permit also requires at least three samples over the term of the permit for all parameters listed in Part D of the application form for POTWs so that these data will be available when the City applies for a reissued permit.[2] In accordance with Part E of the form 2A application, the permit requires quarterly whole effluent toxicity testing for one year.[3]

Table 3: Effluent Monitoring Requirements

Parameter	Units	Sample Location	Sample Frequency	Sample Type
Flow	mgd	Effluent	continuous	recording
Temperature (April – October)	ºC	Effluent	continuous	recording
Temperature (November – March)	ºC	Effluent	5/week	grab
BOD_5	mg/L	Influent & Effluent	1/week	24-hour composite
	lb/day	Influent & Effluent		calculation[1]
	% Removal	% Removal	1/month	calculation[2]
TSS	mg/L	Influent & Effluent	2/week	24-hour composite
	lb/day	Influent & Effluent		calculation[1]
	% Removal	% Removal	1/month	calculation[2]
E. coli	#/100 ml	Effluent	5/month	grab
pH	standard units	Effluent	daily	grab
Total Ammonia as N	mg/L	Effluent	1/month	24-hour composite
Total Phosphorus as P	mg/L	Effluent	2/week	24-hour composite
	lb/day			calculation[1]

[1] See 40 CFR 122.21(j)(4)(iii)
[2] See also 40 CFR 122.21(j)(4)(iv)
[3] See also 40 CFR 122.21(j)(5)

Table 3: Effluent Monitoring Requirements				
Parameter	**Units**	**Sample Location**	**Sample Frequency**	**Sample Type**
Copper, Total Recoverable	µg/L	Effluent	1/week	24-hour composite
	lb/day			calculation[1]
Alkalinity	mg/L as $CaCO_3$	Effluent	1/quarter	24-hour composite
Cadmium, Total Recoverable	µg/L	Effluent	1/quarter	24-hour composite
Dissolved Oxygen	mg/L	Effluent	1/month	grab
Hardness	mg/L	Effluent	1/quarter	24-hour composite
Lead, Total Recoverable	µg/L	Effluent	1/quarter	24-hour composite
Mercury	µg/L	Effluent	1/quarter	24-hour composite
Nitrate + Nitrite	mg/L	Effluent	1/quarter	24-hour composite
Oil and Grease	mg/L	Effluent	1/quarter	grab
Orthophosphate as P	mg/L	Effluent	1/quarter	24-hour composite
Total Dissolved Solids	mg/L	Effluent	1/quarter	24-hour composite
Total Kjeldahl Nitrogen	mg/L	Effluent	1/quarter	24-hour composite
Zinc, Total Recoverable	µg/L	Effluent	1/quarter	24-hour composite
NPDES Application Form 2A Expanded Effluent Testing	---	Effluent	3x/5 years	---
Whole Effluent Toxicity (WET)	TUc	Effluent	Quarterly for one year	24-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.

C. Surface Water Monitoring

Table 4 presents the proposed surface water monitoring requirements for the draft permit. Surface water monitoring results must be submitted quarterly with the March, June, September, and December DMRs, except for temperature, which must be submitted monthly with the DMRs for April – October.

EPA proposes to discontinue the surface water monitoring for copper that was required in the prior permit. The purpose of the receiving water monitoring for copper was to determine if the discharge had the reasonable potential to cause or contribute to excursions above water quality standards for copper and therefore whether effluent limits were necessary for copper. EPA has determined that the discharge has the reasonable potential to cause or contribute to excursions above water quality standards for copper; therefore, surface water monitoring for copper is no longer necessary.

Table 4: Surface Water Monitoring Requirements			
Parameter and Units	**Location(s)**	**Sampling Frequency**	**Maximum Method Detection Limit (MDL)**
Alkalinity, mg/L as $CaCO_3$	Upstream	1/quarter	—
Cadmium, dissolved, µg/L	Upstream	1/quarter	0.1 µg/L
Hardness, mg/L as $CaCO_3$	Upstream	1/quarter	—
Lead, dissolved, µg/L	Upstream	1/quarter	0.5 µg/L
Mercury, total, µg/L	Upstream	1/quarter	0.01 µg/L
pH, standard units	Upstream	1/quarter	—
Temperature, °C (April – October)	Upstream and downstream	Hourly	—
Total Ammonia as N, mg/L	Upstream	1/quarter	0.04 mg/L
Zinc, dissolved, µg/L	Upstream	1/quarter	2 µg/L

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 City of Ketchum 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 City of Ketchum 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. 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.

D. 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 G 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 City of Ketchum WWTP 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.

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:	ID0020281
Physical Address:	110 River Ranch Road Ketchum, Idaho 83340
Mailing Address:	P.O. Box 2315 Ketchum, Idaho 83340
Facility Background:	The most recent NPDES permit for the pollution control plant was issued on May 9, 2001, became effective on June 11, 2001 and expired on June 12, 2006. An application for permit reissuance was submitted by the city on June 7, 2006. EPA determined that the application was timely and complete, and the permit has been administratively extended under 40 CFR 122.6 until the permit can be reissued. The first NPDES permit was issued to this facility in June 1975.

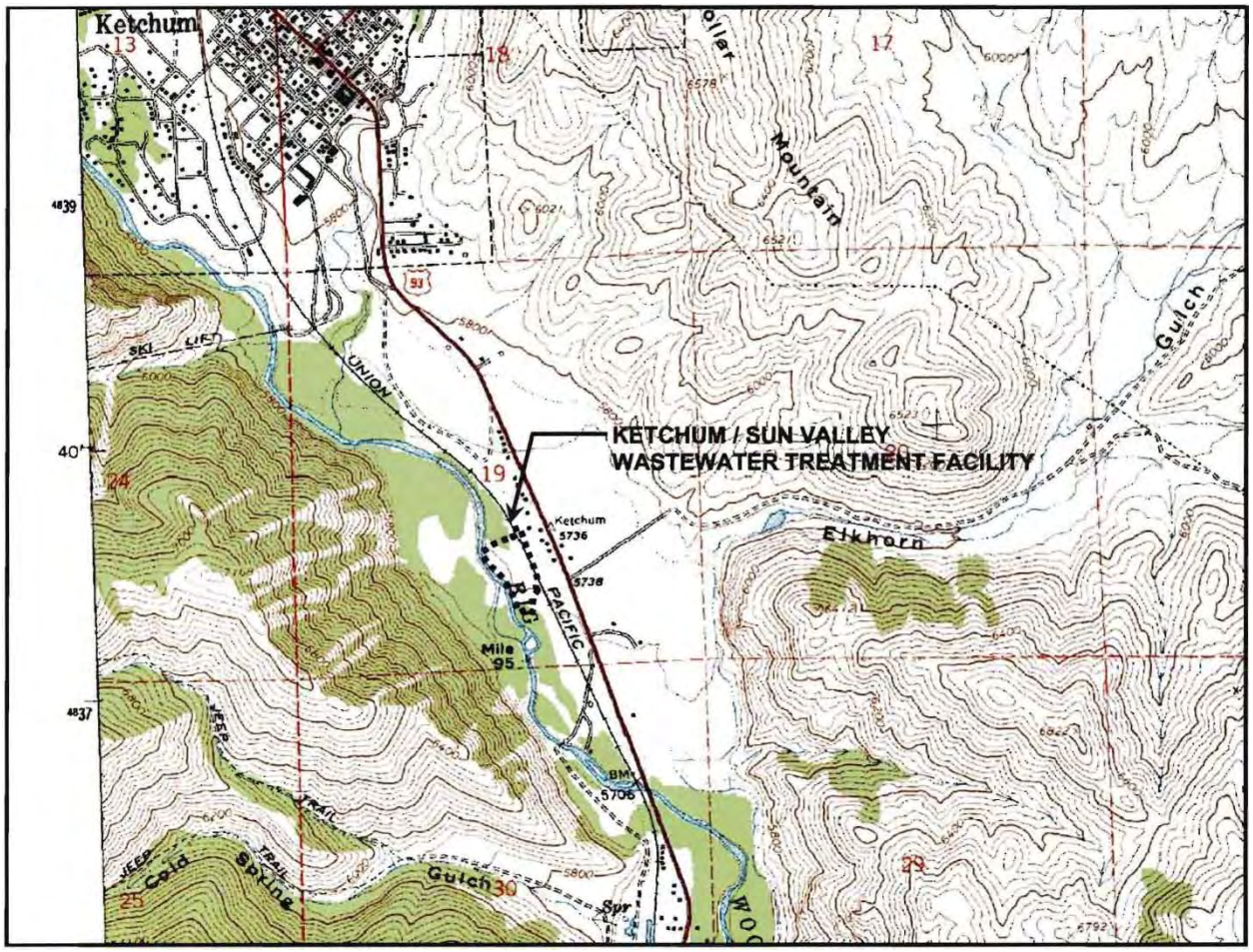
Facility Information

Type of Facility:	Publicly Owned Treatment Works (POTW)
Treatment Train:	The facility consists of screening and grit removal followed by biological treatment using an extended aeration activated sludge process. Alum and polymers are added prior to secondary clarification for phoshorous removal. The facility uses ultraviolet disinfection. Sludge from the facility is treated by aerobic digestion and is disposed of at a landfill site.
Flow:	Design flow is 4.0 mgd.
Outfall Location:	latitude 43º 40’ 8”; longitude 114º 21’ 7”

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, 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

Federal Secondary Treatment Effluent Limits

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

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

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

Chlorine

The Ketchum WWTP does not use chlorine for disinfection; therefore, no technology-based effluent limits for chlorine are applicable to this facility.

Use of Technology-based Effluent Limits in the Draft Permit

The concentration and removal rate limits for BOD_5 and TSS are the technology-based effluent limits of 40 CFR 133.102. However, the mass limits for BOD_5 and TSS are more stringent than the technology-based effluent limits. The mass limits for TSS are water quality-based effluent limits that are consistent with the assumptions and requirements of the wasteload allocation for the discharge in the *Big Wood River Watershed Management Plan*. The BOD_5 mass limits are identical to the limits in the prior permit, and have been continued forward based on the anti-backsliding provisions of the Clean Water Act (Section 402(o)).

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 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, and where 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, the water quality-based effluent limits in this permit have been calculated using a mixing zone. If IDEQ does not grant a mixing zone, the water quality-based effluent limits will be recalculated such that the criteria are met before the effluent is discharged to the receiving water.

Procedure for Deriving Water Quality-based Effluent Limits

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

In cases where a mixing zone is not authorized, either because the receiving water already exceeds the criterion, the receiving water flow is too low to provide dilution, or the State does not authorize one, the criterion becomes the WLA. Establishing the criterion as the wasteload allocation ensures that the permittee will not cause or contribute to an exceedance of the

criterion. The following discussion details the specific water quality-based effluent limits in the draft permit.

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

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 13.6 ºC.

Table C-4: Water Quality Criteria for Ammonia

	Acute Criterion[1]	Chronic Criterion[2]
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

1. No seasonal variation was assumed for pH, therefore, there is no seasonal variation in the acute criterion (which is a function of pH only).

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.

Cadmium, Copper and Zinc

The toxicities of some metals vary with the hardness of the water. Therefore, the water quality criteria for these metals also vary with hardness. Since toxicity decreases (and numeric water quality criteria increase) as hardness increases, EPA has used the 5th percentile ambient hardness as a worst-case assumption for ambient hardness. The 5th percentile ambient hardness is 71.0 mg/L as $CaCO_3$. Effluent hardness data were not available.

The hardness-dependent water quality criteria for the metals of concern are expressed as dissolved metal. The dissolved fraction of the metal is the fraction that will pass through a 0.45-micron filter. However, the federal regulation at 40 CFR 122.45(c) requires that NPDES permit effluent limits must be expressed as total recoverable metal. Total recoverable metal is the concentration of the metal in an unfiltered sample. To develop effluent limits for total recoverable metals which are protective of the dissolved metals criteria, "translators" are used in the equations to determine reasonable potential and derive effluent limits. Translators can either be site specific values or default values. EPA has published guidance related to the use of translators in NPDES permits in *The Metals Translator: Guidance for Calculating a Total Recoverable Permit Limit from a Dissolved Criterion* (EPA 823-B-96-007, June 1996). In the absence of site specific translators, this guidance recommends the use of water quality criteria

conversion factors as the default translators. Because site-specific translators were not available, EPA has used the conversion factors in the Idaho Water Quality Standards in the reasonable potential and effluent limit calculations for the City of Ketchum discharge. Tables C-2 and C-3, below, detail the calculations for water quality criteria for metals that have been detected in the City of Idaho Falls effluent (IDAPA 58.01.02.210).

Table C-2: Aquatic Life Metals Criteria

Parameter	Equations for Metals Criteria (expressed as total recoverable, in µg/L)[1,2,3]		Equations or Values of Conversion Factors and Translators[4]	
	Acute	Chronic	Acute	Chronic
Cadmium	$e^{1.0166[\ln(\text{hardness})-3.924]}$	$e^{0.7852[\ln(\text{hardness})-3.490]}$	$1.136672 \times \ln(\text{hardness}) \times 0.041838$	$1.101672 \times \ln(\text{hardness}) \times 0.041838$
Copper	$e^{0.9422[\ln(\text{hardness})-1.464]}$	$e^{0.8545[\ln(\text{hardness})-1.465]}$	0.960	0.960
Zinc	$e^{0.8473[\ln(\text{hardness})+0.884]}$	$e^{0.8473[\ln(\text{hardness})+0.884]}$	0.978	0.986

Notes:
1. "e" is the exponential constant, approximately equal to 2.718
2. "ln" is the natural logarithm (log base "e")
3. Hardness is measured in mg/L as $CaCO_3$
4. Multiplying the results of the criteria equations by these conversion factors yields the dissolved criteria.

Table C-3: Metals Criteria Values as Dissolved Metal at 71.0 mg/L Hardness

Parameter	Acute Criterion (µg/L)	Chronic Criterion (µg/L)
Cadmium	1.01	0.47
Copper	12.3	8.47
Zinc	87.6	88.3

EPA has determined that the discharge has the reasonable potential to cause or contribute to excursions above water quality standards for copper. Therefore, the draft permit proposes a water quality-based effluent limit for copper.

EPA has determined that the discharge does not have the reasonable potential to cause or contribute to excursions above water quality criteria for cadmium or zinc. Effluent monitoring data for mercury was performed using a method using an analytical reporting limit greater than the chronic water quality criterion. It is not clear from the available effluent data whether the discharge has the reasonable potential to cause or contribute to excursions above water quality standards for mercury, therefore, the permit requires effluent monitoring for mercury, with a lower required analytical minimum level.

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 was approved by EPA on May 15, 2002. In November 2011, IDEQ issued the *Errata to the Big Wood River Watershed Management Plan*, which corrected calculation errors affecting the E. coli wasteload allocations in the TMDL. EPA approved the modifications in February 2011. The TMDL's wasteload allocation for E. coli for this discharge as modified by the errata is 19.07 billion (19.07×10^9) CFU/day.

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 appropriate 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 a discharge at the lower technology-based pH limit of 6.0 standard units (which was the lower pH limit in the previous permit) would not ensure compliance with water quality standards for pH, downstream from the outfall. However, a water quality-based pH limit of 6.2 standard units would ensure compliance with water quality standards for pH at the edge of a mixing zone encompassing 25% of the critical low flow of the receiving water. The upper technology-based pH limit is identical to the upper limit of the criteria (9.0 standard units). Thus, the draft permit proposes a pH limit of 6.2 – 9.0 standard units.

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 26.5 tons per year (see the Watershed Management Plan at Table BBB). On a daily basis, the wasteload allocation is equivalent to 145 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 275 lb/day, which is calculated as 1.89 times the wasteload allocation translated to a daily load. The monthly average effluent limits will nonetheless ensure that the facility will have a low probability of exceeding its 26.5 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 413 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 July 2006 and August 2011 was 61.0 lb/day. This is 22% 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

The previous permit had concentration effluent limits for phosphorus equal to 1.0 mg/L as an average monthly limit and 1.5 mg/L as an average weekly limit. These effluent limits have been continued forward in the draft permit under the anti-backsliding provisions of the Clean Water Act (Section 402(o)).

In addition, 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 was approved by EPA on May 15, 2002. The TMDL's wasteload allocation for total phosphorus for this discharge was 9.9 lb/day.

In the TMDL, the loading capacity was calculated using the annual average river flow and the maximum monthly average in-stream target of 50 µg/L (0.05 mg/L) total phosphorus (see the TMDL at page 62). Federal regulations require that effluent limits for POTWs be expressed as average monthly and average weekly limits, unless impracticable (40 CFR 122.45(d)(1)). Therefore, it is consistent with the assumptions and requirements of the wasteload allocation to establish an average monthly effluent limit equal to the wasteload allocation. Consistent with the technology-based effluent limits for BOD_5 and TSS and with the concentration limits for phosphorus, EPA has established an average weekly limit equal to 1.5 times the maximum daily limit.

EPA has estimated the facility's current effluent phosphorus loads by multiplying the reported average monthly effluent concentrations of phosphorus by the reported monthly average effluent flows and the density of water. The estimated maximum monthly effluent total phosphorus load is from September 2006 through August 2011 was 6.16 lb/day, which is 62% of 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.

Five-day Biochemical Oxygen Demand

The BOD_5 mass limits are identical to the comparable effluent limits in the previous permit. The previous mass limits have been retained based on the anti-backsliding provisions of the Clean Water Act (Section 402(o)).

Temperature

There are insufficient data to determine if the discharge has the reasonable potential to cause or contribute to excursions above water quality standards for temperature. Therefore, no effluent limits are proposed for temperature.

The State of Idaho's draft Clean Water Act Section 401 certification for the City of Ketchum requires hourly monitoring of the receiving water temperature, upstream and downstream of the outfall, from April through October each year. EPA is required to incorporate requirements specified in Section 401 certifications into NPDES permits (40 CFR 124.55(a)(2)). Therefore, the draft permit proposes hourly monitoring of the receiving water temperature, upstream and downstream of the outfall, from April through October each year.

The draft permit also proposes continuous monitoring of the effluent temperature, from April through October.

Mass-Based Limits

Effluent limits are generally calculated on a concentration basis. However, the federal regulation at 40 CFR 122.45(f) requires that effluent limits be expressed in terms of mass, if possible. The regulation at 40 CFR 122.45(b) requires that effluent limitations for POTWs be calculated based on the design flow of the facility. The mass based limits are expressed in pounds per day and are generally calculated as follows:

$$\text{Mass based limit (lb/day)} = \text{concentration limit (mg/L)} \times \text{design flow (mgd)} \times 8.34^{4}$$

While the draft permit proposes technology-based *concentration* limits for BOD_5 and TSS, the *mass* limits for BOD_5 and TSS are water quality-based effluent limits that are more stringent than the technology-based limits, as explained above. The water quality-based mass limits for BOD_5 and TSS are unrelated to the technology-based concentration limits.

The phosphorus mass limits are also unrelated to the concentration limits. The concentration limits from the previous permit have been carried forward under the anti-backsliding provisions of the Clean Water Act, but the mass limits have been established for consistency with the *Big Wood River Watershed Management Plan*.

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.

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-4 Summary of Effluent Limit Bases

Limited Parameter	Basis for Limit
BOD_5 and TSS concentration and removal rate	Clean Water Act (CWA) Section 301(b)(1)(B), 40 CFR 133 (technology-based)
TSS mass	CWA Section 301(b)(1)(C), 40 CFR 122.44(d)(1)(vii)(B) (water quality-based, TMDL)
BOD_5 mass	CWA Section 402(o) (anti-backsliding)
Phosphorus concentration	CWA Section 402(o) (anti-backsliding)
Phosphorus mass	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)
pH	CWA Section 301(b)(1)(C), 40 CFR 122.44(d), IDAPA 58.01.02.060, 250.01.a. (water quality-based, with mixing zone)

[4] 8.34 is a conversion factor equal to the density of water in pounds per gallon

Table C-4 Summary of Effluent Limit Bases	
Limited Parameter	**Basis for Limit**
E. coli concentration	CWA Sections 301(b)(1)(C) and 402(o), 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 122.44(d)(1)(vii)(B) (water quality-based, TMDL)
Copper	CWA Section 301(b)(1)(C), 40 CFR 122.44(d), IDAPA 58.01.02. 060, 210 (water quality-based, with mixing zone)
Temperature, August 15 – September 30th	CWA Section 301(b)(1)(C), 40 CFR 122.44(d), IDAPA 58.01.02.060, 250.01.a. (water quality-based, with mixing zone)

E. References

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.

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 multiple values for the dilution factor. Dilution factors are based on different critical low flow rates: The 1Q10 flow rate for acute aquatic life criteria, the 7Q10 for chronic aquatic life criteria (except for ammonia) and conventional pollutants, and the 30B3 flow rate for the chronic ammonia criterion. The dilution factors are listed in Table D-1, below.

Table D-1: Dilution Factors

Mixing Zone	Acute Dilution Factor (1Q10)	Chronic Dilution Factor (7Q10)	Chronic Ammonia Criterion Dilution Factor (30B3)	Human Health Non-Carcinogen Dilution Factor (30Q5)	Human Health Carcinogen Dilution Factor (Harmonic Mean)
25% of Critical Flow	2.74	3.18	3.38	3.75	6.13

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

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

If the criterion is expressed as dissolved metal, the effluent concentrations, which are measured in total recoverable metal, must be converted to dissolved metal as shown in Equation D-7.

$$C_d = \left[\frac{CF \times C_e - C_u}{D} \right] + C_u \qquad \text{(Equation D-7)}$$

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

Equations D-6 and D-7 are the forms 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, cadmium, copper and zinc, 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 copper 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.

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

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 24 copper samples collected from the effluent, therefore:

$$p_n = (1 - 0.99)^{1/24}$$
$$p_n = 0.825$$

This means that we can say, with 99% confidence, that the maximum reported effluent copper concentration is greater than the 82nd 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 copper:

CV = coefficient of variation = 0.492
$\sigma^2 = \ln(CV^2 + 1) = 0.217$
$\sigma = \sqrt{\sigma^2} = 0.466$
z = 2.326 for the 99th percentile; 0.936 for the 82nd percentile

$$C_{99} = \exp(2.326 \times 0.492 - 0.5 \times 0.217) = 2.650$$

C_{82} = exp (0.936× 0.492 - 0.5 × 0.217) = 1.387

RPM = C_{99}/C_{82} = 2.65/1.39
RPM = 1.91

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 copper,

C_e = (1.91)(30 mg/L) = **57.3 µg/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:

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

Or, if the criterion is expressed as dissolved metal, the maximum projected receiving water concentration is calculated from Equation D-7:

$$C_d = \left[\frac{CF \times C_e - C_u}{D}\right] + C_u \quad \text{(Equation D-7)}$$

Where C_e is expressed total recoverable metal, C_u and C_d are expressed as dissolved metal, and CF is the conversion factor.

For copper the acute receiving water concentration is, in micrograms per liter:

$$C_d = \left[\frac{0.960 \times 57.3 - 0}{2.74}\right] + 0 = 20.1$$

For copper the chronic receiving water concentration is, in micrograms per liter:

$$C_d = \left[\frac{0.960 \times 57.3 - 0}{3.18}\right] + 0 = 17.3$$

The acute and chronic water quality criteria are 12.3 and 8.47 µg/L, respectively. Because the projected receiving water concentrations are greater than the criteria, a water quality-based effluent limit is necessary for copper.

Table D-2, below, summarizes the reasonable potential calculations ammonia, cadmium, copper and zinc.

Table D-2: Reasonable Potential Calculations

Effluent Percentile value	99%																
		State Water Quality Standard		Max concentration at edge of...													
	Ambient Concentration (metals as dissolved)	Acute	Chronic	Acute Mixing Zone	Chronic Mixing Zone	LIMIT REQ'D?		Max effluent conc. measured (metals as total recoverable)	Coeff Variation		# of samples	Multiplier	Acute Dil'n Factor	Chronic Dil'n Factor		Metal Criteria Translator as decimal	Metal Criteria Translator as decimal
Parameter	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*		*Pn*	*ug/L*	*CV*	*s*	*n*				COMMENTS	Acute	Chronic
Ammonia, Effluent, mg/L	0.4000	2.59	1.29	0.79	0.71	**NO**	0.963	0.98	0.855	0.741	122	1.49	2.7	3.4	25% Mixing Zone	1.00	1.00
Zn	69.6	87.61	88.329	78.82	77.78	**NO**	0.825	65.00	0.294	0.288	24	1.49	2.7	3.2	25% Mixing Zone	0.98	0.99
Cd		1.01	0.467	0.378	0.314	**NO**	0.825	0.50	0.600	0.555	24	2.16	2.7	3.2	25% MZ, all but 1 BLOQ, assume CV = 0.6	0.96	0.92
Cu		12.31	8.466	20.101	17.294	**YES**	0.825	30.00	0.492	0.466	24	1.91	2.7	3.2	25% Mixing Zone	0.96	0.96

Appendix E: WQBEL Calculations - Aquatic Life Criteria

The following calculations demonstrate how the water quality-based effluent limits (WQBELs) in the draft permit were calculated. The new WQBELs for copper are derived from aquatic life criteria. The following discussion presents the general equations used to calculate the water quality-based effluent limits for the copper WQBEL. The calculations are summarized in Table E-1.

A. Calculate the Wasteload Allocations (WLAs)

Wasteload allocations (WLAs) are calculated using the same mass balance equations used to calculate the concentration of the pollutant at the edge of the mixing zone in the reasonable potential analysis (Equations D-6 and D-7). To calculate the wasteload allocations, C_d is set equal to the acute or chronic criterion and the equation is solved for C_e. The calculated C_e is the acute or chronic WLA. Equation D-6 is rearranged to solve for the WLA, becoming:

$$C_e = WLA = D \times (C_d - C_u) + C_u \qquad \text{(Equation E-1)}$$

Idaho's water quality criteria for some metals are expressed as the dissolved fraction, but the Federal regulation at 40 CFR 122.45(c) requires that effluent limits be expressed as total recoverable metal. Therefore, EPA must calculate a wasteload allocation in total recoverable metal that will be protective of the dissolved criterion. This is accomplished by dividing the WLA expressed as dissolved by the criteria translator, as shown in equation E-2.

$$C_e = WLA = \frac{D \times (C_d - C_u) + C_u}{CT} \qquad \text{(Equation E-2)}$$

Or, if no mixing zone is allowed, for metals with criteria expressed as the dissolved fraction:

$$C_e = WLA = C_d \div CT \qquad \text{(Equation E-3)}$$

In the case of copper, for the acute criterion,

$$WLA_a = \frac{2.74 \times (12.3 - 0) + 0}{0.960}$$

WLA_a = 35.1 µg/L

For the chronic criterion,

$$WLA_c = \frac{3.18 \times (8.47 - 0) + 0}{0.960}$$

WLA_c = 28.1 µg/l

The next step is to compute the "long term average" concentrations which will be protective of the WLAs. This is done using the following equations from Chapter 5 of EPA's *Technical Support Document for Water Quality-based Toxics Control* (TSD):

$$LTA_a = WLA_a \times \exp(0.5\sigma^2 - z\,\sigma) \qquad \text{(Equation E-4)}$$

$$LTA_c = WLA_c \times \exp(0.5\,\sigma_4^2 - z\,\sigma_4) \qquad \text{(Equation E-5)}$$

where,

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

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

$\sigma_4^2 = \ln(CV^2/4 + 1)$

$\sigma_4 = \sqrt{\sigma_4^2}$

z = 2.326 for 99th percentile probability basis

In the case of copper,

$\sigma^2 = \ln(0.492^2 + 1) = 0.217$

$\sigma = \sqrt{\sigma^2} = 0.466$

$\sigma_4^2 = \ln(0.492^2/4 + 1) = 0.0588$

$\sigma_4 = \sqrt{\sigma_4^2} = 0.242$

z = 2.326 for 99th percentile probability basis

Therefore,

$LTA_a = 35.0 \times \exp(0.5 \times 0.217 - 2.326 \times 0.466)$

LTA_a = 13.2 µg/L

$LTA_c = 28.0\ \mu g/L \times \exp(0.5 \times 0.0588 - 2.326 \times 0.242)$

LTA_c = 16.4 µg/L

The LTAs are compared and the more stringent is used to develop the daily maximum and monthly average permit limits as shown below. For copper the acute LTA of 13.2 µg/L is more stringent.

B. Derive the maximum daily and average monthly effluent limits

Using the TSD equations (section 5.4.1), the MDL and AML effluent limits are calculated as follows:

$MDL = LTA \times \exp(z_m \sigma - 0.5 \sigma^2)$ (Equation E-4)

$AML = LTA \times \exp(z_a \sigma_n - 0.5 \sigma_n^2)$ (Equation E-5)

where σ, and σ^2 are defined as they are for the LTA equations (E-2 and E-3) and,

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

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

z_a = 1.645 for 95th percentile probability basis

z_m = 2.326 for 99th percentile probability basis

n = number of sampling events required per month (minimum of 4)

In the case of copper,

$MDL = 13.2\ \mu g/L \times \exp(2.326 \times 0.466 - 0.5 \times 0.217)$

MDL = 35.1 µg/L

$AML = 13.2\ \mu g/L \times \exp(1.645 \times 0.242 - 0.5 \times 0.0588)$

AML = 19.2 µg/L

Table E-1, on the following page, details the calculations for water quality-based effluent limits based on two-value aquatic life criteria.

Table E-1: Effluent Limit Calculations

Statistical variables for permit limit calculation																	
LTA Probability Basis	99%																
MDL Probability Basis	99%																
AML Probability Basis	95%																
Permit Limit Calculation Summary									**Waste Load Allocation (WLA) and Long Term Average (LTA) Calculations**								
	Acute Dil'n Factor	Chronic Dil'n Factor	Ambient Concentration	Water Quality Standard Acute	Water Quality Standard Chronic	Average Monthly Limit (AML)	Maximum Daily Limit (MDL)	Comments	WLA Acute	WLA Chronic	LTA Acute	LTA Chronic	Limiting LTA	Coeff. Var. (CV)	# of Samples per Month	Metal Criteria Translator	Metal Criteria Translator
PARAMETER			*ug/L*	*ug/L*	*ug/L*	ug/L	ug/L		*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*decimal*	*n*	Acute	Chronic
Copper	2.74	3.18		12.3	8.47	**19.2**	**35.1**	25% MZ	35.1	28.1	13.2	16.4	13.2	0.49	4.00	0.96	0.96

Appendix F: Effluent Limit Calculations for pH

As shown in Table F-1, below, EPA has determined that a discharge at the technology-based lower pH limit of 6.4 standard units will ensure compliance with Idaho's water quality criteria for pH at the edge of a mixing zone encompassing 25% of the 1Q10 flow rate of the receiving water. EPA did not perform a water quality-based calculation for the upper pH limit because the technology-based upper pH limit is identical to the upper limit of the water quality criteria (9.0 standard units).

Table F-1: Effluent Limit Calculations for pH

INPUT	
1. DILUTION FACTOR AT MIXING ZONE BOUNDARY	2.74
2. UPSTREAM/BACKGROUND CHARACTERISTICS	
Temperature (deg C):	6.84
pH:	7.22
Alkalinity (mg CaCO3/L):	72.3
3. EFFLUENT CHARACTERISTICS	
Temperature (deg C):	18
pH:	**6.2**
Alkalinity (mg CaCO3/L):	123.3
OUTPUT	
1. IONIZATION CONSTANTS	
Upstream/Background pKa:	6.49
Effluent pKa:	6.40
2. IONIZATION FRACTIONS	
Upstream/Background Ionization Fraction:	0.84
Effluent Ionization Fraction:	0.39
3. TOTAL INORGANIC CARBON	
Upstream/Background Total Inorganic Carbon (mg CaCO3/L):	86.07
Effluent Total Inorganic Carbon (mg CaCO3/L):	317
4. CONDITIONS AT MIXING ZONE BOUNDARY	
Temperature (deg C):	10.92
Alkalinity (mg CaCO3/L):	90.93
Total Inorganic Carbon (mg CaCO3/L):	170.5
pKa:	6.46
pH at Mixing Zone Boundary:	**6.51**

Appendix G: 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 City of Ketchum 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 City of Ketchum will have no effect on the 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 City of Ketchum 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 H: 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-0020281** City of Ketchum 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.

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

Instream Water Quality Monitoring

In order to ensure compliance with Water Quality Standards, the permittee must conduct surface water monitoring at two Big Wood River sites (approved by DEQ), one above and one below the influence of the facility's discharge for: temperature (hourly from April to October); and quarterly for hardness, alkalinity, pH, total ammonia as nitrogen, cadmium, mercury, and dissolved zinc. The permittee must follow the conditions for surface water monitoring as defined in the NDPES permit (Part I.D).

Wasteload Allocations for Total Phosphorus and Total Suspended Solids

The current permit does not have wasteload allocations for total phosphorus (TP). Instead, the concentration limit of 1.0 mg/L as an average monthly and 1.5 mg/L as an average weekly exists. These same concentration limits are carried forward in the proposed permit; but with wasteload allocations of 9.9 lb/day as an average monthly and 14.9 lb/day as a weekly average. These wasteload allocations are consistent with the approved Big Wood River TMDL (DEQ 2002).

The current permit has wasteload allocations for total suspended solids (TSS) of 505 lb/day as an average monthly and 760 lb/day as an average weekly. Although the equivalent concentrations of 30 mg/L and 45 mg/L, respectively, are carried forward in the proposed permit; the wasteload allocations are reduced to 275 lb/day as an average monthly and 413 lb/day as an average weekly. The Big Wood River TMDL wasteload allocation for Ketchum is 26.5 ton/year. The 275 lb/day limit is consistent with the WLA of 26.5 tons/year. (See EPA Fact Sheet, Appendix C.)

Compliance Schedules

The Big Wood River TMDL (DEQ 2002) set limits for total phosphorus and total suspended solids at 9.9 lb/day and 26.5 ton/year, respectively. The permit sets limits for total phosphorus and total suspended solids at 9.9 lb/day and 275 lb/day, respectively. These limits should be achievable by the facility immediately. As such, no compliance schedule is necessary.

Mixing Zones

Pursuant to IDAPA 58.01.02.060, the DEQ authorizes a mixing zone that utilizes 25% of the critical low flow volumes (7Q10 flow) of the Big Wood River for total recoverable copper, ammonia, zinc and cadmium. Using this dilution, total ammonia, zinc and cadmium were not shown to have a reasonable potential to cause or contribute to excursions of WQS and therefore no limits were set for these pollutants. (See Appendix D of the EPA 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 limits in the proposed new permit for the City of Ketchum 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 Balthasar Buhidar, DEQ (Twin Falls Regional Office) at (208) 736-2190 or Balthasar.buhidar@deq.idaho.gov.

DRAFT

Bill Allred
Regional Administrator
DEQ Twin Falls Regional Office

ANTIDEGRADATION REVIEW

NPDES Permit # ID-0020281 City of Ketchum 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 provides 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 City of Ketchum Wastewater Treatment Facility (Ketchum) discharges the following pollutants of concern: biological oxygen demand (BOD), total suspended solids (TSS), *E. coli*, pH, ammonia, total phosphorus (TP), nitrate + nitrite, total Kjeldahl nitrogen, copper, mercury, cadmium, zinc, alkalinity, dissolved oxygen, hardness, oil & grease, orthophosphate, total dissolved solids and temperature. Effluent limits have been developed for BOD, TSS, *E. coli*, pH, total phosphorus, and total recoverable copper. Effluent limits were not developed for temperature, alkalinity, cadmium, dissolved oxygen, hardness, mercury, nitrate + nitrite, oil & grease, ammonia, total dissolved solids, total Kjeldahl nitrogen and zinc in the new permit; however, additional monitoring is necessary for these parameters to assess whether water quality based effluent limits will be needed in future permits.

Receiving Water Body Level of Protection
Ketchum 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 the 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 (Tier 1 Protection)
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 Ketchum contains effluent limits for *E. coli*, TP and TSS that are consistent with the TMDL (Table 1). The phosphorus effluent concentration limits have been continued forward from the previous permit; but load effluent limits are now included. The sediment (TSS) effluent limits have been reduced from the previous 505 lbs/day to 275 lbs/day (Table 1); and 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 Ketchum 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 Ketchum. 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 Hailey.

		Proposed Permit			**Current Permit**		
Parameter	Units	Average Monthly Limit	Average Weekly Limit	Maximum Daily Limit	Average Monthly Limit	Average Weekly Limit	Maximum Daily Limit
Five-Day BOD	mg/L	30	45	-	30	45	-
	lb/day	505	760	-	505	760	-
	removal	85%	-	-	85%	-	-
TSS	mg/L	30	45	-	30	45	-
	lb/day	275	413	-	505	760	-
	removal	85%	-	-	85%	-	-
pH	s.u.	6.5 – 9.0 all times			6.5 – 9.0 all times		
E. coli	#/100 mL	126 (geometric mean)	-	406 (instantaneous maximum)	126 (geometric mean)	200 cfu/100 mL FC[1]	406 (instantaneous maximum)
Total Phosphorus (final)	mg/L	1.0	1.5	-	1.0	1.5	-
	lb/day	9.9	14.9	-	-	-	-
Total Recoverable Copper	µg/L	19.2	-	35.1	Report	-	-
	lb/day	0.64	-	1.17	Report	-	-
Temperature	°C	Report	-	Report	Report	-	-
Alkalinity	mg/L as $CaCO_3$	Report	-	Report	Report	-	-
Cadmium, Total Recoverable	µg/L	Report	-	Report	Report	-	-
Dissolved Oxygen	mg/L	Report	-	Report	-	-	-
Hardness	mg/L as $CaCO_3$	Report	-	Report	-	-	-

Total Mercury	µg/L	Report	-	Report	Report	-	-
Nitrate + Nitrite	mg/L	Report	-	Report	-	-	-
Oil & Grease	mg/L	Report	-	Report	-	-	-
Total Ammonia	mg/L	Report	-	-	Report	-	-
Total Dissolved Solids	mg/L	Report	-	Report	-	-	-
Total Kjeldahl Nitrogen	mg/L	Report	Report	-	Report	Report	-
Total Recoverable Zinc	µg/L	Report	-	Report	Report	-	-
1. FC = Fecal coliform in the current permit set as an average weekly limit as a geometric mean.							

In sum, the effluent limitations and associated conditions contained in the Ketchum permit are set at levels that ensure compliance with the narrative and numeric 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 beneficial uses in the Big Wood River.