Fact Sheet

The U.S. Environmental Protection Agency (EPA)
Proposes to Reissue a National Pollutant Discharge Elimination System (NPDES) Permit to Discharge Pollutants Pursuant to the Provisions of the Clean Water Act (CWA) to:

City of Winchester Wastewater Treatment Plant

Public Comment Start Date: August 9, 2012
Public Comment Expiration Date: September 10, 2012

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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

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

After the Public Notice expires, and all comments have been considered, the EPA's regional Director for the Office of Water and Watersheds will make a final decision regarding permit issuance. If no substantive comments are received, the tentative conditions in the draft permit will become final, and the permit will become effective upon issuance. If substantive comments

are received, the EPA will address the comments and issue the permit. The permit will become effective no less than 30 days after the issuance date, unless an appeal is submitted to the Environmental Appeals Board within 30 days pursuant to 40 CFR 124.19.

Documents are Available for Review

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

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

Prairie River Library District
103 North Main
Lapwai, ID 83540
(208) 843-7254

Acronyms

1Q10	1 day, 10 year low flow
7Q10	7 day, 10 year low flow
30B3	Biologically-based design flow intended to ensure an excursion frequency of less than once every three years, for a 30-day average flow.
30Q10	30 day, 10 year low flow
ACR	Acute-to-Chronic Ratio
AML	Average Monthly Limit
ASR	Alternative State Requirement
AWL	Average Weekly Limit
BA	Biological Assessment
BAT	Best Available Technology economically achievable
BCT	Best Conventional pollutant control Technology
BE	Biological Evaluation
BO or BiOp	Biological Opinion
BOD_5	Biochemical oxygen demand, five-day
BOD_{5u}	Biochemical oxygen demand, ultimate
BMP	Best Management Practices
BPT	Best Practicable
°C	Degrees Celsius
C BOD_5	Carbonaceous Biochemical Oxygen Demand
CFR	Code of Federal Regulations
CFS	Cubic Feet per Second
COD	Chemical Oxygen Demand
CSO	Combined Sewer Overflow
CV	Coefficient of Variation
CWA	Clean Water Act
DMR	Discharge Monitoring Report
DO	Dissolved oxygen
EA	Environmental Assessment
EFH	Essential Fish Habitat

EIS	Environmental Impact Statement
The EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FDF	Fundamentally Different Factor
FR	Federal Register
gpd	Gallons per day
HUC	Hydrologic Unit Code
IC	Inhibition Concentration
ICIS	Integrated Compliance Information System
IDEQ	Idaho Department of Environmental Quality
I/I	Infiltration and Inflow
LA	Load Allocation
lbs/day	Pounds per day
LC	Lethal Concentration
LC_{50}	Concentration at which 50% of test organisms die in a specified time period
LD_{50}	Dose at which 50% of test organisms die in a specified time period
LOEC	Lowest Observed Effect Concentration
LTA	Long Term Average
LTCP	Long Term Control Plan
mg/L	Milligrams per liter
ml	Milliliters
ML	Minimum Level
µg/L	Micrograms per liter
mgd	Million gallons per day
MDL	Maximum Daily Limit or Method Detection Limit
MF	Membrane Filtration
MPN	Most Probable Number
N	Nitrogen
NThe EPA	National Environmental Policy Act
NOAA	National Oceanic and Atmospheric Administration
NOEC	No Observable Effect Concentration

NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NSPS	New Source Performance Standards
OWW	Office of Water and Watersheds
O&M	Operations and maintenance
POTW	Publicly owned treatment works
PSES	Pretreatment Standards for Existing Sources
PSNS	Pretreatment Standards for New Sources
QAP	Quality assurance plan
RP	Reasonable Potential
RPM	Reasonable Potential Multiplier
RWC	Receiving Water Concentration
SIC	Standard Industrial Classification
SPCC	Spill Prevention and Control and Countermeasure
SS	Suspended Solids
SSO	Sanitary Sewer Overflow
s.u.	Standard Units
TKN	Total Kjeldahl Nitrogen
TMDL	Total Maximum Daily Load
TOC	Total Organic Carbon
TRC	Total Residual Chlorine
TRE	Toxicity Reduction Evaluation
TSD	Technical Support Document for Water Quality-based Toxics Control (EPA/505/2-90-001)
TSS	Total suspended solids
TU_a	Toxic Units, Acute
TU_c	Toxic Units, Chronic
USFWS	U.S. Fish and Wildlife Service
USGS	United States Geological Survey
UV	Ultraviolet
WET	Whole Effluent Toxicity
WLA	Wasteload allocation

WQBEL	Water quality-based effluent limit
Water Quality Standards	Water Quality Standards
WWTP	Wastewater treatment plant

I. Applicant

A. General Information

This fact sheet provides information on the draft National Pollutant Discharge Elimination System (NPDES) permit for the following entity:

City of Winchester Wastewater Treatment Plant
NPDES Permit # ID-002018-4

Physical Address:
570 North Shore Road
Winchester, ID 83555

Mailing Address:
Box 245
Winchester, ID 83555

Contact:
Mike Haight, Facility Operator
208-924-5358

B. Permit History

The most recent NPDES permit for the City of Winchester Wastewater Treatment Plant (WWTP) was issued on February 5, 2004, became effective on April 1st, 2004, and expired on March 31, 2009. An NPDES application for permit issuance was submitted by the permittee on August 18th, 2008. EPA determined that the application was timely and complete. Therefore, pursuant to 40 CFR 122.6, the permit has been administratively extended and remains fully effective and enforceable.

II. Facility Information

A. Treatment Plant Description

The City of Winchester (City) owns, operates, and maintains the WWTP. The secondary treatment plant discharges treated municipal wastewater to Lapwai Creek. The discharge is continuous. The facility uses activated sludge with UV disinfection, with chlorination used as a backup method during periods of high flow. The collection system has no combined sewers. The facility serves a resident population of 308. The design flow of the facility is 0.03 mgd. Details about the wastewater treatment process and a map showing the location of the treatment facility and discharge are included in Appendices A and B, respectively.

B. Background Information

The City of Winchester and the WWTP outfall are located within the boundaries of the Nez Perce Reservation. The outfall is located within Winchester Lake State Park. The City of Winchester discharged its municipal wastes via septic systems until a new wastewater facility became operational in 1972. The City constructed a new WWTP facility that came on-line in

October, 2001. Wastewater from the City of Winchester is discharged downstream from the Winchester Lake outlet.

They City is generally in compliance with its previous permit, but exceeded its permit limits for the following parameters:

- Total residual chlorine in November, 2005 and February, 2006.
- E. coli in November, 2005, February, 2006, April, 2006, and February, 2007.
- TSS in February, 2007.
- BOD in February, 2007.

The facility had been reporting total residual chlorine in its DMRs such a manner that it was not clear whether the facility had used chlorine for disinfection. EPA has been in contact with the City regarding this issue.

III. Receiving Water

The City of Winchester is located approximately 30 miles southeast of Lewiston, Idaho, and sits on the north shore of Winchester Lake. The outfall is located in a spillway, through which Winchester Lake drains into Lapwai Creek near the City of Winchester, Idaho. Lapwai Creek is a tributary to the Clearwater River. The point of discharge is within the Lower Clearwater sub-basin (HUC 17060306).

In 1910, the headwaters of Lapwai Creek were dammed to produce Winchester Lake. The lake is a man-made reservoir and was originally formed to serve as a mill pond.

The City of Winchester, including the point of discharge, is entirely within the exterior boundaries of the Nez Perce Reservation.

A. Low Flow Conditions

The low flow conditions of a water body are used to assess the need for and develop water quality based effluent limits. As required in the previous permit, the City of Winchester WWTP conducted quarterly monitoring in the Lapwai Creek spillway above the influence of the facility's discharge. The facility conducted surface water monitoring on a quarterly basis from March 29, 2006 to June 9, 2008. There is no monitoring data for four of the monitored quarters because there was no flow across the spillway. Therefore, the low flow is zero.

B. Water Quality Standards

Overview

Section 301(b)(1)(C) of the Clean Water Act (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 that each water body is expected to achieve, such as drinking water supply, contact recreation, and aquatic life. The numeric

and 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.

The facility discharges to Lapwai Creek within the exterior boundaries of the Nez Perce Reservation as established by the 1863 Treaty with the Nez Perce. The outfall is also within the boundaries of Winchester Lake State Park. Winchester Lake State Park is held in fee ownership by the State of Idaho. The discharge is about 30 miles upstream of the State of Idaho boundary. The Nez Perce Tribe does not have treatment in the same manner as a state (TAS) under the CWA water quality standards and certification programs set forth in 40 CFR 131.8 and 131.4(c). The Nez Perce Tribe has developed draft water quality standards. These water quality standards have not been finalized by the Tribe or submitted to EPA for approval. In the absence of EPA-approved tribal water quality standards, EPA evaluated the facility's discharge consistent with the State of Idaho's water quality standards to ensure that the effluent limits will meet the downstream State's water quality standards in both the Tribal and State waters.

Designated Beneficial Uses

This facility discharges to Lapwai Creek in the Clearwater subbasin (USGS HUC17060306). Lapwai Creek (from Winchester Lake to Sweetwater Creek) is protected for the following designated uses (IDAPA 58.01.02.120.08):

- cold water aquatic life
- primary contact recreation

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

Surface Water Quality Criteria

The criteria are found in the following sections of the Idaho Water Quality Standards:

- The narrative criteria applicable to all surface waters of the State are found at IDAPA 58.01.02.200 (General Surface Water Quality Criteria).

- The numeric criteria for toxic substances for the protection of aquatic life and primary contact recreation are found at IDAPA 58.01.02.210 (Numeric Criteria for Toxic Substances for Waters Designated for Aquatic Life, Recreation, or Domestic Water Supply Use).

- Additional numeric criteria necessary for the protection of aquatic life can be found at IDAPA 58.01.02.250 (Surface Water Quality Criteria for Aquatic Life Use Designations).

- Numeric criteria necessary for the protection of recreation uses can be found at IDAPA 58.01.02.251 (Surface Water Quality Criteria for Recreation Use Designations).

- Water quality criteria for agricultural water supply can be found in the EPA's *Water Quality Criteria 1972*, also referred to as the "Blue Book" (EPA R3-73-033) (See IDAPA 58.01.02.252.02)

The numeric and narrative water quality criteria applicable to Lapwai Creek at the point of discharge are provided in Appendix B of this fact sheet.

Antidegradation

EPA is required by Section 301(b)(1)(C) of the Clean Water Act 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 those of downstream States that are affected by the discharge, and including antidegradation requirements. Since EPA evaluated the discharge consistent with Idaho's water quality standards, EPA used IDEQ's antidegradation implementation methods as guidance to determine whether the permit meets Idaho's antidegradation policy. See Appendix F.

C. Water Quality Limited Waters

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

Section 303(d) of the Clean Water Act (CWA) requires states to develop a Total Maximum Daily Load (TMDL) management plan for water bodies determined to be water quality limited segments. A TMDL is a detailed analysis of the water body to determine its assimilative capacity. The assimilative capacity is the loading of a pollutant that a water body can assimilate without causing or contributing to a violation of water quality standards. Once the assimilative capacity of the water body has been determined, the TMDL will allocate that capacity among point and non-point pollutant sources, taking into account natural background levels and a margin of safety. Allocations for non-point sources are known as "load allocations" (LAs). The allocations for point sources, known as "waste load allocations" (WLAs), are implemented through effluent limitations in NPDES permits. Effluent limitations for point sources must be consistent with applicable TMDL allocations.

Lapwai Creek is not listed as water quality limited at the point of discharge (http://mapcase.deq.idaho.gov/wq2010/). According to Idaho's 2010 Integrated Report (303(d) List), the stretch of Lapwai Creek from Winchester Lake to Sweetwater Creek fully supports the cold water aquatic life beneficial use, and was not assessed for primary contact recreation as of the January, 2005 assessment date.

IV. Effluent Limitations

A. Basis for Effluent Limitations

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

technology-based effluent limits. The basis for the effluent limits proposed in the draft permit is provided in Appendix C.

B. Proposed Effluent Limitations

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

Table 1 below presents the proposed effluent limits for BOD_5, TSS, *E. coli*, chlorine, ammonia, and pH.

Table 1: Proposed Effluent Limits

Parameter	Units	Effluent Limits		
		Average Monthly Limit	Average Weekly Limit	Maximum Daily Limit
Five-Day Biochemical Oxygen Demand (BOD_5)	mg/L	30	45	
	lb/day	7.5	11.3	
Total Suspended Solids (TSS)	mg/L	30	45	
	lb/day	7.5	11.3	
E. coli	#/100 ml	126 (geometric mean)		406
Total Residual Chlorine[1]	µg/L	9.0	--	18.1
	lb/day	0.002	--	0.004
Total Ammonia (as N)	mg/L	1.3	--	3.1
	lb/day	0.3	--	0.8
pH	s.u.	Between 6.5 and 9.0 s.u. at all times		

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 permit also requires the permittee to perform effluent monitoring required by the NPDES Form 2A application, so that these data will be available when the permittee applies for a renewal of its NPDES permit.

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

B. Effluent Monitoring

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

Table 2, below, presents the proposed effluent monitoring requirements for the City of Winchester WWTP. The sampling location must be after the last treatment unit and prior to discharge to the receiving water. The samples must be representative of the volume and nature of the monitored discharge. If no discharge occurs during the reporting period, "no discharge" shall be reported on the DMR.

Monitoring Changes from the Previous Permit

This draft permit includes the same flow, BOD_5, TSS, pH, E. coli, and temperature monitoring as required in the previous permit. The five samples per month monitoring frequency for E. coli is based on Idaho's water quality criterion for E. coli (IDAPA 58.01.02.251.01.a). Weekly monitoring is required for total ammonia as N in order to determine compliance with the new effluent limits. The facility will monitor for chlorine five times per week if chlorine is used in the treatment process. This permit also includes more frequent DO monitoring, and nutrient monitoring will occur twice a year throughout the permit cycle.

Table 2: Effluent Monitoring Requirements

Parameter	Units	Sample Location	Sample Frequency	Sample Type
Flow	mgd	Effluent	5/week	measured
BOD_5	mg/L	Influent & Effluent	1/month	24-hour composite
	lb/day	Influent & Effluent	1/month	calculation[1]
	% Removal	--	--	calculation[2]
TSS	mg/L	Influent & Effluent	1/month	24-hour composite
	lb/day	Influent & Effluent	1/month	calculation[1]
	% Removal	--	--	calculation[2]
pH	standard units	Effluent	1/week	grab
E. Coli Bacteria	#/100 ml	Effluent	5/month	grab
Total Residual Chlorine (if chlorine is used in the treatment process)	µg/L	Effluent	5/week	grab
	lb/day	Effluent		calculation[1]
Total Ammonia as N	mg/L	Effluent	1/week	grab
Oil and Grease	Visual	Effluent	1/month	visual
Floating Solids or Visible Foam	Visual	Effluent	1/month	visual

Table 2: Effluent Monitoring Requirements				
Parameter	**Units**	**Sample Location**	**Sample Frequency**	**Sample Type**
Temperature	ºC	Effluent	1/month	grab
Total Phosphorus as P	mg/L	Effluent	2/year	grab
Nitrate plus Nitrite as N	mg/L	Effluent	2/year	grab
Total Kjeldahl Nitrogen	mg/L	Effluent	2/year	grab
Dissolved Oxygen	mg/L	Effluent	1/week	grab

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. Monitoring and Reporting

The draft permit includes new provisions to allow the permittee the option to submit DMR data electronically using NetDMR. NetDMR is a national web-based tool that allows DMR data to be submitted electronically via a secure Internet application. NetDMR allows participants to discontinue mailing in paper forms under 40 CFR § 122.41 and § 403.12. The permittee may use NetDMR after requesting and receiving permission from the EPA Region 10.

Under NetDMR, all reports required under the permit are submitted to the EPA as an electronic attachment to the DMR. Once a permittee begins submitting reports using NetDMR, it is no longer required to submit paper copies of DMRs or other reports to the EPA and insert State/Tribe.

The EPA encourages permittees to sign up for NetDMR, and currently conducts free training on the use of NetDMR. Further information about NetDMR, including upcoming trainings and contacts, is provided on the following website: http://www.EPA.gov/netdmr.

VI. Sludge (Biosolids) Requirements

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

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

VII. Other Permit Conditions

A. Quality Assurance Plan

The federal regulation at 40 CFR 122.41(e) requires the permittee to update procedures to ensure that the monitoring data submitted is accurate and to explain data anomalies if they

occur. The City of Winchester is required to update the Quality Assurance Plan for the City of Winchester WWTP within **90** days of the effective date of the final permit. The Quality Assurance Plan must include standard operating procedures the permittee will follow for collecting, handling, storing and shipping samples, laboratory analysis, and data reporting. The plan must be retained on site and be made available to the EPA and the Nez Perce Tribe upon request.

B. Operation and Maintenance Plan

The permit requires for the City of Winchester 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 update and implement an operation and maintenance plan for their facility within **90** days of the effective date of the final permit. The plan must be retained on site and made available to the EPA and the Nez Perce Tribe 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 the 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, tribal and/or state level, a plan that describes how, under various overflow (and unanticipated bypass and upset) scenarios, the public, as well as other entities, would be notified of overflows that may endanger health. The plan should identify all overflows that would be reported and to whom, and the specific information that would be reported. The plan should

include a description of lines of communication and the identities of responsible officials. (See 40 CFR 122.41(l)(6)).

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

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

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

D. Design Criteria

The permit includes design criteria requirements. This provision requires the permittee to compare influent flow and loading to the facility's design flow and loading and prepare a facility plan for maintaining compliance with NPDES permit effluent limits when the annual average flow or loading exceeds 85% of the design criteria values for three consecutive months.

E. Electronic Submission of Discharge Monitoring Reports

The draft permit includes provisions to allow the permittee the option to submit DMR data electronically using NetDMR. NetDMR is a national web-based tool that allows DMR data to be submitted electronically via a secure Internet application. NetDMR allows participants to discontinue mailing in paper forms under 40 CFR § 122.41 and § 403.12. The permittee may use NetDMR after requesting and receiving permission from the EPA Region 10.

Under NetDMR, all reports required under the permit are submitted to the EPA as an electronic attachment to the DMR. Once a permittee begins submitting reports using NetDMR, it is no longer required to submit paper copies of DMRs or other reports to the EPA and the Nez Perce Tribe.

The EPA encourages permittees to sign up for NetDMR, and currently conducts free training on the use of NetDMR. Further information about NetDMR, including upcoming trainings and contacts, is provided on the following website: http://www.EPA.gov/netdmr.

F. 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. A review of the threatened and endangered species located in Idaho finds that the reissuance of the City of Winchester WWTP's NPDES permit will have no effect on listed species or their habitat (see Appendix E).

B. Essential Fish Habitat

Essential fish habitat (EFH) is the waters and substrate (sediments, etc.) necessary for fish to spawn, breed, feed, or grow to maturity. The Magnuson-Stevens Fishery Conservation and Management Act (January 21, 1999) requires the EPA to consult with NOAA Fisheries when a proposed discharge has the potential to adversely affect EFH (i.e., reduce quality and/or quantity of EFH). A review of the Essential Fish Habitat documents shows that the reissuance of the City of Winchester WWTP's NPDES permit will have no effect on Essential Fish Habitat.

The EFH regulations define an adverse effect as any impact which reduces quality and/or quantity of EFH and may include direct (e.g. contamination or physical disruption), indirect (e.g. loss of prey, reduction in species' fecundity), site specific, or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions. The EPA has prepared an EFH assessment which appears in (see Appendix E).

The EPA has determined that issuance of this permit will have no effect on EFH in the vicinity of the discharge. The EPA has provided NOAA Fisheries with copies of the draft permit and fact sheet during the public notice period. Any comments received from NOAA Fisheries regarding EFH will be considered prior to reissuance of this permit.

C. State Certification

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

D. Permit Expiration

The permit will expire five years from the effective date.

IX. References

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

Water Pollution Control Federation. Subcommittee on Chlorination of Wastewater. *Chlorination of Wastewater.* Water Pollution Control Federation. Washington, D.C. 1976.

EPA. 2010. *NPDES Permit Writers' Manual.* Environmental Protection Agency, Office of Wastewater Management, EPA-833-K-10-001.

Appendix A: Facility Information and Maps

General Information

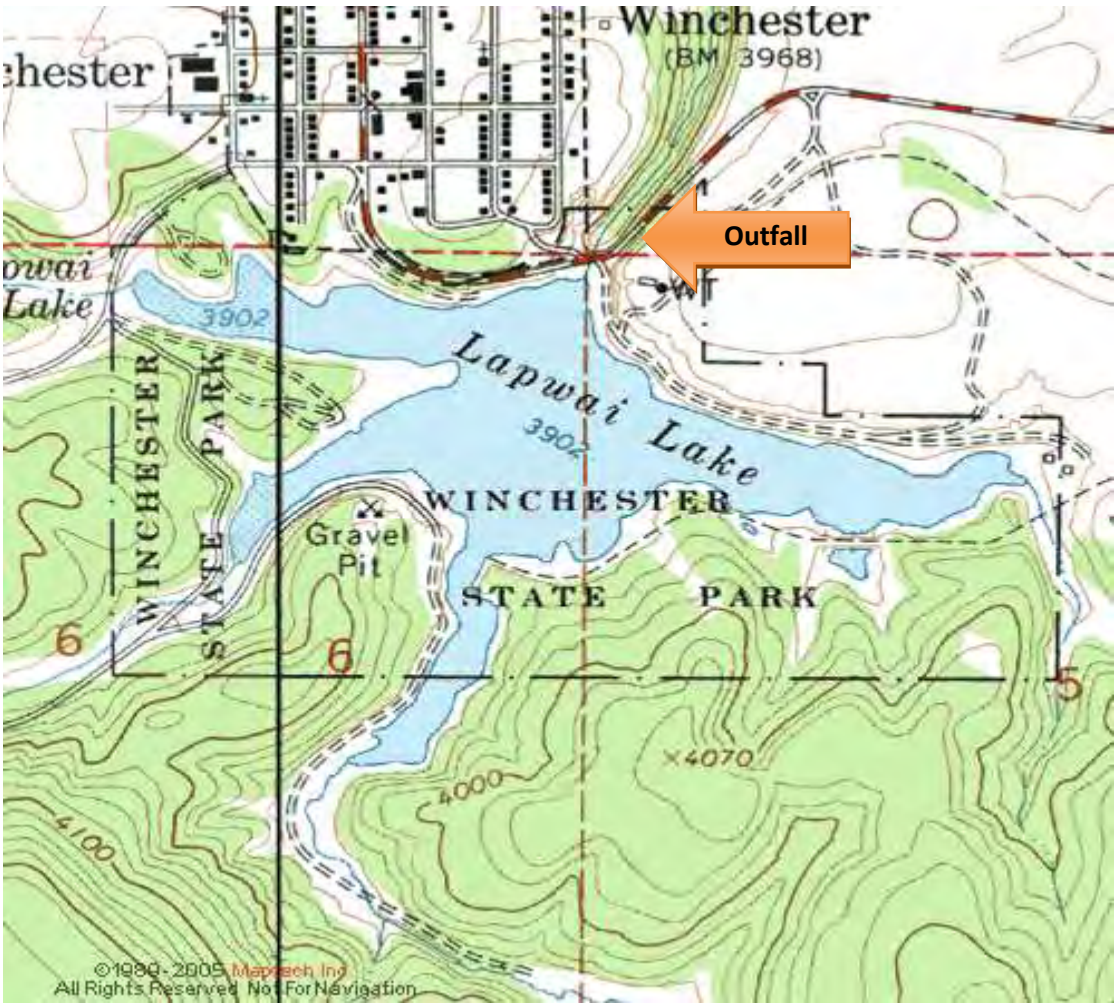
NPDES ID Number:	ID-002018-4
Physical Location:	570 North Shore Road Winchester, ID 83555
Mailing Address:	City of Winchester WWTP Box 245 Winchester, ID 83555
Contact:	Mike Haight, Facility Operator 208-924-5358
Facility Background:	The facility's existing permit became effective April 1, 2004.

Facility Information

Type of Facility:	Publicly Owned Treatment Works (POTW)
Treatment Train:	Activated sludge and UV disinfection. Chlorination used as needed, generally as a backup during periods of high flow.
Flow:	Design flow is 0.03 mgd.
Outfall Location:	Latitude: 46º 14' 17" N; Longitude: 116º 37' 09 " W

Receiving Water Information

Receiving Water:	Lapwai Creek spillway
Watershed:	Lower Clearwater sub-basin (HUC 17060306)
Beneficial Uses:	Cold water communities, primary contact recreation


Winchester
(BM 3968)
Outfall
Lapwai Lake
3902
WINCHESTER
STATE PARK
Gravel Pit
6
5
4070
4000
4100
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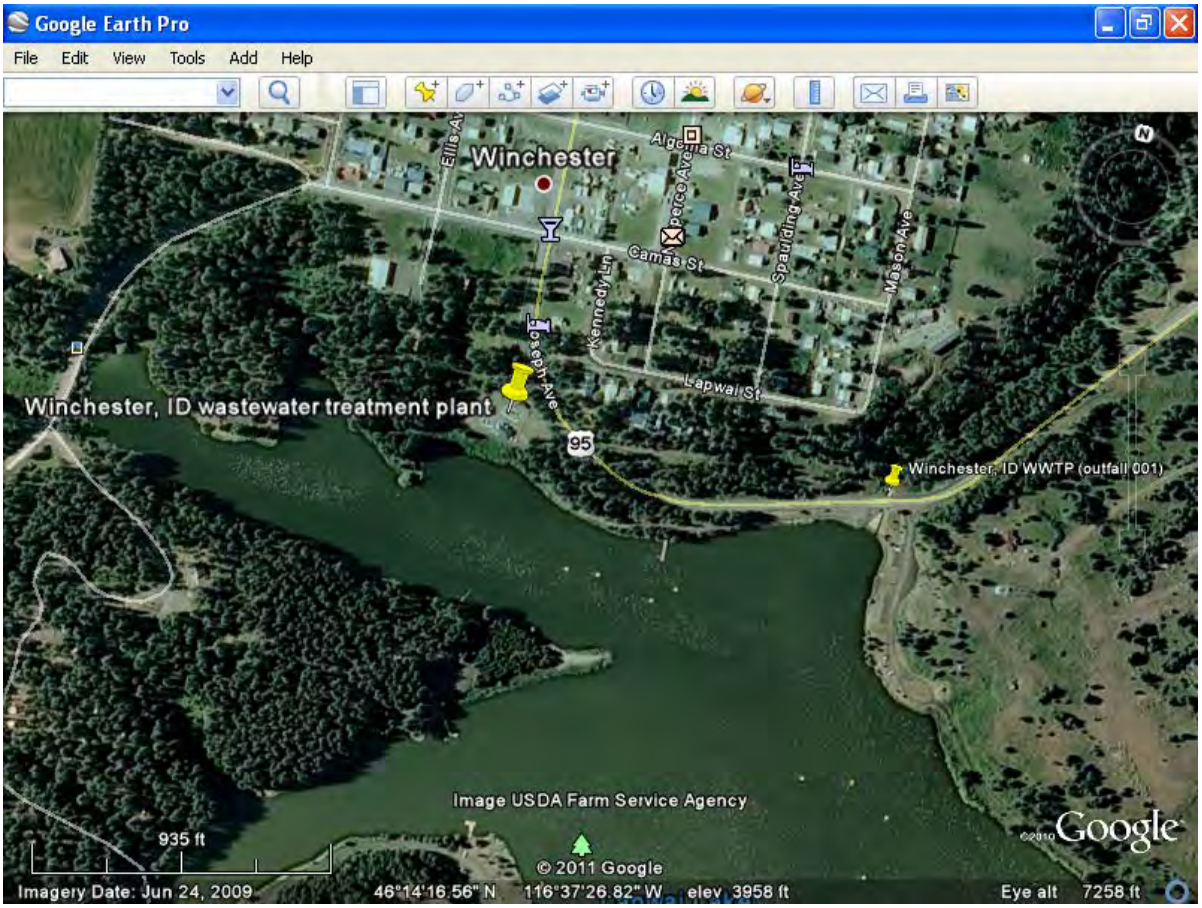
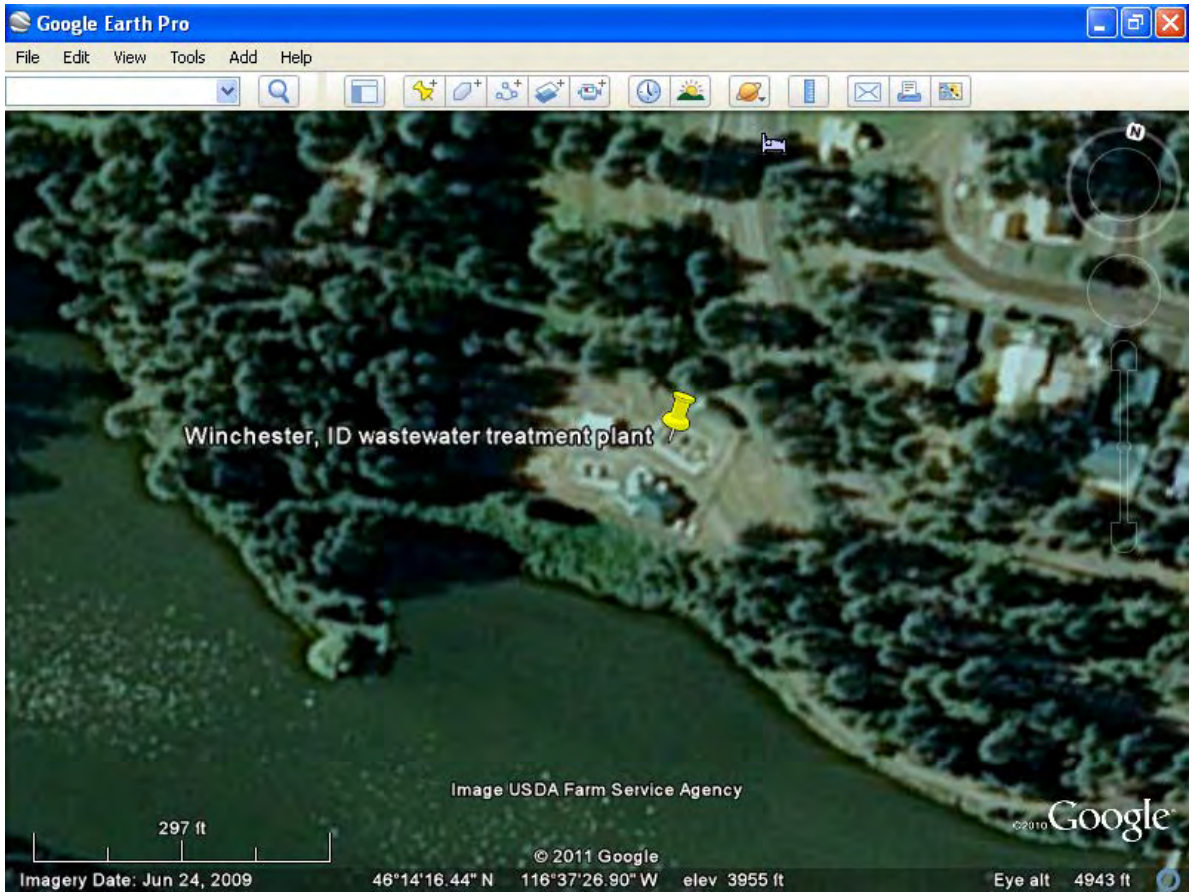


Aerial photograph of the wastewater treatment plant in Winchester, Idaho. The outfall is located approximately ¼ mile east of the plant.

Aerial photograph of the wastewater treatment plant in Winchester, Idaho.



Ph
th
UV

Photograph by EPA on May 18, 2011 looking at the spillway from Lake Winchester to Lapwai Creek.

Photograph by EPA on May 18, 2011 looking at outfall 001 for the wastewater treatment plant. Effluent flows approximately ¼ mile east from the plant to the spillway from Lake Winchester to Lapwai Creek.

Appendix B: Water Quality Criteria Summary

This appendix provides a summary of water quality criteria applicable to Lapwai Creek.

Idaho water quality standards include criteria necessary to protect designated beneficial uses. The standards are divided into three sections: General Water Quality Criteria, Surface Water Quality Criteria for Use Classifications, and Site-Specific Surface Water Quality Criteria. The EPA has determined that the criteria listed below are applicable to Lapwai Creek. This determination was based on (1) the applicable beneficial uses of the river (i.e., cold water aquatic life and primary contact recreation), (2) the type of facility, (3) a review of the application materials submitted by the permittee, and (4) the quality of the water Lapwai Creek.

A. General Criteria (IDAPA 58.01.02.200)

Surface waters of the state shall be free from:

- hazardous materials,
- toxic substances in concentrations that impair designated beneficial uses,
- deleterious materials,
- radioactive materials,
- floating, suspended, or submerged matter of any kind in concentrations causing nuisance or objectionable conditions or that may impair designated beneficial uses,
- excess nutrients that can cause visible slime growths or other nuisance aquatic growths impairing designated beneficial uses,
- oxygen demanding materials in concentrations that would result in an anaerobic water condition

Surface water level shall not exceed allowable level for:

- radioactive materials, or
- sediments

B. Numeric Criteria for Toxics (IDAPA 58.01.02.210)

This section of the Idaho Water Quality Standards provides the numeric criteria for toxic substances for waters designated for aquatic life, recreation, or domestic water supply use. Monitoring of the effluent has shown that the following toxic pollutants have been present at detectable levels in the effluent:

- Ammonia
- Chlorine (Total Residual)

C. Surface Water Criteria To Protect Aquatic Life Uses (IDAPA 58.01.02.250)

1. pH: Within the range of 6.5 to 9.0
2. Total Dissolved Gas: <110% saturation at atm. pressure.

3. Dissolved Oxygen: Exceed 6 mg/L at all times.

4. Temperature: Water temperatures of 22°C or less with a maximum daily average of no greater than 19°C.

5. Ammonia:

Ammonia criteria are based on a formula which relies on the pH and temperature of the receiving water, because the fraction of ammonia present as the toxic, un-ionized form increases with increasing pH and temperature. Therefore, the criteria become more stringent as pH and temperature increase. The table below details the equations used to determine water quality criteria for ammonia.

The City of Winchester WWTP has collected pH data in the Lapwai Creek spillway upstream of the facility on a quarterly basis from spring of 2006 to summer of 2008. Temperature data was collected upstream of the facility from during the same period of time. These data were used to determine the appropriate pH and temperature values to calculate the ammonia criteria.

As with any natural water body, the pH and temperature of the water will vary over time. Therefore, to protect water quality criteria it is important to develop the criteria based on pH and temperature values that will be protective of aquatic life at all times. The EPA used the 95% percentile of the pH and temperature data for the calculations, which equals a pH of 8.3 and temperature of 15.2 °C.

Table B-1: 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:	3.15 mg N/L	1.46 mg N/L

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).

6. Turbidity: Turbidity below any applicable mixing zone set by the Department shall not exceed background turbidity by more than 50 NTU instantaneously or more than 25 NTU for more than ten (10) consecutive days.

7. Salmon spawning: Waters designated for salmon spawning are not to vary from the following characteristics due to human activities:

Water temperatures of 13°C or less with a maximum daily average no greater than 9°C.

D. Surface Water Quality Criteria For Recreational Use Designation (IDAPA 58.01.02.251)

a. Geometric Mean Criterion. Waters designated for primary or secondary contact recreation are not to contain *E. coli* in concentrations exceeding a geometric mean of 126 *E. coli* organisms per 100 ml based on a minimum of 5 samples taken every 3 to 7 days over a 30 day period.

b. Use of Single Sample Values: A water sample exceeding the *E. coli* single sample maximums below indicates likely exceedance of the geometric mean criterion but is not alone a violation of water quality standards.

If a single sample exceeds the maximum of 406 *E. coli* organisms per 100 ml at any time for waters designated as primary contact recreation, there are additional sampling requirements.

Appendix C: Basis for Effluent Limits

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

A. Technology-Based Effluent Limits

Federal Secondary Treatment Effluent Limits

The CWA requires POTWs to meet performance-based requirements based on available wastewater treatment technology. Section 301 of the CWA established a required performance level, referred to as "secondary treatment," which all POTWs were required to meet by July 1, 1977. The EPA has developed and promulgated "secondary treatment" effluent limitations, which are found in 40 CFR 133.102. These technology-based effluent limits apply to 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-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.

Mass-Based Limits

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 calculated as follows:

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

Since the design flow for this facility is 0.03 mgd, the technology based mass limits for BOD_5 and TSS are calculated as follows:

Average Monthly Limit = 30 mg/L × 0.03 mgd × 8.34 = 7.51 lbs/day

Average Weekly Limit = 45 mg/L × 0.03 mgd × 8.34 = 11.26 lbs/day

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

Chlorine

Chlorine is often used to disinfect municipal wastewater prior to discharge. The City of Winchester WWTP uses chlorine disinfection as a backup method (it normally uses UV disinfection).

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

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

Monthly average Limit= 0.5 mg/L x 0.03 mgd x 8.34 = 0.1251 lbs/day

Weekly average Limit = 0.75 mg/L x 0.03 mgd x 8.34 = 0.1877 lbs/day

The EPA has determined that the technology-based effluent limit for chlorine is not sufficiently stringent to meet water quality standards. Refer to discussion on water quality-based effluent limits below.

B. Water Quality-based Effluent Limits

Statutory and Regulatory Basis

Section 301(b)(1)(C) of the CWA requires the development of limitations in permits necessary to meet water quality standards. 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 the pollutant parameters in the effluent 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/Tribal water quality criterion, the EPA projects the receiving water concentration (downstream of where the effluent enters the receiving water) for each pollutant of concern. The EPA uses the concentration of the pollutant in the effluent and receiving water and, if appropriate, the dilution available from the receiving water, to project the receiving water concentration. If the projected concentration of the pollutant in the receiving water exceeds the numeric criterion for that specific pollutant, then the discharge has the reasonable potential to cause or contribute to an excursion above the applicable water quality standard, and a water quality-based effluent limit is required.

Sometimes it may be appropriate to allow a small area of the receiving water to provide dilution of the effluent. These areas are called mixing zones. Mixing zone allowances will 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 the concentration of the pollutant in the receiving water is less than the criterion necessary to protect the designated uses of the water body.

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. Wasteload allocations are determined in one of the following ways:

1. TMDL-Based Wasteload Allocation

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

   To ensure that these waters will come into compliance with water quality standards Section 303(d) of the CWA requires States to develop TMDLs for those water bodies that will not meet water quality standards even after the imposition of technology-based effluent limitations. The first step in establishing a TMDL is to determine the assimilative capacity (the loading of pollutant that a water body can assimilate without exceeding water quality standards). The next step is to divide the assimilative capacity into allocations for non-point sources (load allocations), point sources (wasteload allocations), natural background loadings, and a margin of safety to account for any uncertainties. Permit limitations are then developed for point sources that are consistent with the wasteload allocation for the point source.

   Reference any TMDLs with WLAs here

2. Mixing zone based WLA

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

3. Criterion as the Wasteload Allocation

In some cases a mixing zone cannot be authorized, either because the receiving water is already at, or exceeds, the criterion, the receiving water flow is too low to provide dilution, or the facility can achieve the effluent limit without a mixing zone. In such cases, the criterion becomes the wasteload allocation. Establishing the criterion as the wasteload allocation ensures that the effluent discharge will not contribute to an exceedance of the criteria. The WLA for the City of Winchester WWTP was derived using this method because receiving water flow is too low to provide dilution.

Once the wasteload allocation has been developed, the EPA applies the statistical permit limit derivation approach described in Chapter 5 of the *Technical Support Document for Water Quality-Based Toxics Control* (EPA/505/2-90-001, March 1991, hereafter referred to as the TSD) to obtain monthly average, and weekly average or daily maximum permit limits. This approach takes into account effluent variability, sampling frequency, and water quality standards.

Summary - Water Quality-based Effluent Limits

The water quality based effluent limits in the draft permit are summarized below.

Ammonia and Chlorine

A reasonable potential calculation showed that the City of Winchester WWTP discharge would have the reasonable potential to cause or contribute to a violation of the water quality criteria for ammonia and chlorine. Therefore, the draft permit contains water quality-based effluent limits for ammonia and chlorine. See Appendices C and D for reasonable potential and effluent limit calculations for ammonia and chlorine.

pH

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

E. coli

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

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

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

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

Residues

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

C. Anti-backsliding Provisions

Section 402(o) of the Clean Water Act and federal regulations at 40 CFR §122.44 (l) generally prohibit the renewal, reissuance or modification of an existing NPDES permit that contains effluent limits, permit conditions or standards that are less stringent than those established in the previous permit (i.e., anti-backsliding) but provides limited exceptions. All permit limits and conditions are as stringent or more stringent than the previous permit, therefore no further analysis is needed.

D. Facility Specific Limits

Table B-5 summarizes the numeric effluent limits that are in the proposed permit. The final limits are the more stringent of technology treatment requirements, water quality based limits or limits retained as the result of anti-backsliding analysis or to meet the State's anti-degradation policy.

Table 1: Basis Proposed Effluent Limits

Parameter	Units	Effluent Limits			Basis
		Average Monthly Limit	Average Weekly Limit	Maximum Daily Limit	
Five-Day Biochemical Oxygen Demand (BOD_5)	mg/L	30	45		Technology-based
	lb/day	7.5	11.3		
Total Suspended Solids (TSS)	mg/L	30	45		Technology-based

Table 1: Basis Proposed Effluent Limits					
Parameter	**Units**	**Effluent Limits**			**Basis**
		Average Monthly Limit	**Average Weekly Limit**	**Maximum Daily Limit**	
	lb/day	7.5	11.3		
E. coli	#/100 ml	126 (geometric mean)		406	Water quality-based effluent limit
Total Residual Chlorine[1]	µg/L	9.0	--	18.1	Water quality-based effluent limit
	lb/day	0.002	--	0.004	
Total Ammonia (as N)	mg/L	1.3	--	3.1	Water quality-based effluent limit
	lb/day	0.3	--	0.8	
pH	s.u.	Between 6.5 and 9.0 s.u. at all times			Water quality-based effluent limit

Appendix D: Reasonable Potential and Water Quality-Based Effluent Limit Calculations

Part A of this appendix explains the process the 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. Part B demonstrates how the water quality-based effluent limits (WQBELs) in the draft permit were calculated.

A. Reasonable Potential Analysis

The EPA uses the process described in the *Technical Support Document for Water Quality-based Toxics Control* (EPA, 1991) to determine reasonable potential. To determine if there is reasonable potential for the discharge to cause or contribute to an exceedance of water quality criteria for a given pollutant, the EPA compares the maximum projected receiving water concentration to the water quality criteria for that pollutant. If the projected receiving water concentration exceeds the criteria, there is reasonable potential, and a water quality-based effluent limit must be included in the permit. This following section discusses how the maximum projected receiving water concentration is determined

Mass Balance

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

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

where,

- C_d = Receiving water concentration downstream of the effluent discharge (that is, the concentration at the edge of the mixing zone)
- C_e = Maximum projected effluent concentration
- C_u = 95th percentile measured receiving water upstream concentration
- Q_d = Receiving water flow rate downstream of the effluent discharge = Q_e+Q_u
- Q_e = Effluent flow rate (set equal to the design flow of the WWTP)
- Q_u = Receiving water low flow rate upstream of the discharge (1Q10, 7Q10 or 30B3)

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

$$C_d = \frac{C_e \times Q_e + C_u \times Q_u}{Q_e + Q_u} \qquad \text{Equation 2}$$

The above form of the equation is based on the assumption that the discharge is rapidly and completely mixed with 100% of the receiving stream.

If the mixing zone is based on less than complete mixing with the receiving water, the equation becomes:

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

Where:

% MZ = the percentage of the receiving water flow available for mixing.

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

$$C_d = C_e \qquad \text{Equation 4}$$

A dilution factor (D) can be introduced to describe the allowable mixing. Where the dilution factor is expressed as:

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

After the dilution factor simplification, the mass balance equation becomes:

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

If the criterion is expressed as dissolved metal, the effluent concentrations are measured in total recoverable metal and must be converted to dissolved metal as follows:

$$C_d = \frac{CF \times C_e - C_u}{D} + C_u \qquad \text{Equation 7}$$

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

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

Maximum Projected Effluent Concentration

When determining the projected receiving water concentration downstream of the effluent discharge, the EPA's Technical Support Document for Water Quality-based Toxics Controls (TSD, 1991) recommends using the maximum projected effluent concentration (Ce) in the mass balance calculation (see equation 3, page C-5). To determine the maximum projected effluent concentration (Ce) the EPA has developed a statistical approach to better characterize the effects of effluent variability. The approach combines knowledge of effluent variability as estimated by a coefficient of variation (CV) with the uncertainty due to a limited number of data to project an estimated maximum concentration for the effluent. Once the CV for each pollutant parameter has been calculated, the reasonable potential multiplier (RPM) used to derive the maximum projected effluent concentration (Ce) can be calculated using the following equations:

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

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

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

and

$$RPM = \frac{C_{99}}{C_{P_n}} = \frac{e^{Z_{99} \times \sigma - 0.5 \times \sigma^2}}{e^{(Z_{P_n} \times \sigma - 0.5 \times \sigma^2}}$$ Equation 9

Where,

σ^2 = $\ln(CV^2 + 1)$
Z_{99} = 2.36 (z-score for the 99th percentile)
Z_{Pn} = z-score for the P_n percentile (inverse of the normal cumulative distribution function at a given percentile)
CV = coefficient of variation (standard deviation ÷ mean)

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

$C_e = (RPM)(MRC)$ Equation 10

where MRC = Maximum Reported Concentration

Reasonable Potential

The discharge has reasonable potential to cause or contribute to an exceedance of water quality criteria if the maximum projected concentration of the pollutant at the edge of the mixing zone exceeds the most stringent criterion for that pollutant.

Results of Reasonable Potential Calculations

EPA determined that both chlorine and ammonia have reasonable potential to cause or contribute to an exceedance of water quality criteria. The results of the calculations are presented in Table E-1 of this appendix.

B. WQBEL Calculations

The following calculations demonstrate how the water quality-based effluent limits (WQBELs) in the draft permit were calculated. WQBELs are intended to protect aquatic life criteria. The following discussion presents the general equations used to calculate the water quality-based effluent limits. The calculations for all WQBELs based on aquatic life criteria are summarized in Table F-1.

Calculate the Wasteload Allocations (WLAs)

Wasteload allocations (WLAs) are calculated using the same mass balance equations used to calculate the concentration of the pollutant in the reasonable potential analysis (Equations 1 and 2). To calculate the wasteload allocations, C_d is set equal to the acute or chronic criterion and the equation is solved for C_e. The calculated C_e is the acute or chronic WLA. Equation 6 is rearranged to solve for the WLA, becoming:

$$C_e = WLA = D \times (C_d - C_u) + C_u \qquad \text{Equation 11}$$

Idaho's water quality criteria for some metals are expressed as the dissolved fraction, but the Federal regulation at 40 CFR 122.45(c) requires that effluent limits be expressed as total recoverable metal. Therefore, the EPA must calculate a wasteload allocation in total recoverable metal that will be protective of the dissolved criterion. This is accomplished by dividing the WLA expressed as dissolved by the criteria translator, as shown in equation __. As discussed in Appendix ___, the criteria translator (CT) is equal to the conversion factor, because site-specific translators are not available for this discharge.

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

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

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

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

where,

σ^2 = $\ln(CV^2 + 1)$
Z_{99} = 2.326 (z-score for the 99th percentile probability basis)
CV = coefficient of variation (standard deviation ÷ mean)
σ_4^2 = $\ln(CV^2/4 + 1)$

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

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

where,

σ_{30}^2 = $\ln(CV^2/30 + 1)$

The LTAs are compared and the more stringent is used to develop the daily maximum and monthly average permit limits as shown below.

Derive the maximum daily and average monthly effluent limits

Using the TSD equations, the MDL and AML effluent limits are calculated as follows:

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

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

where σ, and σ² are defined as they are for the LTA equations above, and,

σ_n^2 = $\ln(CV^2/n + 1$

z_a = 1.645 (z-score for the 95th percentile probability basis)

z_m = 2.326 (z-score for the 99th percentile probability basis)

N = number of sampling events required per month. With the exception of ammonia, if the AML is based on the LTA_c, i.e., $LTA_{minimum} = LTA_c$), the value of ''n'' should is set at a minimum of 4. For ammonia, In the case of ammonia, if the AML is based on the LTA_c, i.e., $LTA_{minimum} = LTA_c$), the value of ''n'' should is set at a minimum of 30.

Table F-1, below, details the calculations for water quality-based effluent limits.

Reasonable Potential Calculation

Facility:	City of Winchester WWTP
Water Body Type	Freshwater

Basis (IDAPA 58.01.02 03. b)

Water Designation	Annual	Low Flow	High Flow	
Aquatic Life - Acute Criteria - Criterion Max. Concentration (CMC)	1.0	1.0	1.0	1Q10
Aquatic Life - Chronic Criteria - Criterion Continuous Concentration (CCC)	1.0	1.0	1.0	7Q10 or 4B3
Ammonia	1.0	1.0	1.0	30B3 or 30Q10
Human Health - Non-Carcinogen	1.0	1.0	1.0	30Q5
Humn Health - carcinogen	1.0	1.0	1.0	Harmonic

	Annual	Low Flow	High Flow	Notes:
Receiving Water Hardness = 100 mg/L				
Receiving Water Temp, °C	15.2			95th percentile
Receiving Water pH	8.3			95th percentile

Pollutant			AMMONIA, Criteria as Total NH3	AMMONIA, Criteria as Total NH4	AMMONIA, Criteria as Total NH5	CHLORINE (Total Residual)
Effluent Data	# of Samples (n)		12			52
	Coeff of Variation (Cv)		0.895408			0.6
	Effluent Concentration, µg/L (Max. or 95th		990			900
	Calculated 50th percentile Effluent Conc.					
Mizing Zone Used	Aquatic Life - Acute		1.0			1.0
	Aquatic Life - Chronic					1.0
	Ammonia		1.0			1.0
	Human Health - Non-Carcinogen					1.0
	Human Health - carcinogen					1.0
Receiving Water Data	90th Percentile Conc., µg/L		602.0			
	Geo Mean, µg/L					
Water Quality Criteria	Aquatic Life Criteria, µg/L	Acute	3,149			19
		Chronic	1,458			11
	Human Health Water and Organism, µg/L		-	-	-	-
	Human Health, Organism Only, µg/L		-	-	-	-
	Metal Criteria Translator, decimal	Acute	-	-	-	-
		Chronic	-	-	-	-
	Carcinogen?		N			N

Aquatic Life

σ	σ2=ln(CV^2+1)	σ	0.767			0.555
Pn	=(1-confidence level)$^{1/n}$	99%	0.681			0.915
Multiplier	=exp(2.3262σ-0.5σ^2)/exp(invnorm(P_N)σ-	99%	4.15			1.7
Max. conc.(ug/L) at edge		Acute	4,109			1526.0
		Chronic	4,109			1526.0
Reasonable Potential?			YES			YES

Aquatic Life Limit

n = # samples assumed			4			4
# of Compliance Samples			4			4
LTA Coeff. Var. (CV),	default = 0.6 or calculate from data		0.895408			0.6
Permit Limit Coeff. Var.			0.895408			0.6
Waste Load Allocations,	$C_d=(C_f x MZ_a)-C_{sa} x (MZ_a-1)$	Acute	3,149.1			19.00
	$C_d=(C_f x MZ_c)-C_{sc}*(MZ_c-1)$	Chronic	1,458.5			11.00
Long Term Averages,	WLAc x exp(0.5σ^2-2.326σ)	Acute	709.5			6.10
	WLAa x exp(0.5σ^2-2.326σ); ammonia	Chronic	1,012.9			5.80
Limiting LTA, ug/L	used as basis for limits calculation		709.5			5.80
Metal Translator or 1?			1.00			1.00
Average Monthly Limit (AML), ug/L		**95%**	**1308**			**9.0**
Maximum Daily Limit (MDL), ug/L		**99%**	3150			**18.1**
Average Monthly Limit (AML), mg/L			**1.308**			0.0090
Maximum Daily Limit (MDL), mgL			**3.150**			0.0181
Average Monthly Limit (AML), lb/day			**0.327**	0	0	**0.0022534**
Maximum Daily Limit (MDL), lb/day			**0.788**	0	0	**0.0045**

Appendix E: Endangered Species Act and Essential Fish Habitat

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.

The subject discharge is located in Lewis County, Idaho. The USFWS species list for Lewis County lists the following threatened and endangered species and critical habitat:

- Bull trout (*Salvelinus confluentus*) listed threatened
- Bull trout critical habitat
- Spalding's catchfly (*Lepidium papilliferum*) listed threatened

NOAA Fisheries lists the following species and critical habitat:

- Fall Chinook salmon (*Oncorhynchus tshawytscha*) listed threatened
- Fall Chinook salmon critical habitat
- Snake River steelhead (*Oncorhynchus mykiss*) listed threatened
- Snake River steelhead critical habitat

EPA has determined that the issuance of an NPDES permit to the City of Winchester WWTP will have no effect on bull trout, Spalding's catchfly, fall Chinook salmon, or steelhead. EPA has prepared a memo to the permit's administrative file providing more detail on the no effect determination.

The U.S. Fish and Wildlife Service Draft Bull Trout Recovery Plan (USFWS 2002) identified causes of the bull trout listing. They are: operation and maintenance of dams and other diversion structures, forest management practices, livestock grazing, agriculture, agricultural diversions, road construction and maintenance, mining, and introduction of nonnative species. No sewage treatment plant is identified as a contributing factor to the decline in bull trout. Similar factors have likely caused the decline of other salmonid species such as the fall Chinook salmon and the Snake River steelhead.

In addition, there are site-specific factors supporting EPA's no effect determination. The facility is very small; it serves a population of 300 and has a design flow of 0.03 mgd. There are no industrial dischargers contributing to the WWTP. The WWTP will be required to meet water quality criteria for ammonia, chlorine, E. coli, and pH at the end-of-pipe. The facility has ultraviolet disinfection, and only uses chlorine during periods of high flow. Therefore, the facility is not expected to discharge chlorine in significant amounts. The facility's effluent will meet water quality standards, and effluent pollutant concentrations are expected to be less than levels known to cause toxicity to aquatic life, including threatened and endangered species. Therefore, threatened and endangered aquatic species will not be exposed to elevated pollutant concentrations as a result of the discharge, and the discharge will have no effect on bull trout, fall Chinook salmon, or Snake River steelhead, or critical habitat for these species. Furthermore, the discharge will not adversely affect essential fish habitat.

EPA has determined that the reissuance of an NPDES permit to the City of Winchester WWTP will have no effect on the Spalding's catchfly. The perennial plant grows on mesic grassland

prairies at low- to mid- elevations, and is not susceptible to the water quality impacts that may result from the issuance of an NPDES permit (http://www.fws.gov/oregonfwo/Species/Data/SpaldingsCatchfly/). The primary causes of the Spalding's catchfly's decline are nonnative invasive plants, habitat fragmentation, changes in the fire regime and fire effects, land conversion associated with urban and agricultural development, livestock and wildlife grazing and trampling, herbicide and insecticide spraying, off-road vehicle use, insect damage and disease, impacts from prolonged drought and climate change, and the inadequacy of existing regulatory mechanisms (USFWS 2007). Issuance of an NPDES permit to the City of Winchester WWTP will have no effect on the factors causing the decline of the Spalding's catchfly. Therefore, the issuance of this permit will have no effect on the Spalding's catchfly.

References

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U.S. Fish and Wildlife Service. 2002. Chapter 16, Clearwater River Recovery Unit, Idaho. 196 p. In: U.S. Fish and Wildlife Service. Bull Trout (Salvelinus confluentus) Draft Recovery Plan. Portland, Oregon.

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Progresssive Engineering Group, Inc. 2006. City of Lapwai, Idaho and Nez Perce Tribe Lapwai Valley Wastewater Facilities Plan. June 2004, revised June 2005 and February 2006. Lewiston, ID.

Appendix F: Antidegradation Analysis

EPA is required by Section 301(b)(1)(C) of the Clean Water Act 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 those of downstream States that are affected by the discharge, and including antidegradation requirements. Since EPA evaluated the discharge consistent with Idaho's water quality standards, EPA used IDEQ's antidegradation implementation methods as guidance to determine whether the permit meets Idaho's antidegradation policy.

Idaho WQS (IDAPA 58.01.02.051.01) provide that existing uses and the water quality necessary to protect the existing uses shall be maintained and protected (Tier 1 protection). 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 (Tier II protection).

Pollutants of Concern

The City of Winchester WWTP discharges the following pollutants of concern: Biological Oxygen Demand, Total Suspended Solids, *E. coli* Bacteria, pH, Chlorine, and Ammonia. Effluent limits have been developed for the parameters listed above.

Receiving Water Level of Protection

IDEQ has established a water body by water body approach for identifying waters that will receive Tier 2 antidegradation protection. Tier 2 determination is based on the following three factors:

- The water body's category of use support according to the most recent federally approved Integrated Report
- The beneficial uses of the receiving water body
- Whether data indicate the water body as a whole is of high quality

The City of Winchester WWTP discharges to assessment unit (USGS HUC17060306 - Lapwai Creek from Winchester Lake to Sweetwater Creek). Lapwai Creek is not listed as water quality limited at the point of discharge (http://mapcase.deq.idaho.gov/wq2010/). According to Idaho's 2010 Integrated Report (303(d) List), the stretch of Lapwai Creek from Winchester Lake to Sweetwater Creek fully supports the cold water aquatic life beneficial use, and was not assessed for primary contact recreation as of the January, 2005 assessment date. Idaho's 2010 303(d)/305(b) integrated report is the most recent federally approved integrated report. According to Section 39-3603(2)(b) of the Idaho Code, "water bodies identified in the Integrated Report as not assessed will be provided an appropriate level of protection on a case-by-case basis using information available at the time of a proposal for a new or reissued permit or license." To be conservative, EPA considered the Lapwai Creek assessment unit a high quality water related to aquatic life and recreational uses for the purposes of this antidegradation review. Therefore, EPA will provide Tier 2 protection, in addition to Tier 1, for both aquatic life and recreational beneficial use.

Tier 1 Protection

The discharge is to Lapwai Creek, downstream from Winchester Lake. Per Idaho WQS, this segment (USGS HUC17060306 including Lapwai Creek from Winchester Lake to Sweetwater Creek) has the following use designations: Cold Water Aquatic Life and Primary Contact Recreation. Lapwai Creek was also designated as a Special Resource Water prior to the recent deletion of the Special Resource Water designation. The effluent limits in the draft permit ensure compliance with IDEQ numeric and narrative water quality criteria. The numeric and narrative water quality criteria are set at levels that ensure protection of the designated uses.

As there is no information indicating the presence of existing beneficial uses other than those that are designated, the draft permit ensures a level of water quality necessary to protect the designated uses and ensures that the level of water quality necessary to protect existing uses is maintained and protected.

Tier II Protection

For a reissued permit or license, the effect on water quality is determined by looking at the difference in water quality that would result from the activity or discharge as authorized in the current permit and the water quality that would result from the activity or discharge as proposed in the reissued permit or license (IDAPA 58.01.02.052.04.a).

In order to determine whether degradation will occur, EPA evaluated the effect on water quality of the issuance of the permit for each pollutant that is relevant to aquatic life use and the recreation use. The parameters BOD, TSS, pH, chlorine, and ammonia are relevant to cold water aquatic life, and the E. coli bacteria is relevant to the primary contact recreation beneficial use.

Since the limits in this draft permit are equal to or more stringent than the previous permit, there is no degradation and a Tier 2 analysis is not triggered.