

FACT SHEET

The United States Environmental Protection Agency (EPA)
Plans To Reissue A
National Pollutant Discharge Elimination System (NPDES) Permit To:

City of Weiser Wastewater Treatment Plant
West 9th Street
Weiser, Idaho 83672

Permit Number: ID-002029-0
Public Notice start date: March 26, 2001
Public Notice expiration date: April 25, 2001

EPA Proposes NPDES Permit Reissuance.

EPA proposes to reissue an NPDES permit to the City of Weiser. The draft permit places conditions on the discharge of pollutants from the City of Weiser's wastewater treatment plant to the Snake River. 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.

This Fact Sheet includes:

- information on public comment, public hearing, and appeal procedures
- a description of the current discharge and current sewage sludge (biosolids) practices
- a listing of proposed effluent limitations, schedules of compliance, and other conditions
- a map and description of the discharge location
- technical material supporting the conditions in the permit

The State of Idaho Proposes Certification.

EPA is requesting that the Idaho Department of Environmental Quality certify the NPDES permit for the City of Weiser, under section 401 of the Clean Water Act.

Public Comment.

Persons wishing to comment on, or request a Public Hearing for, the draft permit may do so in writing by the expiration date of the Public Notice. 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.

Persons wishing to comment on State Certification should submit written comments by the Public Notice expiration date to the Idaho Division of Environmental Quality (IDEQ) at 1445 N. Orchard, Boise, Idaho 83706-2239. A copy of the comments should also be submitted to EPA.

After the Public Notice expires, and all comments have been considered, EPA's regional Director for the Office of Water, will make a final decision regarding permit reissuance. 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 comments are received, EPA will address the comments and issue the permit. The permit will become effective 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 (see address below). Draft permits, Fact Sheets, and other information can also be found by visiting the Region 10 website at "www.epa.gov/r10earth/water.htm."

United States Environmental Protection Agency
Region 10
1200 Sixth Avenue, OW-130
Seattle, Washington 98101
(206) 553-2108 or
1-800-424-4372 (within Alaska, Idaho, Oregon and Washington)

The Fact Sheet and draft permit are also available at:

EPA Idaho Operations Office
1435 North Orchard Street
Boise, Idaho 83706
(208) 378-5746

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I. APPLICANT

City of Weiser Wastewater Treatment Facility
NPDES Permit No.: ID-002029-0

Facility Mailing Address:
55 West Idaho
Weiser, Idaho 83672

Facility Address:
West 9th Street
Weiser, Idaho 83672

II. FACILITY INFORMATION

A. Treatment Plant Description

The City of Weiser owns, operates, and has maintenance responsibility for a facility that treats domestic sewage that is primarily from local residents and commercial establishments. Appleton Produce, Inc. is the only industrial discharger to the system and discharges approximately 0.046 million gallons per day (mgd) to the treatment system.

The treatment plant provides secondary treatment using a mechanical facility, which consists of primary screening, followed by biological treatment using the activated sludge process, followed by secondary clarification and chlorination. Sludge is treated by a floatation thickener followed by aerobic digestion. Final sludge is disposed of by land application.

The facility serves a population of 4,900 and currently has an annual average flow rate of 1.67 mgd. The design characteristics of the facility are as follows:

Daily Average Design Flow:	2.4 mgd
Design BOD ₅ Removal	85%
Design TSS Removal	85%

B. Background Information

The NPDES permit for the wastewater treatment plant expired on June 29, 1996. Under federal law, specifically, the Administrative Procedures Act (APA), a federally issued NPDES permit is administratively extended (i.e., continues in force and effect) provided the permittee submits a timely and complete application for a new permit prior to the expiration of the current permit. Since the City did submit a timely application for a new permit, the current permit was

administratively extended.

A review of the facility's Discharge Monitoring Reports¹ for the past five years indicates that the facility has generally been in compliance with its permit effluent limits.

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

III. RECEIVING WATER

A. Outfall location/ Receiving Water

The treated effluent from the City of Weiser's wastewater treatment facility is discharged continuously to the Snake River at river mile 351, which is within the Brownlee Reservoir Subbasin. The outfall is located at latitude 44° 14' 46" and longitude 116° 58' 57".

The Snake River USGS gaging station at Weiser, Idaho was used to calculate a 1Q10 of 6960 cfs (4496 mgd), and a 7Q10 of 7280 cfs (4793 mgd). These values were calculated using data from 1950 through 1987.

The 1Q10 flow is the one day low flow with a return period of 10 years, and the 7Q10 is the seven day average low flow with a return period of 10 years.

B. Water Quality Standards

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 (i.e., cold water biota, contact recreation, etc.) 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.

1. Idaho Water Quality Standards: The Idaho *Water Quality Standards and Wastewater Treatment Requirements* (IDAPA 16.01.02.140.19.SW-4) protects this segment of the Snake River for the following beneficial uses:

¹Discharge monitoring reports are forms used by the permittee to report the results of monitoring that is conducted to verify that they are adhering to the effluent limitations and conditions in their NPDES permit.

domestic, agricultural, and industrial water supply, cold water biota, and primary contact recreation.

The criteria that the State of Idaho has deemed necessary to protect the beneficial uses for this portion of the Snake River, and the State's anti-degradation policy are summarized in Appendix B.

2. Oregon Water Quality Standards: The federal regulation at 40 CFR 122.4 states: "No permit may be issued when the imposition of conditions cannot ensure compliance with the applicable water quality requirements of all affected states."

The mid-point of the Snake River is the boundary between the states of Idaho and Oregon. Since the Weiser facility discharges to the Snake River, it is possible that the effluent discharged from the facility may affect the water quality of Snake River in Oregon State, therefore, Oregon State water quality standards must be considered when developing effluent limits.

The *Oregon Water Quality Standards and Beneficial Uses* (Oregon Administrative Code 340-041) classify this section of the Snake River for the following beneficial uses: public and private drinking water supply, industrial water supply, irrigation, livestock watering, salmonid fish rearing (trout), salmonid fish spawning (trout), resident fish (warm water) and aquatic life, wildlife and hunting, fishing, boating, water contact recreation, and aesthetic quality.

In general, the Idaho water quality criteria will be protective of the beneficial uses established by Oregon, with the following exceptions: Oregon's standard for pH is more stringent, and its designation of salmonid spawning as a beneficial use of the river requires more stringent dissolved oxygen and temperature criteria. However, since the effluent from the Weiser facility will be significantly diluted (2246:1) before reaching the Oregon side of the Snake River, it is anticipated that the effluent will not effect the Oregon water quality standards. Therefore, only Idaho water quality standards will be considered when developing effluent limits.

C. Water Quality Limited Segment

A water quality limited segment is any waterbody, or definable portion of water body, where it is known that water quality does not meet applicable water quality standards, and/or is not expected to meet applicable water quality standards. The Snake River has been listed as a water quality limited segment. In the state of

Idaho this section of the river has been listed as water quality limited for sediment, nutrients, dissolved oxygen, and pH. In the State of Oregon this section of the Snake River has been listed as water quality limited for temperature and toxics (mercury).

Section 303(d) of the CWA requires States to develop a plan, known as a Total Maximum Daily Load (TMDL) management plan, for water bodies determined to be water quality limited. The TMDL documents the amount of a pollutant a waterbody can assimilate without violating a state's water quality standards and allocates that load to known point sources and nonpoint sources. Neither the Idaho Department of Environmental Quality (IDEQ) nor the Oregon Department of Environmental Quality (ODEQ) has established a TMDL for this portion of the river, however, the IDEQ is scheduled to complete a TMDL by December 2001, and the ODEQ is scheduled to complete a TMDL in 2005.

IV. EFFLUENT LIMITATIONS

In general, the Clean Water Act requires that the effluent limits for a particular pollutant be the more stringent of either technology-based effluent limits or water quality-based effluent limits. A technology based effluent limit requires a minimum level of treatment for municipal point sources based on currently available treatment technologies. A water quality based effluent limit is designed to ensure that the water quality standards of a waterbody are being met and they may be more stringent than technology-based effluent limits. For more information on deriving technology-based effluent limits and water quality-based effluent limits see Appendix C.

The following summarizes the proposed effluent limitations that are in the draft permit.

1. The pH range shall be between 6.5 - 9.0 standard units.
2. For any month, the monthly average effluent concentration for 5-day biochemical oxygen demand (BOD₅) and total suspended solids (TSS) shall not exceed 15 percent of the monthly average influent concentration for BOD₅ and TSS.
3. There shall be no discharge of floating solids or visible foam, or oil and grease in other than trace amounts.
4. Table 1, below, presents the proposed average monthly, average weekly, and instantaneous maximum effluent limits for BOD₅, TSS, escherichia coli (E. coli) bacteria, fecal coliform bacteria, and total residual chlorine.

TABLE 1: Effluent Limitations

Parameters	Average Monthly Limit	Average Weekly Limit	Instantaneous Maximum Limit
BOD ₅	30 mg/L (600.5 lbs/day)	45 mg/L (900.7 lbs/day)	---
TSS	30 mg/L (600.5 lbs/day)	45 mg/L (900.7 lbs/day)	---
E. coli Bacteria	126 /100 ml	---	406 /100 ml
Fecal Coliform Bacteria	---	200 colonies/100 ml	---
Total Residual Chlorine	0.5 mg/L (10.0 lbs/day)	0.75 mg/L (15.0 lbs/day)	---

V. MONITORING REQUIREMENTS

A. Basis for Monitoring

Section 308 of the Clean Water Act and the 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 receiving water data to determine if additional effluent limitations are required and/or to monitor effluent impacts on receiving water quality. The permittee is responsible for conducting the monitoring and for reporting results to EPA on Discharge Monitoring Reports.

B. Monitoring Parameters/Frequency of Monitoring

EPA developed *Interim Guidance for Performance-Based Reduction of NPDES Permit Monitoring Frequencies* (EPA, 1996) to help determine if the frequency of effluent monitoring may be reduced from the requirements in a permittee's current NPDES permit. This guidance document was used to determine if the frequency of effluent monitoring for BOD₅, TSS, and total residual chlorine could be reduced. The guidance document allows permitting authorities to use a statistical analysis of the permittee's historical effluent data to reduce unnecessary monitoring while at the same time maintaining a high level of environmental protection. Based on this guidance document, and the compliance history of the facility for the last five years it was found that monitoring for BOD₅, and TSS could be reduced from three times per week to once per week, and total residual chlorine could be reduced from daily to five times per week. These changes were made in the draft permit.

Table 2, presents the proposed effluent monitoring requirements, and table 3 presents the proposed receiving water monitoring requirements.

TABLE 2: Waste Water Treatment Plant Monitoring Requirements			
Parameter	Sample Location	Sample Frequency	Sample Type
Flow, mgd	Effluent	Continuous	—
BOD ₅ , mg/L	Influent and effluent	1/week	24-hour composite
TSS, mg/L	Influent and effluent	1/week	24-hour composite
pH, standard units	Effluent	5/week	grab
Fecal Coliform Bacteria, colonies/100 ml	Effluent	3/week	grab
E. Coli Bacteria, colonies/100 ml	Effluent	5/month	grab
Total Residual Chlorine, mg/L	Effluent	5/week	grab
Total Ammonia as N, mg/L ¹	Effluent	1/month	24-hour composite
Temperature, °C	Effluent	1/week	grab
Mercury, total, µg/L ¹	Effluent	1/month	24-hour composite
1. Monitoring for mercury and ammonia must start two years after the effective date of the permit and continue for two years.			

TABLE 3: Receiving Water Monitoring Requirements			
Parameter	Sample Location	Sample Frequency	Sample Type
Temperature, °C	upstream of outfall	1/month	grab
pH, standard units	upstream of outfall	1/month	grab
Total Ammonia, mg/L	upstream of outfall	1/month	grab
Mercury, total, µg/L	upstream of outfall	1/month	grab
Note: Receiving water monitoring must start 2 years after the effective date of the permit and continue for 2 years.			

C. Method Detection Limit for Mercury.

The aquatic life, and human health criteria and for mercury are very low. In order to determine if the effluent discharged from the facility has the potential to cause or contribute to a violation of these criteria, the facility must use an analytical test method with a method detection limit below the aquatic life and human health criteria. The draft permit requires the permittee to use a test method that achieves a method detection limit of 0.005 µg/L for mercury.

VI. SLUDGE (BIOSOLIDS) REQUIREMENTS

The biosolids conditions in the administratively extended permit were based on best professional judgment (BPJ) since EPA had not promulgated regulations for the use and disposal of biosolids at the time of permit issuance. Since that time EPA has promulgated regulations and they are contained in 40 CFR 503. Therefore, the BPJ biosolids requirements contained in the existing permit have not been incorporated into the draft permit.

EPA Region 10 recently decided to separate wastewater and sludge permitting. Under the CWA, EPA has the authority to issue separate sludge-only permits for the purposes of regulating biosolids. EPA will issue a sludge-only permit to this facility at a later date, as appropriate.

Until future issuance of a sludge-only permit, any sludge management and disposal activities at the 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, meaning that permittees must comply with them whether or not a permit has been issued. Therefore, the CWA does not require the facility to have a permit prior to use or disposal of biosolids.

VII. OTHER PERMIT CONDITIONS

A. Quality Assurance Plan

The federal regulation at 40 CFR 122.41(e) requires the permittee to develop and submit a Quality Assurance Plan to ensure that the monitoring data submitted is accurate and to explain data anomalies if they occur. The permittee is required to complete a Quality Assurance Plan within 60 days of the effective date of the final permit. The Quality Assurance Plan must consist of standard operating procedures the permittee must follow for collecting, handling, storing and shipping samples, laboratory analysis, and data reporting.

B. Facility Planning Requirements

The draft permit requires the City to develop a plan when the annual average flow exceeds 85 percent of the design flow of the plant. This plan requires the City to develop a strategy for remaining in compliance with effluent limits in the permit.

C. Additional Permit Provisions

Sections II through IV of the draft permit contain standard regulatory language that must be included in all NPDES permits. Because they are regulations, they cannot be challenged in the context of an NPDES permit action. The standard regulatory language covers requirements such as monitoring, recording, 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 the National Marine Fisheries Service and the U.S. Fish and Wildlife Service if their actions could adversely affect any threatened or endangered species. EPA has determined that issuance of this permit will not affect the threatened species in the vicinity of the discharge. See Appendix E for further details.

B. 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.

C. Permit Expiration

This permit will expire five years from the effective date of the permit.

APPENDIX A
Wastewater Treatment Plant Location

APPENDIX B
WATER QUALITY STANDARDS

(A) Idaho Water Quality Criteria

For the City of Weiser discharge, the following water quality criteria are necessary for the protection of the beneficial uses of the Snake River:

1. IDAPA 16.01.02.200.02 - Surface waters of the State shall be free from toxic substances in concentrations that impair designated beneficial uses. These substances do not include suspended sediment produced as a result of nonpoint source activities.
2. IDAPA 16.01.02.200.05 - 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.
3. IDAPA 16.01.02.200.06 - Excess Nutrient. Surface waters of the State shall be free from excess nutrients that can cause visible slime growths or other nuisance aquatic growths impairing designated beneficial uses.
4. IDAPA 16.01.02.200.08 - Sediment. Sediment shall not exceed quantities specified in section 250 and 252, or, in the absence of specific sediment criteria, quantities which impair designated beneficial uses. Determinations of impairment shall be based on water quality monitoring and surveillance and the information utilized as described in Subsection 350.
5. IDAPA 16.01.02.250.01.a. - Hydrogen ion concentration (pH) values within the range of 6.5 to 9.5 standard units.
6. IDAPA 16.01.02.210 - Toxic substances set forth in 40 CFR 131.36(b)(1), as of July 1, 1993, is hereby incorporated by reference in the manner provided in subsection 210.02, however, the standard for arsenic shall be 50 µg/L.
7. IDAPA 16.01.02.250.01.c. - The one hour average concentration shall not exceed 19 µg/L. The four day concentration shall not exceed 11 µg/L.
8. IDAPA 16.01.02.250.02.a - Dissolved oxygen concentrations shall exceed 6 mg/L at all times.
9. IDAPA 16.01.02.250.02.b. - Water temperatures of 22°C or less with a maximum daily average of no greater than 19°C .
10. IDAPA 16.01.02.250.02.c. - The one hour average, and the four day average concentration of un-ionized ammonia (as N) is 0.22 mg/L and 0.0349 mg/L, these values can be expressed in terms of total ammonia and are 1.08 mg/L and 0.018 mg/L respectively. The criteria are derived using the equations in the Idaho water quality standards and a receiving water temperature and pH of 19.5° C and 8.8 standard units, the temperature and pH are

the 95th percentile of the receiving water monitoring data set. The data set consists of data collected from October 1995 through September 2000.

11. IDAPA 16.01.02.251.01. - Waters designated for primary contact recreation are not to contain E. coli bacteria significant to the public health in concentrations exceeding:
 - a. A single sample of four hundred and six E. coli organisms per one hundred ml; or
 - b. A geometric mean of one hundred and twenty six E. coli organisms per one hundred ml based on a minimum of five samples taken, every three to five days, over a thirty day period.

(B) Oregon Water Quality Criteria

The State of Idaho water quality standards are generally as protective as the Oregon water quality standards for this particular stretch of the river, with the following exceptions:

1. OAR 340-041-0805(2)(a)(A) - For waterbodies identified by the Department as providing salmonid spawning, during the periods from spawning until fry emergence from the gravels, the dissolved oxygen level shall not be less than 11.0 mg/L. However, if the minimum intergravel dissolved oxygen, measured as a spatial median, is 8.0 mg/L or greater, then the DO criterion is 9 mg/L.
2. OAR 340-041-0805(2)(b)(A)(i) - No measurable surface water temperature increase resulting from anthropogenic activities is allowed in a basin for which salmonid fish rearing is a designated beneficial use, and in which surface water temperatures exceed 64.0°F (17.8° C).
3. OAR 340-041-0805(2)(b)(A)(ii) - No measurable surface water temperature increase resulting from anthropogenic activities is allowed in waters and periods of the year determined by the Department to support native salmonid spawning, egg incubation, and fry emergence from the eff and from the gravels in a basin which exceeds 55°F (12.8° C).
4. OAR 340-041-0805(2)(d) - the pH shall not fall outside of the range of 7.0 - 9.0 standard units.

(B) Anti-Degradation Policy

The State of Idaho has adopted an anti-degradation policy as part of their water quality standards. The anti-degradation policy represents a three tiered approach to maintain and protect various levels of water quality and uses. The three tiers of protection are as follows:

- Tier 1 - Protects existing uses and the level of water quality necessary to protect those uses.
- Tier 2 - Protects the level of water quality necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water in waters that are currently of higher quality than required to support these uses. Before water quality in Tier 2 waters can be lowered, there must be an anti-degradation review consisting of: (1) a finding that it is necessary to accommodate important economic or social development in the area where the waters are located (2) full satisfaction of all intergovernmental coordination and public participation provisions; and (3) assurance that the highest statutory and regulatory requirements for point sources and best management practices for nonpoint sources are achieved. Furthermore, water quality may not be lowered to less than the level necessary to fully protect the “fishable/swimmable” uses and other existing uses.
- Tier 3 - Protects the quality of outstanding national resources, such as waters of national and State parks and wildlife refuges and waters of exceptional recreational or ecological significance. There may be no new or increased discharges to these waters and no new or increased discharges to tributaries of these waters that would result in lower water quality.

The Snake River is a tier 1 waterbody, therefore, water quality should be such that it results in no mortality and no significant growth or reproductive impairment of resident species. An NPDES permit cannot be issued that would result in the water quality criteria being violated. The draft permit contains effluent limits which ensures that the existing beneficial uses for the Snake River will be maintained.

APPENDIX C
Basis for Effluent Limitations

The CWA requires Publicly Owned Treatment Works (POTW) to meet certain effluent limits based on available wastewater treatment technology. These types of effluent limits are called technology based effluent limits. EPA may find, by analyzing the effect of an effluent discharge on the receiving water, that technology based effluent limits are not sufficiently stringent to meet water quality standards. In such cases, EPA is required to develop more stringent water quality-based effluent limits which are designed to ensure that the water quality standards of the receiving water are met.

Technology based effluent limits may not limit every parameter that is in an effluent. For example, technology based effluent limits for POTWs have only been developed for five-day biochemical oxygen demand (BOD₅), total suspended solids (TSS), and pH, yet effluent from a POTW may contain other pollutants such as chlorine, ammonia, or metals depending on the type of treatment system used and the service area of the POTW (i.e., industrial facilities as well as residential areas discharge into the POTW). When technology based effluent limits do not exist for a particular pollutant, EPA must still determine if the pollutants expected to be in the effluent will cause or contribute to a violation of the water quality standards for the water body. If they do, EPA must develop water quality-based effluent limits. The effluent limits in the draft permit reflect whichever limits (technology-based or water quality-based) are more stringent.

The following discussion explains in more detail the derivation of technology based effluent limits, and water quality based effluent limits. Part A discusses technology based effluent limits, Part B discusses water quality based effluent limits, and Part C compares the numeric technology based effluent limits with the numeric water quality based effluent limits, and shows the effluent limits that are proposed in the draft permit.

A. Technology-based Effluent Limitations

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,” that all POTWs were required to meet by July 1, 1977. EPA developed “secondary treatment” regulations which are specified in 40 CFR 133. These technology-based effluent limits apply to all municipal wastewater treatment plants and identify the minimum level of effluent quality attainable by secondary treatment in terms of five-day biochemical oxygen demand (BOD₅), total suspended solids (TSS), and pH. The technology based effluent limits applicable to the City of Weiser are as follows:

1. BOD₅ and TSS, concentration based limits:
Average Monthly Limit = 30 mg/L
Average Weekly Limit = 45 mg/L
Percent Removal Requirements = 85 %
2. BOD₅ and TSS, mass based limits: The federal regulation at 40 CFR § 122.45 (f) require

BOD₅ and TSS limitations to be expressed as mass based limits using the design flow of the facility. In the existing permit the mass loading limits were derived based on the facility influent design load, and a removal efficiency of 85%. Since federal regulations require limits to be derived using the design flow of the facility, the limits have been recalculated as follows: concentration X design flow X 8.34.

BOD₅ and TSS loading, monthly average = 30 mg/L X 2.4 mgd X 8.34 = 600.5 lbs/day

BOD₅ and TSS loading, weekly average = 45 mg/L X 2.4 mgd X 8.34 = 900.7 lbs/day

3. pH: The pH range must be between 6.0 - 9.0 standard units.
4. Fecal Coliform Bacteria: In addition to the above, the Idaho *Water Quality Standards and Wastewater Treatment Requirements* (IDAPA16.01.02.420.02.b) require that fecal coliform concentrations in treated effluent not exceed a geometric mean of 200 colonies/100ml based on no more than one week's data and a minimum of five samples.
5. Total Residual Chlorine: The Water Pollution Control Federation's *Chlorination of Wastewater* (1976) states that a properly designed and maintained wastewater treatment facility can achieve adequate disinfection if a 0.5 mg/L chlorine residual is maintained after 15 minutes of contact time. A treatment plant that provides adequate chlorination contact time can meet the 0.5 mg/L limit on a monthly average basis.

Additionally, the NPDES regulation at 40 CFR 122.45(d) requires permit limits for publicly owned treatment works be expressed as average monthly limits (AMLs) and average weekly limits (AWLs) unless impracticable. The AWL is expressed as 1.5 X AML, or, in this case, 0.75 mg/L.

Finally, since the federal regulation at 40 CFR § 122.45 (f) requires limitations to be expressed as mass based limits using the design flow of the facility, mass based limits have been added to the draft permit. The mass based limit is calculated as follows:
concentration X design flow X 8.34.

monthly average = 0.5 mg/L X 2.4 mgd X 8.34 = 10 lbs/day

weekly average = 0.75 mg/L X 2.4 mgd X 8.34 = 15 lbs/day

B. Water Quality-Based Effluent Limits

The following discussion is divided into four sections. Section 1 discusses the statutory basis for including water quality based effluent limits in NPDES permits, section 2 discusses the procedures used to determine if water quality based effluent limits are needed in an NPDES permit, section 3 discusses the procedures used to develop water quality based effluent limits, and section 4 discusses the water quality based limits specific to this permit.

1. Statutory Basis for Water Quality-Based Limits

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 waters must also comply with limitations imposed by the state as part of its certification of NPDES permits under section 401 of the CWA.

The NPDES regulation (40 CFR 122.44(d)(1)) implementing section 301 (b)(1)(C) of the CWA requires that permits include limits for all pollutants or parameters which are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any state water quality standard, including state narrative criteria for water quality.

The regulations require that this evaluation be made 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.

2. Reasonable Potential Analysis

When evaluating the effluent to determine if water quality-based effluent limits are needed based on chemical specific numeric criteria, a projection of the receiving water concentration (downstream of where the effluent enters the receiving water) for each pollutant of concern is made. The chemical specific concentration of the effluent and receiving water and, if appropriate, the dilution available from the receiving water are factors used to project the receiving water concentration. If the projected concentration of the receiving water exceeds the numeric criterion for a specific chemical, then there is a reasonable potential that the discharge may cause or contribute to an excursion above the applicable water quality standard, and a water quality-based effluent limit is required (see Appendix B for the applicable water quality criteria).

Sometimes it is appropriate to allow a small area of 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 decrease treatment requirements. Mixing zones can be used only when there is adequate receiving water flow volume and the receiving water is below the criteria necessary to protect designated uses. Mixing zones can only be authorized by the Idaho Department of Environmental Quality.

3. Procedure for Deriving Water Quality-Based Effluent Limits

The first step in developing a water quality based permit limit is to develop a wasteload allocation 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.

For this permit the wasteload allocations have been determined for pH and E. coli bacteria without using a mixing zone, because the state does not generally authorize mixing zones for these pollutants. For these particular parameters, the wasteload allocation translates directly into the effluent limit without any statistical conversion.

4. Specific Water Quality-Based Effluent Limits

(a) Toxic Substances

The Idaho state water quality standards require surface waters of the state to be free from toxic substances in concentration that impair designated uses. The facility's existing permit required the permittee to conduct whole effluent toxicity tests on the effluent. The results of these tests indicate that whole effluent toxicity is not a concern and therefore, the toxicity testing requirements will not be retained in the draft permit.

(b) Floating, Suspended or Submerged Matter/Oil and Grease

The Idaho state water quality standards require surface waters of the state to be free from floating, suspended, or submerged matter of any kind in concentrations causing nuisance or objectionable conditions that may impair designated beneficial uses. Therefore, a narrative condition is proposed for the draft permit that states there must be no discharge of floating solids or visible foam in other than trace amounts, or oily wastes that produce a sheen on the surface of the receiving water.

(c) Excess Nutrients

The Idaho state water quality standards require surface waters of the state be free from excess nutrients that can cause visible slime growths or other nuisance aquatic growths impairing designated beneficial uses.

The Snake River has been listed as water quality limited for nutrients by the state of Idaho. IDEQ has not completed the TMDL for this section of the Snake river. Since a TMDL has not been completed, water quality based effluent limits for nutrients will be deferred until the TMDL is completed. In the future, the permit may be reopened to incorporate the determinations made in the TMDL.

(d) Sediment

The Idaho state water quality standards state that sediment shall not exceed quantities which impair designated beneficial uses. The state of Idaho has

listed the Snake River as water quality limited for sediment.

IDEQ has not yet completed the TMDL for this section of the Snake River therefore, water quality based effluent limits will be deferred until the TMDL is completed. In the future, the permit may be reopened to incorporate the determinations made in the TMDL.

(e) **pH**

The Idaho state water quality standards require surface waters of the state to have a pH value within the range of 6.5 - 9.5 standard units. The state of Idaho has listed the Snake River as water quality limited for pH.

The criteria (6.5 - 9.5 standard units) must be met before the effluent is discharged to the receiving water. Furthermore, the technology based effluent limit range of 6.0 - 9.0 standard units, must also be met before the effluent is discharged to the receiving water (i.e., mixing zones are not allowed for technology based effluent limits).

To ensure that both water quality based requirements and technology based requirements are met the draft permit incorporates the lower range of the water quality standards (6.5 standard units) and the upper range of the technology based limits (9.0 standard units).

(f) **Mercury**

The Idaho water quality standards have developed criteria for mercury that are protective of aquatic life and human health. The criteria are numeric values that represent contaminant concentrations that are not to be exceeded in the receiving water. These criteria are applicable to the Snake River.

Since the Snake River has been listed as water quality impaired for mercury it is important to ensure that the discharge from the facility does not cause or contribute to an exceedance of the allowable mercury criteria for the receiving water. In order to make this determination the draft permit is requiring the facility to collect effluent and receiving water data for mercury. During the next round of permitting the data will be analyzed to determine if the effluent is causing an excursion of the allowable metals criteria.

(g) **Total Residual Chlorine**

The Idaho state water quality standards established an acute criterion of 19 µg/L, and a chronic criterion of 11 µg/L for the protection of aquatic life.

The existing permit has an average monthly limit of 0.5 mg/L, which is based on the technology standard. A reasonable potential analysis was done for total residual chlorine to ensure that the technology based effluent limit would not cause or contribute to a water quality standard violation (see Appendix D for the reasonable potential analysis). The result of the analysis indicated that technology based effluent limits would not cause or contribute to a water quality standard violation.

(h) **Dissolved Oxygen (D.O.)**

The state water quality standards require the level of D.O. in a receiving water to exceed 6 mg/L at all times when the water body is protected for aquatic life use.

The state of Idaho has listed the Snake River as water quality limited for dissolved oxygen. Since the TMDL has not been completed yet water quality based effluent limits will be deferred until the TMDL is completed. In the future, the permit may be reopened to incorporate the determinations made in the TMDL.

(i) **Temperature**

The state water quality standards require receiving water temperatures of 22 degrees C or less with a maximum daily average of no greater than 19 degrees C.

The State of Oregon has listed the Snake River as impaired for temperature. Receiving water and effluent monitoring for temperature have been incorporated into the draft permit, to determine if effluent limits for temperature may be necessary in the future.

(j) **Total Ammonia**

The Idaho Water Quality Standards contain water quality criteria to protect aquatic life against short term and long term adverse impacts from ammonia.

A reasonable potential analysis was performed to determine if water quality based effluent limits were necessary in the draft permit (see Appendix D for the reasonable potential analysis). The analysis indicated that limits were not necessary. However, monitoring has been incorporated into the draft permit to find out if receiving water or effluent conditions are changing over time, and to determine if the changes are significant enough to warrant water quality based effluent limits in the next round of permitting.

(k) **Escherichia Coli (E. Coli) Bacteria**

According to the Idaho Water Quality Standards, waters designated for primary contact recreation, such as the Snake River, are not to contain E. coli bacteria significant to the public health in concentrations exceeding:

- a. A single sample of four hundred and six E. coli organisms per one hundred ml; or
- b. A geometric mean of one hundred and twenty six E. coli organisms per one hundred ml based on a minimum of five samples taken, every three to five days, over a thirty day period.

It is anticipated that a mixing zone will not be authorized for bacteria, therefore, the criteria must be met before the effluent is discharged to the receiving water. The proposed water quality based effluent limits in the permit include an instantaneous maximum limit of 406 organisms/100 ml, and an average monthly limit of 126 organisms/100 ml.

C. Comparison of technology based effluent limits and water quality based effluent limits

The following table compares the technology based effluent limits with the water quality based effluent limits. The proposed effluent limits in the draft permit are the more stringent of the two types of limits.

Parameter	Technology Based Effluent Limits				Water Quality Based Effluent Limits				Proposed Effluent Limits in Draft Permit			
	AML	AWL	IML	Range	AML	AWL	IML	Range	AML	AWL	IML	Range
BOD ₅ , mg/L	30	45	---	---	---	---	---	---	30	45	---	---
BOD ₅ , lbs/day	600.5	900.7	---	---	---	---	---	---	600.5	900.7	---	---
BOD ₅ , Percent Removal	85	---	---	---	---	---	---	---	85	---	---	---
TSS, mg/L	30	45	---	---	---	---	---	---	30	45	---	---
TSS, lbs/day	600.5	900.7	---	---	---	---	---	---	600.5	900.7	---	---
TSS, Percent Removal	85	---	---	---	---	---	---	---	85	---	---	---
Fecal Coliform Bacteria, #/100/ ml	---	200	---	---	---	---	---	---	---	200	---	---
E.Coli Bacteria, #/100 ml	---	---	---	---	126	---	406	---	126	---	406	---
Total Residual Chlorine, µg/L	0.5	0.75	---	---	---	---	---	---	0.5	0.75	---	---
Total Residual Chlorine, lbs/day	10.0	15.0	---	---	---	---	---	---	10.0	15.0	---	---
pH, standard units	---	---	---	6.0-9.0	---	---	---	6.5-9.5	---	---	---	6.5-9.0
AML means Average Monthly Limit AWL means Average Weekly Limit IML means Instantaneous Maximum Limit --- means no limit												

APPENDIX D
Reasonable Potential Analysis
for Total Ammonia and Total Residual Chlorine

To determine if a water quality based effluent limitation is required, the receiving water concentration of pollutants is determined downstream of where the effluent enters the receiving water. If the projected receiving water concentration is greater than the applicable numeric criterion for a specific pollutant, there is reasonable potential that the discharge may cause or contribute to an excursion above the applicable water quality standard and an effluent limit must be incorporated into the NPDES permit.

The receiving water concentration is determined using the following mass balance equation.

$$C_d \times (Q_e + Q_u) = (C_e \times Q_e) + (C_u \times Q_u)$$

$$C_d = \frac{(C_e \times Q_e) + (C_u \times Q_u)}{Q_e + Q_u}$$

where,

C_d = receiving water concentration downstream of the effluent discharge

C_e = maximum projected effluent concentration

Q_e = maximum effluent flow

C_u = upstream concentration of pollutant

Q_u = upstream low flow

I. Mixing Zone/Low Flow Conditions/Effluent Flow

A. Mixing Zones

The Idaho *Water Quality Standards and Wastewater Treatment Requirements* at IDAPA 16.01.02.060 allow the Idaho Department of Environmental Quality to authorize mixing zones. In this case, a mixing zone of twenty-five percent (25%) of the low flow receiving water is assumed.

If a mixing zone (%MZ) is allowed, the mass balance equation, above, becomes

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

B. Low Flow Conditions

The Snake River USGS station shows that the 1 day, 10 year low flow (1Q10) is 4496 mgd, and the 7 day average, 10 year low flow (7Q10) is 4793 mgd. These flows are based on flow data from 1950 through 1987.

The 1Q10 flow is used in determining protection of aquatic life from acute effects of pollutants. It represents the lowest daily flow that is expected to occur once in 10 years. The 7Q10 flow is used in determining protection of aquatic life from chronic effects of pollutants. It represents the lowest 7 day average flow expected to occur in 10 years.

C. Effluent flow

The effluent design flow for the facility is 2.4 mgd.

II. Data Set for Total Ammonia

The effluent data collected from October 1995 through September 2000 was used to determine the coefficient of variation (CV) of the data and the highest observed effluent value. The CV is 0.5, and the maximum observed value is 0.69 mg/L.

Receiving water data was collected from November 1991 through November 1992, the highest detectable ammonia value was 0.05 mg/L. The 95th percentile receiving water values for pH and temperature were 19°C and 8.8 standard units.

III. Numeric Criteria for Total Ammonia

The Idaho water quality standards contain ammonia criteria that are based on the receiving water pH and temperature. Using a receiving water temperature of 19°C and pH of 8.8 standard units, the criteria are:

acute criterion: 1.08 mg/L

chronic criterion: 0.18 mg/L

IV. Maximum Projected Effluent Concentration for Total Ammonia

When determining the projected receiving water concentration, EPA's *Technical Support Document for Water Quality-based Toxics Controls* (TSD, 1991) recommends using the maximum projected effluent concentration. To determine the maximum projected effluent concentration (C_e) 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 has been calculated, the reasonable potential multiplier used to derive the maximum projected effluent concentration (C_e) can be found in Table 3-1 of EPA's TSD.

The maximum projected concentration (C_e) for the effluent is equal to the highest observed concentration value of the data set multiplied by the reasonable potential multiplier, or 0.69 mg/L X 1.6 = 1.1 mg/L

V. Reasonable Potential Calculation for Total Ammonia

- (a) Determine if there is a reasonable potential for the acute aquatic life criterion to be violated:

The upstream flow (Q_u) used to make the determination is the 1Q10 (mgd).
Assume the State will allow a 25% mixing zone (%MZ).

$$C_d = \frac{(C_c \times Q_c) + (C_u \times (Q_u \times \%MZ))}{Q_c + (Q_u \times \%MZ)}$$

$$C_d = \frac{(1.1 \times 2.4) + (0.05 \times (4496 \times .25))}{2.4 + (4496 \times .25)} = 0.05 \text{ mg/L}$$

Since 0.05 mg/L is less than the acute aquatic life criterion (1.08 mg/L), there is no reasonable potential for the effluent to cause an exceedance of the water quality standard.

- (b) Determine if there is a reasonable potential for the chronic aquatic life criterion to be violated:

The upstream flow used to make the determination is the 7Q10 (4793 mgd).
Assume the State will allow a 25% mixing zone.

$$C_d = \frac{(1.1 \times 2.4) + (0.05 \times (4793 \times .25))}{2.4 + (4793 \times .25)} = 0.05 \text{ mg/L}$$

Since 0.05 mg/L is less than the chronic aquatic life criterion (0.18), there is no reasonable potential for the effluent to cause an exceedance of the water quality standard.

VI. Data Set for Total Residual Chlorine

There is no receiving water data for chlorine, therefore it will be assumed that the background (C_u) concentration is zero.

VII. Numeric Criteria for Total Residual Chlorine

The Idaho water quality standards have total residual chlorine criteria. The criteria are :
acute criterion: 19 $\mu\text{g/L}$
chronic criterion: 11 $\mu\text{g/L}$

VIII. Maximum Projected Effluent Concentration for Total Residual Chlorine

The previous permit had a technology based effluent limit for chlorine. The purpose of this analysis is to ensure that the technology based effluent will not cause or contribute to an exceedance of the water quality standard for chlorine. The previous permit had an average monthly limit of 0.5 mg/L. It will be assumed that the maximum effluent concentration is 1.0 mg/L (1000 µg/L).

IX. Reasonable Potential Calculation for Total Ammonia

- (a) Determine if there is a reasonable potential for the acute aquatic life criterion to be violated:

The upstream flow (Q_u) used to make the determination is the 1Q10 (mgd). Assume the State will allow a 25% mixing zone (%MZ). The upstream concentration of total residual chlorine (C_u) is assumed to be 0 µg/L.

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

$$C_d = \frac{(1000 \times 2.4) + 0.0 \times (4496 \times .25)}{2.4 + (4496 \times .25)} = 2.1 \text{ µg/L}$$

Since 2.1 µg/L is less than the acute aquatic life criterion (19 µg/L), there is no reasonable potential for the effluent to cause an exceedance of the water quality standard.

- (b) Determine if there is a reasonable potential for the chronic aquatic life criterion to be violated:

The upstream flow used to make the determination is the 7Q10 (4793 mgd). Assume the State will allow a 25% mixing zone. The upstream concentration of total residual chlorine is assumed to be 0 µg/L .

$$C_d = \frac{(1000 \times 2.4) + (0.0 \times (4793 \times .25))}{2.4 + (4793 \times .25)} = 2.0 \text{ µg/L}$$

Since 2.0 µg/L is less than the chronic aquatic life criterion (11 µg/L), there is no reasonable potential for the effluent to cause an exceedance of the water quality standard.

APPENDIX E
Endangered Species Act

Section 7 of the Endangered Species Act (ESA) requires federal agencies to request a consultation with the National Marine Fisheries Service and the U.S. Fish and Wildlife Service regarding potential effects an action may have on listed endangered species.

A review of the U.S. Fish and Wildlife Service County Species List for the State of Idaho (SP #1-4-00-SP-788) identified the Bald eagle as being a federally-listed threatened species in the vicinity of the discharge. There are no endangered, proposed or candidate species in the area of the discharge. A review of the National Oceanic and Atmospheric Administration, National Marine Fisheries Service Northwest Region Species List indicates that there are no threatened or endangered species in the vicinity of the discharge.

The primary reasons for the decline of the Bald eagle are destruction of their habitat and food sources, and widespread historic application of DDT. This permit will have no impact on any of these issues. Therefore, EPA has determined that issuance of this NPDES permit will have no effect on Bald eagles.