Fact Sheet

NPDES Permit Number: ID-002205-5
Date:
Public Notice Expiration Date:
Technical Contact: Nickie Arnold 208/378-5757 or Arnold.nickie@epa.gov

The U.S. Environmental Protection Agency (EPA) Proposes to Reissue a Wastewater Discharge Permit to:

City of Lewiston Wastewater Facility
P.O. Box 617
Lewiston, Idaho 83501

and the State of Idaho proposes to Certify the Permit

EPA Proposes NPDES Permit Reissuance

EPA proposes to reissue a National Pollutant Discharge Elimination System (NPDES) permit to the City of Lewiston Wastewater Facility. The draft permit sets conditions on the discharge of pollutants from the City's waste water treatment plant to the Clearwater Arm of Lower Granite Dam Pool. In order to ensure protection of water quality and human health, the draft 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 and proposed discharge
- a listing of past and proposed effluent limitations and other conditions
- a map and description of the discharge location
- detailed background information supporting the conditions in the draft permit

Idaho State Certification

The Idaho Division of Environmental Quality proposes to certify the NPDES permit for the City of Lewiston, under section 401 of the Clean Water Act. The state provided preliminary comments prior to the Public Notice which have been incorporated into the draft permit.

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Public Comment

Persons wishing to comment on the tentative determinations contained in the draft permit may do so in writing, within 35 days of the date of this public notice. Comments must be received within the 35 day period to be considered in the formulation of final determinations regarding the permit. All comments should include the name, address and telephone number of the commenter and a concise statement of the exact basis of any comment and the relevant facts upon which it is based.

All written comments should be submitted to EPA at the above address to the attention of the Director, Office of Water.

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 Public Notice.

Persons wishing to comment on State Certification should submit written comments within the 35 day period to the Regional Administrator, State of Idaho Division of Environmental Quality, Lewiston Regional Office, 1118 F Street, Lewiston, Idaho 83501.

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 a request for an evidentiary hearing is submitted 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).

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

IDEQ Lewiston Regional Office
1118 F Street
Lewiston, Idaho 83501
(208) 799-4370

The draft permit and fact sheet can also be found by visiting the Region 10 website at http://www.epa.gov/r10earth/water.htm

For technical questions regarding the permit or fact sheet, contact Nickie Arnold at the phone number or email address at the top of this fact sheet.

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LIST OF ACRONYMS

AML	Average Monthly Limit
BMP	Best Management Practices
BOD_5	Five-day Biochemical Oxygen Demand
CBOD	Carbonaceous Biochemical Oxygen Demand
CFR	Code of Federal Regulations
cfs	Cubic Feet per Second
CWA	Clean Water Act
DMR	Discharge Monitoring Report
CV	Coefficient of Variation
EPA	United States Environmental Protection Agency
IDEQ	Idaho Division of Environmental Quality
IWC	Instream Waste Concentration
LTA	Long Term Average
MDL	Maximum Daily Limit or Method Detection Limit
mgd	Million Gallons per Day
mg/l	Milligrams per Liter
ml	Milliliters
NMFS	National Marine Fisheries Service
NOEC	No Observed Effect Concentration
NPDES	National Pollutant Discharge Elimination System
O&M	Operation and Maintenance
POTW	Publicly Owned Treatment Works
RP	Reasonable Potential
TAC	Technical Advisory Committee
TMDL	Total Maximum Daily Load
TSD	*Technical Support Document for Water Quality-based Toxics Control*, (EPA 1991)
TSS	Total Suspended Solids
TU_c	Toxicity Units, Chronic
USFWS	United State Fish and Wildlife Service
USGS	United States Geological Survey
WWF	Wastewater Facility
WLA	Wasteload Allocation
WET	Whole Effluent Toxicity
%MZ	Percent Mixing Zone
µg/L	Micrograms per Liter

BACKGROUND INFORMATION

I. APPLICANT

City of Lewiston Wastewater Facility — NPDES Permit No.: ID-002205-5

Facility Location:
900 7th Avenue North
Lewiston, Idaho 83501

Mailing Address:
P.O. Box 617
Lewiston, Idaho 83501

Facility contact: Urban Wessels, Superintendent

II. FACILITY ACTIVITY

The City of Lewiston owns and operates a municipal treatment facility that provides secondary treatment and disinfection of domestic and industrial wastes prior to discharge to the Clearwater River at the head of the Clearwater Arm of Lower Granite Dam Pool. The current average design flow of the facility is 5.71 million gallons per day (mgd). Based on data submitted by the City, the current annual average flow is 4.42 mgd. The City transfers biosolids generated during the treatment process to a state-approved commercial composting operation owned by EKO. The final product is sold as a soil amendment.

See Appendix A for a map of the location of the treatment plant and discharge. Appendix B contains a detailed discussion of the treatment processes and waste streams.

III. RECEIVING WATER

The Lewiston Wastewater Facility (WWF) discharges through Outfall 001 to the Clearwater River at the head of the Clearwater Arm of Lower Granite Dam Pool at approximate river mile 0.7 (latitude 46^{O} 25' 38", longitude 117^{O} 01' 16"). The outfall is a multi-port diffuser that extends approximately 150 feet into the water from the north bank of the Pool. At the point of discharge, there is significant river current across the diffuser which results in complete mixing as the effluent leaves the diffuser.

In addition to Lewiston's discharge, this section of the Clearwater River receives water from four separate pumping plants operated by the Corps of Engineers. The pumps remove groundwater and stormwater from behind the levies that have been constructed along the river. The Potlatch Mill also discharges seeps from the

secondary treatment system to this section of the Clearwater River through groundwater that is hydrologically connected to the river. Lewiston's water treatment plant also discharges filter backwash water to the river upstream of the WWF and downstream of the Potlatch Corporation's lagoon.

Lewiston's discharge is just upstream from the Idaho/Washington border, and has the potential to impact the water quality in both states. Therefore, the water quality standards of both states were considered in developing the draft permit.

The Clearwater Arm of Lower Granite Pool is protected by the State of Idaho for the following uses: domestic and agricultural water supply, cold water biota, and primary and secondary recreation. The State of Washington has classified the Snake River from the mouth to the Washington/Idaho border as Class A (excellent), with special conditions for temperature. Class A waters are protected for domestic, industrial, and agricultural water supply, stock watering, fish and shellfish, wildlife habitat, recreation, commerce, and navigation.

The Clearwater River is listed on Idaho's 303(d) list (a list of impaired waters compiled under section 303(d) of the Clean Water Act) as not meeting standards for total dissolved gases. The Snake River downstream from Lewiston's discharge is on Washington's 303(d) list for total dissolved gas and temperature. High levels of total dissolved gas are caused by releases from dams and are not related to Lewiston's discharge. Data show that it is likely that the temperature exceeded the criteria during short periods in the summer prior to any human-caused influences. However, the timing and extent of the exceedences have been changes by construction of dams up- and downstream from Lewiston's discharge.

IV. FACILITY BACKGROUND

On March 31, 1986, EPA issued the current permit for the Lewiston WWF. The permit expired April 1, 1991. The City applied for reissuance on October 11, 1990. Because the City submitted a timely application, the permit has been administratively extended and the City is authorized to continue discharging.

On September 30, 1993, EPA public noticed its intent to reissue an NPDES permit to the City of Lewiston. However, a final permit was never issued. Since 1993, changes in the state water quality standards have occurred and modifications have taken place at both the WWF and at the city's primary industrial user. Therefore, a new fact sheet and draft NPDES permit have been developed which address the latest regulations and facility changes.

The City submits monthly discharge monitoring reports (DMRs) to EPA summarizing the results of effluent monitoring required by the permit. Based on the past five years' DMRs, the City has reported the following violations:

PARAMETER	DATE	PERMIT LIMIT	REPORTED VALUE
BOD_5, Weekly Average Concentration	7/96	45 mg/l	52.8 mg/l
BOD_5, % Removal	10/95 4/96	85 85	77.10 84.3
Residual Chlorine, Daily Maximum Concentration	1/96 4/96 9/96 3/97	2.0 mg/l " " "	2.1 mg/l 2.8 mg/l 2.3 mg/l 3.0 mg/l
TSS, Weekly Average Concentration	4/96	45	52.9 mg/l

In addition, the city conducts pretreatment monitoring on a quarterly basis. In 1993, the City's primary industrial contributor, Blount Industries, brought its wastewater system on line. The addition of this system resulted in significant reductions in the metals discharged from the Lewiston WWF. In 1998, the City converted from chlorine to Ultra-Violet (UV) disinfection. The chlorine system has been retained as an emergency back-up.

V. EFFLUENT LIMITATIONS

EPA followed the Clean Water Act, State and federal regulations, and EPA's 1991 *Technical Support Document for Water Quality-Based Toxics Control* (*TSD*) to develop the proposed effluent limits. In general, the Clean Water Act requires that the effluent limits for a particular pollutant be the more stringent of either the technology-based or water quality-based limits. Appendix C provides the basis for the development of technology-based and water quality-based effluent limits.

Technology-based limits are set based on the level of treatment that is achievable using readily available technology. For publicly owned treatment works, federal regulations include technology-based limits for three parameters: five-day biochemical oxygen demand (BOD_5), total suspended solids (TSS), and pH.

The Agency evaluates the technology-based limits to determine whether they are adequate to ensure that water quality standards are met in the receiving water. If the

limits are not adequate, EPA must develop additional water quality-based limits. These limits are designed to prevent exceedences of the Idaho water quality standards in the Clearwater River and the Washington state standards below the confluence of the Snake and the Clearwater Rivers. The proposed permit includes water quality-based limits for total residual chlorine. Appendix D provides an example calculation for development of a water quality-based permit limit.

Table 1 compares the limits in the 1986 permit with those in the draft permit.

Table 1: Outfall 001 Effluent Limits

Parameter	Average Monthly Limit		Average Weekly Limit		Maximum Daily Limit	
	Draft	1986	Draft	1986	Draft	1986
Effluent Flow, mgd		5.71	---	---	---	—
BOD_5						
mg/l	30	30	45	45	---	---
lb/day	1,430	1,430	2,145	2,145		
Percent Removal[1]	85	85	85	85		
TSS						
mg/l	30	30	45	45	---	---
lb/day	1,430	1,430	2,145	2,145	---	---
Percent Removal[1]	85	85	85	85		
Fecal Coliform, #/100 ml		100		200		---
May 1 - September 30	50		200		500[2]	
October 1 - April 30	---		200		800[3]	
Total Residual Chlorine[4]						2.0mg/L
mg/l	340	---	---	---	700	
lb/day	14.29	—	—	---	33.33	
Copper						
mg/l	—	0.3 mg/L	—	---	—	0.6 mg/L
lb/day		—		—		---

Table 1: Outfall 001 Effluent Limits

Parameter	Average Monthly Limit		Average Weekly Limit		Maximum Daily Limit	
	Draft	1986	Draft	1986	Draft	1986
Lead mg/l lb/day	—	0.4 mg/L —	--- —	--- —	—	0.8 mg/L ---
Nickel mg/l lb/day	—	0.8 mg/L	— —	— —	—	1.6 mg/L
Zinc mg/l lb/day	—	1.3 mg/L —	--- —	--- ---	---	2.6 mg/L ---
pH, std units	---	---	---	---	6.5-9.0[5]	6.5-9.0[5]

Footnotes:
1 The percent removal requirements represent a minimum.
2 The draft permit also contains a requirement that no more than 10% of samples over a 30 day period may exceed 200/100 ml.
3 The draft permit also contains a requirement that no more than 10% of samples over a 30 day period may exceed 400/100 ml.
4 The residual chlorine limits and monitoring are required only when the chlorination system is in use.
5 The 1986 and draft permit require that the pH be within the specified range at all times.

The draft permit prohibits the discharge of waste streams that are not part of the normal operation of the facility, as reported in the permit application. The draft permit also requires that the discharge be free from floating, suspended, or submerged matter in concentrations that cause/may cause a nuisance.

VI. PRETREATMENT PROGRAM

Section 301(b) of the Clean Water Act requires that industrial users who discharge to publicly owned treatment works comply with pretreatment requirements established under section 307 of the Act. The objectives of the pretreatment program are: (1) to prevent the introduction of pollutants into the POTW that will interfere with the operation of the POTW; (2) to prevent the introduction of pollutants into the POTW which will pass through the POTW, inadequately treated, into receiving waters or otherwise be incompatible with the POTW; (3) to ensure that the quality of the POTW sludge is maintained at a level which allows its use and disposal in compliance with applicable statutes and regulations; (4) to protect POTW personnel who may be affected by

wastewater and sludge in the course of their employment and to protect the general public; and (5) to improve the opportunity to recycle and reclaim wastewater and sludge from the POTW.

The draft permit contains pretreatment requirements that are essentially the same as those in the 1986 permit. The draft permit requires Lewiston to implement the pretreatment program in accordance with its 1982 Industrial Pretreatment Program, with subsequent modifications. The pretreatment program includes requirements to enforce pretreatment standards promulgated under section 307 of the Act, to issue permits to significant industrial users that contain limits and other conditions, to maintain records, to carry out inspections, and to obtain remedies for non-compliance by industrial users. The draft permit also requires monitoring of influent, effluent, and sludge quarterly for metals and cyanide. Finally, the draft permit requires Lewiston to submit an annual report summarizing pretreatment program activities.

VII. MUNICIPAL SEWAGE SLUDGE/BIOSOLIDS MANAGEMENT

The final use and disposal of sewage sludge from this facility is regulated by EPA under 40 CFR § 503. The Clean Water Act (CWA) prohibits any use or disposal of biosolids not in compliance with these standards. The standards may be implemented by EPA through a permit. EPA Region 10 has historically implemented the biosolids standards by inclusion of the requirements in the facility's NPDES wastewater permit. Under the CWA, EPA also has the authority to issue separate "sludge only" NPDES permits for the purpose of regulating biosolids. EPA Region 10 has recently decided to change the regional approach to permitting disposal of biosolids by separating wastewater and sludge permitting. The EPA will issue a sludge-only permit to this facility at a later date.

The final use and disposal of sewage sludge is regulated under 40 CFR §503, even without a permit. The CWA prohibits any use or disposal of biosolids not in compliance with these standards. EPA has the authority under the CWA to enforce these standards directly, even in the absence of a permit. The CWA does not require the facility to have a permit prior to use or disposal of its biosolids.

VIII. MONITORING REQUIREMENTS

A. Effluent Monitoring

Section 308 of the Clean Water Act and federal regulation 40 CFR 122.44(i) require that monitoring be included in permits to determine compliance with effluent limitations. Monitoring may also be required to gather data for future effluent limitations or to monitor effluent impacts on receiving water quality. The City of

Lewiston is responsible for conducting the monitoring and for reporting results to EPA on Discharge Monitoring Reports (DMRs).

Table 2 compares the proposed monitoring requirements in the draft permit to those in the 1986 permit. Monitoring frequency is based on the minimum sampling necessary to adequately monitor the facility's performance as well as the monitoring requirements in the 1986 permit. This table shows that monthly effluent monitoring for metals has been omitted from the draft permit. These monitoring requirements were discontinued because monitoring conducted under the 1986 permit indicated there was no reasonable potential to exceed water quality criteria for these compounds. Metals monitoring (influent, effluent and sludge) will continue to be required on a quarterly basis through the pretreatment program. Monitoring for nutrients and temperature are included in the draft permit to gather data for future effluent limitations or to monitor the effluent impacts on receiving water quality.

TABLE 2: Outfall 001 Monitoring Requirements

Parameter	Draft Sample Frequency	1986 Sample Frequency
$BOD_{5,}$ mg/l[1]	5/Week	5/Week
TSS, mg/l[1]	5/Week	5/Week
Total Ammonia as N, mg/l	1/Month	---
Total Phosphorus as P, mg/l	1/Month	—
Nitrite + nitrate nitrogen, mg/l	1/Month	---
Fecal Coliform Bacteria, #/100 ml	5/Week	5/Week
pH, standard units[2]	5/Week	5/Week
Total Residual Chlorine, mg/l[3]	1/Day	1/Day
Copper, µg/l	---	Monthly
Lead, µg/l	---	Monthly
Nickel, µg/l	---	Monthly
Zinc, µg/l	---	Monthly
Flow, mgd	Continuous	Continuous
Temperature, °C	1/Week	---
Chronic Whole Effluent Toxicity Testing	Semi-annually for 5 years	---

TABLE 2: Outfall 001 Monitoring Requirements		
Parameter	**Draft Sample Frequency**	**1986 Sample Frequency**

Footnotes:
1 The draft permit and the 1986 permit require influent and effluent monitoring to determine compliance with effluent limitations and percent removal requirements.
2 The draft permit requires the City to report the number and duration of pH excursions during the month.
3 Total Residual Chlorine monitoring and reporting is required only when the chlorine system is in use.

B. Ambient Water Column Monitoring

Ambient water column monitoring was not required in the 1986 permit. The proposed permit includes upstream and downstream monitoring for temperature, hardness, pH, dissolved oxygen and nutrients (ammonia, nitrate, nitrite, total kjeldahl nitrogen, total phosphorus, and orthophosphate) beginning 90 days after the effective date of the permit and continuing monthly for 24 months. Data collected will be used to evalute the need for nutrient limits in future permits.

C. Representative Sampling

The draft permit has expanded the requirement in the federal regulations regarding monitoring (40 CFR 122.41[j]). This provision now specifically requires representative sampling whenever a bypass, spill, or non-routine discharge of pollutants occurs, if the discharge may reasonably be expected to cause or contribute to a violation of an effluent limit under the permit. If such a discharge occurs, the City must conduct additional, targeted monitoring to quantify the effects of the discharge on the final effluent. This provision is included in the draft permit because routine monitoring could easily miss permit violations and/or water quality standards exceedences that could result from bypasses, spills, or non-routine discharges.

D. Whole Effluent Toxicity

Whole effluent toxicity tests are laboratory tests that replicate to the greatest extent possible the total effect and actual environmental exposure of aquatic life to effluent toxicants without requiring the identification of specific toxicants. Whole effluent toxicity tests use small vertebrate and invertebrate species, and/or plants, to measure the aggregate toxicity of an effluent. There are two different durations of toxicity test: acute and chronic. Acute

toxicity tests measure survival over a 96-hour exposure. Short-term chronic toxicity tests measure reductions in survival, growth, and reproduction over a 7-day exposure.

Federal regulations at 40 CFR 122.44(d)(1) require that permits contain limits on whole effluent toxicity when a discharge has reasonable potential to cause or contribute to an exceedence of a water quality standard. In Idaho, the relevant water quality standards (IDAPA 16.01.02200.02) state that surface waters of the state shall be free from toxic substances in concentrations that impair designated beneficial uses.

Lewiston's 1986 permit did not require toxicity testing. The draft permit requires quarterly toxicity testing of the final effluent for five years, using *Ceriodaphnia dubia* (water flea) and *Pimephales promelas* (fathead minnow).

IX. OTHER PERMIT CONDITIONS

A. Quality Assurance Plan

Federal regulations at 40 CFR 122.41(e) require permittees to properly operate and maintain their facilities, including "adequate laboratory controls and appropriate quality assurance procedures." To implement this requirement, the draft permit requires that the City develop a Quality Assurance Plan to ensure that monitoring data are accurate and to explain data anomalies if they occur. Lewiston is required to implement the plan within 90 days of the effective date of the draft permit. The Quality Assurance Plan must include standard operating procedures the City must follow for collecting, handling, storing and shipping samples, laboratory analysis, and data reporting.

B. Operation & Maintenance Plan

Section 402 of the Clean Water Act and federal regulations 40 CFR 122.44(k)(2) and (3) authorize EPA to require best management practices, or BMPs, in NPDES permits. BMPs are measures for controlling the generation of pollutants and their release to waterways. For municipal facilities, these measures are typically included in the facility's Operation & Maintenance (O&M) plan. These measures are important tools for waste minimization and pollution prevention.

The draft permit requires the City of Lewiston to incorporate appropriate BMPs into their O&M plan within 180 days of permit issuance. Specifically, the City must consider spill prevention and control, optimization of chlorine and other chemical use, public education aimed at controlling the introduction of household hazardous materials to the sewer system, and water conservation. To the extent that any of these issues have already been addressed, the City need only reference the appropriate document in its O&M plan. The O&M plan must be revised as new practices are developed.

As part of proper operation and maintenance, the draft permit requires the City to develop a facility plan when the annual average flow exceeds 85 percent of the design flow of the plant (5.71 mgd). This plan requires the City to develop a strategy for remaining in compliance with effluent limits in the permit.

C. Additional Permit Provisions

In addition to facility-specific requirements, sections III, IV, and V of the draft permit contain "boilerplate" requirements. Boilerplate is standard regulatory language that applies to all permittees and must be included in NPDES permits. Because the boilerplate requirements are based on regulations, they cannot be challenged in the

context of an NPDES permit action. The boilerplate covers requirements such as monitoring, recording, reporting requirements, compliance responsibilities, and general requirements.

X. 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 beneficially or adversely affect any threatened or endangered species. In a letter dated December 17, 1998, the US Fish and Wildlife Service (USFWS) identified the following federally-listed species in the area of discharge:

1. Threatened
   None

2. Endangered Species
   • Bull trout (*Salvelinus confluentus*)

3. Proposed Species
   None

4. Candidate Species
   None

Additionally, the USF&WS expressed concern about white sturgeon (*Accipenser transmontanus*) and westslope cutthroat trout (*Oncorhynchys clarki lewisi*). While the species have no status under the Endangered Species Act, the USF&WS suggested that, in the context of ecosystem-level management, the EPA considers these species and their habitats in project planning and review.

In a letter dated December 7, 1998, the National Marine Fisheries Service (NMFS) identified the following threatened or endangered species under its jurisdiction in the area of discharge:

1. Threatened
   • Chinook salmon (*Oncorhynchus tshawytscha*)
   Snake River Fall Chinook Salmon
   Snake River Spring/Summer Chinook Salmon
   Lower Columbia River Chinook Salmon (Proposed Threatened)
   Upper Columbia River Chinook Salmon (Proposed Threatened)

- Steelhead (*Oncorhynchus mykiss)*
  Snake River Basin Steelhead
  Lower Columbia River Basin Steelhead
  Middle Columbia River Basin Steelhead (Proposed Threatened)
- Chum Salmon (*Oncorhynchus keta)*
  Columbia River Chum Salmon (Proposed Threatened)

2. Endangered
   - Sockeye Salmon (*Oncorhynchus nerka)*
     Snake River Sockeye Salmon
   - Steelhead (*Oncorhynchus mykiss)*
     Upper Columbia River Basin Steelhead

3. Proposed
   None

4. Candidate
   None

EPA has been consulting informally with the NMFS and the USFWS on the effects of the discharge on listed species. Based on these discussions, EPA may enter into formal consultation with the NMFS and the USFWS during the public comment period. The EPA has prepared a biological assessment (BA) to evaluate the impact of the permit on listed species. The BA was submitted to the NMFS and the USFWS as the basis for the consultation. These consultations must be completed prior to issuance of the permit. If the NMFS or the USFWS identifies any "reasonable and prudent measures" that must be included in the permit to protect listed species, EPA will incorporate these provisions in the final permit.

In evaluating the potential effects of Lewiston's permit on endangered species, EPA must consider cumulative effects of the discharge with other federal actions occurring in the same area. The most important of these is the recovery effort for endangered salmon on the Columbia River.

As part of the Columbia River salmon recovery effort, the Army Corps of Engineers is conducting a feasibility study on the Lower Snake River to identify and evaluate alternatives for improving juvenile salmon survival in the Lower Snake River. The NMFS will review the environmental impact statement (EIS), determine whether the preferred alternative is consistent with the recovery plan and issue its findings in a biological opinion.

One of the possibilities being considered in the EIS is breaching four dams (Little Goose, Lower Granite, Lower Monumental, and Ice Harbor) to restore natural flows to the Lower Snake River. (This alternative is also referred to as "drawdown" of the dams.) Restoration of natural flows would change conditions (for example, temperature) in the reach of the Clearwater River where Lewiston discharges, which would mean that some of the assumptions that were used to calculate the permit limits in the draft permit would no longer be valid (for example, assumptions regarding mixing zone dilution).

Based on discussions with the NMFS, if this alternative is chosen in the final EIS, it is unlikely to be implemented within the time frame of the permit. Therefore, it is premature to include specific requirements in the draft permit related to the drawdown at this time. However, the reopener clause in the draft permit states that the results of the NMFS' biological opinion will be considered new information that may be used to modify the permit. When the biological opinion on the EIS is issued, EPA will work with the NMFS to determine what studies or other conditions are appropriate to prepare for implementation of the EIS and whether those requirements should be required through a permit modification or through other mechanisms, such as a request for information under section 308 of the Clean Water Act.

B. State Certification

Section 401 of the Clean Water Act requires EPA to seek certification from the State that the permit is adequate to meet State water quality standards before issuing a final permit. The regulations allow for the State to stipulate more stringent conditions in the permit, if the certification cites the Clean Water Act or State law provisions upon which that condition is based. In addition, the regulations require a certification to include statements of the extent to which each condition of the permit can be made less stringent without violating the requirements of State law.

Part of the State's certification is authorization of a mixing zone. The water quality based calculations and limits in the proposed permit are based on a mixing zone of 25 percent of the 7Q10 and 1Q10 flows in the Clearwater River. If the State authorizes a different mixing zone in its final certification, EPA will recalculate the effluent limitations based on the dilution available in the final mixing zone. If the State does not certify the mixing zone, EPA will recalculate the permit limitations based on meeting water quality standards at the point of discharge.

Because Lewiston's discharge could affect Washington's waters, EPA must ensure that the discharge will not cause violations of Washington's water quality standards. EPA has been working with the Washington Department of Ecology to ensure that this permit is consistent with Washington's standards. In addition, EPA has sent a copy of

the draft permit to the Washington Department of Ecology and will address their comments prior to issuing the final permit. However, under the Clean Water Act, the authority to provide certification of the permit belongs to the State in which the discharge occurs. Therefore, the State of Washington will not provide EPA with a 401 certification.

C. Permit Expiration

This permit will expire five years from the effective date.

REFERENCES

EPA 1991. *Technical Support Document for Water Quality-based Toxics Control*. Office of Water Enforcement and Permits, Office of Water Regulations and Standards. Washington, D.C., March 1991. EPA/505/2-90-001.

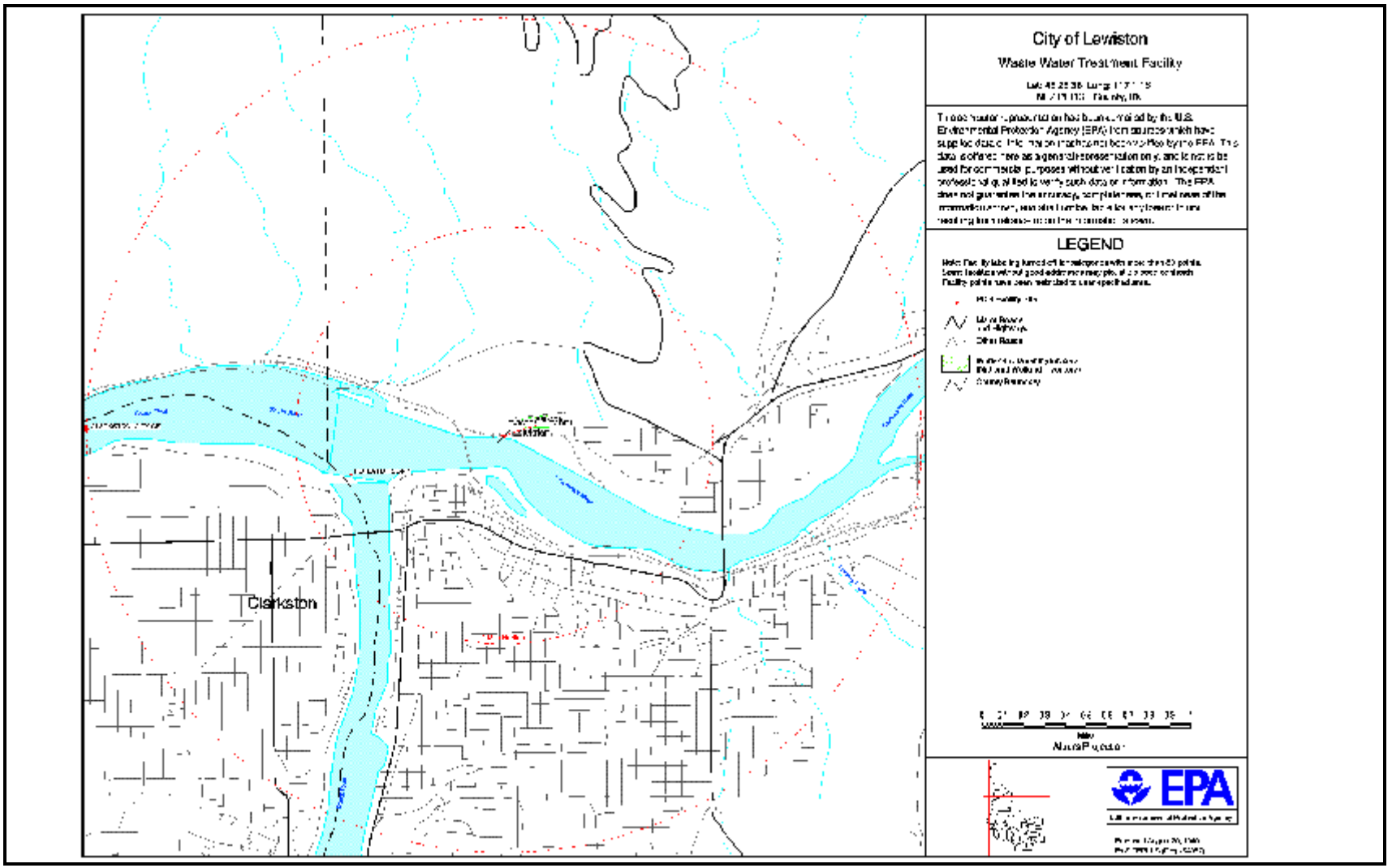

Figure 1: **LEWISTON FACILITY LOCATION**

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APPENDIX B - CITY OF LEWISTON WASTE STREAMS AND TREATMENT PROCESSES

I. Discharge Composition

In determining the pollutants present in the discharge and their maximum concentrations, EPA considered the City's NPDES application, effluent, and pretreatment sampling required under the 1986 permit. Table B-1 lists the maximum concentration of pollutants reported by the City as being detected in its discharge. The toxic and conventional pollutant categories are defined in the regulations (40 CFR 401.15 and 401.16, respectively). The category of nonconventional pollutants includes all pollutants not included in either of the other categories.

Table B-1: Pollutants Detected in Discharge

Pollutant Type	Parameter	Maximum Reported Concentration
Conventional	5-day Biochemical Oxygen Demand (BOD_5), weekly average	53 mg/l
	Total Suspended Solids (TSS), weekly average	53 mg/l
	pH, min - max	6.8 - 8.3
	Fecal Coliform Bacteria, weekly average	157 /100ml
Toxic	Arsenic, daily maximum[1]	8.0 µg/l
	Cadmium, daily maximum[1]	0.7 µg/l
	Chromium, daily maximum[1]	5.8 µg/l
	Copper, daily maximum[1]	30.0 µg/l
	Cyanide, daily maximum[1]	14 µg/l
	Lead, daily maximum[1]	6.7 µg/l
	Mercury, daily maximum[1]	<0.2 µg/l[2]
	Nickel, daily maximum[1]	17.0 µg/l
	Silver, daily maximum[1]	2.0 µg/l[2]
	Zinc, daily maximum[1]	105 µg/l
Non-conventional	Chlorine, daily maximum	3.0 mg/l

Table B-1: Pollutants Detected in Discharge		
Pollutant Type	**Parameter**	**Maximum Reported Concentration**
Footnotes 1 Metals concentrations are reported as total metals. 2 Because this concentration is below the method detection limit, zero was used in calculating "reasonable potential" for this parameter.		

II. Treatment Processes

Preliminary treatment:

- Flow measurement and recording
- Solids removal (bar screen)
- Dewatering and landfilling removed solids
- Preaeration/grit removal (grit chamber)

Primary treatment:

- Primary Clarification

Secondary treatment:

- Activated Sludge
- Secondary clarification
- Ultraviolet Disinfection (Chlorine System still available for emergency use)
- Flow measurement

Final Discharge

- Design flow - 5.71 mgd
- Maximum effluent flow (1/94-5/99) - 5.28 mgd
- Average effluent flow (1/94-5/99) - 4.42 mgd

Biosolids (sludge) handling

- Anaerobic digestion
- Belt filter press
- Aerated static pile composting

APPENDIX C - BASIS FOR EFFLUENT LIMITATIONS

I. Statutory and Regulatory Basis for Limits

Sections 101, 301(b), 304, 308, 401, 402, and 405 of the Clean Water Act provide the basis for the effluent limitations and other conditions in the draft permit. The EPA evaluates discharges with respect to these sections of the CWA and the relevant NPDES regulations to determine which conditions to include in the draft permit.

In general, the EPA first determines which technology-based limits must be incorporated into the permit. EPA then evaluates the effluent quality expected to result from these controls, to see if it could result in any exceedences of the water quality standards in the receiving water. If exceedences could occur, EPA must include water quality-based limits in the permit. The draft permit limits reflect whichever requirements (technology-based or water quality-based) are more stringent. A table of the limits that EPA is proposing in the draft permit is found in Section V.A of this fact sheet. This Appendix describes the technology-based and water quality-based evaluation for the City of Lewiston.

II. Technology-based Evaluation

The 1972 Clean Water Act required publicly owned treatment works (POTWs) to meet performance-based requirements based on available wastewater treatment technology. Under Section 301(b)(1)(B) of the Act, EPA was required to develop a performance level referred to as “secondary treatment” for POTWs.

Based on this statutory requirement, EPA developed secondary treatment regulations which are specified in 40 CFR Part 133.102. These technology-based regulations 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 (BOD_5), total suspended solids (TSS), and pH.

In addition to the federal technology requirements, the State of Idaho has technology-based requirements for fecal coliform bacteria for municipal sewage treatment plants. See section IV for a complete discussion of the limits for BOD_5, TSS, and pH.

III. Water Quality-based Evaluation

In addition to the technology-based limits discussed above, EPA evaluated the discharge to determine compliance with Section 301(b)(1)(C) of the Clean Water

Act. This section requires the establishment of limitations in permits necessary to meet water quality standards by July 1, 1977.

The regulations at 40 CFR 122.44(d)(1) implement section 301(b)(1)(C) of the Clean Water Act. These regulations require that NPDES 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 limits must be stringent enough to ensure that water quality standards are met, and must be consistent with any available wasteload allocation (WLA).

In determining whether water quality-based limits are needed and developing those limits when necessary, EPA uses the approach outlined below:

a. Determine the appropriate water quality criteria
b. Determine whether there is "reasonable potential" to exceed the criteria
c. If there is "reasonable potential", develop a WLA
d. Develop effluent limitations based on the WLA

The following sections provide a detailed discussion of each step. Appendix D provides example calculations to illustrate how these steps are implemented.

A. Determine Water Quality Criteria

The first step in developing water quality-based limits is to determine the applicable water quality criteria. For Idaho, the State water quality standards are found at IDAPA 16 Title 1, Chapter 2. Because Lewiston's discharge is immediately upstream from the State of Washington, their standards were also considered. Washington's water quality standards are found in the Washington Administrative Code at WAC 172-201A.

The applicable criteria are determined based on the beneficial uses of the receiving water. Beneficial uses for the Clearwater Arm of Lower Granite Dam Pool in Idaho are: domestic and agricultural water supply; cold water biota; and primary and secondary contact recreation. In Washington, the Snake River from the mouth to the Oregon/Washington/Idaho border is a Class A waterbody, protected for domestic, industrial, and agricultural water supply; stock watering; fish and shellfish; wildlife habitat; recreation; and commerce and navigation. In addition, Washington's standards contain a special condition for temperature for this water body (see Section IV.B, below).

For any given pollutant, different uses may have different criteria. To protect all beneficial uses, the permit limits are based on the most stringent of the water quality criteria applicable to those uses (see Table C-5).

B. Reasonable Potential Evaluation

To determine if there is "reasonable potential" to cause or contribute to an exceedence of the water quality criteria for a given pollutant, EPA compares applicable water quality criteria to the maximum expected receiving water concentrations for a particular pollutant. If the expected receiving water concentration exceeds the criteria, there is "reasonable potential" and a water quality-based effluent limit must be included in the permit.

EPA used the recommendations in Chapter 3 of the *Technical Support Document for Water Quality-based Toxics Control* (TSD, EPA 1991) to conduct this "reasonable potential" analysis for the City of Lewiston Wastewater Facility. An example reasonable potential (RP) analysis for total chlorine is found in Appendix D.

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

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

where,

C_d = receiving water concentration downstream of the effluent discharge (at the edge of the mixing zone)
C_e = maximum projected effluent concentration
= maximum reported effluent value X reasonable potential multiplier
Q_e = design flow
C_u = upstream concentration of pollutant
Q_d = receiving water flow downstream of the effluent discharge
= $Q_e + Q_u$
Q_u = upstream flow

Sections 1 through 3 below discuss each of the factors used in the mass balance equation to calculate C_d. Section 4 discusses the actual "reasonable potential" calculation for Lewiston's discharge.

1. Ambient Concentration

The ambient concentration in the mass balance equation is based on a reasonable worst-case estimate of the pollutant concentration upstream from Lewiston's discharge. For criteria that are expressed as maxima (for example, copper, ammonia), the 95th percentile of the ambient data is generally used as an estimate of worst-case. For criteria that are expressed as minima (for example, dissolved oxygen) the 5th percentile of the ambient data is generally used as an estimate of worst-case. These percentiles were calculated based on data collected by the USGS from the gage at Spalding, Idaho, approximately 11 miles upstream of Lewiston's discharge. The period of record is 1977 through March 1992. Where there were no data to determine the ambient concentration, zero was used in the mass balance equation. See Table C-2 in section 5, below, for a summary of ambient concentrations for specific pollutants.

2. Effluent Concentration

The maximum projected effluent concentration in the mass balance equation is represented by the 99th percentile, calculated using the statistical approach recommended in the TSD. The 99th percentile effluent concentration is calculated by multiplying the maximum reported effluent concentration by a reasonable potential multiplier. The reasonable potential multiplier accounts for uncertainty in the data. The multiplier decreases as the number of data points increases and variability of the data decreases. Variability is measured by the coefficient of variation (CV) of the data. When there are not enough data to reliably determine a CV, the TSD recommends using 0.6 as a default value. A partial listing of reasonable potential multipliers can be found in Table 3-1 of the TSD. EPA evaluated Lewiston's discharge monitoring reports for the past five years to determine the projected maximum effluent concentrations.

3. Upstream Flow

The upstream flow used in the mass balance equation is based on Idaho State water quality standards. The standards contain the following restrictions on chronic mixing zones:

> The size may be up to 25 percent of the stream width or 300 meters plus the horizontal length of the diffuser, whichever is less;

The mixing zone may be no closer to the 7-day, 10-year low flow (7Q10)[1] than 15 percent of the stream width; and

The mixing zone may not be more than 25 percent of the volume of the stream flow.

In addition to these restrictions, the standards specify that an acute mixing zone may be authorized inside the chronic mixing zone. The size of that mixing zone is limited to the "zone of initial dilution." Typically, EPA and the State have interpreted the acute mixing zone to be 25 percent of the 1-day, 10-year low flow (1Q10)[2].

Flows in the Clearwater Arm of Lower Granite Pool vary significantly. The highest flows occur during spring runoff, lasting through July or August. Flows gradually decrease through the summer so that by mid- to late August, they are below 10,000 cfs.

Table C-1 shows the flows used in developing permit limits and the dilutions calculated using 25 percent of those flows for the Clearwater River alone and for the Snake River below the confluence with the Clearwater River.

Table C-1: Design Flows and Dilution

	1Q10 Flow	Acute Dilution	7Q10 Flow	Chronic Dilution
		Q_e = 5.71 mgd		Q_e = 5.71 mgd
Clearwater	814 mgd	37:1	1005 mgd	45:1
Snake & Clearwater	7028 mgd	309:1	9218 mgd	405:1

[1]The 7-day, 10-year low flow is the 7-day average low flow that has a 10 percent chance of occurring in any given year. The 7Q10 was calculated based on the Log Pearson Type III distribution using United States Geological Survey (USGS) data (station #13342500) from 1974 through 1992.

[2]The 1-day, 10-year low flow is the 1-day low flow that has a 10 percent chance of occurring in any given year. The 1Q10 was calculated based on the Log Pearson Type III distribution using United States Geological Survey (USGS) data (station #13342500) from 1974 through 1992.

4. “Reasonable potential” calculations

   Table C-2 summarizes the data, multipliers, and criteria used to determine “reasonable potential” to exceed criteria. When all effluent data for a particular pollutant were below the detection limit (for example, mercury), EPA assumed that there was no reasonable potential. Section IV, below, provides a detailed discussion of the development of water quality-based effluent limitations for specific pollutants.

TABLE C-2: Reasonable Potential Calculations

Parameter	Maximum Reported Effluent Conc	Number of Samples	CV	Reasonable Potential Multiplier	Maximum Projected Effluent Conc (C_e)	Upstream Conc (C_u)	Projected Downstream Conc (C_d)	Most Stringent Criterion
Fecal Coliform Bacteria, #/100 ml	157	65	NA	NA	NA	0	—	50/100[1]
Arsenic, µg/l	8[2]	45	0.6	2.3	18.4	0.8035	1.19	50
Cadmium, µg/l	0.7[2]	45	0.1	1.2	0.84	0[3,5]	0.02	.37[3,4]
Chromium, µg/l	5.8[2]	45	0.4	1.8	10.44	0[3]	0.22	11[5]
Copper, µg/l	30[2]	45	0.4	1.5	45	0[3]	1.18	3.5[3,5]
Lead, µg/l	6.7[2]	45	0.4	1.8	12.6	0.175	0.48	.54[3,4]
Mercury, µg/l	0.0[2,6]	45	NA	NA	NA	NA	NA	0.012
Nickel, µg/l	17[2]	45	0.5	2.0	34	0	10.5	49[3,5]
Silver, µg/l	2.0[2]	45	7.0	2.6	5.2	0	0.12	0.32[3,4,5]
Zinc, µg/l	105[2]	45	0.2	1.3	136	11.395	14.1	32[4]
Chlorine, µg/l	3000.0	65	0.5	1.5	4500	0	100[7]	11
pH, std units	6.8 -8.3[8]	N/A[9]	N/A[9]	N/A[9]	N/A[9]	6.65 - 8.1	---	6.5 - 9.5

Footnotes

1 Fecal coliform standards are seasonal, with 50/100 ml applying in the summer and 100/100 ml applying in the winter.
2 Effluent metals concentrations are reported as total recoverable metal.
3 The criterion for this parameter is based on effluent hardness. See section IV.F for further discussion.
4 Metals criteria (except arsenic, lead and mercury) are expressed as dissolved metal.
5 Upstream and downstream concentrations for these parameters are reported as dissolved metal.
6 Concentrations are below the method detection limit. Therefore, zero was used in the calculations.
7 Maximum projected concentration indicates “reasonable potential” to exceed the chronic water quality criteria.
8 These values are the minimum and maximum pH reported by the City of Lewiston.
9 See the discussion on pH in Section IVG.

C. Wasteload Allocation Development

Once EPA has determined that a water quality-based limit is required for a pollutant, the first step in developing a permit limit is development of a wasteload allocation (WLA) for the pollutant. A WLA is the concentration (or loading) of a pollutant that the permittee may discharge without causing or contributing to an exceedence of water quality standards in the receiving water. WLAs for this permit were calculated based on a mixing zone and assimilative capacity.

1. Mixing Zone

Where the state authorizes a mixing zone for the discharge, the WLA is calculated as a mass balance, based on the available dilution, background concentrations of the pollutant(s), and the water quality criteria. The mass balance equation is the same as that used to calculate reasonable potential, with the acute or chronic criterion substituted for C_d and the WLA substituted for C_e.

Because the different criteria (acute aquatic life, chronic aquatic life, human health) apply over different time frames and may have different mixing zones, it is not possible to compare them directly to determine which criterion results in more stringent limits. The acute criteria are applied as one-hour averages and may have a smaller mixing zone, while the chronic criteria are applied as four-day averages and may have a larger mixing zone. To allow for comparison, each criterion is statistically converted to a long-term average WLA. This conversion is dependent upon the coefficient of variation (CV) of the effluent data and the probability basis used. The probability basis corresponds to the percentile of the estimated concentration. EPA uses a 99^{th} percentile probability basis for calculating a long-term average, as recommended in the TSD. Based on this analysis, the most stringent long-term average WLA is used to calculate the permit limits. Section D below discusses the permit limit derivation procedure.

2. Analysis of Assimilative Capacity

Permit limits must ensure that a discharge does not cause or contribute to an exceedence of water quality standards. When a water body exceeds the criteria and the State has not done a TMDL, this requirement typically means meeting criteria at the point of discharge. However, for some

pollutants, meeting criteria at “end-of-pipe” will not ensure that downstream water quality standards are met. For example, meeting the dissolved oxygen criterion at the point of discharge does not ensure that the downstream water will also meet the criteria. Oxygen demanding substances in the discharge can cause dissolved oxygen depressions far downstream even though the effluent meets the dissolved oxygen criteria. For such pollutants, an analysis must be conducted that looks at downstream effects of the discharge.

D Permit Limit Derivation

Once the WLA has been developed, EPA applies the statistical permit limit derivation approach described in Chapter 5 of the TSD to obtain daily maximum and monthly average permit limits. This approach takes into account effluent variability (through the CV), sampling frequency, and the difference in time frames between the monthly average and daily maximum limits.

The daily maximum limit is based on the CV of the data and the probability basis, while the monthly average limit is dependent on these two variables and the monitoring frequency. As recommended in the TSD, EPA used a probability basis of 95 percent for monthly average limit calculation and 99 percent for the daily maximum limit calculation. As with the reasonable potential calculation, when there were not enough data to calculate a CV, EPA assumed a CV of 0.6 for both monthly average and daily maximum calculations. Appendix D provides an example permit limit calculation.

E. Antidegradation

In addition to water quality-based limitations for pollutants that could cause or contribute to exceedences of numeric or narrative criteria, EPA must consider the State’s antidegradation policy. This policy is designed to protect existing water quality when it is better than that required to meet the standard and to prevent water quality from being degraded below the standard when existing quality at the level of the standard.

For waters that are at the level of the standard (known as “Tier 1" waters), the antidegradation policy requires that water quality standards continue to be met. For waters with better quality than the standards (known as “high quality” or “Tier 2" waters), antidegradation requires that the State find that allowing lower water quality is necessary to accommodate important economic or social development before any lowering of water quality is authorized. States may

also designate waters as “Tier 3," in which case no lowering of water quality is allowed.

In Idaho, waters that are listed in the State standards as “Special Resource Waters” are considered Tier 2 waters. In addition, the State may designate other waters as Tier 2. In its pre-certification, DEQ indicated that the Snake and Clearwater Arms of the Lower Granite Pool are Tier 1 waters. Therefore, increases in pollutant loadings are allowed, provided that the permit limits ensure that water quality standards continue to be met.

IV. Pollutant-specific Analysis

This section discusses the way in which the steps in Sections II and III were implemented to determine reasonable potential for pollutants of concern and, where appropriate, to establish limits in the draft permit.

A. Dissolved Oxygen, Biochemical Oxygen Demand and Total Suspended Solids

The Lewiston WWF is a publicly owned treatment works (POTW). As such, the facility is subject to the technology-based requirements for oxygen-demanding substances and solids. Oxygen-demanding substances are controlled by limitations on five-day biochemical oxygen demand (BOD_5), as specified in 40 CFR 133.102(a)(1)-(3).

In addition to limitations for BOD_5, 40 CFR 133.102 establishes limitations for total suspended solids (TSS) for POTWs. The limits are for both concentration and percent removal. These limits have been incorporated into the draft permit.

Table C-3 outlines the secondary treatment requirements that are applicable to Lewiston’s discharge. In addition, the table contains the loading limits required by 40 CFR 122.45(f). Mass-based limits are derived by multiplying the design flow (5.71 mgd) by the concentration limit and a conversion factor of 8.34.

Table C-3: BOD_5 and TSS Limitations					
Parameter	**Average Monthly Limitation**		**Average Weekly Limitation**		**Percent Removal (%)**
	mg/l	lb/day	mg/l	lb/day	
BOD_5	30	1430	45	2145	85
TSS	30	1430	45	2145	85

In Idaho, the most restrictive water quality standard for dissolved oxygen that applies to this segment of the Clearwater River is for the protection of cold water biota. This standard establishes a minimum dissolved oxygen concentration of 6 mg/l. In Washington, the applicable standard for Class A waters is a minimum of 8.0 mg/l. Washington interprets its water quality standard to allow a cumulative dissolved oxygen decrease of 0.2 mg/l due to human activity, based on the assumption that 0.2 mg/l is an insignificant decrease.

Data collected by the Potlatch Corporation as required by its 1992 permit show that, while the Snake River upstream of the discharge meets Idaho's dissolved oxygen standard, it occasionally violates Washington's standard. In addition, there is concern that Lower Granite Pool sometimes violates Washington's standards. A 1990 study by Falter indicated that the likely cause of the dissolved oxygen depression is algal blooms. The State of Washington plans to review data and determine whether a TMDL is appropriate for Lower Granite Pool.

Evaluating compliance with the dissolved oxygen standard is more complicated than the process outlined in section III.B. That analysis assumes that the concentration of a pollutant in the water column is determined solely by the ambient concentration, the dilution available, and the concentration in the discharge. The concentration of dissolved oxygen in the water column is determined by a number of other factors, including the exchange of oxygen between the air and water, photosynthesis, algal respiration, sediment oxygen demand, and the oxygen demand caused by degradation of pollutants in effluent from the city of Lewiston and other dischargers in the area (measured as 5-day biochemical oxygen demand, or BOD_5). In addition, the analysis is complicated by the fact that BOD_5 in effluent typically is not completely degraded by the time it reaches the edge of the discharge's mixing zone.

Therefore, the analysis must extend beyond the edge of the mixing zone, often several miles downstream, before the maximum impact from the discharge is seen.

Modeling conducted by EPA in developing BOD_5 limits for Potlatch Corporation's NPDES permit showed that the cumulative dissolved oxygen decrease from the discharges from the cities of Lewiston and Clarkston and Potlatch was 0.15 mg/l or less. This decrease allows at least a 25 percent margin of safety for compliance with Washington's standard of 0.2 mg/l dissolved oxygen depletion. This margin of safety accounts for uncertainty regarding the assumptions used in the calculation (for example, the use of zero for some of the parameters) and allows for potential growth for municipal sewage treatment plants or new industry in the area.

B. Fecal Coliform Bacteria

In establishing fecal coliform limits for Lewiston's draft permit, EPA considered three requirements: 1) Idaho's technology-based requirement for POTWs; 2) Idaho's water quality standard for primary recreation; and 3) Idaho's water quality standard for secondary recreation. Table C-4 provides a summary of the requirements and the times of year that the requirements are applicable.

Table C-4: Idaho Fecal Coliform Standards

Basis	Period of Applicability	Average Monthly (#/100 ml)[1]	Average Weekly (#/100 ml)[1]	Maximum Daily (#/100 ml)
Technology standard for POTWs (IDAPA 16.01.02420.05)	Year-round	---	200	---
Water Quality Criterion for Primary Contact Recreation (IDAPA 16.01.02250.01.a)	May 1- September 30	50	---	500[2]
Water Quality Criterion for Secondary Contact Recreation (IDAPA 16.01.02250.01.b)	Year-round	200	---	800[3]

Table C-4: Idaho Fecal Coliform Standards				
Basis	**Period of Applicability**	**Average Monthly (#/100 ml)[1]**	**Average Weekly (#/100 ml)[1]**	**Maximum Daily (#/100 ml)**

Footnotes:
1 For fecal coliform bacteria, the average is defined as the geometric mean, based on a minimum of 5 samples.
2 The standard for primary contact recreation also states that no more than 10 percent of the samples can exceed 200/100ml.
3 The standard for secondary contact recreation also states that no more than 10 percent of the samples can exceed 400/100ml.

The draft permit incorporates the most stringent of the fecal coliform requirements for each season. The draft permit does not include 200/100 ml as a monthly average permit limit in the winter because the weekly average limit of 200/100 ml will ensure that the monthly requirement is met. Table C-5 presents the draft permit limits for fecal coliform.

Table C-5: Fecal Coliform Limits				
Period of Applicability	**Average Monthly**	**Average Weekly**	**Maximum Daily**	**Value Not to Be Exceeded by >10% of Samples**
May 1 - Sept 30	50	200	500	200
Oct 1 - Apr 30	---	200	800	400

C. Total Residual Chlorine

The State acute and chronic water quality criteria for total residual chlorine for protection of aquatic life (IDAPA 16.01.02250.02.a.iii) are 19 µg/l and 11 µg/l, respectively. In addition, EPA uses a technology-based effluent limitation of 500 µg/l, 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 (500 µg/l) chlorine residual is maintained after 15 minutes of contact time. A treatment plant that provides adequate chlorination contact time can meet the 500 µg/l limit on a monthly average basis.

Water quality-based chlorine limits were derived using the state water quality standards and the methodology described in Section III. The derivation of the water quality-based chlorine limit is included in Attachment D of this fact sheet. Based on this derivation, EPA determined that the water quality-based limitations are more stringent than the technology-based limit described above. Therefore, the draft permit contains a monthly average limitation of 340 µg/l, and a daily maximum limitation of 700 µg/l.

In 1998, the primary disinfection system was converted to UV (ultra-violet ray). The chlorine system has been retained for emergency backup purposes. Therefore, the chlorine limits and monitoring requirements in the proposed permit are only applicable when the chlorine system is actually in use.

D. Nutrients

Although the Clearwater River is not currently listed as water quality limited for nutrients in either Idaho or Washington, some studies in the past have indicated that algal growth may be contributing to dissolved oxygen depressions in Lower Granite Pool. Therefore, the proposed permit includes monitoring requirements for phosphorus and nitrite as N to enable the states and EPA to evaluate the potential for water quality concerns in future permits.

E. Metals

The 1986 permit had effluent limitations and monitoring requirements for copper, lead, nickel, and zinc. This monitoring has been discontinued in the draft permit because of changes to the city's pretreatment program. On December 15, 1992 , local limits were put in place for Lewiston's significant industrial users (SIUs), including Blount. In 1993, Blount Industries completed its wastewater treatment plant. These changes have resulted in significant, consistent reductions in the amounts of metals and other toxic pollutants discharged by the city. Data collected by Lewiston since 1986 confirm these reductions, indicating no reasonable potential to cause or contribute to an exceedence of water quality criteria for these metals at the edge of the mixing zone. Levels of metals in the influent will continue to be tracked by the regular monitoring and reporting conducted by SIUs under the city's pretreatment program.

F. pH

In addition to limits on BOD_5 and TSS, 40 CFR 133.102 requires that effluent pH be within the range of 6.0 to 9.0 standard units for POTWs. The State water quality standards for protection of aquatic life (IDAPA 16.01.02250.02) require that ambient pH be in the range of 6.5 to 9.5 standard units.

Because pH is a logarithmic scale, the statistical approach in the TSD cannot be used to establish reasonable potential. Instead, the technology-based limits were compared directly to the criteria to determine whether there was reasonable potential to exceed the criteria at the edge of the mixing zone.

For the upper end of the pH range, the technology-based limit is clearly protective of water quality at the edge of the mixing zone. For the lower pH limit, there are not sufficient data to determine whether the technology-based limit is protective. Ambient pH is a function of effluent and ambient pH, flow, alkalinity (buffering capacity), and temperature. Effluent data for temperature and alkalinity are not available. Therefore the proposed permit includes a lower pH limit of 6.5 to ensure compliance with state water quality standards. It also includes monitoring requirements for temperature and alkalinity to allow the calculation of water quality based limits in future permits.

G. Temperature

The most stringent of Idaho's temperature criteria applicable to the Snake and Clearwater Rivers is for protection of cold water biota. This criterion specifies a maximum temperature of 22^{O}C (71.6^{O}F) at any time, with a maximum temperature of 19^{O}C (66.2^{O}F) as a daily average. Washington's standards include the following special conditions for the Snake River:

> Below Clearwater River (river mile 139.3). Temperature shall not exceed 20^{O}C due to human activities. When natural conditions exceed 20^{O}C, no temperature increase will be allowed which will raise the receiving water temperature by greater than 0.3^{O}C, nor shall such temperature increases, at any time, exceed t=34/(T+9)
>
> where "t" represents the maximum permissible temperature increase measured at the mixing zone boundary; and "T" represents the background temperature as measured at a point or points unaffected by the discharge and representative of the highest ambient water temperature in the vicinity of the discharge.

Sufficient data are not available to evaluate the need for temperature limits in the Lewiston permit. The proposed permit includes both effluent and ambient monitoring for temperature. Collection of these data will enable the EPA to perform the reasonable potential calculation for temperature when the Lewiston permit is next reissued.

H. Total Ammonia (as N)

Low concentrations of ammonia can be toxic to freshwater fish, particularly salmonids. Un-ionized ammonia (NH_3) is the principal toxic form of ammonia. The ammonium ion (NH_4^+) is much less toxic. The relative percentages of these two forms of ammonia in the water vary as the temperature and pH vary. As the pH and temperature increase, the percentage of ammonia that is in the un-ionized form increases, causing increased toxicity.

Although it is the un-ionized form that is toxic, the criteria are expressed as total ammonia. As effluent mixes with receiving water, the temperature and pH change, making it difficult to predict how much of the total ammonia in the discharge will convert to the un-ionized form.

Sufficient data are not available to evaluate the need for ammonia limits in the Lewiston permit. The proposed permit includes both effluent and ambient monitoring for ammonia, temperature, and pH. Collection of these data will enable the EPA to perform the reasonable potential calculation for ammonia when the Lewiston permit is next reissued.

I. Floating, Suspended or Submerged Matter

The State water quality standards (IDAPA 16.01.02200.05) 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 or that may impair designated beneficial uses. This condition was included in the 1986 permit and has been retained in the draft permit.

REFERENCES

EPA. *1996. The Metals Translator: Guidance for Calculating a Total Recoverable Permit Limit from a Dissolved Criterion* EPA 823-B-96-007, June 1996.

APPENDIX D - SAMPLE EFFLUENT LIMIT CALCULATIONS

NPDES Permit Limit Calculation for Chlorine

Step 1: Determine the appropriate criteria

1A. Determine the uses

The Clearwater Arm of Lower Granite Dam Pool is protected by the State of Idaho for the following uses: domestic and agricultural water supply, cold water biota, and primary and secondary recreation. In addition the Nez Perce Tribe whose reservation is immediately upstream of Lewiston are subsistance fishers. The Pool is one of their primary sources of fish.

1B. Determine the most stringent criterion to protect the uses

The most stringent chlorine criterion associated with these uses is for protection of cold water biota. The acute (CMC) and chronic criteria (CCC) are 19 µg/l and 11 µg/l, respectively.

Step 2: Determine whether there is "reasonable potential" to exceed the criteria

2A. Determine the "reasonable potential" multiplier

The "reasonable potential" multiplier is based on the coefficient of variation (CV) of the data and the number of data points. Where there are fewer than 10 data points to calculate a CV, the TSD recommends using 0.6 as a default value. In this case, there were 65 data points, with a CV of 0.5. Using the equations in section 3.3.2. of the TSD, the "reasonable potential" multiplier (RPM) is calculated as follows:

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

where,
p_n = the percentile represented by the highest concentration
n = the number of samples

$$p_n = (1-0.99)^{1/65}$$
$$p_n = 0.93$$

This means that the largest value in the data set of 65 data points is greater than the 93rd percentile.

Next, the ratio of the 99th percentile to the 93rd percentile is calculated, based on the equation:

$$C_p = \exp(z\sigma - 0.5\sigma^2)$$

where,

σ^2 = $\ln(CV^2 + 1)$

CV = coefficient of variation
= 0.5

σ^2 = $\ln(0.5^2 + 1)$
= 0.22

z = normal distribution value
= 2.326 for the 99th percentile
= 1.476 for the 93rd percentile

C_{99} = $\exp(2.326*0.47 - 0.5*0.22)$
= 2.67

C_{93} = $\exp(1.476*0.47 - 0.5*0.22)$
= 1.79

RPM= C_{99}/C_{93}
= 2.67/1.79

RPM = 1.5

2B. Calculate the concentration of the pollutant at the edge of the mixing zone

There is reasonable potential to exceed criteria if the maximum projected concentration of the pollutant at the edge of the mixing zone exceeds the criterion. The maximum projected concentration is calculated from the following equation:

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

where,

C_d = receiving water concentration at the edge of the mixing zone
C_e = maximum projected effluent concentration

= maximum reported effluent concentration * reasonable potential multiplier (3000*1.5 = 4500)
Q_e = maximum effluent flow (5.71mgd)
C_u = upstream concentration of pollutant (0 mg/l)
Q_u = upstream flow (814 mgd for acute, 1005 mgd for chronic)
%MZ = % of upstream flow allowed for mixing zone (25%)

For the acute criterion, use the acute flow

$$C_d = \frac{(4500*5.71) + (0*814*0.25)}{5.71 + (814*0.25)}$$

C_d = 123 µg/l

For the chronic criterion, use the chronic flow

$$C_d = \frac{(4500*5.71) + (0*1005*0.25)}{5.71 + (1005*0.25)}$$

C_d = 100 µg/l

The concentrations at the edges of the acute and chronic mixing zones are greater than the criteria, therefore a limit must be included in the permit.

Step 3: Calculate the wasteload allocations

Wasteload allocations (WLAs) are calculated using the same mass balance equation used to calculate the concentration of the pollutant at the edge of the mixing zone. However, C_d becomes the CMC or CCC and C_e is replaced by the acute or chronic WLA. The equation is rearranged to solve for the WLA, becoming:

$$WLA_a = \frac{CCC*Q_u * \%MZ + CCC*Q_e - Q_u*C_u*\%MZ}{Q_e}$$

For the acute criterion

$$WLA_a = \frac{0.019*814*0.25 + 0.019*5.71 - 814*0*0.25}{5.71}$$

WLA_a = 696 µg/l

For the chronic criterion

$$WLA_c = \frac{0.011*1005*0.25 + 0.011*5.71 - 1005*0*0.25}{5.71}$$

WLA_c = 495 µg/l

The WLAs are converted to long-term average concentrations, using the following equations from EPA's *Technical Support Document for Water Quality-based Toxics Control* (TSD):

$$LTA_a = WLA_a * \exp[0.5\sigma^2 - z\sigma]$$

$$LTA_c = WLA_c * \exp[0.5\sigma_4^2 - z\sigma_4]$$

where,

σ^2 = $\ln(CV^2 + 1)$
= 0.22
σ_4^2 = $\ln(CV^2/4 + 1)$
= 0.06
z = 2.326 for 99th percentile probability basis

$LTA_a = 0.696 * \exp[0.5 * 0.22 - 2.326 * 0.47]$

LTA_a = 0.261 mg/l

$LTA_c = 0.495 * \exp[0.5 * 1.063 - 2.326 * 0.235]$

LTA_c = 0.288 mg/l

The LTAs are compared and the most stringent is used to develop the daily maximum and monthly average permit limits. In this case, the acute LTA is the most stringent.

Step 4: Derive the maximum daily (MDL) and average monthly (AML) permit limits

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

$$MDL = LTA_a * \exp[z\sigma - 0.5\sigma^2]$$

where:

σ^2 = $\ln(CV^2 + 1)$
= 0.22

z = 2.326 for 99th percentile probability basis
CV = coefficient of variation

MDL= 0.261 * exp[2.326 * 0.469 - 0.5 *0.22]

MDL= 0.696 mg/l = 700 µg/l, rounded to two significant digits

$AML= LTA_a * \exp[z\sigma - 0.5\sigma^2]$

where:

σ^2 = $\ln(CV^2/n + 1)$
= 0.031
z = 1.645 for 95th percentile probability basis
CV = coefficient of variation
n = number of sampling events required per month (8)

AML= 0.261 * exp[1.645 * 0.175 - 0.5 * 0.031]

AML= 0.340 mg/l = 340 µg/l