Fact Sheet

U.S. Environmental Protection Agency
Region 10

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

Applicant: City of Culdesac
Wastewater Treatment Plant
100 6th Street
Culdesac, Idaho

Permit No.: ID0024490

Public Comment Period
Starts: August 5, 2002
Ends: September 5, 2002

Technical Contact
Name: Kristine Koch
Phone: (206)553-6705
1-800-424-4372 ext.6705 (within Alaska, Idaho, Oregon, and Washington)
Email: koch.kristine@epa.gov

EPA's Tentative Determination
EPA proposes to reissue an NPDES permit to the City of Culdesac Wastewater Treatment Plant. The draft permit places conditions on the discharge of pollutants from the Wastewater Treatment Plant to Lapwai Creek. 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 facility and proposed discharge;
- a listing of proposed effluent limitations, and other conditions;
- a map and description of the discharge location; and
- detailed technical material supporting the conditions in the permit.

Public Comment and Public Hearings

Persons wishing to comment on the tentative determinations contained in the draft permit must do so, in writing, by the end date of this public comment period. All comments should include the name, address, and telephone number of the commenter, reference the facility name and NPDES permit number, and include a concise statement of the exact basis of any comment and the relevant facts upon which it is based.

Persons wishing to request that a public hearing be held may do so, in writing, by the end date of this public comment period. A request for a public hearing must state the nature of the issues to be raised, reference the facility name and NPDES permit number, and include the requester's name, address, and telephone number.

All written comments and requests should be submitted to the attention of the Director, Office of Water at the following address:

U.S. EPA, Region 10
1200 Sixth Avenue, M/S OW-130
Seattle, Washington 98101

Comments may also be submitted electronically to the technical contact listed above.

After the Public Notice expires, and all comments have been considered, EPA's Director for the Office of Water in Region 10 will make a final decision regarding permit reissuance. If no significant comments are received, the tentative conditions in the draft permit will become final, and the permit will become effective upon reissuance. If comments are received, EPA will address the comments and reissue the permit. The permit will become effective not less than 30 days after the reissuance date, unless the permit is appealed to the Environmental Appeals Board within 30 days.

Availability of Documents
The following documents are available at the EPA Region 10 Office, 1200 Sixth Ave, Seattle, Washington, between 8:30 a.m. and 4:00 p.m., Monday through Friday:

- permit application and any supporting data submitted by the permittee
- draft permit
- fact sheet
- documents referenced in fact sheet
- other documents (e.g., meeting reports, correspondence, trip reports, telephone memos, calculations, etc.)
- state of Idaho preliminary comments

Copies of the draft permit and fact sheet are also available at:

EPA Region 10 website: **www.epa.gov/r10earth.htm**

EPA Idaho Operations Office
1435 North Orchard Street
Boise, Idaho 83706
(206)378-5746

Peck Public Library
217 N Main St
Peck, ID 83545

State Certification
EPA is requesting that the Idaho Department of Environmental Quality certify this NPDES permit for the City of Culdesac, under section 401 of the Clean Water Act. The State provided preliminary comments on the draft permit, and those comments have been incorporated into this draft permit.

Persons wishing to comment on the State's intent to certify this permit should submit written comments by the end date of this public comment period to the Administrator of IDEQ, with a copy to EPA, at the following address:

Administrator, State of Idaho
Department of Environmental Quality
Lewiston Regional Office
1118 "F" Street
Lewiston, Idaho 83501

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

I. APPLICANT

Facility Name:	City of Culdesac Wastewater Treatment Plant
NPDES Permit Number:	ID0024490
Facility Location Address:	Main Street and Canyon Road Intersection
Facility Mailing Address:	100 6th Street Culdesac, Idaho
Facility Contact:	Shannon Marcell, City Clerk
Contact Phone Number:	(208)843-5483

II. FACILITY INFORMATION

A. Facility Description

The city of Culdesac is located in the Clearwater Basin, Nez Perce County, Idaho, on the Nez Perce Reservation. The city owns and operates a wastewater treatment plant that serves a current population of 506. A map has been included in Appendix A which shows the location of the treatment plant and the discharge location(s).

The Culdesac facility receives domestic wastewater from residential and commercial sources. The collection system has no combined stormwater with sanitary wastewater sewers. The current treatment plant utilizes a 0.05 mgd facultative lagoon system. The facility consists of the following unit operations: comminutor, two lagoon treatment cells, chlorine contact chamber, three intermittent sand filters, and two infiltration and percolation ditches. The treatment plant is expected to provide equivalent to secondary treatment and disinfection of wastewater prior to discharge in Lapwai Creek. Sludge generated at this facility is removed from the system periodically in a liquid state and land applied at a location approximately 10 miles south of the treatment plant. A process flow diagram has been included in Appendix A which shows the processes of the treatment plant.

B. Background Information

The city of Culdesac was issued an NPDES permit in 1976 that expired in 1981. The city reapplied for a permit in 1984. A new permit was not reissued to the city because they constructed two infiltration and percolation trenches that eliminated their need for an NPDES permit since the city no longer discharged to waters of the U.S. The city is now proposing to upgrade the facility and needs to discharge their treated effluent to Lapwai Creek, therefore, requiring an NPDES permit. The treatment plant improvements are designed to a flow rate of 0.055 mgd based on a 2018 projected population. The improvements include removal of comminutor, reconstruction of lagoon treatment cells, addition of a course bubble static tube aeration system, reconstruction of the sand filter beds, new generator building, new blower equipment, new chlorination system, and reconstruct infiltration and percolation trenches.

III. RECEIVING WATER

A. Outfall Location

The treated effluent from the City of Culdesac POTW will be discharged from outfall 001, located at latitude N 46°22'30" and longitude W 116°40', to Lapwai Creek.

B. Description of Receiving Water

Lapwai Creek is located in the Clearwater Subbasin to the Clearwater hydrologic basin (HUC 17060306). This creek flows from Winchester Lake to Sweetwater Creek.

There is no information about the flow regime of Lapwai Creek in the vicinity of the discharge. The nearest USGS gaging station is station #13342450 located on Lapwai Creek near Lapwai, Idaho, at Latitude 46°25'36", Longitude 116°48'15". Statistical analysis of available flow information for this segment of Lapwai Creek indicate a 7Q10 flow of 1.0 cubic feet per second (cfs) and a 1Q10 flow of 1.17 cfs, or 0.65 mgd and 0.75 mgd, respectively. Since there are several creeks and streams that influence the flow between Culdesac and Lapwai, this flow data cannot be used to develop effluent limits for this permit, except to show that low flows are expected to be lower than those at the Lapwai gaging station.

C. Water Quality Standards

The State’s water quality standards are composed of use classifications, numeric and/or narrative water quality criteria, and an anti-degradation policy. The use classification system designates the beneficial uses that each water body is expected to achieve (such as cold water biota, contact recreation, etc.). 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.

The Idaho *Water Quality Standards and Wastewater Treatment Requirements* (IDAPA 16.01.02.120.08.C-8) protect Lapwai Creek for the following beneficial use classifications: cold water biota, and primary contact recreation. The criteria that the state of Idaho has deemed necessary to protect the beneficial uses for this water body are provided in the basis for effluent limitations (see Appendix B).

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

> Tier 1 - Protects existing uses and provides the absolute floor of water quality.
>
> 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 wastes can be lowered, there must be an antidegradation review consisting of: (1) a finding that is necessary to accommodate important economical 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.

Lapwai Creek is a tier 1 water body, therefore, no antidegradation analysis is required by the State. This means that, if water quality is at or above the level necessary to meet the water quality standards, increased permit limits cannot be authorized unless they do not cause degradation or if the State makes the determination that it is necessary.

Because the effluent limits in the draft permit are based on current water quality criteria or technology-based limits that have been shown to not cause or contribute to an exceedence of water quality standards the discharges as authorized in the draft permit will not result in degradation of the receiving water.

D. Water Quality Limited Segment

A water quality limited segment is any water body, or definable portion of a water body, where it is known that water quality does not meet applicable water quality standards. The segment of Lapwai Creek where the discharge is proposed to occur does not meet water quality standards for sediment, nutrients, DO, flow, habitat alterations, and pathogens. Downstream of the proposed discharge, Lapwai Creek discharges into the Clearwater River which does not meet water quality standards for total dissolved gasses.

Section 303(d) of the Clean Water Act (CWA) requires states to develop a Total Maximum Daily Load (TMDL) management plan for water bodies determined to be water quality limited. A TMDL documents the amount of a pollutant a water body can assimilate without violating a state's water quality standards and allocates that load to known point sources as waste load allocations (WLAs) and nonpoint sources as load allocations (LAs).

Federal regulations require effluent limits in NPDES permits to be consistent with a TMDL that has been prepared by the state and approved by EPA. A TMDL for Lapwai Creek is not scheduled to be completed until 2008, therefore, the TMDL will not affect this permit. The requirements of the TMDL will be incorporated into a future permit once EPA has approved the TMDL.

IV. PROPOSED EFFLUENT LIMITATIONS

A. Basis for Permit Effluent Limits

In general, the Clean Water Act requires that the effluent limits for a particular pollutant be the more stringent of either technology-based limits or water quality-based 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 water body are being met. The basis for the proposed effluent limits in the draft permit are provided in Appendix C.

B. Proposed Effluent Limitations

Table 1 and the following list summarizes the effluent limitations that are in the draft permit:

1. The effluent pH range must be between 6.5 and 9.0 standard units (s.u.).
2. For BOD_5 and TSS, the monthly average percent removal shall not be less than 65 percent.
3. There must be no discharge of floating, suspended, or submerged matter of any kind in concentrations causing nuisance or objectionable conditions or that may impair designated beneficial uses.

Table 1: Proposed Effluent Limitations for Outfall 001

Parameter	Unit	Average Monthly	Average Weekly	Maximum Daily
BOD_5	mg/l	45	65	---
	lbs/day	21	30	---
TSS	mg/l	70	100	---
	lbs/day	32	46	---
Chlorine, Total Residual	µg/L	9[1]	---	17[1]
	lbs/day	0.0041	---	0.0082
E. Coli Bacteria	colonies/100 ml	126[2]	---	406[3]

Footnotes:
1. The effluent limits for chlorine are not quantifiable using EPA approved analytical methods. The permittee will be in compliance with the effluent limits provided the total chlorine residual is at or below the compliance evaluation level of 0.100 mg/L (100 µg/L).
2. Based on the geometric mean of all samples taken during the month.
3. Based on any single sample.

V. PROPOSED MONITORING REQUIREMENTS

A. Basis for Effluent and Receiving Water Monitoring

Section 308 of the Clean Water Act and federal regulation 40 CFR 122.44(i) require effluent monitoring in NPDES permits to determine compliance with effluent limitations. Section 308 also allows additional effluent and receiving water monitoring to gather 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 on Discharge Monitoring Reports to EPA.

B. Proposed Effluent Monitoring

Monitoring frequencies are based on the nature and effect of the pollutant, as well as a determination of the minimum sampling necessary to adequately monitor the facility's performance. Table 2 presents the proposed effluent monitoring requirements for the draft permit.

Table 2: Proposed Effluent Monitoring for Outfall 001

Parameter	Unit	Location[1]	Sample Frequency	Sample Type
BOD_5	mg/l	influent and effluent	1/week	24-hour composite
	% removal			calculation[2]
	lbs/day			calculation[3]
TSS	mg/l	influent and effluent	1/week	24-hour composite
	% removal			calculation[2]
	lbs/day			calculation[3]
Flow	mgd	effluent	continuous	recording
E. Coli Bacteria	colonies/100 ml	effluent	1/week	grab[4]
pH	s.u.	effluent	5 days/ week	grab
Temperature	°C	effluent	5 days/ week	grab
Total Residual Chlorine	:g/l	effluent	5 days/ week	grab
	lbs/day			calculation[3]
Total Phosphorus as P	mg/l	effluent	1/month	24-hour composite
Total Ammonia as N	mg/l	effluent	1/month	24-hour composite
Total Nitrate an N	mg/l	effluent	1/month	24-hour composite

Table 2: Proposed Effluent Monitoring for Outfall 001				
Parameter	Unit	Location[1]	Sample Frequency	Sample Type

Footnotes:
1 Influent and effluent samples must be collected during the same 24-hour period.
2 Percent removal is calculated using the following equation:
(influent - effluent) ÷ influent.
3 Maximum daily loading is calculated by multiplying the concentration in mg/l by the average daily flow and a conversion factor of 8.34.
4 Average monthly limit is calculated as the geometric mean of all samples collected during the month. See Part VI for the definition of geometric mean.

C. Proposed Receiving Water Monitoring

Receiving water monitoring is needed to evaluate if the effluent is causing or contributing to an instream excursion of the water quality criteria. The information gathered under this permit will be used to evaluate the effluent for the permit reissuance. The proposed receiving water monitoring requirements for the draft permit are provided in Table 4.

The draft permit proposes that the permittee work with the Lewiston IDEQ Regional Office and the Nez Perce Tribe to establish the appropriate upstream monitoring location in the Middle Fork Clearwater River.

Table 3: Proposed Receiving Water Monitoring				
Parameter	Unit	Location	Sample Frequency[1]	Sample Type[2]
Temperature	°C	upstream	1/month	composite
pH	s.u.	upstream	1/month	composite
Total Nitrate as N	mg/l	upstream	1/month	composite
Total Phosphorus as P	mg/l	upstream	1/month	composite
Total Ammonia as N	mg/l	upstream	1/month	composite

Footnote:
1. Monitoring must occur in the first and fourth years of the permit.
2. Composite samples consist of three grab samples, one collected from each side of the river and one collected from the middle of the river.

VI. SPECIAL CONDITIONS

A. Quality Assurance Plan (QAP)

The federal regulation at 40 CFR 122.41(e) requires the permittee to develop a Quality Assurance Plan (QAP) to ensure that the monitoring data submitted is accurate and to explain data anomalies if they occur. The permittee is required to develop a QAP within 60 days of the effective date of the final permit and implement the QAP within 120 days of the effective date of the final permit. The QAP must consist of standard operating procedures the permittee must follow for collecting, handling, storing and shipping samples, laboratory analysis, and data reporting.

B. Best Management Practices (BMP) 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) manual. These measures are important tools for waste minimization and pollution prevention.

The draft permit requires the City of Culdesac to incorporate appropriate BMPs into their O&M manual for their POTW within 180 days of permit the effective date of the permit. Specifically, the City of Culdesac should 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 in the facility's current O&M manual, the City of Culdesac need only reference the O&M manual in the BMP plan. The BMP plan must be revised as new practices are developed for the facility.

C. Sewage Sludge

Section 405 of the Clean Water Act requires NPDES permits to include sewage sludge use and disposal standards unless these requirements are included in another permit. However, the sewage sludge standards at 40 CFR Part 503 are self-implementing which means the permittee is required to comply with the them whether or not they have an NPDES permit that includes sewage sludge requirements. Since EPA Region 10 has recently decided to separate waste water and sewage sludge permitting, sewage sludge requirements are not included in this draft permit. EPA will issue a sludge only permit to this facility at a later date.

Until the issuance of a sludge only permit, the facility's sludge activities will continue to be subject to the national sewage sludge standards and any requirements of the State. The Part 503 regulations require that the permittee have a current sewage sludge application on file with EPA. The City of Culdesac is working with EPA to complete their sludge application prior to commencement of their discharge from the newly constructed facility.

VII. OTHER LEGAL REQUIREMENTS

A. State Certification Requirements

Since this permit authorizes the discharge to Idaho State waters, section 401 of the Clean Water Act 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 to ensure that the permit complies with water quality standards.

B. Standard Permit Provisions

Sections II, III, and 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.

C. Endangered Species Act of 1973

Section 7 of the Endangered Species Act requires Federal agencies to consult with the National Marine Fisheries Service (NMFS) and the U. S. Fish and Wildlife Service (USFWS) if their actions could beneficially or adversely affect any threatened or endangered species. EPA has determined that the reissuance of this permit will not affect any of the threatened or endangered species in the vicinity of the discharge. See Appendix E for further details.

D. Essential Fish Habitat

Essential fish habitat (EFH) is the waters and substrate (sediments, etc.) necessary for fish to spawn, breed, feed, or grow to maturity. The Magnuson-Stevens Fishery Conservation and Management Act (January 21, 1999) requires EPA to consult with the National Marine Fisheries Service (NMFS) when a proposed discharge has the potential to adversely affect (reduce quality and/or quantity of) EFH. The EPA has tentatively determined that the reissuance of this permit will not affect any EFH species in the vicinity of the discharge, therefore consultation is not required for this action. This fact sheet and the draft permit will be submitted to NMFS for review during the public notice period. Any recommendations received from NMFS regarding EFH will be considered prior to final reissuance of this permit.

E. Permit Expiration

Section 402(1)(B) of the Clean Water Act require that NPDES permits are issued for a period not to exceed five years, therefore, this permit will expire five years from the effective date of the permit.

VIII. REFERENCES

EPA, 1991. *Technical Support Document for Water Quality-based Toxics Control*. U.S. Environmental Protection Agency, Office of Water, 3PA\505\2-90-001, March, 1991.

EPA Region 10, 1996. *EPA Region 10 Guidance for WQBEL Below Analytical Detection/Quantitation Level*, U.S. Environmental Protection Agency, Region 10, Office of Water, March 22, 1996.

IDAPA, 1996. *Idaho Administrative Procedures Act 16, Title 01, Chapter 02: Water Quality Standards and Wastewater Treatment Requirements*. Idaho Department of Environmental Quality, IDAPA 16.01.02.

APPENDIX A

WASTE WATER TREATMENT PLANT LOCATION AND PROCESS FLOW DIAGRAM

Figure A-1: Sewage Treatment Plant Location

Figure A-2: Process Flow Diagram

APPENDIX B

BASIS FOR EFFLUENT LIMITATIONS

This appendix discusses the basis for the proposed effluent limits in the draft permit. This section includes: an overall discussion of the statutory and regulatory basis for development of effluent limitations (Section I); a general discussion of mass versus concentration for limits (Section II) discussion of the development of technology-based effluent limits (Section III) and water quality-based effluent limits (Section IV); and a summary of the effluent limits proposed for this draft permit (Section V). A discussion of the development of water quality-based effluent limitations is provided in Appendix C.

I. STATUTORY AND REGULATORY BASIS FOR LIMITS

Section 101, 301(b), 304, 308, 401, 402, and 405 of the Clean Water Act (CWA) provide the basis for the effluent limitations and other conditions in the draft permit. The EPA evaluates the discharge(s) with respect to these section of the CWA and the relevant National Pollutant Discharge Elimination System (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. The EPA then evaluates the effluent quality expected to result from these controls to see if it could result in any exceedances of the water quality standards in the receiving water. If exceedances could occur, EPA must include water quality-based limits in the permit. The proposed permit limits will reflect whichever requirements (technology-based or water quality-based) are more stringent.

II. MASS VERSUS CONCENTRATION LIMITS

The regulations at 40 CFR 122.45(f)(1) require that all permit limits, standards, or prohibitions be expressed in terms of mass units (e.g., pounds, kilograms, grams) except under the following conditions:

- For pH, temperature, radiation, or other pollutants that cannot appropriately be addressed by mass limits;
- When applicable standards and limitations are expressed in terms of other units of measurement; or
- If in establishing technology-based permit limitations on a case-by-case basis limitations based on mass are infeasible because the mass or pollutant cannot be related to a measure of production. The limitations,

however, just ensure that dilution will not be used as a substitute for treatment.

While the regulations require that limitations be expressed in terms of mass, a provision is included at 40 CFR 122.45(f)(2) that allows limits to be expressed in additional units (e.g., concentration units). Where limits are expressed in more than one unit, the permittee must comply with both.

The basis for expressing limitations in terms of concentration as well as mass is to encourage proper operation of treatment units. In the absence of concentration limits, a permittee would be able to increase its effluent concentration (i.e., reduce its level of treatment) during low flow periods and still meet its mass-based effluent limits. Therefore, concentration limits discourage the reduction in treatment efficiency during low flow periods, and require proper operation of treatment units at all times. The calculations for mass-based limits is provided in Appendix C.

III. TECHNOLOGY-BASED EVALUATION

A. Statutory Basis for Technology-based Limits

There are two general approaches for developing technology-based effluent limits for sewage wastewater: (1) using national secondary treatment requirements and (2) using Best Professional Judgment (BPJ) on a case-by-case basis. The intent of a technology-based effluent limitation is to require a minimum level of treatment for industrial point sources based on currently available treatment technologies while allowing the discharger to use any available control technique to meet the limitations.

The CWA requires Publicly Owned Treatment Works (POTWs) to meet performance-based requirements from 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, 1997. EPA applies the most stringent technology-based requirements (national or state) to the POTW’s discharge.

Where national secondary treatment technology-based requirements have not been developed or did not consider specific pollutant parameters in discharges, the same performance-based approach is applied to a specific facility based on the permit writer’s BPJ. In some cases, technology-based effluent limits based on national secondary treatment requirements and BPJ may be included in a single permit.

B. National Secondary Treatment Requirements

The secondary treatment regulations developed by EPA 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 (BOD_5), total suspended solids (TSS), and pH. EPA has established the minimum level of effluent quality attainable by secondary treatment in 40 CFR 133.102.

The definition of "secondary treatment" includes special considerations regarding lagoons. The regulations allow less stringent limits for facilities using lagoons. These alternative limits are called "treatment equivalent to secondary treatment" (40 CFR 133.101(g), and 40 CFR 133.105(d)). However, allowing these less stringent limits can only be done when it has been determined that the more stringent secondary treatment requirements cannot be met through proper operation and maintenance of the facility. The state of Idaho ha

The national technology-based effluent limits applicable to the City of Culdesac POTW are provided in Table B-1:

Table B-1. National Technology-based Effluent Limits for POTWs

Pollutant Parameter	Duration	Limitation
BOD_5	30-day average	45 mg/l
	7-day average	65 mg/l
	30-day percent removal	65%
TSS	30-day average	45 mg/l
	7-day average	65 mg/l
	30-day percent removal	65%
pH	in any measurement	6.0 - 9.0

C. State of Idaho Sewage Wastewater Discharge Restrictions

In addition to EPA's secondary treatment regulations, the state of Idaho has minimum treatment requirements for the discharge of sewage wastewater (IDAPA 58.01.02.420). The State requires all sewage wastewater, which applies to POTWs, discharged into surface waters of the State to meet the general treatment requirements at IDAPA 58.01.02.420.01. The State also has alternative treatment requirements that apply to facilities which provide 65% BOD removal using a lagoon as the principal treatment process and cannot meet the State's secondary treatment requirements. These alternative treatment requirements are located at IDAPA 58.01.02.420.02.

Idaho's technology-based treatment requirements are summarized in Table B-2.

Table B-2. Idaho's Technology-based Effluent Limits for Lagoon Treatment		
Pollutant Parameter	Duration	Limitation
BOD_5	30-day average	45 mg/l
	30-day percent removal	65%
TSS	30-day average	70 mg/l[1]
	30-day percent removal	65%

Footnote:

1 The federal regulations at 40 CFR 133.103(c) allows the Regional Administrator or the State Director, subject to EPA approval, to adjust the minimum levels of effluent quality for equivalent to secondary treatment for TSS to conform with lagoon systems when the facility is properly operating and maintaining the facility and the lagoon system cannot meet the federal equivalent to secondary requirements of 40 CFR 133.105.

The federal regulations at 40 CFR 122.45(d)(2) require permits for POTWs to contain average weekly and average monthly discharge limitations. A 30-day average limit of 70 mg/l TSS would equate to a 7-day average 100 mg/l TSS. This 7-day average was determined by evaluating the expected range of variability in the effluent for BOD_5 (i.e., dividing the 7-day average by the 30-day average) to obtain a ratio of 1.4 and then multiplying the 30-day average TSS limit by that ratio. The calculations for this process are:

$$Ratio = \frac{7 - day BOD_5 limit}{30 - day BOD_5 limit} = \frac{65}{45} = 1.4$$

$$30-day\,TSS\,limit \times Ratio = 70 \times 1.4 = 100\,mg/L\,TSS\,7-day\,limit$$

D. State of Idaho Disinfection Requirements for Sewage Wastewater Treatment Plant Effluent.

The state of Idaho wastewater treatment requirements (IDAPA 16.01.02.420.05.a) specify that the E. coli concentration in treated effluent not exceed a geometric mean of 126 colonies per 100 milliliters (ml) based on a minimum of five samples taken every three to five days over a 30-day period. A single sample must not exceed 406 colonies per 100 ml

Table B-3. Idaho's Technology-based Effluent Limitations for Disinfection

Pollutant Parameter	Sample Frequency	Duration	Limitation
E. coli bacteria	5/month	30-day geometric mean	126 colonies/100 ml
		single sample	406 colonies/100 ml

E. Best Professional Judgement for Total Residual Chlorine

The City of Culdesac POTW uses chlorine to disinfect the effluent. The Water Pollution Control Federation's *Chlorination of Wastewater* (1976) states that a treatment plant that provides adequate chlorination contact time can meet the 0.5 mg/l limit on a monthly average bases. The NPDES regulations at 40 CFR 122.45(d) require permit limits for publicly owned treatment works be expressed as average monthly limits (AMLs) and average weekly limits (AWLs) unless impracticable. The average weekly limit is expressed as 1.5*AML, or in this case, 0.75 mg/L.

IV. WATER QUALITY-BASED EVALUATION

A. 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 regulations (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 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.

In determining whether water quality-based limits are needed and developing those limits when necessary, EPA follows guidance in the *Technical Support Document for Water Quality-based Toxics Control* (TSD) (EPA, 1991). The water quality-based analysis consists of four steps: (1) determine the appropriate water quality criteria that applies to each discharge, (2) determine if there is "reasonable potential" for the discharge to exceed the criteria in the receiving water, (3) develop a WLA if there is reasonable potential, and (4) develop effluent limitations based on the WLA.

B. Reasonable Potential Determination

1. Reasonable Potential Based on Numeric Criteria

EPA evaluates the effluent for each pollutant of concern that has chemical-specific numeric criteria. The determination of "reasonable potential" to cause or contribute to an exceedance of water quality criteria for a given pollutant (and therefore the need for a water quality-based effluent limit), is made by comparing the maximum projected receiving water concentration (i.e., the expected concentration at the edge of the mixing zone or end-of-pipe when no mixing zone is authorized) to the criteria for that pollutant. If the projected receiving water concentration exceeds the criteria, there is "reasonable potential," and a limit must be included in the permit. EPA uses the recommendations in Chapter 3 of the TSD (EPA, 1991) to conduct this "reasonable potential" analysis.

2. Reasonable Potential Based on Narrative Criteria

The EPA must establish levels that are protective of the narrative criteria (40 CFR 122.44(d)(1)(vi)) in the absence of State numeric criteria and when there is reasonable potential for the discharge to cause or contribute to an excursion that results in the violation of the narrative water quality standard. In order to determine this, EPA must use the best information available to characterize the conditions of the receiving water body and the point source discharge (effluent).

3. Reasonable Potential Analysis

a. E. Coli Bacteria

The Idaho State water quality standards require surface waters of the state designated for recreation use not to exceed a concentration of 406 E. coli organisms/100 mL in a single sample or a geometric mean of 126 E. coli organisms/100 mL based on a minimum of 5 samples taken every 3 to 5 days over a 30-day period.

In order to determine reasonable potential, the technology-based effluent limitation is converted to E. coli using the ratio of 126 E. coli to 200 fecal coliform. The techology-based limit is then used as the maximum projected effluent concentration and 0 is assumed for the background concentration. The analysis indicates that WQBELs are not necessary for the sanitary discharge.

b. pH

The Idaho State water quality standards require surface waters of the state designated for aquatic life to maintain a hydrogen ion concentration (pH) in the range of 6.5 to 9.0 standard units.

The technology-based effluent range of pH is 6.0 - 9.0 standard units. Since IDEQ has not proposed a mixing zone for pH, EPA has determined that there is reasonable potential for this discharge and more stringent limits than technology are necessary to protect water quality.

c. Floating, Suspended or Submerged Matter/Residues

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. EPA has determined that there is reasonable potential for this discharge to violate this water quality standard.

d. Ammonia

The Idaho State water quality standards require surface waters of the state designated for aquatic life, cold water, not to exceed a one-hour average concentration or a four-day average concentration of un-ionized ammonia as N. EPA uses the tables in the Gold Book (EPA 440/5-86-001) to use the total ammonia concentrations that are equivalent to each unionized ammonia concentration. These concentrations are dependent upon the pH and temperature of Lapwai Creek, however, the data is not available. Additionally, there is no data regarding the concentration of ammonia in the effluent.

However, the state of Idaho water quality standards indicate that the water quality of the Middle Fork Clearwater River maintain a pH in the range of 6.5 to 9.0 and the temperature must not exceed 22°C and maintain a maximum daily temperature of 19°C. Applying a temperature of 22°C and the pH range of 6.5 to 9.0 would give minimum one-hour average concentration (or acute criterion) in the range of 0.83 to 25 mg/L total ammonia as N. Likewise, applying a temperature of 19°C and the pH range of 6.5 to 9.0 would give a minimum four-day average concentration (or chronic criterion) range of 0.14 to 1.63 mg/L. The facility is designed such that the ammonia concentration is less that 1.0 mg/L. Since this is in the range of acceptable ammonia toxicity for Lapwai Creek, EPA's initial determination is that there is not reasonable potential to violate this water quality standard.

e. Dissolved Oxygen

The Idaho State water quality standards require surface waters of the state designated for aquatic life, cold water, to exceed a dissolved oxygen concentration of 6.0 mg/L at all times. EPA has determined that there is not reasonable potential to violated this water quality standard.

f. Excess Nutrients

The Idaho State water quality standards require surface waters of the state to be free from excess nutrients that can cause visible slime growths or other nuisance aquatic growths impairing designated beneficial uses. EPA has determined that there is not reasonable potential for excess nutrients in this discharge.

g. Total Residual Chlorine

The Idaho State water quality standards require surface waters of the state designated for aquatic life not to exceed a one-hour average concentration of 19 µg/L total residual chlorine or a four-day average concentration of 11 µg/L. In order to determine reasonable potential, the technology-based effluent limitation is used as the maximum projected effluent concentration and 0 is assumed for the background concentration. In the absence of data to evaluate the true variability of the effluent, EPA has used a value of 0.6 for the coefficient of variation (CV) in the statistical calculations for WQBELs. A CV of 0.6 is a conservative estimate that assumes relatively high variability in the final permit limit. This assumption is consistent with the methodology in the TSD. The analysis shows that there is reasonable potential to violate this water quality standard.

C. Procedure for Deriving Water Quality-based Effluent Limits

1. Development of Wasteload Allocations

Once EPA has determined that a water quality-based limit is required for a pollutant, the first step in developing the permit limit is development of a wasteload allocation (WLA) for the pollutant. A WLA is the concentration (or loading) of a pollutant that may be discharged without causing or contributing to an exceedence of water quality standards in the receiving water. The WLAs and permit limits are derived based on guidance in the TSD (EPA, 1991). Wasteload allocations for this permit have been determined in one of the following ways:

a. TMDL-based Wasteload Allocation

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

Section 303(d) of the CWA requires states to develop TMDLs for water bodies that will not meet water quality standards after the imposition of technology-based effluent limitations to ensure that these waters will come into compliance with water quality standards. Federal regulations at 40 CFR 122.44(d)(vii) require effluent limitations in NPDES permits to be consistent with the assumptions and requirements of any available wasteload allocation prepared by the State and approved by EPA.

Even though Lapwai Creek is as an impaired water body under 303(d) of the Clean Water Act, a TMDL has not been developed for this water body. Therefore, there are no wasteload allocations from a TMDL for this facility.

b. Mixing Zone-based Wasteload Allocation

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

Since the state of Idaho has not authorized a mixing zone for any of the parameters that had reasonable potential to violate water quality standards, there are no wasteload allocations that are based on a mixing zone.

c. Criterion-based Wasteload Allocation

In some cases, the State may not or cannot authorize a mixing zone. This can happen in instances where the receiving water already exceeds the criteria or the receiving water flow is too low to provide dilution. When the State does not authorize a mixing zone, the criterion becomes the wasteload allocation. Establishing the criterion as the wasteload allocation ensures that the permittee will not contribute to an exceedance of the criteria. WLA for pH and total residual chlorine are based on a criterion.

2. Water Quality-based Permit Limit Derivation Procedure

After the WLAs have been established, they are converted to effluent limitations. The method used to derive the permit limits must be consistent with the nature of the WLA.

For toxic pollutants, the TSD recommends converting the WLA to a long-term average concentration (LTA) before an appropriate effluent limitation can be established for the effluent. Methods of converting a non-toxic WLA to an effluent limitation are determined on a case-by-case basis and depend upon the exposure period.

The LTA is the performance level the plant would need to maintain in order to meet each requirement. When there are two criteria, acute and chronic, the LTA for each criterion is calculated and then compared to determine the most stringent LTA. The most stringent LTA concentration for each parameter is then converted to effluent limits. This statistical approach takes into account effluent variability, sampling frequency, and water quality standards.

3. Derivation of Water Quality-based Effluent Limits

a. Floating, Suspended or Submerged Matter/Residue

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. The permittee will be required to visually inspect the receiving water downstream of the discharge and report whether or not floating solids, foam, or an oily sheen was present.

b. pH

The draft permit incorporates the more stringent water quality-based pH range of 6.5 to 9.0 standard units.

c. Total Residual Chlorine

The draft permit incorporates the more stringent water quality-based effluent limits of 9 :g/L average monthly limit and 17 :g/L average daily limit.

V. SUMMARY OF PROPOSED EFFLUENT LIMITS

The following table compares the technology-based effluent limits applicable to this discharge with the water quality-based effluent limits for this discharge and provides the most stringent of the two sets of limits as the proposed effluent limits in the draft permit.

Table B-4. Comparison of Technology-based and Water Quality-based Effluent Limits

Parameter	Units	Technology-based Effluent Limits			Water Quality-based Effluent Limits			Proposed Effluent Limits for Draft Permit		
		AML[1]	AWL[2]	MDL[3]	AML	AWL	MDL	AML	AWL	MDL
BOD_5[4]	mg/L	45	65	---	---	---	---	45	65	---
TSS[5]	mg/L	70	100	---	---	---	---	70	100	---
pH	s.u.	6.0 - 9.0			6.5 - 9.0			6.5 - 9.0		
E. coli bacteria	#/100 mL	126[6]	---	406[7]	126[6]	---	406[7]	126[6]	---	406[7]
Total Residual Chlorine	:g/L	500	750	---	9	---	17	9	---	17

Footnotes:
1 AML is the average monthly limit.
2 AWL is the average weekly limit.
3 MDL is the maximum daily limit
4 BOD_5 is the 5-day biochemical oxygen demand.
5 TSS is total suspended solids.
6 Based on the geometric mean of all samples collected during the month.
7 Based on any single sample.

APPENDIX C

WATER QUALITY-BASED EFFLUENT LIMIT CALCULATIONS

This appendix discusses the calculations for the proposed water quality-based effluent limits in the draft permit. This section includes: a discussion of the calculations used to determine reasonable potential to cause or contribute to a violation of water quality standards (Section I); a discussion of the calculations used to develop wasteload allocations (Section II); a discussion of the calculations used to develop water quality-based effluent limits (Section IV); and the calculations used for total residual chlorine (Section V).

I. Reasonable Potential Calculations

To determine if there is “reasonable potential” to cause or contribute to an exceedence of water quality criteria for a given pollutant (and therefore whether a water quality-based effluent limit is needed), for each pollutant present in a discharge, EPA compares the maximum projected receiving water concentration to the criteria for that pollutant. If the projected receiving water concentration exceeds the criteria, there is “reasonable potential”, and a limit must be included in the permit. EPA uses the recommendations in Chapter 3 of the TSD to conduct this “reasonable potential” analysis. This section discusses how reasonable potential is evaluated.

A. Maximum Projected Receiving Water Concentration

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

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

where,

C_d = maximum projected receiving water concentration
C_e = maximum projected effluent concentration
C_u = receiving water upstream concentration
Q_e = effluent flow
Q_u = receiving water upstream flow
Q_d = receiving water flow downstream of the effluent discharge = $(Q_e + Q_u)$

If a mixing zone is allowed and solving for C_d, the mass balance equation becomes :

$$C_d = \frac{[C_e Q_e + C_u (Q_u \cdot MZ)]}{[Q_e + (Q_u \cdot MZ)]} \qquad \text{(Equation 2)}$$

where, MZ is the percent dilution in the mixing zone based on receiving water flow.

Where no mixing zone is allowed,

$$C_d = C_e. \qquad \text{(Equation 3)}$$

B. Maximum Projected Effluent Concentration (C_e)

To better characterize the effects of effluent variability and reduce uncertainty in the process of deciding whether to require an effluent limit, EPA utilizes the statistical approach recommended in the TSD to project the 99th percentile of the effluent data. Since the monitoring data represents a subset of the true effluent concentrations, it is necessary to project the 99th percentile of the effluent data by multiplying the highest concentration in an effluent sample by a multiplier that takes into account effluent variability (i.e., the coefficient of variation or CV) and uncertainty in the effluent data. The 99th percentile concentration of the effluent is calculated using the following equation:

$$C_e = MEC \times RPM \qquad \text{(Equation 4)}$$

where,
MEC = maximum measured effluent concentration
RPM = reasonable potential multiplier.

When there are not enough data to reliably determine a CV (less than 10 data points), the TSD recommends using 0.6 as a default value. Once the CV of the data is determined, the RPM is determined using the statistical methodology discussed in Section 3.3 of the TSD (alternately, Table 3-1 of the TSD may be used). If all the data was below detect, EPA assumes a RPM of 1.0.

$$RPM = \frac{\exp(2.326F - 0.5F^2)}{\exp(z_p F - 0.5F^2)} \qquad \text{(Equation 5)}$$

where,
F^2 = ln (CV^2 + 1)
CV = coefficient of variation
z_p = statistical z-score for p_n

p_n = percentile of highest concentration = $(1 - 0.99)^{1/n}$
n = number of samples

C. Upstream Receiving Water Concentration (C_u)

The upstream receiving water concentration in the mass balance equation is based on a reasonable worst-case estimate of the pollutant concentration upstream from the discharge point. Where sufficient data exists, the 95th percentile of the receiving water data is generally used as an estimate of worst-case. When no data exists, EPA assumes an upstream concentration of zero.

D. Upstream Flow (Q_u)

The upstream flow used in the mass balance equation depends upon the criterion that is being evaluated. In accordance with the applicable federal and state regulations and the TSD guidance, the critical low flows used to evaluate compliance with the water quality criteria are:

- The 1-day, 10-year low flow (1Q10) is used for the protection of aquatic life from acute effects. It represents the lowest daily flow that is expected to occur once in 10 years.
- The 7-day, 10-year low flow (7Q10) is used for protection of aquatic life from chronic effects. It represents the lowest 7-day average flow expected to occur once in 10 years.
- The 30-day, 5-year low flow (30Q5) is used for the protection of human health and agricultural uses from non-carcinogens. It represents the 30-day average flow expected to occur once in 5 years.
- The harmonic mean flow is a long-term average flow and is used for the protection of human health and agricultural uses from carcinogens. It is the number of daily flow measurements divided by the sum of the reciprocals of the flows.

E. Mixing Zone (MZ)

Mixing zones are defined as a limited area or volume of water where the discharge plume is progressively diluted by the receiving water. Water quality criteria may be exceeded in the mixing zone as long as acutely toxic conditions are prevented from occurring and the applicable existing designated uses of the water body are not impaired as a result of the mixing zone. Mixing zones are allowed at the discretion of the State, based on the State waster quality standards regulations.

The Idaho water quality standards at IDAPA 58.01.02.060 allow for the use of mixing zones after a biological, chemical, and physical appraisal of the receiving water and the discharge. The standards allow water quality within a mixing zone to exceed chronic water quality criteria so long as chronic water quality criteria are met at the boundary of the mixing zone. Acute water quality criteria may be exceeded within a zone of initial dilution inside the chronic mixing zone.

F. Effluent Flow (Q_e)

The effluent flow used in the mass balance equation is the design flow for the facility.

II. Development of Wasteload Allocations (WLAs)

Once EPA has determined that a water quality-based effluent limit is required for a pollutant, the first step in deriving the effluent 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 and permit limits are derived based on guidance in the TSD (EPA, 1991). WLAs for this permit were established in two ways: based on a mixing zone (for most metals) and based on meeting water quality criteria at “end-of-pipe” (for pH).

WLAs are calculated for each parameter for each criterion. Where the state authorizes a mixing zone for the discharge, the WLA is calculated as a mass balance, based on the available dilution, background concentration of the pollutant, and the water quality criterion.

Since the different criteria (acute aquatic life, chronic aquatic life, human health, agriculture) apply over different time frames and may have different mixing zones, it is not possible to compare the criteria, or the WLAs developed from the criteria, directly to determine which criterion results in the most stringent limits. For comparison between aquatic life criteria, human health criteria, and agricultural criteria, effluent limits must be derived for each, and the most stringent effluent limits apply to the discharge.

WLAs are calculated using the same mass balance equation used in the reasonable potential evaluation (see Equation 1) although, C_d becomes the criterion and C_e the WLA. Making these substitutions, Equation 1 is rearranged to solve for the WLA (or C_e), becoming:

$$WLA = C_e = \frac{[\text{criterion} \cdot (Q_e + (Q_u \cdot MZ)] - [C_u\,(Q_u \cdot MZ)]}{Q_e} \qquad \text{(Equation 6)}$$

Where no mixing zone is allowed, the criterion becomes the WLA (see Equation 6). Establishing the criterion as the WLA ensures that the permittee does not contribute to an exceedence of the criteria.

$$WLA = \text{criterion.} \qquad \text{(Equation 7)}$$

III. Derivation of Water Quality-based Effluent Limits

Because many criteria for protection of aquatic life have two criteria, acute and chronic, the effluent limits for each requirement yields different effluent treatment requirements that cannot be compared to each other without calculating the long-term average performance level the facility would need to maintain in order to meet each requirement. Therefore, EPA develops effluent limits for aquatic life protection by statistically converting the WLAs to long-term average (LTA) concentrations and using the most stringent LTA to develop effluent limitations for protection of aquatic life. This procedure will allow the facility to design a treatment system for one level of effluent toxicity - the most limiting toxic effect.

A. Long-term Average Concentrations (LTAs) for Aquatic Life Criteria

The conversion of a WLA to a LTA is dependent upon the coefficient of variation (CV) of existing effluent data and the selected probability distribution of the effluent. The probability distribution corresponds to the percentile of the estimated effluent concentration. EPA uses a 99th percentile probability distribution for calculating a long-term average, as recommended in the TSD (EPA, 1991). The following equation from Chapter 5 of the TSD is used to calculate the LTA concentrations (alternately, Table 5-1 of the TSD may be used):

$$LTA = WLA \cdot \exp[0.5\sigma^2 - z\sigma] \qquad \text{(Equation 8)}$$

where,

σ^2 $= \ln(CV^2 + 1)$ for acute aquatic life criteria
$= \ln(CV^2/4 + 1)$ for chronic aquatic life criteria
CV = coefficient of variation
z = 2.326 for 99^{th} percentile occurrence probability.

B. Effluent Limits Based on Aquatic Life Criteria

Once the LTA concentration is calculated for each criterion, the most stringent LTA concentration is then used to develop the maximum daily (MDL) and monthly average (AML) permit limits. The MDL is based on the effluent variability (i.e., CV of the data) and the selected probability distribution, while the AML is dependent upon these two variables as well as the monitoring frequency. As recommended in the TSD, EPA used the

95^{th} percentile as the selected probability distribution for the AML calculation and the 99^{th} percentile for the MDL calculation. The MDL and AML are calculated using the following equation from the TSD (alternately, Table 5-2 of the TSD may be used):

$$\text{MDL or AML} = \text{LTA} @ \exp[zF - 0.5F^2] \qquad \text{(Equation 9)}$$

for the MDL:

F^2 = $\ln(CV^2 + 1)$
z = 2.326 for the 99^{th} percentile occurrence probability

for the AML:

F^2 = $\ln(CV^2/n + 1)$
n = number of sampling events required per month
z = 1.645 for the 95^{th} percentile occurrence probability.

C. Effluent Limits Based on Human Health and Agricultural Criteria

Developing permit limits for pollutants affecting human health agriculture is somewhat different from setting limits for aquatic life because the exposure period is generally longer than one month and the average exposure, rather than the maximum exposure, is usually of concern. Because compliance with permit limits is normally determined on a daily or monthly basis, it is necessary to set human health and agriculture permit limits that meet a given WLA for every month.

If the procedures described previously for aquatic life protection were used for developing permit limits for human health and agriculture, both MDLs and AMLs would exceed the WLA necessary to meet criteria concentrations in the receiving water. Thus, even if a facility was discharging in compliance with permit limits calculated using these procedures, it would be possible to constantly exceed the WLA.

In addition, the statistical derivation procedure is not applicable to exposure periods more than 30 days. Therefore, the recommended statistical approach for setting water quality-based limits for human health and agriculture protection is to set the AML equal to the WLA, and then calculate the MDL based on effluent variability and the number of samples per month using the multipliers provided in Table 5-3 of the TSD. These multipliers are the ratio of the MDL to the AML as calculated by the following relationship:

$$\frac{\text{MDL}}{\text{AML}} = \frac{\exp[z_m F - 0.5F^2]}{\exp[z_a F_n - 0.5F_n^2]} \qquad \text{(Equation 10)}$$

where,

F_n^2 = ln (CV^2/n + 1)
F^2 = ln (CV^2 + 1)
CV = coefficient of variation
n = number of samples per month
z_m = 2.326 for the 99th percentile exceedance probability of the MDL
z_a = 1.645 for the 95th percentile exceedance probability of the AML.

As stated above, EPA used the 95th percentile as the selected probability distribution for the AML and the 99th percentile for the MDL in this calculation.

V. Total Residual Chlorine Calculations

Reasonable Potential Analysis for Acute Aquatic Life Criterion			
Acute Aquatic Life	Nomenclature	Value	Units
criterion		**0.019**	mg/L
projected receiving water concentration $C_d = (Q_eC_e+Q_uC_u)\div(Q_e+Q_u)$	C_d	**0.5**	mg/L
maximum projected effluent concentration C_e = technology-based effluent limit	C_e	0.5	mg/L
upstream flow Q_u = 1Q10 @ dilution	Q_u	0	mgd
acute critical flow	1Q10	NA	mgd
dilution[1]		0	%
upstream concentration[2]	C_u	0	mg/L
Footnotes: 1 The state of Idaho has not authorized a mixing zone. 2 The upstream concentration is assumed to be zero.			

The projected receiving water concentration (C_d) is greater than the protection level for acute aquatic life, thus, there is reasonable potential to violate this water quality standard.

Reasonable Potential Analysis for Chronic Aquatic Life Criterion			
Chronic Aquatic Life	Nomenclature	Value	Units
criterion		**0.011**	mg/L
projected receiving water concentration $C_d = (Q_eC_e+Q_uC_u)\div(Q_e+Q_u)$	C_d	**0.5**	mg/L
average annual effluent flow	Q_e	0.55	mgd
maximum projected effluent concentration C_e = technology-based effluent limit	C_e	0.5	mg/L
upstream flow Q_u = 7Q10 @ dilution	Q_u	0	mgd
chronic critical flow	7Q10	NA	mgd
dilution[1]		0	%
upstream concentration[2]	C_u	0	mg/L

Footnotes:
1 The state of Idaho has not authorized a mixing zone.
2 The upstream concentration is assumed to be zero.

The projected receiving water concentration (C_d) is greater than the protection level for chronic aquatic life, thus, there is reasonable potential to violate this water quality standard.

Waste Load Allocations			
Acute Aquatic Life	Nomenclature	Value	Units
wasteload allocation $WLA=C_e = [C_d(Q_e+Q_u)-Q_uC_u]\div Q_e$	$WLA_{a,c}$	**0.019**	mg/L
criterion	C_d	0.019	mg/L
average annual effluent flow	Q_e	0.55	mgd
upstream flow Q_u = 1Q10 @ dilution	Q_u	0	mgd
acute critical flow	1Q10	NA	mgd
dilution		0	%
upstream concentration	C_u	0	mg/L
Chronic Aquatic Life			
wasteload allocation $WLA=C_e = [C_d(Q_e+Q_u)-Q_uC_u]\div Q_e$	WLA_c	**0.011**	mg/L
criterion	C_d	0.011	mg/L
average annual effluent flow	Q_e	0.55	mgd
upstream flow Q_u = 7Q10 @ dilution	Q_u	0	mgd
chronic critical flow	7Q10	NA	mgd
dilution		0	%
upstream concentration	C_u	0	mg/L

Effluent Limitations			
Aquatic Life	Nomenclature	Value	Units
maximum daily limit MDL = LTA $\cdot$ exp[z_{99}F - 0.5F^2]	MDL	**0.017**	mg/L
maximum daily loading loading (lbs/day) = MDL(mg/L) $\cdot$ Q_e $\cdot$ 8.34		**0.082**	lbs/day
average monthly limit AML = LTA $\cdot$ exp[$z_{95}F_n$ - 0.5F_n^2]	AML	**0.009**	mg/L
average monthly loading loading (lbs/day) = AML(mg/L) $\cdot$ Q_e $\cdot$ 8.34		**0.041**	lbs/day
average annual effluent flow	Q_e	0.55	mgd
lowest long term average	LTA	0.0058	
acute long term average $LTA_{a,c}$ = $WLA_{a,c}$ $\cdot$ exp[0.5F^2 - z_{99}F]	$LTA_{a,c}$	0.0062	
acute wasteload allocation	$WLA_{a,c}$	0.019	
z-score (99th percentile)	z_{99}	2.326	
popular variance F^2 = ln(CV^2+1)	F^2	0.31	
coefficient of variation[1] CV = s ÷ :	CV	0.6	
standard deviation F = $(F^2)^{0.5}$	F	0.55	
chronic long term average LTA_c = WLA_c $\cdot$ exp[0.5F_4^2 - $z_{99}F_4$]	LTA_c	0.0058	
chronic wasteload allocation	WLA_c	0.011	
F_4^2 = ln [(CV^2 ÷ 4) + 1]	F_4^2	0.086	
F_4 = $(F_4^2)^{0.5}$	F_4	0.29	
z-score (95th percentile)	z_{95}	1.645	
F_n^2 = ln[(CV^2 ÷ n)+1]	F_n^2	0.086	
number of samples required per month[2]	n	4	
F_n = $(F_n^2)^{0.5}$	F_n	0.29	

Footnotes:
1 In the absence of data to evaluate the true variability of the effluent, EPA has used a value of 0.6 for the coefficient of variation (CV).
2 The TSD recommends that the minimum number of samples used in the calculations is 4, even when the true number of samples is less than 4.

APPENDIX D

ENDANGERED SPECIES ACT

As discussed in Section VII.C. of this fact sheet, Section 7 of the Endangered Species Act requires federal agencies to consult with the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS) regarding potential affects a federal action may have on threatened and endangered species.

I. Threatened and Endangered Species

According to the USFWS species list 1-4-02-SP-178, the following federally-listed species are in the vicinity of the discharge. The species denoted by a * are under the jurisdiction of NMFS:

Endangered Species:
none

Threatened Species:
Bald Eagle (*Haliaeetus leucocephalus*)
Bull Trout (*Salvelinus confluentus*)
MacFarlane's Four-O'clock (*Mirabilis macfarlanei)*
Snake River Fall Chinook (*Oncorhynchus tshawytscha*)*
Steelhead (*Oncorhynchus mykiss*)*
Ute' ladies-tresses (*Spiranthes diluvialis*)
Water Howellia (*Howellia aquatilis*)

Proposed Threatened Species:
Canada Lynx (*Lynx canadensis*)

II. Potential Effects for Species

A. Bald eagle (*Haliaeetus leucocephalus*) - Threatened

Bald eagles begin to appear at wintering sites in early November and concentrate at locations with open water during the colder months when smaller or slower moving waterbodies freeze (Spahr 1990). Diet includes fish species, mule deer, ground squirrels, rabbits, waterfowl, and other small mammals (Spahr 1990). Consumption of fish relative to other species declines in the colder months as waterbodies freeze. Water quality could potentially affect bald eagles through four avenues: prey displacement or quantitative decline, prey mortality, bioaccumulation in prey, or direct consumption. The USFWS has not designated critical habitat in Idaho for the bald eagle, but there is a Bald Eagle Recovery Plan (FWS 1986). One of the general recommendations for augmenting bald eagle populations is to reduce mortality through exposure to contaminants.

The bald eagle historically ranged throughout North America except for extreme northern Alaska and Canada and central and southern Mexico. A significant population of bald eagles winters in Idaho and some are presumed to remain in the state year round. In Idaho, bald eagle winter habitat includes the Coeur d'Alene Lake and River, Pend Orielle Lake and River, Snake River, Priest River, Clearwater River, and the American Falls Reservoir.

As discussed above, the primary threats to bald eagles are prey displacement or mortality, bioaccumulation of contaminants through prey species, or direct exposure to contaminants. Reissuance of the NPDES permit to the City of Culdesac for their Sewage Treatment Plant discharge would not affect prey availability/distribution. Additionally, it would not result in a potential increase of toxic compounds in prey species or an increase in the potential for direct exposure to toxics. The facility discharges only domestic waste, and the facility's application for discharge shows no metals, or other toxics. The proposed permit requires monitoring for potentially harmful contaminants, hence, it is not expected that reissuance of the wastewater discharge permit to the City of Culdesac Sewage Treatment Plant would affect bald eagles.

B. Bull Trout (*Salvelinus confluentus*) - Threatened

The bull trout is a member of the char subgroup of the family Salmonidae. Bull trout populations are known to exhibit two distinct life history forms: 1) resident bull trout that spend their entire life cycle in the same (or nearby) streams in which they were hatched, and 2) migratory bull trout which can exhibit either a fluvial life history- spawning in tributary streams where the young rear from one to four years before migrating to a river, or an adfluvial form--spawning in tributary streams where the young rear before migrating to a lake (Fraley and Shepard 1989).

Bull trout generally mature at between 5 and 7 years of age (Fraley and Shepard 1989; Goetz 1989; Leathe and Enk 1985). Spawning occurs from August through November (Armstrong and Murrow 1980; Brown 1994; McPhail and Murray 1979). Embryos incubate over winter and hatch in late winter or early spring (Weaver and White 1985). Emergence has been observed over a relatively short period of time after a peak in stream discharge from early April through May (Rieman and McIntyre 1993).

In-stream habitat requirements make bull trout exceptionally sensitive to activities which directly or indirectly affect stream channel integrity and natural flow patterns, including groundwater flow. Stream flow, bed load movement, and channel instability influence the survival of juvenile bull trout (Weaver 1985; Goetz 1989). The presence of fine sediments reduces pool depth, alters substrate composition, reduces interstitial spaces in substrate, and causes channel braiding, all of which can negatively impact the survival of bull trout eggs and fry. Cover, such as large woody debris, undercut banks, boulders, pools, side margins, and beaver ponds, is heavily utilized by all life stages of bull trout for rearing, foraging and resting habitat, as well as for protection from predators (USFWS 1998a). Bull trout prefer cold waters, and temperatures in excess of 15 ^{o}C are considered to limit their distribution (Rieman and McIntyre 1993). USACE (1999) suggested that water temperature in fact influences bull trout distribution more than any other habitat factor. Finally, migration corridors are important for sustaining bull trout populations, allowing for gene flow and connecting wintering areas to summer/foraging habitat (Rieman and McIntyre 1993).

The bull trout is threatened by habitat degradation (e.g., land management activities with negative impacts on water quality or spawning habitat); passage restrictions, mortality, or entrapment at dams; and competition from non-native lake and brook trout (USFWS 1998b). According to USACE (1999), bull trout populations are likely affected by dam operation as well as augmentation (i.e., spill) used to mitigate effects on salmon migration by increasing fish passage efficiency. Bull trout growth, survival and long-term population persistence are correlated with stream habitat conditions such as cover, channel stability, substrate composition, temperature, and migratory corridors (Rieman and McIntyre 1993). These habitat features are often impaired as the result of land management activities such as forest harvest, road building, hydropower development, irrigation diversions, and grazing. Mining has altered stream channel morphology, increased sediment transport and deposition, decreased vegetative cover, and contributed to acidic water discharge and heavy metal water pollution (Chapman et al. 1991).

Reissuance of the NPDES permit to the City of Culdesac Sewage Treatment Plant would not affect bull trout As discussed above, the primary threats to bull trout are changes in water temperature and habitat degradation. Reissuance of the City of Culdesac NPDES permit would not lead to increased habitat degradation. In addition, the facility will be required to monitor for temperature in both its effluent and in the Middle Fork Clearwater River upstream of the discharge. Therefore, reissuance of the permit would not affect bull trout.

C. MacFarlane’s Four-O’clock (*Mirabilis macfarlanei)* - Threatened

The MacFarlane’s four o’clock was originally listed as endangered in 1979. At the time of listing, only three populations were known from the Snake River and Salmon River canyons in Idaho and Oregon. Since 1979, six additional populations of this plant have been discovered in Idaho and Oregon and some populations have been actively monitored by the U.S. Forest Service and the Bureau of Land Management. As a result, the species was downlisted to threatened on March 15, 1996.

The MacFarlane’s four o’clock is a long-lived herbaceous perennial with a deep-seated root and bright pink flowers. The species occurs in grassland habitats that are characterized by regionally warm and dry conditions. Sites are dry and generally open, although scattered scrubs may be present. Established plants generally start growth in early April with the timing and duration of flowering apparently linked to precipitation levels. Once established, individual plants may survive for decades.

Threats to the species include livestock grazing, herbicide use, road/trail construction and maintenance, exotic plant species, off-road vehicles, mining, fire suppression and rehabilitation efforts, trampling landslides, flood damage, exotic species and herbicide, and pesticide spraying (FWS, 1997b).

Reissuance of the NPDES permit to the City of Culdesac Sewage Treatment Plant would not cause an increase in any of the identified threats to the MacFarlane’s four-o’clock. Therefore, reissuance of the permit would not have an affect on this species.

D. Chinook Salmon (*Oncorhynchus tshawytscha*) - Threatened

Chinook salmon are the largest of the five Pacific salmon species occurring in North America. The commercial fishing industry values chinook salmon highly, due in no small part to their large size. Also known as king salmon, these fish are caught using gill nets in both the high seas salmon fishery as well as coastal fisheries. Their migration patterns exhibit a high degree of variability as do their ages at seaward migration, and their distribution spans both sides of the Pacific Ocean (Groot and Margolis, 1991).

Chinook salmon (from here on referred to as chinook) have a diversity of juvenile and adult life history strategies. Biological characterization of chinook populations differentiates these fish into two primary population segments: spring/summer and fall chinook (NMFS 1995). Only fall chinook species are listed as present in the Middle Fork Clearwater River.

Snake River fall chinook have a life history pattern typical of ‘ocean-type' chinook. Generally, ocean-type chinook spend all of their oceanic life in coastal waters less than 1000 km from their natal streams and return to spawn in those natal streams in the fall at age 2-5. Emergent fry migrate seaward slowly from the main stem Snake River within several weeks of emergence (NMFS, 1996a). Most fall chinook have migrated to sea within their first year. In the ocean, juvenile fall chinook feed primarily on herring, pelagic amphipods and crab megalopa, while adult fish feed on herring and squid (Groot and Margolis, 1991).

Threats to fall chinook include hydropower development, commercial, recreational and sports fisheries, drought, and poor ocean survival. Hydropower development is commonly regarded as the most substantial threat to the survival of fall chinook for three reasons: alteration/inundation of salmon habitat, mortality associated with downstream migration of juveniles, and migration delay due to the presence and operation of dams on the Snake and Columbia Rivers (NMFS, 1996a).

NMFS has designated critical habitat for Snake River fall chinook on the Columbia, Snake and Deschutes Rivers in Oregon, Washington, and Idaho (58FR68543, 63FR11515). NMFS has not designated the Middle Fork Clearwater River as critical habitat for the Snake River fall run chinook salmon. Therefore, it is not expected that reissuance of the NPDES permit to the City of Culdesac Sewage Treatment Plant will affect Snake River fall chinook salmon.

E. Steelhead (*Oncorhynchus mykiss*) - Threatened

Steelhead have the most complex life histories of any Pacific salmon species. These fish have variable run timing and degree of anadromy and are capable of more than one spawning cycle. In the Snake River subbasin, steelhead are ‘stream-maturing’ as they enter freshwater in a sexually immature state and require several months in freshwater before they mature then spawn. These stream maturing fish are referred to as ‘summer run’ based on the time that they enter freshwater. Summer steelhead of the Snake River subbasin have generally two potential run timings. The A-run enters freshwater from June to August and the B-run enters fresh water from late August to October. A-run fish have generally spent one year in the ocean while B-run fish have spent two.

Steelhead can have various life histories in terms of the degree of anadromy. The anadromous form that migrates between the ocean and freshwater are termed ‘steelhead’, while the non-anadromous or ‘resident’ form does not migrate and is called ‘rainbow trout’. Like steelhead, rainbow trout spawn in winter/spring and emerge in spring/early summer. In inland *O. mykiss* populations, including the upper Snake River basin, both anadromous and non-anadromous forms commonly co-occur. Although both the anadromous and non-anadromous forms are classified as the same species taxonomically, the relationship of the two forms in a given area is typically unclear. The migratory and resident forms of this species may be ecophenotypes within a common gene pool or they may be distinct due to reproductive isolation (Zimmerman and Reeves 2000).

The primary factors that have affected Steelhead populations are dam construction (which restricts the ability of individuals to reach their spawning areas); and habitat loss and degradation due to human activities such as land development, logging, mining, and agriculture.

The Middle Fork Clearwater River has been designated as critical habitat for the Snake River Steelhead and the Clearwater stock of Steelhead salmon has been identified as a population of special concern. However, reissuance of the wastewater discharge permit to the Stites Wastewater Treatment Plant would not affect Steelhead. As discussed above, the primary threats to Steelhead are dams and habitat degradation. Reissuance of the NPDES permit to the City of Culdesac Sewage Treatment Plant would not lead to increased dam construction or habitat degradation. Therefore, reissuance of this permit would not affect Steelhead.

F. Ute ladies' tresses (*Spiranthes diluvialis*) - Threatened

Ute ladies' tresses is a perennial, terrestrial orchid with three to 15 small white or ivory flowers clustered into a spike arrangement at the top of the stem. This species generally inhabits riverbanks where inundation occurs infrequently (Sheviak 1984). Ute ladies' tresses is endemic to moist soils in mesic or wet meadows near springs, lakes, and perennial streams. The elevation range of known occurrences is 4,000 to 7,000 feet. Generally, this species occurs in areas where the vegetation is relatively open (e.g. grass and forb dominated sites), but some populations are found in riparian woodlands. This orchid is found in several areas of the interior western United States and all known identifications of this plant in Idaho have been along the South Fork Snake River (Idaho Conservation Data Center 2000).

Urban development and watershed alterations in riparian and wetland habitat adversely affect this plant. It may also be threatened by invasions of exotic plant species such as purple loosestrife, whitetop and reed canarygrass.

Reissuance of the NPDES permit to the City of Culdesac Sewage Treatment Plant would not cause an increase in any of the identified threats to the Ute ladies'-tresses. Therefore, reissuance of this permit would not have an affect on this species.

G. Water howellia (*Howellia aquatilis*) - Threatened

Howellia aquatilis (water howellia) was described by Gray in 1879. It is an aquatic plant that grows 10-60 cm tall. Water howellia most frequently occurs in glacial pothole ponds and former river oxbows whose bottom surfaces are firm, consolidated clay and sediments. Water howellia has very narrow ecological requirements, and therefore even subtle changes in its habitat could be devastating to a population. The species does not appear to be capable of colonizing disturbed habitats (Shelly and Moseley, 1988).

The species is threatened by impacts from loss of wetland habitat and habitat changes due to timber harvesting, encroachment by an exotic grass, development, and grazing. Alterations of water quality and the composition of the wetland bottom and vegetation, may affect the viability of *Howellia aquatilis*. Idaho bottom land habitats have been altered by roads, development, conversion to agriculture, and pasture lands. Water howellia may be less able to adapt to environmental changes because of its lack of genetic variability (Lesica et al., 1988).

Reissuance of the NPDES permit to the City of Culdesac Sewage Treatment Plant would not cause an increase in any of the identified threats to the water howellia. Therefore, reissuance of this permit would not have an affect on the water howellia.

H. Canada lynx (*Lynx canadensis*) - Threatened

The Canada lynx (*Lynx canadensis*), the only lynx in North America, is a secretive, forest-dwelling cat of northern latitudes and high mountains. It feeds primarily on small mammals and birds and is especially dependent on snowshoe hare for prey. It was historically found throughout much of Canada, the forests of northern tier States, and subalpine forests of the central and southern Rocky Mountains. Threats to lynx from changes in water quality would be through direct drinking water exposure.

No information is currently available regarding populations of Canada lynx in the Middle Fork Clearwater area. However, because the only direct threats to the lynx from the City of Culdesac Sewage Treatment Plant discharge would be through direct drinking water exposure, there should be no impact on the lynx from the discharge. The facility discharges only domestic waste, and the facility's current discharge shows no metals, or other toxics. The proposed permit requires monitoring for potentially harmful contaminants. Therefore, the reissuance of the NPDES permit to the City of Culdesac Sewage Treatment Plant is not expected to affect Canada lynx.

III. SUMMARY OF IMPACT FROM EPA ACTION TO REISSUE AN NPDES PERMIT

EPA has determined that the requirements contained in the draft permit will not have an impact on the threatened or endangered species in the vicinity of the discharge. The reissuance of an NPDES permit to the City of Culdesac Sewage Treatment Plant will not result in habitat destruction, nor will it result in changes in population that could result in increased habitat destruction. Furthermore, reissuance of this permit will not impact the food sources for these species.

IV. REFERENCES

Idaho Department of Fish and Game, 2001. Website at http://www2.state.id.us/fishgame/, accessed August, 2001.

National Marine Fisheries Service, 1991. NOAA Technical Memorandum NMFS-F/NEC 195. Status Review for Snake River Sockeye Salmon. R.S. Waples and O.W. Johnson. April, 1991.

National Marine Fisheries Service. NOAA Technical Memorandum NMFS-NWFSC-27. Status Review of West Coast Steelhead from Washington, Idaho, Oregon, and California. P.J. Busby, T.C. Wainwright, G.J. Bryant, L.J. Lierheimer, R.S. Waples, F.W. Waknitz, and I.V. Lagomarsino. Undated.

National Marine Fisheries Service, 2002. Website at http://www.nwr.noaa.gov/1salmon/salmesa/mapswitc.htm, accessed February, 2002.

Baker, J. P., D. P. Bernard, S. W. Christensen, M. J. Sale, J. Freda, K. Heltcher, D. Marmorek, L. Rowe, P. Scanlon, G. Suter, W. Warren-Hicks, and P. Welbourn, 1990. "Biological Effects of Changes in Surface Water Acid-Base Chemistry." NAPAP rpt. 13. In: National Acid Precipitation Assessment Program, Acidic Deposition: State of Science and Technology, Vol. II, cited by Oregon Department of Environmental Quality (1995), Standards & Assessment Section, 1992-1994 Water Quality Standards Review, pH.

Baudo, R., 1983. "Is analytically-defined chemical speciation the answer we need to understand trace element transfer along a trophic chain?" In: Leppard, G. C. (ed) Trace Element Speciation in Surface Waters and its Ecological Implications. Plenum Press, New York, pp. 275-290.

Bell, M. C., 1971. "Water Demands for Enhancement of Fisheries (Food and Growth)." State of Washington Water Research Center.

European Inland Fisheries Advisory Commission (EIFAC), 1969. "Water Quality Criteria for European Freshwater Fish- Extreme pH Values and Inland

Fisheries," as cited in: U.S. Environmental Protection Agency. Quality Criteria for Water- 1986.

Fulton, L.A. 1968. Spawning areas and abundance of chinook salmon, *Oncorhynchus tshawytscha*, in the Columbia River Basin-Past and present. U.S. Fish. Wildl. Serv. Spec. Sci. Rep. Fish. 571:26.

Groot, C. and L. Margolis, 1991. Pacific Salmon Life Histories. Vancouver: UBC Press.

Howell, P., K. Jones, D. Scarnecchia, L. LaVoy, W. Knedra, and D. Orrmann. 1985. Stock assessment of Columbia River anadromous salmonids. Vol: I. U.S. Dep. Energy, Bonneville Power Administration. Project No. 83-335, 558 p.

Hymer, J., R. Pettit, M. Wastel, P. Hahn, and K. Hatch. 1992a. Stock summary reports for Columbia River anadromous salmonids. Volume III: Washington subbasins below McNary Dam. Bonneville Power Administration. Project No. 88-108, 1077 p. (Available from Bonneville Power Administration, Division of Fish and Wildlife, Public Information Officer - PJ, P.O. Box 3621, Portland, OR, 97208.)

Hymer, J., R. Pettit, M. Wastel, P. Hahn, and K. Hatch. 1992b. Stock summary reports for Columbia River anadromous salmonids. Vol. IV: Washington subbasins above McNary Dam. Bonneville Power Administration. Project No. 88-108, 375 p. (Available from Bonneville Power Administration, Division of Fish and Wildlife, Public Information Officer - PJ, P.O. Box 3621, Portland, OR, 97208.)

Kostow, K. 1995. Biennial Report on the Status of Wild Fish in Oregon. Oreg. Dep. Fish Wildl. Rep., 217 p. + app. (Available from Oregon Department of Fish and Wildlife, P.O. Box 59, Portland, OR 97207.)

Mance, G., 1987. Pollution Threat of Heavy Metals in Aquatic Environments. Elsevier Applied Science. New York, 372 pp.

Mattson, C.R. 1948. Spawning ground studies of Willamette River spring chinook salmon. Fish Comm. Oreg. 1(2):21-32.

Mattson, C.R. 1955. Sandy River and its anadromous salmonids. (Available from Oregon Department of Fish and Wildlife, 2501 SW First Avenue, PO Box 59, Portland, OR 97207.)

NMFS. 1996a. Snake River Fall Chinook. Retrieved 10 August 1998 from the World Wide Web: http://kingfish.ssp.nmfs.goc/tmcintyr/fish/snarfall.html

NMFS. 1998. NOAA Technical Memorandum NMFS-NMFSC-35, Status Review of Chinook Salmon from Washington, Idaho, Oregon, and California. J.M. Myers, R.G. Kope, G.J. Bryant, D. Teel, L.J. Lierheimer, T.C. Wainwright, W.S. Grant, F.W. Waknitz, K. Neely, S.T. Lindley, and R.S. Waples.

Newcombe, C. P. and J. O. T. Jensen, 1996. "Channel suspended sediment and fisheries; a synthesis for quantitative assessment of risk and impact." North American Journal of Fisheries Management 16:693-727.

Olsen, E., P. Pierce, M. McLean, and K. Hatch. 1992. Stock Summary Reports for Columbia River Anadromous Salmonids Volume I: Oregon. U.S. Dep. Energy., Bonneville Power Administration. Project No. 88-108. (Available from Bonneville Power Administration, Division of Fish and Wildlife, Public Information Officer - PJ, P.O. Box 3621, Portland, OR 97208.)

Reimers, P.E., and R.E. Loeffel. 1967. The length of residence of juvenile fall chinook salmon in selected Columbia River tributaries. Fish Comm. Oreg. 13, 5-19 p.

Washington Department of Fisheries (WDF), Washington Department of Wildlife (WDW), and Western Washington Treaty Indian Tribes (WWTIT). 1993. 1992 Washington State salmon and steelhead stock inventory (SASSI). Wash. Dep. Fish Wildl., Olympia, 212 p. + 5 regional volumes. (Available from Washington Department of Fish and Wildlife, 600 Capitol Way N., Olympia, WA 98501-1091.)

Waters, T. F., 1995. "Sediment in streams: sources, biological effects, and control." American Fisheries Society Monograph 7.

APPENDIX E

ESSENTIAL FISH HABITAT

As discussed in Section VII.D. of this fact sheet, the Magnuson-Stevens Fishery Conservation and Management Act requires federal agencies to consult with the National Marine Fisheries Service (NMFS) regarding potential affects a federal action may have on essential fish habitat (EFH). The NMFS has requested that EFH assessments contain the following requirements:

I. ACTION AGENCY

US Environmental Protection Agency, Region 10

II. PROJECT NAME

Reissuance of the National Pollutant Discharge Elimination System (NPDES) permit to the City of Culdesac for a Sewage Treatment Plant.

III. SPECIES IN THE VICINITY OF THE PROJECT

The Clearwater Subbasin, HUC 17060306, has been designated to support chinook salmon (Oncorhynchus tshawytscha) for EFH, according to NMFS website at:

http://www.nmfs.noaa.gov/habitat/habitatprotection/efh_designations.htm

IV. DESCRIPTION OF THE PROJECT/PROPOSED ACTIVITY

The facility activities, wastewater sources, and the discharge location are described in Part II of this fact sheet. A map showing the location of the discharge is provided in Appendix A of this fact sheet.

V. EVALUATE POTENTIAL EFFECTS TO EFH

The EPA has tentatively determined that the reissuance of this permit will not affect any EFH species in the vicinity of the discharge for the following reasons:

A. The proposed permit has been developed in accordance with the Idaho water quality standards to protect aquatic life species in Lapwai Creek. NPDES permits are established to protect water quality in accordance with State water quality standards. The standards are developed to protect the designated uses of the waterbody, including growth and propagation of aquatic life and wildlife. Self-monitoring conducted by the applicant indicates that the facility will be able to comply with all limits of the proposed permit.

B. The derivation of permit limits and monitoring requirements (refer to Section IV of this fact sheet for specifics pertaining to the proposed permit) for an NPDES discharger are in accordance with state water quality standards using procedures prescribed in the TSD (EPA, 1991).