Fact Sheet

NPDES Permit Number: ID-000116-3
Date: December 15, 1999
Public Notice Expiration Date: February 15, 2000
Contact: **Carla Fisher (206) 553-1756 or**
1-800-424-4372 (within Region 10 only)
fisher.carla@epa.gov

The U.S. Environmental Protection Agency (EPA) Plans to Reissue the Wastewater Discharge Permit for:

Potlatch Corporation
805 Mill Road
Lewiston, Idaho 83501
and

The State of Idaho Proposes to Certify the Permit

EPA Proposes NPDES Permit Reissuance.
EPA proposes to reissue the existing National Pollutant Discharge Elimination System (NPDES) permit for Potlatch Corporation. The draft permit sets conditions on the discharge--or release--of pollutants from the Potlatch facility to the Snake and Clearwater Rivers.

This Fact Sheet includes:
- information on public comment, public hearing, and appeal procedures
- a description of the current discharge
- a listing of proposed effluent limitations and other conditions
- a map and description of the discharge location
- detailed background information supporting the conditions in the permit

The State of Idaho proposes certification.
The Idaho Division of Environmental Quality (IDEQ) proposes to certify the NPDES permit for Potlatch, under section 401 of the Clean Water Act. The State provided preliminary comments prior to the public notice which are incorporated into the draft permit.

EPA Invites Comments on the Draft Permit.

EPA will consider all substantive comments before issuing a final permit. Those wishing to comment on the draft permit may do so in writing by February 15, 2000. In addition, EPA has scheduled a public hearing on January 15, 2000, beginning at 7:00 p.m. and ending when all persons have been heard, at Lewis-Clark College - Williams Conference Center, 500 8th Avenue, Lewiston, ID 83501. A sign-in process will be used for persons wishing to make a statement or submit written comments at the hearing.

After the comment period closes and all comments have been considered, EPA's regional Office of Water Director will make a final decision regarding permit reissuance.

Persons wishing to comment on State Certification should submit written comments by the public notice expiration date to the State of Idaho Division of Environmental Quality, 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 along with a response to comments. The permit will become effective 30 days after the issuance date, unless a request for an evidentiary hearing is submitted within 30 days.

<u>Documents Are Available for Review.</u>
The draft NPDES permit and related documents can be reviewed at EPA's Regional Office in Seattle between 8:30 a.m. and 4:00 p.m., Monday through Friday. To request copies and other information, contact the NPDES Permits Unit at:

United States Environmental Protection Agency
Region 10
1200 Sixth Avenue, OW-130
Seattle, Washington 98101
(206) 553-1214 or
1 (800) 424-4372 (within Region 10 only)

The fact sheet and draft permit are also available at:

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

Idaho Division of Environmental Quality
1118 F Street
Lewiston, Idaho 83501
(208) 799-4370

The draft permit and fact sheet can also be found by visiting the Region 10 web site at www.epa.gov/r10earth/offices/water/npdes.htm.

For technical questions regarding the permit or fact sheet, contact Carla Fisher at the phone numbers or email address at the top of this fact sheet. Those with impaired hearing or speech may contact a TDD operator at 1-800-833-6384. Ask to be connected to Carla Fisher at the above phone numbers. Additional services can be made available to persons with disabilities by contacting Carla Fisher.

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LIST OF ACRONYMS

AML - average monthly limit
AOX - adsorbable organic halides
AVS - acid volatile sulfides
BA - biological assessment
BAT - best available technology economically achievable
BCT - best conventional pollutant control technology
BPT - best practicable control technology currently available
BMPs - best management practices
BOD_5 - five-day biochemical oxygen demand
BTU/cfs day - British Thermal Units per cubic feet per second per day
C_u - upstream (ambient) concentration
C_e - maximum projected effluent concentration
C_d - downstream concentration (at the edge of the mixing zone)
CCC - criterion continuous concentration (chronic criterion)
CFR - Code of Federal Regulations
cfs - cubic feet per second
COD - chemical oxygen demand
CV - coefficient of variation
D - dilution
DMRs - Discharge Monitoring Reports
EIS - environmental impact statement
EOX - extractable organic halogens
EPA - Environmental Protection Agency
IDEQ - Idaho Division of Environmental Quality
lb/day - pounds per day
ln - natural logarithm
LTA_c - chronic long-term average
MDL - maximum daily limit
mgd - million gallons per day
mg/day - milligrams per day
mg/l - milligrams per liter
N - nitrogen
NMFS - National Marine Fisheries Service
NPDES - National Pollutant Discharge Elimination System
NTU - nephelometric turbidity units
PAHs - polynuclear aromatic hydrocarbons
pg/l - picograms per liter
RPM - reasonable potential multiplier
STAP - secondary treatment aeration pond
T_u - upstream (ambient) turbidity
T_e -effluent turbidity
TMDL - total maximum daily load

TOC - total organic carbon
TSD -EPA's *Technical Support Document for Water Quality-based Toxics Control*
TSS - total suspended solids
TU_c - chronic toxic units
Fg/l - micrograms per liter
USFWS - United States Fish and Wildlife Service
USGS - United States Geologic Survey
WLA - wasteload allocation
2,3,7,8-TCDD - 2,3,7,8 tetrachlorodibenzo-p-dioxin
2,3,7,8-TCDF - 2,3,7,8 tetrachlorodibenzofuran

BACKGROUND INFORMATION

I. APPLICANT

Potlatch Corporation NPDES Permit No: ID-000116-3

Mailing Address:	Facility Location:
P.O. Box 1016	805 Mill Road
Lewiston, ID 83501	Lewiston, ID 83501

Contact: Alan Prouty, Manager, Environmental Engineering

II. FACILITY ACTIVITY

Potlatch Corporation produces bleached grades of paperboard, tissue and market pulp by the kraft (sulfate) process. Potlatch also manufactures wood products at the Lewiston facility. See Appendix A for a map of the facility and outfall locations. See Appendix B for a detailed discussion of the waste streams and treatment processes.

III. RECEIVING WATER

Potlatch Corporation discharges through outfall 001 to the Snake River at the head of Lower Granite Pool, just below the confluence of the Clearwater River. The discharge is at latitude 46E 25' 31" N, and longitude 117E 02' 15" W (river mile 140). In addition to outfall 001, the facility discharges seeps from the surface impoundments on the property to the Clearwater Arm of Lower Granite Pool through groundwater that is hydrologically connected to the Clearwater.

The facility's discharges are just upstream from the Idaho/Washington border, and have 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 and Snake Arms of Lower Granite Pool are 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 Snake River is not included in Idaho's 303(d) list (a list of impaired waters compiled under section 303(d) of the Clean Water Act). However, the Snake River downstream from Potlatch'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 Potlatch'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 influence by human activity in the watershed.

On February 25, 1991, EPA established a total maximum daily load (TMDL) for 2,3,7,8-TCDD (dioxin) for the Columbia River Basin, including the Snake River. The TMDL was developed because the State of Idaho had listed the Snake River, the State of Oregon had listed the Willamette and Columbia Rivers, and the State of Washington had listed the Columbia River under section 303(d) of the Clean Water Act as not meeting standards for dioxin. This TMDL established a wasteload allocation for Potlatch which was incorporated into the 1992 permit.

IV. FACILITY BACKGROUND

EPA issued the current NPDES permit for Potlatch on March 6, 1992. Requests for an evidentiary hearing on this permit were submitted on April 8, 1992, by the Sierra Club Legal Defense Fund (representing the Idaho Conservation League and Dioxin/Organochlorine Center) and on April 13, 1992, by the Nez Perce Tribe. Therefore, under 40 CFR 124.15(b)(2), the permit did not become effective and Potlatch continued to operate under its 1985 permit.

On January 24, 1997, the Sierra Club Legal Defense Fund withdrew its challenge to the permit and on February 14, 1997, the Nez Perce Tribe withdrew its challenge. Therefore, the permit became effective on March 16, 1997. The expiration date of the permit was not changed, however, so the permit expired April 7, 1997.

On October 3, 1996, Potlatch submitted a timely NPDES permit application for reissuance. Because the application was timely, Potlatch is authorized to continue discharging under the terms of the 1992 permit until a new permit is effective under the provisions of 40 CFR 122.6.

V. EFFLUENT AND FIBER LINE LIMITATIONS

EPA followed the Clean Water Act, State and federal regulations, and EPA's 1991 *Technical Support Document for Water Quality-Based Toxics Control* 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 limit.

In establishing technology-based limits, EPA considers the effluent quality that is achievable using readily available technology. EPA develops these limits based either on federally-promulgated effluent guidelines or, where such guidelines have not been promulgated for an industry, based on best professional judgement.

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 and Washington water quality standards in the Snake and Clearwater Rivers.

A. Effluent Limitations

Table 1 compares the proposed effluent limits in the draft permit with those in the 1992 permit. Some of the limitations are derived from technology-based effluent guidelines. Others are based on Idaho's or Washington's water quality standards. Appendix C provides the basis for the development of effluent limits.

Table 1: Comparison of Effluent Limitations

Parameter	**Effluent Limitations**					
	Maximum Daily		**Monthly Average**		**Annual Average**	
	1992 Permit	Draft Permit	1992 Permit	Draft Permit	1992 Permit	Draft Permit
Five Day Biochemical Oxygen Demand (BOD_5, lb/day)						
River Flow:						
≥ 22,000 cfs	43,800	53,800[1]	22,800	28,100[1]	---	---
<22,000 ≥ 20,000 cfs	36,300	36,300	18,900	18,900	---	---
<20,000 ≥ 18,000 cfs	29,000	"	15,100	"	---	---
<18,000 ≥ 16,000 cfs	24,600	24,600	12,800	12,800	---	---
<16,000 ≥ 14,000 cfs	20,400	"	10,600	"	---	---
< 14,000 cfs	18,800	"	9,800	"	---	---
Total Suspended Solids (TSS, lb/day)	80,700	92,800	43,400	49,800	---	---
2,3,7,8-TCDD (mg/day)	0.83	1.1			0.39	0.39
Temperature						
October 1 - June 14	92^{O}F[2, 3]	33^{O}C	---	---	---	---
June 15 - Sept. 30	92^{O}F	---[4]	---	---	---	—

Table 1: Comparison of Effluent Limitations						
Parameter	**Effluent Limitations**					
	Maximum Daily		**Monthly Average**		**Annual Average**	
	1992 Permit	Draft Permit	1992 Permit	Draft Permit	1992 Permit	Draft Permit
Turbidity (NTU)[5] Ambient Turbidity (T_a): $T_a \leq 50$ NTU $T_a > 50$ NTU	875 $T_a + 175$ $T_a * 4.5$	---	---	---	---	---
Adsorbable Organic Halides (AOX, lbs/day)	---	3,700	6,590	2,400	5,200	---
Ammonia, Total (mg/l as N)	5.4	---	3.0	---	---	---
Chronic Toxicity (TU_c)	38	---	---	---	---	---
Chloroform (Fg/l)	237	See footnote 6	---	See footnote 6	---	---
Mercury (Fg/l)	0.48	---	0.35	---	---	---
Aluminum (mg/l)	3.5	---	2.5	---	---	---
Arsenic (Fg/l)	2.7	---	2.0	---	---	---
Selenium (mg/l)	1.4	---	1.0	---	---	---
Lead (Fg/l)	100	---	72	---	---	---
pH	5.0 - 9.0	5.5 - 9.0	---	---	---	---

Footnotes
1 The draft permit contains 3 tiers for BOD_5 - flow >22,000 cfs; ≤ 22,000 and >18,000 cfs; and ≤ 18,000 cfs.
2 $92^{O}F = 33^{O}C$.
3 The 1992 permit also contains a heat limit equal to the flow of the Snake River multiplied by 593,000 BTU/cfs day when the Snake River temperature is greater than or equal to $67.5^{O}F$.
4 The draft permit contains an instantaneous maximum temperature limit of $20^{O}C$.
5 Turbidity limits in the 1992 permit were based on an increment over background. The limit was established with 2 tiers - one for ambient turbidity less than or equal to 50 NTU and one for ambient turbidity greater than 50 NTU, with a maximum limit of 875 NTU regardless of ambient turbidity.
6 Chloroform limits in the draft permit are applied as fiber line limitations, not effluent limitations (see Table 2).

As discussed in section III, Potlatch discharges to the Snake River through outfall 001 and to the Clearwater River through seepage from the secondary treatment pond and the power boiler ash settling ponds #1 through #4. The settling ponds were used to settle the ash from the number 4 power boiler. However, in June 1999, Potlatch converted to a dry ash system. The ponds are now used to receive clarifier backwash from the influent clarifier for the mill process water.

Where groundwater is hydrologically connected to surface water, discharges to surface water through the groundwater are subject to the requirements of the Clean Water Act and may not be discharged without a National Pollutant Discharge Elimination System (NPDES) permit. However, Clean Water Act jurisdiction extends only to surface waters. Therefore, this permit does not authorize the discharge of pollutants to groundwater or soil. Any discharge to soil or groundwater from leaks in any of the surface impoundments at the Potlatch's facility does not constitute a federally permitted release as defined under the Comprehensive Environmental Response, Compensation, and Liability Act (Superfund).

For limits based on loadings, compliance with the limits in Table 1 is determined based on the total loading from outfall 001 and the seeps. See section VI.A. for a discussion of the monitoring associated with this requirement.

B. Fiber Line Limitations

In addition to the above effluent limitations, the draft permit incorporates the “fiber line” limitations required by the effluent guidelines at 40 CFR Part 430 promulgated by EPA on April 15, 1998 (also known as the Cluster Rule). The Cluster Rule defines the fiber line as pulping, de-knotting, brownstock washing, pulp screening, centrifugal cleaning, and multiple bleaching and washing stages. For the Potlatch facility, there are two fiber lines, the chip line and the sawdust line. These limitations apply to each bleach line separately, with the point of compliance at the point where the effluent leaves the bleach plant. (See Figure B-1). Limits listed as “<“ require the permittee to be below the specified minimum level established in the Cluster Rule for that pollutant. The minimum level is the concentration at which the amount of pollutant present can be accurately quantified. Table 2 provides a summary of these limitations.

Table 2: Fiber Line Limitations

Parameter	Limitations	
	Maximum Daily	Monthly Average
2,3,7,8-TCDD (pg/l)	<10	--
2,3,7,8-TCDF (pg/l)	31.9	--
Chloroform (lb/day)	27	16
Trichlorosyringol (Fg/l)	<2.5	--
3,4,5-trichlorocatechol (Fg/l)	<5.0	--
3,4,6-trichlorocatechol (Fg/l)	<5.0	--
3,4,5-trichloroguaiacol (Fg/l)	<2.5	--
3,4,6-trichloroguaiacol (Fg/l)	<2.5	--
4,5,6-trichloroguaiacol (Fg/l)	<2.5	--
2,4,5-trichlorophenol (Fg/l)	<2.5	--
2,4,6-trichlorophenol (Fg/l)	<2.5	--
Tetrachlorocatechol (Fg/l)	<5.0	--
Tetrachloroguaiacol (Fg/l)	<5.0	--
2,3,4,6-tetrachlorophenol (Fg/l)	<5.0	--
Pentachlorophenol (Fg/l)	<5.0	--

The limits on trichlorophenol and pentachlorophenol in the above table control the amounts of these compounds that can be created as byproducts of the pulping and bleaching processes. In addition to these limits, the Cluster Rule establishes limits for trichlorophenol, pentachlorophenol, and zinc for facilities that use chemical agents containing these pollutants. For facilities that do not use agents containing these pollutants, no additional monitoring is required. Potlatch indicated in its application that it does not use chemical agents containing these pollutants. Therefore, the draft permit prohibits the use of chemical agents containing trichlorophenol, pentachlorophenol, or zinc. This prohibition is also contained in the 1992 permit.

VI. MONITORING REQUIREMENTS

A. Effluent Monitoring

Section 308 of the Clean Water Act and the federal regulations at 40 CFR 122.44(i) require that permits include monitoring 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. Potlatch is responsible for conducting the monitoring and for reporting the results to EPA on monthly Discharge Monitoring Reports (DMRs).

The 1992 permit required Potlatch to estimate the quantity and quality of the seepage from the secondary treatment pond and other impoundments at the facility and add the loading from the seepage to the loading from outfall 001 to determine compliance with limitations based on loading. The quality of the seeps was assumed to be the same as the quality from outfall 001 and the quantity was estimated based on a water balance. The 1992 permit also required Potlatch to conduct a groundwater study to enable more accurate estimation of the amount of seepage. Potlatch submitted the completed study to EPA on June 30, 1999. Based on the results of this study, the estimated rates of seepage to the Clearwater River are 0.44 million gallons per day (mgd) from the number 4 power boiler ash settling ponds number 1 through 4 and 3.3 mgd from the secondary treatment pond. The draft permit requires Potlatch to use these seepage rates in calculating compliance with the loading limits.

Table 3 compares the effluent monitoring requirements in the 1992 permit with the monitoring requirements in the draft permit. This Table shows that monitoring for metals and several chlorinated organic compounds has been omitted from the draft permit. Monitoring for metals was discontinued because monitoring conducted under the 1992 permit indicated that there was no reasonable potential to exceed water quality criteria for those compounds. Monitoring for chlorinated organics was deleted because the fiber line monitoring and limits established under the Cluster Rule provide adequate control of chlorinated organics.

Table 3: Comparison of Effluent Monitoring Requirements

Parameter	Monitoring Requirements			
	1992 Permit		Draft Permit	
	Frequency	Sample Type	Frequency	Sample Type
BOD_5	Daily	24-hour Composite	Daily	24-hour Composite
TSS	Daily	24-hour Composite	Daily	24-hour Composite
Temperature	Continuous	Recording	Continuous	Recording
2,3,7,8-TCDD	Monthly	24-hour Composite	Monthly	24-hour Composite
Turbidity	Quarterly	---	Weekly	Grab
AOX	Weekly	24-hour Composite	Daily	24-hour Composite
pH	Continuous	Recording	Continuous	Recording
Effluent Flow	Continuous	Recording	Continuous	Recording
River Flow	Daily	USGS Gauge	Daily	USGS Gauge
Production	Monthly	---	Monthly	---
Phosphorus, Total	Monthly	24-hour Composite	Monthly	24-hour Composite
Ammonia, Total (as N)	See Footnote 1	24-hour Composite	Monthly	24-hour Composite
Nitrite + Nitrate Nitrogen	---	---	Monthly	24-hour Composite
Chronic Toxicity	Quarterly	Grab	Quarterly[2]	24-hour Composite
2,3,7,8-TCDF	Quarterly	24-hour Composite	See Footnote 3	---
Chloroform	Monthly	Grab	See Footnote 3	---
Mercury	Weekly	24-hour Composite	---	---
Aluminum	Weekly	24-hour Composite	---	---
Arsenic	Weekly	24-hour Composite	---	---

Table 3: Comparison of Effluent Monitoring Requirements

Parameter	**Monitoring Requirements**			
	1992 Permit		**Draft Permit**	
	Frequency	Sample Type	Frequency	Sample Type
Selenium	Weekly	24-hour Composite	---	---
Lead	Weekly	24-hour Composite	---	---
Hexavalent Chromium	Weekly	24-hour Composite	---	---
Copper	Weekly	24-hour Composite	---	---
Zinc	Weekly	24-hour Composite	---	---
Resin Acids	Quarterly	24-hour Composite	---	---
Fatty Acids	Quarterly	24-hour Composite	---	---
Chlorophenols	Quarterly	24-hour Composite	See Footnote 3	---
Guaiacols	Quarterly	24-hour Composite	See Footnote 3	---
Catechols	Quarterly	24-hour Composite	See Footnote 3	---
6-chlorovanillin	Quarterly	24-hour Composite	---	---
a-terpineol	Quarterly	24-hour Composite	---	---
5,6-dichlorovanillin	Quarterly	24-hour Composite	---	---
2-methyl-2-cyclopenten-1-one	Quarterly	24-hour Composite	---	---
3,4,5-Trichlorosyringol	Quarterly	24-hour Composite	See Footnote 3	---
3-methyl-2-cylopentene-1-one	Quarterly	24-hour Composite	---	---
Dimethyl-2-cyclopenten-1-one	Quarterly	24-hour Composite	---	---

Table 3: Comparison of Effluent Monitoring Requirements				
Parameter	**Monitoring Requirements**			
	1992 Permit		**Draft Permit**	
	Frequency	Sample Type	Frequency	Sample Type

Footnotes
1 Daily when ammonia is added to the treatment system, weekly at other times.
2 Whole effluent toxicity testing in the draft permit is required in the fourth year of the permit only. See section C, below.
3 The draft permit requires fiber line monitoring for these parameters. See Table 4.

B. Fiber Line Monitoring

In addition to the above effluent monitoring, the draft permit contains fiber line monitoring. As with the limits discussed in Section V.A., the monitoring location is the effluent from each separate line (the chip line and sawdust line). The parameters monitored and monitoring frequencies are specified in the Cluster Rule. These requirements have been incorporated into the permit as shown in Table 4. The 1992 permit required quarterly fiber line monitoring for AOX, 2,3,7,8-TCDD, and 2,3,7,8-TCDF.

Table 4: Fiber Line Monitoring Requirements		
Parameter	**Monitoring Requirements**	
	Sample Frequency	Sample Type
2,3,7,8-TCDD (pg/l)	Monthly	24-hour Composite
2,3,7,8-TCDF (pg/l)	Monthly	24-hour Composite
Chloroform (lb/day)	Weekly	24-hour Composite
Trichlorosyringol (Fg/l)	Monthly	24-hour Composite
3,4,5-trichlorocatechol (Fg/l)	Monthly	24-hour Composite
3,4,6-trichlorocatechol (Fg/l)	Monthly	24-hour Composite
3,4,5-trichloroguaiacol (Fg/l)	Monthly	24-hour Composite
3,4,6-trichloroguaiacol (Fg/l)	Monthly	24-hour Composite
4,5,6-trichloroguaiacol (Fg/l)	Monthly	24-hour Composite
2,4,5-trichlorophenol (Fg/l)	Monthly	24-hour Composite
2,4,6-trichlorophenol (Fg/l)	Monthly	24-hour Composite
Tetrachlorocatechol (Fg/l)	Monthly	24-hour Composite
Tetrachloroguaiacol (Fg/l)	Monthly	24-hour Composite

Table 4: Fiber Line Monitoring Requirements		
Parameter	**Monitoring Requirements**	
	Sample Frequency	Sample Type
2,3,4,6-tetrachlorophenol (Fg/l)	Monthly	24-hour Composite
Pentachlorophenol (Fg/l)	Monthly	24-hour Composite
Flow, mgd	Continuous	Recording

C. Method Detection Limits

The effluent limit for dioxin and some of the fiber line limits in the draft permit are close to or below the capability of current analytical technology to detect and/or quantify. To address this concern, the draft permit specifies the methods that must be used and the levels that must be achieved. For purposes of averaging results, the draft permit requires Potlatch to use zero for all values below the listed levels.

D. Whole Effluent Toxicity Testing

The 1992 permit required Potlatch to conduct monthly whole effluent toxicity testing using water fleas and fathead minnows. In reissuing this permit, EPA has reviewed the data generated by Potlatch to fulfill this requirement. The data show that the discharge has no reasonable potential to contribute to an exceedence of State water quality standards for toxicity. (See Appendix C for the reasonable potential analysis.) Therefore, the draft permit contains no limits on whole effluent toxicity. However, because EPA believes that it is important to have current data when reissuing the permit in the future, the draft permit requires Potlatch to conduct quarterly chronic whole effluent toxicity testing in the fourth year of the permit term, using water fleas, fathead minnows, and a green alga. These data will be analyzed to determine whether a limit should be included in future permits.

E. Ambient Monitoring

The ambient monitoring requirements in the draft permit are largely the same as those in the 1992 permit. The rationale for the proposed ambient monitoring requirements and changes from the current requirements is provided below.

1. Water column monitoring

Water column monitoring was required during the first year of the permit term in the 1992 permit to gather data to determine whether the BOD_5 limits in the permit were adequate to protect dissolved oxygen in Lower Granite Pool. These data were used to update the dissolved oxygen/BOD_5 analysis for the draft permit (see Appendix C, section IV.A.) The draft permit requires monitoring during the third year to provide an update on the 1997 data that can be used to ensure that the BOD_5 limits in the permit continue to be protective.

The 1992 permit and the draft permit both require water column monitoring for the following parameters:

i) dissolved oxygen,
ii) velocity,
iii) temperature,
iv) pH,
v) nutrients (ammonia, nitrate, nitrite, total kjeldahl nitrogen, total phosphorus, and orthophosphate), and
vi) BOD_5 (at upstream stations only).

The draft permit requires monitoring for these parameters (except BOD_5) at seven stations, two more than was required in the 1992 permit (see Figure A-2). These stations are the same as those approved by EPA in the monitoring plan for the 1992 permit, with the exception of the upstream station on the Clearwater River. The 1992 permit inadvertently specified a sampling location in the Clearwater River that was downstream from Potlatch's treatment pond. As discussed above, the treatment pond discharges through seepage to the Clearwater River. Therefore, the draft permit specifies that the background station on the Clearwater be immediately upstream from Potlatch's facility.

The ambient metals and turbidity monitoring required in the 1992 permit has been deleted from the draft permit. The 1992 permit required monitoring for these parameters to determine ambient concentrations of pollutants for calculating effluent limitations. This objective has been met, so no additional monitoring is necessary.

2. Sediment monitoring

Sediment monitoring is important to ensure that pollutants in the effluent are not accumulating in the downstream sediments at levels of concern. The data that were collected under the 1992 permit are inconclusive. The 1997 data did not capture possible deposition because river flows were never low enough in the summer of 1997 to prevent scouring of depositional areas. This leaves only the data collected in 1998, which is insufficient to determine trends.

As in the 1992 permit, the draft permit requires annual sediment monitoring for the following parameters:

- i) all congeners of TCDD
- ii) all congeners of TCDF
- iii) extractable organic halogens (EOX)
- iv) total organic carbon (TOC)
- v) metals - including mercury, aluminum, arsenic, selenium, lead, chromium, copper, zinc, cadmium, and nickel
- vi) acid volatile sulfides (AVS).

Sediment monitoring for polynuclear aromatic hydrocarbons (PAHs) was discontinued in the draft permit because EPA believes that PAHs are not a concern in pulp mill effluent.

The draft permit requires Potlatch to collect sediment samples at one station upstream from the discharge on the Snake River, one station on the Clearwater River and at least two stations downstream from the discharge. Samples sites must be depositional areas.

3. Bioaccumulation monitoring

Bioaccumulation is the concentration of pollutants in fish and other organisms at levels above that in the water column. Fish tissue monitoring is important to determine whether pollutants are bioaccumulating in fish tissue to levels of concern. Potlatch did not conduct bioaccumulation monitoring under the 1992 permit because of concerns from the National Marine Fisheries Service that the collection of fish could result in harm to endangered salmon. This concern will be addressed in the draft permit during consultation, as discussed in section IX of this fact sheet.

The draft permit continues the requirements in the 1992 permit to monitor fish tissue for all forms of TCDD, TCDF, and percent lipids. Potlatch is required to collect fish from three trophic levels (fish that feed on bottom-dwelling organisms, fish that feed on algae in the water column, and fish that feed on other fish).

Under the draft permit, fish must be collected from two sites each in the Clearwater and Snake Rivers above the discharge and four sites below the discharge, one of which must be at the edge of the mixing zone. To the extent practicable, the sites chosen must coincide with the sites used for sediment monitoring.

The draft permit requires Potlatch to analyze whole organisms and fillet from game fish and whole organisms from nongame fish. This will provide data to assess the exposures of wildlife, who eat the whole organism, people who use the whole fish, and people who use only the fillet.

F. 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 Potlatch to develop a Quality Assurance Plan. The Quality Assurance Plan consists of standard operating procedures permittees must follow for collecting, handling, storing and shipping samples, laboratory analysis, and data reporting. The draft permit requires Potlatch to submit the Quality Assurance Plan to EPA for review within 60 days of effective date of the permit.

G. Representative Sampling

The draft permit has expanded the requirement in the federal regulations regarding representative sampling (40 CFR 122.41[j]). This provision now specifically requires 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. This provision is included in the draft permit because routine monitoring could miss permit violations and/or water quality standards exceedences due to bypasses, spills, or non-routine discharges. This requirement directs Potlatch to conduct additional, targeted monitoring to quantify the effects of these occurrences on the final effluent.

VII. BEST MANAGEMENT PRACTICES

Best management practices (BMPs) are measures that are intended to prevent or minimize the generation and the potential for the release of pollutants from industrial facilities to the waters of the United States through normal operations and ancillary activities. The 1992 permit required Potlatch to develop a BMP plan. The plan was submitted to EPA on August 1997, and updated December 1997. The draft permit requires Potlatch to implement this plan. In addition, the draft permit requires that the BMP plan be reviewed and updated as necessary to comply with the BMP requirements in the Cluster Rule.

As part of the Cluster Rule, EPA promulgated BMPs for the pulp and paper industry (40 CFR 430.03). The BMPs in the Cluster Rule require specific best management practices including recovery and prevention of leaks, construction (for example, construction of secondary containment structures), monitoring, and training. In addition, the Cluster Rule requires Potlatch to develop a BMP plan outlining how it will achieve the specific BMPs. Finally, under the requirements of the Cluster Rule, Potlatch must develop “action levels” to alert the facility staff to possible leaks or spills and detect trends in pulping liquor losses. The action levels are based on statistical analysis of six months of daily monitoring of the treatment system influent for a “measure of organic content” (for example, BOD_5 or total organic carbon). Based on this monitoring, Potlatch must establish a lower and an upper action level. After the action levels are established, if continued daily monitoring shows that the treatment system influent exceeds the lower action level for a specified period of time, Potlatch must conduct an investigation to determine the cause of the exceedence. If monitoring results exceed the upper action level for a specified period of time, Potlatch must undertake corrective action.

VIII. OTHER PERMIT CONDITIONS

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 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 and reporting requirements, compliance responsibilities, and general requirements.

IX. OTHER LEGAL REQUIREMENTS

A. Endangered Species Act

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 affect (either beneficially or adversely) any threatened or endangered species.

EPA requested lists of threatened and endangered species from the NMFS and the USFWS in letters dated March 6, 1997. The NMFS identified Snake River fall and spring/summer chinook (*Oncorhynchus tschawytscha*) and Snake River sockeye (*O. nerka*) as endangered in a letter dated March 30, 1997. In addition, on May 14, 1999, the NMFS added the Upper Columbia River steelhead (*O. mykiss*) as endangered and the Snake River and Middle Columbia steelhead as endangered.

The USFWS identified the peregrine falcon (*Falco peregrinus*) as endangered and the bald eagle (*Haliaeetus leucocephalus*) as threatened in a letter dated March 31, 1997. In addition, on June 10, 1998, bull trout (*Salvelinus confluentus*) was listed as endangered.

EPA has been engaging in informal consultation with the NMFS and the USFWS on the effects of the discharge on listed species. On October 12, 1999, EPA submitted a draft biological assessment (BA) to the Services for comment. The BA will be used as the basis for the consultation. EPA will enter into formal consultation with the NMFS and the USFWS after addressing comments on the draft BA. 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. These revisions to the permit may necessitate re-notice of the draft permit.

In evaluating the potential effects of Potlatch’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 draft environmental impact statement (EIS) is scheduled to be released on December 17, 1999. The final EIS expected to be released in May 1999, along with a biological opinion written by the NMFS.

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. Restoration of natural flows would change conditions (for example, temperature) in the reach of the Snake River where Potlatch 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 breaching the dams 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 references 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. On September 30, 1998, the Idaho Division of Environmental Quality (IDEQ) provided EPA with a proposed mixing zone for Potlatch's discharge. See section III.B.3. of Appendix C for a detailed discussion of the mixing zone.

The draft permit has been sent to the State to begin the final certification process. If the State authorizes a different mixing zone in its final certification, EPA will recalculate the effluent limitations in the final permit 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 (zero dilution).

Because Potlatch'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.

APPENDIX A - POTLATCH CORPORATION FACILITY MAPS

Figure A-1: Potlatch Corporation Discharge Location

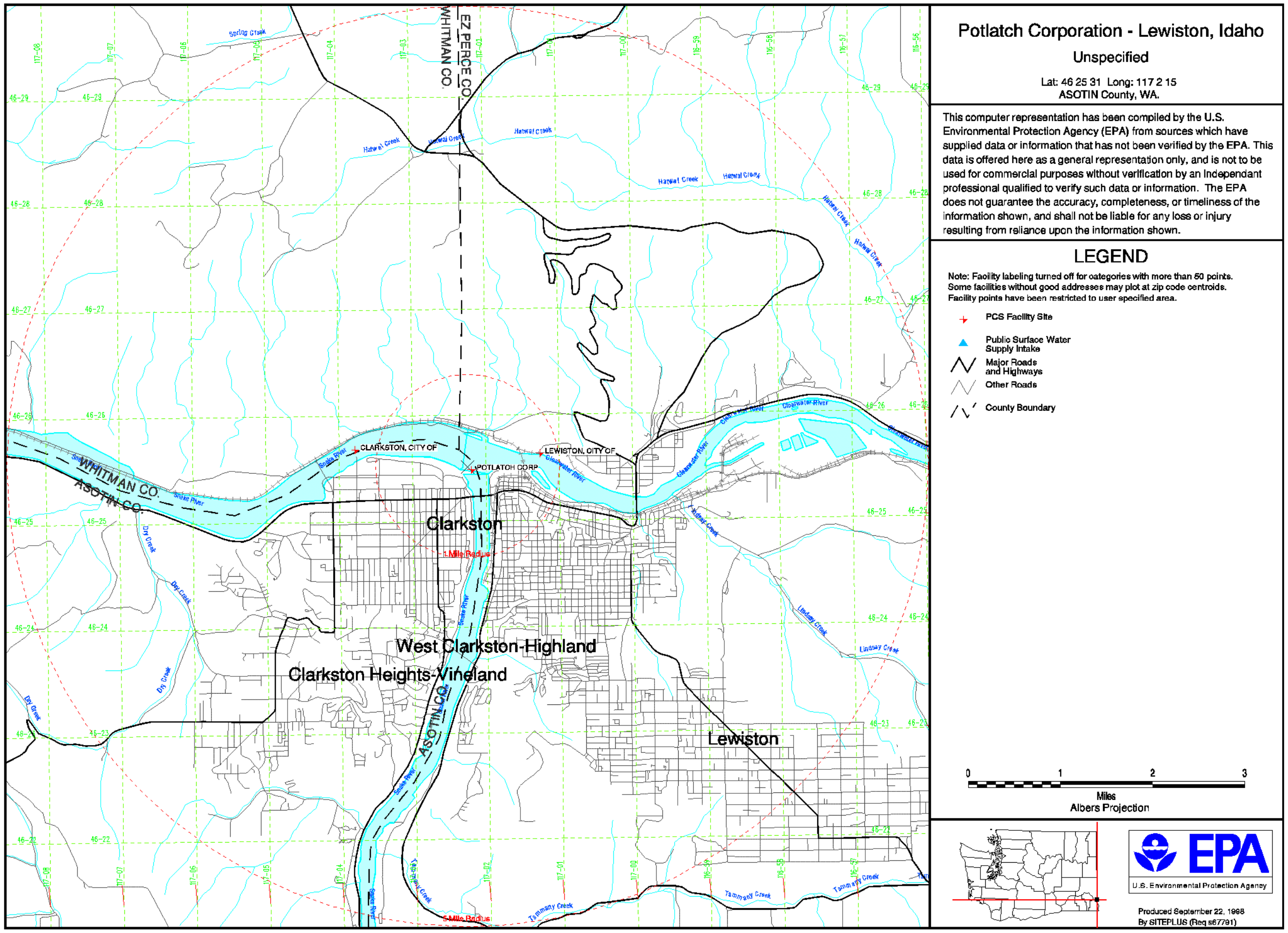
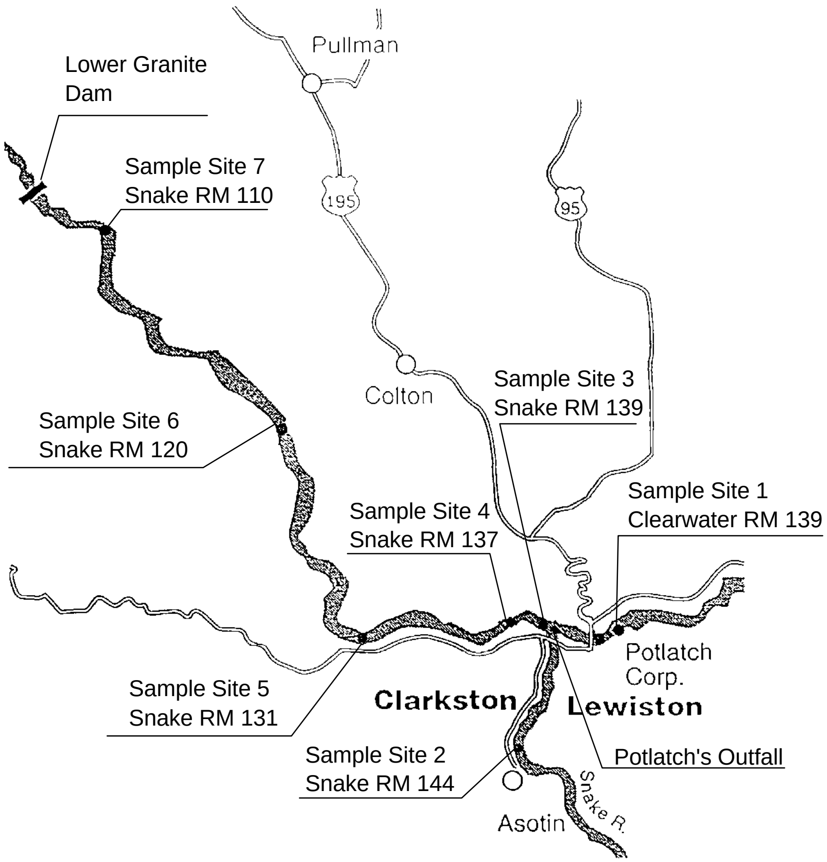


Figure A-2: Ambient Sampling Locations



APPENDIX B - POTLATCH WASTE STREAMS AND TREATMENT PROCESSES

APPENDIX B - POTLATCH WASTE STREAMS AND TREATMENT PROCESSES

I. Discharge Composition

In its NPDES application, discharge monitoring reports, and other monitoring required by the 1992 permit, Potlatch reported the pollutants listed in Table B-1 as detected in its discharge from outfall 001. 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 Value
Conventional	5-day biochemical oxygen demand (BOD_5)	80 mg/l
	Total Suspended Solids (TSS)	206 mg/l
	pH	6.0 -8.8 std units
	Fecal Coliform Bacteria	50 MPN/100ml[1]
Toxic	Arsenic, Total Recoverable	9 Fg/l
	Hexavalent Chromium	31 Fg/l
	Lead, Total Recoverable	8 Fg/l
	Zinc, Total Recoverable	99 Fg/l
	Chloroform	33 µg/l
	2,3,7,8-TCDD	15 pg/l
	Phenols	0.08 mg/l
Non-conventional	Chemical oxygen demand (COD)	1650 mg/l
	Total Organic Carbon (TOC)	190 mg/l
	Total Organic Nitrogen	22.9 mg/l
	Phosphorus	10 mg/l
	Sulfate	280 mg/l
	Surfactants	0.49 mg/l
	Aluminum	1690 Fg/l
	Barium	171 Fg/l
	Boron	62 Fg/l
	Iron	577 Fg/l

Table B-1: Pollutants Detected in Discharge

Pollutant Type	Parameter	Maximum Reported Value
	Magnesium	3740 Fg/l
	Manganese	511 Fg/l
	Titanium	12 Fg/l
	Heat (Temperature)	32.2 ^{O}C
	Ammonia, N	860 µg/l
	Adsorbable Organic Halides (AOX)	2,826 lb/day
	2,3,7.8-TCDF	82 pg/l
	Turbidity	77.1 NTU
	Whole Effluent Toxicity	10 TU_c
	Color	1,800 color units

Footnotes
1 Reported fecal coliform value is believed to be due to the presence of *Klebsiella* bacteria, a common bacteria associated with wood. Potlatch's discharge contains no sanitary waste.

II. Waste Streams and Treatment Processes

Table B-2 shows the waste streams discharged from Potlatch Corporation's pulp mill. The first group of waste streams is treated by primary clarification to remove suspended solids. The effluent from the primary clarifier passes through a mix basin, where it is combined with bleach plant effluent. From the mix basin, the wastewater flows to the secondary treatment aeration pond (STAP), where it receives biological treatment prior to discharge through outfall 001. The secondary treatment pond also receives landfill leachate, digester condensate, and effluent from the power boiler settling ponds.

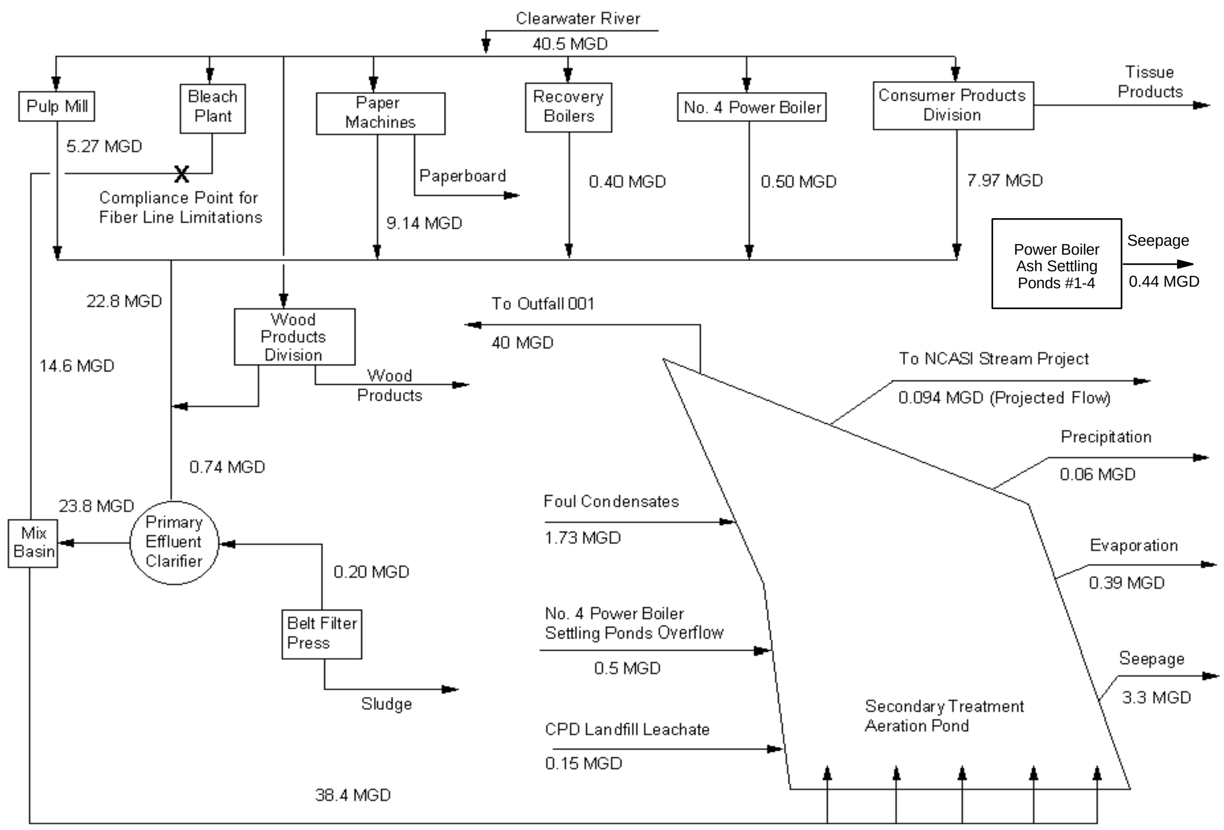
In addition to the discharge through outfall 001, approximately 0.4 million gallons per day (mgd) of effluent is discharged from the bottom of the secondary treatment pond as seepage to the Clearwater River. See Figure B-1 for a flow diagram of Potlatch's waste streams and treatment processes.

Table B-2: Potlatch Corporation Waste Streams

Outfall	Waste stream	Flow[1] (MGD)	Treatment
001	Pulp Mill	5.27	Primary Clarifier/ Mix Basin/ STAP
	Paper Machines	9.14	
	Recovery Boilers	0.40	
	No. 4 Power Boiler	0.05	
	Consumer Products Division	7.97	
	Belt Filtration Presses	0.2	
	Wood Products Division	0.74	
001	Bleach Plant	14.6	Mix Basin/ STAP
	Digester Condensate System	1.73	STAP
	No. 4 Power Boiler Settling Ponds	0.5	
	Landfill Leachate	0.15	
Seepage	Treated effluent	3.7	N/A
Total		41.2	

Footnotes
1 Flow estimates are based on actual data collected during July and August 1996.

Figure B-1: Potlatch Waste Streams and Processes



APPENDIX C - BASIS FOR EFFLUENT AND FIBER LINE LIMITATIONS

APPENDIX C - BASIS FOR EFFLUENT AND FIBER LINE 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 the discharge(s) with respect to these sections of the Clean Water Act and the relevant National Pollutant Discharge Elimination System (NPDES) regulations to determine which conditions to include in the draft permit.

In general, 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 proposed permit limits will reflect whichever requirements (technology-based or water quality-based) are more stringent. This Appendix discusses the technology-based and water quality-based evaluations for Potlatch's discharge.

II. Technology-based Evaluation

Section 301(b)(2) of the Clean Water Act requires technology-based controls on effluents. This section of the Clean Water Act requires that, by March 31, 1989, all permits contain effluent limitations which: (1) control toxic pollutants and nonconventional pollutants through the use of "best available technology economically achievable" (BAT), and (2) represent "best conventional pollutant control technology" (BCT) for conventional pollutants. In no case may BCT or BAT be less stringent than "best practicable control technology currently available" (BPT), which is a minimum level of control required by section 301(b)(1)(A) the Clean Water Act.

On April 15, 1998, EPA published revised effluent guidelines for the pulp and paper industry in the Federal Register (98 FR 18503). These guidelines, known as the "Cluster Rule," replace the guidelines that were used to calculate the technology-based limitations in Potlatch's 1992 permit. They can be found in the Code of Federal Regulations (CFR) at 40 CFR Part 430.

The Cluster Rule established revised subcategories for the pulp and paper industry. As a result of the Cluster Rule, Potlatch is regulated under Subpart B (Bleached Papergrade Kraft and Soda) and Subpart L (Tissue, Filter, Non-Woven, and Paperboard from Purchased Pulp). Under the old guidelines, the following subparts were applicable to Potlatch: Subpart G (Market Bleached Kraft), Subpart H (BCT Bleached Kraft) and Subpart S (Nonintegrated - Tissue Paper).

A. Best Conventional Pollutant Control Technology

Except for pH, BCT in the Cluster Rule is based on production. Subparts B and L of the Cluster Rule establish BCT for 5-day biochemical oxygen demand (BOD_5) and total suspended solids (TSS) based on annual average production. To calculate effluent limitations, the production is multiplied by the effluent guidelines in Table C-1.

Table C-1: BCT for Potlatch (40 CFR Part 430)

Production Type	BOD_5		TSS	
	Maximum Daily (lb/1,000 lb)	Monthly Average (lb/1,000 lb)	Maximum Daily (lb/1,000 lb)	Monthly Average (lb/1,000 lb)
Paperboard	13.65	7.1	24	12.9
Market Pulp	15.45	8.05	30.4	16.4
Tissue	13.65	7.1	24	12.9
Non-Integrated	11.4	6.25	10.25	5

As noted in Table C-1, the effluent guidelines for BOD_5 and TSS depend on the type of production. The Cluster Rule specifies that limits based on these guidelines must be calculated using bleached production. To calculate limits for BOD_5 and TSS, EPA used the most recent five years of monthly data for each type of production. For each month, each type of production was multiplied by the appropriate effluent guideline to calculate the loading for that type of production. These individual loadings were summed to develop a limit for each month. Twelve-month rolling average loadings were then calculated, and the average production that resulted in the largest total loading was used to calculate the proposed limits. Table C-2 shows the technology-based limits for BOD_5 and TSS.

Table C-2: Technology-based BOD_5 and TSS Limitations for Potlatch

Parameter	Production (1,000 lb/day)	BOD_5		TSS	
		Max Daily (lb/day)	Monthly Avg (lb/day)	Max Daily (lb/day)	Monthly Avg (lb/day)
Paperboard	2,352	32,096	16,694	56,432	30,332
Market Pulp	412	6,412	3,341	12,616	6,806
Tissue	858	11,698	6,085	20,568	11,055
Non-Integrated	306	3,494	1,916	3,142	1,532
Total (to nearest 100 lb)	3,928	53,800	28,100	92,800	49,800

BCT for pH for the pulp and paper industry requires that the pH be within the range of 5.0 to 9.0 standard units at all times.

B. Best Available Technology Economically Achievable

Subparts B and L of the Cluster Rule establish BAT for chloroform and adsorbable organic halides (AOX) based on annual average “unbleached” production. Unbleached production is a measure of the pulp weight before it enters the bleach plant. It is calculated as bleached production multiplied by 1.0667. For other chlorinated organics, the Cluster Rule establishes BAT as concentration-based limits independent of production.

Table C-3 shows BAT effluent guidelines for chlorinated organics at Potlatch’s facility. Except for AOX, the limitations calculated from these guidelines apply to the “fiber line.” The Cluster Rule defines the fiber line as pulping, de-knotting, brownstock washing, pulp screening, centrifugal cleaning, bleaching, and washing. Monitoring for compliance with these limitations (except AOX) is conducted at the effluent from the bleach plant (see Figure B-1). Limits listed as “<“ require the permittee to be below the specified minimum level established in the Cluster Rule for that pollutant. The minimum level is the concentration at which the amount of pollutant present can be accurately quantified.

Table C-3: BAT Effluent Guidelines (40 CFR Part 430)

Parameter	**Limitations**	
	Maximum Daily	Monthly Average
2,3,7,8-TCDD (pg/l)	<10	--
2,3,7,8-TCDF (pg/l)	31.9	--
Chloroform (lb/1,000 lb)	0.00692	0.00414
Trichlorosyringol (Fg/l)	<2.5	--
3,4,5-trichlorocatechol (Fg/l)	<5.0	--
3,4,6-trichlorocatechol (Fg/l)	<5.0	--
3,4,5-trichloroguaiacol (Fg/l)	<2.5	--
3,4,6-trichloroguaiacol (Fg/l)	<2.5	--
4,5,6-trichloroguaiacol (Fg/l)	<2.5	--
2,4,5-trichlorophenol (Fg/l)	<2.5	--
2,4,6-trichlorophenol (Fg/l)	<2.5	--

Table C-3: BAT Effluent Guidelines (40 CFR Part 430)		
Parameter	**Limitations**	
	Maximum Daily	Monthly Average
Tetrachlorocatechol (Fg/l)	<5.0	--
Tetrachloroguaiacol (Fg/l)	<5.0	--
2,3,4,6-tetrachlorophenol (Fg/l)	<5.0	--
Pentachlorophenol (Fg/l)	<5.0	--
Adsorbable Organic Halides (AOX, lb/1,000 lb)	0.951	0.623

BAT for chloroform and AOX were calculated in a similar manner to the limits for BOD_5 and TSS, with two exceptions. First, the Cluster Rule specifies that BAT for chloroform and AOX must be calculated using unbleached production. Second, BAT for chloroform and AOX are not based on the types of products made, but on the total amount of pulp. Therefore, the step of calculating monthly production for each production type is unnecessary. The maximum twelve-month rolling average production used to calculate the limits for chloroform and AOX is 1,933 tons/day unbleached production. Table C-4 shows the proposed limits for chloroform and AOX. As discussed above, compliance with the chloroform limitations is determined at the bleach plant and compliance with the AOX limitations is determined in the final effluent.

Table C-4: Technology-based Limits for Chloroform and AOX		
Parameter	**Maximum Daily (lb/day)**	**Monthly Average (lb/day)**
Chloroform	27	16
AOX	3,700	2,400

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) 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). The draft permit includes water quality-based limits for BOD_5, temperature, dioxin (2,3,7,8-TCDD), turbidity, and pH.

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

1. Determine the appropriate water quality criterion,
2. Determine whether there is "reasonable potential" to exceed the criterion,
3. If there is "reasonable potential," develop a WLA,
4. Develop effluent limitation based on the WLA.

Table C-5 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, copper, selenium, and mercury), EPA assumed that there was no reasonable potential. The following sections provide an explanation of Table C-5 and a detailed discussion of each step. Appendix D provides example calculations to illustrate how these steps are implemented.

A. 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 Potlatch'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 Snake and Clearwater Arms 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).

TABLE C-5: Reasonable Potential Calculations								
Parameter	**Maximum Reported Effluent Conc**	**Number of Samples**	**CV**	**Reas Potential Multiplier**	**Maximum Projected Effluent Conc (C_e)**	**Upstream Conc (C_u)**	**Projected Downstream Conc (C_d)**	**Most Stringent Criterion**
Arsenic, Fg/l	9[1]	112	0.6	1.4	12.6	5.18	5.31	50[2]
Chromium VI, Fg/l	31[1]	112	0.6	1.4	43.4	0[3]	0.76[3]	11[4]
Lead, Fg/l	8[1]	112	0.6	1.4	11.2	0.08[3]	0.26[3]	1.3[4]
Zinc, Fg/l	99[1]	112	0.6	1.4	139	3.6[3]	6.0[3]	62[4]
Chloroform, Fg/l	33	27	0.4	1.6	53	0	0.96	57
2,3,7,8-TCDD, pg/l	15	7	0.6	1.8	54	0	0.98[5]	0.013
Ammonia, mg/l	0.86	112	0.6	1.4	1.2	0	0.022	0.36
Temperature ^{O}F Summer Winter	95.4	1800	0.06	1	95.4	 74.2 59	 72.2[5,6] 60	66
Turbidity, NTU	77.1	8	0.6	3.3	254	2.3	6.9	7.3
Chronic Toxicity, TU_c	10	13	0.6	2.7	27	0	0.58	1
Phenol, mg/l	0.80	3	0.6	5.6	4.48	0	0.008	4,600
pH, std units	6 - 8.8[7]	1800	N/A[8]	N/A[8]	N/A[8]	7.8 - 8.2	N/A[8]	6.5 - 9.5

Footnotes
1 Effluent metals concentrations are reported as total recoverable metal.
2 Washington’s human health criterion for arsenic is 0.14 Fg/l, measured as the inorganic form only. However, because there is no EPA-approved test method to measure inorganic arsenic, the State does not apply this criterion in NPDES permits. Therefore, the applicable criterion is Idaho’s human health criterion, expressed as total recoverable metal.
3 Upstream and downstream concentrations for all metals except arsenic are reported as dissolved metal.
4 Metals criteria (except arsenic) are expressed as dissolved metal.
5 Maximum projected ambient concentration indicates “reasonable potential” to exceed water quality standards.
6 See the discussion on temperature in Section IV.E.
7 These values are the minimum and maximum pH reported by Potlatch.
8 See the discussion on pH in Section I’VE.

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 water quality criteria for a given pollutant, 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 *Technical Support Document for Water Quality-based Toxics Control* (TSD, EPA 1991) to conduct this “reasonable potential” analysis.

The maximum projected receiving water concentration is determined using the following mass balance equation. As the equation shows, the maximum projected receiving water concentration is based on the maximum projected effluent concentration, dilution (if available), and the background pollutant concentration.

$$C_d * Q_d = C_u * Q_u + C_e * Q_e$$

where,

C_d = downstream concentration (at the edge of the mixing zone)
Q_d = downstream flow
C_u = upstream (ambient concentration)
Q_u = upstream flow
C_e = maximum projected effluent concentration
Q_e = effluent flow

Combining this equation with the equation for dilution, D, and solving for C_d:

$$C_d = C_u + \frac{C_e - C_u}{D}$$

where:

$$D = \frac{Q_u + Q_e}{Q_e}$$

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" calculations for Potlatch'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 Potlatch's discharge. For criteria that are expressed as maxima (for example, copper, ammonia), the 95^{th} 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 5^{th} percentile of the ambient data is generally used as an estimate of worst-case. These percentiles were calculated based on data submitted by Potlatch as part of its 1997 and 1998 ambient monitoring studies.

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 Potlatch's discharge monitoring reports from July 1993 through June 1999 to determine the projected maximum effluent concentrations.

3. Dilution

   As shown above, dilution is calculated from the effluent and upstream flows. Based on data submitted by Potlatch, the maximum reported effluent flow was 62.5 mgd. EPA did not use this flow in calculating the dilution, however, because it is an outlier. Instead, EPA used the 95^{th} percentile flow, 42.5 mgd. This flow is slightly greater than the flow used to calculate the dilution in the 1992 permit (40 mgd).

   The upstream flow used in the dilution equation was calculated using Idaho State water quality standards and data from the US Geologic

Survey (USGS). Idaho's standards contain the following recommendations for 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 should be no closer to the 7-day, 10-year low flow (7Q10)[1] than 15 percent of the stream width; and
>
> The mixing zone should 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 the acute mixing zone is limited to a "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]. The 1992 permit was based on acute and chronic flows of 12,670 and 14,620, respectively. The permit required Potlatch to conduct a mixing zone study to verify these values.

On June 11, 1997, Potlatch submitted a mixing zone study plan to EPA and IDEQ, as required by its NPDES permit. Preliminary study results were submitted on December 22, 1997. Potlatch received comments on the study from EPA on July 30, 1998, and from IDEQ on August 10, 1998. On September 16, 1998, Potlatch submitted the final study, which addressed EPA's and IDEQ's comments. In that submittal, Potlatch requested a dilution of 38:1 for the chronic mixing zone. This dilution is the minimum dilution based on the maximum effluent flow (40 mgd) and the 7Q10 flow used to calculate the limits in the 1992 permit (14,620 cubic feet per second, cfs). On September 30, 1998, IDEQ sent EPA a preliminary certification for Potlatch's permit, indicating that it would authorize the mixing zone and dilution requested by Potlatch.

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[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. It is calculated by taking the lowest 7-day average flow for each year of the flow record, ranking them, and taking the 10th percentile.

[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. It is calculated by taking the lowest flow for each year of the flow record, ranking them, and taking the 10th percentile.

Subsequent to Potlatch's mixing zone request, EPA updated the data base used to calculate the 7Q10 and the 1Q10. Based on the flow records for the Clearwater and Snake Rivers from July 22, 1958, to September 30, 1997, the 7Q10 and the 1Q10 for the Snake River below the confluence with the Clearwater are 14,270 and 10,880 cfs, respectively. As recommended by the State standards, 25 percent of these flows (3,570 and 2,720 cfs, respectively) were used in both the reasonable potential evaluation and derivation of the proposed permit limits. Use of these flows results in minimum dilutions of 55:1 and 42:1 for the chronic and acute mixing zones, respectively. If IDEQ authorizes a different size mixing zone in its final certification, EPA will recalculate the reasonable potential and effluent limits based on the final mixing zone. If no mixing zone is authorized in the final certification, EPA will recalculate the limits based on meeting water quality criteria at the point of discharge.

4. "Reasonable potential" calculations

In evaluating whether there is reasonable potential to cause or contribute to a violation of State water quality standards, EPA considered the following sources of information:

Potlatch's NPDES application (2c) form (October 3, 1996),
Potlatch's Mixing Zone Evaluation (September 16, 1998),
Discharge Monitoring Reports (DMRs) from 1993 - 1998, and
Potlatch's Receiving Water Monitoring Reports (June 30, 1998 and June 30, 1999).

Section IV, below, provides a detailed discussion of the development of water quality-based effluent limitations for specific pollutants.

C. Wasteload Allocation Development

Once the need for a permit limit is established, the first step in developing the limit is developing a wasteload allocation (WLA) for the pollutant. A WLA is the concentration (or loading) of a pollutant that a facility may discharge without causing or contributing to an exceedence of water quality standards in the receiving water. WLAs for this permit were established in four ways: based on a mixing zone (for temperature in the winter and pH), based on a TMDL (for dioxin), based on an analysis of assimilative capacity (for BOD_5), and based on meeting criteria at "end-of-pipe" (for temperature in the summer).

1. Mixing zone

   Where the State authorizes a mixing zone for a 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.

   For temperature and pH, the criteria are not expressed as acute and chronic criteria. Therefore, it was not necessary to convert from acute and chronic criteria to long-term WLAs. See the discussions in section IV. of this appendix for a complete discussion of the limits calculations for these parameters.

2. TMDL

   Where the receiving water quality does not meet water quality standards, 40 CFR 122.44(d)(1)(vii)((B) requires that the effluent limit in the permit must be consistent with the WLA in any approved total maximum daily load (TMDL). 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 would violate water quality standards. Section 303(d) of the Clean Water Act requires states to develop TMDLs for water bodies that will not meet water quality standards after the imposition of any technology-based effluent limitations, to ensure that these waters will come into compliance with water quality standards.

   The first step in establishing a TMDL is to determine the assimilative capacity (the loading of pollutant that a water body can assimilate without exceeding water quality standards), accounting for any seasonal variation, if appropriate. The next step is to divide the assimilative capacity into allocations for nonpoint sources (called load allocations), allocations for point sources (called wasteload allocations, or WLAs), natural background loadings, and a margin of safety to account for any uncertainties. Permit limits are then developed for point sources that are consistent with the WLAs.

   On February 25, 1991, EPA issued a final TMDL for 2,3,7,8-TCDD (dioxin) for the Columbia River. The TMDL established WLAs for pulp and paper mills on the Columbia, Snake, and Willamette Rivers, including the Potlatch facility.

3. "End-of-Pipe" WLA

In some cases, there is no dilution available. For example, the State may decide not to authorize a mixing zone for a particular pollutant, or the receiving water may exceed the criteria, leaving no "clean" upstream water available for dilution. When there is no dilution, the criterion becomes the WLA (except in limited cases, as described in section 4, below).

4. 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, as described in section 3. 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 Potlatch's discharge could cause dissolved oxygen depressions far downstream even though the effluent meets the dissolved oxygen criteria. Therefore, downstream conditions must be analyzed to ensure that standards will be met throughout the waterbody.

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 coefficient of variation), sampling frequency, and the difference in time frames between the annual average, monthly average and daily maximum limits. Section IV. of this appendix provides detailed discussions of the ways in which limits were developed from the appropriate WLAs.

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 is 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," for which 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. The Snake and Clearwater Arms of Lower Granite Pool are not listed as special resource waters, and in discussions with EPA, DEQ indicated that they 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 Analyses

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

A. Dissolved Oxygen and 5-day Biochemical Oxygen Demand

In Idaho, the most restrictive water quality standard for dissolved oxygen that applies to this segment of the Snake 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 Potlatch 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 Potlatch 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.

Potlatch's 1992 permit contains tiered effluent limits for BOD_5, based on an analysis performed by EPA in 1985. This analysis showed that more stringent BOD_5 limits were needed at lower river flows to ensure that the oxygen demanding materials in the effluent, in combination with the BOD_5 in the discharges from the cities of Lewiston and Clarkston, did not cause a dissolved oxygen depression greater than 0.2 mg/l in Lower Granite Pool. This analysis was updated for the draft permit using more recent data and somewhat different assumptions, as discussed below.

For the draft permit, EPA used a model comparing dissolved oxygen downstream from the discharge with and without Potlatch's discharge. The proposed limits were designed so that the difference with and without Potlatch's discharge was 0.06 mg/l or less, which represents approximately 1/3 of the dissolved oxygen depression allowed under Washington's water quality standards. In addition, dissolved oxygen downstream from Potlatch's discharge was evaluated with and without the combined discharges of Lewiston's and Clarkston's sewage treatment plants and Potlatch. Potlatch's permit limits were designed so that the cumulative decrease from these sources was 0.09 mg/l or less to allow at least a 50 percent margin of safety because of uncertainty regarding the assumptions used in the calculation (for example, the use of zero for some of the parameters) and to allow for potential growth for municipal sewage treatment plants or new industry in the area.

Both the 1985 analysis and the analysis for the draft permit used the Streeter-Phelps equation to model dissolved oxygen depletion. The model uses the following effluent and ambient parameters to predict dissolved oxygen downstream from a discharge:

River geometry (depth and width),
Deoxygenation and nitrification rates,
Sediment oxygen demand,
Temperature,
pH,

Photosynthesis and algal respiration,
Dissolved oxygen, and
Carbonaceous and nitrogenous BOD.

In both the 1985 and current analyses, values from a 1977 EPA study were used for the deoxygenation and nitrification rates, and sediment oxygen demand, photosynthesis, and algal respiration were assumed to be zero.

The temperature, pH, dissolved oxygen, depth, and width estimates used in the current analysis were taken from Potlatch's 1997 and 1998 receiving water studies. The studies included data for two stations upstream and five downstream of the discharge. Width was not measured directly, but was calculated from depth, flow, and velocity data. Data were interpolated between stations to generate points every mile from river mile144 to river mile 109, with stations every 0.1 mile between river mile 139 and 140 to allow for inputs from the Clearwater River, Potlatch, and the City of Clarkston.

With respect to carbonaceous and nitrogenous BOD, there are some differences between the 1985 and current analyses. In the 1985 analysis, the nitrogenous BOD loading was assumed to be 500 lb/day, with Potlatch and Lewiston each contributing 45 percent and Clarkston contributing 10 percent. In the current analysis, the nitrogenous BOD loading was assumed to be the ammonia loading in the discharge multiplied by 4.57 (the ratio of the amount of oxygen needed to oxidize ammonia to the amount of ammonia). For Potlatch's discharge, the 95th percentile of the effluent data (0.49 mg/l) was used. For Lewiston and Clarkston, the ammonia concentration was assumed to be 25 mg/l, a typical value for municipal wastewater.

For carbonaceous BOD, the weekly average effluent limitations for BOD_5 for Lewiston and Clarkston were used for the 1985 analysis. However, the 1985 analysis did not specify an averaging period for the BOD_5 limits for Potlatch and they were incorporated into the permit as monthly average limits. Given the kinetics of the degradation of BOD_5, it is more appropriate to use weekly averages than monthly averages. Therefore, in the current analysis, the weekly average BOD_5 limits for Lewiston and Clarkston were used and the monthly average limits for Potlatch were converted to weekly average loadings for use in the model.

Based on the current analysis, the draft permit contains three tiers of BOD_5 limits, based on river flow, as shown in Table C-6. EPA has determined that three tiers are adequate to ensure that the discharge does not cause or contribute to exceedences of the criteria, while being easier to track and comply with than the six tiers in the 1992 permit. The highest tier is a technology-based limitation and the two lower tiers are water quality-based.

Table C-6: Potlatch BOD_5 Limitations		
River Flow	**Daily Maximum**	**Monthly Average**
≥ 22,000 cfs	53,800	28,100
<22,000 ≥ 18,000 cfs	36,300	18,900
<18,000 cfs	24,600	12,800

Because the draft permit reduces the number of tiers from six to three, the limits are less stringent than the 1992 permit at some flows. For example, when the river flow is between 14,000 to 16,000 cfs, the limits in the 1992 permit are more stringent. The 1992 permit also has more stringent limits when river flow is between 18,000 and 20,000 cfs and when river flow is greater than 22,000 cfs. Because the draft permit contains less stringent requirements, EPA considered the "anti-backsliding" requirements in section 402(o) of the Clean Water Act and in the federal regulations at 40 CFR 122.44(l). These provisions require that limits in a reissued permit must generally be as stringent as those in the existing permit, with some exceptions. In the case of Potlatch's permit, those exceptions apply.

For technology-based limits, 40 CFR 122.44(l) allows backsliding in several instances, including " . . . when circumstances on which the previous permit was based have materially and substantially changed since the time the permit was issued". As discussed above, technology-based limits for the pulp and paper industry are based on production. When production increases, the limitations increase. Potlatch's production has increased over that used to calculate the limits in 1992. Therefore, an increase in technology-based limits is allowed, providing the revised limit complies with the State's antidegradation policy.

For water quality-based limits, section 402(o) of the Clean Water Act allows backsliding in compliance with section 303(d)(4). Section 303(d)(4) states that, for waters where the water quality standard is attained, backsliding is allowed if the revised limit complies with antidegradation.

EPA evaluated the revised limits to determine if they complied with the State's antidegradation requirements. As discussed above, the analysis conducted to determine the limits shows that the discharge will result in compliance with State water quality standards. Therefore, the proposed limits are consistent with Idaho's antidegradation policy.

B. Temperature

The most stringent of Idaho's temperature criteria applicable to the Snake River 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.

Potlatch's 1992 permit contains a temperature limitation of 92^{O}F (33^{O}C). In addition, when the temperature in the Snake River upstream from Potlatch's outfall exceeds 67.5^{O}F (19.7^{O}C), Potlatch is limited to a net heat discharge of 593,000 BTU/cfs day multiplied by the flow in the Snake River. These limits were based on an analysis done by EPA in 1977. The analysis showed that, when the river temperature was below 67.5^{O}F, Potlatch's discharge could reach 92^{O}F without causing a violation of water quality standards. At water temperatures above 67.5^{O}F, a limit on the amount of heat discharged was necessary to ensure that the discharge did not cause the standards to be exceeded.

The analysis used for the 1992 permit assumed that the river upstream from the discharge did not exceed water quality standards. However, subsequent work on temperature issues in the Columbia River Basin has shown that the Snake River upstream from the discharge seasonally exceeds both Washington's and Idaho's criteria.

As discussed above, when the upstream water exceeds the criteria, there is no "cool" water to dilute temperature of the discharge. This means that, regardless of the dilution, the water at the edge of the mixing zone will never meet the criteria. Therefore, if no TMDL has been done, the permit limits must ensure that water quality standards are met at the point of discharge.

Because the upstream water exceeds the temperature criteria only during the summer, the draft permit contains seasonal temperature limits. In addition, because Washington's instantaneous maximum criterion is more stringent than Idaho's, the Washington criterion was used to develop the summer permit limit to ensure meeting the Washington standards at the border.

To determine the time periods for the seasonal limits, EPA evaluated temperature data for the Snake River from 1975 to 1996. These data show that there eight years in which the River exceeds the criteria starting before the end of June and eight years in which the exceedence lasts through the last half of September. Therefore, the draft permit requires that the summer limits be met from June 15 through September 30.

In determining what summer limitations are needed to comply with standards, EPA considered the duration of Washington's temperature criterion. Unlike most aquatic life criteria, which are based on one-hour and four-day averages, Washington's temperature criterion establishes an instantaneous maximum of 20^{O}C. Because Potlatch monitors its effluent temperature continuously, compliance with this limit can be determined directly. Therefore, the draft permit contains an instantaneous maximum permit limit of 20^{O}C.

EPA evaluated the 33^{O}C limit in the 1992 permit to determine whether it is adequate to ensure that water quality standards are met at the edge of the mixing zone during the remainder of the year (October 1 through March 31). EPA calculated the 95th percentile ambient temperature based on daily temperature data from 1975 through 1995. The 95th percentile for the period from October through March is 15^{O}C. Using this temperature and the mass balance equation from section III.B., the ambient temperature at the edge of the mixing zone (C_d) is

$$C_d = 15 + \frac{33 - 15}{55}$$

$$C_d = 15.3\ ^{O}C$$

Therefore, the limit in the 1992 permit is adequate to ensure compliance with water quality standards during the time period from October 1 through June 14 and has been included as a daily maximum limit in the draft permit.

These limitations do not authorize an increase over the limit in the 1992 permit. Therefore, antidegradation and antibacksliding do not apply.

Potlatch is unable to meet the summer temperature limit at this time. Under such circumstances, Idaho's water quality standards authorize the State to establish a compliance schedule in the permit to meet the limits. Based on discussions with the State, the draft permit includes a five-year compliance schedule for temperature, with interim limits. In addition, Potlatch has indicated interest in pursuing a variance from the temperature criteria under section 16.01.02.260 of Idaho's water quality standards. As discussed below, EPA expects that the final permit will contain either a variance or a compliance schedule.

Before a variance can be incorporated into the permit, the following steps must be taken:

1. Potlatch must complete a variance request and submit it to the State.

2. The State must adopt the variance into its water quality standards and submit it to EPA for approval under section 303(c) of the Clean Water Act.

3. EPA must approve the variance. This step includes consultation with the USFWS and the NMFS under section 7 of the Endangered Species Act.

If a water quality standards variance is approved by EPA prior to issuance of the final permit, the final permit will contain limits based on the variance. Based on discussions with Potlatch and the State, EPA expects that a variance would allow Potlatch to continue discharging with the heat limits that are contained in the 1992 permit, in which case the temperature and heat limits from the 1992 permit will be incorporated directly into the final permit. If EPA approves a variance allowing limits that differ from those in the 1992 permit, EPA will allow the public additional time to comment on the limits based on that variance prior to permit issuance.

If Potlatch does not apply for a variance or the variance is not adopted by the State or approved by EPA, EPA expects that the final permit will contain a compliance schedule for the summer temperature limits. Although the draft permit contains a five-year compliance schedule, the State may authorize a shorter schedule as part of its 401 certification. If the 401 certification contains a shorter schedule, it will be incorporated into the final permit.

The interim limits in the draft permit require Potlatch to meet the heat limit in the 1992 permit. This requirement ensures that Potlatch performs at least as well as it is currently performing.

C. 2,3,7,8-TCDD (Dioxin)

Idaho’s most stringent water quality standard for dioxin is 0.013 picograms per liter (pg/l) as a long-term average, for the protection of human health. This concentration was used as the basis for the 1991 Columbia River TMDL. In the TMDL, Potlatch was given a wasteload allocation of 0.39 mg/day as an annual average. Based on the “reasonable potential” analysis of the effluent data submitted by Potlatch (see Table C-5), there is reasonable potential for the discharge to cause or contribute to an exceedence of the WLA in the TMDL. Therefore, in addition to the technology-based limit on bleach plant effluent (see section II-B in this

Appendix), the WLA was incorporated in the draft permit as an annual average limit. The statistical analysis in the TSD was used to derive a daily maximum limit of 1.1 mg/day from the annual average. This number is higher than the daily maximum limit in the 1992 permit, which was incorrectly calculated.

This limitation does not authorize an increase over the limit in the 1992 permit. Therefore, antidegradation and antibacksliding do not apply.

D. pH

The 1992 permit contains technology-based pH limits of 5.0 to 9.0. EPA evaluated these limits to determine whether they were adequate to ensure compliance with the water quality standards for pH. The most stringent Idaho standard applicable to this portion of the Snake River is for protection of aquatic life and requires that pH be within the range of 6.5 to 9.5 pH units. Washington's standard for Class A waters requires that the pH be in the range of 6.5 to 8.5 at all times.

Because pH is a logarithmic scale, the reasonable potential multipliers cannot be used to determine the maximum and minimum projected pH. Instead, the minimum and maximum pH limits were used as input to a pH model to determine whether the pH at the edge of the mixing zone would meet water quality standards.

The model calculates the pH of a mixture of effluent and ambient water, based on dilution and the effluent and ambient alkalinity (a measure of buffering capacity), temperature, and pH. EPA used the 5th percentile for ambient alkalinity and the 95th percentile for effluent alkalinity, based on data submitted by Potlatch. These assumptions model the worst-case: a highly buffered effluent discharged into a receiving water with little buffering capacity.

As temperature increases, the buffering capacity of the water decreases. Therefore, EPA used the 95th percentile temperature for both ambient and effluent. In calculating the effect of low pH, EPA used the 5th percentile ambient pH. Similarly, in calculating the effect of high pH, EPA used the 95th percentile ambient pH. Table C-8 contains a summary of the values used in the model.

Table C-8: Effluent and Ambient pH, Temperature, and Alkalinity

Parameter	Effluent		Ambient	
	Low pH	High pH	Low pH	High pH
Temperature, ^{O}C	33	33	21	21

Table C-8: Effluent and Ambient pH, Temperature, and Alkalinity				
Parameter	Effluent		Ambient	
	Low pH	High pH	Low pH	High pH
pH, std units	5.5	9.0	7.8	8.2
Alkalinity, mg/l $CaCO_3$	440	440	67	67

Based on this model, the pH of the effluent must be no lower than 5.5 to achieve compliance with criteria at the edge of the mixing zone. At an effluent pH of 9.0, the pH at the edge of the mixing zone is 8.3. Therefore, the draft permit contains a water quality-based lower pH limit and a technology-based upper pH limit. Because these limits are more stringent than those in the 1992 permit, antidegradation and anti-backsliding do not apply.

E. Turbidity

For the Snake River, the most stringent turbidity requirement under Idaho's water quality standards is contained in the point source wastewater treatment requirements in section 401.03. Under this standard, turbidity may not exceed background by more than 5 nephelometric turbidity units (NTU) if the background turbidity is 50 NTU or less and may not increase background turbidity by more 10 percent when background turbidity is greater than 50 NTU. This standard is the same as Washington's water quality standard for Class A waters. There is no duration (for example, chronic or acute) associated with this criterion. Therefore, as recommended in the TSD, EPA is considering the turbidity criterion as a chronic value.

Using the mass balance equation from section III.B, above, with (C_u + 5) substituted for C_d,

$$C_u + 5 = C_u + \frac{C_e - C_u}{55}$$

Solving for the wasteload allocation,

$$C_e = C_u + 275.$$

To calculate C_u, EPA used data collected by Potlatch as required under the 1992 permit to characterize the ambient turbidity. EPA used the 5^{th} percentile ambient turbidity (2.3 NTU) to develop the most stringent criterion and wasteload allocation. At the 5^{th} percentile turbidity, the criterion is 7.3 NTU and the wasteload allocation is 282 NTU.

The maximum of eight effluent turbidity samples reported by Potlatch was 77.1 NTU. Using a default CV of 0.6, as recommended in the TSD, the “reasonable potential” multiplier is 3.3, resulting in a maximum projected effluent concentration of 254 NTU. At the edge of the mixing zone, this would result in a turbidity of 6.9 NTU, which is less than the criterion. Therefore, there is no reasonable potential and an effluent limit is not needed.

F. Ammonia

The Idaho water quality standards for ammonia for protection of aquatic life are 1.80 and 0.29 mg/l as acute and chronic criteria, respectively.

The 1992 permit contained limits of 5.4 and 3.0 mg/l (daily maximum and monthly average, respectively) for ammonia because Potlatch occasionally added ammonia to the treatment system influent to provide nutrients for the treatment system. Potlatch has since discontinued this practice. The maximum effluent ammonia concentration reported by Potlatch is 0.86 mg/l. Based on these data, there is no reasonable potential to cause or contribute to an exceedence of water quality criteria at the edge of the mixing zone. Therefore, permit limits are not needed.

G. Whole Effluent Toxicity

Idaho’s water quality standard for whole effluent toxicity is based on the narrative criterion of “no toxics in toxic amounts.” EPA and the State have interpreted this criterion as 1 chronic toxic unit (TU_c at the edge of the mixing zone.

A maximum daily toxicity limit of 38 TU_c was included in the 1992 permit. Since that time, additional data have been collected by Potlatch. The maximum whole effluent toxicity reported is 10 TU_c. Based on these data, there is no reasonable potential to cause or contribute to an exceedence of water quality criteria at the edge of the mixing zone. Therefore, the draft permit contains no limit for whole effluent toxicity.

H. Chloroform

Idaho’s most stringent water quality criterion for chloroform is 57 Fg/l for the protection of human health.

The 1992 permit contained a maximum daily limit of 237 Fg/l for chloroform, based on data submitted as part of the application for that permit showing reasonable potential to cause or contribute to an exceedence of State water quality standards. Potlatch has since made process changes that have reduced the concentration of chloroform in its discharge. The maximum reported effluent concentration since the process changes is 33 Fg/l. Based on this concentration, there is no “reasonable potential” to cause or contribute to an exceedence of water quality standards. Therefore, water quality-based effluent limits are not needed and the draft permit contains only the technology-based requirements discussed in section II.B. of this appendix.

I. Metals

Table C-5 contains a summary of the criteria for arsenic, chromium, lead, and zinc. Because mercury, aluminum, selenium, and copper were not found in the effluent, these metals are not discussed in the table.

The 1992 permit contained effluent limitations for mercury, aluminum, arsenic, selenium, and lead and effluent monitoring for copper, chromium VI, and zinc. Data collected by Potlatch since 1993 indicate no reasonable potential to cause or contribute to an exceedence of water quality criteria for these metals at the edge of the mixing zone. Therefore, no limits are included in the draft permit.

J. Fecal Coliform Bacteria

The most stringent water quality standard for fecal coliform bacteria is Idaho’s standard for primary contact recreation. From May 1 through September 30, the geometric mean may not exceed 50 colonies/100 ml, with a maximum of 500/100 ml. In addition, no more than ten percent of the samples in a 30-day period may exceed 200/100 ml. This standard is intended to protect humans from exposure to human pathogens in sanitary waste.

In its application form, Potlatch reported a fecal coliform level of 50/100 ml. However, Potlatch also indicated on its application that the discharge contains no sanitary waste and that the positive test was due to the presence of *Klebsiella*, a bacterium commonly associated with wood. Because Potlatch’s discharge contains no sanitary waste, it does not pose a risk to humans due to exposure to pathogens. Therefore, no limit for fecal coliform has been included in the draft permit.

REFERENCES

Falter, C. Michael. *Temperature and Oxygen Patterns in the Lower Granite Pool, Snake River, Idaho-Washington During Low Flows, 1988-89.* March 1990.

USEPA. *Total Maximum Daily Loading (TMDL) to Limit Discharges of 2,3,7,8-TCDD (Dioxin) to the Columbia River Basin.* February 25, 1991.

USEPA. *Technical Support Document for Water Quality-based Toxics Control.* March 1991.

APPENDIX D - SAMPLE EFFLUENT LIMIT CALCULATIONS

APPENDIX D - SAMPLE CALCULATIONS

"Reasonable Potential" Calculation for Turbidity

Step 1: Determine the appropriate criteria

1A. Determine the uses

The Clearwater and Snake Arms of Lower Granite Pool are 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).

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

The most stringent turbidity criterion associated with these uses states that turbidity may not be increased over background by more than 5 nephelometric turbidity units (NTU) if the background turbidity is 50 NTU or less and may not be increased over background by more than 10 percent when background turbidity is greater than 50 NTU. Data collected by Potlatch show that the background turbidity is less than 50 NTU. Therefore, the 5 NTU increase applies.

1C. Calculate the criterion

The turbidity criterion is a single-value standard. In other words, unlike many numeric criteria, it does not have separate acute and chronic values. When criteria are single-value, EPA's *Technical Support Document for Water Quality-based Toxics Control* (TSD, EPA 1991) recommends applying the criterion as a chronic value (also referred to as a criterion continuous concentration, or CCC). Therefore, the CCC for turbidity can be represented as:

$$CCC = C_u + 5$$

where,

CCC = the criterion
C_u = upstream turbidity

When criteria are dependent upon ambient conditions (e.g., turbidity or metals), EPA uses the reasonable worst-case ambient conditions to calculate the criteria. For turbidity, a lower ambient turbidity results in more stringent limits. Therefore, EPA considers the 5^{th} percentile representative of worst-case.

The 5^{th} percentile turbidity is 2.3 NTU. Therefore, the criterion is:

$$CCC = 2.3 + 5$$

CCC = 7.3 NTU.

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 8 data points, so a CV of 0.6 was used. Using the equations in section 3.3.2. of the TSD, the "reasonable potential" multiplier (RPM) is calculated as follows:

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

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

p_n = $(1-0.99)^{1/8}$
p_n = 56

This means that the largest value in the data set of 8 data points is greater than the 56th percentile.

Next, the ratio of the 99th percentile to the 56th percentile is calculated, based on the equation:

C_p = $\exp(zF - 0.5F^2)$

where,
F^2 = $\ln(CV^2 + 1)$
= $\ln(0.6^2 + 1)$
= 0.307

z = normal distribution value
= 2.326 for the 99th percentile
= 0.157 for the 56th percentile

C_{99} = exp(2.326*0.554 - 0.5*0.307)
= 3.11

C_{40} = exp(0.157*0.554 - 0.5*.31)
= 0.935

$RPM = C_{99}/C_{40}$
$= 3.11/0.935$

RPM = 3.3

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:

$$C_d = C_u + \frac{C_e - C_u}{D}$$

where,

C_d = downstream concentration (at the edge of the mixing zone)
C_u = upstream concentration
= 2.5 NTU
C_e = maximum projected effluent concentration
= maximum reported effluent concentration * RPM
= 77.1 * 3.3
= 254 NTU
D = dilution
= 55 (from Appendix C, section III.B.3)

$$C_d = 2.3 + \frac{254 - 2.3}{55}$$

C_d = 6.9 NTU

This value is less than the criterion, therefore no limit is necessary.

Permit Limit Calculation for 2,3,7,8-TCDD

Step 1: Determine the wasteload allocation

For 2,3,7,8-TCDD, the WLA is based on the 1991 Columbia River TMDL. The WLA for Potlatch in this TMDL is 0.39 mg/day, as an annual average. To ensure compliance with this WLA, it has been incorporated directly into the draft permit as an annual average limit. To ensure that the variability of the effluent is minimized, EPA calculated a daily maximum permit limit.

Step 2: Convert the WLA into a long-term average concentration

The WLAs are converted to long-term average concentrations, using the following equation:
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$$LTA = WLA * \exp[0.5F_n^2 - zF_n]$$

where,

F_n^2 = $\ln(CV^2/n + 1)$
n = the number of days during the averaging period (365)
z = 2.326 for 99th percentile probability basis
CV = coefficient of variation

$F_{365}^2 = \ln[(0.6^2/365) + 1]$
$= 0.00099$

$F_{365} = 0.0314$

$LTA_c = 0.39 * \exp[0.5 * 0.00099 - 2.326 * 0.0314]$

LTA = 0.36 mg/day

Step 3: Derive the maximum daily limit (MDL)

Using the TSD equation, the MDL is calculated as follows:

$$MDL = LTA * \exp[zF - 0.5F^2]$$

where:

LTA = long-term average from step 3 above
$F^2 = \ln(CV^2 + 1)$

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

F^2 = $\ln(0.6^2 + 1)$
F^2 = 0.307

F = 0.554

MDL= 0.36 * exp[2.326 * 0.554 - 0.5 * 0.307]

MDL= 1.1 mg/day