Fact Sheet

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

Clearwater Paper Corporation
Lewiston Mill

Public Comment Start Date: March 29, 2019
Public Comment Expiration Date: April 29, 2019

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The EPA Proposes to Reissue NPDES Permit
The EPA proposes to reissue the NPDES permit for the facility referenced above. The draft permit places conditions on the discharge of pollutants from the wastewater treatment plant to waters of the United States. In order to ensure protection of water quality and human health, the permit places limits on the types and amounts of pollutants that can be discharged from the facility.

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

State Certification
The EPA is requesting that the Idaho Department of Environmental Quality (IDEQ) certify the NPDES permit for this facility, under Section 401 of the Clean Water Act. Comments regarding the certification should be directed to:

Idaho Department of Environmental Quality
1118 "F" St.
Lewiston, ID 83501
(208) 799-4370
Toll-free: (877) 541-3304

Public Comment
Persons wishing to comment on, or request a Public Hearing for the draft permit for this facility

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

After the Public Notice expires, and all comments have been considered, the EPA's regional Director for the Office of Water and Watersheds will make a final decision regarding permit issuance. If no substantive comments are received, the tentative conditions in the draft permit will become final, and the permit will become effective upon issuance. If substantive comments are received, the EPA will address the comments and issue the permit. The permit will become effective no less than 30 days after the issuance date, unless an appeal is submitted to the Environmental Appeals Board within 30 days pursuant to 40 CFR 124.19.

Documents are Available for Review

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

United States Environmental Protection Agency
Region 10
1200 Sixth Avenue, OWW-191
Seattle, Washington 98101
(206) 553-0523 or
Toll Free 1-800-424-4372 (within Alaska, Idaho, Oregon and Washington)

The fact sheet and draft permits are also available at:

Idaho Department of Environmental Quality
1118 "F" St.
Lewiston, ID 83501
(208) 799-4370
Toll-free: (877) 541-3304

EPA Idaho Operations Office
950 W Bannock, Suite 900
Boise, ID 83702
208-378-5746

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Acronyms

1Q10	1 day, 10 year low flow
7Q10	7 day, 10 year low flow
30B3	Biologically-based design flow intended to ensure an excursion frequency of less than once every three years, for a 30-day average flow.
30Q10	30 day, 10 year low flow
AML	Average Monthly Limit
BAT	Best Available Technology economically achievable
BCT	Best Conventional pollutant control Technology
BE	Biological Evaluation
BO or BiOp	Biological Opinion
BOD_5	Biochemical oxygen demand, five-day
BOD_u	Biochemical oxygen demand, ultimate
BMP	Best Management Practices
BPT	Best Practicable Control Technology Currently Available
°C	Degrees Celsius
CFR	Code of Federal Regulations
CFS	Cubic Feet per Second
COD	Chemical Oxygen Demand
CV	Coefficient of Variation
CWA	Clean Water Act
DMR	Discharge Monitoring Report
DO	Dissolved oxygen
EFH	Essential Fish Habitat
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FR	Federal Register
HUC	Hydrologic Unit Code
IC	Inhibition Concentration
ICIS	Integrated Compliance Information System
IDEQ	Idaho Department of Environmental Quality

LA	Load Allocation
lbs/day	Pounds per day
LC	Lethal Concentration
LC_{50}	Concentration at which 50% of test organisms die in a specified time period
LTA	Long Term Average
mg/L	Milligrams per liter
ml	Milliliters
ML	Minimum Level
µg/L	Micrograms per liter
mgd	Million gallons per day
MDL	Maximum Daily Limit or Method Detection Limit
N	Nitrogen
NOAA	National Oceanic and Atmospheric Administration
NOEC	No Observable Effect Concentration
NOAEC	No Observed Adverse Effect Concentration
NPDES	National Pollutant Discharge Elimination System
NSPS	New Source Performance Standards
OWW	Office of Water and Watersheds
O&M	Operations and maintenance
QAP	Quality assurance plan
RP	Reasonable Potential
RPM	Reasonable Potential Multiplier
RWC	Receiving Water Concentration
SIC	Standard Industrial Classification
SPCC	Spill Prevention and Control and Countermeasure
SS	Suspended Solids
s.u.	Standard Units
TKN	Total Kjeldahl Nitrogen
TMDL	Total Maximum Daily Load
TRE	Toxicity Reduction Evaluation
TSD	Technical Support Document for Water Quality-based Toxics Control (EPA/505/2-90-001)

TSS	Total suspended solids
TU_a	Toxic Units, Acute
TU_c	Toxic Units, Chronic
USFWS	U.S. Fish and Wildlife Service
USGS	United States Geological Survey
WET	Whole Effluent Toxicity
WLA	Wasteload allocation
WQBEL	Water quality-based effluent limit
WQS	Water Quality Standards

I. Background Information

A. General Information

This fact sheet provides information on the draft NPDES permit for the following entity:

Table 1. General Facility Information

NPDES Permit #	ID0001163
Applicant	Clearwater Paper Corporation Lewiston Mill
Type of Ownership	Private
Physical Address:	803 Mill Road Lewiston, ID 83501
Mailing Address:	803 Mill Road Lewiston, ID 83501
Facility Contact:	Bill Hoesman, Senior Environmental Engineer
Outfall Location	46° 25' 31" N, 117° 2' 15" W

B. Permit History

The most recent NPDES permit for the Clearwater Paper Corporation Lewiston Mill was issued on March 8, 2005, became effective on May 1, 2005, and expired on April 30, 2010. An NPDES application for permit issuance was submitted by the permittee on March 1, 2010. The EPA determined that the application was timely and complete. Therefore, pursuant to 40 CFR 122.6, the permit has been administratively extended and remains fully effective and enforceable.

A modification to the 2005 permit became effective on April 15, 2010. This modification consisted of a change to the water quality-based effluent limits (WQBELs) for five-day biochemical oxygen demand for June – November.

II. Facility Information

A. Description of Operations

Clearwater Paper Corporation owns and operates an integrated paper mill located in Lewiston, Idaho. The mill produces market pulp, tissue, and paperboard. Tissue and paperboard are produced both from pulp produced on site as well as purchased pulp. The facility is therefore subject to effluent limit guidelines (ELGs) in subparts B and L of 40 CFR Part 430.

Clearwater Paper's treatment system also accepts wastewater from an adjacent sawmill owned by Idaho Forest Group (see the flow diagram in Appendix A).[1] As such, the facility is also a "privately owned treatment works" as defined in 40 CFR 122.2. The discharge of wastewater from the Idaho Forest Group sawmill to Clearwater Paper's treatment system

[1] More information about the Idaho Forest Group sawmill can be found using the EPA's Facility Registry Service (FRS): https://iaspub.epa.gov/enviro/fii_query_detail.disp_program_facility?p_registry_id=110063999632

does not require a separate NPDES permit (40 CFR 122.3(g)). Prior to January 2012, the sawmill had been owned by Clearwater Paper (IDEQ 2014).

Stormwater from the facility is directed to the process wastewater treatment system.

Treatment Process

Wastewater is treated using a primary clarifier, mix basin, and an aerated stabilization basin. A dissolved air flotation clarifier is used seasonally, to achieve compliance with the June – November water quality-based effluent limits for BOD_5.

Water drawn from the Clearwater River is added to the outfall from May 15 – September 30th to reduce the temperature of the discharge. This was part of a conservation measure to which the permittee committed as part of Endangered Species Act consultation on the 2005 permit. See the response to comments on the 2005 permit at Page 7.

Details about the wastewater treatment process and a map showing the location of the treatment facility and discharge are included in Appendix A. Because of its score on the NPDES Permit Rating Work Sheet[2], the facility is considered a major facility.

Compliance History

The EPA reviewed the last thirteen years of effluent monitoring data (May 2005 – September 2018) from the discharge monitoring report (DMR). The data are summarized below and in Tables 9 and 10.

Overall, the facility has had a good record of compliance with Clean Water Act requirements.[3] Violations of the fiber line effluent limits for 4,5,6-trichloroguaiacol occurred in August and October of 2006, and violations of the fiber line effluent limits for chloroform occurred in November and December of 2016. Otherwise, there have been no effluent limit violations during the term of the existing permit.

The EPA conducted a Clean Water Act inspection of the facility in June 2015. During the inspection, the following issues were identified:

- The facility was found to have submitted one late discharge monitoring report (DMR).
- The facility was having difficulty calibrating the effluent flow meter.
- The facility was measuring the pH of the bleach plant samples at the laboratory rather than at the time of collection (as required by the administratively continued permit), which could cause the sample to be analyzed after the 15-minute holding time for pH samples.
- The facility was collecting samples for chloroform from the bleach plant wastewater using stainless steel tubing instead of Teflon tubing (as required by the administratively continued permit).

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[2] https://www3.epa.gov/npdes/pubs/owm0116.pdf

[3] Additional compliance information for this facility, including compliance with other environmental statutes, is available on Enforcement and Compliance History Online: https://echo.epa.gov/detailed-facility-report?fid=110053991720

The EPA inspected the facility once again on March 6, 2017. During this inspection, the only area of concern identified was the chloroform effluent limit violations which occurred in late 2016 and which are discussed above. The inspection report states that the cause of the violations has been corrected.

III. Receiving Water

A. Receiving Water

Effluent from the Clearwater Paper Lewiston Mill discharges through outfall 001 to the Snake River at its confluence with the Clearwater River, near the head of Lower Granite Pool. The outfall is located at latitude 46° 25' 31" N, and longitude 117° 02' 15" W (approximately river mile 140). The discharge location is near the nexus of three 8-digit hydrologic units. It is at the downstream ends of both the Lower Snake-Asotin watershed, which is hydrologic unit code (HUC) 17060103 and the Clearwater watershed (HUC 17060306). It is at the upstream end of the Lower Snake-Tucannon watershed (HUC 17060107).

The permit also authorizes the discharge of an estimated 3 million gallons per day of seepage from the secondary treatment pond to the Clearwater River in HUC 17060306.

The Nez Perce reservation is located to the west of the facility and encompasses a portion of the Clearwater River upstream from the discharges.

Outfall Description

The effluent is released through outfall 001 from a 400-foot long diffuser. The depth of the water at the discharge point is approximately 30 feet. The diffuser is in waters of the state of Idaho and upstream of the Idaho-Washington state line by 627 feet. The diffuser consists of 79 individual ports spaced 5 feet apart rising from a common, buried 48-inch outfall pipe. Each riser pipe is angled 30 degrees from horizontal with the exit port about 1.5 feet above the river bottom. Each riser pipe is 3 inches in diameter.

B. Designated Beneficial Uses

This facility discharges to the Snake River in the Lower Snake-Asotin Subbasin (HUC 17060103), water body unit S-1. At the point of discharge, the Snake River is protected for the following designated uses (IDAPA 58.01.02.130.02):

- cold water aquatic life
- primary contact recreation
- domestic water supply

Seepage from the secondary treatment pond is discharged to the Clearwater River (Lower Granite Dam Pool) in the Clearwater subbasin (HUC 17060306), water body unit C-1. At the point of discharge, the Clearwater River is protected for the following designated uses (IDAPA 58.01.02.120.08):

- cold water aquatic life
- primary contact recreation
- domestic water supply

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

In the State of Washington, downstream from the discharge, the Snake River, from its mouth to the Washington-Idaho-Oregon border (River Mile 176.1) is designated for salmonid spawning; rearing and migration; primary contact recreation; domestic, industrial, and agricultural water supply; stock watering; wildlife habitat; harvesting; commerce and navigation; boating; and aesthetics (WAC 173-201A-602).

C. Water Quality

Table 2. Receiving Water Quality Data

Parameter	Units	Statistic	Value	Source
2,3,7,8-TCDD	Not detected			Anchor Environmental 2008
2,4,5-Trichlorophenol	Not detected			Anchor Environmental 2008
2,4,5-Trichlorophenol	Not detected			Anchor Environmental 2008
Ammonia	mg/L	95th Percentile	0.051	Washington State Department of Ecology (Ecology) monitoring station 35A150[1], 1996 - 2015
Arsenic (dissolved)	µg/L	Maximum	4.96	Ecology monitoring station 35A150[1], 2009
Arsenic (total)	µg/L	Median	3.89	Ecology monitoring station 35A150[1], 2009
Arsenic (total)	µg/L	Maximum	4.47	Ecology monitoring station 35A150[1], 2009
Chloroform	µg/L	Maximum[2]	2.5	Anchor Environmental 2008
Chromium (dissolved)	µg/L	Maximum	1.54	Ecology monitoring station 35A150[1], 2009
Chromium (total)	µg/L	Maximum	1.78	Ecology monitoring station 35A150[1], 2009
Copper (dissolved)	µg/L	Maximum	0.89	Ecology monitoring station 35A150[1], 2009
Dissolved Organic Carbon	mg/L	Average	2.06	Ecology monitoring station 35A150[1], 2010 - 2018
Dissolved Oxygen	mg/L	5th Percentile	8.0	Ecology monitoring station 35A150[1], 1996 – 2015
Hardness	mg/L	Min - Max	47 - 143	Ecology monitoring station 35A150[1], 2009
Lead (dissolved)	µg/L	Maximum	0.051	Ecology monitoring station 35A150[1], 2009
Mercury	µg/L	Maximum	0.0064	Ecology monitoring station 35A150[1], 2009
Nickel (dissolved)	µg/L	Maximum	0.78	Ecology monitoring station 35A150[1], 2009
Nitrate + Nitrite	mg/L	95th Percentile	1.19	Ecology monitoring station 35A150[1], 1996 – 2015
Pentachlorophenol	Not detected			Anchor Environmental 2008
pH	Standard units	5th – 95th Percentiles	7.87 – 8.54	AMEC Earth and Environmental 2006 and 2007
pH	Standard units	5th – 95th Percentiles	7.96 – 8.55	Ecology monitoring station 35A150[1], 2005 – 2018

Zinc (dissolved)	µg/L	Maximum	6.2	Ecology monitoring station 35A150[1], 2009

Notes:
1. https://fortress.wa.gov/ecy/eap/riverwq/station.asp?theyear=&tab=notes&scrolly=undefined&sta=35A150
2. All results for chloroform, for the receiving waters upstream from the discharge, were non-detect. A result of 2.5 µg/L was observed downstream from the discharge.

Table 3. Receiving Water Temperature Data

Month	Upstream Temperature (°C)
January[3]	4.4
February[3]	5.0
March[3]	7.9
April[3]	11.1
May[3]	13.2
June[3]	18.3
Early July[2]	20.0
Late July[1,2]	22.5
August[1,2]	22.8
Early September[1,2]	21.0
Late September[1,2]	19.0
October[1,2]	18.5
November[3]	10.2
December[3]	5.8

Notes:
1. The ambient temperature is stratified from late July – October. The ambient temperature listed is the temperature at the surface.
2. Source: Hydraulic Characteristics of the Lower Snake River During Periods of Juvenile Fall Chinook Salmon Migration. http://www.pnl.gov/main/publications/external/technical_reports/PNNL-15532.pdf
3. 90th percentile. Source: USGS National Water Information System (NWIS) stations 13334300 and 13342500. http://waterdata.usgs.gov/id/nwis/dv/?site_no=13334300 http://waterdata.usgs.gov/id/nwis/dv/?site_no=13342500

D. Water Quality Limited Waters

The State of Idaho’s 2014 Integrated Report Category 5 (the “303(d) list”) lists the cold water aquatic life use of the Snake River, assessment unit ID17060103SL001_08, as impaired due to temperature. The integrated report lists the Clearwater River, assessment unit ID17060306CL013_07, (North Fork Clearwater River to mouth) as impaired due to dissolved gas supersaturation.

In the State of Washington’s water resource inventory area (WRIA) 35, downstream from the facility, various segments of the Snake River (and impoundments thereof) are listed as impaired due to 2,3,7,8 tetrachlorodibenzo-p-dioxin (TCDD), 4,4’ dichlorodiphenyldichloroethylene (DDE), dieldrin, dissolved oxygen, mercury, pH, polychlorinated biphenyls (PCBs), temperature, total chlordane, and Toxaphene.

In 1991, the EPA issued a multi-state TMDL for TCDD in the Columbia River basin, including the Snake River. This TMDL includes a TCDD wasteload allocation for this facility. In 2003, the State of Washington completed, and the EPA approved, a TMDL for the Snake River, in WRIA 35, for total dissolved gas.

E. Low Flow Conditions

Critical low flows for the receiving waters are summarized in *Table 4. Critical Flows in the Snake River.* Critical low flows at the point of discharge were calculated by summing the river flows measured in the Clearwater River at Spalding (USGS station #13342500) and the Snake River at Anatone (USGS station #13334300), and then using the USGS Surface Water Toolbox to analyze the resulting flows.

To determine if the sum of the flows of the Snake River at Anatone and the Clearwater River at Spalding is a reasonable estimate of the total flow at the point of discharge, the EPA compared the sum of the Anatone and Spalding flows to the flow measured at the former gauge near Clarkston, Washington (USGS station #13343500), which was located just downstream from the confluence of the Snake and Clearwater Rivers and which operated until January 1973. Contemporaneous flow measurements for these three gauges are available from October 1971 through December 1972. During that time, the monthly average flow measured at Clarkston was within 5% of the sum of the monthly average flows measured at Anatone and Spalding. In addition, the drainage area of the former Clarkston gauge (103,200 square miles) is within 1% of the sum of the drainage areas of the Anatone and Spalding gauges (102,243 square miles). Thus the sum of the flows at the Anatone and Spalding gauges is a reasonable estimate of the total flow of the Snake River at the point of discharge.

In general, for the purposes of determining reasonable potential to cause or contribute to excursions above water quality standards and for calculating water quality-based effluent limits, the EPA used the 1Q10, 7Q10, 30Q10 and 30Q5 flow rates for September. September is not the lowest-flow month (the month with the lowest 7Q10 flow is October), however, modeling of the effluent plume using the Cornell Mixing Zone Expert System (Cormix) model shows that the poorest near-field mixing will occur in early September, due to the strong stratification of the ambient water temperature (and, in turn, density). The ambient density stratification causes the effluent plume to “trap” at an intermediate depth, instead of rising to the surface. This effectively limits the amount of water available for dilution in the near field.

Since human health criteria for carcinogens are long-term averages, using the vertically stratified conditions that occur in the summer to establish a year-round dilution factor for such criteria is overly conservative. Dilution for human health carcinogens was therefore evaluated on a seasonal basis. For July – September, the EPA used the same early September stratification conditions as used for other types of criteria. For October – June, the EPA used a uniform ambient temperature of 7.7 °C, which is the median upstream temperature for that season.

Table 4. Critical Flows in the Snake River

Flows	September Flow (cfs)	July – September Flow (cfs)	October – June Flow (cfs)
1Q10	14,061	—	—
7Q10	16,285	—	—
30Q10	18,457	—	—
30Q5	19,829	—	—
Harmonic Mean	—	29,154	33,951

Low flows are defined below:

1Q10 represents the lowest one day flow with an average recurrence frequency of once in 10 years.

7Q10 represents lowest average 7 consecutive day flow with an average recurrence frequency of once in 10 years.

30Q5 represents the lowest average 30 consecutive day flow with an average recurrence frequency of once in 5 years.

30Q10 represents the lowest average 30 consecutive day flow with an average recurrence frequency of once in 10 years.

Harmonic mean is a long-term mean flow value calculated by dividing the number of daily flow measurements by the sum of the reciprocals of the flows.

Further discussion of critical low flow rates for dilution calculations can be found in Section 4 and Appendix D of the *Technical Support Document for Water Quality-based Toxics Control* (hereinafter "TSD") (EPA 1991).

IV. Effluent Limitations and Monitoring

Table 5, below, presents the existing effluent limits and monitoring requirements in the 2005 permit, as modified in 2010. Table 6, below, presents the proposed effluent monitoring requirements in the draft permit. Effluent limits with bold type in Table 6 are different from the corresponding limits in the 2005 permit.

Technology-based effluent limits for BOD_5 (December – May), TSS, and adsorbable organic halides (AOX) have been re-calculated based on recent production levels, consistent with 40 CFR 122.45(b)(2). More information on calculating technology-based effluent limitations from production-normalized ELGs is provided in Section 5.2.2.5 of the *U.S. EPA NPDES Permit Writers' Manual* (EPA 2010) and in Section 8 of the *Permit Guidance Document: Pulp, Paper and Paperboard Manufacturing Point Source Category* (EPA 2000).

The ELGs for the pulp and paper industry include some effluent limits that apply at the fiber line effluent, as opposed to the final effluent (40 CFR 430.24(a)(1)). Table 7 and Table 8 list the fiber line effluent limits and monitoring requirements for the 2005 permit and the draft permit, respectively. Effluent limits with bold type in Table 8 are different from the corresponding limits in the 2005 permit.

The EPA proposes to change the effluent limits for chloroform so that separate effluent limits are applicable to the chip and sawdust fiber lines. The *Permit Guidance Document: Pulp, Paper and Paperboard Manufacturing Point Source Category* states, on Page 8-8, that, when mills operate multiple bleach plants, the separate production rates for each bleach plant must be used to calculate production normalized limits. See also Case Study #6 in the *Permit Guidance Document: Pulp, Paper and Paperboard Manufacturing Point Source Category* (EPA 2000), which involves a mill with two fiber lines, which states that "permit limits for those pollutants regulated in bleach plant effluent must be established for each fiber line" (Page 11-37). For Clearwater Paper, the applicable concentration-based ELGs for TCDD, TCDF, and chlorinated phenolic compounds are identical for both fiber lines. However, the mass-based, production-normalized effluent limits for chloroform are different for the two fiber lines, because of the different production rates for each fiber line.

Table 5. Existing Permit – Final Effluent Limits and Monitoring Requirements

Parameter	Units	Effluent Limitations		Monitoring Requirements	
		Maximum Daily	Average Monthly note 1	Sample Frequency	Sample Type
BOD_5 (December - May)	mg/L	—	—	3/week	24-hour Composite
	lb/day	55,100	28,800		Calculated note 3
BOD_5 note 2 (June - November)	mg/L	—	—	Daily	24-hour Composite
	lb/day	15,000	8,400		Calculated note 3
TSS notes 14 & 16	mg/L	—	—	Daily	24-hour Composite
	lb/day	94,400	50,600		Calculated note 3
2,3,7,8-TCDD note 4	pg/L	note 5		Quarterly note 13	24-hour Composite
	mg/day	0.22 note 5	0.15 note 5		Calculated note 6
Temperature (October - June)	°C	33	—	Continuous	Recording
Temperature note 2 (July)	°C	32	—	Continuous	Recording
Temperature note 2 (August - September)	°C	31	—	Continuous	Recording
pH note 7	s.u.	within the range of 5.5 to 9.0		Continuous	Recording
Adsorbable Organic Halides (AOX) notes 4 & 8	mg/L	—	—	Daily	24-hour Composite note 15
	lb/day	3,950	2,590		Calculated note 3
Effluent Flow	mgd	—	—	Continuous	Recording
Production note 9	tons per day	—	—	Monthly note 10	Calculated
Phosphorus, Total	mg/L	—	—	Monthly	24-hour Composite
Ammonia, Total as N	mg/L	—	—	Monthly	24-hour Composite
Nitrite + Nitrate Nitrogen	mg/L	—	—	Monthly	24-hour Composite
Chemical Oxygen Demand (COD)	mg/L	—	—	Daily	24-hour Composite
Whole Effluent Toxicity note 11	TU_c	—	—	Quarterly notes 12, 13	24-hour Composite

Parameter	Units	Effluent Limitations		Monitoring Requirements	
		Maximum Daily	Average Monthly note 1	Sample Frequency	Sample Type

Notes:
1. The average monthly limit is determined as the arithmetic average of all the samples collected within the month. For the purpose of calculating the monthly average, the permittee must use all values greater than the method detection level; however, zeros may be used for values less than the method detection level.
2. See Section I.D. (Interim Effluent Limitations for Outfall 001)
3. To calculate the maximum daily loading in lb/day, multiply the concentration (mg/L) by a conversion factor of 8.34 lb×L/mg×gal and the daily average effluent flow rate (mgd). For BOD_5 and AOX, 3 mgd must be added to the daily average effluent flow rate to account for pond seepage.
4. See Section III.G. (Twenty-four Hour Notice of Noncompliance Reporting)
5. This effluent limit is not quantifiable using EPA approved analytical methods. The permittee will be in compliance with the effluent limit provided the measured concentration is at or below the compliance evaluation level of 10 pg/L and the calculated quantity is < 0.72 mg/day using EPA Method 1613.
6. To calculate the maximum daily loading in mg/day, multiply the measured concentration (pg/L) by a conversion factor of 0.003786 mg×L/pg×gal×10^6 and the daily effluent flow rate (in mgd or 10^6 gallons per day) plus 3 mgd for pond seepage. If the measured concentration is not detectable, then use one half the detection level as the concentration in the calculation and report as "< {calculated value}" on the DMR.
7. See paragraph I.B.5.
8. AOX must be analyzed using EPA method 1650. Both the suspended and dissolved fractions of the wastewater must be included in the analysis.
9. See definition of Production in Part VI.
10. Monthly production information is to be submitted in an annual report by the 31st of January of the following year. The bleaching shrinkage factor and total operating days per year must be included in the report.
11. See Section I.E. (Whole Effluent Toxicity Testing)
12. Monitoring is required only during the first, second and fourth years of the permit.
13. Quarters are January through March, April through June, July through September, and October through December. Results must be reported on the DMR for the last month of the quarter, which must be postmarked by the 10th day of the following month. See Section III.B.
14. By May 1, 2008 the permittee will reduce TSS by 25% determined by comparing a 12-month rolling average to the 2002 annual average discharge level.
15. See paragraphs I.B.7 and 8.
16. During the first year of the permit, the permittee must analyze TSS once per quarter for dioxins and furans using Method 1613 and for CPOCs using Method 1653. Quarters are January through March, April through June, July through September, and October through December. Results must be reported on the DMR for the last month of the quarter. See also the attached Monitoring Plan Summary.

Table 6. Draft Permit – Final Effluent Limits and Monitoring Requirements

Parameter	Units	Effluent Limitations		Monitoring Requirements	
		Maximum Daily	**Average Monthly**	**Sample Frequency**	**Sample Type**
Adsorbable Organic Halides (AOX) notes 2,6	mg/L	Report	Report	1/week	24-hour Composite note 6
	lb/day	**2,979**	**1,951**		Calculated note 1
BOD_5 (December – May)	mg/L	Report	Report	1/week	24-hour Composite
	lb/day	**52,074**	**27,260**		Calculated note 1
BOD_5 (June – November)	mg/L	Report	Report	3/week	24-hour Composite
	lb/day	15,000	8,400		Calculated note 1
Pentachlorophenol note 2 (July – September)	µg/L	**0.15** note 8	**0.10** note 8	1/month	24-hour Composite note 8
	lb/day	**0.038** note 8	**0.026** note 8		Calculated note 1
Pentachlorophenol note 2 (October – June)	µg/L	**0.23** note 8	**0.16** note 8	1/month	24-hour Composite note 8
	lb/day	**0.072** note 8	**0.050** note 8		Calculated note 1
pH note 5	s.u.	Within the range of 5.7 to 8.5		Continuous	Recording
TSS	mg/L	Report	Report	1/week	24-hour Composite
	lb/day	**88,030**	**47,081**		Calculated note 1
	lb/day	12-month rolling average: 14,042			Calculated notes 1, 9

Parameter	Units	Effluent Limitations		Monitoring Requirements	
		Maximum Daily	Average Monthly	Sample Frequency	Sample Type
2,3,7,8-TCDD [note 2] (July – September)	pg/L	**0.94** [note 3]	**0.65** [note 3]	Quarterly [note 7]	24-hour Composite [note 3]
	mg/day	**0.113** [note 3]	**0.077** [note 3]		Calculated [note 4]
2,3,7,8-TCDD [note 2] (October – June)	pg/L	**1.5** [note 3]	**1.0** [note 3]	Quarterly [note 7]	24-hour Composite [note 3]
	mg/day	**0.177** [note 3]	**0.121** [note 3]		Calculated [note 4]
Temperature (October - June)	°C	33	Report	Continuous	Recording
Temperature (July)	°C	32	Report	Continuous	Recording
Temperature (August – September)	°C	31	Report	Continuous	Recording
Floating, Suspended or Submerged Matter	—	See paragraph I.B.3.		1/month	Visual Observation
Ammonia, Total as N	mg/L	Report	Report	Monthly	24-hour Composite
Arsenic	µg/L	—	Report	Quarterly [note 7]	24-hour Composite
COD (December – May)	mg/L	Report	Report	1/week	24-hour Composite
COD (June – November)	mg/L	Report	Report	3/week	24-hour Composite
Effluent Flow	mgd	Report	Report	Continuous	Recording
Mercury	µg/L	—	Report	Quarterly [note 7]	Grab
Nitrate + Nitrite	mg/L	Report	Report	Monthly	24-hour Composite
Nitrogen, Total	mg/L	Report	Report	Monthly	24-hour Composite
Phosphorus, Soluble Reactive	mg/L	Report	Report	Monthly	24-hour Composite
Phosphorus, Total	mg/L	Report	Report	Monthly	24-hour Composite
Polychlorinated biphenyl congeners	pg/L	—	See I.B.12	2/year	Grab
Production	Tons per day	See Part I.B.13.			
Whole Effluent Toxicity	TU_c	See Part I.C.		2/year	24-hour Composite

Notes:
1. Loading (in lbs/day) is calculated by multiplying the concentration (in mg/L or parts per million) by the corresponding flow (in mgd) for the day of sampling and by the density of water (8.34 lb/gallon). For BOD_5 and AOX, 3 mgd must be added to the daily average effluent flow rate to account for pond seepage. For more information on calculating, averaging, and reporting loads and concentrations see the NPDES Self-Monitoring System User Guide (EPA 833-B-85-100, March 1985).
2. See Part I.B.2.
3. See Part I.B.9.
4. Loading (in mg/day) is calculated by multiplying the concentration (in pg/L) by the corresponding flow (in mgd) for the day of sampling plus 3 mgd to account for pond seepage and by a conversion factor of 0.003786.
5. See Part I.B.4.
6. See Part I.B.11.
7. Quarters are January through March, April through June, July through September, and October through December. Results must be reported on the DMR for the last month of the quarter, which must be postmarked by the 10th day of the following month. See Section III.B.
8. See Part I.B.10.
9. See Part I.B.14.

Table 7. Existing Permit – Fiber Line Limits and Monitoring Requirements

Parameter	Units	Limitations		Monitoring Requirements	
		Maximum Daily	Monthly Average	Sample Frequency	Sample Type
2,3,7,8-TCDD	pg/L	<10	—	Monthly	24-hour Composite
2,3,7,8-TCDF	pg/L	31.9	—	Monthly	24-hour Composite

Parameter	Units	Limitations		Monitoring Requirements	
		Maximum Daily	Monthly Average	Sample Frequency	Sample Type
Chloroform	lb/day	28.8	17.2	Weekly	24-hour Composite
Trichlorosyringol	µg/L	<2.5	—	Monthly	24-hour Composite
3,4,5-trichlorocatechol	µg/L	<5.0	—	Monthly	24-hour Composite
3,4,6-trichlorocatechol	µg/L	<5.0	—	Monthly	24-hour Composite
3,4,5-trichloroguaiacol	µg/L	<2.5	—	Monthly	24-hour Composite
3,4,6-trichloroguaiacol	µg/L	<2.5	—	Monthly	24-hour Composite
4,5,6-trichloroguaiacol	µg/L	<2.5	—	Monthly	24-hour Composite
2,4,5-trichlorophenol	µg/L	<2.5	—	Monthly	24-hour Composite
2,4,6-trichlorophenol	µg/L	<2.5	—	Monthly	24-hour Composite
Tetrachlorocatechol	µg/L	<5.0	—	Monthly	24-hour Composite
Tetrachloroguaiacol	µg/L	<5.0	—	Monthly	24-hour Composite
2,3,4,6-tetrachlorophenol	µg/L	<5.0	—	Monthly	24-hour Composite
Pentachlorophenol	µg/L	<5.0	—	Monthly	24-hour Composite
Flow	mgd	—	—	Continuous	Recording

Table 8. Draft Permit – Fiber Line Limits and Monitoring Requirements

Parameter	Units	Limitations		Monitoring Requirements	
		Maximum Daily	Monthly Average	Sample Frequency	Sample Type
2,3,7,8-TCDD	pg/L	<10	—	Monthly	24-hour Composite
2,3,7,8-TCDF	pg/L	31.9	—	Monthly	24-hour Composite
Chloroform: chip fiber line	lb/day	**15.0**	**9.0**	2/month	24-hour Composite
Chloroform: sawdust fiber line	lb/day	**6.7**	**4.0**	2/month	24-hour Composite
Trichlorosyringol	µg/L	<2.5	—	Monthly	24-hour Composite
3,4,5-trichlorocatechol	µg/L	<5.0	—	Monthly	24-hour Composite
3,4,6-trichlorocatechol	µg/L	<5.0	—	Monthly	24-hour Composite
3,4,5-trichloroguaiacol	µg/L	<2.5	—	Monthly	24-hour Composite
3,4,6-trichloroguaiacol	µg/L	<2.5	—	Monthly	24-hour Composite
4,5,6-trichloroguaiacol	µg/L	<2.5	—	Monthly	24-hour Composite
2,4,5-trichlorophenol	µg/L	<2.5	—	Monthly	24-hour Composite
2,4,6-trichlorophenol	µg/L	<2.5	—	Monthly	24-hour Composite
Tetrachlorocatechol	µg/L	<5.0	—	Monthly	24-hour Composite
Tetrachloroguaiacol	µg/L	<5.0	—	Monthly	24-hour Composite
2,3,4,6-tetrachlorophenol	µg/L	<5.0	—	Monthly	24-hour Composite
Pentachlorophenol	µg/L	<5.0	—	Monthly	24-hour Composite
Flow	mgd	—	—	Continuous	Recording

V. Basis for Effluent Limits

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

A. Pollutants of Concern

In order to determine pollutants of concern for further analysis, EPA evaluated the application form, nature of the discharge and discharge data. The table below summarizes recent effluent data.

Table 9. Effluent Characterization – Outfall 001

Parameter and Units	Minimum	Average	Maximum	Standard Deviation	Number of Samples
Ammonia (mg/L)	0.098	2.30	8.50	1.58	157
Antimony (µg/L)	0.1	0.1	0.1	N/A	1
Arsenic (µg/L)	1.6	1.6	1.6	N/A	1
Chromium (µg/L)	11.8	11.8	11.8	N/A	1
Copper (µg/L)	2.5	2.5	2.5	N/A	1
Lead (µg/L)	0.62	0.62	0.62	N/A	1
Nickel (µg/L)	3.6	3.6	3.6	N/A	1
Nitrate + Nitrite (mg/L)	0.002	0.067	1.79	0.177	118
Phosphorus (mg/L)	0.41	1.57	9.90	0.97	157
Thallium (µg/L)	0.008	0.070	0.190	0.104	3
Whole Effluent Toxicity (TU_c)	1.0	4.2	10	3.92	24
Zinc (µg/L)	14.4	14.4	14.4	N/A	1

Sources: Discharge monitoring reports, permit application, and correspondence with Clearwater Paper Corporation.

Table 10. Effluent Temperature by Month – Outfall 001

Month	Average Effluent Temperature (°C)	Maximum Effluent Temperature (°C)
January	20.8	23.0
February	21.7	24.0
March	22.2	26.0
April	24.8	29.0
May	27.2	30.0
June	28.7	32.0
July	29.3	31.0
August	28.7	31.0
September	25.8	30.0
October	25.0	27.0
November	22.6	26.0
December	21.2	23.0

The ELGs for this facility establish technology-based effluent limits for BOD_5, TSS, pH, TCDD, TCDF, chloroform, trichlorosyringol, 3,4,5-trichlorocatechol, 3,4,6-trichlorocatechol, 3,4,5-trichloroguaiacol, 3,4,6-trichloroguaiacol, 4,5,6-trichloroguaiacol, 2,4,5-trichlorophenol, 2,4,6-trichlorophenol, tetrachlorocatechol, tetrachloroguaiacol, 2,3,4,6-tetrachlorophenol, pentachlorophenol, and AOX. Proposed ELGs for this facility included technology-based effluent limits for COD (58 FR 66078) however, the final ELGs did not.

Of the pollutants for which technology-based effluent limits have been established by the ELGs, only pH, TCDD, 2,4,5-trichlorophenol, 2,4,6-trichlorophenol, pentachlorophenol, and chloroform have water quality criteria. As discussed above, this facility has a wasteload allocation for TCDD in the Columbia River dioxin TMDL.

Based on this analysis, pollutants of concern are as follows:

- 2,3,7,8 tetrachlorodibenzo-p-dioxin (TCDD)
- 2,4,5-Trichlorophenol
- 2,4,6-Trichlorophenol
- Ammonia
- Antimony
- Arsenic
- BOD_5
- COD
- Chloroform
- Chromium III
- Chromium VI
- Color
- Copper
- Lead
- Nickel
- Nitrate + Nitrite
- Pentachlorophenol
- pH
- Phosphorus
- Temperature
- Thallium
- TSS
- Whole Effluent Toxicity (WET)
- Zinc

EPA assessed the need for water quality based effluent limits for these pollutants of concern.

B. Technology-Based Effluent Limits

Effluent Limit Guidelines

ELGs for the pulp and paper industry are found in 40 CFR Part 430. This facility is subject to subparts B and L. For additional information and background refer to Section 5.2 *Technology-Based Effluent Limitations for Industrial (Non-POTW) Dischargers* in the Permit Writers Manual and the *Permit Guidance Document: Pulp, Paper and Paperboard Manufacturing Point Source Category* (EPA 2000).

Table 11. Technology-based Effluent Limits for Outfall 001

Parameter	Average Monthly	Maximum Daily
BOD_5	27,260 lb/day	52,074 lb/day
TSS	47,081 lb/day	88,030 lb/day
Adsorbable Organic Halides	1,951 lb/day	2,979 lb/day
pH	within the range of 5.0 - 9.0 s.u.	
Source: 40 CFR 430 subparts B and L.		

Table 12. Technology-based Effluent Limits for Fiber Lines

Parameter	Units	Average Monthly	Maximum Daily
TCDD	pg/L	—	10
TCDF	pg/L	—	31.9
Chloroform: chip fiber line	lb/day	9.0	15.0
Chloroform: sawdust fiber line	lb/day	4.0	6.7

Trichlorosyringol	µg/L	—	2.5
3,4,5-trichlorocatechol	µg/L	—	5.0
3,4,6-trichlorocatechol	µg/L	—	5.0
3,4,5-trichloroguaiacol	µg/L	—	2.5
3,4,6-trichloroguaiacol	µg/L	—	2.5
4,5,6-trichloroguaiacol	µg/L	—	2.5
2,4,5-trichlorophenol	µg/L	—	2.5
2,4,6-trichlorophenol	µg/L	—	2.5
Tetrachlorocatechol	µg/L	—	5.0
Tetrachloroguaiacol	µg/L	—	5.0
2,3,4,6-tetrachlorophenol	µg/L	—	2.5
Pentachlorophenol	µg/L	—	5.0
Source: 40 CFR 430.01 and 430.24.			

C. Water Quality-based Effluent Limits

Statutory and Regulatory Basis

Section 301(b)(1)(C) of the CWA requires the development of limitations in permits necessary to meet water quality standards. Discharges to State or Tribal waters must also comply with limitations imposed by the State or Tribe as part of its certification of NPDES permits under section 401 of the CWA. The NPDES regulation 40 CFR 122.44(d)(1) implementing Section 301(b)(1)(C) of the CWA requires that permits include limits for all pollutants or parameters which are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any State or Tribal water quality standard, including narrative criteria for water quality. Effluent limits must also meet the applicable water quality requirements of affected States other than the State in which the discharge originates, which may include downstream States (40 CFR 122.4(d), 122.44(d)(4), see also CWA Section 401(a)(2)).

The regulations require the permitting authority to make this evaluation using procedures which account for existing controls on point and nonpoint sources of pollution, the variability of the pollutant in the effluent, species sensitivity (for toxicity), and where appropriate, dilution in the receiving water. The limits must be stringent enough to ensure that water quality standards are met, and must be consistent with any available wasteload allocation for the discharge in an approved TMDL. There is an approved TMDL which specifies a wasteload allocation for TCDD for this discharge, however, the EPA has determined that effluent limits more stringent than those necessary to ensure consistency with the TMDL are necessary for TCDD, to ensure compliance with Washington water quality standards at the State line.

Washington Water Quality Standards

For most of the pollutants of concern, the applicable water quality criteria for Idaho waters are at least as stringent as the water quality criteria applicable to Washington waters.

A comparison of applicable human health criteria is provided in Table 13, below. The EPA has not yet made a decision to approve or disapprove the State of Idaho's revised human health criteria for these pollutants, which became effective under Idaho state law on March 25, 2016 and were submitted to the EPA for review on December 13, 2016. The previous human health water quality criteria for these pollutants, as published in the 2005 Idaho

Administrative Code, are in effect for Clean Water Act purposes.[1] A comparison of applicable aquatic life criteria is provided in Table 14, below. The most stringent criterion is shown in bold type.

Table 13. Washington and Idaho Human Health Water Quality Criteria Comparison

Water Quality Criteria in µg/L			
	Human Health Criterion		
Chemical	**Idaho (2005)**	**Idaho (Current)**	**Washington**
2,4,5-Trichlorophenol	N/A	**140**	N/A
2,4,6-Trichlorophenol	2.1	1.5	**0.25**
Antimony	5.6	**5.2**	6
Chloroform	**5.7**	61	100
Dioxin (2,3,7,8-TCDD)	**0.000000013**	0.000000018	**0.000000013**
Nickel	610	**58**	80
Pentachlorophenol	0.28	0.11	**0.002**
Thallium	1.7	**0.017**	1.7
Zinc	7400	**870**	1000

Table 14. Washington and Idaho Aquatic Life Water Quality Criteria Comparison

Water Quality Criteria in µg/L				
	Idaho		Washington	
	Acute	Chronic	Acute	Chronic
Ammonia	1.983	0.743	1.983	**0.300**
Chromium **III**	307	**39.9**	**296**	95.9
Chromium VI	16	11	**15**	**10**
Copper	8.35	5.95	8.35	5.95
Lead	28.1	1.10	28.1	1.10
Nickel	**247**	**27.5**	747	83.0
Pentachlorophenol	42.6	26.9	42.6	26.9
Zinc	61.8	62.3	**60.4**	**55.1**

Reasonable Potential Analysis

The EPA uses the process described in Chapter 3 of the TSD to determine reasonable potential. To determine if there is reasonable potential for the discharge to cause or contribute to an exceedance of water quality criteria for a given pollutant, the EPA compares the maximum projected receiving water concentration to the water quality criteria for that pollutant. If the projected receiving water concentration exceeds the criteria, there is reasonable potential, and a water quality-based effluent limit must be included in the permit.

In cases where Washington water quality criteria are more stringent than Idaho's water quality criteria, the EPA evaluated the discharge's reasonable potential to cause or contribute to excursions above Washington's water quality criteria in addition to Idaho's water quality criteria.

[1] http://www.deq.idaho.gov/water-quality/surface-water/standards/epa-actions-on-proposed-standards/

Mixing Zones and Dilution

In some cases, a dilution allowance or mixing zone is permitted. The federal regulations at 40 CFR 131.13 states that "States may, at their discretion, include in their State standards, policies generally affecting their application and implementation, such as mixing zones, low flows and variances." A mixing zone is a limited area or volume of water where initial dilution of a discharge takes place and where certain numeric water quality criteria may be exceeded (EPA 2014).

The Idaho Water Quality Standards at IDAPA 58.01.02.060 provides Idaho's mixing zone policy for point source discharges. In the State 401 Certification, the IDEQ proposes to authorize mixing zones. The proposed mixing zones and dilution factors are summarized in Table 15. The EPA calculated dilution factors based on September critical low flow conditions, except for temperature, which uses monthly critical low flows, and for human health water quality criteria for carcinogens, which use the seasonal harmonic mean flows (see the TSD at Section 4.6.2). Modeling of the discharge using the Cormix computer model shows that early September is when the poorest mixing is likely to occur.

In general, the effluent flow rate was set at 31.6 million gallons per day, which is the maximum daily effluent flow rate reported by the facility between January 2013 and August 2018. However, Clearwater Paper operates a flow augmentation system which adds up to 7 mgd of Clearwater River water to the discharge pipe from May 15 – September 30 each year. Thus, for temperature and from May through September, additional scenarios were run with the effluent flow rate set at 38.6 mgd.

Table 15. Mixing Zones

Criteria Type	Critical Low Flow (CFS)	% of Critical Low Flow	Dilution Factor	Basis
Acute Aquatic Life (zone of initial dilution[1])	14,061	4.2%	13.0	TSD §§ 2.2.2 & 4.3.3
Chronic Aquatic Life (except ammonia)	16,285	10.7%	36.5	25% of stream width
Chronic Aquatic Life (ammonia)	18,457	9.7%	37.5	25% of stream width
Human Health Noncarcinogen	19,829	9.4%	39.3	25% of stream width
Human Health Carcinogen (July – September)	29,154	8.2%	49.7	WA State Line
Human Health Carcinogen (October – June)	33,951	11.1%	78.1	WA State Line
Temperature				
January	18,413	13.5%	52.0	25% of stream width
February	19,989	13.2%	55.0	25% of stream width
March	23,207	12.7%	61.4	25% of stream width
April	35,532	11.3%	83.3	WA State Line
May	54,474	10.2%	114.3	WA State Line
May, Augmented Flow	54,474	10.4%	96.1	WA State Line
June	34,402	11.3%	80.4	WA State Line
June, Augmented Flow	34,402	11.8%	69.2	WA State Line
Early July	26,748	12.2%	67.9	WA State Line
Early July, Augmented Flow	26,748	13.0%	59.0	WA State Line
Late July	26,748	8.7%	48.5	25% of stream width
Late July, Augmented Flow	26,748	12.9%	58.9	25% of stream width
August	19,912	9.4%	39.4	25% of stream width

Criteria Type	Critical Low Flow (CFS)	% of Critical Low Flow	Dilution Factor	Basis
August, Augmented Flow	19,912	10.6%	36.5	25% of stream width
Early September	16,285	10.7%	36.5	25% of stream width
Early September, Augmented Flow	16,285	16.0%	44.5	25% of stream width
Late September	16,285	14.1%	47.9	25% of stream width
Late September, Augmented Flow	16,285	16.0%	44.5	25% of stream width
October	15,534	14.3%	46.5	25% of stream width
November	16,350	14.3%	48.8	25% of stream width
December	15,786	15.1%	49.9	25% of stream width

Notes:
1. The Idaho Water Quality Standards define a "zone of initial dilution" as "an area within a Department authorized mixing zone where acute criteria may be exceeded" (IDAPA 58.01.02.010.118).

The reasonable potential analysis and water quality based effluent limit calculations were based on the mixing zones and zone of initial dilution shown in Table 15. If IDEQ revises the allowable mixing zones and zone of initial dilution in its final certification of this permit, reasonable potential analysis and water quality based effluent limit calculations will be revised accordingly.

The EPA has also determined the dilution factors at the point where the discharge plume reaches the Washington State line. These dilution factors have been used to determine if limits are necessary to ensure compliance with Washington's water quality criteria, and, if such limits were necessary, to calculate such limits.

Table 16. Dilution Factors at Washington State Line

Criteria Type	Critical Low Flow (CFS)	Dilution Factor
Acute Aquatic Life	14,061	41.9
Chronic Aquatic Life (except ammonia)	16,285	41.0
Chronic Aquatic Life (ammonia)	18,457	40.8
Human Health Noncarcinogen	19,829	42.0
Human Health Carcinogen (July – September)	29,154	49.7
Human Health Carcinogen (October – June)	33,951	78.1

Reasonable Potential and Water Quality Based Effluent Limits

The reasonable potential and water quality based effluent limit for specific parameters are summarized below. Calculations are provided in Appendices E and F.

pH

The Idaho water quality standards at IDAPA 58.01.02.250.01.a, require pH values of the river to be within the range of 6.5 to 9.0.

The Washington water quality standards at WAC 173-201A-200(1)(g) state that "pH shall be within the range of 6.5 to 8.5 with a human-caused variation within the above range of less than 0.5 units."

The technology-based effluent limit for pH is "within the range of 5.0 to 9.0 at all times" (40 CFR 430.22, 430.122), and the pH limit in the prior permit is "within the range of 5.5 to 9.0" standard units.

The EPA has determined that the lower bound pH effluent limit of 5.5 standard units from the prior permit will not ensure compliance with the lower bound of Idaho's water quality criteria for pH (6.5 standard units) at the edge of the chronic mixing zone. The EPA has determined that a lower-bound pH effluent limit of 5.7 standard units will ensure compliance with Idaho's lower bound pH criterion at the edge of the mixing zone.

The EPA has determined that the upper bound pH limit of 9.0 standard units will not ensure compliance with Washington's water quality standards at Washington state line. The 95th percentile ambient pH is 8.54 standard units, therefore, the receiving water cannot dilute discharges with a pH greater than 8.5 standard units such that the pH will be 8.5 standard units or lower at the Washington state line.

Therefore, the EPA has proposed a pH limit of 5.7 to 8.5 standard units in the draft permit. As explained above, the lower bound pH limit of 5.7 standard units is a water quality-based effluent limit based on Idaho's water quality criteria. The upper bound pH limit of 8.5 standard units is a water quality-based effluent limit based on Washington's water quality criteria (40 CFR 122.4(d)).

Federal regulations allow for brief excursions from pH limits when pH is monitored continuously, and the permit includes language consistent with the regulations (40 CFR 401.17).

Dissolved Oxygen and BOD_5

Natural decomposition of organic material in wastewater effluent impacts dissolved oxygen in the receiving water at distances far outside of the regulated mixing zone. The BOD_5 of an effluent sample indicates the amount of biodegradable material in the wastewater and estimates the magnitude of oxygen consumption the wastewater will generate in the receiving water.

The 2005 permit included water quality-based BOD_5 effluent limits which apply from June – November. In 2010, the EPA modified the June – November water quality-based BOD_5 effluent limits in the previous permit. Both the original and modified June – November BOD_5 water quality-based effluent limits were based on the RBM10 1-dimensional mathematical model and are necessary to meet Washington's water quality criteria for dissolved oxygen (40 CFR 122.4(d)). The modeling supporting the water quality-based BOD_5 limits in the prior permit, as modified in 2010, remains valid. Therefore, the EPA is not proposing to change the June – November BOD_5 effluent limits in the prior permit, as modified in 2010.

The rest of the year (December – May), technology-based effluent limits are applicable for BOD_5. As explained above, the technology-based BOD_5 limits, which apply from December – May, have been changed relative to the corresponding limits in the 2005 permit, based on recent production levels.

Residues

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

2,3,7,8 TCDD

A water quality-based effluent limit for 2,3,7,8 TCDD is necessary for this discharge, because this facility has a wasteload allocation (WLA) in the Total Maximum Daily Loading (TMDL) to Limit Discharges of 2,3,7,8-TCDD (Dioxin) to the Columbia River Basin (Columbia River Dioxin TMDL).

The EPA has determined that an effluent limit that implements the TMDL's WLA of 0.39 mg/day would not ensure that Washington's water quality criterion of 0.013 pg/L would be met at the state line. The water quality-based average monthly effluent limits for 2,3,7,8 TCDD are based on the modeled dilution factors at the Washington state line. Consistent with Section 5.4.4 of the TSD, the average monthly limits are set equal to the WLAs from the water quality-based analysis. Consistent with 40 CFR 122.45(d)(1), and Section 5.4.4 of the TSD, the EPA has also established maximum daily effluent limits based on estimated effluent variability.

The water quality-based effluent limit for 2,3,7,8 TCDD in the final effluent applies in addition to the technology-based effluent limit, which is applicable to the effluent from the bleach plant.

Pentachlorophenol

The EPA has determined that the technology-based effluent limit for pentachlorophenol, which is applicable to the effluent from the bleach plant, is not adequately stringent to ensure compliance with Washington's water quality criterion for pentachlorophenol of 0.002 µg/L at the State line. Therefore, in addition to the technology-based effluent limit for the bleach plant, the EPA has established water quality-based effluent limits for pentachlorophenol, for the final effluent. Consistent with Section 5.4.4 of the TSD, the average monthly limits are set equal to the WLAs from the water quality-based analysis. Consistent with 40 CFR 122.45(d)(1), and Section 5.4.4 of the TSD, the EPA has also established maximum daily effluent limits based on estimated effluent variability.

TSS

The prior permit stated, in footnote #14 to Table 1, that "by May 1, 2008 the permittee will reduce TSS by 25% determined by comparing a 12-month rolling average to the 2002 annual average discharge level."

The 2002 annual average effluent loading of TSS (calculated as the average of the monthly average loadings reported in 2002) was 18,723 lb/day. A 25% reduction from this loading is 14,042 lb/day.

The EPA considers footnote #14 to Table 1 in the 2005 permit to be an enforceable effluent limitation. In the draft permit, the EPA has stated this effluent limit directly in Table 1 as a 12-month rolling average effluent limit of 14,042 lb/day, instead of a footnote. The permit also specifies how the 12-month rolling average TSS load is to be reported. Reporting is similar to an average monthly limit, except for the longer averaging period.

Since calendar year 2008, the highest annual average TSS load was 11,001 lb/day, in calendar year 2010. Therefore, the EPA believes the permittee can comply with the 12-month rolling average effluent limit for TSS load.

Arsenic

The result of one effluent sample for arsenic was reported on the most recent permit application. The effluent concentration of arsenic was 1.6 µg/L, which is greater than the water quality criterion of 0.02 µg/L which is in effect for Clean Water Act purposes in Idaho as well as Washington's criterion of 0.018 µg/L. It is less than the upstream concentration of arsenic in the Snake River (see Table 2, above).

Because the effluent has only been sampled once for arsenic, the effluent concentration of arsenic is uncertain. In the draft permit, the EPA proposes to require monitoring of the effluent and receiving water for arsenic. These data will be used to determine if the discharge has the reasonable potential to cause or contribute to excursions above water quality criteria for arsenic at the time the permit is reissued.

Temperature

The 2005 permit included water quality-based effluent limits for temperature. The EPA has determined that the temperature limits in the 2005 permit are adequately stringent to ensure compliance with Idaho's and Washington's applicable water quality criteria for temperature and the applicable natural background condition provisions of the Idaho and Washington water quality standards. See Appendix F for the EPA's assessment of the temperature limits.

Chemical Oxygen Demand

There is some evidence that the toxicity of pulp and paper effluents may be correlated to the COD concentration (Araki 1997, Folke 1995). However, pulp and paper effluents receiving secondary treatment generally have both a low COD concentration and low toxicity (Verta et al. 1996, Martel and Kovacs 1997). The effect of chlorate upon bladder wrack (*Fucus vesiculosus*, a brown macroalga or seaweed) in mesocosom experiments was a confounding factor in some of the experiments showing an apparent correlation between COD and toxicity (NCASI 1996, Lehtinen et al. 1991). Bladder wrack is an important component of the ecosystem of the Baltic Sea, where some of the mesocosm experiments showing an apparent relationship between COD and toxicity were conducted (Lehtinen et al. 1988). While chlorate is highly toxic to certain brown macroalgal species such as bladder wrack, it is non-toxic to most aquatic species (Van Wijk and Hutchinson 1995).

As explained in Appendix D, based on available data for whole effluent toxicity, the discharge does not have the reasonable potential to cause or contribute to excursions above Idaho's narrative criterion for toxic substances. The EPA proposes continued monitoring for whole effluent toxicity.

Effluent Limits Below Analytical Quantification Limits

The WQBELs for pentachlorophenol and TCDD are not quantifiable using EPA-approved analytical methods. If a WQBEL is below the analytical quantification limit, Section 5.7.3 of the TSD recommends that the permit include the actual water quality-based limit and a requirement for the specific method to be used for monitoring. The permit should also state that any sample analyzed using the specified method and found to be below the minimum level (also called the reporting limit or quantitation limit) will be deemed compliant with the limit. The draft permit specifies the use of EPA Method 1613B for TCDD and EPA Method 1653 or NCASI Method CP-86.07 for pentachlorophenol. EPA Method 1613B is the most sensitive EPA-approved method for TCDD, and EPA Method 1653 and NCASI Method CP-86.07 are industry-specific approved methods which are more sensitive than the approved EPA methods for general use (604, 625.1, and 1625B).

D. Antibacksliding

Section 402(o) of the Clean Water Act and federal regulations at 40 CFR §122.44(l) generally prohibit the renewal, reissuance or modification of an existing NPDES permit that contains effluent limits, permit conditions or standards that are less stringent than those established in the previous permit (i.e., anti-backsliding) but provides limited exceptions. For explanation of the antibacksliding exceptions refer to Chapter 7 of the Permit Writers Manual.

All of the effluent limits in the draft permit are at least as stringent as the corresponding limits in the 2005 permit (as modified in 2010).

E. Pond Seepage

To account for permitted seepage from the secondary treatment pond, the 2005 permit requires the permittee to add 3 mgd to the effluent flow rate when calculating the effluent loading of AOX, BOD, and TCDD.

The 2005 permit also required the permittee to monitor groundwater quarterly for TCDD, BOD_5, TSS, ammonia, chloroform, nitrate + nitrite, AOX, and total phosphorus, for two years. The EPA has reviewed the groundwater monitoring data and believes it is reasonable to continue to add the estimated seepage flow of 3 mgd to the effluent flow rate for AOX, BOD, and TCDD.

The 2005 permit also states that the permittee must monitor for BOD_5, pH, temperature, and TSS in the Clearwater River upstream and downstream of the secondary treatment pond. The permit states that, if the State of Idaho determines, based on the monitoring results, that pollutants significant to designated uses can or will result in a reduction of the ambient water quality in the Clearwater River, the permittee shall prepare a seepage reduction/control program for surface impoundments at the facility. The State of Idaho has determined that Clearwater Paper does not need to prepare a seepage reduction/control program (personal communication with Cynthia Barrett, IDEQ, March 9, 2017).

VI. Monitoring Requirements

A. Basis for Effluent and Receiving Water Monitoring

Section 308 of the CWA and federal regulation 40 CFR 122.44(i) require monitoring in permits to determine compliance with effluent limitations. Monitoring may also be required to gather effluent and receiving water data to determine if additional effluent limitations are required and/or to monitor effluent impacts on receiving water quality.

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

B. Effluent Monitoring

In general, monitoring frequencies are based on the nature and effect of the pollutant, as well as a determination of the minimum sampling necessary to adequately monitor the facility's performance.

For pulp and paper facilities subject to subparts B or E of 40 CFR Part 430, minimum monitoring frequencies are promulgated in 40 CFR 430.02. However, these minimum monitoring frequencies only apply for "a duration of 5 years commencing on the date the applicable limitations or standards from subpart B or subpart E of this part are first included in the discharger's NPDES permit" (40 CFR 430.02(b)(1)). Applicable limitations and standards from 40 CFR 430 subpart B were included in the prior NPDES permit, which became effective on May 1, 2005. Thus, these minimum monitoring frequencies are no longer applicable to the Clearwater Paper facility. Where the minimum monitoring frequency has expired, the permit writer shall determine the appropriate monitoring frequency in accordance with the general requirements in 40 CFR 122.44(i).

Permittees have the option of taking more frequent samples than are required under the permit. These samples must be used for averaging if they are conducted using the EPA-approved test methods (found in 40 CFR 136 or in 40 CFR chapter I, subchapter N or O) or as specified in the permit. The ELGs for this facility, in 40 CFR part 430 (which is in chapter I, subchapter N) specify analytical methods for analysis of TCDD, TCDF, AOX, and chlorinated phenolic compounds.

Monitoring Changes from the Previous Permit

PCB Congeners

The draft permit proposes effluent monitoring for PCB congeners.

As discussed above, the Snake River is 303(d) listed due to elevated concentrations of PCBs in fish tissue in the State of Washington, downstream from the discharge. Specifically, four segments of the Snake River or Lower Granite Lake within WRIA 35 are listed for PCBs. The earliest listings, with listing ID numbers 19120 and 19121 were in the 2004 integrated report and were based on fish tissue data collected in 1998.[2,3] In the 2008 integrated report, an additional segment, with listing ID number 52697, was added based on fish tissue data collected in 2004.[4] A fourth segment, with listing ID number 78963, was listed in the current integrated report based on data collected in 2009.[5] Ecology found that there was not a statistically significant change in the concentration of PCBs in comparable fish tissue samples (i.e., the same species, analytes, and seasons of collections) collected from the Snake River in 2009 relative to samples collected in 2004 and 2005 (Seiders et al. 2011).

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[2] https://fortress.wa.gov/ecy/approvedwqa/ApprovedSearch.aspx?LISTING_ID=19120
[3] https://fortress.wa.gov/ecy/approvedwqa/ApprovedSearch.aspx?LISTING_ID=19121
[4] https://fortress.wa.gov/ecy/approvedwqa/ApprovedSearch.aspx?LISTING_ID=52697
[5] https://fortress.wa.gov/ecy/approvedwqa/ApprovedSearch.aspx?LISTING_ID=78963

Thus, the concentration of PCBs in fish tissue collected from the Snake River in WRIA 35 between 1998 and 2009 consistently exceeded 5.3 ppb, which is the tissue the concentration "equivalent" to the PCB water quality criterion that had been in effect in the State of Washington during that time (170 pg/L) (Seiders et al. 2011).

In November 2016, the EPA promulgated a new PCB water quality criterion of 7 pg/L for Washington (81 FR 85417). This criterion is equivalent to 0.2 ppb in fish tissue. The revised water column criterion and its equivalent fish tissue concentration are 96% lower than the prior criterion. Thus, even though the most recent PCB fish tissue data available were collected in 2009, it is likely that the concentration of PCBs in fish tissue still exceeds the concentration equivalent to the water quality criterion.

Congener analysis is appropriate in this case because it will allow for measurement of both legacy and inadvertent PCBs and aid in identifying the origin of any PCBs in the discharge. PCBs are generally not created during the process of bleaching pulp, particularly when elemental chlorine free bleaching techniques are used (as they are at Clearwater Paper) (Macdonald, Et al. 1998). However, PCBs can nonetheless be present in pulp mill discharges due to inadvertently generated PCBs in recycled pulp, or from legacy PCBs in materials within the mill (IEPCO 2015, Rantio 1996). Although Clearwater Paper does not produce secondary fiber (i.e., fiber from recycled paper), Clearwater Paper does purchase pulp, and the origin of the purchased pulp is unknown. Stormwater from this facility is directed to the same wastewater treatment system as process wastewater, and stormwater from industrial and commercial areas can contain high concentrations of PCBs (Ecology 2011).

There are approved analytical methods in 40 CFR Part 136 for the analysis of PCB Aroclors, which are the mixtures of PCBs that were intentionally manufactured (i.e., PCB-1016, PCB-1221, PCB-1232, PCB-1242, PCB-1248, PCB-1254, and PCB-1260). These methods cannot measure inadvertently generated PCBs; a congener-specific PCB method is necessary to measure such PCBs. Congener data can also be used to determine the presence and concentration of Aroclors.

There are no approved analytical methods for PCB congeners. For pollutants for which there are no approved methods under 40 CFR Part 136, including PCB congeners, monitoring must be conducted according to a test procedure specified in the permit (40 CFR 122.44(i)(1)(iv)(B)).

Method 1668C is the most sensitive method available, and it analyzes for nearly all of the 209 individual congeners. The EPA proposed to approve Method 1668C as a Clean Water Act method on September 23, 2010 (75 FR 58027). On May 18, 2012, the EPA chose to defer approval of Method 1668C while it considers the large number of public comments received on the proposed approval. However, the EPA stated that "this decision does not negate the merits of this method for the determination of PCB congeners in regulatory programs or for other purposes when analyses are performed by an experienced laboratory" (77 FR 29763). Therefore, the EPA has specified the use of EPA Method 1668C for analysis of PCB congeners. The draft permit proposes to require grab samples for PCB congeners, to reduce the potential for sample contamination.

These data will be used to determine if the discharge has the reasonable potential to cause or contribute to excursions above water quality standards for PCBs in waters of the State of Idaho or the State of Washington.

Acute Whole Effluent Toxicity

The draft permit proposes effluent monitoring for acute WET in addition to chronic WET. Acute WET testing, using rainbow trout (*Oncorhynchus mykiss*) as the test organism, is appropriate for this discharge because the threatened Snake River steelhead is the same genus and species as rainbow trout. Thus, acute WET testing using rainbow trout will provide useful information regarding the discharge's potential effects upon Snake River steelhead and other salmonids.

Arsenic and Mercury

The draft permit proposes effluent monitoring for arsenic and mercury to determine if the discharge has the reasonable potential to cause or contribute to excursions above water quality criteria for these pollutants. As discussed above, the Snake River is 303(d) listed due to elevated concentrations of mercury in fish tissue in the State of Washington, downstream from the discharge. Arsenic has been measured in the effluent.

Total Nitrogen

The draft permit proposes monthly monitoring for total nitrogen in addition to nitrate + nitrite and ammonia. Total nitrogen monitoring is necessary to determine the impact of the nutrients in the discharge upon water quality.

Monitoring Frequencies

As explained above, the minimum monitoring frequencies in 40 CFR 403.02(a) have expired, and, where the minimum monitoring frequency has expired, the permit writer shall determine the appropriate monitoring frequency in accordance with the general requirements in 40 CFR 122.44(i).

The EPA has determined, consistent with the "Interim Guidance for Performance-based Reductions of NPDES Monitoring Frequencies" (EPA 1996), that monitoring for AOX once per week, instead of the daily monitoring in the previous permit, will adequately characterize the discharge of AOX. Specifically, the average discharge of AOX over the five-year period from January 1, 2012 through December 31, 2016 was 925 lb/day, which is 47% of the proposed average monthly limit, and the coefficient of variation (CV), which is the standard deviation divided by the mean, is 0.191. Based on Table 1 of the guidance, the 47% ratio of the average discharge to the average monthly limit would support a reduced monitoring frequency of 3 times per week. However, since the effluent loading of AOX also has low variability (CV = 0.191), the monitoring frequency may be further reduced. Based on Table 3 of the guidance, when the CV is 0.2 and the long term average discharge is 50% of the average monthly limit, there is a 0% probability of reporting an average monthly limit violation for any sample size from 1 to 30 samples per month. Therefore, a reduction to a sample frequency of weekly for AOX will not appreciably change the probability that an AOX violation will be reported.

Requirements for sample collection procedures for AOX now reference 40 CFR Part 136 and EPA Method 1650, which is the approved analytical method for AOX. Additional guidance on sampling procedures for AOX can be found in Section 6.4.3.4 of the *Kraft Pulp Mill Compliance Assessment Guide* (EPA 1999) and in Section 8 and Appendix B of the *Permit Guidance Document Pulp, Paper and Paperboard Manufacturing Point Source Category* (EPA 2000).

The EPA has determined, consistent with the "Interim Guidance for Performance-based Reductions of NPDES Monitoring Frequencies" (EPA 1996), that monitoring frequencies for BOD_5 and TSS may be reduced relative to those in the previous permit.

To determine reduced monitoring frequencies for BOD_5, for the June – November effluent limits, the EPA considered effluent data from June 2014 – November 2018. The average discharge of BOD_5, during the season of June – November was 5,588 lb/day, which is 67% of the average monthly limit for this season. Based on Table 1 of the guidance, this supports a reduction in monitoring frequency from daily (7/week) in the previous permit to 5/week.

However, the CV was relatively low (0.292). The EPA therefore used the method described in Appendix N to the EPA's *Local Limits Development Guidance* (EPA 2004) to determine whether a further reduction in monitoring frequency was appropriate. This method calculates the minimum number of samples necessary to represent an average discharge of effluent at an acceptable relative error and confidence level. The highest monthly average loading of BOD_5 from June – November, from 2014 – 2018 was 7,221 lb/day, in October 2017. The average monthly limit of 8,400 lb/day is 16.3% higher than this; thus, the acceptable relative error is 16.3%. Given the CV of 0.292, the minimum number of samples necessary to ensure a relative error of 16.3% with a 90% confidence level is 9 samples per month. Sampling three times per week will result in 12 to 13 samples per month, depending on the specific timing of sampling. Thus, sampling BOD_5 three times per week from November – June will adequately characterize the discharge.

The average discharge of BOD_5 during the season of December – May was 7,155 lb/day, which is 26% of the average monthly limit for this season. Based on Table 1 of the guidance, this supports a reduction in monitoring frequency from 3/week in the previous permit to 1/week.

The effluent monitoring frequencies for COD were changed to be the same as the revised monitoring frequencies for BOD_5.

The average discharge of TSS from January 1, 2014 – December 31, 2018 was 7,899 lb/day, and the CV is 0.327. The average TSS load is 16% of the average monthly limit for TSS. Based on Table 1 of the guidance, a ratio of 16% supports a reduction in monitoring frequency from daily in the previous permit to 1/week.

However, the permit includes an additional 12-month rolling average effluent limit for TSS. Weekly sampling would result in about 52 samples from which to calculate the 12-month rolling average TSS load. To determine if 52 samples would adequately characterize the 12-month rolling average TSS load, the EPA used the method described in Appendix N to the *Local Limits Development Guidance*. The highest 365-day rolling average TSS load from January 1, 2014 – December 31, 2018 was 8,750 lb/day. The 12-month rolling average TSS load limit of 14,042 lb/day is 60% higher than this.

Given the CV of 0.327, 52 samples would result in a relative error of only 8% at the 90% confidence level. Thus, weekly sampling will adequately characterize the discharge of TSS for the purposes of determining compliance with both the average monthly limit and the 12-month rolling average limit, and weekly sampling for TSS is therefore proposed in the draft permit.

C. Fiber Line Monitoring

As discussed above, some of the technology-based effluent limits for this industry apply at the fiber lines, as opposed to the final effluent. Monitoring at the fiber lines is necessary to determine compliance with these effluent limits.

As explained above, the minimum monitoring frequencies in 40 CFR 403.02(a) have expired, and, where the minimum monitoring frequency has expired, the permit writer shall determine the appropriate monitoring frequency in accordance with the general requirements in 40 CFR 122.44(i).

The EPA has chosen to maintain the monthly monitoring frequency from the 2005 permit for TCDD, TCDF, and chlorinated phenolic compounds at the fiber lines. The EPA believes that monthly monitoring for these pollutants in the bleach plant effluent is necessary to adequately characterize the discharges and determine compliance with the effluent limits.

However, the EPA has determined, consistent with the "Interim Guidance for Performance-based Reductions of NPDES Monitoring Frequencies" (EPA 1996), that monitoring for chloroform twice per month, instead of the weekly monitoring required in the previous permit, will adequately characterize the discharges of chloroform from the two fiber lines. Therefore, the draft permit proposes a monitoring frequency of twice per month for chloroform in the fiber line effluent.

Requirements for sample collection procedures for TCDD, TCDF, chloroform, and chlorinated phenolic compounds now reference 40 CFR Part 136 and the EPA-approved analytical methods for these compounds. Additional guidance on sampling procedures for these parameters can be found in Section 7.4.4 of the *Kraft Pulp Mill Compliance Assessment Guide* (EPA 1999) and in Section 8 and Appendix B of the *Permit Guidance Document Pulp, Paper and Paperboard Manufacturing Point Source Category* (EPA 2000).

D. Receiving Water and Intake Water Monitoring

Table 17 presents the proposed receiving water monitoring requirements for the draft permit. Table 18 presents the proposed intake water monitoring requirements for the draft permit Receiving water monitoring results must be submitted with the DMR.

In general, receiving water monitoring may be required for pollutants of concern to assess the assimilative capacity of the receiving water for the pollutant. In addition, receiving water monitoring may be required for parameters upon which the water quality criteria are dependent and to collect data for TMDL development if the facility discharges to an impaired water body.

In this case, upstream receiving water monitoring is required for both the Snake and Clearwater Rivers, since the discharge is located at the confluence of these rivers and thus the upstream water quality at the point of discharge is influenced by both the Snake and Clearwater Rivers.

Except for dissolved oxygen, pH, and chlorophyll a, monitoring of upstream water quality in the Clearwater River is accomplished via intake water monitoring. Monitoring of chlorophyll-a and dissolved oxygen is required in the Clearwater River itself instead of the intake, to ensure that the data are representative of river conditions. The permit does not require intake water or receiving water monitoring for temperature in the Clearwater River, because such data are available from the USGS monitoring station at Spalding, Idaho (station #13342500).

Sampling is not proposed for total nitrogen, pH, soluble reactive phosphorus, or total phosphorus in the Snake River upstream from the discharge, because data for these parameters have been collected by the Washington Department of Ecology at the U.S. Highway 12 bridge over the Snake River (station number 35A150).[6]

The EPA has required monitoring for arsenic and mercury in the Clearwater River (intake water) and in the Snake River upstream from the discharge. These data will be used to determine if the discharge has the reasonable potential to cause or contribute to excursions above water quality standards for these pollutants when the permit is reissued.

Receiving water monitoring for nitrogen, phosphorus, chlorophyll a, pH, temperature and dissolved oxygen is required to assess the discharge's effect upon nutrients and response variables in the receiving water. Receiving water samples for chlorophyll-a and pH must be taken from the photic zone, because phytoplankton productivity can influence those parameters, and healthy phytoplankton will be found in the photic zone (see EPA Method 445.0 at Section 8.1).

There is no EPA-approved analytical method for chlorophyll-a in 40 CFR Part 136. Therefore, monitoring must be conducted using a test procedure specified in the permit (40 CFR 122.44(i)(1)(iv)(B)). The permit specifies the use of EPA Methods 445.0, 446.0 or 447.0 for chlorophyll-a.

The EPA proposes receiving water monitoring for PCB congeners in the Snake and Clearwater Rivers, upstream from the discharge. As explained above, there are no approved analytical methods in 40 CFR Part 136 for PCB congeners, thus, monitoring must be conducted using a test procedure specified in the permit (40 CFR 122.44(i)(1)(iv)(B)). As with the effluent monitoring, the EPA has specified the use of EPA Method 1668C for analysis of PCB congeners.

The 2005 permit required that receiving water samples be depth and spatially integrated (see the 2005 permit at Table 7) and defined the term "depth/spatially integrated" as the collection of samples using an equal-width-increment (EWI) sampling method (see the 2005 permit at Part VI). However, the equal-width increment method may not be appropriate for the receiving waters because of the low ambient velocity of Lower Granite Pool. The USGS *National Field Manual for the Collection of Water-Quality Data* (USGS 2015) states that the EWI method should not be used when stream velocities are less than the minimum velocity required for isokinetic samplers, which is at least 1.5 ft/s (see Chapter A4 at Page 42). Clearwater Paper measured ambient velocity as a condition of its permit, from July – October during 2005 and 2006. The average velocities measured at station LGP-13, which is just downstream from the discharge, were 0.16 ft/s in 2005 and 0.33 ft/s in 2006 (AMEC 2006 and 2007).

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[6] Data from this station are available in the Washington State Department of Ecology's Environmental Information Management System database, at: https://apps.ecology.wa.gov/eim/search/Detail/Detail.aspx?DetailType=Location&SystemStationId=134640&LocationUserId=35A150

Nonisokinetic sampling methods should be used when the stream velocity is less than the minimum required for isokinetic samplers. Unlike the EWI method, the equal discharge increment (EDI) method can be used to collect discharge-weighted samples using nonisokinetic samplers. See the USGS *National Field Manual for the Collection of Water-Quality Data* at Chapter A4, Section 4.1.3B. Thus, the draft permit proposes to require the use of the equal discharge increment (EDI) method to collect receiving water samples. The permit specifies the use of at least four sampling increments, consistent with the recommendations of the *National Field Manual for the Collection of Water-Quality Data* (see Chapter A4 at Page 53). The draft permit also proposes to allow the permittee to collect a single sample from the receiving water if the permittee can demonstrate and document that the stream cross-section is well-mixed.

In general, the draft permit proposes to require depth-integrated receiving water samples, except for chlorophyll-a and pH, for which grab samples must be taken from the photic zone.

The draft permit proposes to require grab samples for arsenic, mercury and PCBs, to reduce the potential for sample contamination.

Table 17. Receiving Water Monitoring in Draft Permit

Parameter	Units	Upstream Sample Frequency: Clearwater River	Upstream Sample Frequency: Snake River	Downstream Sample Frequency	Sample Type
Arsenic	µg/L	—	Quarterly[5]	—	Grab
Chlorophyll a	µg/L	See note 3	See note 3	See note 3	See note 2
Mercury, total recoverable	µg/L	—	Quarterly[5]	—	Grab
Nitrogen, total	µg/L	—	—	See note 3	See note 1
Oxygen, dissolved	mg/L	Continuous[4]	Continuous[4]	Continuous[4]	Recording[4]
PCB congeners	pg/L	—	2/year	2/year	Grab
pH	s.u.	See note 3	—	See note 3	See note 2
Phosphorus, soluble reactive	µg/L	—	—	See note 3	See note 1
Phosphorus, total	µg/L	—	—	See note 3	See note 1
Temperature	°C	—	Continuous[4]	Continuous[4]	Recording[4]

Notes:
1. The permittee must analyze a discharge-weighted composite of at least four depth-integrated samples taken across the width of the river or reservoir. Increments must be chosen using the equal discharge increment method. Samples need not be isokinetic. If the permittee demonstrates and documents that the cross-section is well-mixed, one depth-integrated sample may be taken at the centroid of flow. Only one analysis is required.
2. A minimum of four grab samples must be taken across the width of the river or reservoir. Increments must be chosen using the equal discharge increment method. Samples need not be isokinetic. If the permittee demonstrates and documents that the cross-section is well-mixed, one grab sample may be taken at the centroid of flow. Samples must be taken from the photic zone and need not be depth-integrated.
3. Samples for chlorophyll a, nitrogen, pH and phosphorus must be taken once per month from April – October, inclusive.
4. Continuous monitoring for dissolved oxygen and temperature must occur between April 1 and October 31 during the final full calendar year of the permit term. Dissolved oxygen concentrations and temperatures must be logged at least once every 15 minutes. In the Snake River and in Lower Granite Pool, dissolved oxygen concentrations and temperatures must be measured near the deepest part of the river or reservoir cross section and at at least three depths (surface, mid-depth, and bottom).
5. Receiving water samples for arsenic and mercury must be taken on the same days as intake water samples.

Table 18. Clearwater River Intake Water Monitoring in Draft Permit

Parameter	Units	Frequency	Sample Type
Arsenic	µg/L	Quarterly	Grab
Mercury	µg/L	Quarterly	Grab
Nitrogen, total as N	µg/L	See note 1	24-hour Composite
PCB congeners	pg/L	2/year	Grab
Phosphorus, soluble reactive	µg/L	See note 1	24-hour Composite
Phosphorus, total as P	µg/L	See note 1	24-hour Composite
Notes: 1. Samples for nitrogen and phosphorus must be taken once per month from April – October, inclusive.			

E. Electronic Submission of Discharge Monitoring Reports

The draft permit requires that the permittee submit DMR data electronically using NetDMR. NetDMR is a national web-based tool that allows DMR data to be submitted electronically via a secure Internet application. Clearwater Paper has been submitting DMR data electronically since February 2014.

Further information about NetDMR, including upcoming trainings and contacts, is provided on the following website: https://netdmr.epa.gov.

VII. Other Permit Conditions

A. Quality Assurance Plan

Clearwater Paper is required to update the Quality Assurance Plan (QAP) within 90 days of the effective date of the final permit. The QAP must include of standard operating procedures the permittee must follow for collecting, handling, storing and shipping samples, laboratory analysis, and data reporting. The plan must be retained on site and be made available to the EPA and the IDEQ upon request.

Specialized sample collection methods are necessary for some of the chemicals regulated under this permit. Thus, the permit states that, when developing sample collection, preservation, and handling procedures for AOX, chlorinated phenolic compounds, TCDD and TCDF for the QAP, the permittee must consider the guidance in Section 8 and Appendix B of *Permit Guidance Document Pulp, Paper and Paperboard Manufacturing Point Source Category* (EPA-821-B-00-003).

B. Best Management Practices Plan

The permit requires Clearwater Paper to develop a Best Management Practices (BMP) Plan. The BMP Plan requirements implement the requirements of 40 CFR 430.03.

C. Environmental Justice

As part of the permit development process, the EPA Region 10 conducted a screening analysis to determine whether this permit action could affect overburdened communities. “Overburdened” communities can include minority, low-income, tribal, and indigenous populations or communities that potentially experience disproportionate environmental harms and risks. The EPA used a nationally consistent geospatial tool that contains demographic and environmental data for the United States at the Census block group level. This tool is used to identify permits for which enhanced outreach may be warranted.

The facility is located within or near a Census block group that is potentially overburdened because of lead paint, major direct dischargers to water, and ozone levels in air. In order to ensure that individuals near the facility are able to participate meaningfully in the permit process, the EPA published the legal notice for the availability of the draft permit in the Nez Perce Tribe's newspaper in addition to the Lewiston Morning Tribune and contacted the Nez Perce Tribe's radio station (KIYE FM). The EPA sent a copy of the public notice to the Nez Perce Tribe's Nimiipuu Health clinic in Lapwai, Idaho. The EPA also contacted individuals who had filed complaints about the facility in the past, to notify them that the permit is available for public comment.

Regardless of whether a facility is located near a potentially overburdened community, the EPA encourages permittees to review (and to consider adopting, where appropriate) Promising Practices for Permit Applicants Seeking EPA-Issued Permits: Ways To Engage Neighboring Communities (see https://www.federalregister.gov/articles/2013/05/09/2013-10945/epa-activities-to-promote-environmental-justice-in-the-permit-application-process#p-104). Examples of promising practices include: thinking ahead about community's characteristics and the effects of the permit on the community, engaging the right community leaders, providing progress or status reports, inviting members of the community for tours of the facility, providing informational materials translated into different languages, setting up a hotline for community members to voice concerns or request information, follow up, etc.

For more information, please visit https://www.epa.gov/environmentaljustice and refer to Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*[7]

D. Standard Permit Provisions

Sections III, IV and V of the draft permit contain standard regulatory language that must be included in all NPDES permits. The standard regulatory language covers requirements such as monitoring, recording, and reporting requirements, compliance responsibilities, and other general requirements.

In Part VI, this permit includes some definitions that are specific to this industry. The sources of these industry-specific definitions are 40 CFR Part 430 and the glossary of the *Permit Guidance Document: Pulp, Paper and Paperboard Manufacturing Point Source Category* (EPA 2000).

[7] https://www.epa.gov/laws-regulations/summary-executive-order-12898-federal-actions-address-environmental-justice

VIII. Other Legal Requirements

A. Endangered Species Act

The Endangered Species Act requires federal agencies to consult with National Oceanic and Atmospheric Administration Fisheries (NOAA Fisheries) and the U.S. Fish and Wildlife Service (USFWS) if their actions could beneficially or adversely affect any threatened or endangered species.

The EPA has prepared a biological evaluation and determined that the discharge from the Clearwater Paper mill is likely to adversely affect bull trout, steelhead, fall Chinook, spring/summer Chinook, and sockeye salmon or adversely modify the critical habitat for these species.

B. Essential Fish Habitat

Essential fish habitat (EFH) is the waters and substrate (sediments, etc.) necessary for fish to spawn, breed, feed, or grow to maturity. The Magnuson-Stevens Fishery Conservation and Management Act (January 21, 1999) requires the EPA to consult with NOAA Fisheries when a proposed discharge has the potential to adversely affect EFH (i.e., reduce quality and/or quantity of EFH).

C. State Certification

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

D. Permit Expiration

The permit will expire five years from the effective date.

IX. References

AMEC Earth and Environmental. 2006. *Tier 1 Endangered Species Act Monitoring and NPDES Compliance Monitoring Studies Conducted in 2005: Potlatch Lewiston Facility*. January 2006.

AMEC Earth and Environmental. 2007. *Tier 1 Endangered Species Act Monitoring and NPDES Compliance Monitoring Studies Conducted in 2006: Potlatch Lewiston Facility*. January 2007.

Anchor Environmental. 2008. *High Volume Quarterly Study Sampling and Analysis Report: Potlatch NPDES Permit Renewal Compliance Monitoring*. January 2008.

Araki, Hiroshi; N. Tatarazako and H. Sotobayashi. 1997. “Biological and Chemical Characterization of Japanese Pulp and Paper Mill Effluents.” In *Proceedings of the 3rd International conference on environmental fate & effects of pulp and paper mill effluents*. Rotorua, New Zealand. pp. 47–56.

Arar, E. and G.B. Collins. 1997. Method 445.0: *In Vitro Determination of Chlorophyll a and Pheophytin a in Marine and Freshwater Algae by Fluorescence*. U.S. Environmental

Protection Agency. Office of Research and Development. National Exposure Research Laboratory. Revision 1.2. September 1997.
https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=P100PH99.txt

Ecology. 2011. *Control of Toxic Chemicals in Puget Sound: Phase 3 Data and Load Estimates*. Prepared for the Washington State Department of Ecology by Herrera Environmental Consultants, Inc., Seattle, Washington. Washington State Department of Ecology Pub. No. 11-03-010.
https://fortress.wa.gov/ecy/publications/documents/1103010.pdf

EPA. 1991. *Technical Support Document for Water Quality-based Toxics Control.* US Environmental Protection Agency. Office of Water. EPA/505/2-90-001. March 1991.
https://www3.epa.gov/npdes/pubs/owm0264.pdf

EPA. 1996. "Interim Guidance for Performance - Based Reductions of NPDES Permit Monitoring Frequencies." Memorandum from Robert Perciasepe, Assistant Administrator, Office of Water and Steven A. Herman, Assistant Administrator for the Office of Enforcement and Compliance Assurance to Regional Administrators, Regional Water Division Directors and Regional Counsels. April 19, 1996.
https://www.epa.gov/sites/production/files/2014-08/documents/interim-guidance-for-performance-memo-1996.pdf

EPA. 1999. *Kraft Pulp Mill Compliance Assessment Guide (CAA, CWA, RCRA and EPCRA)*. US Environmental Protection Agency. Office of Enforcement and Compliance Assurance. Office of Compliance. Manufacturing, Energy and Transportation Division. EPA-310-B-99-001. May 1999.
https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=1000446B.txt

EPA. 2000. *Permit Guidance Document: Pulp, Paper and Paperboard Manufacturing Point Source Category (40 CFR §430).* US Environmental Protection Agency. Office of Water. EPA-821-B-00-003. May 2000.
https://www.epa.gov/sites/production/files/2015-10/documents/pulp-paper_permit-guidance_2000.pdf

EPA. 2004. *Local Limits Development Guidance Appendices*. Environmental Protection Agency. Office of Wastewater Management. EPA-833-R-04-002B. July 2004.
https://www3.epa.gov/npdes/pubs/final_local_limits_appendices.pdf

EPA. 2010. *NPDES Permit Writers' Manual.* Environmental Protection Agency. Office of Wastewater Management. EPA-833-K-10-001. September 2010.
https://www3.epa.gov/npdes/pubs/pwm_2010.pdf

EPA. 2014. *Water Quality Standards Handbook Chapter 5: General Policies.* Environmental Protection Agency. Office of Water. EPA 820-B-14-004. September 2014.
https://www.epa.gov/sites/production/files/2014-09/documents/handbook-chapter5.pdf

IDEQ. 2014. *Statement of Basis*. Tier I Operating Permit No. Tl-2012.0038. IFG Lewiston, LLC, Lewiston, Idaho. March 26, 2014.
http://www.deq.idaho.gov/media/1241/ifg-lewiston-t1-statement-0314.pdf

Folke, J. (1995) "Does COD Provide a Useful Indication of the Sub Lethal Toxicity of ECF and TCF Effluents?" Paper presented at Non-Chlorine Bleaching Conf., Pulp Pap. Res. Inst. and Emerging Technol. Transfer.

IEPCO. 2015. *Polychlorinated Biphenyl Source Identification Study*. Inland Empire Paper Company. NPDES Permit No. WA-000082-5. Permit Condition S6.A. October 30, 2015. https://fortress.wa.gov/DownloadDocument.aspx?id=160807

Lehtinen, Karl-Johan; M. Notini; J. Mattsson; and L. Landner. 1988. "Disappearance of Bladder-Wrack (Fucus vesiculosus L.) in the Baltic Sea: Relation to Pulp-Mill Chlorate." *Ambio*. Vol. 17, No. 6, pp. 387-393.
http://www.jstor.org/stable/4313505

Lehtinen, Karl-Johan; B. Axelsson; K. Kringstad; and L. Stromberg. 1991. "Characterization of pulp mill effluents by the model ecosystem technique: SSVL-investigations in the period 1982- 1990." *Nordic Pulp and Paper Research Journal*. Vol. 6, No. 2, pp 81-88.
http://www.npprj.se/html/np-viewarticleabstract.asp?m=7353&mp=581

Macdonald, Robie W.; M.G. Ikonomou, and D.W. Paton. 1998. "Historical Inputs of PCDDs, PCDFs, and PCBs to a British Columbia Interior Lake: The Effect of Environmental Controls on Pulp Mill Emissions." *Environmental Science and Technology*. Vol. 32, No. 3., pp. 331-337.
https://pubs.acs.org/doi/full/10.1021/es970345q

Martel, Pierre and T. Kovacs. 1997. "A comparison of the potential of primary- and secondary-treated pulp and paper mill effluents to induce mixed function oxygenase (MFO) activity in fish." *Water Research*. Vol. 31, No. 6, pp 1482-1488.
https://www.sciencedirect.com/science/article/pii/S0043135496003983

NCASI. 1996. "Comments on the Applicability of the Paper, 'Does COD Provide a Useful Indication of the Sub-lethal Toxicity of ECF and TCF Effluents' to the Issue of Regulation of Pulp Mill Effluents for COD. National Council of the Paper Industry for Air and Stream Improvement, Inc. Research Triangle Park, NC. August 5, 1996.

Rantio, Tiina. 1996. "Chlorohydrocarbons in Pulp Mill Effluent and the Environment III. Persistent Chlorohydrocarbon Pollutants." *Chemosphere*. Vol. 32, No. 2, pp 253-265.
https://www.sciencedirect.com/science/article/pii/0045653595003371

Seiders, Keith; C. Deligeannis and M. Friese. 2011. *Focus on Fish Testing*. Washington State Department of Ecology. Environmental Assessment Program. Publication Number 11-03-067. December 2011.
https://fortress.wa.gov/ecy/publications/documents/1103067.pdf

U.S. Geological Survey. 2015. *National Field Manual for the Collection of Water-Quality Data*. U.S. Geological Survey Techniques of Water-Resources Investigations, book 9, chaps. A1-A10. Compiled October 2015.
http://water.usgs.gov/owq/FieldManual/

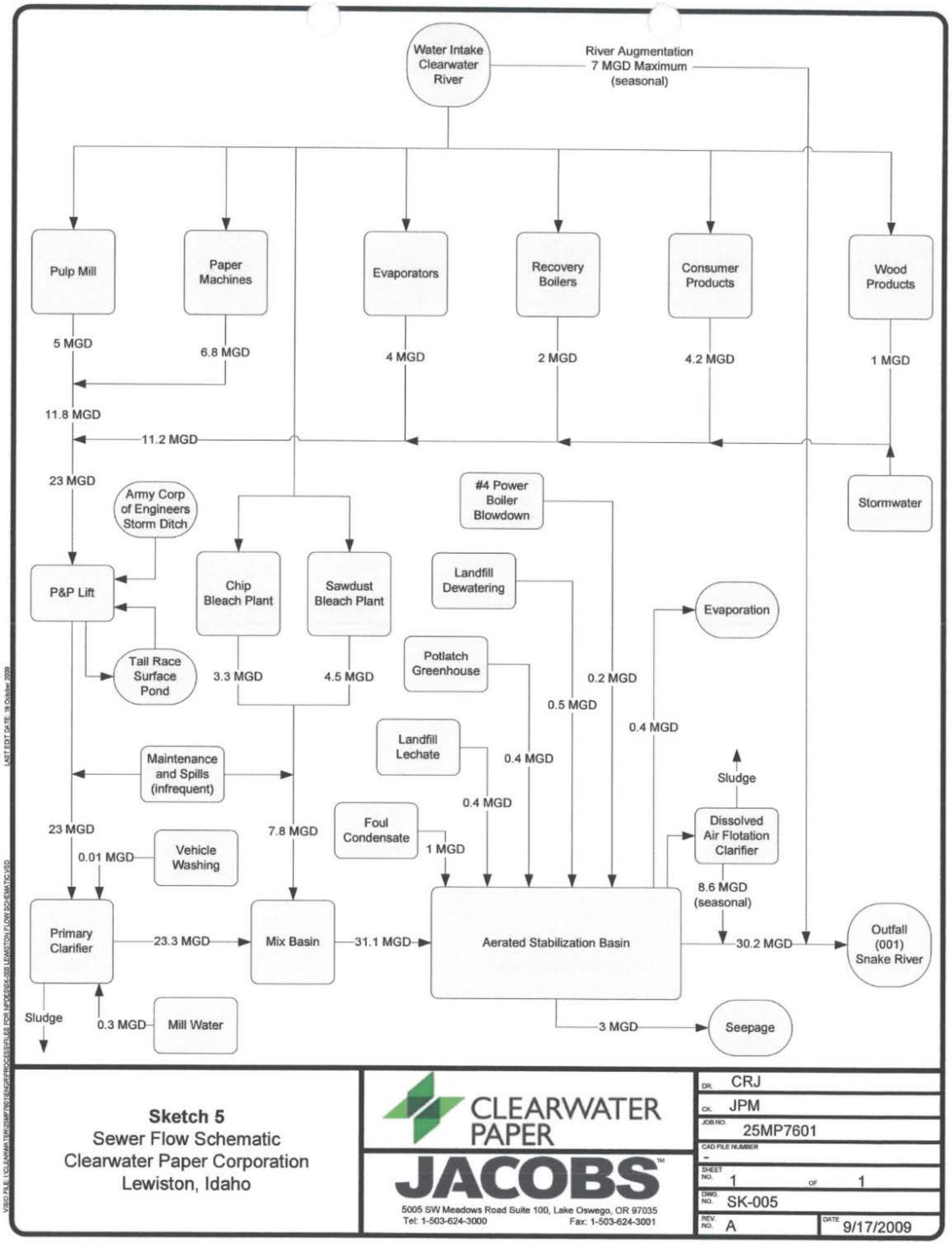
Van Wijk, Dolf J. and T. H. Hutchinson. 1995. "The Ecotoxicity of Chlorate to Aquatic Organisms: A Critical Review." *Ecotoxicology and Environmental Safety*. Vol. 32, No. 3,

pp 244-253.
https://www.sciencedirect.com/science/article/pii/S0147651385711104

Verta, M.; J. Ahtianen; T. Nakari; A. Langi; and E. Talka. 1996. "The Effect of Waste Constituents on the Toxicity of TCF and ECF Pulp Bleaching Effluents." In Environmental Fate and Effects of Pulp and Paper Mill Effluents. CRC Press.

Appendix A. Facility Information

Figure A-1: Process Flow Diagram[1]



[1] The "Potlatch Greenhouse" (and associated wastewater discharge) no longer exists. The "Wood Products" division (sawmill) has been sold to Idaho Forest Group, but wastewater from the facility is still collected and treated by Clearwater Paper's treatment system (personal communication with Bill Hoesman, Clearwater Paper Corporation, February 3, 2017).

Figure A-2: Map

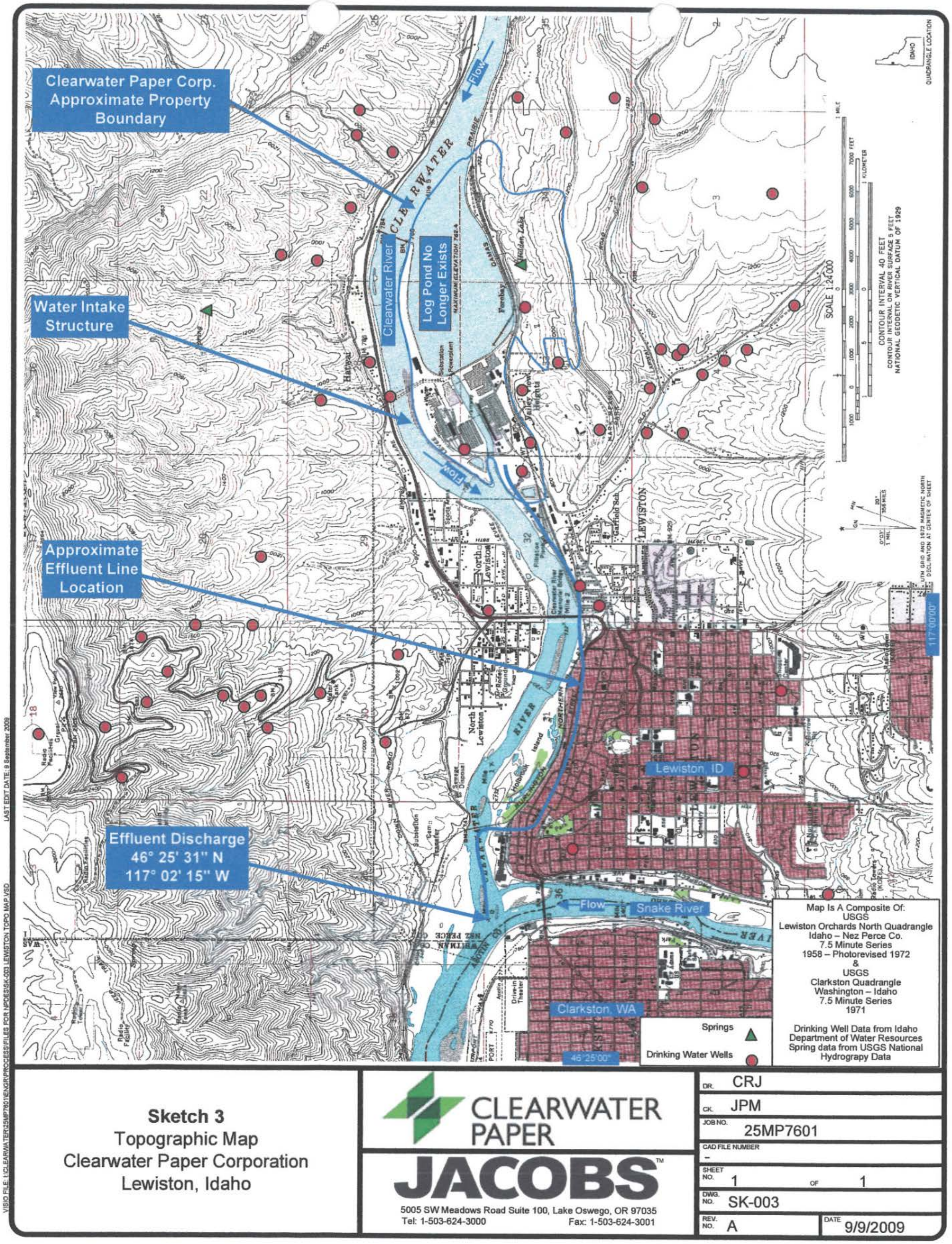
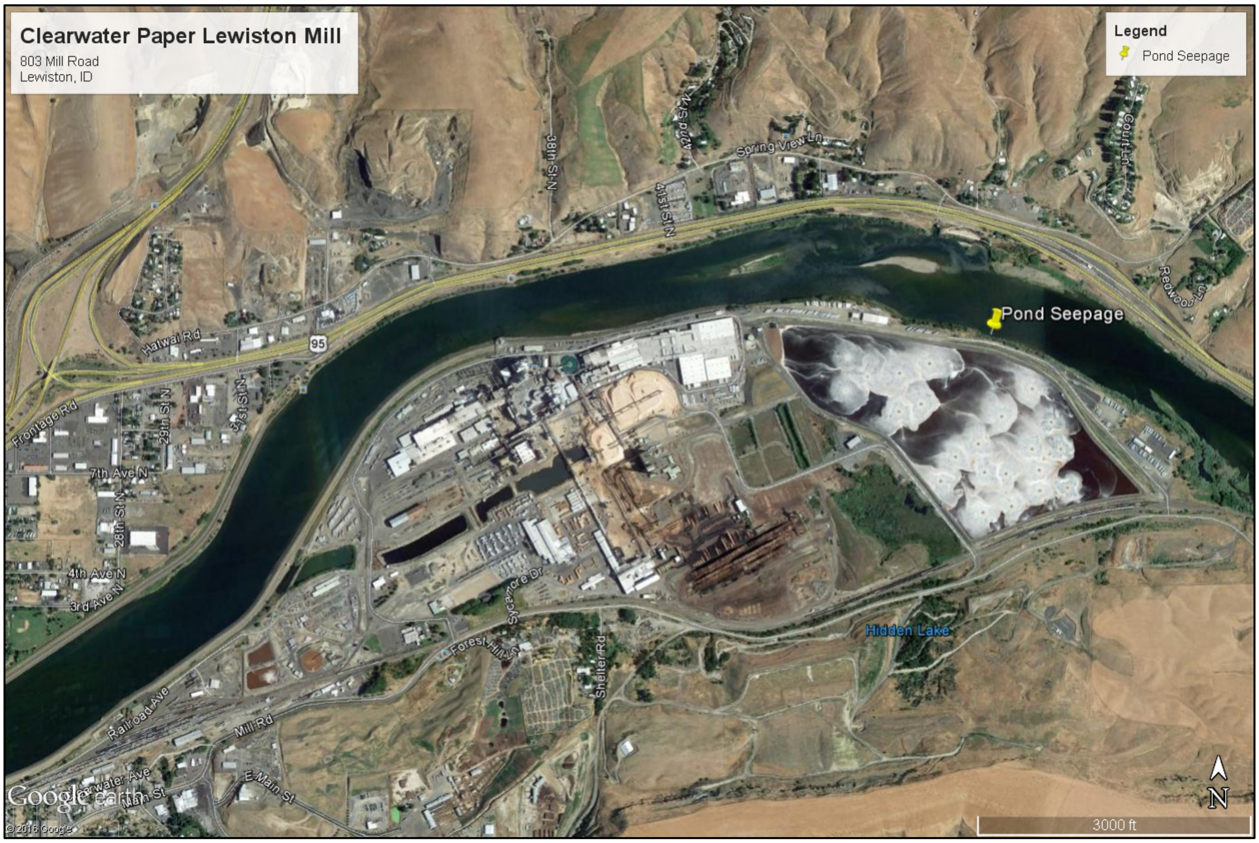


Figure A-3: Aerial Photo



Appendix B. Effluent Limit Guidelines

A. Overview

The NPDES regulations at 40 CFR 125.3(a) require NPDES permit writers to develop technology-based treatment requirements, consistent with CWA section 301(b), that represent the minimum level of control that must be imposed in a permit.

For existing direct discharges, the applicable levels of technology-based control under the Clean Water Act are the best practicable control technology currently available (BPT), the best conventional pollutant[1] control technology (BCT), and the best available technology economically achievable (BAT). Technology-based effluent limits may be based on promulgated effluent limit guidelines (ELGs) or established on a case-by-case basis using best professional judgment (BPJ). This appendix addresses technology-based effluent limits based on ELGs. ELGs for the pulp, paper, and paperboard point source category can be found in 40 CFR Part 430. Clearwater Paper is regulated under Subpart B (Bleached Papergrade Kraft and Soda) and Subpart L (Tissue, Filter, Non-Woven, and Paperboard from Purchased Pulp).

For general information on applying technology-based effluent limits in NPDES permits for discharges other than publicly-owned treatment works, refer to Section 5.2 of the *U.S. Environmental Protection Agency NPDES Permit Writers' Manual*. For more specific information on applying the effluent limit guidelines for the pulp, paper, and paperboard industry, refer to Section 8 of the *Permit Guidance Document: Pulp, Paper and Paperboard Manufacturing Point Source Category*.

Clearwater Paper's treatment system is a privately owned treatment works, as defined in 40 CFR 122.2. The treatment system accepts wastewater from a sawmill, which would be subject to ELGs in 40 CFR Part 429 if it were discharging directly. Discharges of wastewater to privately-owned treatment works are generally excluded from the requirement to obtain an NPDES permit (40 CFR 122.3(g)).

B. BCT

For mills subject to subparts B and L of the ELGs in 40 CFR 430, the ELGs representing the degree of effluent reduction attainable by the application of BCT are the same as those specified for conventional pollutants for BPT (see 40 CFR 430.23 and 430.123).

The BPT ELGs for BOD_5 and TSS for facilities subject to subparts B and L of the pulp, paper, and paperboard point source category are production-normalized. For BOD_5 and TSS, production is defined as the annual off-the-machine production (including off-the-machine coating where applicable) divided by the number of operating days during that year. Paper and paperboard production shall be measured at the off-the-machine moisture content. Market pulp shall be measured in air-dry tons (10% moisture). Production shall be determined for each mill based upon past production practices, present trends, or committed growth (40 CFR 430.01(n)).

The *Permit Guidance Document: Pulp, Paper and Paperboard Manufacturing Point Source Category* (EPA 2000) states on Page 8-8 that the permit writer should calculate permit limits

[1] The following are formally designated as conventional pollutants: 1. biochemical oxygen demand (BOD), 2. total suspended solids (nonfilterable) (TSS), 3. pH, 4. fecal coliform, 5. oil and grease (40 CFR 401.16).

based on either the maximum rolling 12-month production over the last five years or as the maximum yearly production over the last five years. If a facility has papermaking operations that are completely independent of pulp operations, then permit limits may be calculated using different 12-month maximum production dates.

Since the facility produces market pulp as well as tissue and paperboard, and the production of market pulp is independent of papermaking, the EPA has used annual production figures from a different year for market pulp than for other types of production.

The maximum production of market pulp occurred in 2011, thus, the annual production rate for 2011 was used to calculate effluent limits based on production-normalized ELGs for market pulp.

The maximum "integrated" production of tissue and paperboard (i.e., from pulp produced on site) occurred in 2014, thus, the annual production rate for 2014 was used to calculate effluent limits based on production-normalized ELGs for integrated production of paperboard and tissue paper (40 CFR 430.22). The maximum total production from purchased pulp occurred in 2011, however, since production from purchased pulp is not necessarily independent from integrated production, the EPA has used the annual production rate from 2014 (the same year as for integrated production) to calculate effluent limits based on production-normalized ELGs for production from purchased pulp as well (40 CFR 430.122).

In addition to the production-normalized BOD_5 and TSS effluent limits above, the BCT ELGs in 40 CFR 430 subparts B and L also specify a pH limit of "within the range of 5.0 to 9.0 at all times."

The production-normalized BCT effluent limits are shown in Table B-1, below:

Table B-1: BCT Effluent Limits				
Production Rates				
Bleached Kraft Market Pulp (lb/day)	423,244	2011 annual market pulp production. 10% moisture content (air dried).		
Bleached Kraft Paperboard and Tissue - integrated (lb/day)	2,919,043	2014 annual production in off-the-machine moisture content.		
Non-integrated Tissue (lb/day)	367,861	2014 annual production in estimated off-the-machine moisture content.		
Non-integrated Paperboard (lb/day)	230,251	2014 annual production in estimated off-the-machine moisture content.		
ELGs				
	BOD_5		**TSS**	
Production Type	Maximum Daily	Average Monthly	Maximum Daily	Average Monthly
Bleached Kraft Market Pulp - Subpart B (lb/1000lb)	15.45	8.05	30.4	16.4
Bleached Kraft Paperboard and Tissue - Subpart B (lb/1000lb)	13.65	7.1	24	12.9
Non-integrated Tissue - Subpart L (lb/1000 lb)	11.4	6.25	10.25	5
Non-integrated Paperboard - Subpart L (lb/1000 lb)	6.5	3.6	5.8	2.8
TBELs				

	BOD_5		TSS	
Production Type	Maximum Daily	Average Monthly	Maximum Daily	Average Monthly
Bleached Kraft Market Pulp - Subpart B (lb/day)	6,539	3,407	12,867	6,941
Bleach Kraft Paperboard and Tissue - Subpart B (lb/day)	39,845	20,725	70,057	37,656
Non-integrated Tissue - Subpart L (lb/day)	4,194	2,299	3,771	1,839
Non-integrated Paperboard - Subpart L (lb/day)	1,497	829	1,335	645
Total	**52,074**	**27,260**	**88,030**	**47,081**

C. BAT

The EPA has promulgated BAT ELGs for bleached kraft mills in 40 CFR 430.24.

These ELGs address adsorbable organic halides (AOX), chloroform, TCDD, TCDF, and twelve chlorinated phenolic compounds. Limits for chloroform, TCDD, TCDF, and chlorinated phenolic compounds apply at the fiber lines, and limits for AOX apply at the final effluent.

Effluent limits for chloroform and AOX are production-normalized. For AOX and chloroform limitations and standards specified in subpart B of 40 CFR 430, production shall be defined as the annual unbleached pulp production entering the first stage of the bleach plant divided by the number of operating days during that year. Unbleached pulp production shall be measured in air-dried-metric tons (10% moisture) of brownstock pulp entering the bleach plant at the stage during which chlorine or chlorine-containing compounds are first applied to the pulp.

Chloroform and AOX

The *Permit Guidance Document: Pulp, Paper and Paperboard Manufacturing Point Source Category* states on Page 8-8 that, when mills operate multiple bleach plants, the separate production rates for each bleach plant must be used to calculate production normalized limits. Separate chloroform effluent limits must be established for each bleach plant, as shown in Case Study #6 in the *Permit Guidance Document: Pulp, Paper and Paperboard Manufacturing Point Source Category*.

The production-normalized BAT effluent limits for chloroform and AOX are shown in Table B-2, below.

Table B-2: Production-Normalized BAT Effluent Limits		
Production Rates		
Chip Production Rate (lb/day)	2,168,000	2014 annual unbleached pulp entering the first stage of the bleach plant. 10% moisture content (air dried).
Sawdust Production Rate (lb/day)	964,000	
Total Production Rate (lb/day)	3,132,000	
ELGs		
	Maximum Daily	Average Monthly
Chloroform (lb/1000lb)	0.00692	0.00414
AOX (lb/1000lb)	0.951	0.623
TBELs		
	Maximum Daily	Average Monthly

Chloroform: Chip (lb/day)	**15.0**	**8.98**
Chloroform: Sawdust (lb/day)	**6.67**	**3.99**
AOX (lb/day)	**2,979**	**1,951**

TCDD, TCDF and Chlorinated Phenolic Compounds

ELGs for TCDD, TCDF and chlorinated phenolic compounds are concentration-based and are not production-normalized (40 CFR 430.01(i), 430.24). Limits for TCDD, TCDF and chlorinated phenolic compounds are shown in Table B-3, below.

Table B-3: Concentration BAT Limits

Parameter	Units	Average Monthly	Maximum Daily
TCDD	pg/L	—	10
TCDF	pg/L	—	31.9
Trichlorosyringol	µg/L	—	2.5
3,4,5-trichlorocatechol	µg/L	—	5.0
3,4,6-trichlorocatechol	µg/L	—	5.0
3,4,5-trichloroguaiacol	µg/L	—	2.5
3,4,6-trichloroguaiacol	µg/L	—	2.5
4,5,6-trichloroguaiacol	µg/L	—	2.5
2,4,5-trichlorophenol	µg/L	—	2.5
2,4,6-trichlorophenol	µg/L	—	2.5
Tetrachlorocatechol	µg/L	—	5.0
Tetrachloroguaiacol	µg/L	—	5.0
2,3,4,6-tetrachlorophenol	µg/L	—	2.5
Pentachlorophenol	µg/L	—	5.0
Source: 40 CFR 430.01 and 430.24.			

Chemical Oxygen Demand

When the EPA promulgated ELGs for this industry in 1998, the EPA urged permitting authorities to consider including effluent limitations for COD for pulp and paper facilities subject to the ELGs in 40 CFR 430, subpart B, on the basis of best professional judgment. EPA believed that COD limitations can be used to ensure the operation of processes that minimize the discharge of all organic compounds, including toxic organic compounds that are not readily biodegraded (63 FR 18537).

The EPA is not proposing effluent limits for COD in the draft permit. The permit includes BMP requirements that are intended to reduce the discharge of wood extractives, and, in turn, COD. In addition, the permit includes seasonal water quality-based effluent limits for BOD_5 that require reductions in the facility's discharges of organic material beyond what is required by the technology-based effluent limits. Further, the permit has WET provisions to address toxicity. Therefore, COD limits based on BPJ are not warranted.

D. References

EPA. 2000. *Permit Guidance Document: Pulp, Paper and Paperboard Manufacturing Point Source Category (40 CFR §430)*. US Environmental Protection Agency. Office of Water. EPA-821-B-00-003. May 2000. https://www.epa.gov/sites/production/files/2015-10/documents/pulp-paper_permit-guidance_2000.pdf

EPA. 2010. *NPDES Permit Writers' Manual*. Environmental Protection Agency. Office of Wastewater Management. EPA-833-K-10-001. September 2010. https://www3.epa.gov/npdes/pubs/pwm_2010.pdf

Appendix C. Water Quality-Based Effluent Limit Formula

E. Mass Balance

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

$$C_dQ_d = C_eQ_e + C_uQ_u$$

where,

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

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

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

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

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

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

Where:

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

F. Dilution Factor

The following formula is used to calculate a dilution factor based on the allowed mixing zone.

$$D = \frac{Q_e + Q_u \times \%MZ}{Q_e}$$

Where:

D	=	Dilution Factor
Q_e	=	Effluent flow rate (set equal to the maximum daily flow)
Q_u	=	Receiving water low flow rate upstream of the discharge (1Q10, 7Q10, 30B3, etc.)
%MZ	=	Percent Mixing Zone

G. Critical Low Flow Conditions

The low flow conditions of a water body are used to determine water quality-based effluent limits. In general, Idaho's water quality standards require criteria be evaluated at the following low flow receiving water conditions (See IDAPA 58.01.02.210.03) as defined below:

Acute aquatic life	1Q10 or 1B3
Chronic aquatic life	7Q10 or 4B3
Non-carcinogenic human health criteria	30Q5
Carcinogenic human health criteria	harmonic mean flow
Ammonia	30B3 or 30Q10

1. The 1Q10 represents the lowest one day flow with an average recurrence frequency of once in 10 years.
2. The 1B3 is biologically based and indicates an allowable exceedance of once every 3 years.
3. The 7Q10 represents lowest average 7 consecutive day flow with an average recurrence frequency of once in 10 years.
4. The 4B3 is biologically based and indicates an allowable exceedance for 4 consecutive days once every 3 years.
5. The 30Q5 represents the lowest average 30 consecutive day flow with an average recurrence frequency of once in 5 years.
6. The 30Q10 represents the lowest average 30 consecutive day flow with an average recurrence frequency of once in 10 years.
7. The harmonic mean is a long-term mean flow value calculated by dividing the number of daily flow measurements by the sum of the reciprocals of the flows.

Appendix D. Reasonable Potential and Water Quality-based Effluent Limit Calculations

A. Idaho Water Quality Standards

Except Human Health Carcinogens

Reasonable Potential Analysis (RPA) and Water Quality Effluent Limit (WQBEL) Calculations

Facility Name	Clearwater Paper Corporation Lewiston Mill
Facility Flow (mgd)	31.60
Facility Flow (cfs)	48.89

Receiving Water Data

			Notes:	Annual
Hardness, as mg/L $CaCO_3$	= 47 mg/L		5^{th} % at critical flows	Crit. Flows
Temperature, °C		Temperature, °C	95^{th} percentile	19.4
pH, S.U.		pH, S.U.	95^{th} percentile	8.54

			Annual	Annual	Annual	Annual	Annual	Annual	Annual								
Pollutants of Concern			**AMMONIA,** default: cold water, fish early life stages	**CHROMIUM(HEX)**	**CHROMIUM (TRI)**	**COPPER - SEE Toxic BiOp**	**LEAD - SEE Toxic BiOp**	**COLOR**	**WET - both species**	**TRICHLOR OPHENOL 2,4,5**	**TRICHLOR OPHENOL 2,4,6**	**CHLOROFORM**	**ANTIMONY (INORGANIC)**	**NICKEL - SEE Toxic BiOp**	**THALLIUM**	**ZINC - SEE Toxic BiOp**	**NITRATE/NITRITE (N)**
Effluent Data	**Number of Samples in Data Set (n)**		157	1	1	1	1	1	24	0	0	0	1	1	3	1	118
	Coefficient of Variation (CV) = Std. Dev./Mean (default CV = 0.6)		0.68713114	0.6	0.6	0.6	0.6	0.6	0.936				0.6	0.6	0.6	0.6	2.6187013
	Effluent Concentration, µg/L (Max. or 95th Percentile) - (C_e)		8,500.0	11.8	11.8	2.5	0.62	750	10	0.95	0.95	82.2	0.1	3.6	0.19	14.4	1790
	Calculated 50^{th} % Effluent Conc. (when n>10), Human Health Only																
Receiving Water Data	**90^{th} Percentile Conc., µg/L - (C_u)**		51	1.54	1.78	0.89	0.051							0.78		6.2	1190
	Geometric Mean, µg/L, Human Health Criteria Only																
Applicable Water Quality Criteria	Aquatic Life Criteria, µg/L	Acute	1,983	16.	307.003	8.354	28.135	see document	3.	--	--	--	--	247.206	--	61.805	--
	Aquatic Life Criteria, µg/L	Chronic	743	11.	39.935	5.954	1.096	--	1.	--	--	--	--	27.457	--	62.311	--
	Human Health Water and Organism, µg/L		--	Narrative	Narrative	--	Narrative	--	#N/A	140.	1.5	61.	5.2	610.	.017	7,400.	10,000.
	Human Health, Organism Only, µg/L		--	Narrative	Narrative	--	Narrative	--	#N/A	190.	2.	730.	190.	4,600.	.023	26,000.	--
	Metals Criteria Translator, decimal (or default use Conversion Factor)	Acute		.982	.316	.96	.901	1.	1.	--	--	--	1.	.998	1.	.978	1.
		Chronic		.962	.86	.96	.901	1.	1.	--	--	--	1.	.997	1.	.986	1.
	Carcinogen (Y/N), Human Health Criteria Only		--	N	N	N	N	N	--	N	N	N	N	N	N	N	N
Percent River Flow Default Value =	**Aquatic Life - Acute**	**1Q10**	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Aquatic Life - Chronic	7Q10 or 4B3	--	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Ammonia	30B3 or 30Q10	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Human Health - Non-Carcinogen	30Q5	--	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Human Health - carcinogen	Harmonic Mean	--	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Calculated Dilution Factors (DF) (or enter Modeled DFs)	Aquatic Life - Acute	1Q10	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
	Aquatic Life - Chronic	7Q10 or 4B3	36.5	36.5	36.5	36.5	36.5	36.5	36.5	36.5	36.5	36.5	36.5	36.5	36.5	36.5	36.5
	Ammonia	30B3 or 30Q10	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5
	Human Health - Non-Carcinogen	30Q5	39.3	39.3	39.3	39.3	39.3	39.3	39.3	39.3	39.3	39.3	39.3	39.3	39.3	39.3	39.3
	Human Health - carcinogen	Harmonic Mean	47.8	47.8	47.8	47.8	47.8	47.8	47.8	47.8	47.8	47.8	47.8	47.8	47.8	47.8	47.8

Aquatic Life Reasonable Potential Analysis

			AMMONIA	CHROMIUM(HEX)	CHROMIUM (TRI)	COPPER	LEAD	COLOR	WET	TRICHLOROPHENOL 2,4,5	TRICHLOROPHENOL 2,4,6	CHLOROFORM	ANTIMONY	NICKEL	THALLIUM	ZINC	NITRATE/NITRITE (N)
σ	$\sigma^2=\ln(CV^2+1)$		0.622	0.555	0.555	0.555	0.555	0.555	0.793	--	--	--	0.555	0.555	0.555	0.555	1.436
P_n	$=(1\text{-confidence level})^{1/n}$, where confidence level =	**99%**	0.971	0.010	0.010	0.010	0.010	0.010	0.825	--	--	--	0.010	0.010	0.215	0.010	0.962
Multiplier (TSD p. 57)	$=\exp(z\sigma-0.5\sigma^2)/\exp[\text{normsinv}(P_n)-0.5\sigma^2]$, where	**99%**	1.3	13.2	13.2	13.2	13.2	13.2	3.0	--	--	--	13.2	13.2	5.6	13.2	2.2
Statistically projected critical discharge concentration (C_e)			11101	155.72	155.72	32.99	8.18	9897.66	30.13	--	--	--	1.32	47.51	1.07	190.04	3972.86
Predicted max. conc.(ug/L) at Edge-of-Mixing Zone		Acute	901	13.18	5.43	3.26	0.61	761.36	2.32	--	--	--	0.10	4.37	0.08	20.02	1404.07
(note: for metals, concentration as dissolved using conversion factor as translator)		Chronic	346	5.60	5.40	1.73	0.25	271.17	0.83	--	--	--	0.04	2.06	0.029	11.16	1266.24
Reasonable Potential to exceed Aquatic Life Criteria			**NO**	**NO**	**NO**	**NO**	**NO**	**--**	**NO**	**NA**	**NA**	**NA**	**NA**	**NO**	**NA**	**NO**	**NA**

Human Health Reasonable Potential Analysis

			AMMONIA	CHROMIUM(HEX)	CHROMIUM (TRI)	COPPER	LEAD	COLOR	WET	TRICHLOROPHENOL 2,4,5	TRICHLOROPHENOL 2,4,6	CHLOROFORM	ANTIMONY	NICKEL	THALLIUM	ZINC	NITRATE/NITRITE (N)
σ	$\sigma^2=\ln(CV^2+1)$			0.555	0.555	0.555	0.555	0.555	0.793	--	--	--	0.555	0.555	0.555	0.555	1.436
P_n	$=(1\text{-confidence level})^{1/n}$ where confidence level =	**95%**		0.050	0.050	0.050	0.050	0.050	0.883				0.050	0.050	0.368	0.050	0.975
Multiplier	$=\exp(2.326\sigma-0.5\sigma^2)/\exp[\text{invnorm}(P_N)\sigma-0.5\sigma^2]$, prob. =	**95%**		6.198	6.198	6.198	6.198	6.198	1.436	1.000	1.000	1.000	6.198	6.198	3.000	6.198	0.637
Dilution Factor (for Human Health Criteria)				39.3	39.3	39.3	39.3	39.3	47.8	39.3	39.3	39.3	39.3	39.3	39.3	39.3	39.3
Max Conc. at edge of Chronic Zone, ug/L (C_d)				1.861	1.861	0.394	0.098	118.278	0.301	0.024	0.024	2.092	0.016	0.568	0.015	2.271	29.020
Reasonable Potential to exceed HH Water & Organism				**NO**	**NO**	**NO**	**NO**	**NO**	**#N/A**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
Reasonable Potential to exceed HH Organism Only				**NO**	**NO**	**NO**	**NO**	**NO**	**#N/A**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**

References: Idaho Water Quality Standards http://adminrules.idaho.gov/rules/current/58/0102.pdf
Technical Support Document for Water Quality-based Toxics Control, US EPA, March 1991, EPA/505/2-90-001

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Human Health Carcinogens for July – September

Reasonable Potential Analysis (RPA) and Water Quality Effluent Limit (WQBEL) Calculations

Facility Name	Clearwater Paper Corporation Lewiston Mill
Facility Flow (mgd)	31.60
Facility Flow (cfs)	48.89

Pollutants of Concern			PENTACHLOROPHENOL	DIOXIN (2,3,7,8-TCDD)
Effluent Data	Number of Samples in Data Set (n)		0	0
	Coefficient of Variation (CV) = Std. Dev./Mean (default CV = 0.6)		0.6	0.6
	Effluent Concentration, µg/L (Max. or 95th Percentile) - (C_e)		1.91	2.713E-06
	Calculated 50th % Effluent Conc. (when n>10), Human Health Only			
Receiving Water Data	90th Percentile Conc., µg/L - (C_u)			
	Geometric Mean, µg/L, Human Health Criteria Only			
Applicable Water Quality Criteria	Aquatic Life Criteria, µg/L	Acute	42.636	--
	Aquatic Life Criteria, µg/L	Chronic	26.915	--
	Human Health Water and Organism, µg/L		.11	1.30E-08
	Human Health, Organism Only, µg/L		.12	1.40E-08
	Metals Criteria Translator, decimal (or default use Conversion Factor)	Acute	1.	1.
		Chronic	1.	1.
	Carcinogen (Y/N), Human Health Criteria Only		Y	Y
Percent River Flow Default Value =	Aquatic Life - Acute	1Q10	0%	0%
	Aquatic Life - Chronic	7Q10 or 4B3	0%	0%
	Ammonia	30B3 or 30Q10	0%	0%
	Human Health - Non-Carcinogen	30Q5	0%	0%
	Human Health - carcinogen	Harmonic Mean	0%	0%
Calculated Dilution Factors (DF) (or enter Modeled DFs)	Aquatic Life - Acute	1Q10	13.0	13.0
	Aquatic Life - Chronic	7Q10 or 4B3	36.5	36.5
	Ammonia	30B3 or 30Q10	37.5	37.5
	Human Health - Non-Carcinogen	30Q5	39.3	39.3
	Human Health - carcinogen	Harmonic Mean	49.7	49.7

Aquatic Life Reasonable Potential Analysis

σ	$\sigma^2=\ln(CV^2+1)$		0.555	0.555
P_n	$=(1\text{-confidence level})^{1/n}$, where confidence level =	99%	--	--
Multiplier (TSD p. 57)	$=\exp(z\sigma-0.5\sigma^2)/\exp[\text{normsinv}(P_n)-0.5\sigma^2]$, where	99%	1.0	1.0
Statistically projected critical discharge concentration (C_e)			1.91	0.00
Predicted max. conc.(ug/L) at Edge-of-Mixing Zone		Acute	0.15	0.00
(note: for metals, concentration as dissolved using conversion factor as translator)		Chronic	0.05	0.00
Reasonable Potential to exceed Aquatic Life Criteria			**NO**	**NA**

Human Health Reasonable Potential Analysis

σ	$\sigma^2=\ln(CV^2+1)$		0.555	0.555
P_n	$=(1\text{-confidence level})^{1/n}$ where confidence level =	95%		
Multiplier	$=\exp(2.326\sigma-0.5\sigma^2)/\exp[\text{invnorm}(P_N)\sigma-0.5\sigma^2]$, prob. =	50%	1.000	1.000
Dilution Factor (for Human Health Criteria)			49.7	49.7
Max Conc. at edge of Chronic Zone, ug/L (C_d)			0.038	5.46E-08
Reasonable Potential to exceed HH Water & Organism			**NO**	**YES**
Reasonable Potential to exceed HH Organism Only			**NO**	**YES**

Human Health, Water + Organism, Effluent Limit Calculations

Number of Compliance Samples Expected per month (n)		1	1
Average Monthly Effluent Limit, ug/L	equals wasteload allocation	--	**0.00000065**
Maximum Daily Effluent Limit, ug/L	TSD Multiplier, Table 5-3, using 99th and 95th %	--	**0.00000094**
Average Monthly Limit (AML), lb/day		--	**1.70E-07**
Maximum Daily Limit (MDL), lb/day		--	**2.48E-07**

References: Idaho Water Quality Standards http://adminrules.idaho.gov/rules/current/58/0102.pdf
Technical Support Document for Water Quality-based Toxics Control, US EPA, March 1991, EPA/505/2-90-001

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Human Health Carcinogens for October – June

Reasonable Potential Analysis (RPA) and Water Quality Effluent Limit (WQBEL) Calculations

Facility Name	Clearwater Paper Corporation Lewiston Mill
Facility Flow (mgd)	31.60
Facility Flow (cfs)	48.89

Pollutants of Concern			PENTACHLOROPHENOL	DIOXIN (2,3,7,8-TCDD)
Effluent Data	**Number of Samples in Data Set (n)**		0	0
	Coefficient of Variation (CV) = Std. Dev./Mean (default CV = 0.6)		0.6	0.6
	Effluent Concentration, µg/L (Max. or 95th Percentile) - (C_e)		1.91	2.713E-06
	Calculated 50th % Effluent Conc. (when n>10), Human Health Only			
Receiving Water Data	**90th Percentile Conc., µg/L - (C_u)**			
	Geometric Mean, µg/L, Human Health Criteria Only			
Applicable Water Quality Criteria	Aquatic Life Criteria, µg/L	Acute	42.636	--
	Aquatic Life Criteria, µg/L	Chronic	26.915	--
	Human Health Water and Organism, µg/L		.11	1.30E-08
	Human Health, Organism Only, µg/L		.12	1.40E-08
	Metals Criteria Translator, decimal (or default use Conversion Factor)	Acute	1.	1.
		Chronic	1.	1.
	Carcinogen (Y/N), Human Health Criteria Only		Y	Y
Percent River Flow Default Value =	**Aquatic Life - Acute**	**1Q10**	0%	0%
	Aquatic Life - Chronic	7Q10 or 4B3	0%	0%
	Ammonia	30B3 or 30Q10	0%	0%
	Human Health - Non-Carcinogen	30Q5	0%	0%
	Human Health - carcinogen	Harmonic Mean	0%	0%
Calculated Dilution Factors (DF) (or enter Modeled DFs)	Aquatic Life - Acute	1Q10	13.0	13.0
	Aquatic Life - Chronic	7Q10 or 4B3	36.5	36.5
	Ammonia	30B3 or 30Q10	37.5	37.5
	Human Health - Non-Carcinogen	30Q5	39.3	39.3
	Human Health - carcinogen	Harmonic Mean	78.1	78.1

Aquatic Life Reasonable Potential Analysis

σ	$\sigma^2=\ln(CV^2+1)$		0.555	0.555
P_n	$=(1\text{-confidence level})^{1/n}$, where confidence level =	**99%**	--	--
Multiplier (TSD p. 57)	$=\exp(z\sigma-0.5\sigma^2)/\exp[\text{normsinv}(P_n)-0.5\sigma^2]$, where	**99%**	1.0	1.0
Statistically projected critical discharge concentration (C_e)			1.91	0.00
Predicted max. conc.(ug/L) at Edge-of-Mixing Zone		Acute	0.15	0.00
(note: for metals, concentration as dissolved using conversion factor as translator)		Chronic	0.05	0.00
Reasonable Potential to exceed Aquatic Life Criteria			**NO**	**NA**

Human Health Reasonable Potential Analysis

σ	$\sigma^2=\ln(CV^2+1)$		0.555	0.555
P_n	$=(1\text{-confidence level})^{1/n}$ where confidence level =	**95%**		
Multiplier	$=\exp(2.326\sigma-0.5\sigma^2)/\exp[\text{invnorm}(P_N)\sigma-0.5\sigma^2]$, prob. =	**50%**	1.000	1.000
Dilution Factor (for Human Health Criteria)			78.1	78.1
Max Conc. at edge of Chronic Zone, ug/L (C_d)			0.024	3.47E-08
Reasonable Potential to exceed HH Water & Organism			**NO**	**YES**
Reasonable Potential to exceed HH Organism Only			**NO**	**YES**

Human Health, Water + Organism, Effluent Limit Calculations

Number of Compliance Samples Expected per month (n)		1	1
Average Monthly Effluent Limit, ug/L	equals wasteload allocation	--	**0.00000102**
Maximum Daily Effluent Limit, ug/L	TSD Multiplier, Table 5-3, using 99th and 95th %	--	**0.00000148**
Average Monthly Limit (AML), lb/day		--	**2.68E-07**
Maximum Daily Limit (MDL), lb/day		--	**3.90E-07**

References: Idaho Water Quality Standards http://adminrules.idaho.gov/rules/current/58/0102.pdf
Technical Support Document for Water Quality-based Toxics Control, US EPA, March 1991, EPA/505/2-90-001

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B. Washington Water Quality Standards

Except Human Health Carcinogens

Reasonable Potential Analysis (RPA) and Water Quality Effluent Limit (WQBEL) Calculations

Facility Name	Clearwater Paper Corporation Lewiston Mill
Facility Flow (mgd)	31.60
Facility Flow (cfs)	48.89

Receiving Water Data			Notes:	Annual / Annual / Crit. Flows	Annual	Annual	Annual	Annual
Hardness, as mg/L $CaCO_3$	= 47 mg/L		5^{th} % at critical flows					
Temperature, °C		Temperature, °C	95^{th} percentile	19.4				
pH, S.U.		pH, S.U.	95^{th} percentile	8.54				

Pollutants of Concern			AMMONIA, default: cold water, fish early life stages	TRICHLOROPHENOL 2,4,6	ZINC - SEE Toxic BiOp	CHROMIUM(HEX)	CHROMIUM(TRI)
Effluent Data	Number of Samples in Data Set (n)		157	0	1	1	1
	Coefficient of Variation (CV) = Std. Dev./Mean (default CV = 0.6)		0.68713114		0.6	0.6	0.6
	Effluent Concentration, µg/L (Max. or 95th Percentile) - (C_e)		8,500.0	0.95	14.4	11.8	11.8
	Calculated 50^{th} % Effluent Conc. (when n>10), Human Health Only						
Receiving Water Data	90^{th} Percentile Conc., µg/L - (C_u)		51		6.2	1.54	1.78
	Geometric Mean, µg/L, Human Health Criteria Only						
Applicable Water Quality Criteria	Aquatic Life Criteria, µg/L	Acute	1,983	--	60.363	--	--
	Aquatic Life Criteria, µg/L	Chronic	300	--	55.121	--	--
	Human Health Water and Organism, µg/L		--	.25	1,000.	Narrative	Narrative
	Human Health, Organism Only, µg/L		--	.28	1,000.	Narrative	Narrative
	Metals Criteria Translator, decimal (or default use Conversion Factor)	Acute		--	.978	.982	.316
		Chronic		--	.986	.962	.86
	Carcinogen (Y/N), Human Health Criteria Only		--	Y	N	N	N
Percent River Flow Default Value =	Aquatic Life - Acute	1Q10	0%	0%	0%	0%	0%
	Aquatic Life - Chronic	7Q10 or 4B3	--	0%	0%	0%	0%
	Ammonia	30B3 or 30Q10	0%	0%	0%	0%	0%
	Human Health - Non-Carcinogen	30Q5	--	0%	0%	0%	0%
	Human Health - carcinogen	Harmonic Mean	--	0%	0%	0%	0%
Calculated Dilution Factors (DF) (or enter Modeled DFs)	Aquatic Life - Acute	1Q10	41.9	41.9	41.9	41.9	41.9
	Aquatic Life - Chronic	7Q10 or 4B3	41.0	41.0	41.0	41.0	41.0
	Ammonia	30B3 or 30Q10	40.8	40.8	40.8	40.8	40.8
	Human Health - Non-Carcinogen	30Q5	42.0	42.0	42.0	42.0	42.0
	Human Health - carcinogen	Harmonic Mean	49.7	47.8	47.8	49.7	49.7

Aquatic Life Reasonable Potential Analysis

			AMMONIA	TRICHLOROPHENOL 2,4,6	ZINC	CHROMIUM(HEX)	CHROMIUM(TRI)
σ	$\sigma^2=\ln(CV^2+1)$		0.622	--	0.555	0.555	0.555
P_n	$=(1\text{-confidence level})^{1/n}$, where confidence level =	95%	0.981	--	0.050	0.050	0.050
Multiplier (TSD p. 57)	$=\exp(z\sigma-0.5\sigma^2)/\exp[\text{normsinv}(P_n)-0.5\sigma^2]$, where	95%	1.0	--	6.2	6.2	6.2
Statistically projected critical discharge concentration (C_e)			8500	--	89.25	73.13	73.13
Predicted max. conc.(ug/L) at Edge-of-Mixing Zone		Acute	253	--	8.14	3.217	2.29
(note: for metals, concentration as dissolved using conversion factor as translator)		Chronic	258	--	8.20	3.218	3.27
Reasonable Potential to exceed Aquatic Life Criteria			**NO**	**NA**	**NO**	**NA**	**NA**

Human Health Reasonable Potential Analysis

			AMMONIA	TRICHLOROPHENOL 2,4,6	ZINC	CHROMIUM(HEX)	CHROMIUM(TRI)
σ	$\sigma^2=\ln(CV^2+1)$			--	0.555	0.555	0.555
P_n	$=(1\text{-confidence level})^{1/n}$ where confidence level =	95%			0.050	0.050	0.050
Multiplier	$=\exp(2.326\sigma-0.5\sigma^2)/\exp[\text{invnorm}(P_N)\sigma-0.5\sigma^2]$, prob. =	95%		1.000	6.198	6.198	6.198
Dilution Factor (for Human Health Criteria)				47.8	42.0	42.0	42.0
Max Conc. at edge of Chronic Zone, ug/L (C_d)				0.020	2.125	1.741	1.741
Reasonable Potential to exceed HH Water & Organism				**NO**	**NO**	**NO**	**NO**
Reasonable Potential to exceed HH Organism Only				**NO**	**NO**	**NO**	**NO**

References: Idaho Water Quality Standards http://adminrules.idaho.gov/rules/current/58/0102.pdf
Technical Support Document for Water Quality-based Toxics Control, US EPA, March 1991, EPA/505/2-90-001

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Human Health Carcinogens July – September

Reasonable Potential Analysis (RPA) and Water Quality Effluent Limit (WQBEL) Calculations

Facility Name	Clearwater Paper Corporation Lewiston Mill
Facility Flow (mgd)	31.60
Facility Flow (cfs)	48.89

Pollutants of Concern			PENTACHLOROPHENOL	
Effluent Data	Number of Samples in Data Set (n)		0	
	Coefficient of Variation (CV) = Std. Dev./Mean (default CV = 0.6)		0.6	
	Effluent Concentration, µg/L (Max. or 95th Percentile) - (C_e)		1.91	
	Calculated 50th % Effluent Conc. (when n>10), Human Health Only			
Receiving Water Data	90th Percentile Conc., µg/L - (C_u)			
	Geometric Mean, µg/L, Human Health Criteria Only			
Applicable Water Quality Criteria	Aquatic Life Criteria, µg/L	Acute	42.636	--
	Aquatic Life Criteria, µg/L	Chronic	26.915	--
	Human Health Water and Organism, µg/L		.002	--
	Human Health, Organism Only, µg/L		.002	--
	Metals Criteria Translator, decimal (or default use Conversion Factor)	Acute	1.	--
		Chronic	1.	--
	Carcinogen (Y/N), Human Health Criteria Only		Y	--
Percent River Flow Default Value =	Aquatic Life - Acute	1Q10	0%	--
	Aquatic Life - Chronic	7Q10 or 4B3	0%	--
	Ammonia	30B3 or 30Q10	0%	--
	Human Health - Non-Carcinogen	30Q5	0%	--
	Human Health - carcinogen	Harmonic Mean	0%	--
Calculated Dilution Factors (DF) (or enter Modeled DFs)	Aquatic Life - Acute	1Q10	41.9	--
	Aquatic Life - Chronic	7Q10 or 4B3	41.0	--
	Ammonia	30B3 or 30Q10	40.8	--
	Human Health - Non-Carcinogen	30Q5	42.0	--
	Human Health - carcinogen	Harmonic Mean	49.7	--

Aquatic Life Reasonable Potential Analysis

σ	$\sigma^2=\ln(CV^2+1)$		0.555	--
P_n	$=(1\text{-confidence level})^{1/n}$, where confidence level =	95%	--	--
Multiplier (TSD p. 57)	$=\exp(z\sigma-0.5\sigma^2)/\exp[\text{normsinv}(P_n)-0.5\sigma^2]$, where	95%	1.0	--
Statistically projected critical discharge concentration (C_e)			1.91	--
Predicted max. conc.(ug/L) at Edge-of-Mixing Zone		Acute	0.05	--
(note: for metals, concentration as dissolved using conversion factor as translator)		Chronic	0.05	--
Reasonable Potential to exceed Aquatic Life Criteria			**NO**	**--**

Human Health Reasonable Potential Analysis

σ	$\sigma^2=\ln(CV^2+1)$			--
P_n	$=(1\text{-confidence level})^{1/n}$ where confidence level =	95%		--
Multiplier	$=\exp(2.326\sigma-0.5\sigma^2)/\exp[\text{invnorm}(P_N)\sigma-0.5\sigma^2]$, prob. =	50%	1.000	--
Dilution Factor (for Human Health Criteria)			49.7	--
Max Conc. at edge of Chronic Zone, ug/L (C_d)			0.038	--
Reasonable Potential to exceed HH Water & Organism			**YES**	**--**
Reasonable Potential to exceed HH Organism Only			**YES**	**--**

Human Health, Water + Organism, Effluent Limit Calculations

Number of Compliance Samples Expected per month (n)		1	
Average Monthly Effluent Limit, ug/L	equals wasteload allocation	**0.10**	**--**
Maximum Daily Effluent Limit, ug/L	TSD Multiplier, Table 5-3, using 99th and 95th %	**0.15**	**--**
Average Monthly Limit (AML), lb/day		**0.026**	**--**
Maximum Daily Limit (MDL), lb/day		**0.038**	**--**

References: Idaho Water Quality Standards http://adminrules.idaho.gov/rules/current/58/0102.pdf
Technical Support Document for Water Quality-based Toxics Control, US EPA, March 1991, EPA/505/2-90-001

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Human Health Carcinogens October – June

Reasonable Potential Analysis (RPA) and Water Quality Effluent Limit (WQBEL) Calculation

Facility Name	Clearwater Paper Corporation Lewiston Mill
Facility Flow (mgd)	31.60
Facility Flow (cfs)	48.89

Pollutants of Concern			PENTACHLOROPHENOL
Effluent Data	**Number of Samples in Data Set (n)**		0
	Coefficient of Variation (CV) = Std. Dev./Mean (default CV = 0.6)		0.6
	Effluent Concentration, µg/L (Max. or 95th Percentile) - (C_e)		1.91
	Calculated 50th % Effluent Conc. (when n>10), Human Health Only		
Receiving Water Data	**90th Percentile Conc., µg/L - (C_u)**		
	Geometric Mean, µg/L, Human Health Criteria Only		
Applicable Water Quality Criteria	Aquatic Life Criteria, µg/L	Acute	42.636
	Aquatic Life Criteria, µg/L	Chronic	26.915
	Human Health Water and Organism, µg/L		.002
	Human Health, Organism Only, µg/L		.002
	Metals Criteria Translator, decimal (or default use Conversion Factor)	Acute	1.
		Chronic	1.
	Carcinogen (Y/N), Human Health Criteria Only		Y
Percent River Flow Default Value =	**Aquatic Life - Acute**	**1Q10**	0%
	Aquatic Life - Chronic	7Q10 or 4B3	0%
	Ammonia	30B3 or 30Q10	0%
	Human Health - Non-Carcinogen	30Q5	0%
	Human Health - carcinogen	Harmonic Mean	0%
Calculated Dilution Factors (DF) (or enter Modeled DFs)	Aquatic Life - Acute	1Q10	41.9
	Aquatic Life - Chronic	7Q10 or 4B3	41.0
	Ammonia	30B3 or 30Q10	40.8
	Human Health - Non-Carcinogen	30Q5	42.0
	Human Health - carcinogen	Harmonic Mean	78.1

Aquatic Life Reasonable Potential Analysis

σ	σ^2=ln(CV^2+1)		0.555
P_n	=(1-confidence level)$^{1/n}$, where confidence level =	**95%**	--
Multiplier (TSD p. 57)	=exp(zσ-0.5σ^2)/exp[normsinv(P_n)-0.5σ^2], where	**95%**	1.0
Statistically projected critical discharge concentration (C_e)			1.91
Predicted max. conc.(ug/L) at Edge-of-Mixing Zone		Acute	0.05
(note: for metals, concentration as dissolved using conversion factor as translator)		Chronic	0.05
Reasonable Potential to exceed Aquatic Life Criteria			**NO**

Human Health Reasonable Potential Analysis

σ	σ^2=ln(CV^2+1)		
P_n	=(1-confidence level)$^{1/n}$ where confidence level =	**95%**	
Multiplier	=exp(2.326σ-0.5σ^2)/exp[invnorm(P_N)σ-0.5σ^2], prob. =	**50%**	1.000
Dilution Factor (for Human Health Criteria)			78.1
Max Conc. at edge of Chronic Zone, ug/L (C_d)			0.024
Reasonable Potential to exceed HH Water & Organism			**YES**
Reasonable Potential to exceed HH Organism Only			**YES**

Human Health, Water + Organism, Effluent Limit Calculations

Number of Compliance Samples Expected per month (n)		1
Average Monthly Effluent Limit, ug/L	equals wasteload allocation	**0.156**
Maximum Daily Effluent Limit, ug/L	TSD Multiplier, Table 5-3, using 99th and 95th %	**0.228**
Average Monthly Limit (AML), lb/day		**0.041**
Maximum Daily Limit (MDL), lb/day		**0.060**

References:	Idaho Water Quality Standards	http://adminrules.idaho.gov/rules/current/58/0102.pdf
	Technical Support Document for Water Quality-based Toxics Control, US EPA, March 1991, EPA/505/2-90-0(	
Filename:	C:\Users\BNICKEL\OneDrive - Environmental Protection Agency (EPA) 1\Permits\Clearwater_Paper\Limit Cal	

C. References

EPA. 1991. *Technical Support Document for Water Quality-based Toxics Control.* US Environmental Protection Agency. Office of Water. EPA/505/2-90-001. March 1991. https://www3.epa.gov/npdes/pubs/owm0264.pdf

Appendix E. Effluent Limit Calculations for pH

Table F-1: Idaho Water Quality Criteria for pH and Idaho Mixing Zone Policy

Calculation of pH of a Mixture of Two Flows

Based on the procedure in EPA's DESCON program (EPA, 1988. Technical Guidance on Supplementary Stream Design Conditions for Steady State Modeling. USEPA Office of Water, Washington D.C.)

	Yr. Around Basis		
INPUT	**Min Limit**	**Max Limit**	**Comments**
1. Dilution Factor at Mixing Zone Boundary	37.6	46.4	Chronic Dilution Factor at Design Flow and Low River Flow Conditions
2. Ambient/Upstream/Background Conditions			
Temperature (deg C):	22.80	2.10	Max. and min. temperature for lower and upper pH, respectively, USGS & PNNL data
pH:	7.87	8.54	Min. and max. pH for lower and upper pH, respectively, Anchor Environmental data.
Alkalinity (mg $CaCO_3$/L):	74.00	74.00	Minimum from USGS 13334300 SNAKE RIVER NEAR ANATONE, WA
3. Effluent Characteristics			
Temperature (deg C):	32.30	20.00	Max and min for lower and upper temperature, DMR data
pH:	**5.70**	**9.00**	Lower and Upper Effluent Limits
Alkalinity (mg CaCO3/L):	440.00	440.00	From 1999 Fact Sheet (Table C-8)
4. Applicable Water Quality Standards	**6.50**	**9.00**	
OUTPUT			
1. Ionization Constants			
Upstream/Background pKa:	6.36	6.55	
Effluent pKa:	6.31	6.38	
2. Ionization Fractions			
Upstream/Background Ionization Fraction:	0.97	0.99	
Effluent Ionization Fraction:	0.20	1.00	
3. Total Inorganic Carbon			
Upstream/Background Total Inorganic Carbon (mg CaCO3/L):	76	75	
Effluent Total Inorganic Carbon (mg CaCO3/L):	2249	441	
4. Conditions at Mixing Zone Boundary			
Temperature (deg C):	23.05	2.49	
Alkalinity (mg CaCO3/L):	83.73	81.89	
Total Inorganic Carbon (mg CaCO3/L):	134.10	82.64	
pKa:	6.36	6.54	
RESULTS			
pH at Mixing Zone Boundary:	**6.58**	**8.58**	
Reasonable Potential to contribute to excursion above WQS	**NO**	**NO**	

Table F-2: Washington Water Quality Criteria for pH with Dilution at State Line

Calculation of pH of a Mixture of Two Flows

Based on the procedure in EPA's DESCON program (EPA, 1988. Technical Guidance on Supplementary Stream Design Conditions for Steady State Modeling. USEPA Office of Water, Washington D.C.)

	Yr. Around Basis		
INPUT	**Min Limit**	**Max Limit**	**Comments**
1. Dilution Factor at Mixing Zone Boundary	40.5	49.3	Chronic Dilution Factor at Design Flow and Low River Flow Conditions
2. Ambient/Upstream/Background Conditions			
Temperature (deg C):	22.80	2.10	Max. and min. temperature for lower and upper pH, respectively, USGS & PNNL data
pH:	7.87	8.54	Min. and max. pH for lower and upper pH, respectively, Anchor Environmental data.
Alkalinity (mg $CaCO_3$/L):	74.00	74.00	Minimum from USGS 13334300 SNAKE RIVER NEAR ANATONE, WA
3. Effluent Characteristics			
Temperature (deg C):	32.30	20.00	Max and min for lower and upper temperature, DMR data
pH:	**5.60**	**8.50**	Lower and Upper Effluent Limits
Alkalinity (mg CaCO3/L):	440.00	440.00	From 1999 Fact Sheet (Table C-8)
4. Applicable Water Quality Standards	**6.50**	**8.50**	
OUTPUT			
1. Ionization Constants			
Upstream/Background pKa:	6.36	6.55	
Effluent pKa:	6.31	6.38	
2. Ionization Fractions			
Upstream/Background Ionization Fraction:	0.97	0.99	
Effluent Ionization Fraction:	0.16	0.99	
3. Total Inorganic Carbon			
Upstream/Background Total Inorganic Carbon (mg CaCO3/L):	76	75	
Effluent Total Inorganic Carbon (mg CaCO3/L):	2718	443	
4. Conditions at Mixing Zone Boundary			
Temperature (deg C):	23.03	2.46	
Alkalinity (mg CaCO3/L):	83.04	81.42	
Total Inorganic Carbon (mg CaCO3/L):	141.53	82.23	
pKa:	6.36	6.54	
RESULTS			
pH at Mixing Zone Boundary:	**6.51**	**8.55**	
Reasonable Potential to contribute to excursion above WQS	**NO**	**YES**	

Appendix F. Temperature Assessment

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue, Suite 155
Seattle, WA 98101-3123

OFFICE OF
WATER AND
WATERSHEDS

MEMORANDUM **Draft: December 2018**

SUBJECT: Temperature Assessment for the Clearwater Paper Lewiston Mill Discharge through Outfall 001

FROM: Brian Nickel
Environmental Engineer

TO: Administrative Record for Clearwater Paper Lewiston Mill, Permit #ID0001163

1 Introduction

The prior NPDES permit for the Clearwater Paper Lewiston Mill, issued in 2005, included water quality-based effluent limits (WQBELs) for temperature. The basis for these limits was explained in the "Temperature Assessment for the Potlatch Mill Discharge through Outfall 001," (2005 Temperature Assessment) (Koch and Nickel 2005).

The purpose of this memorandum is to reassess the temperature WQBELs in the 2005 permit to determine if they will continue to meet applicable water quality standards and are consistent with the thermal plume recommendations in *EPA Region 10 Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards* (EPA 2003).

2 Description of Receiving Waters and Discharge

2.1 Receiving Water

Effluent from the Clearwater Paper Lewiston Mill discharges through outfall 001 to the Snake River at its confluence with the Clearwater River, near the head of Lower Granite Pool. The outfall is located at latitude 46° 25' 31" N, and longitude 117° 02' 15" W (approximately river mile 140).

The discharge location is at the nexus of three 8-digit hydrologic units. It is at the downstream ends of both the Lower Snake-Asotin watershed (17060103) and the Clearwater watershed (17060306). It is at the upstream end of the Lower Snake-Tucannon watershed (17060107).

2.1.1 Mixing Properties of the Snake and Clearwater Rivers

Mixing of the Snake and Clearwater Rivers at the confluence is complex. As described in *Hydraulic Characteristics of the Lower Snake River During Periods of Juvenile Fall Chinook Salmon Migration* (Cook et al. 2006), circulation patterns at the confluence are driven by the temperatures and discharge rates of the Snake and Clearwater Rivers, and three general patterns are observed:

- When the temperatures as well as the discharge rates of the two rivers are similar, the two rivers flow parallel to each other, with little mixing occurring between the two rivers for several miles downstream from the confluence.

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- When there is a small difference in temperature but a large difference in discharge rates between the two rivers, the two rivers will mix together within a short distance downstream of the confluence.
- When there is a large difference in temperature between the two rivers, the colder Clearwater River plunges beneath the warmer Snake River at the confluence, creating a vertically stratified temperature profile. During July and August, the Clearwater River is significantly cooler (10 degrees or more) than the Snake River, and the resulting density difference is sufficient to stratify Lower Granite Reservoir. This vertical stratification due to large temperature differences occurs over a wide range of discharge rates.

The EPA represented these varying conditions in the modeling as described in Section 6.1.2, below.

2.1.2 Natural Background Temperature

The temperature water quality standards for both Idaho and Washington include natural condition provisions, as described in Section 3, below.

Evaluation of the natural background criterion requires knowledge or estimates of the natural water temperature condition without human impacts. Both temperature observations and the temperature simulations can provide estimates of water temperature. Since there are information gaps and uncertainties associated with both the observations and the simulations, both are used to gain an understanding of the free flowing and impounded temperature regimes and the relative importance of dams, point sources and tributaries in altering the natural regime of the river.

The EPA has used several methods (Cope 2004, 2005) to show that water temperatures in an undeveloped or natural Snake River would exceed Idaho's daily average temperature criterion of 19°C between 97 and 100% of the time in July, 100% of the time in August, and between 17 and 33% of the time in September. Therefore, during these months, EPA has applied the natural condition provisions of Idaho's water quality standards for temperature (IDAPA 58.01.02.200.09 and 58.01.02.401.01.c). See Section 3.1, below, for more information on Idaho's water quality standards for temperature.

2.2 Outfall 001

The effluent is released through outfall 001 from a 400-foot long diffuser. The depth of the water at the discharge point is approximately 30 feet. The diffuser is in waters of the state of Idaho and upstream of the Idaho-Washington state line by 191 meters. The diffuser consists of 79 individual ports spaced 5 feet apart rising from a common, buried 48-inch outfall pipe. Each riser pipe is angled 30 degrees from horizontal with the exit port about 1.5 feet above the river bottom. Each riser pipe is 3 inches in diameter.

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3 Applicable Water Quality Standards

3.1 Idaho

3.1.1 Water Quality Criteria for Temperature

At the point of discharge, the Snake River is designated for cold water aquatic life (as well as primary contact recreation and domestic water supply). The numeric water quality criteria for this designated use are an instantaneous maximum temperature of 22 °C with a maximum daily average temperature of no greater than 19 °C (IDAPA 58.01.02.250.02.b).

Different temperature criteria apply to lakes and reservoirs. A reservoir is considered a lake for the purpose of temperature criteria if its mean detention time is greater than 15 days (IDAPA 58.01.02.250.02.c). Detention time is defined in the Idaho Water Quality Standards as the mean annual storage volume divided by the mean annual flow out of the reservoir for the same period (IDAPA 58.01.2.060.01.h.iv). Using the mean annual flow measured downstream from the Lower Granite Dam, at USGS station number 13343600, for a low flow year (42,380 CFS, during water year 1979)[1] and the full pool storage of the reservoir (483,800 acre-feet),[2] the detention time of Lower Granite Pool is 5.8 days. Thus, Lower Granite Pool is not considered a "reservoir" for the purpose of applying water quality criteria for temperature.

In addition, a numeric criterion for "induced variation" in the ambient water temperature is applicable to this discharge. This criterion has been removed from the Idaho Water Quality Standards, but it remains in effect for Clean Water Act purposes.[3] This criterion requires that wastewater must not affect the receiving water outside the mixing zone so that the temperature is increased by more than 1 °C.

3.1.2 Natural Background

If the numeric temperature criteria are exceeded upstream of the discharge due to natural background temperatures, then wastewater must not raise the receiving water temperatures by more than 0.3 °C (58.01.02.200.09, IDAPA 58.01.02.401.01.c). As explained in Section 2.1.2 above, the natural background temperature of the Snake River exceeds Idaho's numeric criteria in July, August, and September.

3.1.3 Mixing Zone Policy

A number of provisions of Idaho's mixing zone policy (IDAPA 58.01.02.060) are potentially applicable to Clearwater Paper's discharge, including:

- Mixing zones, individually or in combination with other mixing zones, shall not cause unreasonable interference with, or danger to, beneficial uses. Unreasonable interference with, or danger to, beneficial uses includes, but is not limited to, the following:

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[1] http://waterdata.usgs.gov/wa/nwis/annual/?search_site_no=13343600&agency_cd=USGS&referred_module=sw&format=sites_selection_links

[2] http://www.nww.usace.army.mil/Locations/DistrictLocksandDams/LowerGraniteLockandDam.aspx

[3] http://www.deq.idaho.gov/epa-actions-on-proposed-standards

- Impairment to the integrity of the aquatic community, including interfering with successful spawning, egg incubation, rearing, or passage of aquatic life.
    - Heat in the discharge that causes thermal shock, lethality, or loss of cold water refugia.
    - Lethality to aquatic life passing through the mixing zone.
- The width of a mixing zone is not to exceed twenty-five percent (25%) of the stream width.
- The mixing zone shall not include more than twenty-five percent (25%) of the low flow design discharge conditions as set forth in Subsection 210.03.b. of these rules.

Similar to temperature criteria, different mixing zone restrictions apply in lakes and in reservoirs with a mean detention time greater than 15 days (IDAPA 58.01.02.060.h.ii and iii). As explained in Section 3.1.1, Lower Granite Pool does not have a mean detention time greater than 15 days. Therefore, it is not considered a reservoir for the purpose of Idaho's mixing zone policy (IDAPA 58.01.2.060.01.h.iv).

The EPA believes that meeting the EPA's thermal plume recommendations, described in Section 4 below, will ensure that the mixing zone for temperature will not cause unreasonable interference with or danger to beneficial uses. These thermal plume recommendations are specifically designed to minimize or avoid lethality, thermal shock, and migration blockage to salmonids.

3.2 Washington

Because the discharge is close to waters of the State of Washington, the EPA has also considered Washington's water quality standards when evaluating the effect of the Clearwater Paper discharge. In Washington, the Snake River below the Clearwater River has the following site-specific temperature criteria: Temperature shall not exceed a 1-DMax of 20.0 °C due to human activities. When natural conditions exceed a 1-DMax of 20.0 °C, no temperature increase will be allowed which will raise the receiving water temperature by greater than 0.3 °C; nor shall such temperature increases, at any time, exceed $t = 34 \div (T + 9)$.

The capital "T" in the equation above represents the background temperature.

The 1-DMax temperature is defined as "the highest water temperature reached on any given day. This measure can be obtained using calibrated maximum/minimum thermometers or continuous monitoring probes having sampling intervals of thirty minutes or less." Since this is the highest temperature reached on any given day, as opposed to the average temperature over the course of a day, it is analogous to (and more stringent than) Idaho's instantaneous maximum temperature criterion of 22 °C.

4 EPA Thermal Plume Recommendations

Although they are not water quality standards, the EPA also evaluated the Clearwater Paper discharge for consistency with the EPA's recommendations to avoid or minimize impacts of thermal discharges to salmonids. As explained above, the EPA believes that ensuring that the

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thermal plume meets these recommendations will also ensure that the mixing zone for temperature will not cause unreasonable interference with beneficial uses, consistent with Idaho's mixing zone policy (IDAPA 58.01.02.060.01.d). These are:

- Exposures of less than 10 seconds can cause instantaneous lethality at 32 °C. Therefore, EPA suggests that the maximum temperature within the plume after 2 seconds of plume travel from the point of discharge does not exceed 32 °C.
- Thermal shock leading to increased predation can occur when salmon and trout exposed to near optimal temperatures (e.g., 15 °C) experience a sudden temperature increase to 26 – 30 °C for a short period of time. Therefore, EPA suggests that thermal plumes be conditioned to limit the cross-sectional area of a river that exceeds 25 °C to a small percent of the river (e.g., 5 percent or less).
- Adult migration blockage conditions can occur at 21 °C (Table 1). Therefore, EPA suggests that the cross-sectional area of a river at or above 21 °C be limited to less than 25% or, if upstream temperature exceeds 21 °C, the thermal plume be limited such that 75% of the cross-sectional area of the river has less than a de minimis (e.g., 0.25 °C) temperature increase.

The EPA also recommends that the thermal plume be limited so that temperatures exceeding 13°C do not occur in the vicinity of active spawning and egg incubation areas, or that the plume does not cause more than a de minimis (e.g., 0.25 °C) increase in the river temperature in these areas. The receiving waters are not designated for salmonid spawning in Idaho, and the EPA has no information demonstrating that salmonid spawning is an existing use. Therefore, the EPA has not evaluated the discharge for consistency with this recommendation.

5 Temperature Effluent Limits in 2005 Permit

Since effluent limits are already in effect for the Clearwater Paper discharge, EPA must determine if the current limits are stringent enough to meet the water quality criteria, mixing zone requirements, and thermal plume recommendations described in Sections 3 and 4 of this document. To accomplish this, in general, EPA has assumed that the maximum effluent temperature is equal to the current temperature effluent limit. If a discharge at the current temperature limit would meet all mixing zone requirements, more stringent limits are not necessary, but the current effluent limits would be retained based on the anti-backsliding provisions of the Clean Water Act.

The temperature limits in the 2005 permit are:

- 33 °C from October – June
- 32 °C in July
- 31 °C in August and September

The temperature limits are expressed as maximum daily limits, which is defined as the maximum allowable average temperature over a calendar day. See the definitions of "maximum daily discharge limitation" and "daily discharge" in 40 CFR 122.2. Thus, the temperature effluent limits in the 2005 permit have the same averaging period as the State of Idaho's maximum daily average criterion of 19 °C (i.e., 1 day). Thus, the EPA has evaluated the effluent limits for compliance with this criterion, instead of the 22 °C instantaneous maximum criterion.

6 Cormix Modeling

The EPA used the Cormix model (version 11.0) to determine whether a discharge at the limits in the 2005 permit would meet Idaho water quality standards at the edge of a mixing zone complying with Idaho's mixing zone policy and also meet the EPA's thermal plume recommendations described in Sections 3 and 4. Cormix is a comprehensive software system for the analysis, prediction, and design of outfall mixing zones resulting from discharge of aqueous pollutants into diverse water bodies.

The analysis was generally performed on a monthly basis, in order to capture variability in effluent limits and ambient temperatures (including ambient temperature stratification) throughout the year. At least one model simulation was set up for each month. Multiple simulations were set up for July through October, to reflect different ambient temperature stratification conditions that have been observed during July and September and to investigate the effect of changes in effluent temperature (and therefore density) upon plume behavior in a stratified ambient density field during these months.

The simulations were repeated with different mixing zone specifications, in order to evaluate whether the plume would meet all of the requirements and recommendations in Sections 3 and 4.

6.1 Model Inputs

The Cormix model inputs and their bases are described below.

6.1.1 Effluent Tab

In general, the effluent flow rate was set at 31.6 million gallons per day, which is the maximum daily effluent flow rate reported by the facility between January 2013 and August 2018. However, Clearwater Paper operates a flow augmentation system which adds up to 7 mgd of Clearwater River water to the discharge pipe from May 15 – September 30 each year. Thus, for May through September, additional scenarios were run with the effluent flow rate set at 38.6 mgd.

The effluent temperature was used to specify the effluent density. In general, the effluent temperature was set equal to the applicable temperature limit for the month (see Section 5, above).

In some cases, the ambient temperature is vertically stratified, but Cormix predicted that a discharge at the effluent limits would behave as if the effluent was unstratified. In those cases, the EPA also ran Cormix scenarios with the effluent temperature set equal to the average temperature reported for the month. Specifying a lower ambient temperature increases the

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density of the discharge and can change the way the plume interacts with a stratified ambient density field. These average effluent temperatures were:

- 29.3 °C in July
- 25.8 °C in September
- 25.0 °C in October

The "Heated Discharge" pollutant type was selected. A heat loss coefficient was specified for each month, based on Table 4.1 in the Cormix user manual (Doneker and Jirka 2014). Cormix uses this input to simulate heat dissipation to the atmosphere, for plumes that reach the surface of the water (as Clearwater Paper's plume generally does).

In addition to specifying the effluent temperature as an absolute value to quantify the effluent density, the discharge temperature is separately specified as an "excess" above the background temperature (i.e., the difference between the effluent and background temperature) on the effluent tab. This is straightforward at times when the ambient temperature is not stratified, since the background temperature is a single value.

In cases where the ambient temperature is stratified and the Cormix model predicted that the plume will quickly rise to the surface of the river, the "excess" temperature was calculated based on the (warmer) surface ambient temperature. In cases where the plume traps at an intermediate depth, the "excess" temperature was calculated based on as the ambient temperature at the lower end of the thermocline, because Cormix predicts that the plume will not interact with the warmer water above the thermocline.

If the actual background temperature exceeded the target temperature (i.e., the 19 °C numeric water quality criterion for Idaho, or the 20 °C numeric water quality criterion for Washington), the discharge temperature was specified as an excess above the target instead of an excess above the actual (warmer) ambient temperature. This is a conservative approach that takes into account the uncertainty in the natural background temperature estimates. When the background temperature exceeds the numeric target, the target becomes an increase above the background temperature (0.25 – 0.3 °C). Specifying the discharge temperature as an excess above the target, as opposed to a smaller excess above the actual ambient temperature, will result in a larger predicted temperature increase in the receiving water.

6.1.2 Ambient Tab

6.1.2.1 Ambient Width and Depth

The EPA schematized the river channel differently in this analysis relative to the 2005 Temperature Assessment.

In the 2005 Temperature Assessment, the EPA represented vertically stratified conditions, in which the colder Clearwater River plunges beneath the warmer Snake River, by specifying a river channel with a reduced width and depth, to represent only the "Clearwater" layer of the river, thus excluding the upper ("Snake") layer of the river from the model. The EPA represented horizontally stratified conditions, in which the two rivers flow parallel to each other for several miles, by specifying the width of the river as the width of the Snake River upstream from the discharge.

In the revised analysis, the EPA specified the same width and depth for all simulations. The width and depth are consistent with cross section 139.22, located just downstream from the discharge, as shown in *Appendix M: Results of Hydrology Studies: 1992 Reservoir Drawdown Test Lower Granite and Little Goose Dams* (USACE 1993). Both the average depth and the depth at the discharge were specified as 9.14 meters (30 feet). The river was represented as a bounded channel with a width of 610 meters (about 2000 feet). In general, it is appropriate to use a cross-section located somewhat downstream from the discharge to schematize the river channel, because the Cormix model will account for any interactions with the stream bank or bottom, and these interactions will occur downstream from the point of discharge.

The Cormix model allows the user to specify a vertically stratified ambient density. Thus, the vertically stratified ambient density observed when the Clearwater River flow plunges below the Snake River flow can be represented directly in the model, without excluding the upper layer from the model. The model will then determine whether a positively buoyant plume (such as the plume created by the Clearwater Paper discharge) will "trap" at an intermediate depth or break through the stratified ambient density field and reach the water surface. Thus, it is more realistic to represent the entire river cross-section in the model, with a vertically stratified ambient density field, than to exclude of the upper layer of the river (consisting of warmer water from the Snake River), as was done in the 2005 Temperature Assessment.

When the plume is confined to the lower layer of the river by the ambient stratification, this reduces the dilution that would occur at the boundary of a mixing zone, relative to the scenarios using the effluent limits as the effluent temperature, in which the plume quickly reaches the surface. However, with respect to temperature, the effect of this reduced mixing is offset by the fact that the plume is interacting only with the cooler water below the thermocline (see Table 2, below).

Cormix does not have an option to specify a horizontally stratified ambient temperature, such as that which occurs when the two rivers flow parallel to each other downstream from the confluence. However, the EPA believes it is more realistic to represent the entire cross-section of the river in the model, even during horizontally stratified conditions, instead of modeling the discharge as if the river is only as wide as the Snake River upstream from the discharge, as was done in the 2005 Temperature Assessment.

As explained in Sections 3 and 4, above, several of the mixing zone restrictions and thermal plume recommendations are specified as a percentage of the river's width or cross-sectional area. Thus, it is important to specify a realistic river cross-section so that the Cormix model can accurately determine the boundaries of a mixing zone specified as a percentage of the river's width or cross-sectional area and report the plume characteristics at those locations.

In addition, the Cormix model accounts for plume interactions with the stream bank. When the Cormix model predicts that the plume has contacted the stream bank, it will abruptly shift

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the plume centerline to the contacted bank. The model will also assume that there is no more ambient water available for entrainment on the side of the plume which has contacted the bank, as the plume proceeds downstream, thus slowing mixing.

While, under some conditions, the Snake and Clearwater rivers flow side-by-side, with little mixing occurring between the two rivers' flows for several miles, the EPA does not believe it is realistic to represent the "boundary" between the two rivers' flows in the Cormix model as a stream bank, as was done in the 2005 Temperature Assessment, since it is not a solid physical boundary that will prevent entrainment of ambient water.

However, the EPA has nonetheless considered the potential for horizontal stratification of the Snake and Clearwater River flows when specifying the upstream temperature, as described below.

6.1.2.2 Temperature and Stratification

The EPA characterized the ambient density using temperature. The ambient temperatures specified in the model for the purpose of characterizing the ambient density are always based on actual measurements, regardless of whether the ambient temperature exceeds the numeric water quality criteria or other targets, or whether the natural conditions provisions of the water quality standards are applicable. The ambient density is an important factor in determining the mixing properties of the discharge, thus, it should always be specified using measured values.

6.1.2.2.1 Late July – October: Vertical Stratification

From late July – October, the EPA estimated the vertically stratified ambient temperature profile from the chart of the observed temperature profile for the summer of 2003, at "Site 7," in Appendix A to *Hydraulic Characteristics of the Lower Snake River During Periods of Juvenile Fall Chinook Salmon Migration* (Cook et al. 2006). Site 7 was the closest ambient temperature monitoring location to the discharge. It was located about 268 meters downstream from the outfall, near the south bank of the Snake River, which is the bank nearer to the discharge location. From mid-July through the end of data collection in mid-October 2003, the ambient temperature was vertically stratified.

6.1.2.2.2 November – Early July: No Vertical Stratification

From November through early July, the EPA specified a uniform (unstratified) ambient temperature.

In early July, the temperature was estimated from the chart of the observed temperature profile for the summer of 2003, at "Site 7" in Appendix A to *Hydraulic Characteristics of the Lower Snake River During Periods of Juvenile Fall Chinook Salmon Migration*. The ambient temperature was not vertically stratified at this location in early July.

From November through June, the ambient temperature was based on USGS NWIS data for the Snake and Clearwater rivers, from USGS stations 13334300 and 13342500, respectively. During this time, the temperatures of the Snake and Clearwater rivers are similar, so no significant vertical temperature stratification will occur. However, horizontal stratification may occur.

As explained in Section 2.1, above, when the temperatures of the two rivers are similar, mixing properties at the confluence are determined by the relative flow rates of the two rivers.

When the flow rates of the two rivers are similar, water from the Snake and Clearwater Rivers flows in parallel, with little mixing occurring between the two rivers for several miles downstream of the confluence, and with water from the Clearwater River attached to the north bank and water from the Snake River attached to the south bank. Since the diffuser is located nearer to the south bank, near field mixing of the Clearwater Paper discharge will be primarily with water from the Snake River under these conditions. This mixing scenario is described in Section 4.2.1 of *Hydraulic Characteristics of the Lower Snake River During Periods of Juvenile Fall Chinook Salmon Migration*. This type of mixing was observed on April 4, 2002, when the ratio of the Clearwater River flow to the Snake River flow was 0.86 (i.e., the flow rate of the Clearwater River was 86% of the flow in the Snake River).

When the flow rates of the two rivers are dissimilar, the two rivers will mix relatively quickly near the confluence. Thus, under these conditions, near field mixing of the Clearwater Paper discharge will be with a mixture of water from the Snake and Clearwater Rivers. This mixing scenario is described in Section 4.2.2 of *Hydraulic Characteristics of the Lower Snake River During Periods of Juvenile Fall Chinook Salmon Migration*. This type of mixing was observed on May 24, 2003, when the ratio of the Clearwater River flow to the Snake River flow was 0.65.

A threshold flow ratio at which mixing properties change between these two types has not been identified. However, based on the examples described above, the EPA believes it is reasonable to assume that if the ratio of the Clearwater River flow to the Snake River flow is 0.65 or lower (i.e., the flow of the Clearwater River is less than or equal to 65% of the flow of the Snake River), the two rivers will mix at the confluence, since this mixing behavior has been observed at this flow ratio. If the ratio of the Clearwater River flow to the Snake River flow is greater than 0.65, then the EPA has assumed that the two rivers will flow parallel to each other for a significant distance downstream.

The EPA has therefore estimated the upstream temperature at the Clearwater Paper outfall from November – June as follows.

If the ratio of the Clearwater River flow to the Snake River flow is 0.65 or lower, the EPA has calculated the upstream temperature as the mixture of the temperatures of the Snake and Clearwater rivers. That is to say, the EPA has assumed that the two rivers mix immediately at the confluence under these conditions.

If the ratio of the Clearwater River flow to the Snake River flow is greater than 0.65, then the EPA has assumed that the upstream temperature is the temperature of the Snake River (with no influence from the Clearwater River). That is to say, the EPA has assumed that no significant mixing of the two rivers will occur near the outfall under these conditions.

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Using the mixing assumptions described above, the EPA estimated an upstream temperature for each day for which both flow and temperature data were available from USGS NWIS for both rivers, from January 1, 2000 through April 24, 2018. The EPA then calculated the 90th percentile of these estimated temperatures for each month and used those monthly 90th percentile values as the upstream temperature, from November – June.

The EPA believes this is a reasonable (although simplified) characterization of the ambient temperatures (and, in turn, densities) for November – June.

6.1.2.3 Ambient Velocity

The EPA specified the monthly 7-day, 10-year low flow (7Q10) as the flow rate; the velocity was automatically calculated from the flow rate and the area of the schematized river cross section. The 7Q10 flow rates were calculated from the sum of the flow rates of the Snake and Clearwater Rivers, from USGS stations 13334300 and 13342500, respectively. The monthly 7Q10 flow rates and calculated velocities are listed in Table 1, below.

Clearwater Paper measured ambient velocity as a condition of its permit, from July – October during 2005 and 2006. The average velocities measured at station LGP-13, which is just downstream from the discharge, were 0.16 ft/s in 2005 and 0.33 ft/s in 2006 (AMEC 2006 and 2007). The calculated velocities for July – October are similar to the velocities measured in 2005 and 2006.

Table 1: 7Q10 Flow Rates and Calculated Ambient Velocities

Month	7Q10 (CFS)	Calculated Ambient Velocity (ft/s)
January	18,413	0.307
February	19,989	0.333
March	23,207	0.387
April	35,532	0.592
May	54,474	0.908
June	34,402	0.573
July	26,748	0.446
August	19,912	0.332
September	16,285	0.271
October	15,534	0.259
November	16,350	0.272
December	15,786	0.263

6.1.2.4 Wind Speed

The wind speed was specified as 2 meters per second (4.5 miles per hour). This is the value recommended by the Cormix user manual as a conservative estimate, when field data are not available (Doneker and Jirka 2014).

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6.1.2.5 Roughness

The EPA specified a Manning's "n" of 0.025 because it is the appropriate factor to use for an earthen channel with some stones and weeds, according to Table 4.3 of the Cormix user manual (Doneker and Jirka 2014).

6.1.3 Discharge Tab

The EPA selected the "CORMIX2" option because Clearwater Paper's effluent is discharged through a multiport diffuser.

The nearest bank is on the left (i.e., the southern shore of the Snake River in Clarkston, WA) from the perspective of an observer looking downstream. The EPA estimates that the near end of the diffuser is 183 meters from the bank, and the far end is 274 meters from the bank.

The diffuser length is the length from one diffuser end point (first nozzle/port) to the other endpoint (last nozzle/port). The Potlatch Mill diffuser length is 122 meters as reported in the 1997 Potlatch Mixing Zone Study and from Potlatch documents of the diffuser design.

The port height is the height of the discharge port centers above the bottom of the river. This value is 0.45 meters based on Potlatch diffuser design documents and the 1997 Potlatch Mixing Zone Study.

The port diameter is the average diameter of all ports/nozzles in this diffuser. This value is 0.0762 meters (3 inches) based on Potlatch diffuser design documents and the 1997 Potlatch Mixing Zone Study.

The contraction ratio is a coefficient that describes the shape of the port/nozzle. This can range from 1 for well-rounded ports to 0.6 for sharp-edged ports. A default value of 1.0 is used if the user does not know the actual contraction ratio. The value used in the past for this discharge was 0.8, based on the 1997 Potlatch Mixing Zone Study. Cormix 11.0 will only accept contraction ratios between 1.0 and 0.85, so the contraction ratio was set to 0.85.

The total number of openings is the total number of ports/nozzles for this diffuser. The diffuser is designed with 79 ports, and all of the ports are active.

The alignment angle gamma is the difference between the diffuser line and the ambient current measured counterclockwise from the ambient current direction. This value is 48 degrees based on aerial photos (Potlatch and IDEQ) and Potlatch diffuser design documents.

The nozzles per riser option allows the choice between 1) individual single ports (holes) or single nozzles attached to the diffuser, 2) two nozzles or ports per riser, or 3) several nozzles or ports per riser. Since the Potlatch diffuser has a single nozzle, EPA has chosen the "Single" nozzle per riser option. This was based on Potlatch diffuser design documents and the 1997 Potlatch Mixing Zone Study.

The "Orientation of Ports of Nozzles" option allows the choice between a unidirectional arrangement and an alternating arrangement. The unidirectional arrangement is where all the ports/nozzles point, more or less, into the same, mostly horizontal, direction. The alternating

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arrangement is where every other port/nozzle points into the opposite direction or all point directly upward in the vertical direction. Since the Potlatch diffuser nozzles are arranged so that they point in the same direction, EPA chose the "Unidirectional" nozzle arrangement option. This was based on Potlatch diffuser design documents and the 1997 Potlatch Mixing Zone Study.

The horizontal angle (sigma) is the horizontal angle measured clockwise from the ambient current direction to the average port/nozzle centerline direction. Zero degrees represent all ports/nozzles pointing in the downstream direction in a co-flowing direction with the current and 90 degrees represents all ports/nozzles pointing perpendicular to, and to the left of, the ambient flow facing downstream in the current direction. This value is 318 degrees based on Potlatch diffuser design documents and the 1997 Potlatch Mixing Zone Study.

The relative orientation angle (beta) is the nearest angle between the horizontal projection of the average port/nozzle centerline direction and the diffuser axis. Zero degrees represent all ports/nozzles oriented along the diffuser line (staged diffuser) and 90 degrees represents all ports/nozzles oriented normal to the diffuser line (unidirectional diffuser). This value is 90 degrees based on Potlatch diffuser design documents and the 1997 Potlatch Mixing Zone Study.

The nozzle direction option allows the choice between all ports/nozzles pointing in the same direction and the ports/nozzles arranged in a variable fanned-out orientation. EPA chose all nozzles pointing in the "same direction" option based on Potlatch diffuser design documents and the 1997 Potlatch Mixing Zone Study.

6.1.4 Mixing Zone Tab

The entries in the mixing zone tab vary based on the temperature target that was being evaluated against (i.e., the water quality criterion or the EPA thermal plume threshold temperature), the background temperature, and the mixing zone policy restriction or thermal plume recommendation.

For simulations that evaluate compliance with Idaho's water quality criteria and mixing zone policy, the mixing zone was specified as 25% of the channel width (IDAPA 58.01.02.060(h)(i)(1)).

For simulations that evaluate for consistency with the EPA's recommendation that the cross-sectional area of a river at or above 21 °C be limited to less than 25%, in order to prevent or minimize adult migration blockage, the mixing zone was specified as 25% of the channel area.

For simulations that evaluate for consistency with the EPA's recommendation that the cross-sectional area of a river at or above 25 °C be limited to less than 5%, in order to prevent or minimize thermal shock, the mixing zone was specified as 5% of the channel area.

For simulations that evaluate for consistency with the EPA's recommendation that the plume temperature drop to less than 32 °C within 2 seconds of plume travel in order to prevent instantaneous lethality, the mixing zone was specified as a distance downstream. Cormix does

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not provide an option to specify a mixing zone in terms of plume travel time. Through trial-and-error, the EPA determined a downstream distance for each simulation, which is equivalent to 2 seconds of plume travel. This downstream distance is 0.80 – 1.2 meters.

For simulations that evaluate compliance with Washington's water quality criteria, the mixing zone was specified as a distance of 191 meters downstream from the discharge.

The water quality standard is specified as a non-toxic parameter, and the concentration is specified as an excess above background. For example, for January, when the background temperature is 4.4 °C, the water quality standard was specified as 14.6 °C when evaluating compliance with Idaho's water quality criterion of 19 °C.

6.2 Model Results

Model results are summarized in Table 2, below.

Table 2: Cormix Model Results

Month	Ambient T (°C)	Effluent T (°C)	T at 2 s. of Plume Travel (°C) Target: < 32 °C	T at 5% of Cross-Sectional Area (°C) Target: < 25 °C	T at 25% of Cross-Sectional Area (°C) or distance to Target of < 21 °C or < 0.25 °C increase[2]	Dilution Factor at 25% of Stream Width	T at 25% of Stream Width (°C) Criterion: 19 °C and 1 °C increase or 0.3 °C increase	T at Washington Border (°C) Criterion: 20 °C and t = 34÷(T + 9) increase or 0.3 °C increase[4]
January	4.4	33	8.3	5.8	4.7 °C	52.0	5.0 (0.6 increase)	4.9 (0.5 increase)
February	5.0	33	8.7	6.3	5.2 °C	55.0	5.5 (0.5 increase)	5.5 (0.5 increase)
March	7.9	33	11.0	9.0	8.1 °C	61.4	8.3 (0.4 increase)	8.3 (0.4 increase)
April	11.1	33	13.3	11.8	11.2 °C	83.3[3]	11.4 (0.3 increase)[3]	11.4 (0.3 increase)
May (31.6 mgd)	13.2	33	14.6	13.7	13.3 °C	139.6	13.4 (0.2 increase)[3]	13.4 (0.2 increase)
May (38.6 mgd)	13.2	33	14.8	13.7	13.3 °C	113.3	13.4 (0.2 increase)[3]	13.4 (0.2 increase)
June (31.6 mgd)	18.3	33	19.8	18.8	18.4 °C	85.4	18.5 (0.2 increase)[3]	18.5 (0.2 increase)
June (38.6 mgd)	18.3	33	19.9	18.9	18.4 °C	72.0	18.5 (0.2 increase)[3]	18.5 (0.2 increase)
Early July (31.6 mgd)	20.0	32	21.4	20.5	20.1 °C	68.8	0.20 increase[3]	0.20 increase
Early July (38.6 mgd)	20.0	32	21.4	20.5	20.1 °C	59.0	0.22 increase	0.20 increase
Late July (31.6 mgd)	16.0[5]	32	18.3	16.9	0.21 m	48.5	16.3 (0.3 increase)	16.3 (0.3 increase)
Late July (limit, 38.6 mgd)	22.5[1]	32	23.6	22.9	0.11 °C increase	58.9	0.22 increase	0.20 increase
Late July (Avg., 38.6 mgd)	16.0	29.3	18.0	16.8	16.1 °C	42.1	16.3 (0.3 increase)	16.3 (0.3 increase)
August (31.6 mgd)	16.8[5]	31	19.1	17.7	0.27 m	39.4	17.2 (0.4 increase)	17.1 (0.3 increase)

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Month	Ambient T (°C)	Effluent T (°C)	T at 2 s. of Plume Travel (°C) Target: < 32 °C	T at 5% of Cross-Sectional Area (°C) Target: < 25 °C	T at 25% of Cross-Sectional Area (°C) or distance to Target of < 21 °C or < 0.25 °C increase[2]	Dilution Factor at 25% of Stream Width	T at 25% of Stream Width (°C) Criterion: 19 °C and 1 °C increase or 0.3 °C increase	T at Washington Border (°C) Criterion: 20 °C and t = 34÷(T + 9) increase or 0.3 °C increase[4]
August (38.6 mgd)	16.8[5]	31	19.0	17.7	0.29 m	36.5	17.2 (0.4 increase)	17.2 (0.4 increase)
Early Sep. (31.6 mgd)	16.0[5]	31	18.5	17.0	0.22 m	36.5	16.4 (0.4 increase)	16.4 (0.4 increase)
Early Sep. (limit, 38.6 mgd)	21.0[5]	31	22.4	21.5	147 m	44.5	0.27 increase	0.24 increase
Late Sep. (limit, 31.6 mgd)	19.0[1]	31	20.7	19.6	0.76	47.9	0.25 increase	19.2 (0.2 increase)
Late Sep. (limit, 38.6 mgd)	19.0[1]	31	20.7	19.6	19.1	44.5	0.27 increase	19.2 (0.2 increase)
Late Sep. (avg., 31.6 mgd)	19.0[1]	25.8	Note 6	Note 6	Note 6	47.9	0.14 increase	Note 6
Late Sep. (avg., 38.6 mgd)	19.0[1]	25.8	Note 6	Note 6	Note 6	44.6	0.15 increase	Note 6
October (limit)	18.5[1]	33	20.6	19.3	0.74 m	46.5	18.8 (0.3 increase)	18.8 (0.3 increase)
October (avg.)	18.5[1]	25.0	Note 6	Note 6	Note 6	46.5	18.6 (0.1 increase)	Note 6
November	10.2	33	13.5	11.4	10.4	48.0	10.7 (0.5 increase)	10.6 (0.4 increase)
December	5.8	33	9.8	7.2	6.1	46.9	6.4 (0.6 increase)	6.3 (0.5 increase)

Notes:

1. The ambient temperature is stratified at this time. The ambient temperature listed is the temperature at the surface, because Cormix predicts that the plume will rise to the surface.
2. If Cormix predicts that the plume will not spread such that the plume occupies 25% of the cross-sectional area of the river within 50,000 meters downstream of the discharge, the distance at which the temperature falls to 21 °C or 0.25 °C above ambient is reported. The discharge meets the thermal plume recommendation for migration blockage from late July through October.
3. During April, May, June, and early July, a mixing zone encompassing 25% of the stream width would extend downstream past the Washington border. The State of Idaho cannot authorize a mixing zone that extends into another State. Thus, the conditions at the Washington border (191 meters downstream) are reported.
4. The values of t = 34/(T+9) are: 2.5 °C in January, 2.4 °C in February, 2.0 °C in March, 1.7 °C in April, 1.5 °C in May, 1.2 °C in June, 1.32 °C in August, 1.4 °C in late September, 1.3 °C in October, 1.8 °C in November, and 2.3 °C in December. In July and early September, the allowable temperature increase is 0.3 °C.
5. From late July through early September, , the plume traps below the thermocline. For these scenarios, the ambient temperature is listed as the temperature at the lower end of the thermocline. The plume will not affect the warmer water above the thermocline.
6. Additional scenarios evaluating the conditions at 25% of the stream width using the average effluent temperatures instead of the effluent limits were run for late September and October, to determine if the lower effluent temperature would affect the plume's behavior in the stratified receiving water. The lower effluent temperatures had no effect on the plume's behavior, so no other targets were evaluated using the average effluent temperatures.

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As shown in Table 2, above, the effluent limits in the 2005 permit satisfy all of the applicable water quality criteria and mixing zone restrictions as well as the EPA's recommendations for thermal plumes.

- The temperature after 2 seconds of plume travel is always less than 32 °C, with a maximum of 23.6 °C predicted in late July at the maximum augmented flow, thus ensuring that the plume will not cause instantaneous lethality to salmonids.
- Less than 5% of the river's cross-sectional area will exceed 25 °C, thus ensuring that the discharge will not cause thermal shock to salmonids. The maximum temperature at the point where the plume occupies 5% of the river's cross-sectional area is 22.9 °C in late July at the maximum augmented flow.
- Less than 25% of the river's cross-sectional will exceed 21 °C as a result of the discharge, thus ensuring that the discharge will not block migration of salmonids. If the upstream temperature exceeds 21 °C, the discharge will increase the temperature by less than 0.25 °C.
- The temperature meets Idaho's numeric water quality criteria for temperature or the 0.3 °C allowable increase above natural background, as applicable, at the edge of a mixing zone encompassing 25% of the stream width, or at the Washington border (whichever is more restrictive). These restrictions always result in less dilution (i.e., they are more stringent) than a mixing zone encompassing 25% of the volume of the 7Q10 flow rate (IDAPA 58.01.02.060.01.h.i.2).
- The discharge never increases the temperature of the river by more than 1 °C at the edge of a mixing zone encompassing 25% of the stream width, or at the Washington border (whichever is more restrictive). The maximum increase is 0.6 °C, and this occurs in January when ambient temperatures are very cold.
- The temperature meets Washington numeric water quality criteria for temperature or the 0.3 °C allowable increase above natural background, as applicable, at the Washington border.
- The discharge will have an insignificant effect upon cold water refugia created by cool water from the Clearwater River. The plume will generally rise quickly to the surface, thus limiting its effect on the cool water from the Clearwater River, which will plunge to the bottom of the river. In cases where the plume traps below the thermocline, the discharge will increase the temperature by no more than 0.4°C at the edge of the mixing zone.

7 References

AMEC Earth & Environmental. 2006. *Tier 1 Endangered Species Act Monitoring and NPDES Compliance Monitoring Studies Conducted in 2005: Potlatch Lewiston Facility*. Westford, MA. January 2006.

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AMEC Earth & Environmental. 2007. *Tier 1 Endangered Species Act Monitoring and NPDES Compliance Monitoring Studies Conducted in 2006: Potlatch Forest Products Corporation Lewiston Facility*. Westford, MA. January 2007.

Cook, C.B., B. Dibrani, M.C. Richmond, M.D. Bleich, P.S. Titzler, and T. Fu. 2006. *Hydraulic Characteristics of the Lower Snake River During Periods of Juvenile Fall Chinook Salmon Migration*. Pacific Northwest National Laboratory. Richland, WA. Prepared for the Bonneville Power Administration U.S. Department of Energy under Contract DE-AC05-76RLO1830. January 2006.
http://www.pnl.gov/main/publications/external/technical_reports/PNNL-15532.pdf

Cope, B. 2004. Natural Temperatures in the Snake River near Lewiston. Memorandum to Kristine Koch, EPA Region 10, Office of Water. September 23, 2004.

Cope, B. 2005. Additional Analysis of Snake River Temperatures. Memorandum to Brian Nickel, EPA Region 10, Office of Water. January 13, 2005.

Doneker, R.L. and G.H. Jirka. 2014. *CORMIX User Manual: A Hydrodynamic Mixing Zone Model and Decision Support System for Pollutant Discharges into Surface Waters*. December 2007. Updated August 2014.

USACE, 1993. *1992 Reservoir Drawdown Test, Lower Granite and Little Goose Dams, Appendix M, Results of Hydrology Studies*. U.S. Army Corps of Engineers, Walla Walla District, Walla Walla, Washington. December 1993.

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Appendix G. Draft Clean Water Act Section 401 Certification

STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

1118 F Street • Lewiston, Idaho 83501 • (208) 799-4370
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Governor Brad Little
Director John H. Tippets

February 21, 2019

Mr. Michael J. Lidgard
NPDES Permits Unit Manager
EPA Region 10
1200 Sixth Avenue, Suite 900
Seattle, Washington 98101-3140

Subject: DRAFT 401 Water Quality Certification for the Clearwater Paper Corporation Lewiston Mill, ID0001163

Dear Mr. Lidgard:

The Lewiston Regional Office of the Department of Environmental Quality (DEQ) has reviewed the above-referenced permit for the Clearwater Paper Corporation Lewiston Mill. Section 401 of the Clean Water Act requires that states issue certifications for activities which are authorized by a federal permit and which may result in the discharge to surface waters. In Idaho, the DEQ is responsible for reviewing these activities and evaluating whether the activity will comply with Idaho's Water Quality Standards, including any applicable water quality management plans (e.g., total maximum daily loads). A federal discharge permit cannot be issued until DEQ has provided certification or waived certification either expressly, or by taking no action.

This letter is to inform you that DEQ is issuing the attached draft 401 certification subject to the terms and conditions contained therein.

Please contact me directly at 208-799-4370 to discuss any questions or concerns regarding the content of this certification.

Sincerely,

John Cardwell
Regional Administrator
Lewiston Regional Office

c: Brian Nickel, EPA Region 10
Loren Moore, DEQ State Office

Idaho Department of Environmental Quality

Draft §401 Water Quality Certification

February 21, 2019

NPDES Permit Number(s): Clearwater Paper Corporation Lewiston Mill, Permit #ID0001163

Receiving Water Bodies: Outfall 001 - Snake River; Pond Seepage - Clearwater River, Lower Granite Dam Pool

Pursuant to the provisions of Section 401(a)(1) of the Federal Water Pollution Control Act (Clean Water Act), as amended, 33 U.S.C. Section 1341(a)(1); and Idaho Code §§ 39-101 et seq. and 39-3601 et seq., the Idaho Department of Environmental Quality (DEQ) has authority to review National Pollutant Discharge Elimination System (NPDES) permits and issue water quality certification decisions.

Based upon its review of the above-referenced permit and associated fact sheet, DEQ certifies that if the permittee complies with the terms and conditions imposed by the permit along with the conditions set forth in this water quality certification, then there is reasonable assurance the discharge will comply with the applicable requirements of Sections 301, 302, 303, 306, and 307 of the Clean Water Act, the Idaho Water Quality Standards (WQS) (IDAPA 58.01.02), and other appropriate water quality requirements of state law.

This certification does not constitute authorization of the permitted activities by any other state or federal agency or private person or entity. This certification does not excuse the permit holder from the obligation to obtain any other necessary approvals, authorizations, or permits.

Antidegradation Review

The WQS contain an antidegradation policy providing three levels of protection to water bodies in Idaho (IDAPA 58.01.02.051).

- Tier I Protection. The first level of protection applies to all water bodies subject to Clean Water Act jurisdiction and ensures that existing uses of a water body and the level of water quality necessary to protect those existing uses will be maintained and protected (IDAPA 58.01.02.051.01; 58.01.02.052.01). Additionally, a Tier I review is performed for all new or reissued permits or licenses (IDAPA 58.01.02.052.07).
- Tier II Protection. The second level of protection applies to those water bodies considered high quality and ensures that no lowering of water quality will be allowed unless deemed necessary to accommodate important economic or social development (IDAPA 58.01.02.051.02; 58.01.02.052.08).
- Tier III Protection. The third level of protection applies to water bodies that have been designated outstanding resource waters and requires that activities not cause a lowering of water quality (IDAPA 58.01.02.051.03; 58.01.02.052.09).

DEQ is employing a water body by water body approach to implementing Idaho's antidegradation policy. This approach means that any water body fully supporting its beneficial uses will be considered high quality (IDAPA 58.01.02.052.05.a). Any water body not fully supporting its beneficial uses will be provided Tier I protection for that use, unless specific circumstances warranting Tier II protection are met (IDAPA 58.01.02.052.05.c). The most recent federally approved Integrated Report and supporting data are used to determine support status and the tier of protection (IDAPA 58.01.02.052.05).

Pollutants of Concern

The Clearwater Paper Corporation discharges the following pollutants of concern:

- 2,3,7,8 tetrachlorodibenzo-p-dioxin (TCDD)
- 2,4,5-Trichlorophenol
- 2,4,6-Trichlorophenol
- Ammonia
- Antimony
- Arsenic
- Biochemical Oxygen Demand, Five-day (BOD_5)
- Chemical Oxygen Demand (COD)
- Chloroform
- Chromium III
- Chromium VI
- Color
- Copper
- Lead
- Nickel
- Nitrate+Nitrite
- Pentachlorophenol
- pH
- Phosphorus
- Temperature
- Thallium
- Total Suspended Solids (TSS)
- Whole Effluent Toxicity (WET)
- Zinc

Effluent limits have been developed for:

- 2,3,7,8 tetrachlorodibenzo-p-dioxin (TCDD)
- BOD_5
- Chloroform
- Pentachlorophenol
- pH
- Temperature
- TSS

No effluent limits are proposed for:

- 2,4,5-Trichlorophenol
- 2,4,6-Trichlorophenol
- Ammonia
- Antimony
- Arsenic
- COD
- Chromium III
- Chromium VI
- Color
- Copper
- Lead
- Nickel
- Nitrate+Nitrite
- Phosphorus
- Thallium
- WET
- Zinc

Receiving Water Body Level of Protection

The Clearwater Paper Corporation's Outfall 001 discharges to the Snake River within the Lower Snake – Asotin Subbasin assessment unit (AU) ID17060103SL001_08 (Snake River). This AU has the following designated beneficial uses: cold water aquatic life, primary contact recreation, and domestic water supply. In addition to these uses, all waters of the state are protected for agricultural and industrial water supply, wildlife habitat, and aesthetics (IDAPA 58.01.02.100).

According to DEQ's 2014 Integrated Report, this AU is not fully supporting the aquatic life beneficial use due to temperature impairment. As such, DEQ will provide Tier I protection (IDAPA 58.01.02.051.01) for the aquatic life beneficial use. The primary contact recreation beneficial use in this AU is fully supported. *E. coli* bacteria samples collected on May 22, 2017 in AU ID17060103SL001_08 (Snake River) showed results of 17.1 colony forming units per 100 milliliters (cfu/100mL), 19.9 cfu/100mL, and 29.5 cfu/100mL, all of which are below the 406 cfu/100mL primary contact recreation single sample maximum (IDAPA 58.01.02.251.01.b.ii). As such, DEQ will provide Tier II protection in addition to Tier I for contact recreation in this AU (IDAPA 58.01.02.051.02; 58.01.02.051.01).

The Clearwater Paper Corporation also has a secondary treatment pond that discharges 3 million gallons per day (mgd) seepage water to the Lower Granite Dam Pool within the Clearwater Subbasin AU ID17060306CL001_07 (Lower Granite Dam Pool). This AU has the following designated beneficial uses: cold water aquatic life, primary contact recreation, and domestic water supply.

According to DEQ's 2014 Integrated Report, the Lower Granite Dam Pool AU is fully supporting its cold water aquatic life and primary contact recreation beneficial uses (IDAPA 58.01.02.052.05.a). As such, DEQ has provided Tier II protection in addition to Tier I for the aquatic life and contact recreation beneficial uses (IDAPA 58.01.02.051.02; 58.01.02.051.01).

Protection and Maintenance of Existing Uses (Tier I Protection)

As noted above, a Tier I review is performed for all new or reissued permits or licenses, applies to all waters subject to the jurisdiction of the Clean Water Act, and requires demonstration that existing and designated uses and the level of water quality necessary to protect existing and designated uses shall be maintained and protected. In order to protect and maintain existing and designated beneficial uses, a permitted discharge must comply with narrative and numeric criteria of the Idaho WQS, as well as other provisions of the WQS such as Section 055, which addresses water quality limited waters. The numeric and narrative criteria in the WQS are set at levels that ensure protection of existing and designated beneficial uses. The effluent limitations and associated requirements contained in the Clearwater Paper Corporation permit are set at levels that ensure compliance with the narrative and numeric criteria in the WQS.

Water bodies not supporting existing or designated beneficial uses must be identified as water quality limited, and a total maximum daily load (TMDL) must be prepared for those pollutants causing impairment. A central purpose of TMDLs is to establish wasteload allocations for point source discharges, which are set at levels designed to help restore the water body to a condition that supports existing and designated beneficial uses. Discharge permits must contain limitations that are consistent with wasteload allocations in the approved TMDL.

Prior to the development of the TMDL, the WQS require the application of the antidegradation policy and implementation provisions to maintain and protect designated and existing beneficial uses (IDAPA 58.01.02.055.04). As previously stated, the cold water aquatic life beneficial use in the Snake River AU is not fully supported due to thermal loading. An EPA assessment, found in Appendix F of the fact sheet, shows that the water quality based effluent limits for temperature set forth in the permit comply with Idaho water quality standards, including the currently effective point source wastewater treatment requirements for temperature, IDAPA 58.01.02.401.01 (2011 version). The other pollutants of concern either have effluent limits that ensure compliance with WQS or there is no reasonable potential for the pollutant to exceed WQS.

In sum, the effluent limitations and associated requirements contained in the Clearwater Paper Corporation permit are set at levels that ensure compliance with the narrative and numeric criteria in the WQS. Therefore, DEQ has determined the permit will protect and maintain existing and designated beneficial uses in the Snake River in compliance with the Tier I provisions of Idaho's WQS (IDAPA 58.01.02.051.01 and 58.01.02.052.07).

High-Quality Waters (Tier II Protection)

Snake River (AU ID17060103SL001_08)

The Snake River is listed in the most recent Integrated Report as fully supporting recreational beneficial use and is considered high quality for primary contact recreation. As such, the water quality relevant to primary contact recreation use of the Snake River must be maintained and protected, unless a lowering of water quality is deemed necessary to accommodate important social or economic development.

To determine whether degradation will occur, DEQ must evaluate how the permit issuance will affect water quality for each pollutant that is relevant to primary contact recreation (IDAPA 58.01.02.052.05). These pollutants include:

- 2,3,7,8-TCDD
- Antimony
- Arsenic
- Chloroform
- Nickel
- Nitrate+Nitrite
- Pentachlorophenol
- Phosphorous
- Thallium
- Zinc

Effluent limits are set in the proposed and/or existing permit for the following two pollutants:

- 2,3,7,8-TCDD
- Pentachlorophenol

The remaining nine pollutants only have monitoring requirements or were determined to have no reasonable potential to cause or contribute to excursions above water quality criteria:

- Antimony
- Arsenic
- Chloroform
- Nickel
- Nitrate+Nitrite
- Phosphorous
- Thallium
- Zinc

For a reissued permit or license, the effect on water quality is determined by looking at the difference in water quality that would result from the activity or discharge as authorized in the current permit and the water quality that would result from the activity or discharge as proposed in the reissued permit or license (IDAPA 58.01.02.052.06.a). Table 1 lists the comparison between the current and proposed permit limits for the pollutants of concern.

Table 1. Comparison of current and proposed permit limits for pollutants of concern.

Pollutant	Units	Current Permit			Proposed Permit			Change[a]
		Maximum Daily	Average Monthly	Sample Frequency	Maximum Daily	Average Monthly	Sample Frequency	
Pollutants with limits in both the current and proposed permit								
Adsorbable Organic Halides (AOX)	mg/L	---	---	Daily	Report	Report	1/week	D
	lb/day	3,950	2,590		2,979	1,951		
BOD_5 (December – May)	mg/L	---	---	3/week	Report	Report	1/week	D
	lb/day	55,100	28,800		52,074	27,260		
BOD_5 (June – November)	mg/L	---	---	Daily	Report	Report	5/week	NC
	lb/day	15,000	8,400		15,000	8,400		
TSS	mg/L	---	---	Daily	Report	Report	4/week	D
	lb/day	94,400	50,600		88,030	47,081		
	lb/day	---			12-month rolling average: 14,042			
2,3,7,8-TCDD (July – September)[b]	pg/L	See footnote C		Quarterly	0.94	0.65	Quarterly	D
	mg/day	0.22	0.15		0.113	0.077		
2,3,7,8-TCDD (October – June)[b]	pg/L	See footnote C		Quarterly	1.5	1.0	Quarterly	
	mg/day	0.22	0.15		0.177	0.121		
Temperature (October – June)	°C	33	—	Continuous	33	—	Continuous	NC
Temperature (July)	°C	32	—	Continuous	32	—	Continuous	NC
Temperature (August – September)	°C	31	—	Continuous	31	—	Continuous	NC
pH	s.u.	Within the range of 5.5 to 9.0		Continuous	Within the range of 5.7 to 8.5		Continuous	D
Pollutants with new limits in the proposed permit								
Pentachlorophenol (July – September)	µg/L	---	---	—	0.15	0.10	1/month	New
	lb/day	---	---		0.038	0.026		
Pentachlorophenol (October – June)	µg/L	---	---	---	0.23	0.16	1/month	New
	lb/day	---	---		0.072	0.050		
Pollutants with no limits in both the current and proposed permit with monitoring requirements								
Ammonia, Total as N	mg/L	---	---	Monthly	Report	Report	Monthly	NC
Arsenic	µg/L	---	---	---	—	Report	Quarterly	New
COD (December – May)	mg/L	---	---	---	Report	Report	1/week	New
COD (June – November)	mg/L	---	---	—	Report	Report	5/week	New
Effluent Flow	mgd	---	—	Continuous	Report	Report	Continuous	NC
Mercury	µg/L	---	---	—	---	Report	Quarterly	New
Nitrate + Nitrite	mg/L	---	---	Monthly	Report	Report	Monthly	NC
Nitrogen, Total	mg/L	---	---	—	Report	Report	Monthly	New
Phosphorous, Soluble Reactive	mg/L	---	---	—	Report	Report	Monthly	New
Phosphorous, Total	mg/L	---	---	Monthly	Report	Report	Monthly	NC
Polychlorinated biphenyl congeners	pg/L	---	---	—	—	See I.B.12 of permit	2/year	New
Production	Tons per day	---	---	Monthly	See I.B.13 of permit			NC
Whole Effluent Toxicity, Acute	TU_a	---	---	—	See I.C of permit		2/year	New
Whole Effluent Toxicity, Chronic	TU_c	---	---	Quarterly	See I.C of permit		2/year	NC

[a] NC = no change, D = decrease.
[b] Previous limits were not seasonal
[c] This effluent limit was not quantifiable using EPA approved analytical methods, see the permit for further information

Pollutants with Limits in the Current and Proposed Permit: 2,3,7,8-TCDD

For pollutants that are currently limited and will have limits under the reissued permit, the current discharge quality is based on the limits in the current permit (IDAPA 58.01.02.052.06.a.i), and the future discharge quality is based on the proposed permit limits (IDAPA 58.01.02.052.06.a.ii). For the Clearwater Paper Corporation permit, this means determining the permit's effect on water quality based upon the limits in the current and proposed permits.

The water quality-based effluent limit for 2,3,7,8-TCDD is more stringent in the draft permit than the limit contained in the previous permit and is necessary because this facility has a wasteload allocation for 2,3,7,8-TCDD in the Washington Department of Ecology Columbia River Dioxin TMDL. The water quality based effluent limit for 2,3,7,8-TCDD applies in addition to the technology based effluent limit. The wasteload allocation is designed to ensure water quality in the Snake River is achieved to support its existing and designated beneficial uses and comply with the applicable numeric and narrative criteria. The effluent limitations and associated requirements contained in the Clearwater Paper Corporation permit are set at levels that comply with these wasteload allocations and applicable water quality standards.

The proposed permit limits for other pollutants of concern that have limits in Table 1, are the same as, or more stringent than, those in the current permit ("NC" or "D" in change column). Therefore, no degradation will result from the discharge of these pollutants.

New Permit Limits for Pollutants Currently Discharged: Pentachlorophenol

When new limits are proposed in a reissued permit for pollutants in the existing discharge, the effect on water quality is based upon the current discharge quality and the proposed discharge quality resulting from the new limits. Current discharge quality for pollutants that are not currently limited is based upon available discharge quality data (IDAPA 58.01.02.052.06.a.i). Future discharge quality is based upon proposed permit limits (IDAPA 58.01.02.052.06.a.ii).

The proposed permit for Clearwater Paper Corporation includes new limits for pentachlorophenol (Table 1). The EPA determined that the technology based effluent limit for pentachlorophenol, which is applicable to the effluent from the bleach plant, was not adequate to ensure compliance with Washington State's pentachlorophenol water quality criterion at the state line. Therefore, in addition to the technology-based effluent limit for the bleach plant, the EPA established a water quality based effluent limit for pentachlorophenol for the mill's final effluent discharge.

There have been no increases in the production levels as seen by a comparison of the production levels included in the 2005 Permit Fact Sheet (Appendix B) and the draft Fact Sheet (Appendix A), influent quality, or treatment processes that would likely result in an increased discharge of these pollutants and the water quality based analysis for the 2005 permit was based on an effluent flow rate of 40 mgd while the draft permit analysis for pentachlorophenol is based on an effluent flow rate of 31.6 mgd. Therefore, the pollutant limits for pentachlorophenol in the proposed permit reflect an improvement in water quality from current conditions because the proposed permit does not allow for any increased water quality impact from these pollutants. Therefore, no adverse change in water quality and no degradation will occur with respect to these pollutants.

Pollutants with No Limits: Antimony, Arsenic, Chloroform, COD, Nickel, Nitrate+Nitrite, Phosphorous, Thallium, and Zinc

There are nine pollutants of concern relevant to primary contact recreation that currently are not limited and for which the proposed permit also contains no limit: antimony, arsenic, chloroform, COD, nickel, nitrate+nitrite, phosphorous, thallium, and zinc (Table 1). For such pollutants, a change in water quality is determined by reviewing whether changes in production, treatment, or operation that will increase the discharge of these pollutants are likely (IDAPA 58.01.02.052.06.a.ii). The draft permit proposes quarterly effluent monitoring for arsenic to determine if the discharge has the reasonable potential to cause or contribute to excursions above water quality criteria for this pollutant. The draft permit proposes monthly monitoring for nitrate+nitrite and to increase chloroform monitoring from once monthly to twice monthly. There are also monthly monitoring requirements for phosphorous. Antimony, nickel, thallium, and zinc were determined to not have a reasonable potential to cause or contribute to excursions above water quality criteria. With respect to antimony, arsenic, chloroform, nickel, nitrate+nitrite, thallium, phosphorous, thallium and zinc, there is no reason to believe these pollutants will be discharged in quantities greater than those discharged under the current permit. This conclusion is based upon the fact that there have been no increase in the production levels as seen by a comparison of the production levels included in the 2005 Permit Fact Sheet (Appendix B) and the Draft Fact Sheet (Appendix A), influent quality, or treatment processes that would likely result in an increased discharge of these pollutants. The water quality based analysis for the 2005 permit was based on an effluent flow rate of 40 mgd, the draft permit analysis is based on an effluent flow rate of 31.6 mgd for most pollutants. Because the proposed permit does not allow for any increased water quality impact from these pollutants, DEQ has concluded that the proposed permit will not cause a lowering of water quality for the pollutants with no limit. As such, the proposed permit should maintain the existing high water quality in the Snake River.

Clearwater River (AU ID17060306CL001_07)

The Clearwater River - Lower Granite Pool Dam is listed in the most recent Integrated Report as fully supporting recreational and aquatic life beneficial uses and is considered high quality for cold water aquatic life and primary contact recreation beneficial uses. As such, the water quality relevant to cold water aquatic life and primary contact recreation beneficial uses of the Clearwater River must be maintained and protected, unless a lowering of water quality is deemed necessary to accommodate important social or economic development.

The Clearwater Paper Corporation has a secondary treatment pond that discharges seepage water to the Lower Granite Dam Pool within the Clearwater Subbasin AU ID17060306CL001_07. To determine whether degradation will occur, DEQ must evaluate how the permit issuance will affect water quality for pollutants relevant to the aquatic life and primary contact recreation uses of the Lower Granite Dam Pool (IDAPA 58.01.02.052.05).

Pollutant loading in the Clearwater River, due to pond seepage, is unchanged since DEQ's 2008 seepage evaluation. There is no reason to believe these pollutants will be discharged in quantities greater than those discharged under the current permit. There has been no increase in the production levels as seen by a comparison of the production levels included in the 2005 Permit Fact Sheet (Appendix B) and the Draft Fact Sheet (Appendix A), influent quality, or treatment processes that would likely result in an increased discharge of these pollutants. Because the proposed permit does not allow for any increased water quality impact from these pollutants and the seepage is consistent, has not changed from conditions as of July 1, 2011, and is not expected to fluctuate in the future, DEQ has determined that no significant degradation of surface water quality is expected in the Clearwater River as a result of the seepage (IDAPA 58.01.02.052.08.a.iii). Based on this information, DEQ determined that pollutants significant to beneficial uses will not result in a reduction of ambient water quality in the Clearwater River and the Clearwater Paper Corporation does not need to prepare a seepage reduction/control program. Additionally, to account for permitted seepage from the secondary treatment pond, the permit requires the permittee to add 3.0 mgd to the effluent flow rate when calculating the effluent loading of AOX, BOD_5, and 2,3,7,8-TCDD. The proposed permit limits for other pollutants of concern that have limits in Table 1, are the same as, or more stringent than, those in the current permit ("NC" or "D" in change column).

The technology-based effluent limit for BOD_5 (December – May) is more stringent in the draft permit than the limit contained in the previous permit and has been re-calculated based on recent lowered production levels, resulting in a lower maximum daily and average monthly limit. The water quality based effluent limit for BOD_5 (June - November) is the same in the draft permit as the limit contained in the previous permit. The water quality-based effluent limit for 2,3,7,8-TCDD is more stringent in the draft permit than the limit contained in the previous permit and is necessary because this facility has a wasteload allocation for 2,3,7,8-TCDD in the Washington Department of Ecology Columbia River Dioxin TMDL. The water quality based effluent limit for 2,3,7,8-TCDD applies in addition to the technology based effluent limit.

There have been no changes in the production levels, influent quality, or treatment processes that would likely result in an increased discharge of these pollutants. Therefore, no degradation will result from the discharge of these pollutants into the Clearwater River. In sum, DEQ concludes that this discharge permit complies with the Tier II provisions of Idaho's WQS (IDAPA 58.01.02.051.02 and IDAPA 58.01.02.052.06).

Conditions Necessary to Ensure Compliance with Water Quality Standards or Other Appropriate Water Quality Requirements of State Law

Mixing Zones

Pursuant to IDAPA 58.01.02.060, DEQ authorizes a mixing zone that is either 25% of the stream width or the downstream distance from the outfall to the Washington border (approximately 191 meters), whichever is more restrictive, for the following pollutants: ammonia, antimony, chloroform, chromium III, chromium VI, copper, 2,3,7,8-TCDD dioxin, lead, nickel, pentachlorophenol, thallium, 2,4,5-trichlorophenol, 2,4,6-trichlorophenol, whole effluent toxicity, zinc, pH, and temperature. The mixing zone for these pollutants is protective of the most vulnerable beneficial use and provides adequate levels of mixing for all listed pollutants as discussed in EPA's draft memorandum, *Results of CORMIX Modeling of the Clearwater Paper Lewiston Mill Discharge through Outfall 001 for water quality criteria for toxic pollutants* and Appendix F of the fact sheet.

For further information about the mixing zones, critical low flow volume, and dilution factors for all pollutants see section V.C *Water Quality Based Effluent Limits* in the fact sheet.

Other Conditions

This certification is conditioned upon the requirement that any material modification of the permit or the permitted activities—including without limitation, any modifications of the permit to reflect new or modified TMDLs, wasteload allocations, site-specific criteria, variances, or other new information—shall first be provided to DEQ for review to determine compliance with Idaho WQS and to provide additional certification pursuant to Section 401.

Right to Appeal Final Certification

The final Section 401 Water Quality Certification may be appealed by submitting a petition to initiate a contested case, pursuant to Idaho Code § 39-107(5) and the "Rules of Administrative Procedure before the Board of Environmental Quality" (IDAPA 58.01.23), within 35 days of the date of the final certification.

Questions or comments regarding the actions taken in this certification should be directed to Sujata Connell, Lewiston Regional Office at 208-799-4370 or via email at Sujata.Connell@deq.idaho.gov.

DRAFT

John Cardwell

Regional Administrator

Lewiston Regional Office