

FACT SHEET FOR NPDES PERMIT WA-000082-5
EMPIRE PAPER COMPANY

INTRODUCTION

The Federal Clean Water Act (FCWA, 1972, and later modifications, 1977, 1981, and 1987) established water quality goals for the navigable (surface) waters of the United States. One of the mechanisms for achieving the goals of the Clean Water Act is the National Pollutant Discharge Elimination System of permits (NPDES permits), which is administered by the Environmental Protection Agency (EPA). The EPA has authorized the State of Washington to administer the NPDES permit program. Chapter 90.48 RCW defines the Department of Ecology's authority and obligations in administering the wastewater discharge permit program.

The regulations adopted by the State include procedures for issuing permits (Chapter 173-220 WAC), water quality criteria for surface and ground waters (Chapters 173-201A and 200 WAC), and sediment management standards (Chapter 173-204 WAC). These regulations require that a permit be issued before discharge of wastewater to waters of the state is allowed. The regulations also establish the basis for effluent limitations and other requirements which are to be included in the permit. One of the requirements (WAC 173-220-060) for issuing a permit under the NPDES permit program is the preparation of a draft permit and an accompanying fact sheet. Public notice of the availability of the draft permit is required at least thirty days before the permit is issued (WAC 173-220-050). The fact sheet and draft permit are available for review (see Appendix A - Public Involvement of the fact sheet for more detail on the Public Notice procedures).

The fact sheet and draft permit have been reviewed by the Permittee. Errors and omissions identified in this review have been corrected before going to public notice. After the public comment period has closed, the Department will summarize the substantive comments and the response to each comment. The summary and response to comments will become part of the file on the permit and parties submitting comments will receive a copy of the Department's response. The fact sheet will not be revised. Comments and the resultant changes to the permit will be summarized in Appendix D - Response to Comments, an attachment to this fact sheet.

GENERAL INFORMATION	
Applicant:	Inland Empire Paper Company
Facility Name and Address:	Inland Empire Paper Company 3320 N. Argonne Road, Spokane, WA 99212
Type of Facility:	Pulp and Paper Mill
SIC Code:	2611
Discharge Location:	Waterbody name: Spokane River @ River Mile 82.6 Latitude: 47° 41' 21" N, Longitude: 117° 16' 0" W.
Water Body ID Number:	WA-57-1010

TABLE OF CONTENTS

INTRODUCTION	1
BACKGROUND INFORMATION	4
DESCRIPTION OF THE FACILITY	4
Industrial Process	4
Discharge Outfall	5
PERMIT STATUS.....	5
SUMMARY OF COMPLIANCE WITH THE PERMIT	5
WASTEWATER CHARACTERIZATION	5
PROPOSED PERMIT LIMITATIONS.....	5
TECHNOLOGY-BASED EFFLUENT LIMITATIONS	6
SURFACE WATER QUALITY-BASED EFFLUENT LIMITATIONS	7
Numerical Criteria for the Protection of Aquatic Life.....	7
Numerical Criteria for the Protection of Human Health.....	8
Narrative Criteria	8
Antidegradation.....	8
Critical Conditions.....	8
Mixing Zones	8
Description of the Receiving Water.....	9
Surface Water Quality Criteria	9
Consideration of Surface Water Quality-Based Limits for Numeric Criteria	11
Whole Effluent Toxicity	18
Human Health.....	19
Sediment Quality	20
COMPARISON OF EFFLUENT LIMITS WITH THE PREVIOUS PERMIT	21
MONITORING REQUIREMENTS.....	21
EFFLUENT LIMITS BELOW QUANTITATION.....	22
LAB ACCREDITATION	22
OTHER PERMIT CONDITIONS	22
REPORTING AND RECORDKEEPING	22
NON-ROUTINE AND UNANTICIPATED DISCHARGES	22
SPILL PLAN	22
SOLID WASTE PLAN.....	23
TREATMENT SYSTEM OPERATING PLAN	23
GENERAL CONDITIONS	23
PERMIT ISSUANCE PROCEDURES	23
PERMIT MODIFICATIONS	23
RECOMMENDATION FOR PERMIT ISSUANCE.....	23
REFERENCES FOR TEXT AND APPENDICES	24

FIGURES AND TABLES25

APPENDIX A - PUBLIC INVOLVEMENT INFORMATION35

APPENDIX B - GLOSSARY.....36

APPENDIX C - TECHNICAL CALCULATIONS40

APPENDIX D – RESPONSE TO COMMENTS - DRAFT PERMIT.....50

APPENDIX E – RESPONSE TO COMMENTS - DRAFT AMENDED PERMIT51

BACKGROUND INFORMATION

DESCRIPTION OF THE FACILITY

The Permittee owns and operates a pulp and newsprint mill located in Millwood, six miles east of Spokane (see Figure 1). The facility has been in operation since 1911. The facility produces pulp by the groundwood thermo-mechanical pulp (TMP) process and the deink process using recycled newspapers and magazines. Inland Empire Paper has recently installed new TMP pulping equipment. The state-of-the art equipment will significantly reduce both natural gas usage (through energy conservation and heat recovery) and associated air emissions. With the new system, the facility expects a total pulp production capacity of about 625 tons per day consisting of 350 tons per day (dry) of TMP pulp and 275 tons per day (dry) of deink pulp.

INDUSTRIAL PROCESS

Process wastewater is generated from the pulping processes, paper machine, and non contact cooling. Process wastewater that is discharged to the Spokane River receives biological treatment. The treatment facilities consist of a mechanically cleaned bar rack, wastewater pumping station, 100 foot diameter primary clarifier, biological treatment using moving bed bioreactors (MBBRs) and an aeration (Orbal) basin, a 120 foot diameter secondary clarifier, and an outfall diffuser (see Figure 2). The MBBRs consist of vertical tanks packed with plastic media. Wastewater flows through the tanks, along with diffused air. Biological treatment occurs on biofilm growth attached to the media.

Treated wastewater is discharged to the Spokane River via a multiport diffuser at river mile 82.6, adjacent to the mill site. A parshall flume measures the treated effluent flow prior to discharge. Supply water is withdrawn from groundwater production wells onsite.

The Permittee also reclaims and reuses a number of wastestreams within the facility and wastewater treatment system. A portion of the 100 foot primary clarifier effluent is routed through a fractionating type filter (trade name conustrenner). Influent to this filter is sprayed through a series of nozzles. Course and fine material in the water is separated by rotating wire baskets. About 1.0 million gallons per day is recovered from this filter for use as makeup process water.

Wastewater generated from the deinking facility is returned to the front-end of the process, making the deinking process essentially effluent free. Rejects from the deink system are combined with wastewater from the new #5 thermo-mechanical pulping (TMP) refiner line for treatment in the dissolved air floatation (DAF) system. Solids removed by the DAF are sent to the Fluidized Bed Combustor for energy recovery. The remaining water from the DAF passes through a heat exchanger for cooling and is sent to the facility's effluent system for final treatment.

The Permittee has also installed a filtration system for reclaiming a portion of the final effluent. The facility is currently testing and optimizing the operation of the system, which has a capacity to treat about 1.0 mgd of effluent.

Solids withdrawn from the primary clarifiers, DAF clarifier and secondary clarifier are combined, thickened, then dewatered. The dewatered sludge is fed to a fluidized bed combustor that produces steam for use in the process. Ash is currently used as a cement additive.

DISCHARGE OUTFALL

Treated wastewater from the paper mill is discharged through a multi-port diffuser (outfall 001) into the Spokane River at river mile 82.6. Stormwater from the site (mostly from parking areas) is routed through the wastewater treatment system.

PERMIT STATUS

The previous permit for this facility was issued in September, 1997. The permit expired in June 2002 and has been administratively extended since that time. An application for permit renewal was submitted to the Department on December 26, 2006 and accepted by the Department on December 27, 2006.

The previous NPDES permit placed effluent limitations on BOD₅, TSS, and pH during the high river flow (October to June) and low river flow (July to September) seasons. Total phosphorus in the effluent was also limited during the time from June to October.

SUMMARY OF COMPLIANCE WITH THE PERMIT

The facility last received an inspection June, 2009. During the history of the previous permit, the Permittee has remained in compliance based on Discharge Monitoring Reports (DMRs) submitted to the Department and inspections conducted by the Department.

WASTEWATER CHARACTERIZATION

Table 1 summarizes the character of the proposed wastewater discharge. Discharge flow averages about 4.4 million gallons per day (mgd). BOD₅ and TSS average 1,083 and 768 lbs/day, respectively. Trace levels of metals (aluminum, arsenic, chromium, copper, nickel, zinc) and cyanide have been detected in the effluent.

The Permittee does not routinely test for PCBs in their effluent. However, low level effluent PCB testing has been by others (SAIC, 2003 and Ecology, 2006). The average total PCBs discharged from the facility has been measured at 2,544 pg/L, parts per quadrillion (Ecology, 2006).

The Permittee routinely tests for acute whole effluent toxicity. There has been no effluent toxicity noted in these tests.

PROPOSED PERMIT LIMITATIONS

Federal and State regulations require that effluent limitations set forth in a NPDES permit must be either technology- or water quality-based. Technology-based limitations are based upon the treatment methods available to treat specific pollutants. Technology-based limitations are set by regulation or developed on a case-by-case basis (40 CFR 125.3, and Chapter 173-220 WAC).

Water quality-based limitations are based upon compliance with the Surface Water Quality Standards (Chapter 173-201A WAC), Ground Water Standards (Chapter 173-200 WAC), Sediment Quality Standards (Chapter 173-204 WAC) or the National Toxics Rule (40 CFR 131.36). The more stringent of these two limits must be chosen for each of the parameters of concern. Each of these types of limits is described in more detail below.

The limits in this permit are based in part on information received in the application. The effluent constituents in the application were evaluated on a technology- and water quality-basis. The limits necessary to meet the rules and regulations of the State of Washington were determined and included in this permit. Ecology does not develop effluent limits for all pollutants that may be reported on the application as present in the effluent. Some pollutants are not treatable at the concentrations reported, are not controllable at the source, are not listed in regulation, and do not have a reasonable potential to cause a water quality violation. Effluent limits are not always developed for pollutants that may be in the discharge but not reported as present in the application. In those circumstances the permit does not authorize discharge of the non-reported pollutants. Effluent discharge conditions may change from the conditions reported in the permit application. If significant changes occur in any constituent, as described in 40 CFR 122.42(a), the Permittee is required to notify the Department of Ecology. The Permittee may be in violation of the permit until the permit is modified to reflect additional discharge of pollutants.

TECHNOLOGY-BASED EFFLUENT LIMITATIONS

The technology limitations for the mechanical and deink pulping are based on new source performance standards (NSPS) found in “Effluent Guidelines and Standards” in the Code of Federal Regulations (CFR), current as of September 14, 2006, as follows:

Subcategory	Technology
Mechanical Pulp (40 CFR 430, Subpart G)	NSPS effluent limitations where the integrated production of pulp and coarse paper, molded pulp products, and newsprint at groundwood mills occurs (40 CFR 430.75)
Secondary Fiber Deink (40 CFR 430, Subpart I)	NSPS effluent limitations where deink newsprint is produced (40 CFR 430.95)

Regulated pollutants include BOD, TSS, pH, pentachlorophenol, trichlorophenol and zinc. The NSPS limits for pentachlorophenol, trichlorophenol, and zinc are applied if the discharger uses biocides containing chlorophenolic compounds and/or zinc hydrosulfite as a bleaching agent. The Permittee has previously certified that both chlorophenolic containing biocides and zinc hydrosulfite are not used in the facility. Therefore, as per the Federal guidelines, the pentachlorophenol, trichlorophenol and zinc limits will not be applied.

Pollutant limits for BOD, TSS, and pH for the above categories are as follows:

Category	Pollutant	Daily Maximum	Daily Average
Mechanical Pulp	BOD, lbs/1,000 lbs of product	4.6	2.5
	TSS, lbs/1,000 lbs of product	7.3	3.8

	pH, s.u.	within the range 5.0-9.0	
Secondary Fiber Deink Pulp	BOD, lbs/1,000 lbs of product	6.0	3.2
	TSS, lbs/1,000 lbs of product	12.0	6.3
	pH, s.u.	within the range 5.0-9.0	

The total production used to determine the proposed technology-based effluent limitations was the highest 12 consecutive month average during the time period from January, 2004 to November, 2006. This value was determined to be 530.6 tons per day from October, 2005 to September, 2006. The percentage of thermo-mechanical versus deink production was estimated from the ratios given in the permit application (56.6% thermo-mechanical and 43.4% deink).

Table 2 lists the calculation of the resulting technology based effluent limitations, which are summarized below:

Pollutant	Daily Maximum	Daily Average
BOD, lbs/day	7,238	3,816
TSS, lbs/day	13,185	7,016
pH, s.u.	within the range 5.0-9.0	

SURFACE WATER QUALITY-BASED EFFLUENT LIMITATIONS

In order to protect existing water quality and preserve the designated beneficial uses of Washington's surface waters, WAC 173-201A-060 states that waste discharge permits shall be conditioned such that the discharge will meet established Surface Water Quality Standards. The Washington State Surface Water Quality Standards (Chapter 173-201A WAC) is a state regulation designed to protect the beneficial uses of the- surface waters of the state. Surface water quality-based effluent limitations may be based on an individual waste load allocation (WLA) or on a WLA developed during a basin wide total maximum daily loading study (TMDL).

NUMERICAL CRITERIA FOR THE PROTECTION OF AQUATIC LIFE

"Numerical" water quality criteria are numerical values set forth in the State of Washington's Water Quality Standards for Surface Waters (Chapter 173-201A WAC). They specify the levels of pollutants allowed in receiving water while remaining protective of aquatic life. Numerical criteria set forth in the Water Quality Standards are used along with chemical and physical data for the wastewater and receiving water to derive the effluent limits in the discharge permit. When surface water quality-based limits are more stringent or potentially more stringent than technology-based limitations, they must be used in a permit.

NUMERICAL CRITERIA FOR THE PROTECTION OF HUMAN HEALTH

The U.S. EPA has promulgated 91 numeric water quality criteria for the protection of human health that are applicable to Washington State (EPA 1992). These criteria are designed to protect humans from cancer and other disease and are primarily applicable to fish and shellfish consumption and drinking water from surface waters.

NARRATIVE CRITERIA

In addition to numerical criteria, "narrative" water quality criteria (WAC 173-201A-030) limit toxic, radioactive, or deleterious material concentrations below those which have the potential to adversely affect characteristic water uses, cause acute or chronic toxicity to biota, impair aesthetic values, or adversely affect human health. Narrative criteria protect the specific beneficial uses of all fresh (WAC 173-201A-130) and marine (WAC 173-201A-140) waters in the State of Washington.

ANTIDegradation

The State of Washington's Antidegradation Policy requires that discharges into a receiving water shall not further degrade the existing water quality of the water body. In cases where the natural conditions of a receiving water are of lower quality than the criteria assigned, the natural conditions shall constitute the water quality criteria. Similarly, when the natural conditions of a receiving water are of higher quality than the criteria assigned, the natural conditions shall be protected. More information on the State Antidegradation Policy can be obtained by referring to WAC 173-201A-070.

CRITICAL CONDITIONS

Surface water quality-based limits are derived for the water body's critical condition, which represents the receiving water and waste discharge condition with the highest potential for adverse impact on the aquatic biota, human health, and existing or characteristic water body uses. The critical condition for the pollutants in this discharge is during the summertime low river flows.

MIXING ZONES

This permit authorizes an acute and a chronic mixing zone around the point of discharge as allowed by Chapter 173-201A WAC, *Water Quality Standards for Surface Waters of the State of Washington*. The Water Quality Standards stipulate some criteria be met before a mixing zone is allowed. Table 3 summarizes these requirements and Ecology's actions in the proposed permit.

The National Toxics Rule (EPA, 1992) allows the chronic mixing zone to be used to meet human health criteria.

DESCRIPTION OF THE RECEIVING WATER

The facility discharges to Spokane River which has the following use designations (Table 602 of Chapter 173-201A): aquatic life uses (salmonid spawning, rearing, migration); primary contact recreation; water supply uses (domestic, industrial, agricultural, stock); and miscellaneous uses (wildlife habitat, harvesting, commerce/navigation, boating, aesthetics). Water quality of this class shall meet or exceed the requirements for all or substantially all uses.

The Spokane River basin encompasses over 6,000 square miles in Washington and Idaho. The Spokane River begins at the outlet of Lake Coeur d'Alene and flows west 112 statute miles to the Columbia River. The river flows through the cities of Post Falls and Coeur d'Alene in Idaho, and through the large urban areas of Spokane and Spokane Valley. Other cities in the basin include Wallace and Kellogg, upstream from Lake Coeur d'Alene, and Liberty Lake, Deer Park, and Medical Lake.

The flow regime for the Spokane River is dictated largely by freezing temperatures in the winter followed by summer snowmelt. The annual harmonic mean flow is approximately 2,154 cfs as the river crosses the Idaho border. Flow increases to 2,896 cfs downstream of Spokane, reflecting the influx of groundwater through this river reach.

In Idaho, point source outfalls to the Spokane River include the City of Coeur d'Alene, Hayden Area Regional Sewer Board POTW, and the City of Post Falls POTW. In Washington, point sources include Liberty Lake POTW and Kaiser Aluminum (both upstream from the Permittee), and the City of Spokane AWTP (downstream from the Permittee).

Significant nearby non-point sources of pollutants to the Spokane River include stormwater and combined sewer overflows from the City of Spokane; and sources from Latah Creek (or Hangman Creek), Little Spokane River and Coulee/Deep Creek.

SURFACE WATER QUALITY CRITERIA

Applicable criteria are defined in Chapter 173-201A WAC for aquatic life, recreation, and water supply uses. In addition, U.S. EPA has promulgated human health criteria for toxic pollutants (EPA 1992). Criteria for this discharge are summarized below:

Fecal Coliforms	must not exceed a geometric mean value of 100 colonies /100 mL, with not more than 10 percent of all samples (or any single sample when less than ten sample points exist) obtained for calculating the geometric mean value exceeding 200 colonies /100 mL
Dissolved Oxygen	8 mg/L (lowest one day minimum)
Total Dissolved Gas	shall not exceed 110 percent of saturation at any point of sample collection
Temperature	7-DADMax (7-day average of the daily maximum temperatures) of 17.5°C (63.5°F)
pH	within the range of 6.5 to 8.5 with a human-caused variation within the above range of less than 0.5 units

Turbidity	5 NTU over background when the background is 50 NTU or less; or a 10 percent increase in turbidity when the background turbidity is more than 50 NTU
Toxics	No toxics in toxic amounts (see Appendix C for numeric criteria for toxics of concern for this discharge)

Two other special conditions apply to the Spokane River. From Nine Mile Bridge (river mile 58.0) to the Idaho Border (river mile 96.5), temperature shall not exceed a 1 day maximum (1-DMax) of 20.0°C due to human activities. When natural condition 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 $t=34/(T+9)$; "t" represents the maximum permissible temperature increase measured at a mixing zone boundary; and "T" represents the background temperature as measured at a point unaffected by the discharge and representative of the highest ambient water temperature in the vicinity of the discharge.

In addition, from Long Lake Dam (river mile 33.9) to Nine Mile Bridge (river mile 58.0), the average euphotic zone concentration of total phosphorus (as P) shall not exceed 25 ug/L during the period of June 1 to October 31.

In 1989, the Spokane River Phosphorus Management Plan was adopted to meet the 25 ug/L total phosphorus criteria. This plan set total phosphorus limits for each point source discharger to the Spokane River. Under the current plan, two industrial dischargers (the permittee and Kaiser Aluminum Trentwood) are given a monthly average aggregate limit (industrial bubble limit) and a specific individual limit. Under this scenario, one discharger would not have a permit violation of their individual limit as long as the industrial bubble limit is met. The industrial bubble limit is 16.55 Kg per day (36.4 pounds per day) while Inland Empire Paper Company's specific individual limit is 11.2 Kg per day (24.7 pounds per day). These current limits only apply during the algal growing season (June 1 to October 31).

The Department routinely assesses available water quality data on a statewide basis. The results are submitted to the Environmental Protection Agency (EPA) as an "integrated report" to satisfy Sections 303(d) and 305(b) of the federal Clean Water Act. This report lists water quality for a particular location in one of five categories, as recommended by EPA. Categories one through four represent the 305(b) Report which is the overall status of water quality in the State. Category 5 represents waters on the 303(d) list which are the known polluted waters in the State.

A total daily maximum load (TMDL) must be developed for each water body on the 303(d) list. The purpose of a TMDL is to determine the amount of pollution a water body can receive while still meeting water quality standards. Maximum allowable pollution from various sources are established as either individual waste load allocations (WLAs) for points sources or load allocations (LAs) for nonpoint sources.

For the Spokane River, multiple segments are on the Department's 2004 303(d) list. Water quality is not meeting standards for: dissolved oxygen, temperature, dissolved gas, fecal coliform bacteria, total PCBs, and dioxin. There are draft TMDL reports that address the dissolved oxygen and total PCBs listings in the Spokane River. There are not yet TMDLs prepared for the temperature, dissolved gas, fecal coliform bacteria, and dioxin listings.

In the 305(b) Report, the Spokane River also includes category 1, 2, and 4a waters. Category 1 waters are where standards are being met; category 2 waters are where the data are not sufficient for listing as impaired, but there still may be a concern about water quality; and category 4a is for waterbodies that have an approved TMDL. There have been approved TMDLs for metals (cadmium, lead and zinc) and total phosphorus (discussed above) on the Spokane River.

For dissolved oxygen, the Department prepared a draft TMDL report for the Spokane River and Lake Spokane in 2004 (Ecology, 2004); and finalized this TMDL 2009 (Ecology, 2009). EPA approved the TMDL on May 20, 2010. The approved TMDL uses a modeling approach that includes the contributions from both stormwater and point sources in Idaho; and accounts for dissolved oxygen impacts caused by operation of Long Lake Dam during the most critical times of the year.

For point and nonpoint sources, the TMDL recommends reductions in phosphorus, carbeneous biological oxygen demand (CBOD), and ammonia discharged to the Spokane River necessary to meet the dissolved oxygen water quality standard in Lake Spokane. These reductions apply during an expanded critical season (March through October).

As a result of the 2004 draft report, Ecology, NPDES point source dischargers, and other interested parties formed the Spokane River Collaboration to cooperatively address the low dissolved oxygen concentrations in the Spokane River. This effort culminated in a Foundational Concepts document that outlines actions necessary to reduce phosphorus discharged to the river.

While parts of this document are now dated due to the new modeling approach used for the approved TMDL, the Department will use some elements of the Foundational Concepts to implement the TMDL. This fact sheet discusses the portions of the Foundational Concepts applicable to this discharger in the next section below.

The Department has also completed a draft Total Maximum Daily Load (TMDL) assessment for PCBs in the Spokane River (Ecology, 2006). The proposed TMDL is based on meeting a downstream Spokane Tribe water quality PCB criterion of 3.37 pg/l. This requires a 95% PCB load reduction at the Idaho border, a 97% load reduction in the Little Spokane River, and over a 99% reduction in municipal, industrial, and stormwater discharges.

The Spokane River also regularly violates water quality criteria for zinc. Criteria for lead and cadmium are also frequently exceeded, especially at higher flows. In 1999 the Spokane River Metals TMDL was completed to address these water quality exceedences (Ecology, 1999). Specific WLAs applicable to the Permittee are discussed in the next section below.

CONSIDERATION OF SURFACE WATER QUALITY-BASED LIMITS FOR NUMERIC CRITERIA

Pollutant concentrations in the proposed discharge exceed water quality criteria with technology-based controls which the Department has determined to be AKART. Mixing zones are authorized as noted above and are discussed below.

Treated effluent is discharged to the Spokane River through an 18" diameter, 70' outfall line with a 32' attached diffuser. The diffuser has eight ports, four feet apart, on 90 degree risers facing downstream, with an open end. The effluent line is oriented about 10 degrees downstream perpendicular to the shoreline.

The dilution factors of effluent to receiving water that occur within the mixing zones have been determined at the critical condition by field work and computer modeling (Ecology, 1992 and 1994). These studies have shown that dilutions based on percentage of river flow are more restrictive than dilutions based on downstream distances from the diffuser.

The critical condition for the Spokane River is the seven day average low river flow with a recurrence interval of ten years (7Q10). The estimated 7Q10 flow at the Permittee's point of discharge is 820 cfs (Ecology, 1997). The dilution factors will be calculated using a percentage of this 7Q10 river flow as specified in Chapter 173-201A. The resulting dilution factors, using the historic daily maximum and monthly average flowrates from January, 2006 to November, 2006, are as follows:

	Acute (2.5% of 7Q10)	Chronic (25% of 7Q10)
Effluent Flow, MGD	5.24 (daily maximum)	4.61 (monthly maximum)
Dilution Factor	3.53 (28.3% effluent)	29.7 (3.4% effluent)

Pollutants in an effluent may affect the aquatic environment near the point of discharge (near field) or at a considerable distance from the point of discharge (far field). Toxic pollutants, for example, are near-field pollutants--their adverse effects diminish rapidly with mixing in the receiving water. Conversely, pollutants such as total phosphorus and BOD are a far-field pollutants whose adverse effect occurs away from the discharge even after dilution has occurred. Thus, the method of calculating surface water quality-based effluent limits varies with the point at which the pollutant has its maximum effect.

The derivation of surface water quality-based limits also takes into account the variability of the pollutant concentrations in both the effluent and the receiving water. Ambient data at critical conditions in the vicinity of the outfall were taken from the Department's long term monitoring station at Stateline, and from the data collected by Kaiser Aluminum from their monitoring of river intake water. Table 4 lists the ambient background data used for this permit.

The impacts of dissolved oxygen deficiency, temperature, pH, ammonia, metals, and other toxics were determined as shown below, using the dilution factors at critical conditions described above.

BOD₅, Ammonia, and Total Phosphorus - The Spokane River and Lake Spokane (Long Lake) dissolved oxygen TMDL report sets WLAs for total phosphorus, CBOD, and ammonia for each NPDES discharger to the Spokane River. The proposed permit sets interim limits and establishes a compliance schedule for meeting the water quality based effluent limits (WQBELs) for these three parameters.

The Foundational Concepts spreads this approach over a twenty year managed implementation plan (MIP). During the first ten years of the MIP, dischargers will focus efforts to reduce phosphorus discharged to the Spokane River. Permittees would accomplish these reductions by a combination of phosphorus treatment technology and other target pursuit actions.

As part of the TMDL process, the Department will form an oversight and coordination group consisting of dischargers and other interested stakeholders.

This group will oversee and coordinate non-point source control, monitoring, modeling, reporting, and public outreach. In other words, this group will monitor and track all aspects of the TMDL.

The proposed permit sets interim water quality based effluent limits based on best information from the Spokane River and Lake Spokane TMDL. During the first 10 years, the TMDL oversight and coordination group will gather additional effluent and environmental data associated with the low dissolved oxygen (DO) levels in the Spokane River. This new data may change these WLAs. If necessary and appropriate, the Department will revise the TMDL and set new WQBELs based on this new information. An adjustment of the final effluent limitations resulting in less stringent limitations is subject to the provisions of the Clean Water Act for deriving limitations in section 303(d)(4)(A), 42 U.S.C. § 1313(d)(4)(A); and the anti-backsliding provisions of the Clean Water Act, including the exceptions in section 402(o)(2) of the Clean Water Act, 33 U.S.C. § 1342(o)(2).

The Department anticipates the following schedule of actions during the first and second 10 year periods of the managed implementation plan:

	NPDES Permit Cycle			
	I	II	III	IV
Years:	0-5 (2011-2016)	6-10 (2016-2021)	11-15 (2021-2026)	16-20 (2026-2031)
NPDES Permit Requirements During Cycle	Start, continue, and/or complete target pursuit actions.	Start or continue, and complete target pursuit actions, including implementation of technology and Delta Elimination actions.	Continue target pursuit actions. Implement any modifications to technology and Delta Elimination actions.	
	Interim performance based limits; best management practices (BMPs) plan.		-	
	By Year 10 - Final wasteload allocation: effluent data + delta elimination = 1.26 lbs/day (36µg/L @ 4.1 mgd) total phosphorus with possible modifications based on new information.		Wasteload allocation: same as year 10 with possible modifications based on new information. Ecology may re-express the final WQBELs as daily maximum, monthly average, or seasonal total as determined appropriate and consistent with the seasonal average WLAs.	
Avista (Long Lake Dam)	Develop water quality attainment plan (WQAP) within two years following EPA approval of TMDL (2012)	Assess performance in improving dissolved oxygen based on milestones identified in WQAP by 2020.	Continue to implement actions identified in WQAP.	Assess performance in 2030.
Continuous Actions	Monitoring / Assessment , Non-point source reductions by others*			

In this permit, the Department’s approach for meeting the WLAs and WQBELs mirror the Foundational Concepts document for point source dischargers. The proposed permit requires reductions in the total phosphorus, CBOD, and ammonia discharged to the Spokane River, through a combination of treatment technology and other target pursuit actions.

State and Federal law require NPDES permit contain water quality based effluent limits for all applicable parameters, and State law limits compliance schedules necessary to meet water quality based effluent limits to no longer than 10 years (unless a longer compliance schedule becomes available under RCW 90.48.605).

The compliance schedules for total phosphorus, CBOD, and ammonia are based on the actions described for phosphorus in the Foundational Concepts document. For the first five year permit cycle, this includes a schedule to meet the interim and WQBELs; and the obligation to start, continue, and/or complete certain target pursuit actions as described below.

- *Technology Selection Protocol:* NPDES permit holders will prepare, and submit to Ecology for approval, a comprehensive technology selection protocol for choosing the most effective feasible technology for seasonally removing phosphorus, CBOD, and ammonia from their effluent. If pilot testing is a part of the protocol, there will be appropriate provisions for quality assurance and control. The protocol will include a preliminary schedule for construction of the treatment technology.
- *Delta Elimination Plan:* A discharge's Delta is the actual pounds of phosphorus, CBOD, or ammonia discharged per day after the implementation of the most effective feasible technology minus the WLA target pounds. A discharger will complete a planned and scheduled group of actions aimed at eliminating their Delta. These actions will be outlined in a Delta Elimination Plan.

The Delta Elimination Plan will include a schedule for other phosphorus, CBOD, and ammonia removal actions such as conservation, effluent re-use, source control through support of regional phosphorus, CBOD, and ammonia reduction efforts (such as limiting use of fertilizers and dishwasher detergents), and supporting regional non-point source control efforts to be established. The plan, in combination with the pollutant reduction from technology, will provide reasonable assurance of meeting the permit holder's WLAs in ten years (2020).

- *Engineering Report:* After a permit holder implements the Technology Selection Protocol, the permit holder will prepare, and submit to Ecology for approval, an Engineering Report concerning the chosen technology, including any updates to the construction schedule.

The Engineering Report will also (if necessary) be accompanied by amendments to the schedule and substance of the target pursuit actions (i.e. Delta Elimination) so that in combination with the expected technology performance, there is reasonable assurance of meeting the WLAs in ten years (2020).

- *Water Quality Based Limits:* The proposed permit sets WQBELs based on the wasteload allocations in the Spokane River and Lake Spokane dissolved oxygen TMDL. The TMDL gives wasteload allocations to Inland Empire Paper for total phosphorus, ammonia and CBOD as seasonal average values from March through October as shown below:

Point Source Discharge	2027 Projected Flow Rates (MGD) ¹	NH ₃		TP		CBOD ₅ ²	
		mg/L	WLA	mg/L	WLA	mg/L	WLA
			lbs/day		lbs/day		lbs/day
Inland Empire Paper Company	4.1	0.71	24.29	0.036	1.23	3.6	123.2

¹Actual, not projected flows, will determine compliance with wasteload allocations in NPDES permits.
²NPDES permit limits will use CBOD₅ (as shown) rather than CBOD_{ult} as modeled.

40 CFR Part 122.45(d) specifies NPDES industrial permits express effluent limits as either daily maximum or monthly average values, unless impracticable. At this time, the Department believes converting the seasonal wasteload allocations into daily maximum/monthly average limits is impracticable for the following reasons:

- 1) Effluent variability from the not-yet-installed treatment technology is not known. In order to convert a seasonal average (i.e. long term average) into daily maximum and monthly average limits, the Department needs a measure of how pollutant concentrations vary in the effluent (coefficient of variation). Converting long term average values into limits also depends on the type of the data distribution (normal, log-normal, etc.). The Department will not know this information until after the Permittee collects enough effluent data from the installed treatment technology.
- 2) The dissolved oxygen in Lake Spokane depends on season long loadings, and does not appreciably vary with daily fluctuations in effluent concentrations. The nutrients discharged to the Spokane River from point and nonpoint sources cause aquatic plant growth (termed eutrophication). This plant growth may reduce the oxygen in the water to levels that are harmful for fish and other aquatic species. Aquatic plants reduce dissolved oxygen levels in a water body in two ways: during the night when they respire and consume oxygen, and when they decompose and natural biological processes consume oxygen.

The eutrophication and aquatic plant decomposition processes and resulting dissolved oxygen sags in Lake Spokane are a season long occurrence, dependent most on seasonal average pollutant loadings. These processes are relatively insensitive to the daily variations in effluent concentrations discharged from point sources. Therefore, the Department is concerned with the average pollutant loadings through the entire critical period (March to October).

The proposed permit will contain WQBELs expressed identical to the WLAs in the Spokane River DO TMDL (seasonal average loads). At the end of the second permit term, the Department will have sufficient data to determine effluent variability from the installed treatment technology¹. At this time, the Department may include daily maximum, monthly average, or seasonal total loads as the final WQBELs; as determined appropriate and consistent with the seasonal average WLAs.

The Department will determine compliance with the WQBELs by effluent data combined with any credits from the Delta Elimination Plan. The proposed compliance schedule is shown below (Permit Condition S8.):

Target Pursuit Action	Compliance Date
Annual Status Reports	February 1 st of each year
Delta Elimination Plan	Two (2) years after permit effective date
Technology Selection Protocol for Treatment Technology	Two (2) years after permit effective date
Engineering Report for Treatment Technology	Three (3) years after permit effective date
Phosphorus Treatment Technology	Must be installed and operational within Five (5) years after permit effective date
Meet Final Water Quality Based Effluent Limits	Ten (10) years after permit effective date

The interim limitations for phosphorus, CBOD (BOD), and ammonia in the proposed permit include both numeric effluent limitations (phosphorus) and best management practices (BMPs). Federal regulations (40 CFR Part 122.44(k)) allow the use of BMPs to ‘control and abate pollution’ when numeric limitations are infeasible. In this case, the Department does not have sufficient data to establish numeric effluent limits for ammonia. The purpose of these interim limitations are to hold the discharge to existing phosphorus, CBOD, and ammonia levels during the critical time period (i.e. no increase in loading).

For the proposed permit, a performance based phosphorus interim limit was developed by examining the total phosphorus discharged from the facility during the critical season (April through October) from 2004 through 2006. A 95th percentile value was estimated using the mean of the monthly average values plus two standard deviations ($16.69 + 2*6.75 = 30.19$ lbs/day).

This value exceeds the Permittee’s current individual phosphorus monthly average limit of 24.7 lbs/day (that applies from June through October). For this reason, the proposed permit will retain the current limit of 24.7 lbs/day, and expand the season to March through October. A daily maximum phosphorus limit was set by multiplying the monthly average limit by the ratio of maximum daily to maximum monthly average values (see Table 5). The proposed maximum daily limit is 47.9 lbs/day.

Additionally, a performance based BOD₅ limit was calculated similar to total phosphorus. This limit was set by examining the daily BOD₅ discharged from the facility during the critical season (March through October) from 2004 through 2006 (see Figure 3). The data appears to be log-normally distributed and autocorrelated (i.e. a BOD value depends somewhat on the preceding day’s BOD result). A monthly average and daily maximum limit were calculated as the 95th and 99th percentile values, respectively by procedures given in the Department’s Permit Writers

Manual (Table 5). The calculated monthly average and daily maximum limits are 1,101 and 1,555 lbs/day, respectively.

The BMP plan for phosphorus, CBOD, and ammonia is outlined in Permit Condition S4. The goal of the BMP plan is to maintain, or lower these pollutants in the effluent by use of pollution prevention and wastewater reduction opportunities. The proposed permit requires that this plan be updated annually.

Total PCBs - The draft PCB TMDL report assigns a WLA to Inland Empire Paper Company of 5.32 pg/L. Since the TMDL is still draft, and has not been approved by the EPA, the Department will not include the WLA in the permit. However, similar to phosphorus, CBOD, and ammonia, the proposed permit will contain an interim PCB limit as a BMP plan. The goal of the PCB BMP plan is to maintain or lower effluent concentrations through source identification and elimination. The proposed permit also requires routine PCB effluent monitoring (Permit Condition S2) and a PCB source identification study as a component of the BMP plan.

Metals (Lead, Cadmium, and Zinc) - The Spokane River dissolved metals waste load allocation is based on the most restrictive permit limits derived by either meeting aquatic life toxicity criteria at effluent hardness at the end-of pipe, or based on maintaining existing concentrations of metals in effluent using performance based limits with an added 10 percent compliance buffer. Whichever method results in the lower limit will be selected for the permit limit and established as the wasteload allocation.

Performance based limits cannot be calculated for the effluent because the Permittee has not routinely tested for lead, cadmium or zinc. For this reason, the proposed permit will set limits based on criteria based on end-of-pipe hardness. A hardness of 305 mg/L was used as a end-of-pipe hardness (the 3rd lowest of 20 data points collected by the Permittee during April and May, 2007). The resulting limits are as follows:

Metal	Criteria (end-of-pipe)	
	Daily Avg	Daily Max
Cadmium, ug/L	2.7	3.9
Lead, ug/L	9.8	14.3
Zinc, ug/L	203	296

Temperature and pH - The impact of pH and temperature were modeled using the calculations from EPA, 1988. The input variables were chronic dilution factor 29.7, upstream temperature <20°C, upstream pH 7.9, upstream alkalinity 50 (as mg CaCO₃/L), effluent temperature 29.4°C, effluent pH of 5, effluent pH of 9, and effluent alkalinity of 50 (as mg CaCO₃/L).

Under critical conditions there is no predicted violation of the Water Quality Standards for Surface Waters for temperature and pH. The technology-based effluent limitations for pH were placed in the proposed permit.

Turbidity - The impact of turbidity was evaluated based on the range of turbidity in the effluent and turbidity of the receiving water. Due to the large degree of dilution, it was determined that the turbidity criteria would not be violated outside the designated mixing zone.

Toxic Pollutants - Federal regulations (40 CFR 122.44) require NPDES permits to contain effluent limits for toxic chemicals in an effluent whenever there is a reasonable potential for those chemicals to exceed the surface water quality criteria. This process occurs concurrently with the derivation of technology-based effluent limits. Facilities with technology-based effluent limits defined in regulation are not exempted from meeting the Water Quality Standards for Surface Waters or from having surface water quality-based effluent limits.

The following toxics were determined to be present in the discharge: aluminum, arsenic, chromium, copper, cyanide, and nickel. A reasonable potential analysis (See Appendix C) was conducted on these parameters to determine whether or not effluent limitations would be required in this permit.

The determination of the reasonable potential for the aforementioned chemicals to exceed the water quality criteria was evaluated with procedures given in EPA, 1991 (Appendix C) at the critical condition. The critical condition in this case occurs during the summertime low flow period. The parameters used in the critical condition modeling are as follows: acute dilution factor 3.53, chronic dilution factor 29.7, receiving water temperature <20°C, receiving water hardness and alkalinity of 36 and 50 (as mg CaCO₃/L), respectively.

Table 4 lists the ambient background data used in the reasonable potential determination. Calculations using all applicable data resulted in a determination that there is no reasonable potential for this discharge to cause a violation of water quality standards. This determination assumes that the Permittee meets the other effluent limits of this permit.

WHOLE EFFLUENT TOXICITY

The Water Quality Standards for Surface Waters require that the effluent not cause toxic effects in the receiving waters. Many toxic pollutants cannot be detected by commonly available detection methods. However, toxicity can be measured directly by exposing living organisms to the wastewater in laboratory tests and measuring the response of the organisms. Toxicity tests measure the aggregate toxicity of the whole effluent, and therefore this approach is called whole effluent toxicity (WET) testing. Some WET tests measure acute toxicity and other WET tests measure chronic toxicity.

Acute toxicity tests measure mortality as the significant response to the toxicity of the effluent. Dischargers who monitor their wastewater with acute toxicity tests are providing an indication of the potential lethal effect of the effluent to organisms in the receiving environment.

Chronic toxicity tests measure various sublethal toxic responses such as retarded growth or reduced reproduction. Chronic toxicity tests often involve either a complete life cycle test of an organism with an extremely short life cycle or a partial life cycle test on a critical stage of one of a test organism's life cycles. Organism survival is also measured in some chronic toxicity tests. Accredited WET testing laboratories have the proper WET testing protocols, data requirements, and reporting format. Accredited laboratories are knowledgeable about WET testing and capable of calculating an NOEC, LC₅₀, EC₅₀, IC₂₅, etc. All accredited labs have been provided the most recent version of the Department of Ecology Publication # WQ-R-95-80, *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria* which is referenced in the permit.

Any Permittee interested in receiving a copy of this publication may call the Ecology Publications Distribution Center 360-407-7472 for a copy. Ecology recommends that Permittees send a copy of the acute or chronic toxicity sections(s) of their permits to their laboratory of choice.

An effluent characterization for acute and chronic toxicity was conducted during a previous permit term. In accordance with WAC 173-205-060, the Permittee must repeat this effluent characterization for the following reason: the average flow volume appears to have changed by ten percent or more due to an increase in production. In accordance with WAC 173-205-060(1), the proposed permit requires another effluent characterization for toxicity.

The WET tests during effluent characterization indicate that no reasonable potential exists to cause receiving water acute toxicity, and the Permittee will not be given an acute WET limit but will be required to use rapid screening tests to assure acute toxicity doesn't appear. If a rapid screening test indicates that acute toxicity has appeared, the Permittee will investigate immediately and take appropriate action.

If the Permittee makes process or material changes which, in the Department's opinion, results in an increased potential for effluent toxicity, then the Department may require additional effluent characterization in a regulatory order, by permit modification, or in the permit renewal. Toxicity is assumed to have increased if WET testing conducted in response to rapid screening tests fails to meet the performance standards in WAC 173-205-020 "whole effluent toxicity performance standard".

HUMAN HEALTH

Washington's water quality standards now include 91 numeric health-based criteria that must be considered in NPDES permits. These criteria were promulgated for the state by the U.S. EPA in its National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992). The discharge of PCBs from the facility have been previously discussed.

The Department has determined that the effluent is likely to have chemicals of concern for human health (arsenic and cyanide; based on permit application testing results, see Table 1). For cyanide, a determination of the discharge's potential to cause an exceedance of the water quality standards was conducted as required by 40 CFR 122.44(d). The reasonable potential determination was evaluated with procedures given in the Technical Support Document for Water Quality-Based Toxics Control (EPA/505/2-90-001) and the Department's Permit Writer's Manual (Ecology Publication 92-109, July, 1994). The design conditions for the human health reasonable potential determination are summarized below:

Condition	NonCarcinogens	Carcinogens
Receiving Water Flow	30Q5 ¹ (1,002.8 cfs)	Harmonic Mean ¹ (2,123.2 cfs)
Effluent Flow	Highest Monthly Average ² (5.24 MGD; 8.11 cfs)	Annual Average ² (4.39 MGD; 6.79 cfs)
% of Receiving Water Used for Dilution	25%	25%
Resulting Dilution Factor	36.2	79.1

¹30Q5 and harmonic mean flow estimated by calculating the 30Q5 (297.6 cfs) and harmonic mean (1,389 cfs, defined as $n / \sum_{i=1}^n (1/Q_i)$ where Q_i is the daily river flow) at USGS Station #12419500 (Spokane River Ab Liberty Br Nr Otis Orchard, Wa/Harvard Road). An estimated ground water recharge was added to these critical flows of 705.2 cfs (the difference between the 7Q10 at the Permittee's discharge point of 820 cfs and the 7Q10 at the USGS station at Harvard Road of 114.8 cfs).

²Highest monthly average flow and long term average flow from the Permit Application.

The determination indicated that the discharger does not have a reasonable potential to cause a violation of water quality standards for cyanide. For arsenic, a reasonable potential determination was not conducted because of the uncertainty of the freshwater human health criteria.

In 1992, the USEPA adopted risk-based arsenic criteria for the protection of human health for the State of Washington. The freshwater criterion is 0.018 µg/L, and is based on exposure from fish and shellfish tissue and water ingestion. This criterion is controversial because it differs from the drinking water maximum contaminant level (MCL) of 10 µg/L. Further, the human health criteria are sometimes exceeded by natural background concentrations of arsenic in surface water and ground water.

The source of arsenic in the discharge (2 µg/L) is likely from the supply water. For the Spokane Valley-Rathdrum Prairie Aquifer, the City of Spokane has measured arsenic in their drinking water at 3 to 4 µg/L (City of Spokane, 2004). The Department has also measured arsenic at 0.31 to 0.70 µg/L in the Spokane River at Stateline. Both these values exceed the human health freshwater criterion of 0.018 µg/L. At this time, the proposed permit will defer any arsenic permit decisions until the regulatory issues with the human health based arsenic criteria are resolved.

SEDIMENT QUALITY

The Department has promulgated aquatic sediment standards (Chapter 173-204 WAC) to protect aquatic biota and human health. These standards state that the Department may require Permittees to evaluate the potential for the discharge to cause a violation of applicable standards (WAC 173-204-400).

The Spokane River in the vicinity of the discharge is not an area of sediment deposition. However, there are depositional areas downstream from the Permittee in the vicinity of Upriver Dam (at river mile 79.9). Currently, the Department and Avista Development, Inc. are cleaning up Spokane River sediments at the Upriver Dam PCBs Sediments Site.

This cleanup site is divided into two projects. Deposit 1 begins directly behind Upriver Dam in the City of Spokane and continues east for approximately 3.6 acres. Deposit 2 is a small 0.25-acre area near Donkey Island in an unincorporated area. The Permittee was named a potentially liable party for the contamination, along with others.

The Department has been unable to determine at this time the continued potential for this discharge to cause a violation of sediment quality standards. If the Department determines in the future that there is a potential for violation of the Sediment Quality Standards, an order will be issued to require the Permittee to demonstrate that there is not an accumulation of toxics in Spokane River sediments.

COMPARISON OF EFFLUENT LIMITS WITH THE PREVIOUS PERMIT

Table 6 compares the current permit limits with the technology based and performance based limitations calculated in this fact sheet. For BOD₅ and TSS, the existing permit specified a low flow season from July to September. This will be changed to March to October in the proposed permit. For this season, the performance based BOD₅ limits are more stringent than existing permit limits. For TSS, the existing limits are more restrictive than the calculated technology based limitations. Because of the water quality concerns during the low flow season, the proposed permit limit for TSS will be set at the previous permit levels.

The existing permit defined a high flow season as October to June. This will be changed to November to February in the proposed permit. For BOD₅ and TSS, the proposed permit will be set at the technology based limitations. This is an increase over existing permit limits, due to the change in production used to calculate these values.

For total phosphorus, the current permit limit applied from June to October. This season will be expanded in the proposed permit to March to October. As discussed previously, a daily maximum permit limit for total phosphorus is included in the proposed permit.

MONITORING REQUIREMENTS

Monitoring, recording, and reporting are required (WAC 173-220-210 and 40 CFR 122.41) to verify that the treatment process is functioning correctly and the effluent limitations are being achieved. Monitoring for carbonaceous biological oxygen demand (CBOD) and ammonia (other pollutants specified by the Spokane River Total Phosphorus/DO TMDL) will also be required.

Ecology and the Spokane River dischargers have funded a study to determine the biologically available total phosphorus in the wastewater effluent. The DO TMDL assumed 100% of the total phosphorus is bioavailable. Preliminary results of this study indicates the total phosphorus available for aquatic plant growth is less than 100%.

Water Environment Research Foundation and CH2M-Hill studies have indicated that the digestion step of the total phosphorus analysis introduces compounds that interfere with a reliable, reproducible result. Successful compliance monitoring will require reliable, reproducible results. Based on the above study results, total reactive phosphorus may be such an analysis.

Therefore, the proposed permit requires testing for total reactive phosphorus in addition to the monitoring for total phosphorus.

The monitoring schedule is detailed in the proposed permit under Condition S.2. Specified monitoring frequencies take into account the quantity and variability of the discharge, the treatment method, past compliance, significance of pollutants, and relative cost of monitoring.

EFFLUENT LIMITS BELOW QUANTITATION

The water quality-based effluent limits for cadmium in the wastewater is close to the capability of current analytical technology to quantify. The Quantitation Level is the level at which concentrations can be reliably reported with a specified level of error. For maximum daily effluent limits, if the measured effluent concentration is below the Quantitation Level, the Permittee reports NQ for non-quantifiable. For average monthly effluent limits, all effluent concentrations below the Quantitation Level but above the Method Detection Level are used as reported for calculating the average monthly value.

LAB ACCREDITATION

With the exception of certain parameters the permit requires all monitoring data to be prepared by a laboratory registered or accredited under the provisions of Chapter 173-50 WAC, *Accreditation of Environmental Laboratories*. The laboratory at this facility is accredited for BOD₅, dissolved oxygen, pH, total phosphorus, and TSS.

OTHER PERMIT CONDITIONS

REPORTING AND RECORDKEEPING

The conditions of S3 are based on the authority to specify any appropriate reporting and recordkeeping requirements to prevent and control waste discharges (WAC 173-220-210).

NON-ROUTINE AND UNANTICIPATED DISCHARGES

Occasionally, this facility may generate wastewater which is not characterized in their permit application because it is not a routine discharge and was not anticipated at the time of application. These typically are waters used to pressure test storage tanks or fire water systems or leaks from drinking water systems. These are typically clean waste waters but may be contaminated with pollutants. The permit contains an authorization for non-routine and unanticipated discharges. The permit requires a characterization of these waste waters for pollutants and examination of the opportunities for reuse. Depending on the nature and extent of pollutants in this wastewater and opportunities for reuse, Ecology may authorize a direct discharge via the process wastewater outfall or through a stormwater outfall for clean water, require the wastewater to be placed through the facilities wastewater treatment process or require the water to be reused.

SPILL PLAN

The Department has determined that the Permittee stores a quantity of chemicals that have the potential to cause water pollution if accidentally released. The Department has the authority to require the Permittee to develop best management plans to prevent this accidental release under section 402(a)(1) of the Federal Water Pollution Control Act (FWPCA) and RCW 90.48.080.

The Permittee has developed a plan for preventing the accidental release of pollutants to state waters and for minimizing damages if such a spill occurs. The proposed permit requires the Permittee to update this plan and submit it to the Department.

SOLID WASTE PLAN

The Department has determined that the Permittee has a potential to cause pollution of the waters of the state from leachate of solid waste.

This proposed permit requires, under the authority of RCW 90.48.080, that the Permittee update the solid waste plan designed to prevent solid waste from causing pollution of the waters of the state. The plan must be submitted to the local permitting agency for approval, if necessary, and to the Department.

TREATMENT SYSTEM OPERATING PLAN

In accordance with state and federal regulations, the Permittee is required to take all reasonable steps to properly operate and maintain the treatment system (40 CFR 122.41(e)) and WAC 173-220-150 (1)(g). An operation and maintenance manual was submitted as required by state regulation for the construction of wastewater treatment facilities (WAC 173-240-150). It has been determined that the implementation of the procedures in the Treatment System Operating Plan is a reasonable measure to ensure compliance with the terms and limitations in the permit.

GENERAL CONDITIONS

General Conditions are based directly on state and federal law and regulations and have been standardized for all individual industrial NPDES permits issued by the Department.

PERMIT ISSUANCE PROCEDURES

PERMIT MODIFICATIONS

The Department may modify this permit to impose numerical limitations, if necessary to meet Water Quality Standards for Surface Waters, Sediment Quality Standards, or Water Quality Standards for Ground Waters, based on new information obtained from sources such as inspections, effluent monitoring, outfall studies, and effluent mixing studies.

The Department may also modify this permit as a result of new or amended state or federal regulations.

RECOMMENDATION FOR PERMIT ISSUANCE

This proposed permit meets all statutory requirements for authorizing a wastewater discharge, including those limitations and conditions believed necessary to control toxics, protect human health, aquatic life, and the beneficial uses of waters of the State of Washington. The Department proposes that this proposed permit be issued for five years.

REFERENCES FOR TEXT AND APPENDICES

City of Spokane

2004. 2004 City of Spokane Water Quality Report. City of Spokane, Water Department.

Environmental Protection Agency (EPA)

1992. National Toxics Rule. Federal Register, V. 57, No. 246, Tuesday, December 22, 1992.

1991. Technical Support Document for Water Quality-based Toxics Control. EPA/505/2-90-001.

1988. Technical Guidance on Supplementary Stream Design Conditions for Steady State Modeling. USEPA Office of Water, Washington, D.C.

1985. Water Quality Assessment: A Screening Procedure for Toxic and Conventional Pollutants in Surface and Ground Water. EPA/600/6-85/002a.

1983. Water Quality Standards Handbook. USEPA Office of Water, Washington, D.C.

Tsivoglou, E.C., and J.R. Wallace.

1972. Characterization of Stream Reaeration Capacity. EPA-R3-72-012. (Cited in EPA 1985 op.cit.)

Washington State Department of Ecology.

1994. Permit Writer's Manual. Publication Number 92-109

1999. Spokane River Dissolved Metals Total Maximum Daily Load Submittal Report. May 1999, Publication No. 99-49-WQ

2004. Spokane River and Lake Spokane (Long Lake) Pollutant Loading Assessment for Protecting Dissolved Oxygen. February 2004, Publication No. 04-03-006

2006. Spokane River PCBs Total Maximum Daily Load Water Quality Improvement Report. June 2006 Draft, Publication No. 06-03-024

Washington State Department of Ecology.

Laws and Regulations

(<http://www.ecy.wa.gov/laws-rules/index.html>)

Permit and Wastewater Related Information

(<http://www.ecy.wa.gov/programs/wq/wastewater/index.html>)

Wright, R.M., and A.J. McDonnell.

1979. In-stream Deoxygenation Rate Prediction. Journal Environmental Engineering Division, ASCE. 105(EE2). (Cited in EPA 1985 op.cit.)

SAIC.

2003. Report of Wastewater and Sludge Sampling at Inland Empire Paper Company. Prepared for Washington State Department of Ecology, Eastern Regional Office, by Science Applications International Corporation, Bothell, WA.

FIGURES AND TABLES

Figure 1: Inland Empire Paper Company Location	26
Figure 2: Inland Empire Paper Company Site Plan	27
Figure 3: Daily Effluent BOD Values (April-October), Inland Empire Paper Company	28
Table 1: Summary of Effluent Information, Inland Empire Paper Company.....	29
Table 2: Technology Based Limitations, Inland Empire Paper Company	30
Table 3: Requirements for Mixing Zones	31
Table 4: Ambient Conditions, Inland Empire Paper Company	32
Table 5: Performance Based Effluent Limit Calculations, Total Phosphorus and BOD, Inland Empire Paper Company	33
Table 6: Comparison of Effluent Limits, Inland Empire Paper Company	34

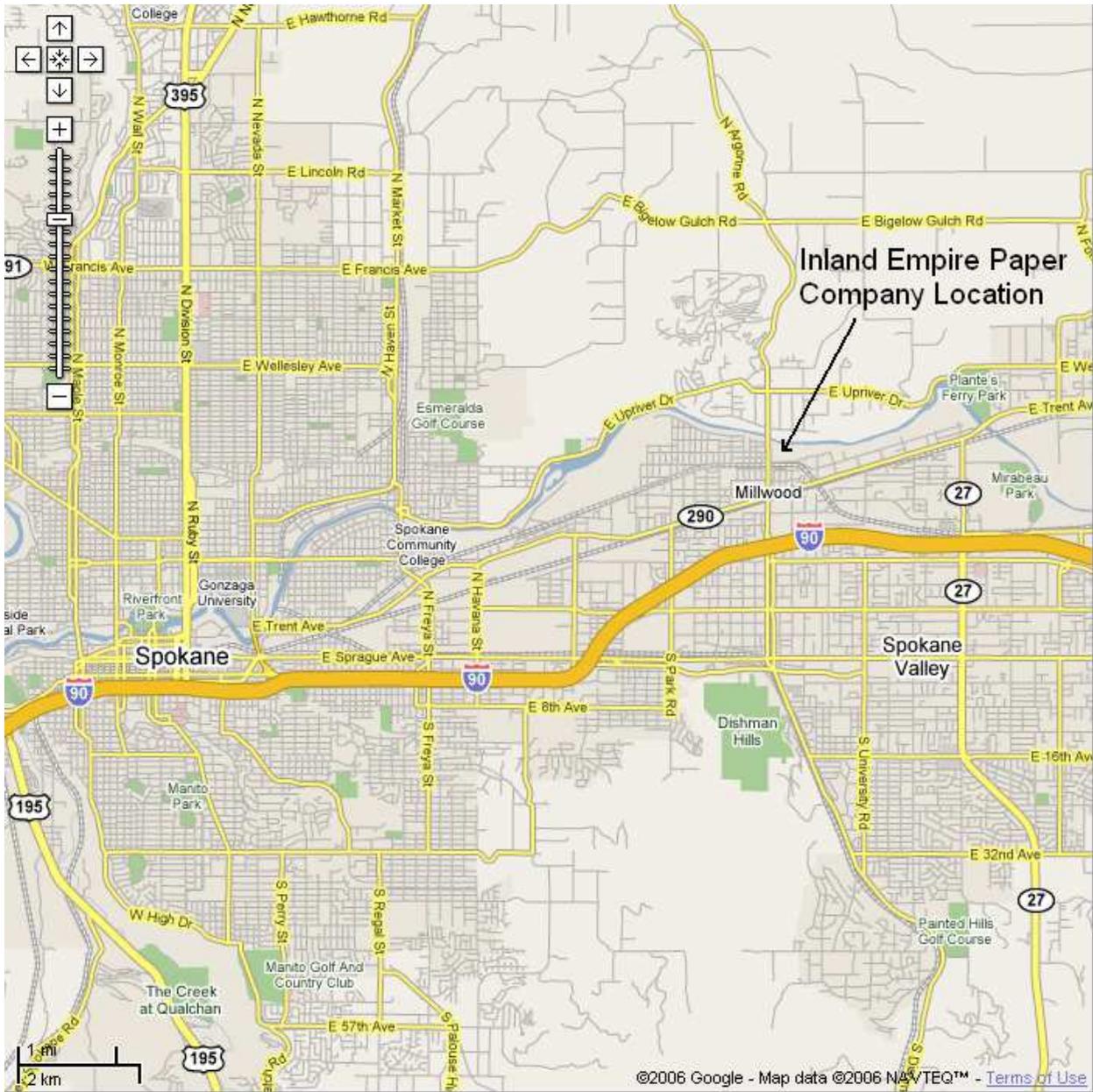


Figure 1: Inland Empire Paper Company Location

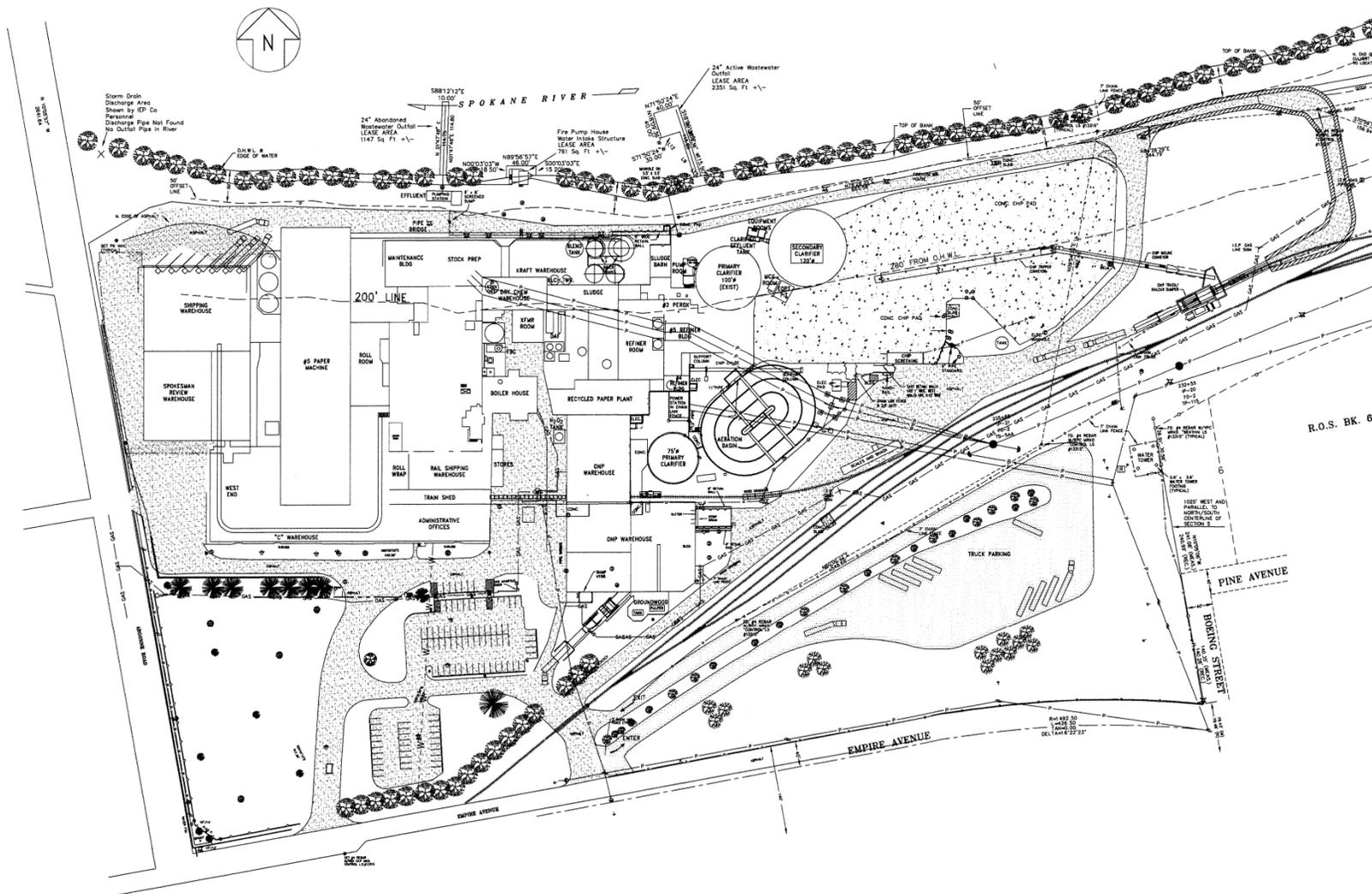


Figure 2: Inland Empire Paper Company Site Plan

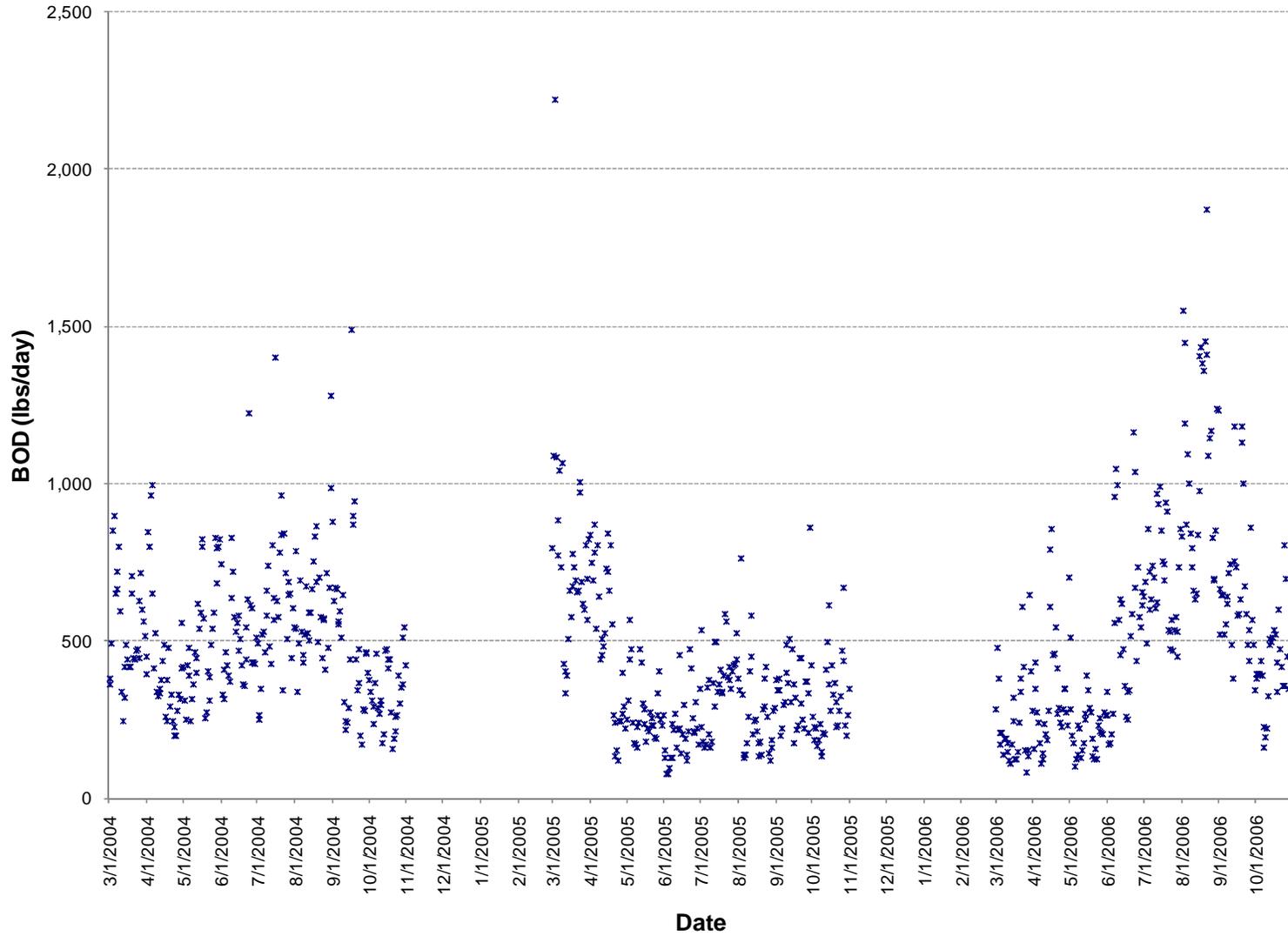


Figure 3: Daily Effluent BOD Values (April-October), Inland Empire Paper Company

Table 1: Summary of Effluent Information, Inland Empire Paper Company

Parameter	Max	Max Month	Avg	# Samples
Flow, MGD	5.24	4.61	4.39	334
pH, s.u.	7.4 (min), 8.2 (max)			334
Temp, °C (summer)	29.4	27.8	27.2	92
Temp, °C (winter)	27.8	24.4	23.9	89
BOD, mg/L	51	29.6	12.7	334
BOD, lbs/day	1,872	1,083	464	334
TSS, mg/L	53	21	11.5	334
TSS, lbs/day	2,059	768	421	334
Ammonia, mg/L	5.76	-	2.26	27
Total Phosphorus (as P), mg/L	1.24	0.64	0.43	100
Aluminum, mg/L	0.539	-	-	3
Arsenic, mg/L	0.002	-	-	1
Chromium, mg/L	0.003	-	-	1
Copper, mg/L	0.003	-	-	1
Nickel	0.003	-	-	1
Zinc, mg/L	0.003	-	-	1
Cyanide, mg/L	0.03	-	-	7
Dioxin, Volatile & Semivolatile Organics, Pesticides/PCBs	None detected			1

Table 2: Technology Based Limitations, Inland Empire Paper Company

Parameter	BCT/BPT Mechanical 40 CFR 430, Subpart G		NSPS Deink 40 CFR 430, Subpart I	
	Daily Max	Monthly Avg	Daily Max	Monthly Avg
BOD, lbs/1000 lbs of product	7.45	3.9	6.0	3.2
TSS, lbs/1,000 lbs of product	12.75	6.85	12.0	6.3

Production					
Mechanical		Deink		Total	
Tons/day	lbs/day	Tons/day	lbs/day	Tons/day	lbs/day
300.3	600,639	230.3	460,561	530.6	1,061,200
56.6%		43.4%			

Parameter	Limits					
	Mechanical		Deink		Total	
	Daily Max	Monthly Avg	Daily Max	Monthly Avg	Daily Max	Monthly Avg
BOD, lbs/day	4,475	2,342	2,763	1,474	7,238	3,816
TSS, lbs/day	7,658	4,114	5,527	2,902	13,185	7,016

Table 3: Requirements for Mixing Zones

Requirements:	Actions:
The allowable size and location be established in a permit.	This permit specifies the size and location of the allowed mixing zone.
Fully apply “all known available and reasonable methods of treatment” (AKART).	The technology-based limitations determined to be AKART are discussed in an earlier Section of this fact sheet (see Technology-based Limitations).
Consider critical discharge condition.	The critical discharge condition is often pollutant-specific or water body-specific and is discussed above.
Supporting information clearly indicates the mixing zone would not have a reasonable potential to cause the loss of sensitive or important habitat, substantially interfere with the existing or characteristic uses, result in damage to the ecosystem or adversely affect public health.	The Department of Ecology has reviewed the information on the characteristics of the discharge, receiving water characteristics and the discharge location. Based on this information, Ecology believes this discharge does not have a reasonable potential to cause the loss of sensitive or important habitat, substantially interfere with existing or characteristic uses, result in damage to the ecosystem or adversely affect public health.
Water quality criteria shall not be violated (exceeded) outside the boundary of a mixing zone.	A reasonable potential analysis, using procedures established by USEPA and the Department of Ecology, was conducted for each pollutant to assure there will be no violations of the water quality criteria outside the boundary of a mixing zone.
The size of the mixing zone and the concentrations of the pollutants shall be minimized.	The size of the mixing zone (in the form of the dilution factor) has been minimized by the use of design criteria with low probability of occurrence. For example, the reasonable potential analysis used the expected 95 th percentile pollutant concentration, the 90 th percentile background concentration, the centerline dilution factor and the lowest flow occurring once in every 10 years. The concentrations of the pollutants in the mixing zone have been minimized by requiring pollution prevention measures where applicable.
Maximum size of mixing zone	The authorized mixing zone does not exceed the maximum size restriction.
Acute criteria met as near to the point of discharge as practicably attainable	The acute criteria have been determined to be met at 10% of the distance volume fraction of the chronic mixing zone at the ten year low flow.
The concentration of, and duration and frequency of exposure to the discharge, will not create a barrier to migration or translocation of indigenous organisms to a degree that has the potential to cause damage to the ecosystem.	The toxicity of pollutants is dependent upon the exposure which in turn is dependent upon the concentration and the time the organism is exposed to that concentration. For example EPA gives the acute criteria for copper as “freshwater aquatic organisms and their uses should not be affected unacceptably if the 1- hour average concentration (in µg/l) does not exceed the numerical value given by (0.960)(e(0.9422[ln(hardness)] - 1.464)) more than once every three years on the average.” The limited acute mixing zone authorized for this discharge will assure that it will not create a barrier to migration. The effluent from this discharge will rise as it enters the receiving water assuring that it will not cause translocation of indigenous organism near the point of discharge.
Comply with size restrictions	The mixing zone authorized for this discharge meets the size restrictions of WAC 173-201A.
Overlap of Mixing Zones	This mixing zone does not overlap another mixing zone

Table 4: Ambient Conditions, Inland Empire Paper Company

Parameter	Value used
7Q10 low flow	820 cfs
Temperature	less than 20.0 °C
pH ^a (high)	7.9
pH ^a (low)	6.9
Hardness ^b	36 mg/L as CaCO ₃
Alkalinity ^c	50 mg/L as CaCO ₃
Ammonia ^d	0.026 mg/L as N
Total Arsenic ^d	0.58 µg/L
Total Chromium ^d	0.17 µg/L
Total Recoverable Copper ^d	1.3 µg/L
Total Recoverable Nickel ^d	0.5 µg/L
Aluminum and Cyanide	assumed zero
^a The 90 th percentile (high) and 10 th percentile (low) pH values measured from Ecology's long term monitoring site on the Spokane River at Stateline.	
^b The 10 th percentile (low) value for hardness from Kaiser Aluminum's monitoring of river intake water from July through October.	
^c Approximate lowest alkalinity measured during summer season at Ecology's long term monitoring site on the Spokane River at Riverside State Park.	
^d The 90 th percentile (high) values measured from Ecology's long term monitoring site on the Spokane River at Stateline.	

Table 5: Performance Based Effluent Limit Calculations, Total Phosphorus and BOD, Inland Empire Paper Company

Total Phosphorus			
Date	Avg	Statistics	
Apr-04	19.48	Mean	16.693
May-04	16.19	Standard Error	1.510
Jun-04	15.71	Median	16.898
Jul-04	19.16	Mode	#N/A
Aug-04	17.606	Standard Deviation	6.752
Sep-04	19.2	Sample Variance	45.595
Oct-04	15.792	Kurtosis	-0.544
Apr-05	30.81	Skewness	0.138
May-05	25.41	Range	24.460
Jun-05	17.79	Minimum	6.350
Jul-05	9.34	Maximum	30.810
Aug-05	7.44	Sum	333.868
Sep-05	7.97	Count	20
Oct-05	8.05		
Apr-06	11.31	mean + 2 std dev	30.2
May-06	6.35		
Jun-06	15.79		
Jul-06	23.91		
Aug-06	22.68		
Sep-06	23.88		
From Permit Application:			
	Daily Maximum Value (mg/L) =		1.24
	Highest Monthly Average Value (mg/L) =		0.64
	Ratio =		1.94
	Proposed Daily Max Limit (lbs/day) =		1.94 x 24.7
			= 47.9

BOD**, lbs/day		
Statistics	Data	Lognormal Transformed
Mean	474.10	5.9997
Standard Error	10.23	0.0214
Median	421.78	6.0445
Mode	#N/A	#N/A
Standard Deviation	277.27	0.5801
Sample Variance	76879.55	0.3365
Kurtosis	3.79	-0.3688
Skewness	1.48	-0.1553
Range	2141.07	3.3499
Minimum	77.86	4.3549
Maximum	2218.93	7.7048
Sum	348465.88	4409.8156
Count	735	735
Calculation of Performance-based limits:		
	Lognormal Transformed Mean =	5.9997
	Lognormal Transformed Variance =	0.3365
	# Samples/Month for Compliance Monitoring =	30
	Autocorrelation Factor (use 0 if unknown) =	0.8274
	E(X) =	477.2328
	V(X) =	91112.6580
	VARn	0.3944
	MEANn=	5.9708
	VAR(Xn)=	110119.2386
	Maximum Daily Limit =	1,555
	Average Monthly Limit =	1,101

** - Daily data (see Figure 3)

Table 6: Comparison of Effluent Limits, Inland Empire Paper Company

Parameter	Existing Limits ^a		Technology/Performance Based Limits ^a		Proposed Limits ^a	
	July-September		March-October		March-October	
	Daily Maximum	Daily Average	Daily Maximum	Daily Average	Daily Maximum	Daily Average
BOD ₅ , lbs/day	4,536	2,374	1,555	1,101	1,555	1,101
TSS, lbs/day	8,450	4,525	13,185	7,016	8,450	4,525
	June-October		March-October		March-October	
Total Phosphorus, lbs/day	-	24.7	49.7	24.7	49.7	24.7
	October-June		November-February		November-February	
BOD ₅ , lbs/day	5,638	2,820	7,238	3,816	7,238	3,816
TSS, lbs/day	8,938	4,791	13,185	7,016	13,185	7,016

^aExisting and proposed pH limits are within the range 5.0 to 9.0

APPENDIX A - PUBLIC INVOLVEMENT INFORMATION

The Department has tentatively determined to reissue a permit to the applicant listed on page 1 of this fact sheet. The permit contains conditions and effluent limitations which are described in the rest of this fact sheet.

The Department will publish a Public Notice of Draft (PNOD) on October 5, 2010 in the Spokesman Review to inform the public that a draft permit and fact sheet are available for review. Interested persons are invited to submit written comments regarding the draft permit. The draft permit, fact sheet, and related documents are available for inspection and copying between the hours of 8:00 a.m. and 5:00 p.m. weekdays, by appointment, at the regional office listed below. Written comments should be mailed to:

Water Quality Permit Coordinator
Department of Ecology
Eastern Regional Office
4601 North Monroe Street
Spokane, WA 99205-1295.

Additionally, a public hearing will be held to take any additional written and verbal testimony on these permits. The hearing date will be on November 10, 2010 at Spokane Regional Health District auditorium, 1101 W. College Avenue, Spokane, Washington from 6:00 to 9:00 p.m.

Comments should reference specific text followed by proposed modification or concern when possible. Comments may address technical issues, accuracy and completeness of information, the scope of the facility's proposed coverage, adequacy of environmental protection, permit conditions, or any other concern that would result from issuance of this permit.

The Department will consider all comments received within forty five (45) days from the date of public notice of draft indicated above, in formulating a final determination to issue, revise, or deny the permit. The Department's response to all significant comments is available upon request and will be mailed directly to people expressing an interest in this permit.

Further information may be obtained from the Department by telephone at (509) 329-3400 or by writing to the address listed above.

APPENDIX B - GLOSSARY

Acute Toxicity - The lethal effect of a compound on an organism that occurs in a short period of time, usually 48 to 96 hours.

AKART - An acronym for “all known, available, and reasonable methods of treatment”.

Ambient Water Quality - The existing environmental condition of the water in a receiving water body.

Ammonia - Ammonia is produced by the breakdown of nitrogenous materials in wastewater. Ammonia is toxic to aquatic organisms, exerts an oxygen demand, and contributes to eutrophication. It also increases the amount of chlorine needed to disinfect wastewater.

Average Monthly Discharge Limitation - The average of the measured values obtained over a calendar month's time.

Best Management Practices (BMPs) - Schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the State. BMPs include treatment systems, operating procedures, and practices to control: plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. BMPs may be further categorized as operational, source control, erosion and sediment control, and treatment BMPs.

BOD₅ - Determining the Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of organic material present in an effluent that is utilized by bacteria. The BOD₅ is used in modeling to measure the reduction of dissolved oxygen in a receiving water after effluent is discharged. Stress caused by reduced dissolved oxygen levels makes organisms less competitive and less able to sustain their species in the aquatic environment. Although BOD is not a specific compound, it is defined as a conventional pollutant under the federal Clean Water Act.

Bypass - The intentional diversion of waste streams from any portion of a treatment facility.

Chlorine - Chlorine is used to disinfect wastewaters of pathogens harmful to human health. It is also extremely toxic to aquatic life.

Chronic Toxicity - The effect of a compound on an organism over a relatively long time, often 1/10 of an organism's lifespan or more. Chronic toxicity can measure survival, reproduction or growth rates, or other parameters to measure the toxic effects of a compound or combination of compounds.

Clean Water Act (CWA) - The Federal Water Pollution Control Act enacted by Public Law 92-500, as amended by Public Laws 95-217, 95-576, 96-483, 97-117; USC 1251 et seq.

Compliance Inspection - Without Sampling - A site visit for the purpose of determining the compliance of a facility with the terms and conditions of its permit or with applicable statutes and regulations.

Compliance Inspection - With Sampling - A site visit to accomplish the purpose of a Compliance Inspection - Without Sampling and as a minimum, sampling and analysis for all parameters with limits in the permit to ascertain compliance with those limits; and, for municipal facilities, sampling of influent to ascertain compliance with the 85 percent removal requirement. Additional sampling may be conducted.

Composite Sample - A mixture of grab samples collected at the same sampling point at different times, formed either by continuous sampling or by mixing discrete samples. May be "time-composite"(collected at constant time intervals) or "flow-proportional" (collected either as a constant sample volume at time intervals proportional to stream flow, or collected by increasing the volume of each aliquot as the flow increased while maintaining a constant time interval between the aliquots.

Construction Activity - Clearing, grading, excavation and any other activity which disturbs the surface of the land. Such activities may include road building, construction of residential houses, office buildings, or industrial buildings, and demolition activity.

Continuous Monitoring - Uninterrupted, unless otherwise noted in the permit.

Critical Condition - The time during which the combination of receiving water and waste discharge conditions have the highest potential for causing toxicity in the receiving water environment. This situation usually occurs when the flow within a water body is low, thus, its ability to dilute effluent is reduced.

Dilution Factor - A measure of the amount of mixing of effluent and receiving water that occurs at the boundary of the mixing zone. Expressed as the inverse of the percent effluent fraction e.g., a dilution factor of 10 means the effluent comprises 10% by volume and the receiving water 90%.

Engineering Report - A document which thoroughly examines the engineering and administrative aspects of a particular domestic or industrial wastewater facility. The report shall contain the appropriate information required in WAC 173-240-060 or 173-240-130.

Fecal Coliform Bacteria - Fecal coliform bacteria are used as indicators of pathogenic bacteria in the effluent that are harmful to humans. Pathogenic bacteria in wastewater discharges are controlled by disinfecting the wastewater. The presence of high numbers of fecal coliform bacteria in a water body can indicate the recent release of untreated wastewater and/or the presence of animal feces.

Grab Sample - A single sample or measurement taken at a specific time or over a short period of time as is feasible.

Industrial Wastewater - Water or liquid-carried waste from industrial or commercial processes, as distinct from domestic wastewater. These wastes may result from any process or activity of industry, manufacture, trade or business, from the development of any natural resource, or from animal operations such as feed lots, poultry houses, or dairies. The term includes contaminated storm water and, also, leachate from solid waste facilities.

Major Facility - A facility discharging to surface water with an EPA rating score of > 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Maximum Daily Discharge Limitation - The highest allowable daily discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. The daily discharge is calculated as the average measurement of the pollutant over the day.

Method Detection Level (MDL) - The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is above zero and is determined from analysis of a sample in a given matrix containing the analyte.

Minor Facility - A facility discharging to surface water with an EPA rating score of < 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Mixing Zone - An area that surrounds an effluent discharge within which water quality criteria may be exceeded. The area of the authorized mixing zone is specified in a facility's permit and follows procedures outlined in state regulations (Chapter 173-201A WAC).

National Pollutant Discharge Elimination System (NPDES) - The NPDES (Section 402 of the Clean Water Act) is the Federal wastewater permitting system for discharges to navigable waters of the United States. Many states, including the State of Washington, have been delegated the authority to issue these permits. NPDES permits issued by Washington State permit writers are joint NPDES/State permits issued under both State and Federal laws.

pH - The pH of a liquid measures its acidity or alkalinity. A pH of 7 is defined as neutral, and large variations above or below this value are considered harmful to most aquatic life.

Quantitation Level (QL) - A calculated value five times the MDL (method detection level).

Responsible Corporate Officer - A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or the manager of one or more manufacturing, production, or operating facilities employing more than 250 persons or have gross annual sales or expenditures exceeding \$25 million (in second quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures (40 CFR 122.22).

Technology-Based Effluent Limit - A permit limit that is based on the ability of a treatment method to reduce the pollutant.

Total Suspended Solids (TSS) - Total suspended solids is the particulate material in an effluent. Large quantities of TSS discharged to a receiving water may result in solids accumulation. Apart from any toxic effects attributable to substances leached out by water, suspended solids may kill fish, shellfish, and other aquatic organisms by causing abrasive injuries and by clogging the gills and respiratory passages of various aquatic fauna. Indirectly, suspended solids can screen out light and can promote and maintain the development of noxious conditions through oxygen depletion.

State Waters - Lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, and all other surface waters and watercourses within the jurisdiction of the state of Washington.

Stormwater - That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a storm water drainage system into a defined surface water body, or a constructed infiltration facility.

Upset - An exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, lack of preventative maintenance, or careless or improper operation.

Water Quality-Based Effluent Limit - A limit on the concentration of an effluent parameter that is intended to prevent the concentration of that parameter from exceeding its water quality criterion after it is discharged into a receiving water.

APPENDIX C - TECHNICAL CALCULATIONS

Several of the Excel® spreadsheet tools used to evaluate a discharger's ability to meet Washington State water quality standards can be found on the Department's homepage at <http://www.ecy.wa.gov>.

Calculations of end-of-pipe WQ Based Limits for Zinc, Lead and Cadmium (1 of 3)

Effluent and Receiving Water Critical Conditions

Facility: **Inland Empire Paper Company**
 Receiving Water: **Spokane River**

Design Case: **End of Pipe Metals**

CLICK HERE FOR INSTRUCTIONS	Effluent Data			Receiving Water Data			%flow for dilution
	Annual Average	Monthly Average	Daily Maximum	7Q10 Critical	30Q5 Critical	Harmonic	
	Flow	Flow	Flow	Flow	Flow	Mean Flow	
Flow (MGD)	4.39	4.61	5.24	529.97	648.11	1353.48	0
(cfs)	6.79	7.13	8.11	820.00	1002.80	2094.20	
Critical Temp (°C)	29.40			18.00			
(°F)	84.9			64.4			
Critical Hardness (mg/L CaCO3)	305.00	← Effluent Data		25.50	← Receiving Water Data		
Critical pH (s.u.)	9.00			7.90			
Critical Alkalinity (mg/L as CaCO3)	50.00			50.00			
Enter own pH & Temp for Ammonia Criteria?	n					n	
	pH	Temp (°C)					
@ Acute Boundary							
@ Chronic Boundary							
	@ Acute Boundary	@ Chronic Boundary	Whole River Dilution (@ 7Q10 Flow)	@ 30Q5 River Flow (non C)	@ Harmonic Mean River Flow (Carcn)		
Dilution Factor (% effluent)	1.00	1.00	115.96	1.00	1.00		
Hardness	100.00	100.00	0.86	100.00	100.00		
Alkalinity	305.00	305.00	27.91	-	-		
Max pH (s.u.)	50.00	50.00	50.00	-	-		
Max Temp (°C)	9.00	9.00	7.90	-	-		
Max Temp (°F)	29.40	29.40	18.10	-	-		
	84.92	84.92	64.58	-	-		

Calculations of end-of-pipe WQ Based Limits for Zinc, Lead and Cadmium (2 of 3)

Pollutant, Effluent, and Receiving Water Data

Facility Inland Empire Paper Company
 Receiving Water Spokane River
 Design Case End of Pipe Metals

Pollutant, CAS No. & Application Ref. No.	priority pollutant?	standard	Freshwater Quality Criteria		Metals Translators		Probability (0.95 - WQ Based; 0.5 - Human Health)	Enter Effluent Data				Enter RW Data
			acute ug/L	chronic ug/L	acute	chronic		max effluent concentration ug/L	# of data points	Coefficient of Variation	# samples per month for compliance monitoring	50% percentile effluent conc for HHRPD, when n>10 (leave blank otherwise) ug/L
CADMIUM** - 7440439 4M	Y	WQ Stnd	12.4	2.348	0.943	0.943	0.95	200.0	1	0.6	1	
LEAD** - 7439921 7M	Y	WQ Stnd	212.2	8.269	0.466	0.466	0.95	200.0	1	0.6	1	
ZINC** - 7440666 13M	Y	WQ Stnd	294.4	268.8	0.996	0.996	0.95	200.0	1	0.6	1	

Note: Metals Translators derived from procedures in Permit Writer's Manual (Ecology, 2008), Table VI-1, page VI-6

Calculations of end-of-pipe WQ Based Limits for Zinc, Lead and Cadmium (3 of 3)

Summary of Effluent Reasonable Potential Determination & Limits

Facility
Receiving Water
Design Case
Inland Empire Paper Company
Spokane River
End of Pipe Metals

POLLUTANT	priority pollutant?	standard	Maximum Expected (or 50%) Effluent Concentration, µg/L	Does reasonable potential exist?	Receiving Water	Acute Boundary		Chronic Boundary		Permit Limits	
					Upstream RW Conc, µg/L	RW Acute Criteria, µg/L	Conc @ Acute MZ Boundary, µg/L	RW Chronic (or Human Health) Criteria, µg/L	Conc @ Chronic (or Human Health) MZ Boundary, µg/L	Daily Maximum Limit, µg/L	Monthly Average Limit, µg/L
CADMIUM** - 7440439 4M	Y	WQ Stnd	1239.5	YES	0.0	12.4	1168.9	2.348	1232.1	3.88	2.66
LEAD** - 7439921 7M	Y	WQ Stnd	1239.5	YES	0.0	212.2	577.6	8.269	1178.8	14.3	9.791
ZINC** - 7440666 13M	Y	WQ Stnd	1239.5	YES	0.0	294.4	1234.6	268.8	1172.6	295.6	202.6

CORRECTED (Final Permit) - Calculations of end-of-pipe WQ Based Limits for Zinc, Lead and Cadmium (1 of 3)

Effluent and Receiving Water Critical Conditions

Facility: **IEPCo Metals Check**
 Receiving Water: **Spokane River**

Design Case: **Reasonable Potential**

CLICK HERE FOR INSTRUCTIONS	Effluent Data			Receiving Water Data			%flow for dilution
	<u>Annual Average</u>	<u>Monthly Average</u>	<u>Daily</u>	<u>7Q10 Critical</u>	<u>30Q5 Critical</u>	<u>Harmonic</u>	
	Flow	Flow	Flow	Flow	Flow	Mean Flow	
Flow (MGD)	4.39	4.61	5.24	529.97	648.11	1353.48	0
(cfs)	6.79	7.13	8.11	820.00	1002.80	2094.20	
Critical Temp (1DMax or 7DADMax) °C	29.40			18.00			
(F)	84.9			64.4	Receiving		
Critical Hardness (mg/L CaCO3)	305.00	← Effluent Data		25.50	Water Data		
Critical pH (s.u.)	9.00	←		7.90	←		
Critical Alkalinity (mg/L as CaCO3)	50.00			50.00			
Enter own pH & Temp for Ammonia Criteria?	n			Enter own Dilution Factors (DFs)?			n
	pH	Temp (°C)		Acute DF			
@ Acute Boundary				Chronic DF			
@ Chronic Boundary				Human Health (non C) DF			
				Human Health (Carcn) DF			
	@ Acute Boundary	@ Chronic Boundary	Whole River Dilution (@ 7Q10 Flow)	@ 30Q5 River Flow (non C)	@ Harmonic Mean River Flow (Carcn)		
Dilution Factor	1.00	1.00	115.96	1.00	1.00		
(% effluent)	100.00	100.00	0.86	100.00	100.00		
Hardness	305.00	305.00	27.91	-	-		
Alkalinity	50.00	50.00	50.00	-	-		
Max pH (s.u.)	9.00	9.00	7.90	-	-		
Max Temp (°C)	29.40	29.40	18.10	-	-		
Max Temp (°F)	84.92	84.92	64.58	-	-		

CORRECTED (Final Permit) - Calculations of end-of-pipe WQ Based Limits for Zinc, Lead and Cadmium (2 of 3)

Pollutant, Effluent, and Receiving Water Data

Facility IEPco Metals Check
 Receiving Water Spokane River
 Design Case Reasonable Potential

Pollutant, CAS No. & Application Ref. No.	priority pollutant?	standard	Freshwater Quality Criteria		Metals Translators		Probability (0.95 - WQ Based; 0.5 - Human Health)	Enter Effluent Data				Enter RW Data	
			acute ug/L	chronic ug/L	acute	chronic		max effluent concentration ug/L	# of data points	Coefficient of Variation	#samples per month for compliance monitoring	50% percentile effluent conc for HH RPD, when n>10 (leave blank otherwise) ug/L	Ambient Concentration ug/L
CADMIUM** - 7440439 4M	Y	WQ Stnd	12.4	2.348	0.943	0.943	0.95	200.0	1	0.6	1		
LEAD** - 7439921 7M	Y	WQ Stnd	212.2	8.269	0.466	0.466	0.95	200.0	1	0.6	1		
ZINC** - 7440666 13M	Y	WQ Stnd	294.4	268.8	0.996	0.996	0.95	200.0	1	0.6	1		

CORRECTED (Final Permit) - Calculations of end-of-pipe WQ Based Limits for Zinc, Lead and Cadmium (3 of 3)

Summary of Effluent Reasonable Potential Determination & Limits

Facility Receiving Water Design Case IEPCo Metals Check Spokane River Reasonable Potential

POLLUTANT	priority pollutant?	standard	Maximum Expected (or 50%) Effluent Concentration, µg/L	Does reasonable potential exist?	Receiving Water	Acute Boundary		Chronic Boundary		Permit Limits	
					Upstream RW Conc, µg/L	RW Acute Criteria, µg/L	Conc @ Acute MZ Boundary, µg/L	RW Chronic (or Human Health) Criteria, µg/L	Conc @ Chronic (or Human Health) MZ Boundary, µg/L	Daily Maximum Limit, µg/L	Monthly Average Limit, µg/L
CADMIUM** - 7440439 4M	Y	WQ Stnd	1239.5	YES	0.0	12.4	1168.9	2.348	1168.9	4.09	2.804
LEAD** - 7439921 7M	Y	WQ Stnd	1239.5	YES	0.0	212.2	577.6	8.269	577.6	29.1	20.0
ZINC**- 7440666 13M	Y	WQ Stnd	1239.5	YES	0.0	294.4	1234.6	268.8	1234.6	295.6	202.6

Reasonable Potential Determination (1 of 3)

Effluent and Receiving Water Critical Conditions

Facility: **Inland Empire Paper Company**
 Receiving Water: **Spokane River**

Design Case: **RPD**

CLICK HERE FOR INSTRUCTIONS	Effluent Data			Receiving Water Data			%flow for dilution
	Annual Average Flow	Monthly Average Flow	Daily Maximum Flow	7Q10 Critical Flow	30Q5 Critical Flow	Harmonic Mean Flow	
Flow (MGD)	4.39	4.61	5.24	529.97	648.11	1353.48	25
(cfs)	6.79	7.13	8.11	820.00	1002.80	2094.20	
Critical Temp (°C)	29.40			18.00			
(°F)	84.9			64.4			
Critical Hardness (mg/L CaCO3)	305.00	← Effluent Data		25.50	← Receiving Water Data		
Critical pH (s.u.)	9.00			7.90			
Critical Alkalinity (mg/L as CaCO3)	50.00			50.00			
Enter own pH & Temp for Ammonia Criteria?	n			Enter own Dilution Factors (DFs)?			n
	pH	Temp (°C)		Acute DF			
@ Acute Boundary				Chronic DF			
@ Chronic Boundary				Human Health (non C) DF			
				Human Health (Carcn) DF			
	@ Acute Boundary	@ Chronic Boundary	Whole River Dilution (@ 7Q10 Flow)	@ 30Q5 River Flow (non C)	@Harmonic Mean River Flow (Carcn)		
Dilution Factor	3.53	29.74	115.96	36.15	78.08		
(% effluent)	28.34	3.36	0.86	2.77	1.28		
Hardness	104.71	34.90	27.91	-	-		
Alkalinity	50.00	50.00	50.00	-	-		
Max pH (s.u.)	8.01	7.91	7.90	-	-		
Max Temp (°C)	21.23	18.38	18.10	-	-		
Max Temp (°F)	70.22	65.09	64.58	-	-		

Reasonable Potential Determination (2 of 3)

Pollutant, Effluent, and Receiving Water Data

Facility Inland Empire Paper Company
 Receiving Water Spokane River
 Design Case RPD

Pollutant, CAS No. & Application Ref. No.	priority pollutant?	standard	Freshwater Quality Criteria		Metals Translators		Probability (0.95 - WQ Based; 0.5 - Human Health)	Enter Effluent Data				Enter RW Data
			acute ug/L	chronic ug/L	acute	chronic		max effluent concentration ug/L	# of data points	Coefficient of Variation	# samples per month for compliance monitoring	50% percentile effluent conc for HH RPD, when n>10 (leave blank otherwise) ug/L
ALUMINUM, total recoverable, pH 6.5-9.0 7429905	N	WQ Stnd	750.0	n/a	0.0	0.0	0.95	539.0	3	0.6	1	0.00
AMMONIA unionized	N	WQ Stnd	5020.8	1181.5	0.0	0.0	0.95	5.76	27	0.6	1	26.00
ARSENIC (dissolved) 7440382 2M	Y	WQ Stnd	360.0	190.0	1.0	1.0	0.95	2.0	1	0.6	1	0.58
CHROMIUM(TRI)** -7440473 5M	N	WQ Stnd	569.8	75.2	0.0	0.0	0.95	3.0	1	0.6	1	0.17
COPPER** - 744058 6M	Y	WQ Stnd	17.8	4.617	0.996	0.996	0.95	3.0	1	0.6	1	1.30
CYANIDE 57125 14M	Y	WQ Stnd	22.0	5.2	0.0	0.0	0.95	30.0	7	0.6	1	0.00
CYANIDE 57125 14M	Y	HH-Non C	HH	700.0	0.0	0.0	0.5	30.0	7	0.6	1	0.00
NICKEL** - 7440020 9M	Y	WQ Stnd	1471.6	64.5	0.998	0.997	0.95	3.0	1	0.6	1	0.50

Note: Metals Translators derived from procedures in Permit Writer’s Manual (Ecology, 2008), Table VI-1, page VI-6

Reasonable Potential Determination (3 of 3)

Summary of Effluent Reasonable Potential Determination & Limits

Facility
Receiving Water
Design Case
Inland Empire Paper Company
Spokane River
RPD

POLLUTANT	priority pollutant?	standard	Maximum Expected (or 50%) Effluent Concentration, µg/L	Does reasonable potential exist?	Receiving Water	Acute Boundary		Chronic Boundary		Permit Limits	
					Upstream RW Conc, µg/L	RW Acute Criteria, µg/L	Conc @ Acute MZ Boundary, µg/L	RW Chronic (or Human Health) Criteria, µg/L	Conc @ Chronic (or Human Health) MZ Boundary, µg/L	Daily Maximum Limit, µg/L	Monthly Average Limit, µg/L
ALUMINUM, total recoverable, pH 6.5-9.0 7429905	N	WQ Stnd	1616.7	NO	0.0	750.0	458.2	n/a	54.4		
AMMONIA unionized	N	WQ Stnd	7.156	NO	26.0	5020.8	20.7	1181.5	25.4		
ARSENIC (dissolved) 7440382 2M	Y	WQ Stnd	12.4	NO	0.58	360.0	3.929	190.0	0.977		
CHROMIUM(TRI)** -7440473 5M	N	WQ Stnd	18.6	NO	0.17	569.8	5.391	75.2	0.789		
COPPER** - 744058 6M	Y	WQ Stnd	18.6	NO	1.3	17.8	6.18	4.617	1.775		
CYANIDE 57125 14M	Y	WQ Stnd	60.2	NO	0.0	22.0	17.0	5.2	2.023		
CYANIDE 57125 14M	Y	HH-Non C	24.2	NO	0.0	HH		700.0	0.668		
NICKEL** - 7440020 9M	Y	WQ Stnd	18.6	NO	0.5	1471.6	5.612	64.5	1.102		

APPENDIX D – RESPONSE TO COMMENTS - DRAFT PERMIT

The public notice that informed the public that a draft permit was available for review was published in the Spokesman Review on October 5, 2010. Ecology received comments on the draft permit following the 45-day public comment period. The Response to Comments Document is attached to this Fact Sheet as Attachment D1.

APPENDIX E – RESPONSE TO COMMENTS - DRAFT AMENDED PERMIT

The public notice that informed the public that a draft amended permit was available for review was published in the Spokesman Review on May 31, 2011. Ecology received comments on the amended portion of the draft permit following the 30-day public comment period. The Response to Comments Document is attached to this Fact Sheet as Attachment D2.