

FACT SHEET FOR NPDES PERMIT WA-002447-3
City of Spokane - Riverside Park Water Reclamation Facility (POTW)
and
Spokane County (Pretreatment Program)

SUMMARY

The City of Spokane's NPDES permit for the Riverside Park Water Reclamation Facility is proposed for reissuance. There are several issues this NPDES permit fact sheet discusses:

1. The Spokane River and Lake Spokane Dissolved Oxygen TMDL, effluent nutrient (including phosphorus) concentrations and offset plans based in part on management of phosphorus from non-point sources,
2. Pretreatment and source identification and control of mercury, PCBs, PBDE, 2,3,7,8, TCDDs (one of the dioxins), and
3. Ongoing CSO control implementation and discharge notification.

The issuance of this permit is being timed to follow the approval of the Spokane River and Lake Spokane Dissolved Oxygen (DO) TMDL by the U.S. EPA. This permit implements the Spokane River DO TMDL, its waste load allocation and Managed Implementation Plan.

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I. 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), technical criteria for discharges from municipal wastewater treatment facilities (Chapter 173-221 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 body of fact sheet will not be revised. Any necessary amendment due to comments and the resultant changes to the permit will be summarized in Appendix D - Response to Comments.

GENERAL INFORMATION	
Applicant:	City of Spokane / Spokane County (Pretreatment Program)
Facility Name and Address:	Riverside Park Water Reclamation Facility 4401 N. Aubrey L. White Parkway, Spokane, WA 99205 Spokane County Division of Utilities (Pretreatment Program) 1026 W. Broadway Ave., Spokane, WA 99260-0430
Type of Treatment:	Activated Sludge, chlorine disinfection and dechlorination, seasonal phosphorus removal, partial nitrification-denitrification and pH adjustment
Discharge Location:	Spokane River w/side stream discharge at RM 67.4 Latitude: 47° 41' 43" N Longitude: 117° 28' 26" W.
Water Body ID Number:	Old ID WA-54-1020 & New ID QZ45UE

II. BACKGROUND INFORMATION

A. DESCRIPTION OF THE FACILITY

HISTORY

The City of Spokane completed construction of a combined storm/sanitary sewage interceptor and primary system in 1958 and expanded the treatment capacity in 1962. Major upgrades to the plant occurred in 1977. The current upgrades began in 1997 and are continuing. The 1977 upgrades are the basis for the current secondary wastewater treatment facility and seasonal phosphorus removal. The current upgrades provide an improvement in hydraulic capacity, replacing old mechanical equipment in the headworks, new screen channels, new septage receiving station, 2 new digesters, clarifiers and aeration basins; replace pumps, upgrade electrical system and telemetry and SCADA (supervisory control and data acquisition). An additional aeration basin has been added to the liquid process train with capability of denitrification. The ability to denitrify will be added to the remaining aeration basins in the next few years. The laboratory has been relocated and expanded.

The facility serves as a regional facility that provides wastewater treatment for the wastewater flows from the City of Spokane, City of Spokane Valley, Spokane County, Town of Millwood, City of Airway Heights, and Fairchild Air Force Base. The treatment plant currently provides tertiary treatment including seasonal phosphorus removal to the wastewater except during large storm events when combined storm/sanitary sewer flows cause hydraulic overloading of the collection system and treatment facility. The hydraulic overloading of the collection system results in combined sewage overflow (CSO) discharged directly to the river at 22 possible outfalls. Occasional system malfunctions can also cause dry weather discharges directly to the river at some of the CSO outfalls. Hydraulic overloading at the plant can cause an occasional bypass of the secondary portion of the treatment plant. The bypass of the secondary treatment portion has been historically regulated as a treated CSO requiring the discharge to receive primary clarification and disinfection. The primary treated portion is blended with the portion receiving secondary treatment and disinfected. The blended effluent has been in compliance with effluent limitations. Previous modifications in plant operations and the addition of dechlorination equipment has allowed for dechlorination of the CSO bypass in combination with the normally treated plant effluent.

COLLECTION SYSTEM STATUS

The 2000 census gives the City of Spokane population as 195,629 and the 2006 estimate from OFM is 201,600. The City NPDES permit application estimates that the POTW serves a population of 251,000 in the Spokane metropolitan area. The City owned collection system consists of the following:

- a. 471 miles of separated sanitary sewer
- b. 400 miles of combined sewer
- c. 356 miles of storm sewer

- d. 18 inverted siphons aka sag pipe facilities (2 are inactive)
- e. 1 Storm Sewer Lift Station
- f. 16,807 catch basins
- g. 3,121 drywells
- h. 27 lift stations
- i. 22 CSO outfalls
- j. 100+ storm sewer outfalls (now regulated by the Eastern Washington Ph II Municipal Stormwater Permit WAR-04-065)
- k. 1 WWTP outfall (includes treated CSO discharge)

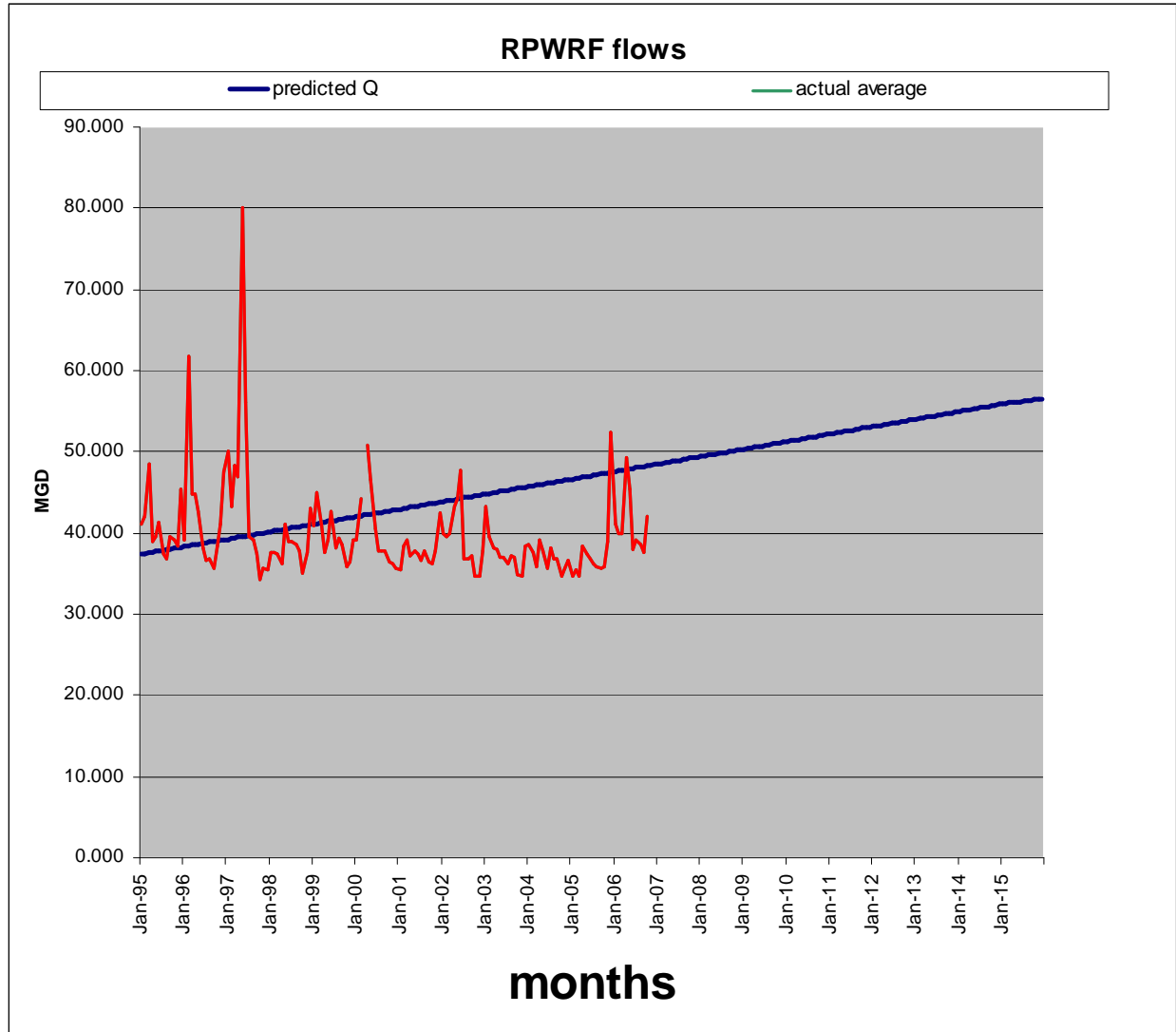
The City completed a large combined sewer separation project in 1993 which separated 186 miles of sewer in the northwestern part of the City and eliminated an estimated 86 percent of the annual untreated CSO volume discharged to the river (City of Spokane, 1998). A plan to further eliminate CSOs and meet the State's CSO requirement was approved in 1994. The City has submitted an extended CSO reduction schedule that takes CSO reduction improvements to the year 2017. In 2017, or earlier, the City's system will meet the State CSO requirement of no more than one CSO event per outfall per year.

During the previous permit, the City did an analysis of the CSO system including the treatment plant to consider if the treatment plant could be expanded to eliminate CSO discharges. The analysis concluded that the treatment could not be expanded due to constraints of the site. It is a federal requirement that analysis be updated each permit cycle. The analysis is an element of the engineering report described in the compliance section of the fact sheet and the permit compliance schedule.

The City has an ongoing program to identify and reduce infiltration and inflow and reduce water consumption. Due to these efforts, flow to the water reclamation facility has been relatively steady despite community growth. The currently approved engineering report projects a wastewater dry weather flow of 56 MGD by 2015.

The chart below shows predicted annual average flows and the actual annual average flows taken from the submitted Discharge Monitoring Reports (DMRs).

Predicted annual average flows and actual annual average flows taken from the submitted DMRs:



Spokane County has purchased 10 MGD of treatment plant and interceptor capacity from the City to provide conveyance and treatment of wastewater. The Spokane County 2001 Comprehensive Wastewater Management Plan estimates the sewered population served by County owned sanitary sewer collection systems as 63,859. The County owned collection system serving North Spokane and the Spokane Valley consists of 270 miles of sanitary sewer and 20 pump stations.

The County continues to implement a septic tank elimination program and construct new sewerage to expand sewer service for an estimated sewered population of 161,010 in the year 2020. The County hopes to have wastewater treatment facilities located in the western Spokane Valley substantially complete in 2011 ready for testing and start up and operational in 2012.

TREATMENT PROCESSES

Spokane's Riverside Park Water Reclamation Facility (RPWRF) is located on a 28 acre site in northwest Spokane along the north bank of the Spokane River (Figure 1). The RPWRF is considered a Class IV treatment plant and except for significant storm events, currently provides tertiary wastewater treatment, which includes conventional secondary treatment plus year round addition of alum for removal of zinc and other metals, seasonal nitrification of ammonia and seasonal chemical phosphorus removal. A fine-bubble aeration upgrade to the aeration basins provides for more efficient nitrification of ammonia.

The RPWRF treatment process units consist of the following:

- 1) Headworks with flow measurement (Parshall flumes), mechanically cleaned bar screens, (in the process of being replaced with perforated plate screens and washer/compactor for screenings) excess CSO diversion venture, and aerated grit chambers (being replaced with new grit handling equipment),
- 2) Primary clarifiers,
- 3) Aeration basins with capability to nitrify and partially denitrify,
- 4) Alum injection system for phosphorus removal,
- 5) Secondary clarifiers,
- 6) CSO storage/treatment clarifiers,
- 7) Chlorine contact basins with dechlorination,
- 8) Residual solids (sludge) treatment including anaerobic digesters with gas collection, gravity belt thickeners, and belt-filter presses (Figure 2), and
- 9) pH adjustment using magnesium hydroxide.

Twenty-four hour operation of the plant is performed by four person operating crews (two Class 3 and two Class 2) working in eight-hour shifts with support from additional maintenance, laboratory, and management personnel. Minimum operating crew size is a three person operating crew for limited periods of time.

The City operates a delegated industrial pretreatment program that currently has 11 Significant Industrial Users (SIUs) and Categorical Industrial Users (CIUs) under formal permit (2 industrial laundry, 1 dairy products processor (CIU), 1 juice product processor, 1 beverage bottler, 1 manufacturer of home products, 2 metal finishers (CIUs), 1 chemical supply processor, 1 pharmaceutical manufacturer (CIU), and 1 major car wash). The County also has a delegated industrial pretreatment program that currently has 9 SIUs and CIUs under formal permit (6 metal finishers (CIUs), 1 fertilizer supplier (CIU), 1 portal-potties wash, and 1 landfill ground water pump and treat). Since both the County and City have delegated industrial pretreatment programs, they are both authorized by this permit as a co-permittee for these pretreatment programs. The County and City have adopted an interlocal agreement that will have the City perform inspections, draft permits, and make recommendations for enforcement, with the County performing the administrative implementation and legal enforcement as well as updating the list of industrial users on the County collection system. The City will perform all the required pretreatment requirements for the City's delegated industrial pretreatment program.

The City of Spokane and Spokane County will update all their interlocal agreements with multijurisdictional pretreatment agreements and develop other multijurisdictional agreements if needed to ensure each delegate pretreatment programs can enforce their programs legally.

Figure 1. Location map of City of Spokane Riverside Park Water Reclamation Facility

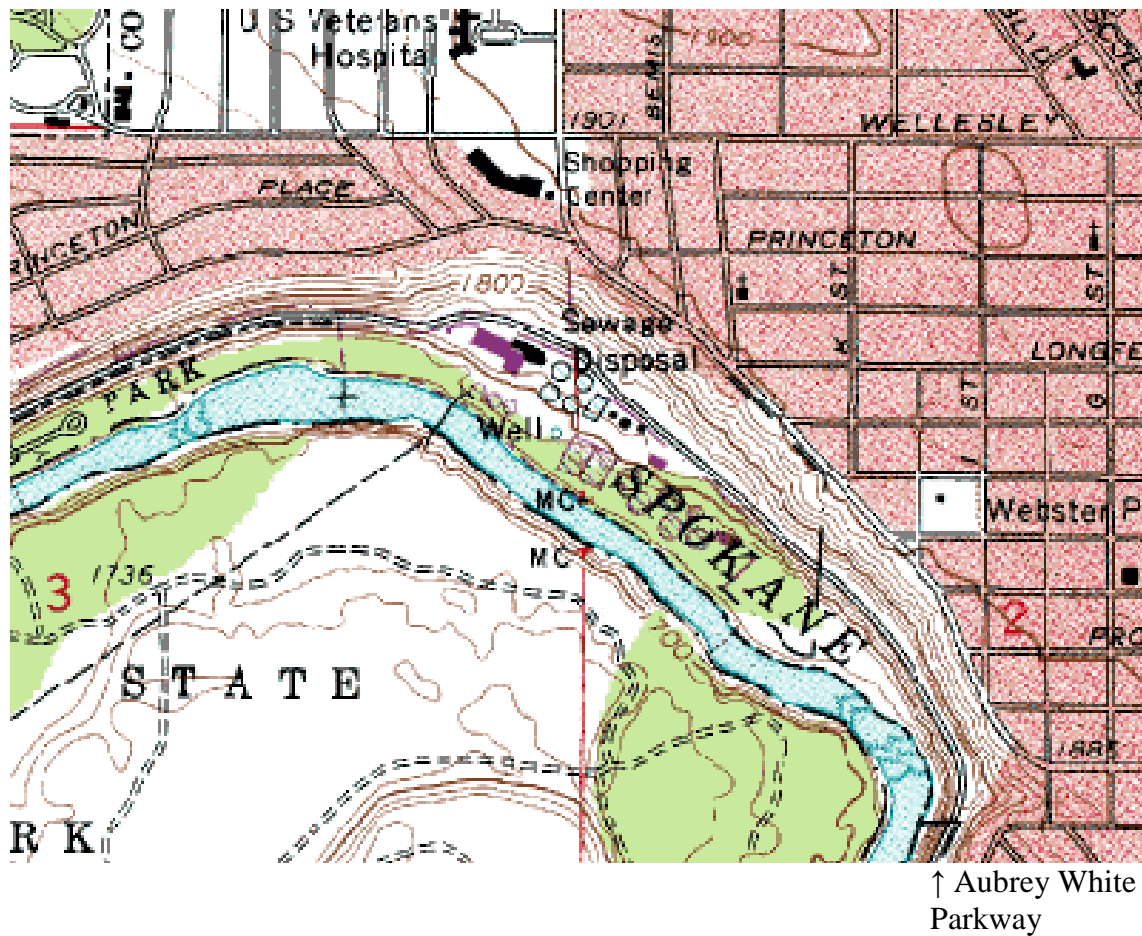
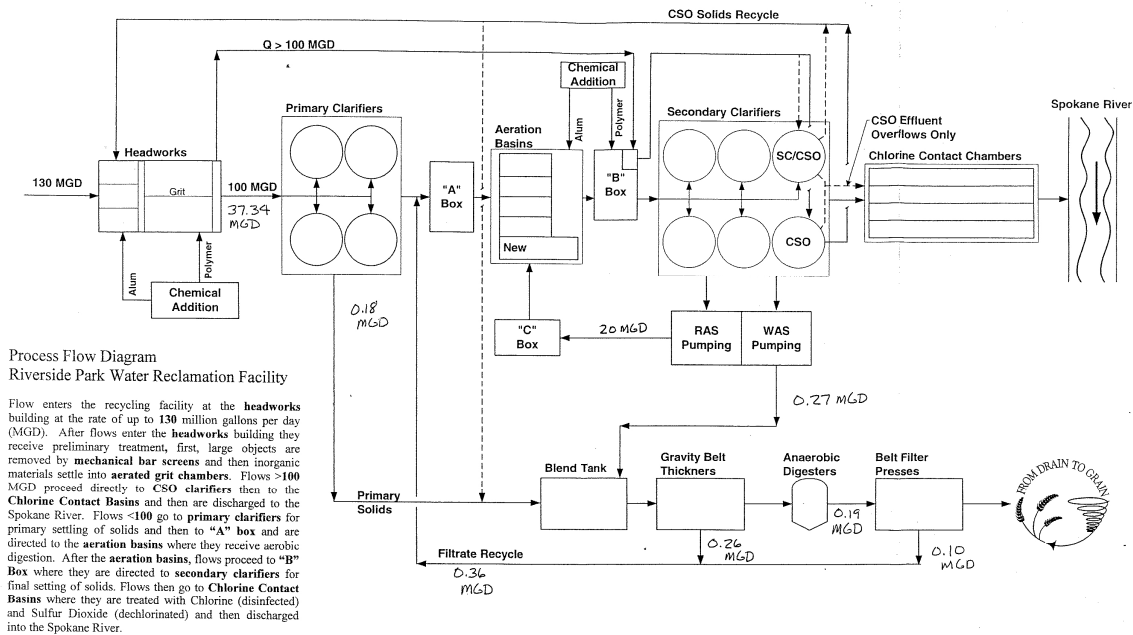


Figure 2: Schematic of Treatment Process



City of Spokane
 Phase 1
 Liquids Conceptual Design Report

**Figure 9-2
 PROCESS FLOW DIAGRAM - PHASE 1**

DISCHARGE OUTFALL

Tertiary treated and disinfected effluent is discharged from the WWTP facility via a side stream discharge into the Spokane River. During CSO related peak flow, it may be necessary for the City to bypass the secondary portion of the plant. The primary treated effluent is recombined with the main waste stream from the plant prior to disinfection. The previous permit and fact sheet listed a CSO outfall 005B. That outfall is no longer operational and all flows use outfall 005A, which does ensure adequate disinfection.

In addition to the main plant's outfall, there are 22 CSO outfalls from the collection system with intermittent discharges directly to the river during significant precipitation events and during system malfunctions in dry weather.

RESIDUAL SOLIDS

The treatment facilities remove solids during the treatment of the wastewater at the headworks (grit and screenings), in addition to incidental solids (rags, scum, and other debris) removed as part of the routine maintenance of the equipment.

Grit, rags, scum and screenings are drained and disposed of as solid waste. The scum, rags and screenings are directed to the waste to energy plant. The grit is directed to the local MSW landfill. Biosolids removed from the clarifiers are treated, digested and applied to land near Reardan, near Deer Park and in west Spokane County under a permit from Department of Ecology's Waste to Resources Program.

B. PERMIT STATUS

The previous permit for this facility was issued on March 30, 2000 and administratively extended on April 13, 2005. The previous permit placed effluent limitations on 5-day Biochemical Oxygen Demand (BOD₅), Total Suspended Solids (TSS), pH, Cadmium, Lead, Zinc, Fecal Coliform Bacteria, with seasonal limits for Ammonia and Residual Chlorine and an 85 percent removal requirement for Total Phosphorus.

An application for permit renewal was submitted to the Department on October 29, 2004 and accepted by the Department on December 6, 2004.

C. SUMMARY OF COMPLIANCE WITH THE PREVIOUS PERMIT

The facility received its last inspection on July 7, 2009.

During the history of the previous permit, the effluent from the wastewater treatment facility has remained in compliance, based on Discharge Monitoring Reports (DMRs) submitted to the Department and inspections conducted by the Department. The city's CSO system has experienced several overflow events. The City is making improvements and has submitted the documentation required by the permit and is continuing to submit updates.

D. WASTEWATER CHARACTERIZATION

The concentration of pollutants in the discharge was reported in the NPDES application and in DMRs. The effluent is characterized as follows:

Table 1: Wastewater Characterization

	Data from NPDES application
Parameter	Concentration (average / maximum)
BOD ₅ (mg/L)	5 / 27
TSS (mg/L)	6 / 27
pH (s.u.)	range 5.83 – 8.11
Max seasonal Temp. (°C)	18.4 summer / 20.8 summer
Fecal Coliform (cfu)	19 / 1600
TP (mg/L) year round	1.6 / 4.05
TP (mg/L) summer season	0.69
TP Removal (% , summer)	90.4 / 88.8 minimum
Residual Chlorine (mg/L)	NA / 0.034
Ammonia (total, mg/L)	0.29 / 9.22
TKN (mg/L)	2.04 / 9.35

METALS (total recov.µg/L)	
Antimony	0.594 / 1.59
Arsenic	1.73 / 3.5
Beryllium	0.03 / 0.111
Cadmium	0.108 / 0.2904
Chromium	1.97 / 3
Copper	3.80 / 15.18
Lead	1.070 / 1.818
Mercury	0.022 / 0.24
Nickel	4.243 / 35.9
Selenium	1.258 / 2.92
Silver	0.151 / 0.289
Thallium	0.006 / 0.0473
Zinc	49.876 / 61.8
Hardness (as CaCO ₃)	162/193
Cyanide (total, µg/L)	Non detect
ORGANICS	
Total Phenol	Non detect
VOCs	Non detect
Acid – Extractable Compounds	Non detect
Base – Neutral Compounds	Non detect

E. SEPA COMPLIANCE

The City of Spokane prepared environmental review documents for the upgrade of the wastewater treatment plant and submitted them for agency and public review in January 2002 and again in 2005 for the digesters and other upgrades in accordance with the State Environmental Policy Act.

III. 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 for municipal discharges are set by regulation (40 CFR 133, and Chapters 173-220 and 173-221 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 (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992.) The most stringent of these types of 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.

F. DESIGN CRITERIA

In accordance with WAC 173-220-150 (1)(g), flows or waste loadings shall not exceed approved design criteria.

The design criteria for this treatment facility are taken from the “*Conceptual Design Report for the Phase 1 Liquid Improvements City of Spokane Advanced Wastewater Treatment Plant*” dated July 2001; prepared by CH2MHILL and are as follows:

Table 2: Design Standards for the Spokane RPWRF – design year 2015

Parameter	Dry Season (May through October)	Wet Season
Average flow, MGD	55.9	60.6
Maximum Monthly flow, MGD	59.6	79.8
Maximum Day flow, MGD	103.9	129.5
Peak Hour flow, MGD	130	130
BOD₅ influent loading, lbs/day		
Annual Average	85,100	
Maximum Month	102,120	
Maximum Day	170,200	
TSS influent loading, lbs/day		
Annual Average	85,100	
Maximum Month	102,120	
Maximum Day	170,200	
TKN influent loading, lbs/day		
Annual Average	16,300	

*Fact Sheet for NPDES Permit WA-002447-3
City of Spokane's Riverside Park Water Reclamation Facility (the POTW) &
Spokane County Flows and Pretreatment Programs
for both the City of Spokane and Spokane County*

Maximum Month	19,560	
Maximum Day	32,600	
TP influent loading, lbs/day		
Annual Average	2,270	
Maximum Month	2,570	
Maximum Day	3,630	

The City is developing plans to increase the peak hydraulic capacity to 150 MGD.

While the maximum month design flow for the Water Reclamation Facility is 59.6 MGD and the average is 55.9 MGD, as part of the collaboration effort for the DO TMDL the anticipated flows from various sources were considered in detail. The anticipated flows were used to calculate the final effluent mass limitation in pounds per day. The City of Spokane has had a vigorous infiltration and inflow control program and water conservation program. As a result, flows have not increased. In addition, Spokane County and Airway Heights have begun projects to build satellite water reclamation facilities that will divert flow from the City of Spokane's Riverside Park Water Reclamation Facility. Through the coming five year permit cycle the projected flows are expected to be:

Table 3: Influent Flow Distribution Projections

Year	Spokane City	Spokane County	Airway Heights	RPWRF Total
2004	29.65	7.20	0.31	37.16
2005	30.09	7.75	0.37	38.21
2006	30.55	8.30	0.43	39.28
2007	31.00	8.85	0.49	40.34
2008	31.47	8.40	0.55	40.42
2009	31.94	8.95	0.61	41.50
2010	32.42	9.50	0.67	42.59
2011	32.91	10.05	0	42.96
2012	33.40	1.95	0	35.35
2013	33.90	2.40	0	36.30
2014	34.41	3.24	0	37.65
2015	34.93	4.08	0	39.01
2016	35.45	4.92	0	40.37
2017	35.98	5.76	0	41.74
2018	36.52	6.60	0	43.12
2019	37.07	6.84	0	43.91
2020	37.63	7.08	0	44.71
2021	38.19	7.32	0	45.51
2022	38.76	7.56	0	46.32
2023	39.34	7.80	0	47.14
2024	39.93	8.11	0	48.04
2025	40.53	8.42	0	48.95
2026	41.14	8.73	0	49.87

2027	41.76	9.04	0	50.80
2028	42.38	9.34	0	51.72

In the discussion that produced the “Foundational Concepts” the flow estimates were projected out 20 years with a projected average monthly flow of 41.76 MGD in 2017 and 50.80 MGD in 2027. This flow was retained for calculating the mass effluent limitations for the waste load allocations in the Spokane River and Lake Spokane DO TMDL.

G. TECHNOLOGY-BASED EFFLUENT LIMITATIONS

Municipal wastewater treatment plants are a category of discharger for which technology-based effluent limits have been promulgated by federal and state regulations. These effluent limitations are given in the Code of Federal Regulations (CFR) 40 CFR Part 133 (federal) and in Chapter 173-221 WAC (state). These regulations are performance standards that constitute all known available and reasonable methods of prevention, control, and treatment for municipal wastewater.

The following technology-based limits for pH, Fecal Coliform, BOD₅, and TSS are taken from Chapter 173-221 WAC. They are below in Table 4:

Table 4: Technology-Based Limits

Parameter	Limit
pH:	shall be within the range of 6 to 9 standard units.
Fecal Coliform Bacteria	Monthly Geometric Mean = 200 organisms/100 mL Weekly Geometric Mean = 400 organisms/100 mL
BOD ₅ (concentration)	Average Monthly Limit is the most stringent of the following: - 30 mg/L - may not exceed fifteen percent (15%) of the average influent concentration Average Weekly Limit = 45 mg/L
TSS (concentration)	Average Monthly Limit is the most stringent of the following: - 30 mg/L - may not exceed fifteen percent (15%) of the average influent concentration Average Weekly Limit = 45 mg/L
Chlorine Residual	Average Monthly Limit = 0.5 mg/L Average Weekly Limit = 0.75 mg/L

The technology-based monthly average limitation for chlorine is derived from standard operating practices. The Water Pollution Control Federation's Chlorination of Wastewater (1976) states that a properly designed and maintained wastewater treatment plant can achieve adequate disinfection if a 0.5 mg/liter chlorine residual is maintained after fifteen minutes of contact time. See also Metcalf and Eddy, Wastewater Engineering, Treatment, Disposal and Reuse, Third Edition, 1991. A treatment plant that provides adequate chlorination contact time can meet the 0.5 mg/liter chlorine limit on a monthly average basis. According to WAC 173-221-030(11)(b), the corresponding weekly average is 0.75 mg/liter.

The existing permit has a monthly average chlorine limit of 8.5 ug/L and a daily maximum chlorine limit of 22.2 ug/L and the facility is complying with the limitations. The proposed permit includes the same limitations.

Interim monthly mass loadings (lbs/day) effluent limits for BOD₅ and TSS were calculated based on the maximum monthly design flow projected to be in effect at the end of this permit cycle, (43 MGD) x Concentration limit (30 mg/L) x 8.34 (conversion factor) = mass limit 10,759 lbs/day.

Interim monthly mass loadings (lbs/day) effluent limits for BOD₅ and TSS are also calculated as the maximum monthly influent design loading (102,120 lbs/day) x 0.15 = 10,760 lbs/day.

The interim weekly average effluent BOD₅ mass loading is calculated as 1.5 x monthly loading = 16,138 lbs/day.

The interim weekly average effluent TSS mass loading is calculated as 1.5 x monthly loading = 16,138 lbs/day.

H. 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. 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). The TMDL collaboration team and the Department of Ecology submitted a collaborative statement of “*Foundational Concepts for the Spokane River TMDL Managed Implementation Plan*” dated June 30, 2006. This was followed by the “*Spokane River and Lake Spokane Dissolved Oxygen Total Maximum Daily Load – Draft Water Quality Improvement Report*” published September 2009. The public comment period ran to October 30, 2009 with a public hearing on October 20, 2009. The final report was submitted to EPA for approval in February 12, 2010 and approved by the U.S. EPA on May 20, 2010.

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 the 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 state was issued 91 numeric water quality criteria for the protection of human health by the U.S. EPA (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 the receiving water are of lower quality than the criteria assigned, the natural conditions shall constitute the water quality criteria. Similarly, when receiving waters are of higher quality than the criteria assigned, the existing water quality shall be protected. More information on the State Antidegradation Policy can be obtained by referring to WAC 173-201A-070.

The Department has reviewed existing records and is unable to determine if ambient water quality is either higher or lower than the designated classification criteria given in Chapter 173-201A WAC; therefore, the Department will use the designated classification criteria for this water body in the proposed permit. The discharges authorized by this proposed permit should not cause a loss of beneficial uses.

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.

MIXING ZONES

The Water Quality Standards allow the Department of Ecology to authorize mixing zones around a point of discharge in establishing surface water quality-based effluent limits. Both "acute" and "chronic" mixing zones may be authorized for pollutants that can have a toxic effect on the aquatic environment near the point of discharge. The concentration of pollutants at the boundary of these mixing zones may not exceed the numerical criteria for that type of zone. Mixing zones can only be authorized for discharges that are receiving all known, available, and reasonable methods of prevention, control and treatment (AKART) and in accordance with other mixing zone requirements of WAC 173-201A-100.

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):

1. Aquatic life uses (salmonid spawning, rearing, migration);
2. Primary contact recreation;
3. Water supply uses (domestic, industrial, agricultural, stock); and
4. 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. Prior to the 401 Avista dam relicensing, the annual harmonic mean flow was approximately 2,154 cfs as the river crosses the Idaho border. Flow increased 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 and the stormwater discharges associated with those cities. In Washington, points sources include Liberty Lake POTW and Kaiser Aluminum (both upstream from the Permittee), and the City of Spokane AWTP.

Significant nearby non-point sources of pollutants to the Spokane River include stormwater 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) When a waterbody's D.O. is lower than the criteria (or within 0.2 mg/L of the criteria) and that condition is due to natural conditions, then human actions considered cumulatively may not cause the D.O. of that water body to decrease more than 0.2 mg/L. For lakes, human actions considered cumulatively may not decrease the D.O. concentration more than 0.2 mg/L below natural conditions.
Total Dissolved Gas	Shall not exceed 110 percent of saturation at any point of sample collection.
Temperature	1) 7-DADMax (7-day average of the daily maximum temperatures) of 17.5°C (63.5°F) 2) Temperature shall not exceed a 1-DMax of 20.0°C due to human activities. 3) When natural conditions exceed a 1-DMax of 20.0°C, no temperature increase will be allowed which will raise the receiving water temperature by greater than 0.3°C; 4) Nor shall such temperature increases, at any time, exceed $t = 34/(T + 9)$.
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.

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.

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 point source or load allocations (LAs) for non-point 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. The DO TMDL report has been approved by the U.S. EPA Region 10 office. The PCB TMDL report will be finished as a technical support document to guide source control and cleanup activities. 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.

In response to the Dissolved Oxygen 303(d) listings, the Department prepared a draft TMDL report for the Spokane River and Lake Spokane (Ecology, 2004). The report recommends substantial reductions in Phosphorus, Carbonaceous Biological Oxygen Demand (CBOD), and Ammonia discharged to the Spokane River from both point and non-point sources. The reductions apply during the season from April through October.

As a result of this 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.

Ecology revised the draft 2004 TMDL and released it for public comment in 2007 and 2008. These 2007 and 2008 TMDL drafts still contained very stringent wasteload allocations, but also accounted for non-point pollution sources, and anticipated that pollutant trading might be used to help the point source dischargers meet their load allocations. Despite this improvement, these draft TMDLs were flawed in two ways:

1. They did not consider Avista's responsibility for the impacts caused by Long Lake Dam.

2. They assumed that the impacts of the Idaho dischargers were set by the NPDES permits EPA had proposed even though those permits did not contain discharge limits stringent enough to meet Washington's water quality standards when considered cumulatively with Washington sources (see Appendix H).

To develop a TMDL that will achieve compliance with Washington water quality standards, Ecology developed a revised TMDL based on modeling that now assesses the cumulative impact of all dischargers and accounts for the impacts of Long Lake Dam on dissolved oxygen in Lake Spokane. Because all the impacts causing the water quality impairment are considered, the proportional share that each discharger bears is less than in earlier draft TMDLs. The new wasteload allocations for the point source dischargers, assumed reductions in the Idaho discharges, load allocations for non-point sources, and the improvements that Avista will make to mitigate the effect of the dam, give assurance that compliance with water quality standards will be achieved. The final Water Quality Improvement Report was submitted to EPA for approval in February 2010.

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. While the PCB TMDL has been delayed, clean up efforts are in progress and this proposed permit includes monitoring of toxics including PCBs and development of cleanup plans as contaminated sites are identified. The City is developing management plans for PCBs in stormwater and CSOs. EPA rules (40 CFR Subpart K (44 FR 32954-5)) do provide for the use of narrative limitations rather than numeric effluent limitations.

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.

The Spokane River is not specifically listed for Mercury. However, the effluent from the POTW is monitored for Mercury. From January 2002 through May, 2005 the effluent concentration for Mercury on occasion exceeded or equaled the chronic water quality criteria for Mercury (0.012 ug/L). With consideration of dilution the water quality criterion for Mercury would not be exceeded outside the authorized mixing zone nor does the maximum effluent concentration reported in the NPDES permit application exceed the reasonable potential criterion for Mercury. Nevertheless the permit's pretreatment section does require action to be taken.

The potential for effluent temperature impacts during the critical low flow season were checked with a simple dilution model. The input variables were dilution factor 3.96, upstream temperature 16.8°C in 2005, and an effluent temperature 20.2°C. The water quality standards were recently revised downward to better protect cold water fish species.

The Department's ambient monitoring station is well upstream of the POTW and temperature data is highly variable. Instream monitoring of ambient water temperatures by the permittee immediately upstream of the outfall and downstream of the mixing zone is necessary before analyzing for reasonable potential to exceed the temperature standard.

CONSIDERATION OF SURFACE WATER QUALITY-BASED LIMITS FOR NUMERIC CRITERIA

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, a pollutant such as Biological Oxygen Demand (BOD) is a far-field pollutant 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.

In the reasonable potential calculation, the dilution factor will be derived based on the maximum fraction of the river flow authorized for acute (2.5%) and chronic (25%) mixing zones at the established critical conditions (seasonal 7Q20).

The dilution factors of effluent to receiving water that occur within these zones have been determined at the critical condition and have been determined to be (from Appendix D):

Dilution Factors	Low River Flow Period (July – October)		High River Flow Period (November – June)	
	Acute	Chronic	Acute	Chronic
Aquatic Life	1.17	3.96	1.23	6.40
Human Health, Carcinogen	12.75 (annually based)			
Human Health, Non-carcinogen	5.19 (annually based)			

The critical seasonal flow conditions for the Spokane River at the Spokane WWTP are the seven day average low river flow with a recurrence interval of twenty years (7Q20). The critical flow was calculated from the sum of the 7Q20 flows from the USGS gages at Spokane River @ Spokane, Hangman Cr. @ Spokane, and 200 cfs groundwater inflow. Ambient water quality data at critical seasonal conditions in the vicinity of the WWTP outfall was determined from both historical data, intensive monitoring data collected by the City of Spokane, and 3 separate sets of continuous Hydrolab Datasonde monitoring obtained during the summer of 1998. During the summer of 1998, Spokane River (Spokane River @ Spokane) lowest 7-day average flow (845 cfs) approached the 7Q10 flow of 757 cfs for that station. The critical ambient background data used for the previous NPDES and this permit includes the following:

Parameter	Value used (low river flow)	Value used (high river flow)
7Q20 low flow	805.5 cfs	1532.1 cfs
7Q10 low flow used in yr. 2004 Spokane River DO TMDL	578 cfs	

model		
Temperature	20.3°C	15.3
pH (high)	8.5 s.u.	8.27 s.u.
Dissolved Oxygen	8.0 mg/L	8.5 mg/L
Chlorine	0.0 mg/L	0.0 mg/L
Total Ammonia-N	0.22 mg/L	0.3 mg/L
Fecal Coliform	20 cfu	20 cfu
Hardness	82.9 mg/L	58.4 mg/L
Cadmium	Because background concentrations caused by sources in Idaho exceed water quality criterion, limits for Cadmium, and Lead are performance – based. Zinc has a water quality based limitation consistent with the Spokane River Metals TMDL	
Lead		
Zinc		
Arsenic	0.0 µg/L	0.0 µg/L
Copper	0.372 µg/L	0.372 µg/L
Mercury	0.0013 µg/L	0.0031 µg/L
Silver	0.0204 µg/L	0.048 µg/L

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

CBOD₅, Ammonia, and Total Phosphorus - The Spokane River and Lake Spokane (Long Lake) dissolved oxygen TMDL report sets WLAs for total phosphorus, CBOD₅, and ammonia for each NPDES discharger to the Spokane River. The TMDL's managed implementation plan outlines the approach Ecology will take to meet these WLAs and ultimately achieve the water quality standard for dissolved oxygen in Lake Spokane.

This approach is spread over a twenty year managed implementation plan (MIP). During the first ten years of the MIP, efforts focus on phosphorus reduction to the Spokane River. For the Riverside Park Water Reclamation Facility, the first 5 years is needed to install technologies to achieve the limits of technology for phosphorus reduction and implement offset creation and management techniques. The second 5 years will optimize treatment operations, implement offset creation and management techniques and then data collection to establish scientifically defensible and supportable data sets for use in the Ten Year Assessment.

Before the end of the first ten years of the MIP, a thorough assessment will provide any necessary information to guide actions for the second ten year period. These second period actions will include continuation of successful measures conducted in the first 10 years, such as operation of the phosphorus treatment technology and other permanent phosphorous reduction efforts. They may also include new actions such as additional treatment technologies, consideration of river oxygenation, and/or reconsideration of Water Quality Standards applied to the River and Lake Spokane. If new information from the "Ten Year Assessment" justifies relaxing the WLAs and the WQBELs, the WQBELs will be relaxed. If so, the following section in federal regulation regarding "anti-backsliding" is applicable:

122.44(l) Reissued permits.

*1) **Except as provided in paragraph (1)(2)** of this section when a permit is renewed or reissued, interim effluent limitations, standards or conditions must be at least as stringent as the final effluent limitations, standards, or conditions in the previous permit (unless the circumstances on which the previous permit was based have materially and substantially changed since the time the permit was issued and would constitute cause for permit modification or revocation and reissuance under Sec. 122.62.)*

(2) In the case of effluent limitations established on the basis of Section 402(a)(1)(B) of the CWA, a permit may not be renewed, reissued, or modified on the basis of effluent guidelines promulgated under section 304(b) subsequent to the original issuance of such permit, to contain effluent limitations which are less stringent than the comparable effluent limitations in the previous permit.

*(i) **Exceptions**--A permit with respect to which paragraph (1)(2) of this section applies may be renewed, reissued, or modified to contain a less stringent effluent limitation applicable to a pollutant, if--*

Information is available which was not available at the time of permit issuance (other than revised regulations, guidance, or test methods) and which would have justified the application of a less stringent effluent limitation at the time of permit issuance; or

Ecology will establish WLAs and WQBELs on the best scientific information and interpretation available based on the facts that the "Ten Year Assessment" produces. Ecology will also examine and revise as needed the implementation of water quality based effluent limitations in terms of long term average versus monthly averages or maximums.

Phosphorus – In the Spokane River and Lake Spokane Dissolved Oxygen Total Maximum Daily Load – Water Quality Improvement Report, Table 3 gives the model input parameters. The DO TMDL uses a dry weather flow of 50.80 MGD to calculate the mass of the final water quality based effluent limitations (WQBELs). Based on assumptions including weekly sampling, a seasonal average of 42 ug/L was used for model inputs from the RPWRF. Table 5 gives the resulting Waste Load Allocations (WLAs) based on modeling scenario #1. The U.S. EPA model needed to express its input in average monthly lbs/day.

Based on best professional judgment the Department and dischargers agreed that 50 ug/L was the Limit of Technology (LOT) for phosphorus removal at a municipal wastewater treatment plant on an average seasonal basis during the collaboration for the development of the Foundational Concepts. However, the DO TMDL uses a 50 ug/L LOT as a monthly maximum for total phosphorus for all dischargers. TMDLs deal with maximum daily loads and strive for equality among sources. A consistent maximum monthly load, based on a 50 ug/L LOT for TP, accomplishes that.

The U.S. EPA converted a 50 ug/L maximum month to a seasonal average of 42 ug/L; based on assumptions of performance, log normal data distributions and sampling frequency for the Riverside Park Water Reclamation Facility. While performance data for wastewater treatment removing nutrients to low levels exist, the data sets are heavily influenced by significant quantities of data at the detection limit. It will take time to collect data from the as yet un-built treatment facility to derive a reliable statistical basis for better conversion of a maximum limit to monthly and weekly averages. There are no assurances that a log normal distribution will be present for all parameters of interest to make the appropriate conversions.

In the DO TMDL, WLA are set based on a seasonal average effluent concentration. For the Riverside Park Water Reclamation Facility, the equivalent mass is 17.8 lbs/day based on a flow of 50.8 MGD with an effluent concentration of 42 ug/l.

The Department and the Spokane River dischargers have funded a study to determine if all the total phosphorus in the wastewater effluent is biologically available for growth of aquatic organisms. The DO TMDL assumes 100% of the TP is available for growth. Preliminary results of the bio-available study indicate the fraction of TP available for growth is less than 1.

The Water Environment Research Foundation and CH2M-Hill have published studies indicating that in wastewater the digestion step of the total phosphorus analysis introduces compounds that interfere with a reliable, reproducible analytical result. Successful compliance monitoring requires reliable, reproducible results. A surrogate for the total phosphorus analysis appears to be desirable. Wastewater experts (The City of Spokane's Next Level of Treatment Peer Review Group) have suggested that the analysis for total reactive phosphorus is such an analysis.

The permittee will be required to submit a report establishing a ratio of total phosphorus to total reactive phosphorus and a ratio of total reactive phosphorus to bio-available phosphorus.

CBOD₅ - For the Riverside Park Water Reclamation Facility, RPWRF, the DO TMDL projects that compliance requires the effluent CBOD₅ concentration be less than 4.2 mg/L. The effluent limitation will express this as a mass limit for the season March 1 to October 31 of 1,778 lbs/day.

Ammonia - The interim ammonia limits are based on a potential for toxics impacts. The final effluent limits also considered the potential for toxic impacts with a resulting final daily maximum effluent limitation based on chronic toxicity. The ammonia limitations imposed by the DO TMDL are more stringent than limits required based on toxicity when the reasonable potential does exist.

The reasonable potential spreadsheet was used for each season. For the winter season, the low flow was for January 2001 and there was no reasonable potential. Winter is generally not a high flow period for the POTW. But, January 2006 was an exception and was used for a POTW flow (52.4 MGD). For the spring season, the low flow was for March 2001 and there was no reasonable potential. For the fall season, the low flow was for October 2006 and there was no reasonable potential. For the summer season, the low flow was for August 2001 and there was a reasonable potential.

As with total phosphorus in the previous "Foundational Concepts," seasonal averages were given for a spring, summer and fall season. In the DO TMDL the U.S. EPA converted these seasonal averages to monthly maximums and the monthly maximums to monthly averages based on assumptions of performance, log normal data distributions and sampling frequency. The spring season now also includes March.

The 3 seasons will have an average mass per day limit:

1. For the season of March 1 to May 30, the allowable mass of NH_3 is 351 lbs/day.
2. For the season of June 1 to September 30, the allowable mass of NH_3 is 88.9 lbs/day.
3. For the season of October 1 to October 31, the allowable mass of NH_3 is 351 lbs/day.

For the 3 parameters above, federal rules normally require effluent limitations to be expressed in terms of monthly and weekly averages and sometimes daily maximums for a toxicant. 40 CFR 122.45(d) does allow that if the normal monthly averages, weekly averages and daily maximum are impractical, alternatives such as an annual or seasonal limit may be appropriate. For the Spokane River and Spokane Lake system impractical means the water body does not respond in a measurable way to short term variations. Therefore, long term trend analysis and measurements descriptive of long term trends such as seasonal averages and seasonal totals are appropriate. For the municipal dischargers to the Spokane River and Spokane Lake system impractical also means that reliable data sets with log normal distributions for conversion of maximums to averages do not exist. In Chesapeake Bay, EPA recognized that temperature affected plant performance resulting in a skewed data set, making it impracticable to establish monthly and weekly averages. For Chesapeake Bay U.S. EPA cited reasons of temperature affecting plant performance resulting in a skewed data set. A skewed data set can also result when the low end of the data set is determined by the detection limit. Both reasons are currently present, leading to the conclusion that it is currently impracticable to establish monthly and weekly effluent limitations for all 3 parameters.

pH - The impact of pH during the critical low flow season was modeled using the calculations from EPA, 1988. The input variables were dilution factor 3.96, upstream temperature 16.8°C, upstream pH 8.5, upstream alkalinity 103 (as mg CaCO_3/L), effluent temperature 20.2°C, effluent pH of 6, effluent pH of 8, and effluent alkalinity 99 (as mg CaCO_3/L).

Under critical conditions there was no predicted violation of the Water Quality Standards for Surface Waters for pH. Water quality-based ammonia limits are derived using the assumption of certain maximum pH in the effluent. Therefore, the technology-based effluent limitation was used for minimum pH (6.0) and a performance-based limit (99%tile of historic effluent data from 2/93 – 8/97) was used for the upper pH limit (7.8). Temperature was not limited.

Fecal Coliform - The numbers of Fecal Coliform were modeled by simple mixing analysis using the technology-based limit of 400 organisms per 100 ml and a dilution factor of 3.96.

Under critical conditions there is no predicted violation of the Water Quality Standards for Surface Waters caused by the treatment plant discharge meeting the technology-based limit. Therefore, the technology-based effluent limitation for fecal coliform bacteria was placed in the proposed permit. There is evidence that the fecal coliform criterion is violated during significant CSO events from outfalls upstream of the WWTP discharge. This issue is being addressed under the compliance schedule for CSO reduction.

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: chlorine, ammonia, heavy metals, and a few organic compounds were also detected (see Table 1). A reasonable potential analysis was conducted on these parameters to determine whether or not effluent limitations would be required in this permit.

Ammonia removal for DO TMDL compliance will generally result in ammonia concentrations well below toxic levels. The exception is noted above and results in a daily maximum effluent limitation for the “summer” season.

The Spokane River has a TMDL for the heavy metals, cadmium, lead and zinc. The TMDL requires permit limits based on the more stringent of two methods to define effluent limits. The more stringent effluent limitations for cadmium and lead are based on the treatment performance of the facility plus 10% as laid out in the heavy metals TMDL. For zinc the more stringent effluent limit is a water quality based effluent limit. For cadmium and lead the stringent effluent limitation is the performance based limitation.

The performance-based limits for the Riverside Park Water Reclamation Facility were developed from low-level analytical data for dissolved metals obtained in the effluent sampling conducted by the City from January 2008 through July 2009.

The Department does low level monitoring of heavy metals in the Spokane River. For cadmium and lead, the exceedances of the water quality criteria are no longer routine. However, zinc concentrations in the Spokane River still routinely exceed the water quality criterion. The Water quality standards have been revised to reflect new information on partitioning of metals and toxicity that resulting in a higher maximum limitation but a lower average concentration.

There have not been violations of the metals effluent limitations by the City of Spokane water reclamation facility.

The Spokane River is also listed for violating criteria for total Polychlorinated Biphenyls (PCBs). Lake Spokane is also listed for violating water quality standards for 2,3,7,8 TCDDs, also known as Dioxins and Furans. While, a separate TMDL for these pollutants has been drafted, completion has been delayed. Monitoring of the Riverside Park Water Reclamation Facility influent and effluent for these pollutants is appropriate. Source identification is occurring and some subsequent cleanup activities are being implemented. Recent ambient monitoring also indicates the presence of polybrominated diphenyl ethers (PBDE). As an initial step toward future source identification, the wastewater influent and effluent will be monitored for PBDE.

The Clean Water Act has a goal of no discharge. For pollutants which are subject to pass through or partial pass through a wastewater treatment plant, such as PCBs, the permit will require identifying and eliminating the source the of PCBs (also Dioxins, Furans, and PBDEs) into the collection system. This is consistent with the state's basic Water Pollution Control Statute, Chapter 90.48 RCW and implementing rules (Ch. 173-216 WAC, Ch 173-220 WAC) beginning with the directive to "require the use of all known available and reasonable methods by industries and others to prevent and control the pollution of the waters of the state of Washington." The permit writer's manual includes guidelines for appropriate BMPs in, Chapter XII. Based on collection system monitoring results, this permit proposes source identification and cleanup activities following the administrative procedures for BMPs.

Source control will be difficult as common products such as some inks, paint, caulking and bar soap contain PCBs as manufacturing byproducts well above water quality standards. What sources can be found and are controllable should be found and controlled or eliminated.

The determination of the reasonable potential for the compounds identified in the effluent characterization (Table 1) which exceeded the water quality criteria end-of-pipe were evaluated with procedures given in EPA, 1991 (Appendix D) at the critical seasonal conditions. The seasonal critical conditions used to model aquatic toxicity are as follows:

	Winter Season (Nov – Feb)		Spring Season (March – May)		Summer Season (June – Sept)		Fall Season (Oct.)	
Parameter	Effluent	River	Effluent	River	Effluent	River	Effluent	River
pH (s.u.)	6.96	8.24	7.45	8.5	7.26	8.5	7.16	8.33
Temperature (°C)	16.6	10.6	16.8	12	21.2	19.7	18.7	13.9
Alkalinity (mg CaCO ₃ /L)	70	50	74	38	76	44	79	82
Hardness (mg CaCO ₃ /L)	50	55	50	36	50	71	50	100

Effluent limits were derived for ammonia and chlorine which were determined to have a reasonable potential to cause a violation of the Water Quality Standards after mixing. Effluent limits for silver and mercury were eliminated from this permit since new data obtained from using ultra low level analyses show that there is currently no reasonable potential for the WWTP effluent to cause exceedances of the water quality criterion for these parameters.

Effluent limits were calculated using methods from EPA, 1991 as shown in Appendix D. The resultant water quality-based effluent limits based on **toxicity** are as follows:

	Winter Season (Nov – Feb)		Spring Season (March – May)		Summer Season (June – Sept)		Fall Season (Oct.)	
Parameter	Monthly Ave.	Daily Max.	Monthly Ave.	Daily Max.	Monthly Ave.	Daily Max.	Monthly Ave.	Daily Max.
Ammonia, Total as N						7.5 mg/L		
Chlorine, Total Residual	8.5 µg/L	22.2 µg/L	8.5 µg/L	22.2 µg/L	8.5 µg/L	22.2 µg/L	8.5 µg/L	22.2 µg/L

Ammonia and chlorine limits have become less stringent than those in the last permit due to several different source of new information. The new information was used in calculating the revised limits. One factor for the chlorine limit was the use of an acute mixing zone description as result of the City's mixing zone study. This study provides new information that demonstrates more initial dilution of the effluent before having to meet the acute criteria. The U.S. EPA has also been revising the sensitivity of salmonids to ammonia. In addition, the collection of much more river and effluent data was used to better model the critical conditions of temperature and pH at the edge of the mixing zone.

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.

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 and will only be required to retest the effluent prior to application for permit renewal in order to demonstrate that acute toxicity has not increased in the effluent.

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 for submission with a permit application fails to meet the performance standards in WAC 173-205-020, "whole effluent toxicity performance standard". The Permittee may demonstrate to the Department that changes have not increased effluent toxicity by performing additional WET testing after the time the process or material changes have been made. Proposed upgrades however should result in less potential for effluent toxicity in the discharge.

The WET tests during effluent characterization indicate that no reasonable potential exists to cause receiving water chronic toxicity, and the Permittee will not be given a chronic WET limit and will only be required to retest the effluent prior to application for permit renewal in order to demonstrate that chronic toxicity has not increased in the effluent.

Toxicity is assumed to have increased if WET testing conducted for submission with a permit application fails to meet the performance standards in WAC 173-205-020, "whole effluent toxicity performance standard". The Permittee may demonstrate to the Department that changes have not increased effluent toxicity by performing additional WET testing after the time the process or material changes have been made.

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. Proposed upgrades however should result in less potential for effluent toxicity in the discharge.

The previous permit has required WET testing every other month. The testing has shown 100 % survival for the acute test and usually 100% survival and reproductive success in the chronic wet testing.

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 Department has determined that the effluent is likely to have chemicals of concern for human health. The discharger's high priority status is based on the discharger's status as a major discharger and knowledge of data or process information indicating regulated chemicals occur in the discharge,

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 determination indicated that the discharge has a reasonable potential to cause a violation of the human health-based water quality standards for arsenic. The calculated permit limits would be as follows:

Arsenic, Total Recoverable	Monthly Ave. 0.23 µg/L	Daily Max. 0.46 µg/L
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However, there is considerable uncertainty of the appropriateness of the human health-based arsenic criteria and the chemical availability of arsenic in the effluent. Due to the uncertainties of the criteria, available analytical methods for arsenic, and natural sources of arsenic in the environment, Ecology's Water Quality Program management has decided not to include human health-based limits for arsenic in permits. Instead, monitoring of the effluent will be required so that the necessary data will be available to assess the need for a permit modification if or when needed.

SEDIMENT QUALITY

The Department has promulgated aquatic sediment standards (Chapter 173-204 WAC) to protect aquatic biota and human health for marine waters and general considerations to consider for freshwaters. 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).

Section 173-204-400 provides guidance to evaluate the potential for sediment impacts. Local conditions being a key consideration:

- 1) Stream velocity is highly unlikely to result in deposition.
- 2) Sediment substrate is coarse sand, gravel and boulders.
- 3) WWTP TSS is low.

It is the Department's opinion that there is no 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 either the point of discharge is not an area of deposition or, if the point of discharge is a depositional area, that there is not an accumulation of toxics in the sediments.

I. GROUND WATER QUALITY LIMITATIONS

The Department has promulgated Ground Water Quality Standards (Chapter 173-200 WAC) to protect uses of ground water. Permits issued by the Department shall be conditioned in such a manner so as not to allow violations of those standards (WAC 173-200-100).

This Permittee has no discharge to ground and therefore no limitations are required based on potential effects to ground water.

Comparison of Interim Effluent Limits with the Existing Permit Issued, March 30, 2000

Main Plant Outfall 005A			Low Flow Season (July – Oct)	
Parameter	Existing Limits (conc./mass, ppd)		Proposed Limits (conc./mass, ppd)	
	Monthly Ave.	Average Weekly	Monthly Ave.	Average Weekly
BOD ₅ (mg/L)	30 / 10,759	45 / 16,138	Same	
TSS (mg/L)	30 / 10,759	45 / 16,138	Same	
Fecal Coliform (cfu/100 mL)	200	400	Same	
pH (s.u.)	6.0 – 7.8		Same	
Phosphorus (total, mg/L) Through Oct. 31	85% minimum monthly avg. removal		0.63	1.11
Parameter	Monthly Ave.	Max. Daily	Monthly Ave.	Max. Daily
Ammonia (total, mg/L)	1.61 / 577	6.33 / 2,270	Same	Same
Chlorine (total resid, µg/L)	8.5 / 3.0	22.2 / 8.0	Same	Same
Cadmium (Tot. Rec, µg/L)	0.188	0.327	0.076	0.233
Lead (Tot. Recov, µg/L)	1.98	3.18	0.772	1.34
Zinc (Tot. Recov, µg/L)	60.55	82.20	53.8	72.6
Mercury (total, µg/L)	NL**	NL**	NL**	NL**

Silver (total recov., µg/L)	NL**	NL**	NL**	NL**
Main Plant Outfall 005A		High Flow (Nov - June)		
Parameter	Monthly Ave.	Average Weekly	Monthly Ave.	Average Weekly
BOD ₅ (mg/L)	30 / 10,759	45 / 16,138	Same	
TSS (mg/L)	30 / 10,759	45 / 16,138	Same	
Fecal Coli. (cfu/100 mL)	200	400	Same	
pH (s.u.)	6.0 – 7.8		Same	
Phosphorus (total, mg/L) Beginning April 1	Monthly average 85% removal (seasonal)		0.63	1.11
Parameter	Monthly Ave.	Max. Daily	Monthly Ave.	Max. Daily
Ammonia (total, mg/L)	5.30 / 2,679	13.4 / 14,472		7.5
Chlorine (total resid, µg/L)	8.5 / 4.3	22.2 / 24.0	same	same
Cadmium (Tot. Rec, µg/L)	0.188	0.327	0.076	0.233
Lead (Tot. Recov, µg/L)	1.98	3.18	0.772	1.34
Zinc (Tot. Recov, µg/L)	60.55	82.20	53.8	72.6
Mercury (total, µg/L)	NL**	NL**	NL**	NL**
Silver (total recov., µg/L)	NL**	NL**	NL**	NL**
**NL = No Limit				

CSO Outfall 005B				
Fecal Coli. (cfu/100 mL)	200	400	None – outfall eliminated	
Chlorine (total resid, µg/L)	8	19		

FINAL EFFLUENT LIMITATIONS FOR COMPLIANCE WITH THE SPOKANE RIVER DO TMDL

Beginning **March 1, 2018** the Permittee must have installed the full phosphorus removal process train including chemical addition and have operational the technology needed to comply with the following effluent limitations during the season March 1 to October 31.

Beginning **March 1, 2021** the Permittee is authorized to discharge municipal wastewater at the permitted location subject to complying with the following limitations:

EFFLUENT LIMITATIONS^a: OUTFALL # 005A (March – Oct)		
Parameter	Seasonal Total	Maximum Daily
Carbonaceous Biochemical Oxygen Demand – 5 day (CBOD ₅) March 1 to Oct. 31 See notes e and f	1,778 lbs/day	
Total Phosphorus (as P) March 1 to Oct. 31 See notes e and f	17.8 lbs/day	
Total Ammonia (as NH ₃ -N)	See notes e and f	
For “season” of March 1 to May 31	351 lbs/day	
For “season” of June 1 to Sept. 30	89 lbs/day	7.5 mg/L
For “season” of Oct. 1 to Oct. 31	351 lbs/day	
EFFLUENT LIMITATIONS^a: OUTFALL # 005A		
Parameter	Average Monthly	Average Weekly
Carbonaceous Biochemical Oxygen Demand – 5 day (CBOD ₅) Nov. 1 thru Feb. ^e	30 mg/L, 8,775 lbs/day	45 mg/L, 13,162 lbs/day
Total Suspended Solids ^e	30 mg/L, 8,775 lbs/day	45 mg/L, 13,162 lbs/day
Fecal Coliform Bacteria	200/100 mL	400/100 mL
pH	Daily minimum is equal to or greater than 6 and the daily maximum is less than or equal to 9.	
Parameter	Average Monthly	Maximum Daily^b
Total Residual Chlorine ^c	8.5 µg/L, 4.3 lbs/day	22.2 µg/L, 24.0 lbs/day
Cadmium (tot. recoverable)	0.076 µg/L	0.233 µg/L
Lead (tot. recoverable)	0.772 µg/L	1.34 µg/L
Zinc (tot. recoverable)	53.8 µg/L	72.6 µg/L
a. The average monthly and weekly effluent limitations are based on the arithmetic mean of the samples taken with the exception of fecal coliform, which is based on the geometric mean.		
b. The maximum daily effluent limitation is defined as the highest allowable daily discharge. The daily discharge means the discharge of a pollutant measured during a calendar day. For pollutants with limitations expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For other units of measurement, the daily discharge is the average measurement of the pollutant over the day.		
c. Indicates the range of permitted values. When pH is continuously monitored, excursions		

between 5.0 and 6.0, or 9.0 and 10.0 shall not be considered violations provided no single excursion exceeds 60 minutes in length and total excursions do not exceed 7 hours and 30 minutes per month. Any excursions below 5.0 and above 10.0 are violations. The instantaneous maximum and minimum pH shall be reported monthly.
d. The given limits of 30 mg/L and 45 mg/L are default values. During data gathering for the "Ten Year" assessment performance based limits will be calculated.
e. Compliance will be based on a combining of the effluent quality, pollutant equivalencies in term of oxygen depletion and the DO TMDL and pollutant credit earned from implementation of the Offset Plan.
f. See compliance schedule item S15.A for reporting of Offset Plan mass earned and expended.

J. IMPLEMENTATION OF THE MANAGED IMPLEMENTATION PLAN

The collaborative effort that led to the development of the current Managed Implementation Plan contains the following agreed actions which are pertinent to the proposed permit.

The agreed actions are:

- **Technology Selection Protocol:** The City of Spokane will prepare, and submit to Ecology for approval, a comprehensive technology selection protocol for choosing the most effective feasible technology for seasonally removing phosphorus from their effluent with an objective of achieving a discharge with seasonal average 50µg/l phosphorus or lower. Pilot testing is a significant part of the protocol and has appropriate provisions for oversight, quality assurance and control. The protocol includes a preliminary schedule for construction of the treatment technology.
- **Offset Plan:** Not a requirement in the proposed permit. In the next permit cycle it is anticipated that an Offset Plan will be required. The future offset plan is anticipated to address a schedule for offset creation and trading, other phosphorus removal actions such as conservation, effluent re-use, source control through support of regional phosphorus reduction efforts (such as limiting use of fertilizers and dishwasher detergents), and supporting regional non-point source control efforts to be established. The offset plan, in combination with the phosphorus reduction from technology, will provide reasonable assurance of meeting the City of Spokane's final effluent limitations given in S.1.B. Subsequent updates will include an annual assessment of the previous year's offset creation and management effort, an accounting of offset credits earned, expended and available for trading. Based on lessons learned from ongoing studies and evaluations of previously implemented best management practices, the report shall make recommendations for the upcoming year.

• **Engineering Report:** After the City of Spokane concludes the technology selection protocol, the permittee 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 (if necessary) be accompanied by amendments to the schedule and substance of the target pursuit actions so that in combination with the Engineering Report on expected technology performance, there is reasonable assurance of meeting the target in ten years. As the DO TMDL was being finalized a question was raised regarding the equivalency of CBOD₅, Total Phosphorus and Ammonia to one another for purposes of offsets or pollutant credit trading within a permit or between permittees. The modeling done to date for the DO TMDL does not provide an answer. The engineering report will be the document where pollutant equivalencies are presented for the Department review and documented.

The Engineering Report is to address the following topics based on rule requirements, pollutant equivalency consideration, potential for offset creation and management including trading, etc:

- 1) Population projections by year for the next 20 years;
- 2) Loading projections, flow, TP, CBOD, Ammonia, and TN;
- 3) Wastewater treatment processes needed to reliably comply with the CBOD₅, NH₃ and TP WLAs of the Spokane River and Lake Spokane Dissolved Oxygen TMDL; including loadings potentially bypassed in a “blending event,” and requiring an offset or pollutant equivalency consideration;
- 4) projection of loading removed for TP, CBOD, Ammonia, and TN;
- 5) projection of offset(s) and other actions needed for compliance with DO TMDL that reduce TP, CBOD and ammonia loadings to the final effluent and the river;
- 6) options considered to generate offset(s);
- 7) recommended offset option and/or other actions (such as water reclamation and offset generating options if projected to be needed);
- 8) timeline of offsets and other DO compliance actions to be needed and implementation schedule to achieve DO TMDL compliance;
- 9) site options and process options for future addition of process elements and offset generating activities to achieve the final equivalent effluent limitations and water reclamation requirements as described in Chapter 173-219 WAC “Reclaimed Water Use.”;
- 10) establish a ratio of total phosphorus (TP) to total reactive phosphorus (TRP) and a ratio of total reactive phosphorus (TRP) to bio-available phosphorus;
- 11) findings from the University of Washington / WERF bioavailability lab study;
- 12) subsequent monitoring and modeling of bioavailable phosphorus impacts in Lake Spokane;
- 13) the pounds of phosphorus that are not bio-available, not reactive and not a nutrient source that contribute to the total phosphorus waste load allocation;

- 14) recommended adjustment potentially made to the effluent limitations needed for compliance with the DO TMDL because of non bio-available phosphorus in the effluent;
- 15) The plan update, in combination with the pollutant reduction from technology, shall provide reasonable assurance of meeting the Permittee's Waste Load Allocations in ten (10) years; and
- 16) Update analysis of CSO control options and no feasible alternative option for expansion of the treatment facilities to avoid "blending" of fully treated effluent and partially treated effluent during CSO events.

• **Interim Limits:** This portion of the original Foundational Concepts has been superseded by the new DO TMDL.

• **Final Limits:** Final limits based on the DO TMDL WLA will be expressed as total mass (lbs.) for the applicable season until a satisfactory data base exist to calculate appropriate seasonal, monthly, or weekly averages. The effectiveness of the TMDL and the permit limits will be evaluated at the 10 year assessment discussed in the managed implementation plan. If necessary and appropriate, new WQBELs may be established based on the result of the 10 year assessment.

The Clean Water Act generally prohibits relaxing effluent limits in reissued permits. However, exceptions are provided for in the anti-backsliding rule provisions. For example, new information, which would have justified less stringent effluent limits had it been available, can be used to justify relaxing effluent limits in reissued permits (see section 402(o)(2) of the Act). If the revised WQBELs are less stringent based on such new information, this anti-backsliding exception would apply.

• **Investment Stability:** The investment in phosphorus removal technology is recognized by Ecology as having a 20-year life, and no significant modifications or replacements of phosphorus removal facilities will be required during the term of the MIP. Modifications to installed technology that best available data indicate would enhance phosphorus removal performance and are efficient and cost-effective may be required.

• **Conservation:**

The City of Spokane wastewater management division in cooperation with water purveyors, will as soon as possible develop individual and regional programs that reduce flows by funding "LOTT-style" indoor conservation efforts that target 20% water conservation per household in older urban areas and 10% water conservation per household in newer (post 1992) urban areas. These programs will have local ordinances, avoided cost investment principles and per connection expenditures similar to the LOTT program. To the extent these actions are demonstrated as reducing phosphorus loading to the river, they will be recognized as contributing toward achieving phosphorus waste load targets.

• **Class A Effluent:** The City of Spokane's RPWRF will, through their technology updates, produce effluent meeting the State of Washington Class A reclaimed water quality standards in place when the MIP takes effect.

Start Up: The compliance schedule anticipates a period of time for an operational shake down period to establish consistent reliable performance (possibly two years) and allows a couple years of data collection prior to the ten year assessment. The permit will have a compliance schedule to implement planning, design and construction of phosphorus removal process elements. The Department does acknowledge that the following schedule is aggressive and may need to be amendment in the future upon request based on new information including progress made and appropriate justification.

Similarly, the permit compliance schedule requires submission of updates to the Offset Plan including an annual assessment of progress and lessons learned.

COMPLIANCE SCHEDULE AND A REQUIREMENT FOR A ENGINEERING REPORT UPDATE

The proposed DO TMDL and the subsequent managed implementation plan are anticipated to require additional treatment facilities to remove phosphorus and oxygen consuming pollutants.

The City of Spokane will produce the following deliverables on or before the date given:

Item	Date
Annual Offset Plan Update	February (Initial submission in 2013)
Anticipated Pilot Testing Conclusion	Dec. 1, 2010
Engineering Report submitted	January 3, 2013
Submission of Contract Documents for construction of phosphorus removal process units to achieve Final TP effluent limitations	June 30, 2014
Certificate of Construction and Start up Completion for Compliance with Spokane River and Lake Spokane DO TMDL WLAs	March 1, 2018

The "Annual Offset Plan Update" is intended to 1) keep the Department and the public informed of the progress being made with "offset" management efforts and 2) to form the basis and framework for "offset" credit trading for CBOD₅, Total Phosphorus and Ammonia. The contents of the plan shall include an annual assessment of the previous year's offset management effort, an accounting of "offset" credits earned, expended and available for trading. Based on lessons learned from ongoing studies and evaluations of previously implemented best management practices, the report shall make recommendations for the upcoming year.

IV. 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, the effluent limitations are being achieved and the receiving water standards are being met for selected parameters.

Monitoring of sludge quantity and quality is necessary to determine the appropriate uses of the sludge. Sludge monitoring is required by the current state and local solid waste management program and also by EPA under 40 CFR 503.

The monitoring schedule is detailed in the proposed permit under Condition S2. Specified monitoring frequencies take into account the quantity and variability of discharge, the treatment method, past compliance, significance of pollutants, and cost of monitoring.

As a pretreatment Publicly Owned Treatment Works (POTW), the City of Spokane is required to have influent, primary clarifier effluent, final effluent, and sludge sampled for toxic pollutants in order to characterize the industrial input. Sampling is also done to determine if pollutants interfere with the treatment process or pass through the plant to the sludge or the receiving water. The monitoring data will be used by the City of Spokane and Spokane County to develop local limits which commercial and industrial users must meet. The monitoring data will also be used by the City of Spokane and Spokane County to develop source controls programs for phosphorus, mercury, Total PCBs, Dioxins, Furans and PBDEs possibly including educational efforts.

K. EFFLUENT LIMITS BELOW QUANTITATION

The water quality-based effluent limits for chlorine and arsenic in the wastewater are below 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. The Method Detection Level (MDL) is the minimum concentration of an analyte that can be measured and reported with a 99 percent confidence that its concentration is greater than zero as determined by a specific laboratory method.

L. EFFLUENT LIMITS BELOW DETECTION

The water quality-based effluent limit for chlorine in the wastewater is below the capability of current analytical technology to detect. For maximum daily limits, if the concentrations are below the MDL the Permittee reports ND for non-detectable. For average monthly limits, all values above the MDL are used as reported and all values below the MDL are calculated as zero.

M. 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:

General Chemistry			
Parameter Name	Method	Reference	Matrix *
Alkalinity, Total	2320 B(4c)	SM	N
Ammonia (NH ₃ -N)	4500	SM 18	N
Biochemical Oxygen Demand, BOD/CBOD	5210 B	SM	N
Chlorine Residual, Total	4500-Cl G	SM	N
Dissolved Oxygen	4500-O C	SM	N
Dissolved Oxygen	4500-O G	SM	N
Nitrate	353.2	EPA	N
Nitrate + Nitrite	353.2	EPA	N
Nitrite	353.2	EPA	N
pH	4500-H	SM	N
Phosphorus, Total	4500-PF	EPA	N
Phosphorus, Ortho	4500-PF	EPA	N
Solids, Total	2540 B	SM	N
Solids, Total Suspended	2540 D	SM	N
Solids, Total Volatile	2540 E	SM	N
Microbiology			
Parameter Name	Method	Reference	Matrix *
Fecal Coliforms (A-1)	9221 E(2)	SM 18	N
* Matrix key: D = drinking water; N = non-potable water; S = solids/chem materials; A = air			

The permit appendix A lists recommended analytical protocols, because of the significance of nutrient (phosphorus and ammonia) monitoring to the DO TMDL, either the permit appendix A recommended analytical protocol for total phosphorus is required or U.S. EPA method 365.3. For either a required reporting limit of 5 ug/L is required. The recommended analytical protocols for total ammonia (as N) is required with a required reporting limit of 50 ug/L.

The POTW laboratory is accredited by the Washington State Department of Ecology for analysis of PO4-P by the EPA method 365.3, Phosphorus, all forms, Colorimetric, Ascorbic Acid, Two Reagent. The lab's accreditation number is M1455.

Process samples are collected as 24 composite, flow proportioned, refrigerated at 4 degrees Celsius. River and Lake samples are collected as grab samples and are stored on ice until either refrigerated or analyzed. All samples are analyzed within the required time period.

V. OTHER PERMIT CONDITIONS

N. 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).

O. PREVENTION OF FACILITY OVERLOADING

Overloading of the treatment plant is a violation of the terms and conditions of the permit. To prevent this from occurring, RCW 90.48.110 and WAC 173-220-150 require the Permittee to take the actions detailed in proposed permit requirement S4 to plan expansions or modifications before existing capacity is reached and to report and correct conditions that could result in new or increased discharges of pollutants. Condition S4 restricts the amount of flow.

P. RECLAMATION AND REUSE

The Managed Implementation Plan envision reclamation and reuse as being integral to the long term success of the Spokane River DO TMDL. The proposed permit will have two reuse sections.

The first permit section for Reclamation and Reuse will be for small scale pilot and demonstration project(s) to test the feasibility of a reclamation and reuse proposal. Typically small scale pilot projects have been received dual agency oversight through the engineering review and approval process with appropriate follow up and reporting of the project. That process will be kept in place for this permit.

The second permit section will be for long term implementation of successful demonstrations of reclamation and reuse pilot projects. The proposed section will include the general elements of current reclamation permit requirements developed by the Departments of Health and Ecology for other reclamation and reuse facilities. When the permittee is ready to implement a proposal, a request will be submitted to the Departments of Health and Ecology for review and potential approval. Following approval, the permit will be reopened and modified to include appropriate monitoring schedule, water quality limitations, reliability requirements, operation and maintenance requirements and reporting.

Q. OPERATION AND MAINTENANCE (O&M MANUAL)

The proposed permit contains condition S5 as authorized under RCW 90.48.110, WAC 173-220-150, Chapter 173-230 WAC, and WAC 173-240-080. It is included to ensure proper operation and regular maintenance of equipment, and to ensure that adequate safeguards are taken so that constructed facilities are used to their optimum potential in terms of pollutant capture and treatment. The POTW has undergone significant upgrades in the last several years. The updated O&M manual is now in electronic format on the computer control system at the POTW. As additional process improvements are made, revisions to the O&M manual can also be inputted to the electronic system.

R. RESIDUAL SOLIDS HANDLING

To prevent water quality problems the Permittee is required in permit condition S7 to store and handle all residual solids (grit, screenings, scum, sludge, and other solid waste) in accordance with the requirements of RCW 90.48.080 and State Water Quality Standards.

The final use and disposal of sewage sludge from this facility is regulated by U.S. EPA under 40 CFR 503, and by Ecology under Chapter 70.95J RCW and Chapter 173-308 WAC. The disposal of other solid waste is under the jurisdiction of the Spokane County Health Department.

S. PRETREATMENT

To provide more direct and effective control of pollutants discharged, the City of Spokane and Spokane County have been delegated permitting, monitoring and enforcement authority for industrial users discharging to their treatment system. The Department oversees the delegated Industrial Pretreatment Program to assure compliance with federal pretreatment regulations (40 CFR Part 403) and categorical standards and state regulations (Chapter 90.48 RCW and Chapter 173-216 WAC).

A meeting was held on October 20, 2004 at the Department of Ecology Eastern Regional Office on the subject of Spokane-area pretreatment. The following are items that staff of the Department of Ecology, City of Spokane, Spokane County, and the City of Spokane Valley agreed upon pertaining to Delegated Pretreatment Programs in the Spokane area:

- 1) Spokane County has the authority to administer its Delegated Pretreatment Program to their present and future sewer customers located within their designated sewer service areas in Spokane County and in the City of Spokane Valley. For the purpose of this meeting, this applies to customers who contribute wastewater into the Spokane County sewer collection system and are located outside of the corporate limits of the City of Spokane and within the City of Spokane Valley and Spokane County. Existing permitted facilities that this applies to are Ecolite Mfg Co., Galaxy Compound Semiconductors, Inc.; Honeywell Electronic Materials, Inc.; Lloyd Industries LLC, Kemira Water System, American On-Site Services and Novation, Inc. in the City of Spokane Valley, and the Mica Landfill in Spokane County.

The County acknowledges that as owner and operator of a wastewater collection system it is their responsibility to protect their infrastructure, and by agreement the infrastructure of the downstream POTW, and accepts the obligations of a Delegated Pretreatment Program.

- 2) The City of Spokane has the authority to administer its delegated Pretreatment Program to their present and future sewer customers located within their designated sewer service areas in City of Spokane Valley, in Spokane County, and in the City of Spokane. For the purpose of this meeting, this applies to customers who contribute wastewater into the City of Spokane sewer collection system and are located either within or outside of the corporate limits of the City of Spokane. Existing permitted facilities that this applies to are Brenntag Pacific in the City of Spokane Valley, and Goodrich, Johnna Beverages, and Reliance Trailer in the West Plains Area of Spokane County. The City acknowledges that as owner and operator of a wastewater collection system and POTW it is their responsibility to protect their infrastructure, and accepts the obligations of a Delegated Pretreatment Program.
- 3) Both the City of Spokane and Spokane County, as the control authority for their Delegated Pretreatment Programs, will continue to enforce and update, if necessary and appropriate, their interlocal agreements and/or multijurisdictional pretreatment agreements with "contributing" jurisdictions such as Millwood, and Airway Heights. Some of these actions may include conducting Industrial User Surveys, monitoring, and permitting commercial and/or industrial users.
- 4) The agreements reached in the October 20th meeting are based upon individual and collective understanding of applicable laws, rules, regulations, and agreements pertaining to NPDES pretreatment requirements and programs in Washington State, and upon legal opinions provided by Spokane County and the City of Spokane Valley dated October 11, 2004 and October 12, 2004 respectively.

An industrial user survey is required to determine the extent of compliance of all industrial users of the sanitary sewer and wastewater treatment facility with federal pretreatment regulations (40 CFR Part 403 and Sections 307(b) and 308 of the Clean Water Act), with state regulations (Chapter 90.48 RCW and Chapter 173-216 WAC), and with local ordinances.

As sufficient data becomes available, the Permittees shall, in consultation with the Department, reevaluate their local limits in order to prevent pass through or interference. Upon determination by the Department that any pollutant present causes pass through or interference, or exceeds established sludge standards, the Permittees shall establish new local limits or revise existing local limits as required by 40 CFR 403.5.

In addition, the Department may require revision or establishment of local limits for any pollutant that causes an exceedance of the Water Quality Standards or established effluent limits, or that causes whole effluent toxicity. Although the maximum effluent concentration reported in the NPDES application does not exceed the reasonable potential criterion for mercury.

Mercury in the effluent equaled or exceeded the chronic water quality criteria seven times from January 2002 through October 2004. It is the Department's determination that the Permittees need to develop and implement a mercury abatement and control program

Additional Mercury Plan development guidance can be found at the following locations:

Ecology Mercury website	http://www.ecy.wa.gov/mercury/
For Dental Plan guidance	http://www.ecy.wa.gov/dentalbmps/index.html
Reduction Plan guidance	http://www.ecy.wa.gov/biblio/0303001.html

The Department may modify this permit to incorporate additional requirements relating to the establishment and enforcement of local limits for pollutants of concern

Requirements for Performing an Industrial User Survey

This POTW has the potential to serve significant industrial or commercial users and is required to perform an Industrial User Survey. The goal of this survey is to develop a list of SIUs and PSUIs, and of equal importance, to provide sufficient information about industries which discharge to the POTW, to determine which of them require issuance of State waste discharge permits or other regulatory controls. An Industrial User Survey is an important part of the regulatory process used to prevent interference with treatment processes at the POTW and to prevent the exceedance of water quality standards. The Industrial User Survey also can be used to contribute to the maintenance of sludge quality, so that sludge can be a useful biosolids product rather than an expensive waste problem.

An Industrial User Survey is a rigorous method for identifying existing, new, and proposed significant industrial users and potential significant industrial users. A complete listing of methodologies is available in the Department of Ecology guidance document entitled "Conducting an Industrial User Survey".

T. SPILL PLAN

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.

U. COMBINED SEWER OVERFLOWS

In accordance with RCW 90.48.480 and Chapter 173-245 WAC, proposed permit Condition S.13 requires the Permittee to monitor CSO discharges, update and maintain a public notification system, submit an updated CSO inspection and maintenance plan, submit a revised CSO monitoring plan and river monitoring plan, submit an annual Combined Sewer Overflow (CSO) report and to update its CSO reduction plan at the time of permit renewal and submit an annual progress report of planning, design and construction activities including identifying potential difficulties that could result in delays and how the difficulties will be addressed. No later than **December 31, 2017**, the CSO system shall meet all final State and Federal requirements applicable to discharges from a CSO.

V. GENERAL CONDITIONS

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

VI. PERMIT ISSUANCE PROCEDURES

W. PERMIT MODIFICATIONS

The Department may modify this permit to impose numerical limitations, if necessary to meet Water Quality Standards, Sediment Quality Standards, or Ground Water Standards, 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.

X. RECOMMENDATION FOR PERMIT ISSUANCE

This proposed permit meets all statutory requirements for authorizing a wastewater discharge, including those limitations and conditions believed necessary to protect human health, aquatic life, and the beneficial uses of waters of the State of Washington. The Department proposes that this permit be issued for 5 years.

VII. REFERENCES FOR TEXT AND APPENDICES

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.

Metcalf and Eddy.

1991. Wastewater Engineering, Treatment, Disposal, and Reuse. Third Edition.

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.

*Fact Sheet for NPDES Permit WA-002447-3
City of Spokane's Riverside Park Water Reclamation Facility (the POTW) &
Spokane County Flows and Pretreatment Programs
for both the City of Spokane and Spokane County*

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>)

Washington State Department of Ecology.

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

Water Pollution Control Federation.

1976. Chlorination of Wastewater.

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

1979. In-stream Deoxygenation Rate Prediction. Journal Environmental Engineering Division, ASCE. 105(E2). (Cited in EPA 1985 op.cit.)

U.S. EPA Office of Water MEMORANDUM of March 3, 2004 Regarding: Annual Permit Limits for Nitrogen and Phosphorus for Permits Designed to Protect Chesapeake Bay and its tidal tributaries from Excess Nutrient Loading under the National Pollutant Discharge Elimination System.

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 or found on Ecology's web site at http://www.ecy.wa.gov/programs/wq/permits/eastern_permits.html.

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, (509) 329-3400 or by writing to the address listed above.

This permit and fact sheet were written by Richard A. Koch, P.E.

APPENDIX B - GLOSSARY

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

AKART - An acronym for "all known, available, and reasonable methods of prevention, control, and 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 highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month (except in the case of fecal coliform). The daily discharge is calculated as the average measurement of the pollutant over the day.

Average Weekly Discharge Limitation - The highest allowable average of daily discharges over a calendar week, calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week. The daily discharge is calculated as the average measurement of the pollutant over the day.

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.

CBOD₅ - The quantity of oxygen utilized by a mixed population of microorganisms acting on the nutrients in the sample in an aerobic oxidation for five days at a controlled temperature of 20 degrees Celcius, with an inhibitory agent added to prevent the oxidation of nitrogen compounds. The method for determining CBOD₅ is given in 40 CFR Part 136.

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 pollutant 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.

Combined Sewer Overflow (CSO) - The event during which excess combined sewage flow caused by inflow is discharged from a combined sewer, rather than conveyed to the sewage treatment plant because either the capacity of the treatment plant or the combined sewer is exceeded.

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 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 a minimum of four 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 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 User - A discharger of wastewater to the sanitary sewer which is not sanitary wastewater or is not equivalent to sanitary wastewater in character.

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.

Infiltration and Inflow (I/I) - "Infiltration" means the addition of ground water into a sewer through joints, the sewer pipe material, cracks, and other defects. "Inflow" means the addition of precipitation-caused drainage from roof drains, yard drains, basement drains, street catch basins, etc., into a sewer.

Interference - A discharge which, alone or in conjunction with a discharge or discharges from other sources, both:

Inhibits or disrupts the POTW, its treatment processes or operations, or its sludge processes, use or disposal and;

Therefore is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation) or of the prevention of sewage sludge use or disposal in compliance with the following statutory provisions and regulations or permits issued thereunder (or more stringent State or local regulations): Section 405 of the Clean Water Act, the Solid Waste Disposal Act (SWDA) (including title II, more commonly referred to as the Resource Conservation and Recovery Act (RCRA), and including State regulations contained in any State sludge management plan prepared pursuant to subtitle D of the SWDA), sludge regulations appearing in 40 CFR Part 507, the Clean Air Act, the Toxic Substances Control Act, and the Marine Protection, Research and Sanctuaries Act.

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 - A volume 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.

Pass Through - A discharge which exits the POTW into waters of the State in quantities or concentrations which, alone or in conjunction with a discharge or discharges from other sources, is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation), or which is a cause of a violation of State water quality standards.

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.

Potential Significant Industrial User - A potential significant industrial user is defined as an Industrial User which does not meet the criteria for a Significant Industrial User, but which discharges wastewater meeting one or more of the following criteria:

- a. Exceeds 0.5 % of treatment plant design capacity criteria and discharges <25,000 gallons per day or;
- b. Is a member of a group of similar industrial users which, taken together, have the potential to cause pass through or interference at the POTW (e.g. facilities which develop photographic film or paper, and car washes).

The Department may determine that a discharger initially classified as a potential significant industrial user should be managed as a significant industrial user.

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

Significant Industrial User (SIU) -

- 1) All industrial users subject to Categorical Pretreatment Standards under 40 CFR 403.6 and 40 CFR Chapter I, Subchapter N and;
- 2) Any other industrial user that: discharges an average of 25,000 gallons per day or more of process wastewater to the POTW (excluding sanitary, noncontact cooling, and boiler blow-down wastewater); contributes a process wastestream that makes up 5 percent or more of the average dry weather hydraulic or organic capacity of the POTW treatment plant; or is designated as such by the Control Authority* on the basis that the industrial user has a reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement (in accordance with 40 CFR 403.8(f)(6)).

Upon finding that the industrial user meeting the criteria in paragraph 2, above, has no reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement, the Control Authority* may at any time, on its own initiative or in response to a petition received from an industrial user or POTW, and in accordance with 40 CFR 403.8(f)(6), determine that such industrial user is not a significant industrial user.

*The term "Control Authority" refers to the Washington State Department of Ecology in the case of non-delegated POTWs or to the POTW in the case of delegated POTWs.

State Waters - Lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, wetlands, 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.

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 are the particulate materials 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.

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 or mass 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

Water Quality Data for the Spokane River

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/programs/wq/wastewater/index.html>

WQ Monitoring Station (54A120) at riverside state park

date	time	COND (umhos/cm)	FC (#/100ml)	FLOW (CFS)	HH3_IJ (mg/L)	HO2_HO3 (mg/L)	OP_DIS (mg/L)	OXYGEN (mg/L)	PH (pH)	PRESS (mmHg)	SUSSOL (mg/L)	TEMP (deg C)	TP_P (mg/L)	TPH (mg/L)	TURB (NTU)
10/5/2005	8:15	128	34	2130	0.01	0.602	0.0059	9.74	7.94	719.074	2	12	0.0119	0.692	0.8
11/9/2005	8:00	130	13	3100	0.01	0.531	0.015	10.7	8.06	717.55	1	7.8	0.0226	0.573	0.7
12/7/2005	7:50	126	4	3480	0.01	0.517	0.019	11.9	8.09	725.17	1	4.2	0.03	0.572	0.6
1/11/2006	7:55	103	600	10100	0.041	2.77	0.053	12.4	7.52	705.866	372	4.5	0.193	3.02	230
2/8/2006	7:55	93	3	9380	0.01	0.574	0.013	13.5	7.84	719.328	3	4.1	0.0186	0.595	2.4
3/8/2006	7:40	94	3	7900	0.01	0.596	0.015	12.97	7.74	711.962	6	3.7	0.0219	0.63	6.9
4/12/2006	7:55	68	2	16700	0.01	0.273	0.0087	13.9	7.39	711.962	6	5	0.0142	0.361	3.7
5/3/2006	7:45	67	5	18400	0.01	0.149	0.0048	13.3	7.93	720.344	6	7.8	0.006	0.24	2.3
6/7/2006	7:35	78	11	9710	0.01	0.227	0.0051	10.19	7.87	713.994	3	15.6	0.0086	0.285	1.3
7/12/2006	7:45	159	23	2490	0.01	0.691	0.0059	8.48	7.98	719.074	2	U	0.0109	0.757	0.8
8/9/2006	7:45	286	33	741	0.01	2.27	0.014	8.82	8.31	727.71	2	14.3	0.0293	2.57	0.8
9/13/2006	7:15	286	120	1630	0.01	1.32	0.0072	9.49	8.35	727.202	4	12.2	0.0234	1.41	1.1

date	time	ALK (mg/L)	COND (umhos/cm)	DOC (mg/L)	FC (#/100ml)	FLOW (CFS)	HARD (mg/L)	HH3_IJ (mg/L)	HO2_HO3 (mg/L)	OP_DIS (mg/L)	OXYGEN (mg/L)	PH (pH)	PRESS (mm/Hg)	SUSSOL (mg/L)	TEMP (deg C)	TOC (mg/L)	TP_P (mg/L)	TP_P_ICP (mg/L)	TPH (mg/L)	TURB (NTU)	
10/2/2007	12:50	62.1	209	1.3	33	1640	93.2	0.01	1.27	0.01	10	8.33	700.66	2	11.0	1.5	0.024	0.0227	1.38	1.6	
11/13/2007	12:15		172	1	U	7	2140		0.01	1.01	0.024	10.7	709.93	1	8.5	1.3	0.03		1.12	0.6	
12/11/2007	13:35	40	127	1.1	4	3710	53.9	0.01	0.717	0.023	11.91	8.01	711.700	2	5.3	1.4	0.029		0.757	1	
1/14/2008	12:30		150	1.7	3	3230		0.011	1.14	0.064	11.91	7.95	709.93	3	5.1	1.9	0.0700		1.24	3.6	
2/19/2008	12:55	51.3	150	1.9	9	3050	62.1	0.01	1.31	0.0703	12.32	7.91	705.104	2	4.3	2.1	0.0786		1.29	4.9	
3/10/2008	12:10		136	2.2	7	4540		0.01	2.64	0.0574	12.22	7.77	711.2	14	4.7	2.3	0.0813		3.00	11	
4/14/2008	13:15	30	100	1.8	260	6620	36.0	0.01	0.817	0.0479	11.77	7.70	705.350	6	7.2	2.2	0.0626		0.893	4.3	
5/12/2008	12:45		65	1.7	3	21000		0.01	0.191	0.0032	13.46	7.73	716.20	6	8	1.9	0.0089		0.27	3.1	
6/10/2008	15:20	22	59	1.4	7	20300	24.1	0.01	0.193	0.004	11.45	7.82	716.346	4	12.1	1.5	0.011		0.264	2.6	
7/15/2008	13:45		140	1.1	42	3890		0.01	0.793	0.0051	9.34	8.39	714.240	2	19.7	U	0.01		0.857	0.8	
8/12/2008	12:35	85.6	216	1	U	13	1570	95.4	0.01	1.38	0.0057	9.94	8.1	713.74	1	15.7	U	0.015		1.57	0.5
9/16/2008	12:30		202	1	U	12	1620		0.01	1.33	0.0002	9.3	8.17	713.74	2	14.8	U	0.019		1.46	0.5

*Fact Sheet for NPDES Permit WA-002447-3
City of Spokane's Riverside Park Water Reclamation Facility (the POTW) &
Spokane County Flows and Pretreatment Programs
for both the City of Spokane and Spokane County*

Effluent and Receiving Water Critical Conditions							
Facility:	RPWRF			Design Case:	Reasonable Potential - Spring		
Receiving Water:	Spokane River Spring						
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)	41.76	41.76	82.50	1189.19	1664.87	3567.58	25
(cfs)	64.61	64.61	127.65	1840.00			
Critical Temp (°C)	16.80	Effluent Data		12.00	Receiving Water Data		
(°F)	62.2			53.6			
Critical Hardness (mg/L CaCO3)	50.00			34.00			
Critical pH (s.u.)	7.45			8.50			
Critical Alkalinity (mg/L as CaCO3)	74.00			38.00			
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	1.36	8.12	29.48	10.97	22.36		
(% effluent)	73.51	12.32	3.39	9.12	4.47		
Hardness	45.76	35.97	34.54	-	-		
Alkalinity	64.46	42.43	39.22	-	-		
Max pH (s.u.)	7.53	8.02	8.30	-	-		
Max Temp (°C)	15.53	12.59	12.16	-	-		
Max Temp (°F)	59.95	54.66	53.89	-	-		

Summary of Effluent Reasonable Potential Determination & Limits												Facility Receiving Water Design Case	RPWRF Spokane River Spring Reasonable Potential - Spring	
					Receiving Water	Acute Boundary		Chronic Boundary				Permit Limits		
POLLUTANT	priority pollutant?	standard	Maximum Expected (or 50%) Effluent Concentration, µg/L	Does reasonable potential exist?	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	
AMMONIA, unionized	N	WQ Stnd	4875.6	NO	10.0	12693.4	3586.7	1258.4	609.3					

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City of Spokane's Riverside Park Water Reclamation Facility (the POTW) &
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Effluent and Receiving Water Critical Conditions							
Facility: RPWRF			Design Case: Reasonable Potential Summer				
Receiving Water: Spokane River Summer							
	Effluent Data			Receiving Water Data			
CLICK HERE FOR INSTRUCTIONS	Annual Average Flow	Monthly Average Flow	Daily Maximum Flow	7Q10 Critical Flow	30Q5 Critical Flow	Harmonic Mean Flow	%flow for dilution
Flow (MGD)	40.00	41.76	82.50	373.56	522.99	1120.68	25
(cfs)	61.89	64.61	127.65	578.00			
Critical Temp (°C)	22.00			19.70			
(°F)	71.6			67.5			
Critical Hardness (mg/L CaCO3)	50.00	← Effluent Data		71.00	← Receiving Water Data		
Critical pH (s.u.)	7.26			8.50			
Critical Alkalinity (mg/L as CaCO3)	76.00			71.00			
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	1.11	3.24	9.95	4.13	8.00		
(% effluent)	89.83	30.90	10.05	24.21	12.49		
Hardness	52.14	64.51	68.89	-	-		
Alkalinity	75.49	72.54	71.50	-	-		
Max pH (s.u.)	7.30	7.71	8.07	-	-		
Max Temp (°C)	21.77	20.41	19.93	-	-		
Max Temp (°F)	71.18	68.74	67.88	-	-		

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City of Spokane's Riverside Park Water Reclamation Facility (the POTW) &
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Effluent and Receiving Water Critical Conditions							
Facility:	RPWRF			Design Case:	Reasonable Potential		
Receiving Water:	Spokane River Fall						
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)	41.76	41.76	82.50	1528.50	2139.90	4585.50	25
(cfs)	64.61	64.61	127.65	2365.00			
Critical Temp (°C)	18.70	Effluent Data		13.90	Receiving Water Data		
(°F)	65.7			57.0			
Critical Hardness (mg/L CaCO3)	50.00			100.00			
Critical pH (s.u.)	7.16			8.33			
Critical Alkalinity (mg/L as CaCO3)	79.00			82.00			
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	1.46	10.15	37.60	13.81	28.45		
(% effluent)	68.34	9.85	2.66	7.24	3.51		
Hardness	65.83	95.07	98.67	-	-		
Alkalinity	79.95	81.70	81.92	-	-		
Max pH (s.u.)	7.33	7.98	8.21	-	-		
Max Temp (°C)	17.18	14.37	14.03	-	-		
Max Temp (°F)	62.92	57.87	57.25	-	-		

Summary of Effluent Reasonable Potential Determination & Limits										Facility	RPWRF
										Receiving Water	Spokane River Fall
										Design Case	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
AMMONIA unionized	N	WQ Stnd	4875.6	NO	10.0	16848.3	3335.3	1349.0	489.3		

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City of Spokane's Riverside Park Water Reclamation Facility (the POTW) &
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Effluent and Receiving Water Critical Conditions							
Facility: RPWRF				Design Case: Reasonable Potential Winter			
Receiving Water: Spokane River Winter							
	Effluent Data			Receiving Water Data			
CLICK HERE FOR INSTRUCTIONS	Annual Average Flow	Monthly Average Flow	Daily Maximum Flow	7Q10 Critical Flow	30Q5 Critical Flow	Harmonic Mean Flow	%flow for dilution
Flow (MGD)	41.76	52.40	82.50	891.89	1248.65	2675.68	25
(cfs)	64.61	81.08	127.65	1380.00			
Critical Temp (°C)	16.60			10.60			
(°F)	61.9			51.1			
Critical Hardness (mg/L CaCO3)	50.00	← Effluent Data		55.00	← Receiving Water Data		
Critical pH (s.u.)	6.96			8.24			
Critical Alkalinity (mg/L as CaCO3)	70.00			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	1.27	5.26	18.02	6.96	17.02		
(% effluent)	78.72	19.03	5.55	14.37	5.88		
Hardness	51.06	54.05	54.72	-	-		
Alkalinity	65.74	53.81	51.11	-	-		
Max pH (s.u.)	7.04	7.54	7.89	-	-		
Max Temp (°C)	15.32	11.74	10.93	-	-		
Max Temp (°F)	59.58	53.14	51.68	-	-		

Summary of Effluent Reasonable Potential Determination & Limits					Facility		RPWRF				
							Receiving Water	Spokane River Winter			
							Design Case	Reasonable Potential Winter			
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
AMMONIA, unionized	N	WQ Stnd	4875.6	NO	10.0	23250.5	3840.3	2170.8	935.9		

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Effluent and Receiving Water Critical Conditions							
Facility: RPWRF			Design Case: Reasonable Potential - Spring				
Receiving Water: Spokane River Spring							
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)	41.76	41.76	82.50	1189.19	1664.87	3567.58	25
(cfs)	64.61	64.61	127.65	1840.00			
Critical Temp (°C)	16.80	Effluent Data		12.00	Receiving Water Data		
(°F)	62.2			53.6			
Critical Hardness (mg/L CaCO ₃)	50.00			34.00			
Critical pH (s.u.)	7.45			8.50			
Critical Alkalinity (mg/L as CaCO ₃)	74.00			38.00			
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	1.36	8.12	29.48	10.97	22.36		
(% effluent)	73.51	12.32	3.39	9.12	4.47		
Hardness	45.76	35.97	34.54	-	-		
Alkalinity	64.46	42.43	39.22	-	-		
Max pH (s.u.)	7.53	8.02	8.30	-	-		
Max Temp (°C)	15.53	12.59	12.16	-	-		
Max Temp (°F)	59.95	54.66	53.89	-	-		

Summary of Effluent Reasonable Potential Determination & Limits													Facility Receiving Water Design Case		RPWRF Spokane River Spring 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				
AMMONIA unionized	N	WQ Stnd		4875.6	NO	10.0	12693.4	3586.7	1258.4	609.3						

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Effluent and Receiving Water Critical Conditions							
Facility:	RPWRF			Design Case:	Reasonable Potential Summer		
Receiving Water:	Spokane River Summer						
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)	40.00	41.76	82.50	373.56	522.99	1120.68	25
(cfs)	61.89	64.61	127.65	578.00			
Critical Temp (°C)	22.00	Effluent Data		19.70	Receiving Water Data		
(°F)	71.6			67.5			
Critical Hardness (mg/L CaCO ₃)	50.00			71.00			
Critical pH (s.u.)	7.26			8.50			
Critical Alkalinity (mg/L as CaCO ₃)	76.00			71.00			
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	1.11	3.24	9.95	4.13	8.00		
(% effluent)	89.83	30.90	10.05	24.21	12.49		
Hardness	52.14	64.51	68.89	-	-		
Alkalinity	75.49	72.54	71.50	-	-		
Max pH (s.u.)	7.30	7.71	8.07	-	-		
Max Temp (°C)	21.77	20.41	19.93	-	-		
Max Temp (°F)	71.18	68.74	67.88	-	-		

Summary of Effluent Reasonable Potential Determination & Limits										Facility	RPWRF
										Receiving Water	Spokane River Summ
										Design Case	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
AMMONIA unionized	N	WQ Stnd	4875.6	YES	10.0	17506.1	4380.8	1425.7	1513.4	7542.7	3166.3
CADMIUM** - 7440439 4M	Y	WQ Stnd	0.256	NO	0.0	1.827	0.217	0.746	0.075		
LEAD** - 7439921 7M	Y	WQ Stnd	1.555	NO	0.132	31.6	0.664	1.557	0.315		
ZINC** - 7440666 13M	Y	WQ Stnd	84.0	YES	8.92	65.9	76.1	72.1	32.0	72.6	53.8

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Effluent and Receiving Water Critical Conditions							
Facility: RPWRF				Design Case: Reasonable Potential Fall			
Receiving Water: Spokane River Fall							
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)	41.76	41.76	82.50	1528.50	2139.90	4585.50	25
(cfs)	64.61	64.61	127.65	2365.00			
Critical Temp (°C)	18.70	Effluent Data		13.90	Receiving Water Data		
(°F)	65.7			57.0			
Critical Hardness (mg/L CaCO ₃)	50.00			100.00			
Critical pH (s.u.)	7.16			8.33			
Critical Alkalinity (mg/L as CaCO ₃)	79.00			82.00			
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	1.46	10.15	37.60	13.81	28.45		
(% effluent)	68.34	9.85	2.66	7.24	3.51		
Hardness	65.83	95.07	98.67	-	-		
Alkalinity	79.95	81.70	81.92	-	-		
Max pH (s.u.)	7.33	7.98	8.21	-	-		
Max Temp (°C)	17.18	14.37	14.03	-	-		
Max Temp (°F)	62.92	57.87	57.25	-	-		

Summary of Effluent Reasonable Potential Determination & Limits					Receiving Water Design Case		Facility		RPWRF	
									Spokane River Fall	
									Reasonable Potential	
					Receiving Water		Acute Boundary		Chronic Boundary	
									Permit Limits	
POLLUTANT					Upstream RW Conc, µg/L		RW Acute Criteria, µg/L		RW Chronic (or Human Health) Criteria, µg/L	
priority pollutant?							Conc @ Acute MZ Boundary, µg/L		Conc @ Chronic (or Human Health) MZ Boundary, µg/L	
standard										
Maximum Expected (or 50%) Effluent Concentration, µg/L										
Does reasonable potential exist?										
					Daily Maximum Limit, µg/L				Monthly Average Limit, µg/L	
AMMONIA unionized					10.0		16848.3		489.3	

APPENDIX D - RESPONSE TO COMMENTS

Comments on the draft permit and Fact Sheet were received during the public comment period and responses are in preparation.