

Annual Industrial Waste System Stormwater Monitoring Report

Seattle-Tacoma International Airport

For the Period July 1, 2023 through June 30, 2024

September 24, 2024

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Executive Summary

This Annual Report summarizes the results of effluent monitoring at the Seattle-Tacoma International Airport (SEA) Industrial Waste Treatment Plant (IWTP) from July 2023 through June 2024. The IWTP discharges to Puget Sound via Outfall 001 (Outfall 001) as defined in the Port of Seattle's (Port) National Pollutant Discharge Elimination System (NPDES) Waste Discharge Permit, WA-0024651.

The IWTP also operates under King County (KC) Waste Discharge Permit #7810-05. This permit allows the facility to discharge stormwater with higher concentrations of biochemical oxygen demand (BOD₅) to the King County South Treatment Plant (KC STP) for further treatment before ultimately discharging to Puget Sound.

Starting in January 2007, SEA operated under the new effluent limitations, which included separate limits for BOD₅ for November through March and April through October. In addition, the all known, available and reasonable methods of prevention, control and treatment (AKART) system for segregating higher BOD₅ concentrations and routing them to the KC STP was finished and started up in November 2006 with final implementation on January 1, 2007. On October 1, 2022, the permit effluent limits were adjusted to allow for increased daily maximum discharge volume through the system under reduced BOD₅ daily maximum and monthly average mass-loading limits.

During the reporting period, a total of two hundred and eighty-nine (289) million gallons (MG) of stormwater was processed in the IWTP and discharged to either the Outfall 001 or KC STP. The IWTP operated for 153 days during the reporting period.

Outfall 001 Discharges

Outfall 001, as referred to in the Airport's NPDES Permit, is the Midway Sewer District's sewage treatment plant discharge to the Puget Sound. The Midway Sewer District and Port have an operating agreement for joint use of the Midway Sewer District's outfall (Outfall 001). The Port monitors and reports all discharges to Ecology in accordance with Part 1 Special Conditions S1 and S2 of the SEA NPDES permit.

Fifty-nine (59) MG of stormwater was processed and discharged through Outfall 001 to Puget Sound over a total of 30 days during the reporting period. The daily average flow to Outfall 001 was 1.98 MG. There were no discharges in July 2023, August 2023, September 2023, October 2023, December 2023, January 2024, February 2024, March 2024, or April 2024. The daily maximum discharge limit to Outfall 001 is 18 MG. During the reporting period, the daily maximum discharge to Outfall 001 was 4.45 MG and occurred on November 5, 2023.

Thirty (30) samples were collected from Outfall 001 effluent to characterize the daily discharge for BOD₅ concentration and to calculate BOD₅ mass-loading. Concentrations of BOD₅ discharged to Outfall 001 ranged from 2.2 milligrams per liter (mg/L) to 36.8 mg/L. The maximum concentration of BOD₅ was 36.8 mg/L and it occurred on November 10, 2023. All samples were below the BOD₅ concentration permit limits. All samples collected throughout the reporting period were well below their respective daily maximum BOD₅ mass-loading limits. The daily maximum

mass-load of BOD₅ discharged to Outfall 001 was 559 pounds on November 7, 2023. The monthly average BOD₅ mass-loading ranged from 69 pounds in May 2024 to 330 pounds in November 2023.

Ten (10) samples were collected from Outfall 001 effluent and analyzed for total suspended solids (TSS). TSS concentrations discharged to Outfall 001 ranged from 1.0 mg/L to 11.0 mg/L. All TSS samples were below the monthly average effluent limit of 21 mg/L. All TSS samples were below the daily maximum effluent limit of 33 mg/L.

pH was continuously measured at the IWTP, and instantaneous maximum and minimum results were recorded. The plant operated within the permit-required pH range of 6.0 S.U. to 9.0 S.U. throughout the reporting period. A minimum instantaneous pH of 6.3 S.U. and a maximum of 8.6 S.U. were measured.

Ten (10) samples were collected from Outfall 001 effluent and analyzed for oil and grease. Over the reporting period, the maximum concentration of oil and grease was 4.10 mg/L with a daily average concentration of 1.00 mg/L. All monthly average oil and grease concentrations were below the limit of 8 mg/L. All oil and grease samples were well below the daily maximum effluent limit of 15 mg/L.

King County South Treatment Plant Discharges

High concentration BOD₅ treated wastewater is separated and discharged to the Valley View Sewer District and then conveyed to the KC STP where the wastewater undergoes secondary treatment prior to discharging to Puget Sound. All sample parameters were reported in accordance with Condition S4 of the King County Waste Discharge Permit.

Two hundred and twenty-nine (229) MG of industrial stormwater was separated, processed, and routed to the KC STP due to elevated levels of BOD₅. Discharge to KC STP occurred on 126 days over the reporting period. The IWTP did not discharge to KC STP during the months of August 2023, May 2024, or June 2024. The daily maximum discharge permit limit to KC STP is 4.0 MG. The daily maximum discharge to KC STP of 2.92 MG occurred on October 8, 2023. The maximum instantaneous flow rate permit limit to KC STP is 2,883 GPM. The daily maximum flow rate permit limit to KC STP is defined as any continuous recording of 15 minutes or longer above 2,778 GPM within a 24-hour period. The maximum instantaneous flow rate discharged to KC STP over the reporting period was 2,199 GPM and it occurred on September 27, 2023. The facility met all flow discharge limits for the duration of the reporting period.

One hundred and twenty-six (126) composite samples were collected from KC STP effluent and analyzed for BOD₅. During the reporting period, sample concentrations of BOD₅ ranged from 2.0 mg/L to 2,210 mg/L. The KC STP BOD₅ daily average concentration was 350 mg/L during the reporting period. The daily maximum BOD₅ mass-loading limit to KC STP is 45,000 lbs/day. The daily maximum BOD₅ mass-load discharged to KC STP was 14,966 pounds and it occurred on December 1, 2023. The monthly average BOD₅ mass-loading limit to KC STP is 27,500 lbs/day. The maximum monthly average mass-load of 8,299 lbs/day occurred during the month of March 2024. During the reporting period, all samples met the KC STP BOD₅ permit limits for mass-loading.

Section 1: Introduction

Located midway between the cities of Seattle and Tacoma, Washington, the Seattle-Tacoma International Airport (SEA) was built in the 1940s and is owned and operated by the Port of Seattle (Port).

The Port is required by the National Pollutant Discharge Elimination System (NPDES) Waste Discharge Permit Part I, Special Condition S2.F, to submit an annual monitoring report for the SEA Industrial Waste Treatment Plant (IWTP). The Annual Report is a compilation of data submitted monthly to the Washington State Department of Ecology (Ecology) in the Discharge Monitoring Reports (DMRs). Data collected to characterize effluent discharged to King County South Treatment Plant (KC STP) is included in this report for comparison.

The current NPDES Permit (No. WA-0024651) became effective on September 1, 2021, through August 31, 2026. This Annual IWS Stormwater Monitoring Report summarizes the discharge monitoring results from July 2023 through June 2024.

1.1 Industrial Waste System

The primary function of the Port's Industrial Wastewater System (IWS) at SEA is to collect, segregate, treat, and discharge effluent generated from aircraft fueling and maintenance areas in compliance with the Port's NPDES permit (No. WA0024651) and the King County South Treatment Plant (KC STP) waste discharge permit (No. 7810-05).

The SEA IWS collects industrial wastewater from two drainage basins: The North and South Service Basins. The IWS and storm drainage areas are depicted in Figure 1. The IWS North Service Basin includes portions of the airport area between Taxiways A and B and Air Cargo Road, as well as the Weyerhaeuser area on the southern side of the airfield. The IWS South Basin includes the Fuel Farm and Passenger Gate Ramp areas, as well as aircraft hangers. The North drainage basin accounts for approximately 130-acres and the South drainage basin accounts for approximately 242-acres.

The IWS manages stormwater associated with industrial activities from airline and maintenance operations as well as wastewater from other airport-related operations. These contaminants of concern consist primarily of spilled fuel, detergents, lubricants, and de-icing and anti-icing fluids. The system includes collection and conveyance facilities, high biochemical oxygen demand (BOD₅) runoff segregation, runoff storage, and the IWTP. These facilities along with additional information on all known, available, and reasonable methods of treatment determination (AKART) for IWS, an overview of aircraft de-icing and anti-icing operations of SEA, discharge characterization, stormwater pollution prevention, and the mixing zone study are described below.

The IWTP Improvements Project was completed in the summer of 2006, allowing for monitoring and segregation of IWS runoff based on BOD₅ concentrations. This project was initiated by the AKART determination for the IWS. "High BOD₅" effluent is defined as any water that could cause the IWTP to exceed the daily or monthly average concentration or daily maximum load. Final Effluent Limitations are specified in S1.A of the permit. Treated wastewater containing high BOD₅ concentrations is conveyed to the KC STP, while treated wastewater with low BOD₅ concentrations is discharged to Puget Sound via the Midway Sewer District Outfall (Outfall 001).

Start-up for this system occurred on November 6, 2006, and was fully implemented on January 1, 2007.

1.1.1 Collection and Segregation

The IWS collects stormwater from flush gutters and catch basins. These structures collect spilled fluids, which are then conveyed to the IWS storage lagoons during precipitation events. Prior to entering the storage lagoons, the wastewater is automatically analyzed, and flow is directed to specific lagoons based upon BOD₅ concentration.

Untreated industrial wastewater is stored in three lagoons. The primary purpose of Lagoons #1 and #2 is for collection of the “first flush” of high BOD₅ influent from the South Aviation and North Aviation areas, respectively. Although the primary purpose of Lagoon #3 is for collection of low BOD₅ runoff, high BOD₅ runoff during de-icing periods may also be stored in Lagoon #3 when Lagoons #1 and #2 reach full capacity. Prior to treatment, the wastewater flows from Lagoons #1 and #2 through mechanical screening devices, which are sized to remove large objects.

Water stored in Lagoons #1 and #2 drain by gravity to the IWTP. Water is pumped from Lagoon #3 to the IWTP. Some settling of solids occurs in the lagoons. The lagoons are typically cleaned every other year pending summer weather conditions. Lagoon sediments are analyzed and disposed of as necessary. Detailed descriptions of the IWS storage lagoons and the IWTP process are provided in earlier Engineering Reports and the Fact Sheet of the NPDES permit for SEA.

1.1.2 Conveyance

The IWS conveyance system includes approximately 35 miles of piping, 1,200 manholes and catch basins, two below-grade vaults in the parking garage, and 11 pump stations. These facilities are maintained on a regular basis as described in the Port’s Stormwater Pollution Prevention Plan (SWPPP) and the Inspection, Maintenance, and Operation Procedures Manual. Each pump station functions as a key structural source control best management practice (BMP) by diverting runoff to IWTP from various areas that formerly drained to the Airport’s stormwater drainage system (SDS).

1.1.3 Industrial Waste Treatment Plant

The IWTP is located at the southwestern end of the airport, south of Lagoons #1 and #2 and north of 188th Street, just west of the tunnel under the eastern-most airport runway known as 16 Left / 34 Right. The IWTP is designed to remove petroleum hydrocarbons and suspended solids using a dissolved air flotation (DAF) process.

The facility consists of six treatment trains each with flash mix, flocculation, and DAF tanks. The DAF process begins with the addition of coagulation chemicals to the influent water in a flash mix chamber, followed by gentle mixing in a flocculation tank to coagulate suspended solids and oil droplets. The water then flows by gravity to the DAF units. Air bubbles released in the DAF units float the floc particles. Flight scrapers push the float over a scum beach. The skimmed float flows out of the IWTP building in a floor trench to a sludge sump at the eastern side of the IWTP building. The DAF float is collected in the sludge sump and pumped to two decant tanks located east of the IWTP building. The float separates the process-water into water and sludge phases. The

water layer is decanted and returned to the IWS lagoons. The decant tanks are cleaned annually. Sludges are analyzed and disposed of as necessary.

Treated industrial wastewater is directed in either of two underground wet wells located adjacent to the treatment plant. Treated water flows into each wet well from the top of the structure and is discharged through a valve near the bottom of the wet well designated as the high BOD₅ wet well or near the surface of the wet well designated as the low BOD₅ wet well. Treated water is discharged to Puget Sound from the low BOD₅ wet well and to the Valley View Sewer District (VVSD) from the high BOD₅ wet well. Discharges to the VVSD are conveyed to King County South Wastewater Treatment Plant (KC STP) where they undergo secondary treatment before being discharged to Puget Sound. A schematic of the treatment system is presented in Figure 2.

The IWS AKART pump station and pipeline can discharge up to 2,990 GPM (4.3 MGD) to the KC STP. However, the plant hydraulic capacities are effectively limited by either the mass-based effluent or flow limitations. The KC STP Permit's mass-based effluent limits allow a maximum BOD₅ hourly load of 2,500 lbs/hr. As of October 1, 2022, the BOD₅ daily maximum mass-loading limit has been reduced and a new monthly average mass-loading limit has been set to 27,500 lbs/day. The daily maximum load of 60,000 lbs/day was reduced to 45,000 lbs/day. The KC STP permit discharge limits have been increased as of October 1, 2023, from 1,915 GPM for 15-minutes within a 24-hour period to 2,883 GPM for 15-minutes within a 24-hour period, a peak instantaneous flow was raised from 1,965 GPM to 2,778 GPM, and the daily maximum discharge volume was raised from 2.76 MG to 4.0 MG. In addition, the KC STP permit reserves King County and VVSD's authority to request that discharges to their system stop as necessary to prevent hydraulic overloading of the sewer conveyance systems or the KC STP.

Figure 1. Vicinity Map for the POS IWTP at SEA

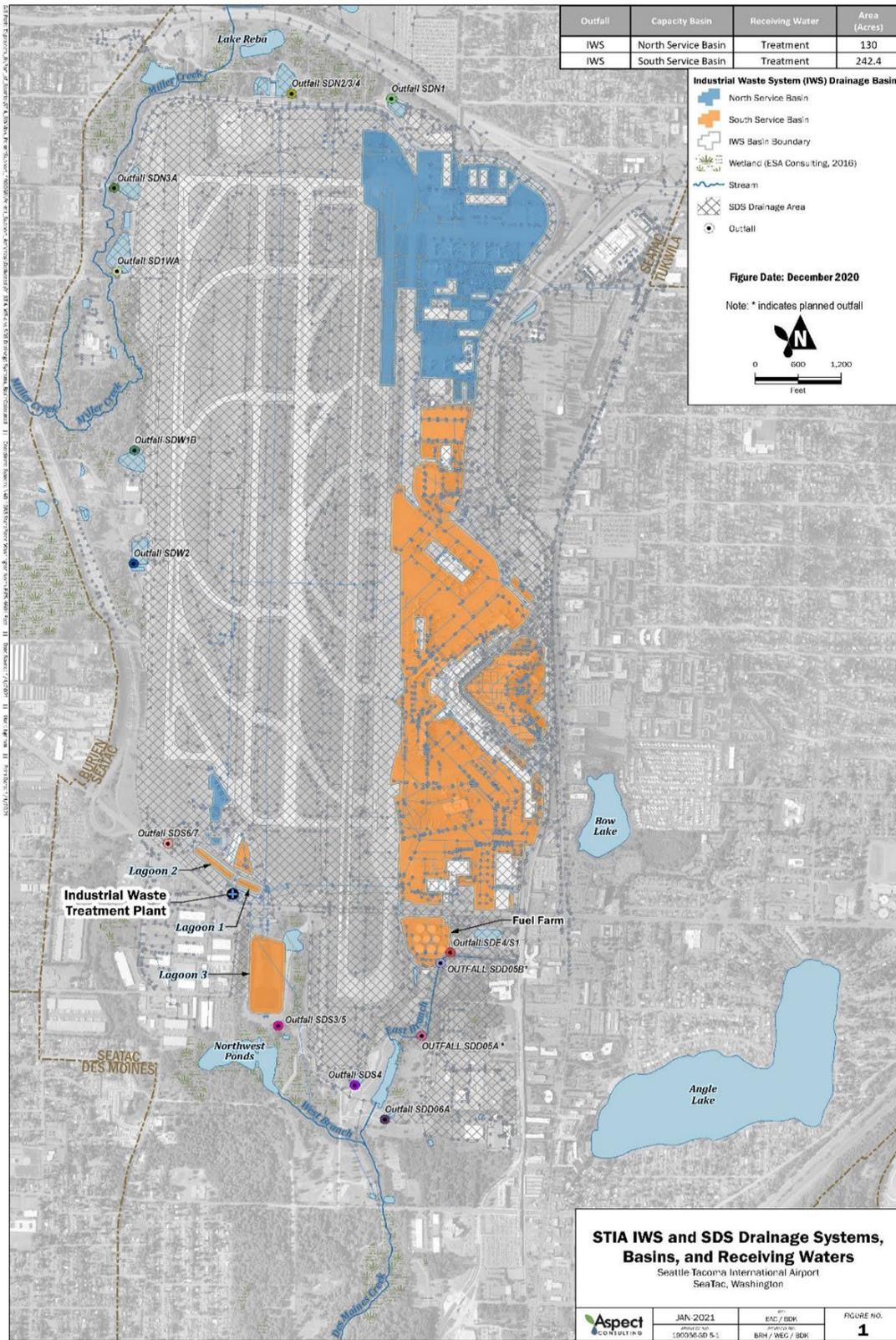
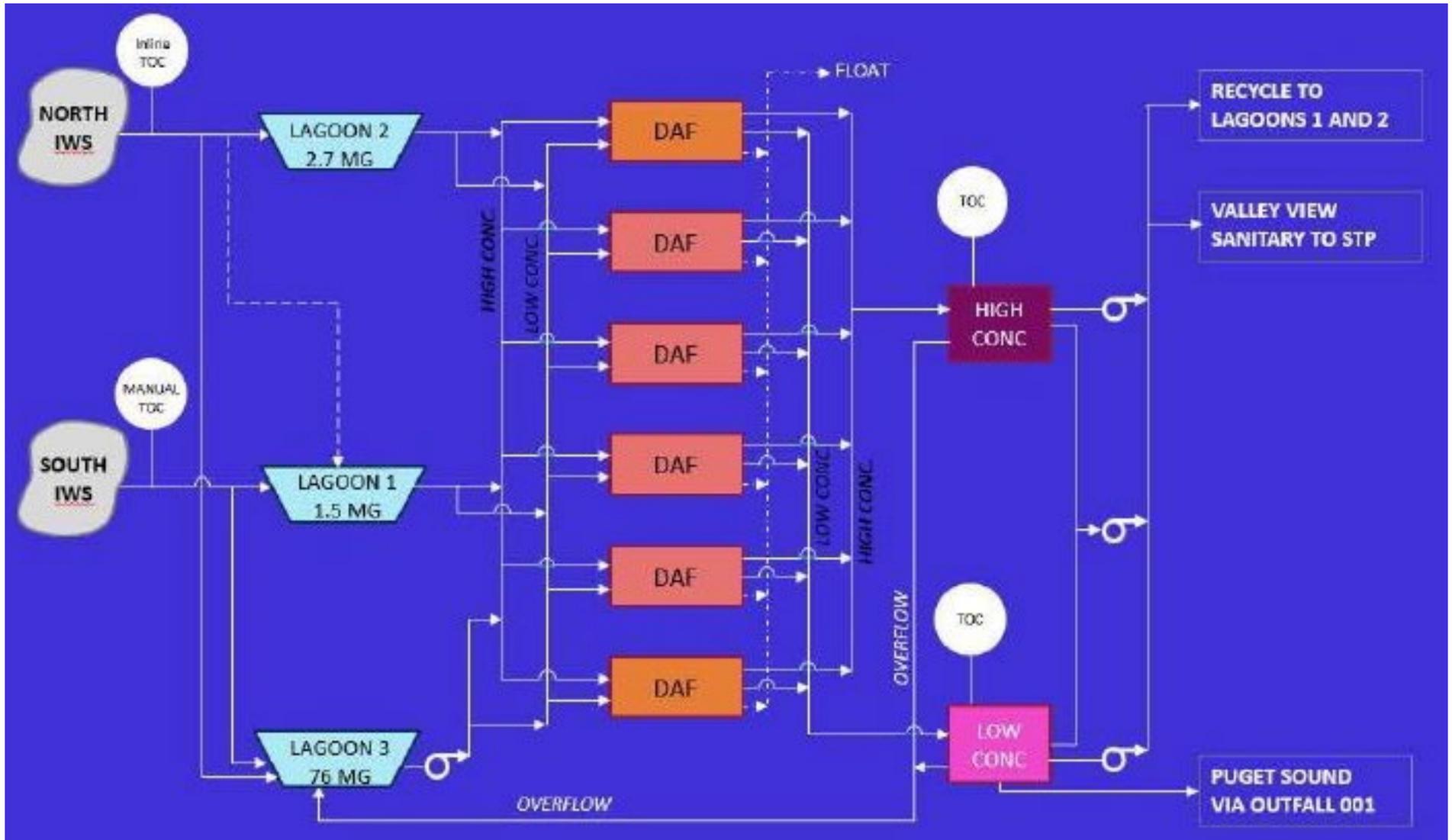


Figure 2. Schematic Diagram of the Port's IWTP at SEA



Section 2: Sampling Objectives, Locations and Methods

The goal of this monitoring program is to characterize the flow and water quality of effluent from the IWTP for compliance with the following permits:

- NPDES Permit No. WA-0024651, Part I, Special Condition S1.A and S2.A
- King County Waste Discharge Permit #7810-05

Program components include:

- Continuous monitoring of effluent discharge rates to operate the treatment plant in accordance with permit requirements.
- Continuous monitoring of water quality of the effluent for selected parameters using in-line meters to ensure permit compliance.
- Collection and analysis of effluent samples in accordance with permit requirements.
- Quality control measures to obtain reliable and consistent data.
- Report data in accordance with permit requirements.

This section provides an overview of the monitoring requirements for discharges to Puget Sound and the Valley View Sewer District. A complete description of the monitoring program is contained in the Quality Assurance Program Plan, Seattle Tacoma International Airport Industrial Waste Treatment Plant Discharge Monitoring Program, REV 3.0 October 2021.

2.1 Influent and Effluent Measurements

Daily grab samples of influent are analyzed for turbidity and pH in-line meters are used to continuously monitor flow, pH, and TOC of the IWTP effluent. These data are used for IWTP operations to determine where to store influent, how to treat influent, and where to discharge effluent. In addition, effluent flow data are used to quantify discharge volumes and constituent loads for compliance with permit requirements.

2.2 Effluent Sampling

Composite and grab sampling techniques are used to collect effluent samples on a daily, weekly, quarterly, or permit-cycle frequency depending on the parameter, as required by the discharge permits. The collected samples are analyzed for pH, turbidity, and total residual chlorine by the sampling personnel, and for the remaining water quality parameters by contract laboratories.

2.3 IWTP Analytes

All sampling and analytical methods used to meet the monitoring requirements follow the Guidelines Establishing Test Procedures for the Analysis of Pollutants contained in 40 CFR Part 136 and the *Standard Methods for the Examination of Water and Wastewater*. A summary of sample parameters and associated sampling frequency and type is provided in Table 1.

Samples were submitted with chains-of-custody for analysis at Ecology-accredited laboratories: Amtest Laboratories of Kirkland, WA; Analytical Resources Inc., of Seattle, WA; and Edge Analytical, Inc. of Burlington, WA. All samples were analyzed by methods defined in Part I, Special Condition S2 and Appendix A of the permit.

2.4 Schedule

Methods and procedures are implemented in compliance with Part I Condition S2 (Monitoring Requirements) and S3 (Reporting and Record Keeping Requirements) of the Airport’s NPDES permit. Sampling for this program occurs at a varied frequency depending on the discharge location and analytical parameter. Data reporting for this program occurs monthly in accordance with the permit requirements. The schedule for sample collection, laboratory analysis, data review and management, and data reporting is summarized in Table 1.

Table 1. IWTP Effluent Monitoring Requirements

Sample Collection	Reporting	Data Review/Management	Data Reporting
Treatment System Operations			
Influent: Daily, turbidity/pH Effluent: Continuous, flow/pH/TOC Daily, TOC	Daily shift logs completed on each monitoring date.	Shift log review within 1 day of monitoring. Effluent data entered into POS operator spreadsheet within 1 day of monitoring.	Effluent flow and pH data are reported for permit compliance as specified below.
Ecology NPDES Permit for Discharge to Outfall 001^a			
Effluent: Continuous, flow/pH Daily, BOD ₅ Weekly ^b , TSS/TPH Weekly ^b , propylene glycol (Nov.- March only) Year 3, priority pollutants (one dry season and one wet season event) ^c	Laboratory report within 10 days of sample date.	Data entry within 15 days of receiving Level 2A Data Review.	Monthly discharge monitoring report (DMR) by the 28th of the following month. Priority pollutant reports submitted within 45 days of the monitoring period. Annual summary report by October 1 following each permit year (July through June).
King County Waste Discharge Permit for Discharge to KC STP			
Effluent: Continuous, flow/pH Daily, BOD ₅ /TSS Monthly, metals/TPH	Laboratory report within 10 days of sample date.	Data entry within 15 days of receiving Level 2A Data Review.	Monthly self-monitoring report by the 15th of the following month

^a Discharge to Outfall 001 may occur only when the BOD₅ concentration and mass loading limits specified in Table 2 are met. Discharge must be to the KC STP if these conditions are not met.

^b One week is defined as Sunday to Saturday.

^c Year 3 of the NPDES permit is November 2023 through October 2024. Dry season is from April through October and wet season is from November through March.

2.5 NPDES Permit Final Effluent Limits

Final Effluent Limits (excerpted from the NPDES Permit No. WA0024651) are summarized in Table 2.

Table 2. Effluent Limitations for Discharges to Outfall 001

Parameter	Average Monthly ^a	Maximum Daily ^b
Flow ^c	Report – MGD	Report – MGD
Oil and Grease ^d	8 mg/L	15 mg/L
BOD ₅ November through March	45 mg/L	Report – mg/L 2,665 lbs/day
BOD ₅ April through October	25 mg/L	Report – mg/L 1,480 lbs/day
Total Suspended Solids	21 mg/L	33 mg/L
pH ^e	Daily minimum is equal to or greater than 6, the daily maximum is less than 9	

^a The average monthly effluent limitations are based on the arithmetic mean of the samples taken during the month.

^b The maximum daily effluent limit 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 limits 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 The daily maximum flow is based on the Port's agreement with Midway Sewer District. Based on this agreement the combined flow from the IWS and Midway Sewer District must not exceed 90% of the capacity of the outfall, which is 18 MGD.

^d Oil and grease analyzed by the NWTPH-Dx method as an approved alternative

^e Indicates range of permitted values. When pH is continuously monitored, excursions between 5.0 and 6.0 or 9.0 and 10.0 S.U. 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 S.U. are violations. The instantaneous maximum and minimum pH shall be reported monthly.

2.6 KC STP Permit Final Effluent Limits

Final Effluent Limits (excerpted from the King County Waste Discharge Permit No. 7810-5) are summarized in Table 3.

Table 3. Effluent Limitations for Discharges to the KC STP.

Parameter	Daily Average Concentration (mg/L)	Instantaneous Maximum Concentration (mg/L)	Daily Maximum Loading ^a (lbs/day)
Total Suspended Solids	NA	NA	NA
Arsenic, Total	1.0	4.0	0.27
Cadmium, Total	0.5	0.6	0.17
Chromium, Total	2.75	5.0	1.2
Copper, Total	3.0	8.0	6.89
Lead, Total	2.0	4.0	1.2
Mercury	0.1	0.2	0.06
Nickel, Total	2.5	5.0	2.49
Silver, Total	1.0	3.0	0.44
Zinc, Total	5.0	10.0	12.31
Cyanide Amenable	2.0	3.0	NA
Non-polar FOG ^b	100	NA	NA

BOD₅^c	Daily Maximum Hourly Load^d (lbs/hr)	Daily Maximum Loading^e (lbs/day)	Average Monthly Loading^f (lbs/day)
Oct 1, '22 – July '26	2,500	45,000	27,500
pH^g	Daily Minimum	Instantaneous Minimum	Maximum
	≥5.5	5.0	≤12.0
Flow	Maximum Instantaneous Discharge Rate	Maximum Daily Discharge Volume	
Oct 1, '22 – July '26 ^h	2,828 GPM	4.0 MG	

^a The daily maximum load equals the daily average concentration in mg/L, multiplied by the flow in million gallons per day, multiplied by 8.34.

^b Analyzed by the NWTPH-Dx method as an approved alternative to nonpolar fats, oils, and grease.

^c In case of anomaly during analysis, the Port may report BOD₅ concentration based on TOC using a KCIW approved statistical procedure. The Port must indicate the use of the TOC in lieu of BOD₅ on self-monitoring reports.

^d The daily maximum hourly load is the daily maximum load (lbs/day) divided by the number of hours of discharge in any given day. To avoid exceeding the daily maximum hourly load, the Port could use the TOC analyzer to monitor the discharge.

^e The maximum daily effluent limit 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 limits 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.

^f The average monthly effluent loading limit is based on the arithmetic mean of the samples taken during the calendar month.

^g The instantaneous minimum pH limit is violated whenever any single grab sample or any instantaneous recording is less than pH 5 S.U. The daily minimum pH limit is violated whenever any continuous recording of 15-minutes or longer remains below pH 5.5 S.U. or when each pH value of four consecutive grab samples collected at 15-minute intervals or longer within a 24-hour period remains below pH 5.5 S.U. Discharges greater than pH 12 S.U. are prohibited unless the Port obtains verbal or written approval from King County prior to discharge.

^h The instantaneous maximum flow rate limit is violated whenever any instantaneous recording is greater than 2,828 GPM. The daily maximum flow rate is violated whenever any continuous recording of 15 minutes or longer remains above 2,778 GPM within a 24-hour period.

Section 3: Results

3.1 General

This report presents the results of IWTP effluent monitoring for discharges to Puget Sound under the Airport's NPDES Permit No. WA0024651 and to the KC STP Permit No. 7810-05 for the period of July 2023 through June 2024. Flow and BOD₅ related results are summarized in this report for samples collected under the King County Waste Discharge permit to provide a complete overview of all discharges from the IWTP.

3.2 Effluent Flow

The amount of water processed in the IWTP is a function of runoff volumes, lagoon inventories, and operations schedules. A total of two hundred and eighty-nine (289) MG of stormwater runoff was processed during the reporting period, this includes both discharges to Outfall 001 and KC STP. Figure 3 depicts the monthly total effluent volume discharged to Outfall 001 and to KC STP from the IWTP.

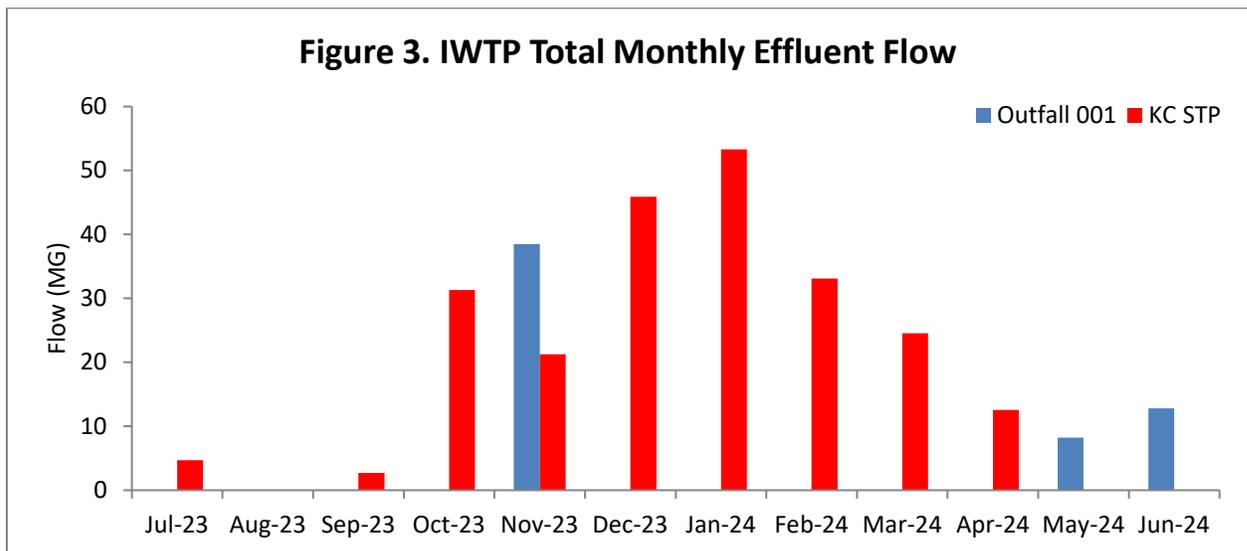


Table 4 depicts the Total Daily Effluent Volume discharged to Outfall 001, as well as the calculated total volume, average, and maximum flows per month. Fifty-nine (59) MG of stormwater were discharged to Outfall 001 during the reporting period. The monthly maximum flow to Outfall 001 was 38 MG in November 2023. The daily maximum flow to Outfall 001 was 4.45 MG and occurred on November 5, 2023. The IWTP discharged to Outfall 001 on 30 days during the reporting period with a daily average flow of 1.98 MG when operating.

Table 5 depicts the Total Daily Effluent Volume discharged to KC STP, as well as the calculated total volume, average, and maximum flows per month. Two hundred and twenty-nine (229) MG of industrial stormwater were discharged to KC STP during the reporting period. The monthly maximum flow routed to the KC STP was 53.3 MG in January 2024. The daily maximum flow to KC STP was 2.92 MG and occurred on October 8, 2023.

The instantaneous maximum flow rate limit is violated whenever any instantaneous recording is greater than 2,828 GPM. The daily maximum flow rate is violated whenever any continuous

recording of 15 minutes or longer remains above 2,778 GPM within a 24-hour period. Figure 4 depicts the instantaneous maximum discharge rate to the KC STP. The instantaneous maximum flow rate, over the reporting period, was 2,199 GPM and occurred on September 27, 2023. The IWTP discharged to KC STP 126 days during the reporting period, with an average daily flow of 1.82 MG when operating.

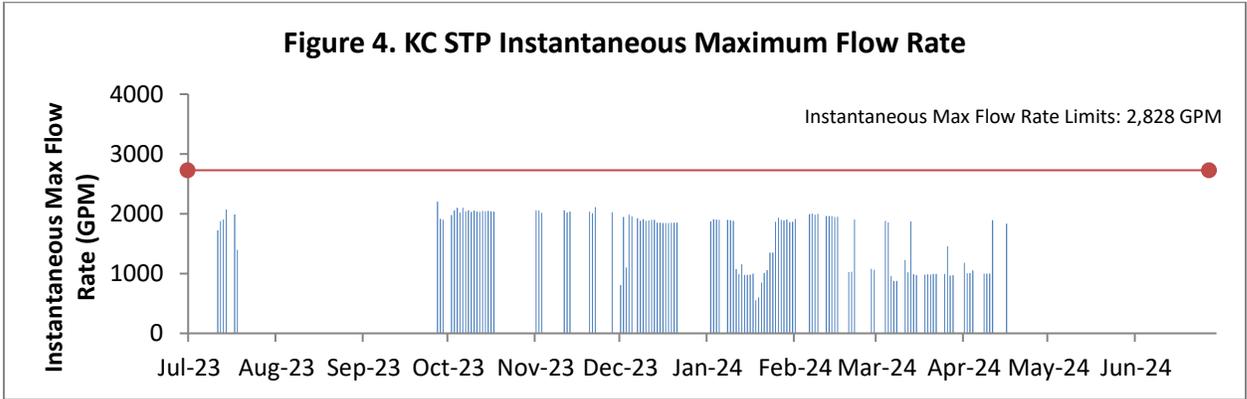


Table 4. Total Daily Effluent Flow Volume to Outfall 001

Date	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	Apr-24	May-24	Jun-24
	(MG)											
1												
2					0.965							
3					3.753							
4					4.270							1.399
5					4.451							1.433
6					4.262							1.433
7					4.268							
8					4.243							
9					3.295							
10					1.641							
11												1.428
12												1.430
13					0.662							1.427
14					1.625						2.088	
15					1.489						1.885	
16					1.261							
17												
18												
19												
20												
21												
22											1.094	
23											1.099	
24												
25												1.424
26												1.411
27												1.422
28												
29					0.555						0.971	
30					1.712						1.092	
31												
Monthly Volume (MG)	-	-	-	-	38.45	-	-	-	-	-	8.23	12.81
Num Days Operation	0	0	0	0	15	0	0	0	0	0	6	9
Daily Avg Flow (MGD)	-	-	-	-	2.56	-	-	-	-	-	1.37	1.42
Daily Max Flow (MGD)	-	-	-	-	4.45	-	-	-	-	-	2.09	1.43

Table 5. Total Daily Effluent Flow Volume to KC STP

Date	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	Apr-24	May-24	Jun-24
	(MG)											
1					2.877	0.812		2.621		1.204		
2				0.918	2.889	1.42	2.543			1.429		
3				1.021	2.526	1.479	2.68			1.433		
4				1.107		2.717	2.686		2.22	1.412		
5				1.079		2.153	1.361		1.586			
6				0.992				2.742	1.303			
7				2.849		1.744		2.78	1.257			
8				2.919		2.689	2.561	2.794	0.681	1.365		
9				1.761		2.692	2.657	1.517		1.422		
10				1.816		2.694	2.295			1.422		
11	0.537			1.82	2.131	2.701	1.481		0.988	2.059		
12	0.965			1.806	2.265	2.702	1.407	2.64	1.267			
13	1.021			1.691	1.563	2.687	1.409	2.79	1.471			
14	0.823			2.837		2.645	1.405	2.771	1.394			
15				2.913		2.645	1.407	2.767	0.753			
16				2.915		2.641	1.409	1.51		0.794		
17	1.006			2.849		2.638	0.641					
18	0.342					0.945	0.64		1.222			
19						2.637	0.757		1.405			
20					0.819	2.651	0.814	1.382	1.405			
21					2.607	2.59	1.225	1.459	1.418			
22					1.253		1.362	2.322	0.773			
23							1.798					
24							1.934					
25							2.669		1.303			
26							2.716		1.331			
27			0.821				2.714		1.387			
28			0.974		2.325		2.707	1.525	1.357			
29			0.892				2.693	1.48				
30							2.662					
31							2.67					
Monthly Volume (MG)	4.69	-	2.69	31.29	21.26	45.88	53.30	33.10	24.52	12.54	-	-
Num Days Operation	6	0	3	16	10	20	28	15	19	9	0	0
Avg Daily Flow (MGD)	0.78	-	0.90	1.96	2.13	2.29	1.90	2.21	1.29	1.39	-	-
Max Daily Flow (MGD)	1.02	-	0.97	2.92	2.89	2.72	2.72	2.79	2.22	2.06	-	-

3.3 Effluent Quality

Analytical results for all permit-required monitoring samples from Outfall 001 are reported in Appendix A. Results are discussed in the following sections. Line charts and graphs are presented for the parameters sampled daily, weekly, and monthly. In the provided graphical plots and tables for discharges to Outfall 001, concentrations of non-detected analytes are presented as:

- For reporting single values:
 - Method detection limit (for values reported below detection) is presented with a less than (<) sign in tables.
- For reporting average concentrations:
 - Half the detection value (for values reported below detection) is used if the laboratory detected the parameter in another sample for the monthly reporting period.
 - Zero (for values reported below detection) is used if the laboratory did not detect the parameter in another sample for the monthly reporting period.
- For reporting mass-loading:
 - Half the method detection limit (for values reported below detection) is used to calculate mass-loading of parameters. Mass is presented with a less than (<) sign in tables.

Analytical results for all permit-required monitoring samples from KC STP are reported in Appendix B. Results are discussed in the following sections. Line charts and graphs are presented for the parameters sampled daily, weekly, and monthly. In the provided graphical plots and tables for discharge to KC STP, concentrations of non-detected analytes are presented as:

- For reporting single values:
 - Method detection limit (for values reported below detection) is presented with a less than (<) sign in tables.
- For reporting average concentrations:
 - Method detection limit (for values reported below detection) is used to calculate average concentrations.
- For reporting mass-loading:

Half the method detection limit (for values reported below detection) is used to calculate mass-loading of parameters. Mass is presented with a less than (<) sign in tables.

3.3.1 Biochemical Oxygen Demand (BOD₅)

One hundred and fifty-six (156) effluent samples were analyzed for BOD₅, for discharges to both Outfall 001 and KC STP. Table 6 summarizes the BOD₅ sample concentrations and mass-loading discharged to Outfall 001. Table 7 summarizes the BOD₅ sample concentrations and mass-loading discharged to KC STP. Figure 5 depicts monthly average BOD₅ concentrations to Outfall

001. Figure 6 depict daily maximum BOD₅ mass-loadings from Outfall 001 during this reporting period. Figures 7, 8, and 9 depict hourly maximum, daily maximum, and monthly average BOD₅ mass-loading to the KC STP outfall.

BOD₅ Concentration

The monthly average BOD₅ concentration discharged to Outfall 001 ranged from 5.4 mg/L in May 2024 to 18.1 mg/L in November 2023. The daily maximum concentration discharged to Outfall 001 was 36.8 mg/L on November 10, 2023. All BOD₅ samples collected from discharges to Outfall 001 during this reporting period were below permit limits.

The daily maximum concentration discharged to KC STP over the reporting period was 2,210 mg/L on December 1, 2023. There are no concentration limits to BOD₅ for discharges to KC STP.

BOD₅ Mass-Loading

The BOD₅ monthly average mass-load discharged to Outfall 001 ranged from 69 pounds in May 2024 to 330 pounds in November 2023. The daily maximum BOD₅ mass-load discharged to Outfall 001 was 559 pounds on November 7, 2023. A total of 6,027 pounds of BOD₅ was discharged to Outfall 001 during this reporting period. All BOD₅ mass-loading in discharges to Outfall 001 during this reporting period were below NPDES permit limits.

The daily maximum pounds of BOD₅ discharged to KC STP was 14,966 pounds which occurred on December 1, 2023. A total of 568,838 pounds of BOD₅ was discharged to KC STP during this reporting period. All BOD₅ mass-loading per month, per day, and per hour to KC STP, during this reporting period, were below King County Waste Discharge permit limits.

Table 6. Outfall 001 Biological Oxygen Demand Results

Date	Jul-23		Aug-23		Sep-23		Oct-23		Nov-23		Dec-23		Jan-24		Feb-24		Mar-24		Apr-24		May-24		Jun-24	
	Conc mg/L	Mass-Load lbs/day																						
1																								
2									4.9	39														
3									10.1	316														
4									10.4	370													2.2	26
5									11.5	427													2.3	27
6									14.9	530													15.0	179
7									15.7	559														
8									12.9	456														
9									12.8	352														
10									36.8	504														
11																							3.8	45
12																							6.6	79
13									35.4	195													5.7	68
14									26.7	362											8.7	152		
15									21.5	267											7.4	116		
16									17.9	188														
17																								
18																								
19																								
20																								
21																								
22																						6.1	56	
23																						4.7	43	
24																								
25																							7.9	94

Date	Jul-23		Aug-23		Sep-23		Oct-23		Nov-23		Dec-23		Jan-24		Feb-24		Mar-24		Apr-24		May-24		Jun-24	
	Conc mg/L	Mass-Load lbs/day																						
26																							7.7	91
27																							4.7	56
28																								
29									19.2 a	89 a											2.7	22		
30									20.5	293											<3.0 b	<27 b		
31																								
Monthly BOD ₅ Mass-Load	-		-		-		-		4,947		-		-		-		-		-		416		664	
Operating Days per Month	0		0		0		0		15		0		0		0		0		0		6		9	
Monthly Average	-	-	-	-	-	-	-	-	18.1	330	-	-	-	-	-	-	-	-	-	-	5.4	69	6.2	74
Monthly Maximum per Day	-	-	-	-	-	-	-	-	36.8	559	-	-	-	-	-	-	-	-	-	-	8.7	152	15.0	179

a A laboratory error caused the BOD sample to be destroyed. Ecology was notified and sample results were estimated by TOC/BOD regression analysis.

b Half the detection value (for values reported below detection) is used if the laboratory detected the parameter in another sample for the monthly reporting period and is presented with a less than (<) sign

Table 7. KC STP Biological Oxygen Demand Results

Date	Jul-23		Aug-23		Sep-23		Oct-23		Nov-23		Dec-23		Jan-24		Feb-24		Mar-24		Apr-24		May-24		Jun-24	
	Conc mg/L	Mass-Load lbs/day	Conc mg/L	Mass-Load lbs/day	Conc mg/L	Mass-Load lbs/day	Conc mg/L	Mass-Load lbs/day	Conc mg/L	Mass-Load lbs/day	Conc mg/L	Mass-Load lbs/day	Conc mg/L	Mass-Load lbs/day	Conc mg/L	Mass-Load lbs/day	Conc mg/L	Mass-Load lbs/day	Conc mg/L	Mass-Load lbs/day	Conc mg/L	Mass-Load lbs/day	Conc mg/L	Mass-Load lbs/day
1									114.0	2,735	2,210.0	14,966			275.0	6,011			386.0	3,876				
2							2.1	16	148.0	3,566	1,000.0	11,843	320.0	6,787					272.0	3,242				
3							2.7	23	92.7	1,953	737.0	9,091	247.0	5,521					315.0	3,765				
4							3.1	29			434.0	9,834	266.0	5,959			570.0	10,553	276.0	3,250				
5							2.7	24			280.0	5,028	277.0	3,144			1,050.0	13,889						
6							3.4	28							250.0	5,717	971.0	10,552						
7							5.3	126			144.0	2,094			228.0	5,286	896.0	9,393						
8							4.6	112			74.7	1,675	180.0	3,845	238.0	5,546	1,000.0	5,680	234.0	2,664				
9							3.5	51			211.0	4,737	141.0	3,124	270.0	3,416			223.0	2,645				
10							2.9	44			267.0	5,999	176.0	3,369					239.0	2,834				
11	13.4	60					2.2 ^a	33 ^a	77.4	1,376	275.0	6,195	232.0	2,866			1,064.0 ^a	8,767 ^a	232.0	3,984				
12	12.2	98					7.8	117	35.3	667	79.5	1,792	197.0	2,312	281.0	6,187	987.0 ^a	10,429 ^a						
13	8.8	75					6.3	89	46.3 ^a	524 ^a	71.1	1,593	208.0	2,444	215.0	5,003	889.0	10,906						
14	8.8	60					5.0	118			62.1	1,370	238.0	2,789	203.0	4,691	763.0	8,871						
15							4.3	104			81.0	1,787	209.0	2,452	316.0	7,292	790.0	4,961						
16							4.7	114			78.8	1,736	211.0	2,479	403.0	5,075			55.5	368				
17	34.2	287					6.3	150			75.5	1,661	1,330.0	7,110										
18	34.3	98									78.5	619	1,190.0	6,352			939.0	9,570						
19											94.2 ^a	2,072 ^a	1,150.0	7,260			886.0	10,382						
20									519.0	3,545	155.0	3,427	910.0	6,178	295.0	3,400	723.0	8,472						
21									447.0	9,719	154.0	3,326	850.0	8,684	238.0	2,896	746.0	8,822						
22									452.0	4,723			736.0	8,360	208.0	4,028	745.0	4,803						
23													692.0	10,377										
24													602.0	9,710										
25													567.0	12,621			469.0	5,097						
26													515.0	11,665			516.0	5,728						
27					9.5	65							494.0	11,182			470.0	5,437						

Date	Jul-23		Aug-23		Sep-23		Oct-23		Nov-23		Dec-23		Jan-24		Feb-24		Mar-24		Apr-24		May-24		Jun-24	
	Conc mg/L	Mass-Load lbs/day	Conc mg/L	Mass-Load lbs/day	Conc mg/L	Mass-Load lbs/day	Conc mg/L	Mass-Load lbs/day	Conc mg/L	Mass-Load lbs/day	Conc mg/L	Mass-Load lbs/day	Conc mg/L	Mass-Load lbs/day	Conc mg/L	Mass-Load lbs/day	Conc mg/L	Mass-Load lbs/day						
28					2.8	23			362.4 ^a	7,027 ^a			388.0	8,760	714.0	9,081	475.0	5,376						
29					2.0	15							330.0	7,412	441.0	5,443								
30													338.0	7,504										
31													294.0	6,547										
Monthly BOD ₅ Mass-Load	678		-		103		1179		35,834		90,845		176,812		79,073		157,687		26,627		-		-	
Operating Days per Month	6		0		3		16		10		20		28		15		19		9		0		0	
Monthly Average	18.6	113	-	-	4.8	34	4.2	74	229.4	3,583	328.1	4,542	474.6	6,315	305.0	5,272	786.8	8,299	248.1	2,959	-	-	-	-
Monthly Maximum per Day			-	-	9.5	65	7.8	150	519.0	9,719	2,210.0	14,996	1,330.0	12,621	714.0	9,081	1,064.0	13,889	386.0	3,984	-	-	-	-

^a An Ecology approved regression analysis of TOC/BOD₅ samples was performed due to lab error during analysis.

BOD₅ Results Summary – Outfall 001

Figure 5. Outfall 001 Monthly Average BOD₅ Concentration

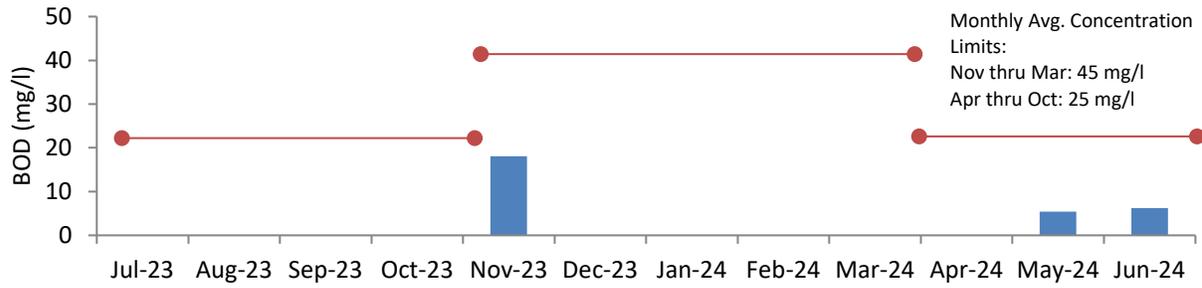
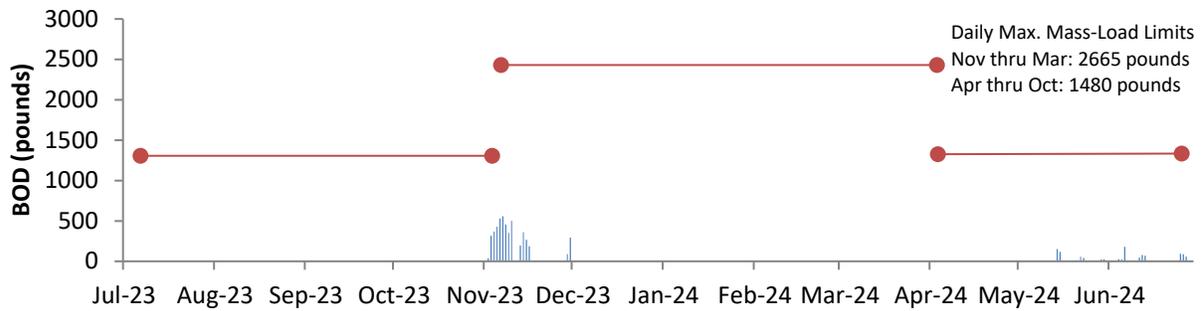


Figure 6. Outfall 001 Daily Maximum BOD₅ Mass-Load



BOD₅ Results Summary – KC STP Outfall

Figure 7. KC STP Daily Maximum Hourly BOD₅ Mass-Load

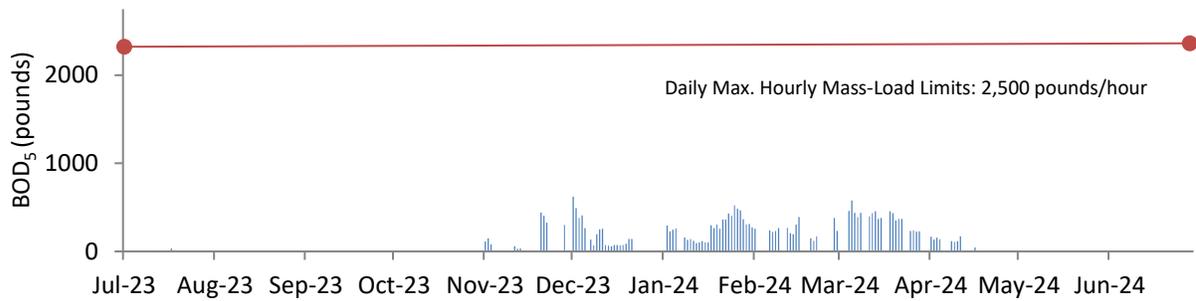


Figure 8. KC STP Daily Maximum BOD₅ Mass-Load

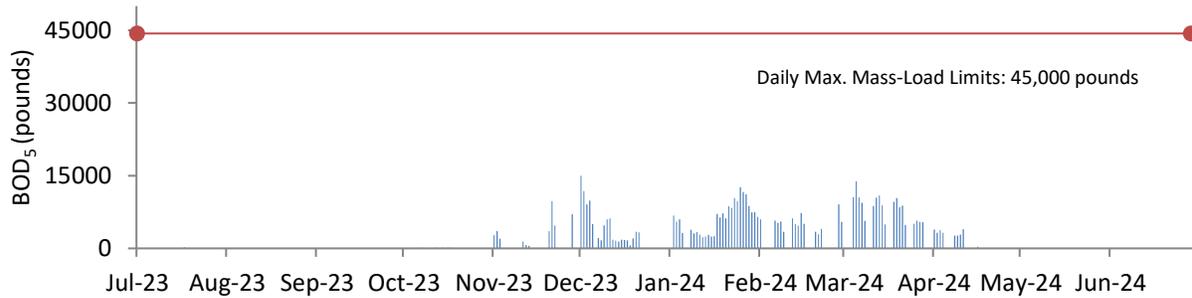
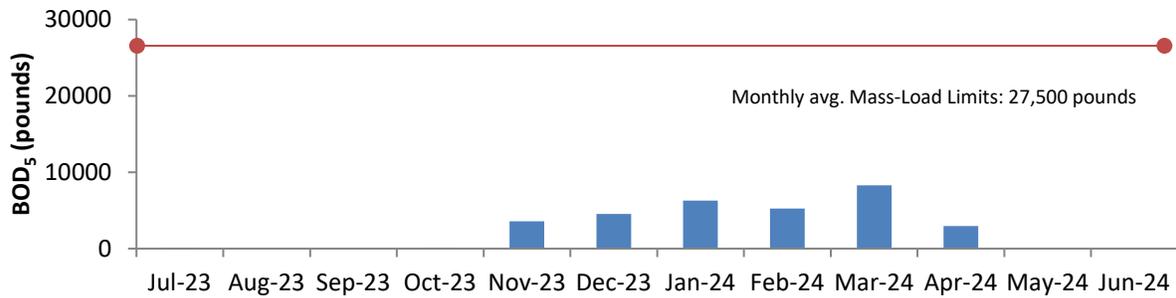


Figure 9. KC STP Monthly Average BOD₅ Mass-Load



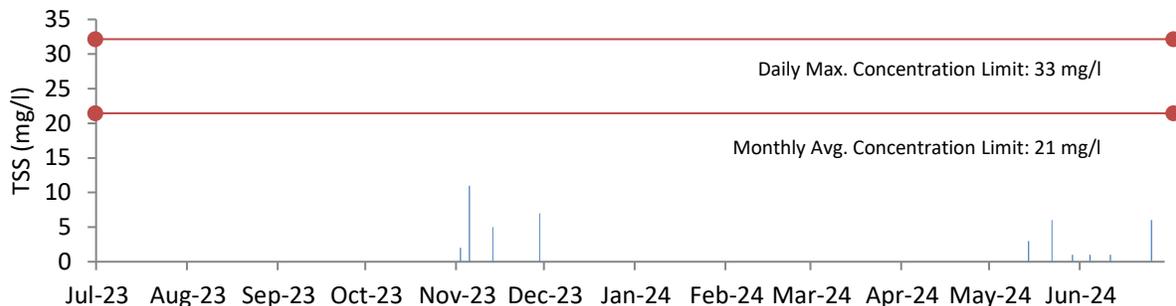
BOD₅ Mass Load Summary – AKART Implementation

Since AKART implementation, the IWTP has processed 14,286,458 pounds of BOD₅ from the 001 and KC STP outfalls. A total of 13,961,225 pounds of BOD₅ (97.7%) were segregated and sent to King County for treatment.

3.3.2 Total Suspended Solids (TSS)

A total of ten (10) samples were collected from Outfall 001 for TSS analysis. TSS results for discharges to Outfall 001 ranged from 1.0 mg/L to 11.0 mg/L. All TSS samples were well below the daily maximum effluent limit of 33 mg/L and the monthly average effluent limit of 21 mg/L. Figure 10 depicts the Outfall 001 Daily Maximum TSS concentrations for the reporting period.

Figure 10 . Outfall 001 Daily Maximum TSS Concentration



3.3.3 Glycols

Four (4) effluent samples were collected from discharges to Outfall 001 and analyzed for propylene-glycol using a modified technique of EPA Method 8015. There is no established effluent limit for propylene-glycol; however monthly reporting is required on DMR's from November through March. The daily concentration for propylene-glycol discharged to Outfall 001 during the reporting period ranged from non-detect to 10.10 mg/L.

3.3.4 pH

Continuous pH metering is performed during discharge to Outfall 001. For Outfall 001 discharges, the instantaneous minimum pH measurement was 6.3 S.U. and the instantaneous maximum pH measurement was 8.6 S.U. All stormwater discharged to Outfall 001 was within the NPDES permitted range throughout the reporting period.

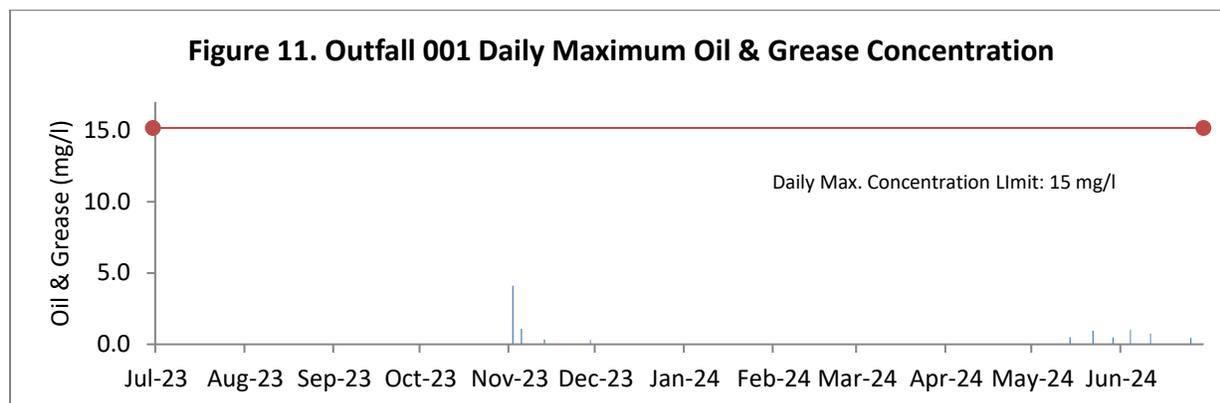
Continuous pH metering is performed during discharge to KC STP. For KC STP, the instantaneous minimum pH measurement was 5.0 S.U., recorded on March 12, 2024. The instantaneous minimum pH of 5.0 S.U. was recorded during a pH sensor cleaning. An IWTP operator noticed clogging on the sensor, while cleaning, the probe pH dropped to 5.0 S.U. for less than 15-minutes. Once the sensor was returned to the discharge the readings were immediately above the ≥ 5.5 S.U. daily minimum pH limit.

On November 12, 2023, the pH dropped to 5.4 S.U. The sensor was below the daily minimum pH permit limit of ≥ 5.5 S.U. for less than 15-minutes.

The maximum pH measurement over the reporting period at KC STP was 9.2 S.U. All stormwater discharged to KC STP throughout the reporting period was within the King County Waste Discharge pH permit range.

3.3.5 Oil and Grease

Ten (10) samples were collected and submitted for oil and grease analysis of discharge to Outfall 001. The oil and grease samples were analyzed by method NW-TPH-Dx which has a lower detection limit and more accurately characterizes potential contaminants related to jet fuel. The maximum concentration during the 2023-2024 reporting period was 4.10 mg/L. As noted in Figure 11, all Oil and Grease samples were well below the daily maximum effluent limit of 15 mg/L.



3.3.6 Priority Pollutants

Wet season priority pollutant sampling was conducted at Outfall 001 on November 29 and 30, 2023. Dry season priority pollutant sampling was conducted at Outfall 001 on May 14 and 15, 2024. Results of priority pollutant sampling have been reported to Ecology as part of the permit renewal process.

3.3.7 Toxicity Testing

Acute and Chronic toxicity testing is scheduled during the 2024 wet season. Results of toxicity testing will be reported to Ecology as part of the permit renewal process.

Section 4: Conclusions

This report summarized results of effluent sampling at the SEA IWTP from July 2023 through June 2024. Results of permit required monitoring were presented for both NPDES Permit (No. WA00224651) and King County Waste Discharge Permit (No. 7810-05). Results were presented for flow, BOD₅, TSS, propylene-glycol, pH, and oil and grease.

The AKART system has been in place for 17.5 years. It is proving to be very effective in reducing discharge of pollutants to Puget Sound. For this reporting period, 568,838 pounds of BOD₅ out of the total processed 574,940 pounds (98.9 %) were segregated and sent to King County for treatment. Since the implementation of AKART on January 1, 2007, a total of 14,286,458 pounds of BOD₅ were processed through the IWTP and 13,961,225 pounds were segregated and sent to KC STP for treatment (97.7%).

Stormwater pollutants to Outfall 001 have been significantly reduced via diversion to KC STP. The stormwater discharged to Outfall 001 met NPDES effluent limitations throughout the reporting period for all parameters measured.

The stormwater discharged to KC STP met King County Waste Discharge Permit effluent limitations throughout the reporting period for all parameters measured.

Section 5: References

Kennedy/Jenks Consultants. April 2012. Port of Seattle Seattle-Tacoma International Airport Industrial Waste System Waste Water Treatment Plant Operation & Maintenance Manual.

Aspect Consulting. October 2021. Quality Assurance Program Plan, Seattle Tacoma International Airport, Industrial Waste Treatment Plant Discharge Monitoring Program REV 3.0.

Washington State Department of Ecology. National Pollutant Discharge Elimination System Waste Discharge Permit WA-0024651, Port of Seattle. Effective Date: September 1, 2021.

King County Industrial Waste Program. King County Waste Discharge Permit 7810-05, Port of Seattle IWS. Effective Date: July 21, 2021.

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Appendix A: Outfall 001 Analytical Results

Appendix A. Outfall 001 Analytical Results

Date	Flow	BOD ₅	BOD ₅	pH Min	pH Max	Propylene-Glycol	TSS	NWTPH-Dx
	MGD	mg/l	pounds	S.U.	S.U.	mg/l	mg/l	mg/l
11/2/2023	0.97	4.9	39	7.9	7.9	<5.0 ^c	2 ^d	4.10
11/3/2023	3.75	10.1	316	7.4	7.4			
11/4/2023	4.27	10.4	370	7.3	7.3			
11/5/2023	4.45	11.5	427	6.4	6.4	<5.0 ^c	11	1.08
11/6/2023	4.26	14.9 ^e	530 ^e	6.3	6.3			
11/7/2023	4.27	15.7 ^e	559 ^e	6.3	6.3			
11/8/2023	4.24	12.9	456	6.8	6.8			
11/9/2023	3.30	12.8	352	6.5	6.5			
11/10/2023	1.64	36.8	504	6.5	6.5			
11/13/2023	0.66	35.4	195	7.8	7.8	10.1	5	<0.33 ^c
11/14/2023	1.63	26.7	362	6.7	6.7			
11/15/2023	1.49	21.5	267	6.8	6.8			
11/16/2023	1.26	17.9	188	6.7	6.7			
11/29/2023	0.56	19.2 ^f	89 ^f	6.6	7.9	<5.0 ^c	7	<0.31 ^c
11/30/2023	1.71	20.5	293	6.7	6.9			
5/14/2024	2.09	8.7	152	6.9	7.7		3 ^d	<0.49 ^c
5/15/2024	1.89	7.4	116	7.4	7.6			
5/22/2024	1.09	6.1	56	7.1	7.1		6	0.97
5/23/2024	1.10	4.7	43	7.1	7.3			
5/29/2024	0.97	2.7	22	7.1	8.3		1 ^d	<0.50 ^c
5/30/2024	1.09	<3.0 ^c	<27 ^c	7.6	8.1			
6/4/2024	1.40	2.2 ^e	26 ^e	7.1	7.4		1 ^d	1.03
6/5/2024	1.43	2.3	27	7.2	7.4			
6/6/2024	1.43	<15.0 ^{c,e}	<179 ^{c,e}	7.2	7.5			
6/11/2024	1.43	3.8	45	7.0	7.7		1 ^d	0.75
6/12/2024	1.43	6.6	79	7.4	8.0			
6/13/2024	1.43	5.7	68	7.6	8.6			
6/25/2024	1.42	7.9 ^e	94 ^e	7.2	8.1		6.00	<0.45 ^c
6/26/2024	1.41	7.7	91	7.3	7.9			
6/27/2024	1.42	4.7	56	7.5	8.0			

^a Method detection limit (for values reported below detection) is used if only a single sample was taken during the monthly reporting period and is presented with a less than (<) sign.

^b Zero (for values reported below detection) is used if the laboratory did not detect the parameter in another sample for the monthly reporting period.

^c Half the detection value (for values reported below detection) is used if the laboratory detected the parameter in another sample for the monthly reporting period and is presented with a less than (<) sign.

^d Lab estimate for TSS as sample result was above method detection limit, but below method reporting limit.

^e Lab analysis error caused BOD samples to be read outside of hold-time, Ecology was notified of the lab error. BOD lab sample results were flagged for the deviation.

^f Lab analysis error caused BOD samples to be damaged during analysis, Ecology was notified of the lab error. Lab sample results were estimated by using a TOC/BOD regression analysis.

Appendix B: KC STP Analytical Results

Appendix B. KC STP Analytical Results

Date	Flow	BOD ₅	BOD ₅	pH Min	pH Max	TSS	NWTPH-Dx
	MGD	mg/L	lbs/day	S.U.	S.U.	mg/L	mg/L
7/11/2023	0.54	13.4	60	8.8	9.2	11 ^d	<1.07 ^c
7/12/2023	0.97	12.2	98	8.6	9.1	6	
7/13/2023	1.02	8.8	75	8.5	9.0	7	
7/14/2023	0.82	8.8	60	8.6	8.8	7	
7/17/2023	1.01	34.2 ^e	287 ^e	7.3	8.7	8	
7/18/2023	0.34	34.3 ^e	98 ^e	7.5	8.2	24	
9/27/2023	0.82	9.5	65	7.0	7.2	21	1.48
9/28/2023	0.97	2.8	23	6.8	7.0	18	
9/29/2023	0.89	2.0	15	6.6	6.8	16	
10/2/2023	0.92	2.1	16	6.6	6.9	13	0.81
10/3/2023	1.02	2.7	23	6.5	6.9	13	
10/4/2023	1.11	3.1	29	6.8	6.9	11	
10/5/2023	1.08	2.7	24	6.8	6.8	8	
10/6/2023	0.99	3.4	28	6.8	6.9	11	
10/7/2023	2.85	5.3	126	6.8	6.9	8	
10/8/2023	2.92	4.6	112	6.9	7.0	8	
10/9/2023	1.76	3.5	51	6.9	7.1	9	
10/10/2023	1.82	2.9	44	6.5	7.1	10	
10/11/2023	1.82	3.1 ^e	47 ^e	6.8	7.1	8	
10/12/2023	1.81	7.8	117	6.7	6.9	8	
10/13/2023	1.69	6.3	89	6.9	7.0	8	
10/14/2023	2.84	5.0	118	6.9	7.0	8	
10/15/2023	2.91	4.3	104	6.9	7.0	4	
10/16/2023	2.92	4.7	114	6.9	7.0	10	
10/17/2023	2.85	6.3	150	6.8	7.0	12	
11/1/2023	2.88	114.0	2,735	6.6	7.4	7	<0.34 ^c
11/2/2023	2.89	148.0	3,566	5.9	6.6	19	
11/3/2023	2.53	92.7	1,953	5.9	6.8	20	
11/11/2023	2.13	77.4	1,376	6.9	7.0	39	
11/12/2023	2.27	35.3	667	5.4 ^f	7.1	25	
11/13/2023	1.56	46.3 ^e	524 ^e	6.5	7.0	11	
11/20/2023	0.82	519.0	3,545	6.9	7.4	38	
11/21/2023	2.61	447.0	9,719	7.2	7.5	24	
11/22/2023	1.25	452.0	4,723	7.1	7.4	34	
11/28/2023	2.33	362.4	7,027	7.2	7.6	6	
12/1/2023	0.81	2,210.0	14,966	6.7	6.9	27	7.42
12/2/2023	1.42	1,000.0	11,843	6.5	6.7	20	
12/3/2023	1.48	737.0	9,091	6.6	7.0	18	

Date	Flow	BOD ₅	BOD ₅	pH Min	pH Max	TSS	NWTPH-Dx
	MGD	mg/L	lbs/day	S.U.	S.U.	mg/L	mg/L
12/4/2023	2.72	434.0	9,834	6.5	6.7	15	
12/5/2023	2.15	280.0	5,028	6.4	6.5	8	
12/7/2023	1.74	144.0	2,094	6.3	6.8	3 ^d	
12/8/2023	2.69	74.7	1,675	6.3	6.3	3	
12/9/2023	2.69	211.0	4,737	6.2	6.4	7	
12/10/2023	2.69	267.0	5,999	6.4	6.4	4	
12/11/2023	2.70	275.0	6,195	6.3	6.6	5	
12/12/2023	2.70	79.5	1,792	6.2	6.4	4	
12/13/2023	2.69	71.1	1,593	6.2	6.3	3	
12/14/2023	2.65	62.1	1,370	6.2	6.3	2	
12/15/2023	2.65	81.0	1,787	6.3	6.3	3	
12/16/2023	2.64	78.8	1,736	6.2	6.4	2	
12/17/2023	2.64	75.5	1,661	6.3	6.4	2	
12/18/2023	0.95	78.5	619	6.4	6.4	3	
12/19/2023	2.64	94.2 ^e	2,072 ^e	6.4	6.5	3	
12/20/2023	2.65	155.0	3,427	6.4	6.5	3	
12/21/2023	2.59	154.0	3,326	6.4	6.5	3	
1/2/2024	2.54	320.0	6,787	6.0	6.5	5	0.93
1/3/2024	2.68	247.0	5,521	6.3	6.5	3	
1/4/2024	2.69	266.0	5,959	6.5	6.6	4	
1/5/2024	1.36	277.0	3,144	6.4	6.7	4	
1/8/2024	2.56	180.0	3,845	6.1	6.9	6	
1/9/2024	2.66	141.0	3,124	6.5	6.6	4	
1/10/2024	2.30	176.0	3,369	6.5	6.7	4	
1/11/2024	1.48	232.0	2,866	5.8	6.7	7	
1/12/2024	1.41	197.0	2,312	6.2	6.8	<2.5 ^c	
1/13/2024	1.41	208.0	2,444	6.7	6.9	4	
1/14/2024	1.41	238.0	2,789	6.7	6.8	4	
1/15/2024	1.41	209.0	2,452	6.8	6.9	5	
1/16/2024	1.41	211.0	2,479	6.8	6.9	5	
1/17/2024	0.64	1,330.0	7,110	6.8	7.2	11	
1/18/2024	0.64	1,190.0	6,352	6.8	6.9	9	
1/19/2024	0.76	1,150.0	7,260	6.8	6.9	7	
1/20/2024	0.81	910.0	6,178	6.9	6.9	8	
1/21/2024	1.23	850.0	8,684	6.8	6.9	10	
1/22/2024	1.36	736.0	8,360	6.6	7.1	10	
1/23/2024	1.80	692.0	10,377	6.6	6.9	10	
1/24/2024	1.93	602.0	9,710	6.5	6.6	9	
1/25/2024	2.67	567.0	12,621	6.5	6.6	16	

Date	Flow	BOD ₅	BOD ₅	pH Min	pH Max	TSS	NWTPH-Dx
	MGD	mg/L	lbs/day	S.U.	S.U.	mg/L	mg/L
1/26/2024	2.72	515.0	11,665	6.4	6.7	9	
1/27/2024	2.71	494.0	11,182	6.4	6.7	10	
1/28/2024	2.71	388.0	8,760	6.3	6.5	8	
1/29/2024	2.69	330.0	7,412	6.3	6.4	6	
1/30/2024	2.66	338.0	7,504	6.2	6.5	6	
1/31/2024	2.67	294.0	6,547	6.2	6.3	4	
2/1/2024	2.62	275.0	6,011	6.2	6.5	4	1.33
2/6/2024	2.74	250.0	5,717	6.3	6.4	5	
2/7/2024	2.78	228.0	5,286	6.3	6.4	5	
2/8/2024	2.79	238.0	5,546	6.3	6.3	<2 °	
2/9/2024	1.52	270.0	3,416	6.2	6.3	<2 °	
2/12/2024	2.64	281.0	6,187	6.1	6.2	8	
2/13/2024	2.79	215.0	5,003	6.1	6.2	9	
2/14/2024	2.77	203.0	4,691	6.1	6.3	20	
2/15/2024	2.77	316.0	7,292	6.1	6.3	11	
2/16/2024	1.51	403.0	5,075	6.2	6.3	5	
2/20/2024	1.38	295.0	3,400	6.1	6.6	9	
2/21/2024	1.46	238.0	2,896	6.6	6.9	10	
2/22/2024	2.32	208.0	4,028	6.4	6.8	12	
2/28/2024	1.53	714.0	9,081	6.5	6.6	8	
2/29/2024	1.48	441.0	5,443	6.5	6.6	5	
3/4/2024	2.22	570.0	10,553	5.9	6.5	5	1.27
3/5/2024	1.59	1,050.0	13,889	6.3	6.5	4	
3/6/2024	1.30	971.0	10,552	6.2	6.7	<7 °	
3/7/2024	1.26	896.0	9,393	6.1	6.4	5	
3/8/2024	0.68	1,000.0	5,680	6.1	6.3	6	
3/11/2024	0.99	1,064.0 °	8,767 °	5.9	6.4	<5 °	
3/12/2024	1.27	987.0 °	10,429 °	5.0 ^g	6.7	7	
3/13/2024	1.47	889.0	10,906	6.0	6.5	10	
3/14/2024	1.39	763.0	8,871	6.0	6.4	11	
3/15/2024	0.75	790.0	4,961	5.9	6.3	11	
3/18/2024	1.22	939.0	9,570	5.7	6.0	10	
3/19/2024	1.41	886.0	10,382	5.8	6.1	10	
3/20/2024	1.41	723.0	8,472	5.8	6.2	11	
3/21/2024	1.42	746.0	8,822	5.7	6.2	10	
3/22/2024	0.77	745.0	4,803	5.5	6.0	12	
3/25/2024	1.30	469.0	5,097	5.7	6.3	12	
3/26/2024	1.33	516.0	5,728	5.5	6.3	10	
3/27/2024	1.39	470.0	5,437	5.7	6.2	15	

Date	Flow	BOD ₅	BOD ₅	pH Min	pH Max	TSS	NWTPH-Dx
	MGD	mg/L	lbs/day	S.U.	S.U.	mg/L	mg/L
3/28/2024	1.36	475.0	5,376	5.8	6.1	12	
4/1/2024	1.20	386.0	3,876	5.9	6.1	9	2.23
4/2/2024	1.43	272.0	3,242	5.9	6.0	8	
4/3/2024	1.43	315.0	3,765	5.7	6.1	9	
4/4/2024	1.41	276.0	3,250	5.9	6.3	10	
4/8/2024	1.37	234.0	2,664	5.9	6.2	9	
4/9/2024	1.42	223.0	2,645	6.0	6.8	6	
4/10/2024	1.42	239.0	2,834	6.3	6.5	12	
4/11/2024	2.06	232.0	3,984	6.2	6.6	9	
4/16/2024	0.79	55.5	368	6.7	7.0	28	

^a Method detection limit (for values reported below detection) is used if only a single sample was taken during the monthly reporting period and is presented with a less than (<) sign.

^b Zero (for values reported below detection) is used if the laboratory did not detect the parameter in another sample for the monthly reporting period.

^c Half the detection value (for values reported below detection) is used if the laboratory detected the parameter in another sample for the monthly reporting period and is presented with a less than (<) sign.

^d A hold time exceedance occurred due to laboratory error.

^e A Hold-Time exceedance occurred on BOD analysis and an Ecology approved regression analysis of TOC/BOD₅ samples was performed.

^f On November 12, 2023, discharged measured at 5.4 for a period less than 15-minutes. The pH meter reading was not below 5.5 S.U. for longer than 15-minutes and therefore was not a violation of the daily minimum pH.

^g On March 12, 2024, an IWTP operator notice the pH probe appeared clogged and quickly removed the probe from solution to clean, resulting in an instantaneous pH measurement of 5.0 S.U. The pH meter reading was not below 5.5 S.U. for longer than 15-minutes and therefore was not a violation of the daily minimum pH.

Date	Arsenic	Cadmium	Chromium	Copper	Lead	Nickel	Silver	Zinc
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
7/11/2023	0.0027	<0.0001 ^a	<0.0005 ^a	0.0104	0.0002	0.0022	<0.0002 ^a	<0.0060 ^a
9/27/2023	0.0020	<0.0003 ^a	<0.0010 ^a	0.0127	0.0015	0.0023	<0.0002 ^a	0.0344
10/02/2023	0.0017	<0.0001 ^a	0.0011	0.0078	0.0007	0.0017	<0.0002 ^a	0.0227
11/01/2023	0.0013	<0.0001 ^a	<0.0005 ^a	0.0059	0.0004	0.0016	<0.0002 ^a	0.0141
12/01/2024	0.0015	0.0008	0.0027	0.0249	0.0019	0.0028	<0.0002 ^a	0.1050
01/02/2024	0.0007	<0.0001 ^a	<0.0005 ^a	0.0066	0.0003	0.0011	<0.0002 ^a	0.0471
02/01/2024	0.0007	0.0002	<0.0005 ^a	0.0056	0.0004	0.0013	<0.0002 ^a	0.0565
03/04/2024	0.0008	<0.0001 ^a	0.0013	0.0066	0.0006	0.0011	<0.0002 ^a	0.0535
04/01/2024	0.0009	<0.0001 ^a	0.0011	0.0064	0.0005	0.0019	<0.0002 ^a	0.0716

Date	Arsenic	Cadmium	Chromium	Copper	Lead	Nickel	Silver	Zinc
	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day
7/11/2023	0.0121	<0.0009 ^b	<0.0045 ^b	0.0466	0.0011	0.0097	<0.0018 ^b	<0.0537 ^b
9/27/2023	0.0138	<0.0167 ^b	<0.0060 ^b	0.0870	0.0101	0.0156	<0.0016 ^b	0.2355
10/02/2023	0.0129	<0.0008 ^b	0.0084	0.0595	0.0052	0.0126	<0.0015 ^b	0.1738
11/01/2023	0.0319	<0.0024 ^b	<0.0120 ^b	0.1418	0.0085	0.0394	<0.0048 ^b	0.3383
12/01/2024	0.0102	0.0054	0.0179	0.1686	0.0130	0.0190	<0.0014 ^b	0.7111
01/02/2024	0.0148	<0.0021 ^b	<0.0106 ^b	0.1398	0.0066	0.0242	<0.0042 ^b	0.9989
02/01/2024	0.0163	0.0044	<0.0109 ^b	0.1224	0.0091	0.0280	<0.0044 ^b	1.2350
03/04/2024	0.0147	<0.0019 ^b	0.0235	0.1228	0.0106	0.0194	<0.0037 ^b	0.9905
04/01/2024	0.0089	<0.0010 ^b	0.0106	0.0641	0.0055	0.0187	<0.0020 ^b	0.7190

^a Method detection limit (for values reported below detection) is used and is presented with a less than (<) sign.

^b Half the detection value (for values reported below detection) is used to calculate mass-loading and is presented with a less than (<) sign.

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