
King County Lower Duwamish Waterway Source Control Annual Report Year 2023

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Final



King County

King County Lower Duwamish Waterway Source Control Annual Report Year 2023

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ACRONYMS

BBP	butyl benzyl phthalate
BEHP	bis(2-ethylhexyl)phthalate
BIPOC	Black, Indigenous, and People of Color
BMPs	best management practices
CA	consistent attainment
CCTV	closed-circuit television
City	City of Seattle
CSL	cleanup screening level
County	King County
CSO	combined sewer overflow
Ecology	Washington State Department of Ecology
EPA	U.S. Environmental Protection Agency
ERTS	Environmental Report Tracking System
FMD	Facilities Management Division
GSI	green stormwater infrastructure
HHW	household hazardous waste
HPAH	high molecular weight polycyclic aromatic hydrocarbon
ISGP	Industrial Stormwater General Permit
KCIA	King County International Airport
KCIW	King County Industrial Waste
LAET	lowest apparent effects threshold
LDW	Lower Duwamish Waterway
MS4	municipal separate storm sewer system
MTCA	Model Toxics Control Act
NBF	North Boeing Field
NPDES	National Pollutant Discharge Elimination System
NTU	nephelometric turbidity unit
OSS	on-site sewage system
OWS	oil–water separator
PAHs	polycyclic aromatic hydrocarbons
PCBs	polychlorinated biphenyls
Public Health	Public Health—Seattle & King County
RM	river mile
SCIP	Source Control Implementation Plan
SIU	significant industrial user
SMS	Washington State Sediment Management Standards
SPU	Seattle Public Utilities
SQS	sediment quality standard
SWD	Solid Waste Division
SWS	Stormwater Services Section
2LAET	second lowest apparent effects threshold
TSS	total suspended solids
West Point	West Point Treatment Plant
WLRD	Water and Land Resources Division
WTD	Wastewater Treatment Division

EXECUTIVE SUMMARY

King County (County) developed a Source Control Implementation Plan in support of the Lower Duwamish Waterway (LDW) Superfund site cleanup. The LDW source control area is comprised of individual combined sewer and stormwater drainage areas that discharge to the LDW Superfund site. The County's plan includes a continued commitment to

- implement planned combined sewer overflow (CSO) control projects to complete control of all County CSOs in the LDW.
- regulate and monitor industrial dischargers to the portions of the regional wastewater system that have releases to the LDW.
- manage implementation of the County's National Pollutant Discharge Elimination System Phase I Municipal Stormwater Permit.
- provide technical and educational programs for businesses and residents on ways to prevent pollutants from entering the LDW.
- conduct sampling, source tracing, and system mapping.
- fully comply with water and air quality permits and regulations at County-owned and -operated facilities.

The County reports on its source control related activities within the LDW drainage basin through annual reports submitted to the Washington State Department of Ecology. This report summarizes the source control activities conducted in 2023 by various County departments and divisions, with most activities being conducted by the King County Wastewater Treatment Division, Water and Land Resources Division, King County International Airport, and Road Services Division.

1.0 INTRODUCTION

This annual report summarizes King County’s (County) Lower Duwamish Waterway (LDW) source control activities in 2023. The report documents implementation of actions outlined in the County’s LDW Source Control Implementation Plan (SCIP) for 2019 to 2023 (King County 2019).¹ This is the fifth annual report associated with the SCIP for 2019 to 2023. The County has produced eight annual reports prior to this one that are associated with the County’s LDW SCIPs for 2014 to 2018 and 2019 to 2023. The SCIP does the following:

- Identifies actions within the County’s authority that are needed to sufficiently control existing sources of contaminants to the LDW to begin sediment cleanup in the waterway.
- Strives to minimize the risk of recontaminating sediments after sediment cleanup to levels above the sediment cleanup standards established in the U.S. Environmental Protection Agency’s (EPA) Record of Decision for the LDW Superfund site (EPA 2014) and Explanation of Significant Differences (EPA 2021).
- Supports the Washington State Department of Ecology’s (Ecology) LDW Source Control Strategy Plan (Ecology 2016) and implementation of EPA’s Record of Decision for the LDW Superfund site.

This annual report is organized according to the County departments and divisions specified in the SCIP.

1.1 LDW Source Control Area

The LDW source control area is comprised of individual drainage areas that discharge to the LDW Superfund site (Figure 1). The area includes (a) King County and Seattle Public Utilities (SPU) combined sewer overflow (CSO) basins and (b) separate stormwater basins that are the responsibility of King County and the cities of Seattle, Tukwila, Burien, and SeaTac. This annual report covers actions in combined sewer basins associated with County CSO outfalls, County separate storm sewer basins that drain to the LDW, and County properties in the LDW source control area.

1.2 Internal Coordination Efforts

Most of King County’s responsibility for LDW source control rests with four County divisions: the Wastewater Treatment Division (WTD), Water and Land Resources Division (WLRD), King County International Airport (KCIA), and Road Services Division. In 2022, meetings were held to coordinate source control efforts and plan for next SCIP. Meetings typically included representatives from the divisions listed above as well as other County

¹ King County provided previous source control updates to the LDW Source Control Work Group and to Ecology’s LDW Source Control Status Reports (2003–2020). The status reports can be found at <https://apps.ecology.wa.gov/cleanupsearch/site/1643#site-documents>

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agencies and divisions (i.e., Facilities Management Division [FMD], Public Health—Seattle & King County [Public Health], and Hazardous Waste Management Program).

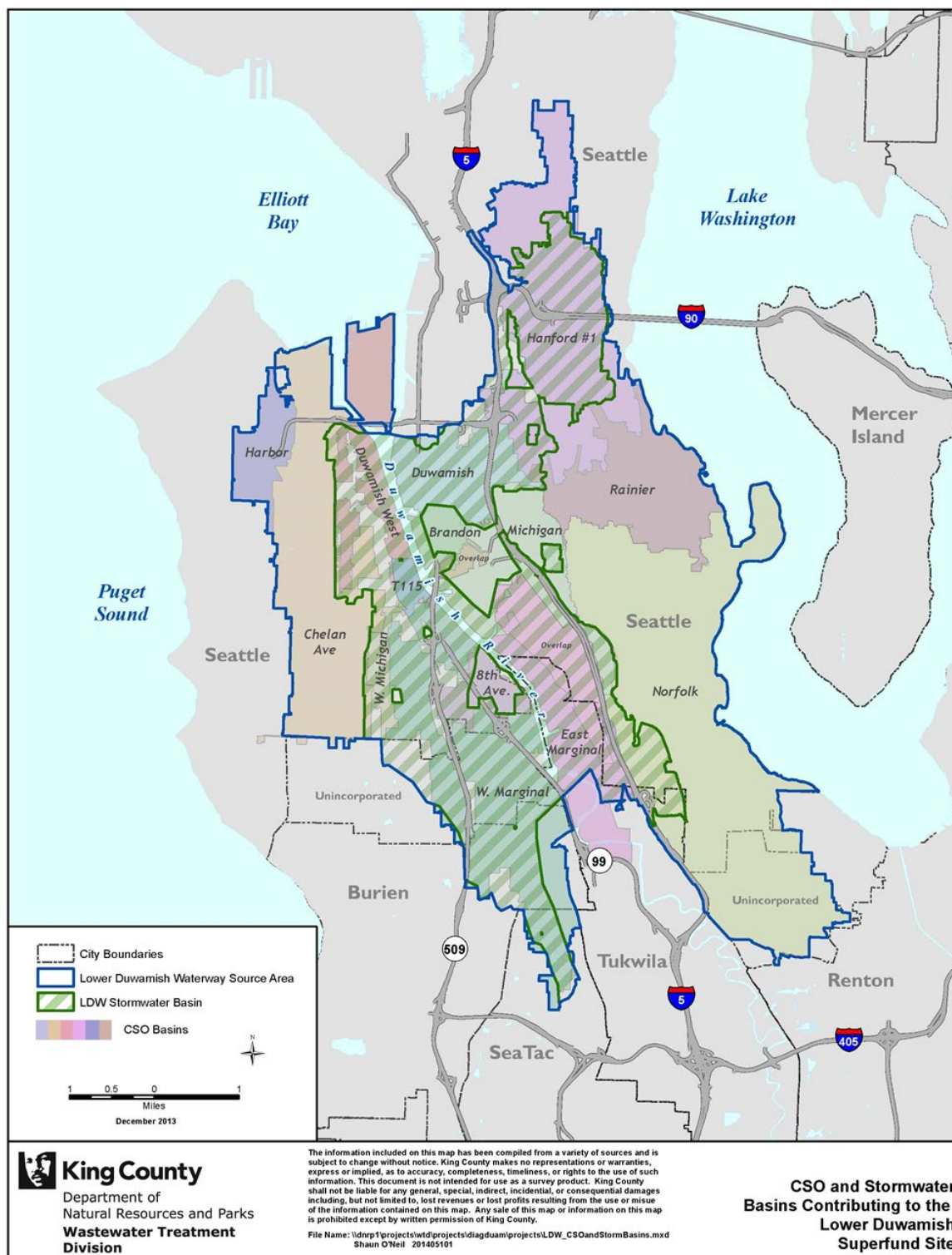


Figure 1. Stormwater and Combined Sewer Basins in the LDW Source Control Area

2.0 WASTEWATER TREATMENT DIVISION

This section summarizes source control actions taken by WTD in the LDW source control area during 2023.

2.1 CSO Control Program

WTD is responsible for managing King County’s regional wastewater system. WTD’s CSO Control Program fulfills requirements under the National Pollutant Discharge Elimination System (NPDES) permit for the County’s West Point Treatment Plant (West Point) (WA0029181) in Seattle and requirements in Washington Administrative Code 173-245-090. The West Point NPDES permit was issued on December 19, 2014, and became effective on February 1, 2015. The application for renewal of the West Point NPDES permit was submitted in January 2019. The current NPDES permit expired on January 31, 2020, and has been administratively extended until Ecology issues a new permit, which was issued in 2024 during the development of this annual report.

In 2013, King County entered into a consent decree (CD) with EPA and Ecology to ensure its CSO control plan is completed by 2030. The CD contains milestone dates for completion of various phases of the project phases. On October 28, 2019, King County submitted a formal request to EPA and Ecology to initiate negotiations to modify the CD to accommodate changed conditions from 2013 when the CD was filed. These changed conditions include substantially higher cost estimates for planned CSO control projects, climate change impacts, anticipated future increases in regulatory requirements for nutrient discharges to Puget Sound, and rate affordability. Negotiations began in 2020 and continued in 2023. The 2013 CD is the enforceable document until a modified CD is approved.

The County’s previous investments in CSO control have significantly reduced CSO discharge events and pollutant loads into Seattle-area waterways. Two CSO control projects have recently been constructed and one CSO control project is currently underway in the LDW. The projects, estimated to cost around \$400 million (escalated dollars), are (a) West Duwamish Wet Weather Storage (West Michigan and Terminal 115 CSOs); (b) Georgetown Wet Weather Treatment Station (Georgetown WWTS; Brandon and South Michigan CSOs); and (c) Rainier Valley Wet Weather Storage and conveyance improvements (Hanford #1 CSO).

Together, these three projects will control the remaining uncontrolled County CSOs in the LDW to the state standard of no more than one untreated CSO discharge per year on a 20-year moving average at each outfall and remove most of the untreated CSOs in the LDW. Rainier Valley Wet Weather Storage became operational in 2018. Monitoring and modeling data from 2019 showed that the Rainier Valley Wet Weather Storage project did not achieve the performance standard, and a supplemental compliance plan was submitted in

August 2020. Remedial actions are underway as well as monitoring of the CSO control status. The Georgetown WWTS project completed the construction phase and became operational in 2022; it is now being monitored for compliance. The West Duwamish project is currently in the design phase. Table 1 summarizes the progress made in 2023 to meet CD project milestones.

Table 1. Summary of King County CSO Control Project Milestones in the LDW for 2023.

Project Name (Status)	Discharge Serial Number	Milestone Deadline	2013 CD Milestone Status
Georgetown WWTS (construction)	039, 041	Construction completion by December 2022	Construction completed in 2022
Rainier Valley Wet Weather Storage (monitoring)	031a, 031b, 031c	Construction completion by December 2019	Construction completed June 2018. Project did not meet standard, and a supplemental compliance plan was submitted August 2020. Corrective actions are underway as well as monitoring of CSO control status
West Duwamish (design)	038, 042	Completion of bidding by December 2022	Force majeure submittals from 2021 and 2022 are in dispute resolution in 2023. In 2023, project completed 60% design and began 90% design phase.

2.2 RainWise Program

Launched by SPU in 2010, RainWise is a rebate program that helps eligible property owners manage stormwater by installing green stormwater infrastructure (GSI) on private property. Proven to be an effective incentive program, King County formed an inter-agency partnership with SPU in 2013 to administer rebates in CSO basins controlled by WTD. RainWise provides rebates for all or a majority of the installation costs of rain gardens and cisterns to eligible private property owners living in specific CSO basins. Rain gardens and cisterns, both forms of GSI, help to slow, detain, or retain stormwater, reducing both the volume and timing of CSOs and sources of pollution into the combined system.

The RainWise program continues to be active in the Lower Duwamish neighborhoods of South Park and Highland Park. As of the end of 2023, 103 installations are capturing the rain that falls on 159,600 square feet of roof area in the Highland Park and South Park neighborhoods.

In addition to residences, RainWise actively seeks out “big roof” properties, which allows the program to partner with schools, multifamily housing, businesses, and places of worship.

For property owners not eligible for RainWise, GSI Mini Grants provide funding for them to install GSI and help with source control in the Duwamish. The grants provide \$1,500 for installation of GSI on private property and \$4,500 for income-qualified and community-based organizations.² As of the end of 2023, these funds supported 35 projects.

In 2023, GSI Mini Grants funds supported 11 out of 12 projects within the LDW source control area. A total of 32% of mini grant capital awarded in the LDW went to either income-limited individuals or nonprofit organizations.

2.3 WaterWorks Grant Funding

King County established the WaterWorks Grant Program to promote source control partnerships, develop local expertise in water quality protection, and enhance economic opportunities in the community. The program funds projects undertaken by organizations and agencies to improve water quality. These projects support the success of King County's CSO control projects by (a) controlling new and ongoing sources of pollution that could harm the environment or recontaminate cleaned-up areas in the LDW and (b) reducing the volume and timing of CSOs.

In 2023, King County awarded \$5.5 million in funding to 61 projects through the WaterWorks competitive and Council-allocated grant program. Of that number, 19 projects totaling \$2,094,828 take place entirely or include activities in the LDW source control area. All funded projects have water quality benefits, focusing on source control through GSI, education and community engagement, or stream and riverbank restoration activities. The 19 projects awarded funding in 2023 that affect the LDW source control area are as follows:

1. *American Rivers: Longfellow Creek Headwater Restoration at Roxhill Bog – Construction (\$195,543)*. Supports construction of a pilot groundwater block and related monitoring to test the engineering approach and allow further restoration and future reconnection of stormwater flows into the peat bog. Restoration of this rare bog will improve habitat and reduce CSOs in the Longfellow Creek Basin.
2. *Delridge Neighborhoods Development Association: Delridge Wetland Park Restoration 3 (\$31,909)*. Supports decreasing pollution impacting the park's wetland by monitoring and making improvements to the newly constructed bioswales that channel and treat stormwater and installing hundreds of native plants.
3. *Delridge Neighborhoods Development Association: Longfellow Creek Restoration and Education Program (\$111,980)*. Supports expanding youth environmental engagement in five Delridge Neighborhoods Development Association restoration sites, organizing restoration efforts in the Longfellow Creek Watershed, and immersing more Delridge youth in environmental awareness.

² See GSI Mini Grants website for more information: <http://www.12000raingardens.org/gsi-mini-grants/>

4. *Environmental Coalition of South Seattle: Immigrant Youth Water Stewards: Household Hazards (\$166,202)*. Supports engaging East African immigrant youth to empower and mobilize community members to take action to prevent pollution and improve local water quality by reducing hazardous materials in the home.
5. *Kubota Garden Foundation: Stormwater Pilot Project (\$180,000)*. Supports green roof test panels, soil borings/test pits, groundwater wells, stormwater monitoring, and assessment of existing tree canopy and root systems to inform the design and minimize impacts of stormwater to ponds and Mapes Creek in future Visitor Center construction and path and plaza resurfacing.
6. *Nature Vision: Youth Watershed Education, Stewardship, and Community Science (\$61,392)*. Supports custom water quality and wastewater education programs, including field trips with small-scale restoration projects and community science to 3rd through 12th grade students from low-income, diverse schools in the Green/Duwamish Watershed service area.
7. *Northwest Maritime Center: The Duwamish River: Past, Present & Future (\$160,828)*. Supports Maritime High School's student program to conduct intensive and multifaceted water quality projects related to the Lower Duwamish Waterway and surrounding waters, including Elliott Bay.
8. *Puget Soundkeeper: Lost Urban Creeks Project 4 (\$97,216)*. Supports working with youth from Unleash the Brilliance to study, restore, and steward Springbrook Creek, a lost urban creek obscured by development and lacking community awareness, as well as continuing student participation in additional stewardship, education, outreach, and community science work in the region.
9. *Salmon-Safe: Salmon-Safe Communities: Building Watershed Friendly Affordable Housing (\$167,800)*. Supports two affordable housing sites going beyond code to create watershed healthy housing that is also climate resilient, in partnership with Homestead Community Land Trust, using GSI.
10. *Seattle 2030 District: Green Stormwater Infrastructure for Affordable Housing (\$125,500)*. Supports working with the Housing Development Consortium and affordable housing providers to create a roadmap for attainable GSI projects at affordable housing sites.
11. *Seattle Parks Foundation, fiscal sponsor for Duwamish Valley Sustainability Association: Cuidadores de Agua (\$135,378)*. Supports working with a cohort of youth from the Duwamish Valley to build expertise in evaluating and stewarding local waters by learning the main physicochemical variables; monitoring drainage points; and producing reports, videos, and events to share their findings.
12. *Serve Ethiopians Washington: Be'er Shiva Park Restoration (\$87,000)*. Supports restoration of approximately 5 acres of wetland and urban forest through regular park and creek clean-ups, invasive plant removal, and native tree planting to protect water quality and foster long-term community involvement.
13. *Stewardship Partners: Equitable Incentives 3 (\$190,000)*. Supports continuation and expansion of the GSI Mini Grants Equitable Incentives program, to provide enough

granting capital to fund an additional 15 to 50 voluntary GSI retrofit projects with equitable distribution of GSI-related community benefits.

14. *Sustainable Seattle, fiscal sponsor of Sustainability Ambassadors: Planning the Future of Our Water 2 (\$33,857)*. Supports engaging middle school and high school teachers to adopt problem-based learning curricula that integrates academic standards with local water resource management goals; and engaging students in projects that connect classroom learning to water quality benefit.
15. *Tilth Alliance: Community Resources for Water Quality Initiative (\$177,767)*. Supports improving water quality by establishing a nursery at the Rainier Beach Urban Farm to provide free plants for restoration and GSI projects; installing community demonstration projects throughout King County on water quality solutions; and partnering with schools on field trips, teacher trainings, and technical assistance.
16. *Toxic-Free Future: Working with King County Communities in Action to Reduce Toxic Chemical Pollution (\$80,000)*. Supports engaging with community-based organizations on how common household products impact water quality and working with them to develop educational materials that are culturally appropriate, with a goal of limiting and reducing the most harmful toxic chemicals.
17. *Weed Warriors: Restoration of Wetland #1 of the Myers Way Parcels (\$10,000)*. Supports removing invasive weeds and planting native plants to restore a wetland at the start of Hamm Creek that flows into the Duwamish River.
18. *YMCA of Greater Seattle: Youth in Action Stewardship, Education and Leadership (\$32,456)*. Supports engaging 6th through 12th graders in a youth-led program through environmental service projects to directly improve watershed health, mini-grants for watershed-related service projects led by youth, and an Environmental Leaders Summit and Environmental Symposium.
19. *Zero Waste Washington: Foundational social marketing research: Use less laundry detergent (\$50,000)*. Supports conducting social marketing audience research to reduce laundry detergent use, providing critical information for a multicultural audience about laundry detergent use and developing behavior change strategies to lower the load of toxic chemicals into the wastewater system.

2.4 Industrial Waste Program

The King County Industrial Waste (KCIW) Program regulates industrial customers of King County's regional wastewater system. KCIW functions under WTD as a delegated pretreatment program required by NPDES permits for operation of the division's wastewater treatment plants. KCIW's duties include issuing approvals to discharge industrial wastewater to the sanitary sewer system, monitoring permitted dischargers, conducting inspections, and taking enforcement action when necessary.

KCIW issues several types of discharge approvals (control documents). The type of approval is determined by the nature of the business, volume and characteristics of the wastewater, and potential risks to the sanitary sewer system. Of the more than 650

customers under an active control document, approximately 20% are in the LDW source control area.

This section describes KCIW's work related to the LDW source control area in 2023 under the following subsection headings:

- Listing of Industrial Users
- Listing of Inspections
- Collaborations
- Special Studies and Incident Responses

A comprehensive list of KCIW activities can be found in their annual pretreatment reports submitted to Ecology.

2.4.1 Listing of Industrial Users

Appendix A, Table A-1, presents a listing of industrial users that were active at the end of each year in LDW CSO drainage areas. The table includes a column designating whether the particular industrial user is a significant industrial user (SIU) with a waste discharge permit or a non-SIU with a lower-level discharge authorization.

2.4.2 Listing of Inspections

KCIW inspects each SIU at least once annually, including all facilities that have applied to renew their discharge approvals. KCIW also conducts periodic inspections of major non-SIUs, typically once within the 5-year permitting cycle or when significant facility modifications occur during the cycle. KCIW staff conduct miscellaneous inspections alone or jointly with staff from other regulatory agencies. Appendix A, Table A-2, presents a listing of inspections conducted in 2023 in LDW CSO drainage areas.

2.4.3 Collaborations

KCIW coordinates with several other agencies on an ongoing basis to control sources of pollutants in the LDW. The following are some KCIW collaborations during 2023:

- KCIW participates in the Duwamish Inspectors Group on a case-by-case basis when an inter-agency issue emerges for an industrial facility that KCIW regulates. The group provides a forum for inspectors from the City of Seattle, Ecology, King County, and other agencies, to discuss regulatory issues at commercial and industrial facilities in the LDW basin. KCIW staff did not meet with the Duwamish Inspectors Group in 2023.
- Staff from KCIW met periodically with the City of Seattle regarding LDW source control issues

- KCIW issued a waste discharge permit to a metal recycling facility (Recycling Depot) based on a referral from the City of Seattle, which resulted from source tracing work in the South Michigan CSO basin, as discussed in Section 2.6.1.1. Upgrade of the recycling facility site to improve drainage and treatment for metals and polychlorinated biphenyls (PCBs) is anticipated to continue into 2024.
- KCIW staff provided input to King County’s proposed future source control activities.

2.4.4 Special Studies and Incident Responses

This subsection describes KCIW special studies and incident responses in 2023.

2.4.4.1 Special Studies

KCIW did not conduct any LDW source control studies in 2023.

2.4.4.2 Notices of Violation

In 2023, KCIW issued notices of violation to certain SIUs in the LDW basin. Appendix A, Table A-3, presents these notices of violation.

2.4.4.3 Responses to Unusual Occurrences

In 2023, KCIW staff continued to work with King County treatment plant and conveyance inspection staff, local sewer agencies, and other regulatory agencies to evaluate and respond to referrals of unusual occurrences in the wastewater system. Staff also responded to notifications from Ecology’s Environmental Report Tracking System (ERTS). ERTS notifies local agencies of complaint calls regarding potential illicit discharges to the sanitary sewer. KCIW evaluates each referral on a case-by-case basis. Responses include follow-up calls to industrial facilities, inspections, sampling, and surveillance monitoring at key sampling maintenance holes.

KCIW responded to four referrals within the Lower Duwamish area. Referrals regarding permitted facilities were handled by the assigned staff. The program did not issue any other new control documents based on referrals. There was no further follow-up required in 2023.

2.4.4.4 Surveillance Monitoring

KCIW investigates potential sources of spills, slug loads, or illicit discharges by monitoring contaminants of concern at strategic maintenance holes near suspected industrial users or possible polluters on an as-needed basis. In addition, KCIW designs key maintenance hole studies to collect technical data in the regional wastewater system to use in the evaluation of local limits. Upstream and downstream sampling was conducted once in 2023 along Airport Way to monitor any discharges from Seattle Barrel. This work is expected to continue in 2024.

2.5 Monitoring, Inspecting, and Maintaining WTD Facilities

This section summarizes the source control actions of WTD facilities during 2023. They are as follows:

- WTD significantly increased monitored flow at approximately 62 locations in LDW combined sewer basins to improve system optimization to reduce overflows.
- The West Duwamish Interceptor Rock Box is cleaned twice a year. The Rock Box captures in-line sediment (and debris) before it goes through the siphon, which was last cleaned in 2019.
- Inspections of County WTD facilities were not conducted in the LDW area in 2023. A section of the Val View Interceptor was inspected by closed-circuit television (CCTV) to determine maintenance needs. No sediment line cleaning was needed.
- Maintenance operations included inspection and report for the East and West Duwamish Outfalls.
- Hydrogen sulfide monitoring and inspection continued at West Marginal Pump Station inlet and force main discharges, West Duwamish Pump Station inlet, and West Duwamish Siphon inlet to ensure proper operation and determine maintenance needs.

2.6 Sediment Management Program

This section summarizes source control activities supported by WTD’s Sediment Management Program in 2023.

2.6.1 Source Tracing Activities

Since 2010, King County has been collecting solids samples from pipes, wet wells, and outfall weir structures in the combined sewer collection system in the LDW basin to trace sources of pollution. The 8th Avenue South and South Michigan Street CSO basins were sampled for this reporting period. In June 2023, an in-line solids grab sample was collected from the 8th Avenue South Regulator Station (8th Ave. S RS) and a sediment trap sample was retrieved from the South Michigan Street Regulator Station (S Michigan St. RS) (Table 2). A sediment trap was also deployed at the 8th Ave. S RS in June 2023 for retrieval in 2024. The sediment trap was installed at a level above sewage base flows at the sampling location. The goal is to capture solids indicative of flows associated with CSOs. Appendix B includes the chemistry results for the 2023 samples.

Table 2. Source Tracing Samples Collected in 2023 from the Combined Sewer System.

Sample Type	Number of Samples Collected	
	South Michigan Street Regulator Station	8th Avenue South Regulator Station
In-line solids grab	0	1
Sediment trap	1	0

As outlined in King County’s LDW SCIP, source tracing screening levels for the combined sewer system are 2 times the second lowest apparent effects threshold (2LAET), and the source tracing focuses on metals, mercury, polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), and certain other semi-volatile organic compounds. Therefore, analyses of all source tracing samples included metals, mercury, PCBs, and semi-volatile organic compounds. In addition, solids from combined sewer lines typically result in analytical matrix interferences that, in turn, often result in elevated detection limits.³

2.6.1.1 South Michigan Street CSO

The sediment trap sample retrieved from the S Michigan St. RS had limited mass available for analysis. The sample was analyzed for metals, including mercury, PCBs (as Aroclors), particle-size distribution, and total solids. Mercury was the only parameter above the combined sewer system screening levels at the S Michigan St. RS. The primary sample was below the lowest apparent effects threshold (LAET), whereas the field replicate sample was above the combined sewer system screening level. The laboratory quality control duplicate samples were all above LAET but below 2LAET, indicating a “nugget” effect in the sediment trap sample. PCBs were above the LAET, but below 2LAET. In addition, dioxin/furan concentrations were above the LDW Record of Decision remedial action level. The concentrations of dioxin/furans were similar to those measured from the S Michigan St. outfall structure inline solids grab sample collected in 2022.

Source tracing sediment trap samples were previously collected in 2018 from the S Michigan St. RS. The 2018 sample had a higher concentration of PCBs, although still below 2LAET, and had mercury concentrations similar to the average concentration of the 2023 samples; both being above combined sewer system screening levels.

Sediments near the S Michigan St. CSO outfall have exceedances of either Washington State Sediment Management Standards (SMS) sediment quality standard (SQS) or benthic cleanup screening level (CSL) for total PCBs, the SQS for butyl benzyl phthalate (BBP), benthic CSL for bis(2-ethylhexyl)phthalate (BEHP), and the LDW remedial action level for dioxin/furans (AECOM 2012; King County 2017; Windward and Anchor 2023). Sediments farther from the outfall also have SQS exceedances for total PCBs, and one sample south of the outfall near the 1st Avenue South Bridge has an SQS exceedance for mercury.

Prior to 2022, King County coordinated with SPU to identify possible sources of mercury and other contaminants based on the 2018 samples. One possible source was identified. As a result, source tracing sample collection near the possible source occurred in 2022. A recycling company was identified as a potential source of mercury, as well as PCBs and PAHs, based on City of Seattle right-away catch basin data collected. Currently, KCIW is working with this company to address industrial stormwater runoff from the property.

³ Sometimes, only smaller mass of sample is available to use from the sample jar for analytical extractions or dilutions are required after analytical extraction is completed. This is done so that analytical quality control/quality assurance performance is acceptable, although it can result in elevated detection limits.

As an additional source control action for mercury, KCIW conducted a survey of dental facilities for pretreatment compliance throughout the combined sewer basins in 2022.

In addition, the Georgetown WWTS, which began operating in late 2022, will control S Michigan St. and Brandon CSO discharges. This facility will treat CSO flows prior to discharge.

2.6.1.2 8th Avenue South CSO

Primary and field duplicate in-line solids grab samples were collected from the 8th Ave. S RS (at a maintenance hole adjacent to the regulator station). In both samples, 1,4-dichlorobenzene was detected above the combined sewer system screening levels. Chromium was detected above the 2LAET in the primary sample, but not in the field duplicate sample. Dioxin/furan concentrations were below the LDW Record of Decision remedial action level.

LDW sediments near the 8th Ave South CSO outfall exceed SMS SQS; sediments sampled in 2011 south of the outfall exceeded the SMS SQS for PCBs and the sediment sample in 2023 north of the outfall exceeded SMS for 1,2,4-trichlorobenzene and 1,4-dichlorobenzene (AECOM 2012; Windward and Anchor 2024).

2.6.1.3 Next Steps

For 2024, source tracing activities will include retrieval of the sediment trap from the 8th Ave. S CSO basin, installation of a sediment trap in the West Michigan CSO basin, and an in-line solids grab sample from the West Michigan CSO basin. In addition, source tracing will be conducted for 1,4-dichlorobenzene in the 8th Ave. S CSO basin.

2.6.2 Summary of Regulatory Review Actions

The County's 2020 and 2021 Annual CSO and Consent Decree Reports (King County 2021; 2022) submitted to Ecology contained

- a description of a pollution prevention program,
- appropriate best management practices (BMPs), and
- the legal authority and administrative procedures that will be used to ensure the pollution prevention program is being implemented in combined sewer basins.

WTD relies on SPU to implement pollution prevention actions (e.g., spill response, water quality complaint response, and street sweeping) in areas of Seattle served by WTD CSO facilities. SPU tracks and reports to WTD on these BMPs. SPU does not report records separately for the LDW combined basins to WTD, although it maintains details of all activities.

SPU tracks the following pollution prevention BMPs in areas served by King County CSOs (this includes the LDW source control area plus all other combined basins within the City of Seattle served by County CSOs):

- **Water Quality Complaints:** SPU inspectors respond to complaints as they are received through the water quality hotline, web page, or agency referrals. This program provides outreach and education on proper BMPs to residents and businesses within the City.
- **Spill Response:** Spills are dispatched through the SPU Operations Response Center to on-call spill coordinators as they are received.
- **Street Sweeping:** SPU coordinates with the Seattle Department of Transportation to conduct street sweeping on arterials in Seattle using high-efficiency regenerative-air street sweepers. In 2023, Seattle Department of Transportation street sweeping crews swept 10,200 miles in the SPU combined sewer area, removing 1,300 short dry tons of debris from the street.
- **Business Inspections:** SPU conducts business inspections to assess how businesses are implementing proper BMPs based on their on-site activities. SPU conducts these inspections in County combined sewer basins as requested by the County.

Per the 2023 Annual CSO and Consent Decree Report (King County 2024), during 2023, SPU tracked the same pollution prevention BMPs in areas served by King County CSOs. SPU did not provide summary statistics beyond street sweeping in 2023 due to staffing levels.

3.0 WATER AND LAND RESOURCES DIVISION

This section summarizes source control actions taken by WLRD in the LDW source control area during 2023.

3.1 Stormwater Services

3.1.1 Mapping Updates

In accordance with the NPDES Phase I Municipal Stormwater Permit (S5.C.2, Municipal Separate Storm Sewer System Mapping and Documentation), King County is required to map and document the municipal separate storm sewer system (MS4) on properties it owns or operates, including the County right-of-way, and on properties that discharge to the MS4. King County submits annual progress reports to Ecology on the MS4 mapping effort; this occurs as part of the Municipal Stormwater NPDES Annual Report.

All mapping efforts within the LDW drainage area were completed in 2021. King County will continue to improve the stormwater asset inventory datasets in the LDW source control area in unincorporated King County, and thus our understanding of the MS4 connectivity.

3.1.2 Business Inspections

King County's Stormwater Services Section (SWS) created an inventory of parcels in the unincorporated area of the LDW source area. Each parcel was rated according to its potential to pollute and its stormwater inspection compliance history. A schedule of these accelerated inspections began in 2016. In 2023, 18 source control inspections were conducted at 14 different businesses located within the Source Control Inspection Focus Area and neighboring areas that drain to the LDW.

Table 3 summarizes the business inspections performed in 2023. No enforcement actions were pursued at these businesses.

King County Lower Duwamish Waterway Source Control Annual Report – 2023

Table 3. Business Source Control Inspection Results for 2023.

Company	Date	Comments	All Issues Resolved?
Source Control Inspection Focus Area			
Sea King Industrial Park	2/9/2023	No issues observed	n/a
Ladybug Espresso	2/14/2023	No issues observed	n/a
Shell Gas Station	2/14/2023	No issues observed	n/a
Sunbelt Rentals	2/14/2023	No issues observed	n/a
Neighboring Areas Draining to the LDW			
Bosen 4-Plex	3/28/2023	Clean storm drains and stencil	Work continues
Craft Build	6/8/2023	No issues observed	n/a
Empire View Mobile Home Park	3/9/2023	Storm drain stencil needed	Work continues
Equipment Share.com	2/9/2023	Clean storm drains and stencil	No
Equipment Share.com	3/21/2023	Storm drains cleaned and stenciled	Yes
MLK Chevron	6/23/2023	No issues observed	n/a
Park Des Moines Apartments	3/30/2023	Clean storm drains and stencil. Clean up litter near dumpster.	No
Park Des Moines Apartments	8/2/2023	Clean storm drains and stencil. Clean up litter near dumpster.	Work continues
Ridge Park Apartments	2/14/2023	Clean and stencil storm drain. Clean up litter around the site and near the dumpster, including oil containers in bushes and engine near south side of south building. Store maintenance/repair materials indoors or under cover and in secondary containment.	No
Ridge Park Apartments	4/13/2023	Clean storm drains and pick up litter around dumpster. All other corrective actions taken.	Work continues
Scott's Autobody	1/25/2023	No issues observed	n/a
Vinh Apartments	3/30/2023	Clean storm drains and stencil. Clean up litter near dumpster. Oil staining in parking lot.	No
Vinh Apartments	8/2/2023	Clean storm drains and stencil. Clean up litter near dumpster. Oil staining in parking lot.	Work continues
Vue Mobile Home Park	5/22/2023	No issues observed	n/a

King County did not receive any water quality complaints in the Lower Duwamish area in 2023.

3.1.3 Participation in Duwamish Inspectors Group

The Source Control Program manager and inspectors regularly attended the Duwamish Inspectors Group meetings, sharing information about inspections and coordinating inspections whenever possible. Other members of this group include Ecology, City of Seattle, Puget Sound Clean Air Agency, Hazardous Waste Management Program, and other King County programs.

3.1.4 Source Tracing Activities

The following section provides summaries of solids data collected in 2023 by SWS from the unincorporated portion of the LDW drainage basin. The locations targeted for sample

collection were outlined in the County’s LDW SCIP (King County 2019) and in previous annual reports (e.g., King County 2020).

SWS collected the sediment trap samples in June 2023 from locations 96-ST1, 96-ST2, and 96-ST3 following a one-year deployment. These sampling locations are associated with the South 96th Street Corridor stormwater drainage basin that flows into the LDW through the North Fork Hamm Creek outfall (Figure 2). Appendix C contains the sample results for these three locations.

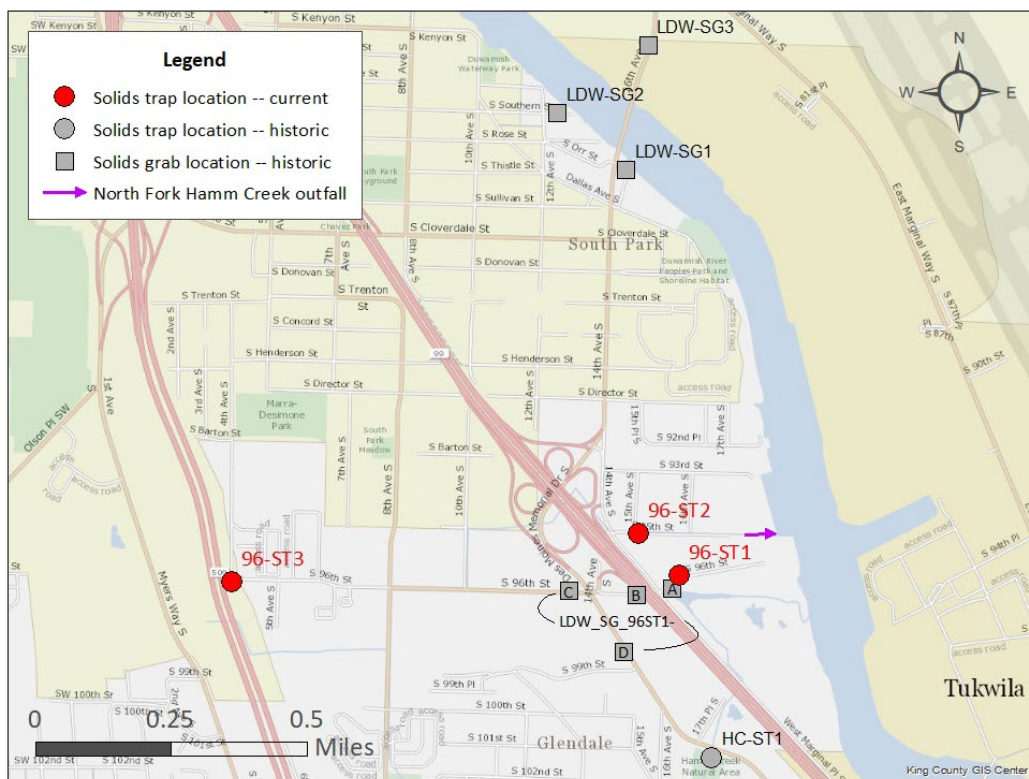


Figure 2. SWS Source Tracing Sampling Locations

As outlined in King County’s LDW SCIP, source tracing screening levels for the storm drain solids are the LAET and the 2LAET, which are dry-weight-equivalent values of the marine criteria of the SMS. The summaries in the following subsections include a comparison of sample data to these screening levels.

3.1.4.1 Location 96-ST1

The sediment trap sample collected from location 96-ST1 had concentrations above the source control screening levels as follows: zinc, butyl benzyl phthalate, and benzyl alcohol were above the LAET; BEHP and dimethyl phthalate were above the 2LAET. The zinc result in 2023 was higher than for the 2020 sample. The 2023 result was roughly equal to the

2019 result. BEHP was found in the 2023 sample at a lower level than in any previous sample at this site. Butyl benzyl phthalate concentrations were higher in 2023 than in 2018 and 2020, and dimethyl phthalate concentrations were lower in 2023 than in 2019, but higher than 2018 or 2020. In 2023, PAHs overall were similar to 2020, and lower than the levels seen prior to 2020. There were no PAH concentrations above source control screening levels.

3.1.4.2 Location 96-ST2

The sediment trap sample collected from location 96-ST2 had concentrations above the source control screening levels as follows: zinc and butyl benzyl phthalate were above the LAET; BEHP, benzoic acid and benzyl alcohol were above the 2LAET. Zinc concentrations at 96-ST2 were roughly the same in 2023 as seen in 2018, but lower than in 2020 when they were above 2LAET. BEHP and butyl benzyl phthalate were both lower in 2023 than in 2018 and 2020.

3.1.4.3 Location 96-ST3

The sediment trap sample collected from location 96-ST3 had concentrations above the source control screening levels as follows: zinc and butyl benzyl phthalate were above the LAET; benzoic acid and benzyl alcohol were above the 2LAET. Zinc concentrations in 2023 were similar to those in 2018, but lower than in 2020. Butyl benzyl phthalate concentrations were higher in 2023 than in 2018 and 2020.

3.1.4.4 Discussion and Next Steps

Historically, there have been two businesses upstream of location 96-ST2 (and downstream of 96-ST3) that King County observed to have been sources of zinc to the stormwater system: Ace Galvanizing, Inc., and Security Contractor Services, Inc. The latter business, which stored large quantities of galvanized fencing on-site, vacated the area in 2021. SWS will conduct a business inspection in 2024 at Ace Galvanizing to ensure implementation of appropriate BMPs. Potential sources of zinc to the stormwater system will be assessed during other business inspections at properties in the basin.

Zinc is also entering the system from upstream sources, as evidenced by the sample collected at 96-ST3. Overall, zinc concentrations in the 96-ST1 and 96-ST3 sediment traps are consistent with levels commonly observed in storm drain systems (City of Seattle 2020), and, therefore, are not likely to be traceable to a specific source.

BEHP and butyl benzyl phthalate were found at levels commonly observed in other storm drain solids (City of Seattle 2020), and benzoic acid and benzyl alcohol are not targeted for source tracing based on the transient nature of these compounds. Over time, dimethyl phthalate has varied and not shown a consistent pattern. Therefore, for these reasons, these five compounds would not likely be traceable to a particular source.

The LDW sediment data near the outfall of the North Fork of Hamm Creek were reviewed as part of the source tracing data evaluation; these data were from the LDW Feasibility

Study (AECOM 2012), outfall sediment sampling by Ecology (SAIC 2011), 2018 sampling conducted by the Lower Duwamish Waterway Group in support of Ecology source control efforts (Windward 2019), and the Quality Assurance Project Plan Addendum for the LDW Upper Reach Pre-Design Investigation Phase II (Windward and Anchor QEA 2021). There are no SMS SQS exceedances in nearby LDW-receiving sediment samples. Therefore, no additional source tracing actions have been taken at this time.

The next sampling is scheduled for the three sediment trap locations — 96-ST1, 96-ST2, and 96-ST3 — in 2026, necessitating redeployment of the sediment trap bottles in spring/summer of 2025. Per the SCIP for 2024–2028, the samples will be analyzed for metals including mercury, PCBs, PAHs, and other semi-volatile organic compounds with SMS marine criteria. If mass is limited, the priority analytes will be zinc and high molecular weight polycyclic aromatic hydrocarbons (HPAHs), based on previous data.

3.2 Hazardous Waste Management Program

The Hazardous Waste Management Program implements the 2021 Hazardous Waste Management Plan adopted and approved by the Ecology. The plan is for management of moderate risk wastes, defined as hazardous wastes generated by residents and small quantity generators (typically small businesses and other organizations generating less than half a drum of hazardous waste per month).

More information on the Hazardous Waste Management Program’s services is available at www.kingcountyhazwastewa.gov, or the 2023 Hazardous Waste Management Program [Annual Report](#).

3.2.1 Dashboard for Select Haz Waste Program Services

3.2.1.1 Collections Facilities

In 2023, 2,298 residents and qualifying small businesses in the LDW source control area delivered moderate risk wastes to Haz Waste Program facilities and collection events for proper disposal, preventing spills or releases. Figure 3 shows moderate risk wastes collection customers by LDW zip code.

2298

Residents or Businesses used an MRW Collections Facility

MRW Collection Customers by LDW Zip Code

Lower Duwamish

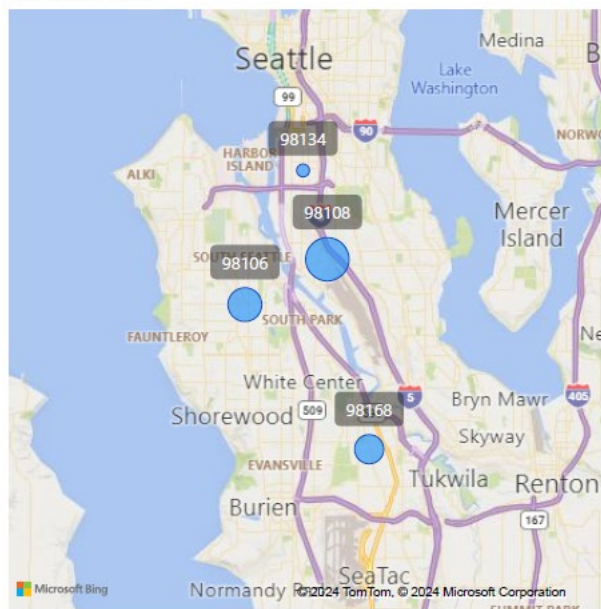


Figure 3. Moderate risk wastes collection summary by zip code within LDW source control area

3.2.1.2 Education and Assistance

In 2023, 57 businesses received technical assistance about the proper management of hazardous waste; 116 residents participated in a community education event designed to educate the public about choosing safer products, preventing pollution, and reducing exposure to hazardous materials; and 97 people called the Haz Waste Help Line from a LDW zip code. Figure 4 shows residents or businesses receiving a technical assistance or education service by LDW zip code.

<p>57</p> <p>Businesses Received Technical Assistance</p>	<p>116</p> <p>Residents Participated in a Community Education Event</p>	<p>97</p> <p>People Called the Haz Waste Help Line</p>
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Residents or Businesses Receiving a Technical Assistance or Education Service by LDW Zip Code
Lower Duwamish

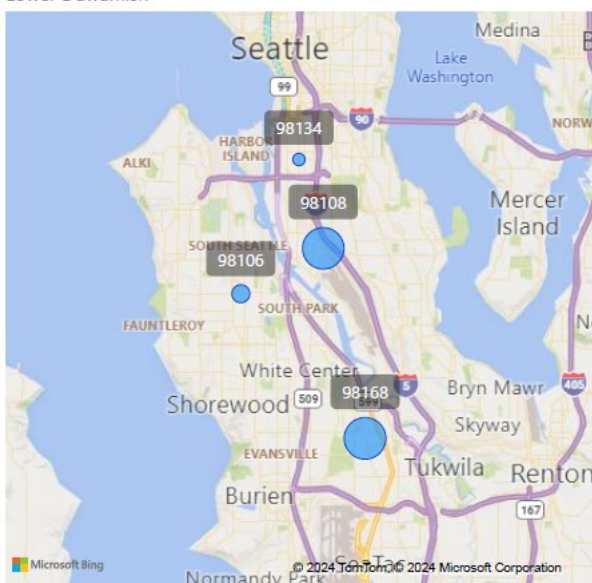


Figure 4. Residents or businesses receiving a technical assistance or education service by zip code within LDW source control area

3.2.2 Businesses and Other Small Quantity Generators

The Hazardous Waste Management Program provides on-site technical assistance visits to small quantity generators. The Program provides consultation, education, and financial incentives throughout King County. The goal of the visits is to increase awareness/adoption of safer products; improve hazardous material and waste management; improve spill preparedness, response, and prevention; and reduce discharges of hazardous waste to sanitary sewer and storm drains. Team members helped implement the EnviroStars program (visit [EnviroStars.org](https://www.envirostars.org)) by referring sites to the program and verifying sites for recognition. In 2023, the team also encouraged small quantity generators to try using safer degreasers. The Program served 57 LDW sites (58 visits) in 2023 (Table 4).

Table 4. Hazardous Waste Management Program Site Visits in 2023 in the LDW Source Control Area.

Zip Code	2023
98106	6
98108	17
98134	4
98168	31
Total	57

The Program issues vouchers to reimburse businesses 75% of their costs (up to \$599) as an incentive for small quantity generators to make recommended improvements on-site. Twenty-seven small quantity generators in the LDW source control drainage area used vouchers totaling \$11,493. This financial incentive helped businesses make improvements and implement Hazardous Waste Management Program recommendations, such as the following:

- Recycled over-accumulated used oil, lubricants, oil filters, or antifreeze at six sites (more than 8,210 pounds).
- Disposed of 450 gallons of abandoned used oil left behind by previous tenant (another business).
- Purchased a polisher to use in new waterborne paint system at an autobody shop. The Hazardous Waste Management Program had previously helped the business replace their solvent-borne automotive basecoat paints with waterborne paints.
- Invested in a new ventilation system for metal working shop.
- Improved stormwater management at three sites: installed 20 ultra drain guards to retain oil and sediments, and cleaned catch basins and properly disposed of the resulting 890 gallons of wastewater and debris.
- Completed a lighting retrofit from fluorescent lamps and hazardous ballasts to LED.
- Properly disposed of over-accumulated waste at a nonprofit: fluorescent lamps (4-foot tubes and compact fluorescent lamps), batteries (lead/acid – small), seven fire extinguishers, and eight labpack flammables.
- Safety gear/personal protective equipment and first aid kit (three sites).
- Helped two property managers adopt safer cleaning products.

At least 5,300 pounds of hazardous waste and hazardous products were moved into secondary containment. Two sites obtained spill kits and updated their spill procedures.

Four King County Housing Authority apartment complexes in zip code 98168 are currently recognized EnviroStars: Riverton Terrace (family and Senior), Pacific Court, and Woodridge Park.

A Program representative attended the Duwamish Inspectors Group meetings, sharing information about inspections and coordinating inspections. Other members of this group include Ecology, City of Seattle, Puget Sound Clean Air Agency, EPA, SWS, and other King County programs.

3.2.3 Residents

The Hazardous Waste Management Program provides a variety of services to residents: collection facilities and the Wastemobile for dropping off HHW and community education programs (priority topics include HHW, identifying hazardous products, choosing safer products, safer cleaning at home, and reducing exposure to household sources of lead). Services were provided through the Haz Waste Help Line (via phone, website, or email), at community events, general marketing (including social media), and through “train-the-trainer” partnerships.

4.0 KING COUNTY INTERNATIONAL AIRPORT

KCIA is housed within the Department of Executive Services, which operates and maintains the airport, also known as Boeing Field. KCIA source control activities conducted in 2023 include Industrial Stormwater General Permit (ISGP) compliance, MS4 permit compliance, contaminated site cleanups, spill responses, and annual stormwater solids monitoring.

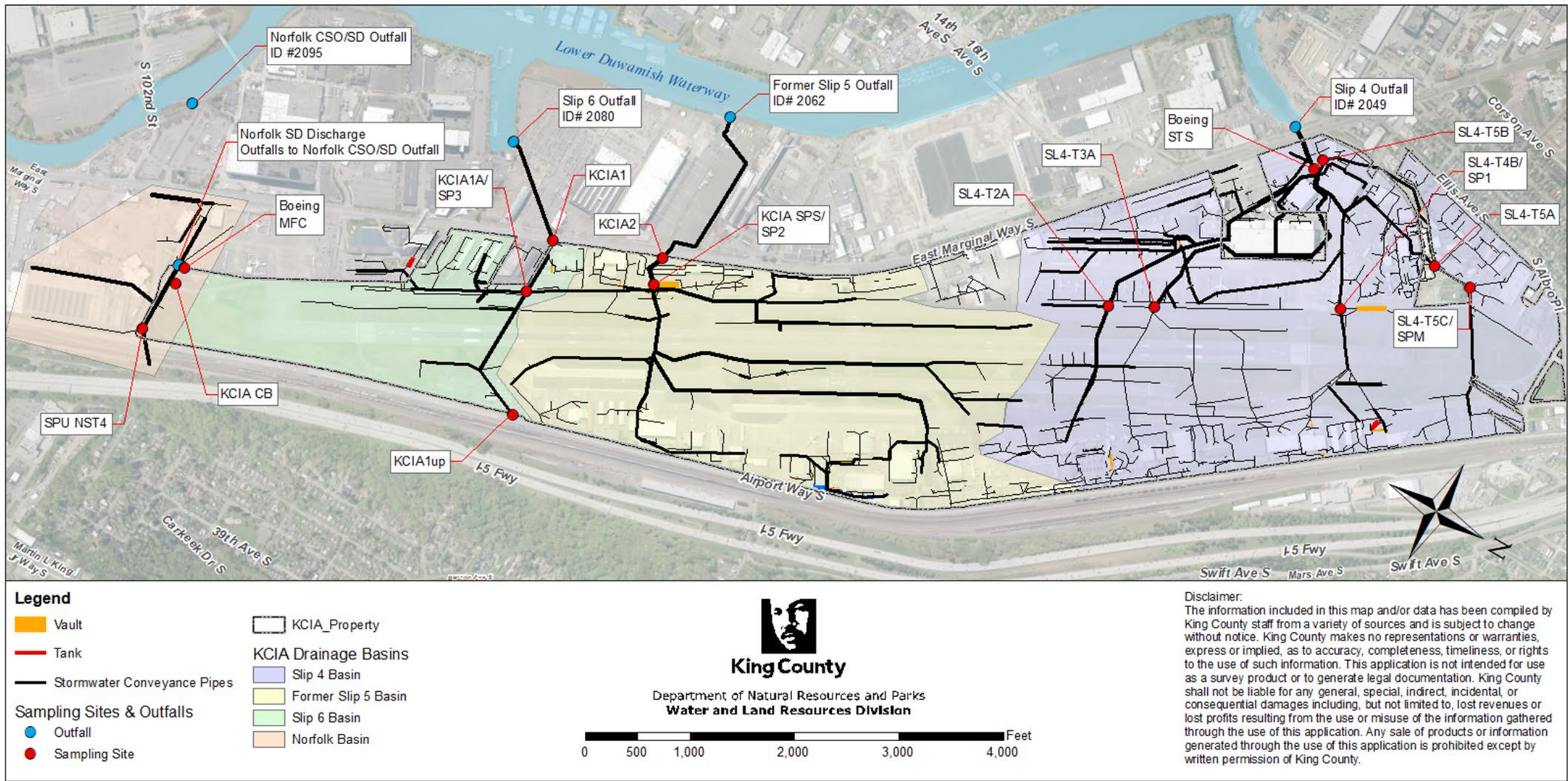
Figure 5 presents a map of KCIA drainage areas.⁴ KCIA is divided into the following four source control areas in associated drainage basins:

- Slip 4 (LDW river mile [RM] 2.8; north drainage area)
- Boeing Isaacson/Central KCIA/Former Slip 5 (LDW RM 3.7–3.9; central drainage basin)
- Slip 6 (LDW RM 3.9–4.3; south-central drainage basin)
- Norfolk CSO/Storm Drain (LDW RM 4.9; south drainage basin)

The Ecology source control action plans for these KCIA source control areas were reviewed, and 2023 actions described in this section are consistent with those listed in the LDW Source Control Status Report for 2018 (Ecology 2019).

Source control activities related to ISGP compliance, the MS4 permit, and other source control activities organized by four different KCIA source control areas are discussed in the following subsections. Detailed maps of KCIA drainage areas and past sampling can be found in the 2014 to 2015 LDW source control annual report (King County 2016). Figure 5 presents recent ISGP and source tracing sampling locations per four KCIA drainage basins.

⁴ These drainage areas do not delineate the entire geographic area or basin that drains to each of these slips or outfalls. They are only intended to delineate the areas within the airport (not including the North Boeing Field area leased by the Boeing Company) that drain to each of these areas.



Document Path: G:\SWS_Cityworks\KCIA sampling map annotated_8_22_SR2868.mxd

Figure 5. KCIA Drainage Basins with ISGP and Source Tracing Sampling Locations

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4.1.1 Industrial Stormwater General Permit Compliance

In 2023, KCIA monitored stormwater at four sampling points in three of the airport's drainage areas in accordance with the ISGP (WAR000343). The three basins sampled were (1) north/Slip 4 basin (SP1 and SPM sampling points), (2) central KCIA basin (SP2 sampling point), and (3) south-central/Slip 6 basin (SP3 sampling point) (Figure 5). Sample parameters include turbidity, pH, total suspended solids (TSS), zinc, copper, and oil sheen, unless consistent attainment (CA) was achieved.⁵ The status of each sampling point is as follows:

- Resumption of full sampling in 2023.
- Quarterly TSS samples collected at all sample points in 2023 were below the TSS limit of 30 mg/L.
- In the 3rd quarter of 2023, there were slight benchmark (14 ug/L) exceedances of copper at SP1 (14.2 ug/L) and SP3 (14.5 ug/L). A Level 1 Corrective Action Report was submitted for the 3rd quarter reporting. In the 4th quarter, SP1 and SP3 were below benchmarks.
- For the 4th quarter of 2023, there was a slight benchmark (25 NTU) exceedance of turbidity observed at SP2 (29.9 NTU). A Level 1 Corrective Action Report was submitted for the 4th quarter reporting. This exceedance was temporary as SP2 during the 1st quarter of 2024 was 18.1 NTU.

Table 5 shows the 2022 average values for turbidity, pH, zinc, and copper based on quarterly data from discharge monitoring reports. Quarterly values did not exceed benchmarks. Oil sheen was not observed for the year.

Table 5. ISGP Discharge Monitoring Data Annual Averages for 2023.

Location	Turbidity (NTU ^a)	pH	Zinc (µg/L)	Copper (µg/L)	TSS (mg/L)
SP1	15.8	7.5	22.7	10.8	5.0
SP2	21.2	6.9	11.0	3.2	8.5
SP3	7.6	7.1	20.6	6.9	5.5
SPM	8.0	7.0	24.3	4.7	4.0
Benchmarks	25	5.0-9.0	117	14	30

^a Nephelometric turbidity unit

KCIA implemented airport-wide BMPs in accordance with its ISGP Stormwater Pollution Prevention Plan. Treatment BMPs such as oil-water separators (OWSs), water quality vaults, and StormFilter systems were maintained. KCIA performs daily mechanical sweeping of paved areas, annual inspections of stormwater facilities, and weekly

⁵ CA is achieved when eight consecutive quarterly samples demonstrate a reported value equal to or less than the benchmark value or for pH when they are within the range of 5.0 to 9.0 standard units. Sampling is reduced to once per year for a period of 3 years. With CA, an annual sample must be taken during the 4th quarter each year. The annual sample may be averaged with any other samples taken over the course of the 4th quarter. The annual sample does not include the first fall storm event. If the annual sample exceeds a benchmark, CA can no longer be claimed. Quarterly sampling must resume thereafter.

maintenance of OWSs. KCIA inspects tenant and airport common areas monthly to ensure that BMPs are being maintained. Stormwater line cleaning is being performed in accordance with the ISGP (see Section 4.1.3, “Source Tracing Activities and Remediation”).

Several tenants at KCIA who are also covered by an ISGP comply directly with Ecology on the ISGP requirements. Table 6 presents a list of KCIA ISGP tenants.

Table 6. KCIA Tenants and Corresponding ISGP Numbers.

Tenant and Facility Name	Permit Number
Signature Aviation (formerly Landmark Aviation)	WAR000607
UPS (Boeing Field)	WAR000434
The Boeing Company (North Boeing Field)	WAR000226
Charles Air	WAR127177
Mente	WAR305886

4.1.2 MS4 Permit Compliance

KCIA performed spill response activities in 2023 in accordance with its spill response policy. The policy requires that spills be addressed immediately upon discovery.⁶ Notification requirements include contacting airport operations and firefighting units. To ensure zero discharge to receiving waters, pump stations are turned off when spills enter the stormwater drainage system. KCIA standard operating procedures include the tenant/operator notifying Airport Operations and Aircraft Rescue and Firefighting to assess life safety and initiate preventive measures. Airport Operations instructs Airport Maintenance to shut down pump stations and to conduct source tracing.

In addition, OWSs are present at downstream locations of the stormwater system to capture fuel, oils, and grease. Spill events resulted in proper cleanup and Ecology notifications, as needed. None of these spills entered receiving waters. In 2023, KCIA was in the process of updating its Spill Response Policy. Feedback was solicited from tenants involved in fueling or storing fuels and chemicals. Standard operating procedures are also being updated to reflect actions performed by airport operations, maintenance, engineering, and firefighting.

In 2023, KCIA did not perform annual illicit discharges/connection inspections. Inspections are typically performed during dry periods and at various discharge points on airport property. Illicit discharges had not been observed based on more than 15 years of annual data, indicating that there are possibly no illicit connections to the airport drainage system. The frequency of inspections will be evaluated. Data are used to track and source-trace any suspected or obvious discharges that are observed.

In 2023, KCIA did not perform annual stormwater facility inspections because stormwater facilities were cleaned in 2022 to 2023. The inspections typically involved measuring the amount of sediments in 20 stormwater structures, including OWSs, stormwater vaults,

⁶ In addition, spill prevention materials (e.g., oil-absorbing materials such as booms and mats) are available in areas required per the NPDES ISGP permit.

water quality vaults, StormFilter treatment systems, and stormwater retention systems. Measurements are used to develop schedules for cleaning. OWSs are also maintained weekly for oils and floatables (e.g., replacing oil-absorbent booms).

4.1.3 Source Tracing Activities and Remediation

In 2023, source control activities such as sampling, source tracing, remediation, and line cleaning (per the ISGP) were performed in KCIA’s four source control areas. Figure 5 shows the sampling and source tracing locations for the data discussed in the following subsections.

Stormwater solids samples were collected in source control areas draining to Slip 4, former Slip 5, and Slip 6 as part of annual stormwater solids sampling and in support of the County’s LDW SCIP. Table 7 presents the number of source tracing samples collected in each area in 2023. Appendix D provides source tracing sampling data for 2023. As outlined in King County’s LDW SCIP, source tracing screening levels for the storm drain solids are the LAET and the 2LAET, which are dry weight equivalent values of the marine criteria of the SMS. In addition, Model Toxics Control Act (MTCA) Method A cleanup standards are used as screening value only to evaluate diesel and heavy oil for which there are no SMS.

Table 7. Source Tracing Samples Collected from KCIA Source Control Areas in 2023.

Sample Type	Number of Samples		
	Slip 4	Former Slip 5	Slip 6
In-line solids grab	4	2	2
Sediment traps	1	1	0

Summaries of source control activities, including sampling and any remedial activities, are presented by drainage basin in the following subsections. In accordance with the County’s LDW SCIP, annual in-line trap and grab sampling occurred in 2023 at all three basins listed in Table 7. The ongoing sampling assists in investigating contaminant trends.

4.1.3.1 Slip 4 Basin

The KCIA Slip 4 source control area is located in the north area of KCIA. North Boeing Field (NBF), an area of KCIA leased by the Boeing Company, is downgradient of the KCIA drainage area; KCIA non-leased areas (runways and taxiways) and areas leased by tenants other than Boeing are located upgradient of NBF. Off-site stormwater from the east (Airport Way) discharges into the KCIA stormwater system. Stormwater is discharged from NBF through the north pump station and to Slip 4 via a stormwater pipe.

Sampling and Source Tracing

In December 2023, KCIA collected annual in-line grab stormwater solids samples at the drainage areas of Slip 4.⁷ Appendix D, Table D-1, presents the sampling results. The

⁷ Up until 2017, Boeing had been providing data results for north-central and north subbasins (sample locations SL4-T4A and SL4-T5A/B) to EPA, Ecology, and KCIA. KCIA resumed sampling in these two sub-basins in 2019.

sediment traps deployed the prior year contained no solids/sediments to collect and analyze for three of four locations when checked in December 2023.

The following is a summary of the 2023 in-line solids grab sample data compared to source control screening benchmarks:

- **North Lateral/SL4-T5C.** KCIA collected a grab sample. The sample had concentrations of fluoranthene above the LAET. No metals, PCBs, low molecular weight PAHs (except for phenanthrene), phthalates, or total petroleum hydrocarbons were above screening levels. Concentrations of HPAH compounds were above the 2LAET in 2023 and increased in concentration compared to 2022, when most HPAHs were also above screening levels.
- **North-central Lateral/SL4-T4B.** KCIA collected a grab sample. The sample had concentrations of zinc above the 2LAET. PCBs, PAHs, phthalates, and total petroleum hydrocarbons were below screening levels. These findings are similar to 2022 data.
- **South-central Lateral/SL4-T3A.** KCIA collected a grab sample, which had no concentrations of metals, PCBs, PAHs, phthalates, or total petroleum hydrocarbons above screening levels. Concentrations were lower than in previous years.
- **South Lateral/SL4-T2A.** There were limited solids within the in-line trap sample. Therefore, the in-line trap sample was prioritized for PAHs and phthalates, which were above 2LAET in 2023. The grab sample had concentrations of arsenic, zinc, dibenz[a,h]anthracene, and indeno(1,2,3-cd) fluoranthene above the 2LAET. These also were above 2LAET in 2022, and concentrations were higher in 2023 than in 2022. The other metals and PAHs, as well as phthalates and PCBs, were below LAET in the grab sample.

In 2022, the year 10 long-term monitoring sampling associated with Slip 4 early action sediment cleanup occurred. The monitoring stations closest to the head of the slip showed that concentrations of BEHP was above the SMS benthic cleanup screening level at one location and concentrations of BEHP, BBP, PCBs and zinc were above the SMS SQS at one or more stations (Windward 2023).

Source control related actions in Slip 4 basin in 2022 and 2023 included the maintenance of OWSs and vaults. Stormwater lines and catch basins were also cleaned from 2021 to 2023 within this basin. Other source tracing and source control activities are included in the MTCA NBF/Georgetown Steam Plant Site remedial investigation activities.

In accordance with EPA and Ecology requirements, Boeing installed the NBF Stormwater Treatment System at the KCIA north pump station in 2011 to reduce contaminants leaving NBF and entering the LDW at Slip 4. Boeing also rerouted KCIA stormwater to a separate pipe from the north lateral to efficiently treat stormwater from Boeing's north lateral drainage basin. Boeing continues to treat stormwater, which comprises flows in NBF and

KCIA Slip 4 drainage areas.⁸ Boeing also continues to operate and evaluate the system in compliance with their NPDES industrial permit.

Remediation Activities

The following remediation activities were conducted in 2023 in the Slip 4 area:

- **Shultz Fuel Farm Site**, 1495 South Hardy St. In 2023, the tenant conducted monitoring of groundwater wells.
- **Boeing Electronics Manufacturing Facility Site**. In 2023, due to tenant and airport development around the Electronics Manufacturing Facility site, Boeing and EPA approved the postponement of activities until construction is completed in 2023. Boeing is now in process with EPA to resume cleanup activities at the site. New monitoring wells will be installed in 2024.

4.1.3.2 Former Slip 5 Basin

The KCIA Former Slip 5 source control area is located in the central area of KCIA. Off-site stormwater from the east (Airport Way–City of Seattle) discharges into the KCIA stormwater system. East Marginal Way in the City of Tukwila also discharges stormwater into the KCIA pipe to the former Slip 5 outfall.

Sampling and Source Tracing

Due to consistent low-contaminant concentrations below LAET, annual sampling was deferred in 2019 and 2020 and resumed in 2023 per the County's LDW SCIP. Stormwater in-line grab samples were collected in 2023 at KCIA2 and South Pump Station. Appendix D, Table D-2, presents sampling results for both locations.

In 2023, concentrations of metals, PCBs, PAHs, phthalates, and total petroleum hydrocarbons were all below source control screening benchmarks in samples collected at locations KCIA2 and South Pump Station. The schedule for future sampling will be outlined in King County's 5-year SCIP.

Source control related actions in Former Slip 5 basin in 2022 and 2023 included the maintenance of OWSs and vaults. Stormwater lines and catch basins were also cleaned from 2021 to 2023 within this basin.

Remediation Activities

Remediation activities were not conducted in 2023 in the former Slip 5 area at the Boeing Electronics Manufacturing Facility site. The groundwater plume overlaps with both Slip 4 and Slip 5 stormwater drainage basins.

⁸ During larger storm events, some stormwater bypasses the treatment system due to treatment system capacity. For example, in 2018, 72% of the combined stormwater discharges from NBF and the north end of KCIA were treated (Windward 2020).

4.1.3.3 Slip 6 Basin

The KCIA Slip 6 source control area is located in the south-central area of KCIA. Off-site stormwater from the east (Airport Way–City of Seattle) discharges into the KCIA stormwater system. Other off-site properties such as the Museum of Flight, Airfield Business Center, East Marginal Way (City of Tukwila), Aviation High School, and Insurance Auto Auctions discharge stormwater into the KCIA stormwater pipe, which drains to the Slip 6 outfall.

Sampling and Source Tracing

In December 2023, KCIA collected annual in-line stormwater solids samples in the Slip 6 drainage areas of KCIA. The sampling point, KCIA1A, is a location intended to avoid off-site discharges and tidal backflow, and thus more accurately represents KCIA stormwater discharges to the LDW. To evaluate the potential of off-site inputs to the KCIA Slip 6 drainage system, a stormwater solids grab sample was collected in 2023 from a location at the boundary of the KCIA Slip 6 basin (see Figure 5, location KCIA1up). The stormwater enters this drainage basin from an approximately 113-acre area of the City of Seattle stormwater drainage from Beacon Hill and Airport Way. Appendix D, Table D-3, presents sampling results for both locations.

The following is a summary of 2023 data compared to screening thresholds:

- **KCIA1A.** The in-line trap sample did not contain any solids so a sample could not be collected and analyzed. The in-line grab sample had concentrations of low molecular weight PAHs (except phenanthrene), most metals, PCBs, phthalates, and total petroleum hydrocarbons below screening levels. HPAH concentrations were above 2LAET this year and were lower in 2022. Zinc was above LAET, but below 2LAET.
- **KCIA1up.** The grab sample did not have metals (except zinc), PCBs, PAHs, phthalates, or total petroleum hydrocarbon concentrations above screening levels in 2023. Zinc was above the LAET. With the exception of zinc, this is the same finding as in 2019 through 2022.

KCIA will continue to sample the upgradient location as part of its sampling program. KCIA continues to use street sweepers on runways and will be cleaning lines as part of ISGP source control measures.

Source control related actions in Slip 6 basin in 2022 and 2023 included the maintenance of OWSs and vaults. Stormwater lines and catch basins were also cleaned from 2021 to 2023 within this basin.

The LDW feasibility study (AECOM 2012) did not show any sediment exceedances in samples nearest the basin's outfall, but there were some PAH SQS exceedances within approximately 150 feet of the outfall. Samples collected by Ecology near the outfall showed sediment exceedances for dimethyl phthalate and benzyl alcohol (SAIC 2011). Newer sediment data collected for the LDW Upper Reach Pre-Design Investigation in 2020 and

2021 only indicated PCBs above the SQS within Slip 6; no exceedances of SQS or LDW remedial action levels were observed near the KCIA outfall in 2020 or 2021 samples (Windward and Anchor QEA 2022).

4.1.3.4 Norfolk CSO/Storm Drain Basin

The KCIA Norfolk source control area includes a portion of Perimeter Road and some grassy areas. Off-site stormwater from the east (Airport Way–City of Seattle and Washington State Department of Transportation) and south (Prologis Emerald Gateway, formally Unified Grocers) discharges to a stormwater pipe located within the boundaries of the KCIA property. The pipe extends westward into the Boeing Military Delivery Center, connects to the City of Tukwila stormwater drainage system, and discharges to the Norfolk CSO/storm drain outfall in the LDW.

Sampling and Remediation

No sampling was conducted by KCIA in 2023. Past sampling indicated PCB contamination concerns from an off-site source; source control action was taken by Boeing to address the PCB contamination discovered on Boeing property that migrated to the off-site KCIA property. Boeing, under approval from Ecology, completed a plan to treat stormwater within their site; construction was completed in 2021.

4.1.3.5 Stormwater Line Cleaning

The 2020 ISGP requires stormwater line cleaning for permitted sites that discharge to the LDW. Stormwater line cleaning started in 2021 in accordance with ISGP requirements. In 2021, the eastside line cleaning project was completed. Central line cleaning was completed in 2022 and the westside line cleaning project was completed in 2023. In 2022, at the Norfolk Basin, KCIA collaborated with SPU and Ecology to clean a stormwater line during 2022 to 2023 at the south end of the airport to ensure that, if legacy sediments are present, they are removed to prevent them from being transported downstream to the LDW.

5.0 OTHER KING COUNTY DIVISIONS

This section summarizes source control actions taken in 2023 in the LDW source control area by various King County divisions that serve smaller roles in the LDW source area than the County agencies described in previous sections of this report.

5.1 Road Services Division

In 2023, the King County Road Services Division, part of the Department of Local Services, continued to maintain roads in the unincorporated portion of the LDW source control area. Source control work primarily focused on catch basin inspections and cleaning. Catch basins were physically inspected using protocols developed for the King County NPDES Municipal Permit.

Currently, the Road Services Division’s inspection approach includes an automated process to meet the NPDES Catch Basin Inspection Program’s requirement. This has resulted in process efficiencies and improvements to water quality by providing cleaning at an enhanced level, thus reducing flooding and sediment transport and, thereby, a pathway source of pollutants.

In addition to field-recording the inspection results on tablets, the process has been automated to create cleaning work orders for Road Services Division’s maintenance crews. This process automatization has inherent efficiencies, which have resulted in increased catch basin inspections and cleaning capacity. These efficiencies have also helped to improve water quality.

In 2023, the Road Services Division cleaned 214 catch basins following inspection, which represents 100% of the culverts that fail the inspection.⁹

The Road Services Division also cleaned 212.78 linear feet of stormwater drainage pipes and performed 63.9 lane miles of street sweeping. Other activities conducted by the division included patching potholes, clean-up of automotive fluid spills (oil and fuel), removal of illegally dumped solid waste, litter pickup, and vegetation management (i.e., mowing and hand-brushing using mechanical tools), which prevented pollutants from entering nearby storm drains and the environment and contributed to eliminating pollutants within the LDW source area.

5.2 Facilities Management Division

In 2023, FMD, part of the Department of Executive Services, did not identify or discover additional relevant FMD sites in the LDW source control area during construction or routine maintenance.

⁹ Numbers of catch basins and numbers of linear feet of drainage system cleaned may include some areas outside of the LDW source control drainage area because of how the data are stored in the County’s tracking system.

FMD contracts with WLRD to perform water quality/business BMP inspections and stormwater facility inspections on properties that are under FMD custodial control. Vacant tax title and open space parcels are inspected every 5 years for water quality compliance. Similarly, all developed parcels are inspected every 5 years for water quality/business BMP compliance; this is in addition to the annual facility maintenance inspections performed on all FMD managed properties with constructed stormwater facilities, such as catch basins or storage and treatment ponds.

Within the LDW source control area, water quality/business BMP inspections were not performed on parcels with County tenants in 2023. Manson Construction, Lehigh-Cadman, Arcosa Specialty Materials, and Ardagh Glass Company will be inspected in 2024.

Annual stormwater facility inspections in the LDW source control area included five parcels with buildings and County tenants (the Orcas Building, the Barclay Dean Building, the Archives/Records Warehouse, and the King County Children and Family Justice Center [facility covering two parcels]). The following are summaries of the results:

- The October 2023 inspection of the Orcas Building system found that four catch basins needed cleaning. The catch basins were cleaned in February 2024.
- The November 2023 inspection at the Barclay Dean Building found no work was needed on the drainage facility.
- The November 2023 inspection of the Archives/Records Warehouse system found that a filter sock needed to be changed and the catch basin cleaned. These tasks were completed in February 2024.
- The November 2023 inspection of the Children and Family Justice Center found that numerous maintenance items were required, including catch basin cleaning. Maintenance of this facility occurred in December 2023 and February 2024.

Four businesses on leased County property fronting the Duwamish were inspected (i.e., Manson Construction, Lehigh-Cadman, Arcosa Specialty Materials [formerly called JA Jack, but is the same business activity], and Ardagh Glass Company). The following are summaries of the results:

- The Manson Construction parcel was found to be compliant when inspected in November 2023.
- The Lehigh-Cadman inspection in November 2023 found that a catch basin had cracks that required repair/replacement.
- The Arcosa Materials parcel was found to be compliant when inspected in November 2023.
- The system on the King County parcel of the Ardagh facility was not inspected in 2023 because plans were not available. Plans have since been obtained and the system will be inspected in 2024.

5.3 Environmental Health Services Division

Public Health’s Environmental Health Services Division’s activities related to source control in the LDW include two regulatory programs: (1) administer and enforce state and local regulations governing the safe handling of solid waste and (2) minimize potential human and environmental exposures to sewage and chemicals released from properties that have on-site sewage (septic) systems in the LDW drainage basin.

5.3.1 Public Health—Seattle & King County Solid Waste Program

Public Health administers and enforces the state and local regulations for solid waste handling. These regulatory standards are intended to minimize human and environmental exposures to employees and surrounding communities of permitted facilities (including solid waste transporters) and permit-exempt solid waste handling facilities. Nearly 25% of permitted solid waste facilities and approximately 30% of permit-exempt solid waste facilities in King County are in the LDW drainage basin. The Solid Waste Program conducts routine inspections of permitted facilities. Periodic audit inspections are conducted for permit-exempt facilities as they are limited to the types of wastes they can accept within prescribed parameters that result in lower risks to human health and the environment. The audit inspections are intended to determine if the permit-exempt facilities continue to meet the parameters of their issued permit exemption. In 2023, the program conducted 35 inspections of permitted facilities and two inspections of permit-exempt facilities.

5.3.1.1 Permitted Facilities

Figure 6 shows the locations of permitted and permit-exempt solid waste facilities and illegal dumping complaints in the LDW drainage basin during 2023. Tables 8, 9, and 10 list the permitted, formerly permit-exempt facilities applying for permits, and current permit-exempt facilities within the LDW drainage basin. There were 13 permitted solid waste facilities, five permitted solid waste transporter fleets (not mapped), and 16 solid waste facilities exempt from permitting that discharge into the LDW drainage basin (Figure 6). The Solid Waste Program’s facility permitting and enforcement activities in 2023 in the LDW source control area are as follows:

- Ensure solid waste permit-exempt facilities are meeting performance standards or obtaining solid waste permits based on changes to Chapter 173-350 WAC, “Solid Waste Regulations,” adopted in September 2018.
- Review permit application for a formerly permit-exempt facility (Table 9) applying for permits based on the above referenced changes.
- Review site schematics, evaluate operational plans, issue permits, monitor operations, and perform routine inspections for permitted facilities.

- The program continues to work on the permit application for The Recycling Depot, a formerly permit-exempt facility located at 6004 Corson Ave. South. This is a piles facility that accepts scrap metals (stored outside), appliances, and batteries.

5.3.1.2 Permit Violations

In 2023, no permit violations were observed at permitted solid waste facilities and solid waste transporters in the LDW. No permitted or permit-exempt facility was issued with a Notice of Violation.

Illegal Dumping Complaints

Figure 6 shows the locations of complaints of unlawful dumping of solid waste around the LDW source control area in 2023. Staff visited these sites to assess conditions and to educate the owners on how to comply with the King County Board of Health Code. If no action was taken after a follow-up letter, Public Health enforced compliance as necessary and appropriate.

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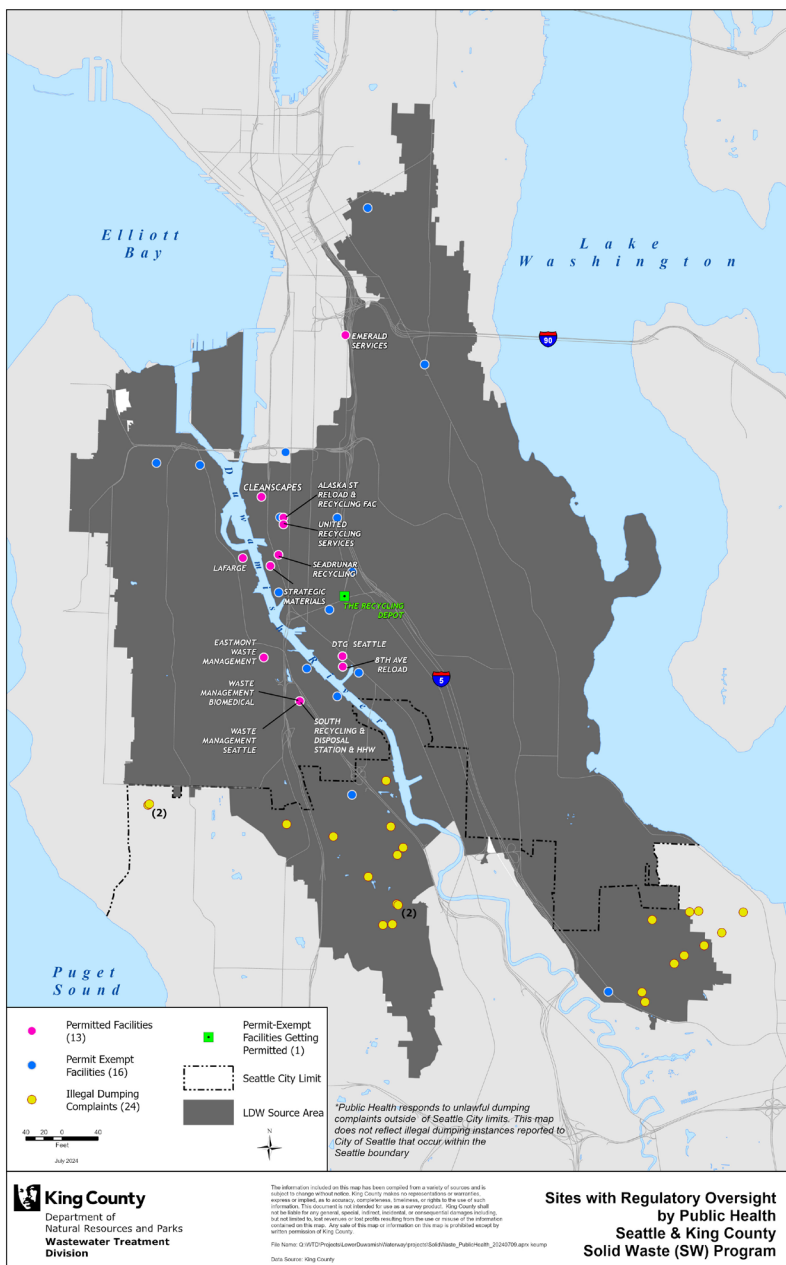


Figure 6. Sites with Regulatory Oversight by Public Health's Solid Waste Program

Table 8. Solid Waste Facilities in the LDW Drainage Basin Permitted by Public Health in 2023.

Name	Type of Facility	Site Address
South Transfer Station (SPU)	Municipal transfer station and recycling	130 S Kenyon St. Seattle, WA 98108
South Recycle & Disposal Station (SPU)	Municipal transfer station	8100 Second Ave. S Seattle, WA 98108
South Seattle Household Hazardous Waste Facility	Moderate risk waste processing facility	8100 Second Ave. S Seattle, WA 98108
Eastmont Waste Management (Waste Management)	Municipal transfer station	7201 W Marginal Way SW Seattle, WA 98108
Alaska Street Reload and Recycling	Solid waste piles and transfer station accepting dredged materials and petroleum contaminated soil	70 S Alaska St. Seattle, WA 98134
Lafarge	Solid waste piles that accept dredged materials and petroleum-contaminated soils	5400 W Marginal Way SW Seattle, WA 98106
Cleanscapes (A Recology Company)	Materials recovery for curbside recyclables	4401 E Marginal Way S Seattle, WA 98134
DTG Hudson Material Recovery Facility	Materials recovery for construction and demolition waste	80 S Hudson St. Seattle, WA 98134
Seadrumar Recycling	Materials recovery for commercial recyclables	28 S Brandon St. Seattle, WA 98134
Waste Management 8th Ave. Reload Facility	A reload facility for contaminated dredge sediment, industrial wastes, and contaminated upland soil	7400 8th Ave. S Seattle, WA 98108
DTG Enterprises, Inc., Seattle	Materials recovery	7201 E Marginal Way S Seattle, WA 98108
Emerald Services	Solidification and consolidation of non-hazardous and non-dangerous waste	1500 Airport Way S Seattle, WA 98134
Strategic Materials	Materials recovery	5801 East Marginal Way S Seattle, WA 98134

Table 9. Formerly Permit-Exempt Solid Waste Facilities Applying for Solid Waste Handling Permits.

Name	Type of Facility	Site Address
The Recycling Depot	Piles	6004 Corson Ave. S Seattle, WA 98134

Table 10. Permit-Exempt Solid Waste Facilities Active in 2023.

Name	Type of Facility	Site Address
Certaineed Gypsum Manufacturing	Materials recovery	5931 E Marginal Way S Seattle, WA 98134
All Metal Company	Materials recovery	5610 Airport Way S Seattle, WA 98108
American Environmental Construction, LLC	Materials recovery	7417 4th Ave. S Seattle, WA 98108
Gypsum to Gypsum	Materials recovery	816 S Kenyon St. Seattle, WA 98108
Bloch Steel	Materials recovery	4580 Colorado Ave. S Seattle, WA 98134
Budget Batteries – Seattle	Materials recovery	2006 Rainier Ave. S Seattle, WA 98144
Buffalo Industries	Materials recovery	99 S Spokane St. Seattle, WA 98134
Icon Materials Seattle Asphalt	Materials recovery	1115 S 96th St. Seattle, WA 98108
Sawdust Supply Co. Inc.	Materials recovery	6314 7th Ave. S Seattle 98108
West Seattle Recycling, Inc.	Materials recovery	3881 16th Ave. SW Seattle, WA 98106
Nucor Steel – Seattle	Materials recovery	2424 SW Andover Seattle, WA 98106
Seattle Barrel Company	Materials recovery	4716 Airport Way S Seattle, WA 98108
Buffalo Export LLC	Materials recovery	99 S Spokane St. Seattle, WA 98134
Cedar Grove Organic – Webster Street Yard	Materials recovery	7343 E Marginal Way S Seattle, WA 98108
Contractors Concrete Recycling	Piles	13001 MLK Jr. Way S Seattle, WA 98178

5.3.2 Public Health—Seattle & King County On-Site Sewage System Program

Public Health administers and enforces the on-site sewage system (septic) code. These regulatory standards are intended to minimize human and environmental exposure to sewage from on-site sewage systems (OSSs). The following is a summary of the program's activities related to source control in the LDW source control area (see Figure 1) in 2023:

- Number of septic systems.** In the County's LDW SCIP, Public Health reported 45 known properties with OSSs in the source control area, primarily in the City of Seattle. In 2015, the On-Site Sewage System Program began tracking the number of properties with septic systems in unincorporated King County and has located many additional OSSs in the LDW drainage basin. As of May 1, 2024, the program has identified 1,390 properties that are likely served by septic systems in the LDW drainage basin. Most of these are outside of the City of Seattle and have been in place for many years. The number of systems and the number of properties (or parcels) should be equal because, in most cases, there is only one system (i.e., one house) per parcel. The number of OSSs were reduced from 1,405 in previous reports

due to properties connecting to the sewer or the house and system being abandoned and the property vacated.

- **Failing septic systems.** In 2023, the On-Site Sewage System Program received nine complaints of failing septic systems in the LDW drainage basin. Four complaints were closed and or addressed by an OSS repair. Eight failing systems from a previous timeframe were completed by an OSS repair.
- **New septic systems.** There were no new septic systems in 2023.
- **Septic system repairs.** In 2023, the On-Site Sewage System Program received four full-repair site applications for failing septic systems (also included in the aforementioned numbers because all were failing systems) in the LDW drainage basin; all of the full repairs have been issued permits and all have been installed. Two of the repairs have received final approval with approved record drawings in 2023. A record drawing shows the house or building, the septic system component locations, reserve drain field area, and other features of the property; its approval is the final step in the permitting process. In addition, six full-repair site applications with permitted installations from 2022 had record drawing approvals in 2023.

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Appendix A: KCIW Industrial Users

Table A-1: Active Industrial Users within the LDW Basin in 2023.

Permits

Facility Name	Treatment Plant	CSO Basin	Authorization Type	Permit No.	Customer Type
Industrial Container Services - WA LLC	WEST POINT	8TH AVE	PERMIT	7929-02	BARREL CLEANING
Kerry Inc.	WEST POINT	8TH AVE	PERMIT	7854-04	FOOD PROCESSING-OTHER
Machinists Inc. - Plant 5	WEST POINT	8TH AVE	PERMIT	7892-04	METAL FINISHING - CFR 433
Magnetic and Penetrant Services Co. (MAPSCO) dba Valence Surface Technologies	WEST POINT	8TH AVE	PERMIT	7873-04	METAL FINISHING - CFR 433
National Products Inc.	WEST POINT	8TH AVE	PERMIT	7834-04	METAL FINISHING - CFR 433
Seattle, City of - SPU - South Transfer Station	WEST POINT	8TH AVE	PERMIT	7878-02	SOLID WASTE - TRANSFER FAC
Lineage Logistics LLC (Orca Bay Foods)	WEST POINT	8TH AVE OR TERMINAL 115	PERMIT	7896-02	FOOD PROCESSING-SEAFOOD
Art Brass Plating Inc.	WEST POINT	BRANDON	PERMIT	7722-07	METAL FINISHING - CFR 433
Georgetown Brewing Company	WEST POINT	BRANDON OR DUWAMISH	PERMIT	7972-01	FOOD PROCESSING-BREWERY
Auto-Chlor System	WEST POINT	DUWAMISH	PERMIT	7956-01	SOAP AND DETERGENT MFG - CFR 417
Seattle Barrel Co.	WEST POINT	DUWAMISH	PERMIT	7113-05	BARREL CLEANING
Lafarge - Seattle Plant	WEST POINT	DUWAMISH WEST	PERMIT	7925-03	SOLID WASTE - TRANSFER FAC
TLP Management Services LLC	WEST POINT	DUWAMISH WEST	PERMIT	7592-06	FUELING FACILITY
Vigor Shipyards LLC	WEST POINT	DUWAMISH WEST	PERMIT	7782-09	BOAT/SHIPYARD
Boeing Company - Plant 2 Facility	WEST POINT	E MARGINAL	PERMIT	7811-05	METAL FINISHING - CFR 433
Boeing Commercial Airplane - North Field	WEST POINT	E MARGINAL OR MICHIGAN	PERMIT	7594-08	METAL FINISHING - CFR 433
Rainier Commons LLC - Old Rainier Brewery Site	WEST POINT	HANFORD 1/2 OR LANDER	PERMIT	7927-03	GENERAL TYPE
Cascade Columbia Distribution	WEST POINT	MICHIGAN	PERMIT	7968-01	CONTAINER WASHING
Elysian Brewing Company - Airport Way S.	WEST POINT	MICHIGAN	PERMIT	7951-01	FOOD PROCESSING-BREWERY
Marine Vacuum Service Inc.	WEST POINT	MICHIGAN	PERMIT	7676-08	CENTRALIZED WASTE TREATMENT-CFR 437
Waste Management National Services - Duwamish Reload Facility	WEST POINT	MICHIGAN	PERMIT	7928-05	SOLID WASTE - TRANSFER FAC
Darigold Inc. - Rainier Plant	WEST POINT	RAINIER	PERMIT	7116-07	FOOD PROCESSING-DAIRY

Discharge Authorizations

Facility Name	Treatment Plant	CSO Basin	Authorization Type	Permit	Customer Type
First Student Inc.	WEST POINT	8TH AVE	LETTER OF AUTHORIZATION	11768-02	VEHICLE WASHING
Gary Merlino Construction Co. Inc.	WEST POINT	8th Ave	LETTER OF AUTHORIZATION	11117-03	VEHICLE WASHING
Meadowbrook Manufacturing LLC (dba Seattle Powder Coat)	WEST POINT	8th Ave	LETTER OF AUTHORIZATION	11849-01	MANUFACTURING-MISC
PACO Ventures LLC	WEST POINT	8TH AVE	LETTER OF AUTHORIZATION	11702-02	GENERAL TYPE
Piroshky Baking Company LLC	WEST POINT	8TH AVE	LETTER OF AUTHORIZATION	11785-02	FOOD PROCESSING-OTHER
Rabanco Ltd. Seattle Hauling Facility	WEST POINT	8th Ave	MINOR DISCHARGE AUTHORIZATION	1199-01	CONTAINER WASHING
Samson Tug and Barge Inc. - 1st Ave. S. (from Detroit Ave. SW)	WEST POINT	8TH AVE	MAJOR DISCHARGE AUTHORIZATION	4406-02	CONTAINER WASHING
Seattle, City of - Joint Training Facility	WEST POINT	8TH AVE	LETTER OF AUTHORIZATION	10849-04	GENERAL TYPE
Seattle, City of - Parks and Recreation - South Park Site Redevelopment	WEST POINT	8th Ave	LETTER OF AUTHORIZATION	11950-01	CONSTRUCTION DEWATERING
Slurry Waste Solutions - Bay Area Concrete	WEST POINT	8TH AVE	MAJOR DISCHARGE AUTHORIZATION	4498-01	DECANT STATION
United Site Services	WEST POINT	8TH AVE	MAJOR DISCHARGE AUTHORIZATION	4549-01	CHEMICAL TOILET
Washington Litruck	WEST POINT	8TH AVE	MINOR DISCHARGE AUTHORIZATION	806-03	PRESSURE WASHING
Waste Management Inc. - Eastmont Transfer Station	WEST POINT	8th Ave	MINOR DISCHARGE AUTHORIZATION	322-07	SOLID WASTE - TRANSFER FAC
Waste Management Inc. - Seattle	WEST POINT	8TH AVE	LETTER OF AUTHORIZATION	11964-01	CONTAINER WASHING
Northland Services Inc.	WEST POINT	8TH AVE OR TERMINAL 115	LETTER OF AUTHORIZATION	10742-03	PRESSURE WASHING
Ardagh Glass Inc.	WEST POINT	BRANDON	MAJOR DISCHARGE AUTHORIZATION	555-06	GLASS MANUFACTURING
Fleet Genius LLC	WEST POINT	BRANDON	LETTER OF AUTHORIZATION	11685-02	CONTAINER WASHING
General Electric Co. - Dawson Street	WEST POINT	BRANDON	MAJOR DISCHARGE AUTHORIZATION	543-05	GROUNDWATER REMEDIATION - ORGANICS
Heidelberg Materials - Seattle	WEST POINT	BRANDON	MAJOR DISCHARGE AUTHORIZATION	4235-03	CEMENT/READYMIX
Seadrunar Recycling	WEST POINT	BRANDON	LETTER OF AUTHORIZATION	11430-03	METALS RECYCLING
Seattle, City of - SPU - Materials Storage Yard	WEST POINT	BRANDON	MAJOR DISCHARGE AUTHORIZATION	774-04	GENERAL TYPE
Seattle Housing Authority - Pocket Park Construction Project	WEST POINT	CONNECTICUT- HANFORD 1/2 OR LANDER	GLA-CONSTRUCTION	40421-01	CONSTRUCTION DEWATERING
Yesler Investors 8, LLC - Yesler Block 8	WEST POINT	CONNECTICUT, HANFORD 1/2 OR LANDER	MINOR DISCHARGE AUTHORIZATION	1171-01	CONSTRUCTION DEWATERING

Table A-1: Active Industrial Users within the LDW Basin in 2023.

Harborview Medical Center	WEST POINT	CONNECTICUT,HANFORD 1/2 OR LANDER	MINOR DISCHARGE AUTHORIZATION	712-05	HOSPITAL
Ash Grove Cement Company	WEST POINT	DUWAMISH	MAJOR DISCHARGE AUTHORIZATION	4009-06	CEMENT/READYMIX
Cascade Designs Inc.	WEST POINT	DUWAMISH	MAJOR DISCHARGE AUTHORIZATION	4179-03	METAL FABRICATION
Cascade Machinery and Electric Inc.	WEST POINT	Duamish	LETTER OF AUTHORIZATION	11851-01	GENERAL TYPE
ConGlobal Industries Inc.	WEST POINT	Duamish	MINOR DISCHARGE AUTHORIZATION	932-02	PRESSURE WASHING
Field Roast Grain Meat Co. - Seventh Ave.	WEST POINT	DUWAMISH	MAJOR DISCHARGE AUTHORIZATION	4417-03	FOOD PROCESSING-MEATS
M Bloch & Co. Inc.	WEST POINT	DUWAMISH	MAJOR DISCHARGE AUTHORIZATION	4085-05	METALS RECYCLING
MacMillan-Piper Inc. - Edmunds Street Facility	WEST POINT	Duamish	LETTER OF AUTHORIZATION	10638-04	GENERAL TYPE
Northwest Container Services Inc. - Seattle Intermodal Yard	WEST POINT	DUWAMISH	MINOR DISCHARGE AUTHORIZATION	964-02	CONTAINER WASHING
Schwartz Brothers Bakery - Seattle	WEST POINT	DUWAMISH	MAJOR DISCHARGE AUTHORIZATION	1089-02	FOOD PROCESSING-BAKERY
Seattle Radiator LLC	WEST POINT	Duamish	MINOR DISCHARGE AUTHORIZATION	796-03	RADIATOR REPAIR
Stoneway Concrete - Seattle	WEST POINT	DUWAMISH	MAJOR DISCHARGE AUTHORIZATION	232-06	CEMENT/READYMIX
Two Beers Brewing Co. - Seattle Cider Co.	WEST POINT	DUWAMISH	MAJOR DISCHARGE AUTHORIZATION	4509-01	FOOD PROCESSING-BREWERY
Union Pacific Railroad - Argo Yard	WEST POINT	DUWAMISH	MAJOR DISCHARGE AUTHORIZATION	668-07	VEHICLE WASHING
United Parcel Service Inc. - Seattle	WEST POINT	DUWAMISH	MAJOR DISCHARGE AUTHORIZATION	4020-05	VEHICLE WASHING
Waste Management Inc. - Alaska Street Facility	WEST POINT	DUWAMISH	MINOR DISCHARGE AUTHORIZATION	691-05	SOLID WASTE - TRANSFER FAC
Alaska Marine Lines Inc.	WEST POINT	DUWAMISH WEST	MINOR DISCHARGE AUTHORIZATION	459-06	CONTAINER WASHING
Chemithon Corporation	WEST POINT	DUWAMISH WEST	MAJOR DISCHARGE AUTHORIZATION	4112-04	MANUFACTURING-MISC
Glacier Northwest Inc. - Vehicle Washing	WEST POINT	DUWAMISH WEST	MINOR DISCHARGE AUTHORIZATION	510-05	VEHICLE WASHING
Rainier Petroleum	WEST POINT	DUWAMISH WEST	MINOR DISCHARGE AUTHORIZATION	536-07	FUELING FACILITY
SeQuential Environmental Services	WEST POINT	DUWAMISH WEST	MAJOR DISCHARGE AUTHORIZATION	4405-02	RENDERING
Westway Feed Products LLC	WEST POINT	DUWAMISH WEST	MINOR DISCHARGE AUTHORIZATION	952-02	MANUFACTURING-MISC
VA Puget Sound Healthcare System - Seattle Division	WEST POINT	DUWAMISH,HANFORD 1/2, LANDER, MICHIGAN/RAINIER	MINOR DISCHARGE AUTHORIZATION	818-03	HOSPITAL
Seattle, City of - Seattle City Light - South Service Center	WEST POINT	DUWAMISH,HANFORD2/LANDER	MAJOR DISCHARGE AUTHORIZATION	4194-05	GENERAL TYPE
Boeing Company - Military Delivery Center	WEST POINT	E MARGINAL	LETTER OF AUTHORIZATION	11764-03	VEHICLE WASHING
Boeing Defense, Space & Security - Developmental Center	WEST POINT	E MARGINAL	MAJOR DISCHARGE AUTHORIZATION	526-08	MANUFACTURING-MISC
Container Properties LLC	WEST POINT	E MARGINAL	MAJOR DISCHARGE AUTHORIZATION	4167-03	GROUNDWATER REMEDIATION - ORGANICS
Star Forge Corp., dba Jorgensen Forge	WEST POINT	E MARGINAL	MINOR DISCHARGE AUTHORIZATION	1122-02	CONSTRUCTION DEWATERING
Boeing North Field Facility - PCB Treatment System for Duwamish Area Boeing Facilities	WEST POINT	E MARGINAL OR MICHIGAN	MAJOR DISCHARGE AUTHORIZATION	4223-03	WATER TREATMENT
King County International Airport - Boeing Field	WEST POINT	E Marginal or Michigan	MAJOR DISCHARGE AUTHORIZATION	4109-04	TRANSPORTATION FACILITY
King County International Airport - Groundwater Remediation	WEST POINT	E MARGINAL OR MICHIGAN	MAJOR DISCHARGE AUTHORIZATION	4129-05	GROUNDWATER REMEDIATION - PETROLEUM
Quad 7 Development LLC - Signature Flight Support	WEST POINT	E MARGINAL OR MICHIGAN	MINOR DISCHARGE AUTHORIZATION	849-03	VEHICLE WASHING
Franz Bakery - Weller St.	WEST POINT	HANFORD 1/2 OR LANDER	MAJOR DISCHARGE AUTHORIZATION	4296-02	FOOD PROCESSING-BAKERY
LabCorp/Dynacare Laboratories	WEST POINT	HANFORD 1/2 OR LANDER	LETTER OF AUTHORIZATION	11784-02	LABORATORY
LIHI Good Shepherd Permanent Supportive Housing Project	WEST POINT	HANFORD 1/2 OR LANDER	GLA-CONSTRUCTION	40364-01	CONSTRUCTION DEWATERING
Northwest Tofu Inc.	WEST POINT	Hanford 1/2 or Lander	MINOR DISCHARGE AUTHORIZATION	1044-02	FOOD PROCESSING-OTHER
Osborne Construction Co. - 9th and Madison Town Home Construction Project	WEST POINT	HANFORD 1/2 OR LANDER	GLA-CONSTRUCTION	40418-01	CONSTRUCTION DEWATERING
Perfect Wealth Investment LLC - Sanctuary at Cherry Hill	WEST POINT	HANFORD 1/2 OR LANDER	GLA-CONSTRUCTION	40355-01	CONSTRUCTION DEWATERING
Photographic Center Northwest	WEST POINT	Hanford 1/2 or Lander	LETTER OF AUTHORIZATION	11531-02	PHOTO PROCESSING
Ralph's Concrete Pumping Inc. - Rainier Avenue	WEST POINT	HANFORD 1/2 OR LANDER	LETTER OF AUTHORIZATION	11760-02	CEMENT/READYMIX
Sea Self Storage II LLC - c/o Urban Development & Construction LLC	WEST POINT	HANFORD 1/2 OR LANDER	LETTER OF AUTHORIZATION	11975-01	CONSTRUCTION DEWATERING
Seattle Academy - SAAS Home of the Upper School Construction Project	WEST POINT	HANFORD 1/2 OR LANDER	GLA-CONSTRUCTION	40428-01	CONSTRUCTION DEWATERING
Seattle Public Schools - Mercer Middle School Replacement Project	WEST POINT	HANFORD 1/2 OR LANDER	LETTER OF AUTHORIZATION	11979-01	CONSTRUCTION DEWATERING
Seattle, City of - Parks and Recreation - Little Saigon Park	WEST POINT	Hanford 1/2 or Lander	LETTER OF AUTHORIZATION	11936-01	CONSTRUCTION DEWATERING
Seattle, City of - SDOT - Madison Street Bus Rapid Transit (BRT) Project	WEST POINT	Hanford 1/2 or Lander	MINOR DISCHARGE AUTHORIZATION	1153-01	CONSTRUCTION DEWATERING
Sound Transit - E130 East Link Extension SPU Discharge Locations Construction Project	WEST POINT	HANFORD 1/2 OR LANDER	MAJOR DISCHARGE AUTHORIZATION	4439-03	CONSTRUCTION DEWATERING
Sound Transit Operations and Maintenance Facility	WEST POINT	Hanford 1/2 or Lander	MINOR DISCHARGE AUTHORIZATION	801-04	TRANSPORTATION FACILITY
Swedish Medical Center - Cherry Hill	WEST POINT	HANFORD 1/2 OR LANDER	MINOR DISCHARGE AUTHORIZATION	707-05	HOSPITAL
Thanh Son Tofu - King Street	WEST POINT	HANFORD 1/2 OR LANDER	MAJOR DISCHARGE AUTHORIZATION	4517-01	FOOD PROCESSING
Atwood Adhesives Inc.	WEST POINT	MICHIGAN	LETTER OF AUTHORIZATION	11816-02	GENERAL TYPE
Classic Impressions Inc.	WEST POINT	MICHIGAN	LETTER OF AUTHORIZATION	11777-02	GENERAL TYPE

Table A-1: Active Industrial Users within the LDW Basin in 2023.

DTG Enterprises Inc., - Seattle	WEST POINT	MICHIGAN	MINOR DISCHARGE AUTHORIZATION	1164-01	SOLID WASTE - TRANSFER FAC
EcoLights Northwest	WEST POINT	Michigan	LETTER OF AUTHORIZATION	11962-01	GENERAL TYPE
Emerald Services Inc. - Brighton Facility	WEST POINT	MICHIGAN	MAJOR DISCHARGE AUTHORIZATION	4372-02	FUEL - BULK STORAGE
Evergreen Tractor LLC	WEST POINT	MICHIGAN	LETTER OF AUTHORIZATION	11008-04	VEHICLE WASHING
First South Properties	WEST POINT	MICHIGAN	MAJOR DISCHARGE AUTHORIZATION	4608-01	VEHICLE WASHING
King County WTD - Georgetown Wet Weather Treatment Station Operational Testing	WEST POINT	Michigan	LETTER OF AUTHORIZATION	11944-01	CONSTRUCTION DEWATERING
Pike Brewing Company - Michigan Street	WEST POINT	MICHIGAN	MAJOR DISCHARGE AUTHORIZATION	4618-01	FOOD PROCESSING-BREWERY
Recology King County Inc.	WEST POINT	MICHIGAN	MINOR DISCHARGE AUTHORIZATION	850-04	CONTAINER WASHING
Seattle Iron and Metals Corp.	WEST POINT	MICHIGAN	MINOR DISCHARGE AUTHORIZATION	750-04	VEHICLE WASHING
U-C Coatings	WEST POINT	MICHIGAN	MINOR DISCHARGE AUTHORIZATION	918-03	GENERAL TYPE
Housing Diversity- 7324 Martin Luther King Way Apts	WEST POINT	Norfolk	GLA-CONSTRUCTION	40361-01	CONSTRUCTION DEWATERING
OHNO Construction Company	WEST POINT	NORFOLK	LETTER OF AUTHORIZATION	11279-03	PRESSURE WASHING
Transportation Demand Management LLC (dba Starline Luxury Coaches)	WEST POINT	Norfolk	LETTER OF AUTHORIZATION	11528-02	VEHICLE WASHING
Seattle, City of - Parks and Recreation - North Rainier Landbanked Site Construction Project	WEST POINT	Rainier	LETTER OF AUTHORIZATION	11965-01	CONSTRUCTION DEWATERING
Seattle, City of - SPU - West Seattle Decant Station	WEST POINT	WEST MICHIGAN	MAJOR DISCHARGE AUTHORIZATION	416-07	DECANT STATION

Zero Discharge Facilities

Facility Name	Treatment Plant	CSO Basin	Authorization Type	Permit	Customer Type
Ace Galvanizing Inc.	WEST POINT	8TH AVE	ZERO DISCHARGE (CATEGORICAL)	9725-02	IRON AND STEEL MANF - CFR 420
Repair Technology Inc.	WEST POINT	8th Ave	ZERO DISCHARGE (CATEGORICAL)	9707-04	METAL FINISHING - CFR 433
Metal Solutions LLC	WEST POINT	BRANDON OR DUWAMISH	ZERO DISCHARGE (CATEGORICAL)	9721-02	METAL FINISHING - CFR 433
Lighthouse for the Blind	WEST POINT	HANFORD 1/2 OR LANDER	ZERO DISCHARGE (CATEGORICAL)	9727-02	METAL FINISHING - CFR 433
Pioneer Industries	WEST POINT	WEST MICHIGAN	ZERO DISCHARGE (CATEGORICAL)	9712-03	METAL FINISHING - CFR 433

General Descriptions of Authorization Types:

Permit: Must meet one of the following -->

(Also referred to as significant industrial users (SIUs))

Flow > 25,000 gpd (although higher threshold applies to low-risk dischargers).

Facility is regulated under a federal effluent guideline category (i.e, categorical industrial user (CIU)).

Discharger contributes 5% or more of the treatment plant dry-weather hydraulic or organic capacity.

Facility has a reasonable potential to pose risk to the publicly owned treatment works (POTW).

Other criteria (e.g., enforcement history, etc.)

Major Discharge Authorization:

Flow < 25,000 gpd (although higher threshold applies to low-risk dischargers).

Non-categorical (i.e., non-CIU)

Minor risk to POTW

Minor Discharge Authorization:

Flow <25,000 gpd

Even lower risk to POTW than Major Discharge Authorization facilities

Letter of Authorization:

Flow <25,000 gpd

Even lower risk to POTW than Minor Discharge Authorization facilities

Zero Discharge (Categorical):

Categorical facilities (CIUs) that do not discharge industrial wastewater to the POTW, but a reasonable potential exists to do so. (Example, a facility with no industrial discharge locations in the industrial processing area, but contains sinks and sanitary sewer connections which could make illicit discharges feasible.)

Table A-2: KCIW Inspections in LDW Basin for 2023

Facility	Inspection date	Authorization number	Type of inspection
Discharge Authorizations & Miscellaneous Inspections (MISC), Post-Violation Inspections (PV)			
Auto-Chlor System	20-Sep-23	7956-01	MISC
Container Properties LLC	19-Dec-23	4167-03	MISC
EcoLights Northwest	8-Feb-23	11962-01	MISC
Evergreen Tractor LLC	6-Feb-23	11008-03	MISC
First South Properties	11-Jan-23	4608-01	MISC
Marine Vacuum Service Inc.	4-Oct-23	7676-08	MISC
Marine Vacuum Service Inc.	19-Dec-23	7676-08	MISC
Pioneer Industries	8-Feb-23	9712-02	MISC
Quad 7 Development LLC - Signature Flight Support	15-Feb-23	849-03	MISC
Quad 7 Development LLC - Signature Flight Support	31-Aug-23	849-03	MISC
Quad 7 Development LLC - Signature Flight Support	4-Dec-23	849-03	MISC
Rabanco Ltd. Seattle Hauling Facility	8-Aug-23	1199-01	MISC
Rainier Petroleum	4-May-23	536-06	MISC
Repair Technology Inc.	1-Nov-23	9707-03	MISC
Schwartz Brothers Bakery - Seattle	16-Aug-23	1089-01	MISC
Seadrunar Recycling	21-Aug-23	11430-03	MISC
Seattle Radiator LLC	2-Nov-23	796-03	MISC
Seattle, City of - SPU - West Seattle Decant Station	24-Jan-23	416-06	MISC
Slurry Solutions - Bay Area Concrete	21-Feb-23	4498-01	MISC
Slurry Solutions - Bay Area Concrete	9-Nov-23	4498-01	MISC
U-C Coatings	4-Oct-23	918-02	MISC
Art Brass Plating Inc.	19-May-23	7722-07	PV
Art Brass Plating Inc.	3-Oct-23	7722-07	PV
Auto-Chlor System	20-Sep-23	7956-01	PV
Seattle, City of - SPU - South Transfer Station	29-Aug-23	7878-02	PV
Slurry Solutions - Bay Area Concrete	28-Feb-23	4498-01	PV

Permits - Annual Inspections of Significant Industrial Users (SIUs)

Art Brass Plating Inc.	18-Dec-23	7722-07	SIU
Auto-Chlor System	14-Jul-23	7956-01	SIU
Boeing Commercial Airplane - North Field	13-Aug-23	7594-08	SIU
Boeing Company - Plant 2 Facility	1-Nov-23	7811-05	SIU
Cascade Columbia Distribution	9-Mar-23	7968-01	SIU
Darigold Inc. - Rainier Plant	29-Jun-23	7116-07	SIU
Elysian Brewing Company - Airport Way S.	12-Jun-23	7951-01	SIU
Georgetown Brewing Company	2-Nov-23	7972-01	SIU
Industrial Container Services - WA LLC	8-Feb-23	7929-02	SIU
Kerry Inc.	6-Feb-23	7854-04	SIU
Lafarge - Seattle Plant	1-Sep-23	7925-03	SIU
Lineage Logistics LLC (Orca Bay Foods)	7-Jun-23	7896-02	SIU
Machinists Inc. - Plant 5	13-Jun-23	7892-03	SIU
Magnetic and Penetrant Services Co. (MAPSCO) dba Valence Surface Technologies	30-Aug-23	7873-04	SIU
Marine Vacuum Service Inc.	21-Apr-23	7676-08	SIU

Table A-2: KCIW Inspections in LDW Basin for 2023

Facility	Inspection date	Authorization number	Type of inspection
Marine Vacuum Service Inc.	17-Oct-23	7676-08	SIU
National Products Inc.	26-Jan-23	7834-04	SIU
Rainier Commons LLC - Old Rainier Brewery Site	21-Aug-23	7927-02	SIU
Seattle Barrel Co.	27-Nov-23	7113-05	SIU
Seattle, City of - SPU - South Transfer Station	9-Nov-23	7878-02	SIU
TLP Management Services LLC	24-May-23	7592-06	SIU
Vigor Shipyards LLC	31-Aug-23	7782-08	SIU
Waste Management National Services - Duwamish Reload Facility	5-Dec-23	7928-05	SIU

Table A-3: KCIW Notices of Violation (NOVs) Issued in LDW Basin for 2023

Notice of Violation issue date	Treatment Plant	Facility	Date of violation	Violating Criteria and/or Pollutants
2/17/2023	West Point	Magnetic and Penetrant Services Co. (MAPSCO) dba Valence Surface Technologies	December 2022	NOV issued for violating monthly average limit for zinc
3/9/2023	West Point	Rainier Petroleum Corp.	2/17/2023	Final Notice issued for failure to submit required report (authorization renewal application)
3/17/2023	West Point	Magnetic and Penetrant Services Co. (MAPSCO) dba Valence Surface Technologies	January 2023	NOV issued for violating monthly average limits for chromium and zinc
4/20/2023	West Point	Atwood Adhesives Inc.	2/26/2023	Final Notice issued for failure to submit required report (authorization renewal application)
4/25/2023	West Point	Quad 7 Development LLC - Signature Flight Support	2/15/2023	NOV issued for violation of King County Code 28.84.060.N.1.d and D.5.k and Discharge Authorization 849-03 Special Condition F, for allowing stormwater to enter sanitary sewer, which contributed to downstream overflows of SPU pump station
4/26/2023	West Point	Marine Vacuum Service Inc.	3/13/2023	NOV issued for violating daily average limits for lead and zinc
5/11/2023	West Point	Art Brass Plating Inc.	3/28/2023	NOV issued for violating instantaneous (grab) limit for nickel
6/8/2023	West Point	Seattle, City of - SPU - South Transfer Station	December 2022, February, March, & April 2023	NOV issued for violating discharge limit for settleable solids in three out of four self-monitoring periods

Table A-3: KCIW Notices of Violation (NOVs) Issued in LDW Basin for 2023

Notice of Violation issue date	Treatment Plant	Facility	Date of violation	Violating Criteria and/or Pollutants
6/15/2023	West Point	Slurry Waste Solutions - Bay Area Concrete	September & October 2022 and March, April, May, June 2023	NOV issued for violating Special Condition B (accepting stormwater from an offsite construction project); King County Code 28.84.060.O.5 (bypassing the pretreatment system and effluent flow meter); wastewater was discharged in September and October 2022 but no SMRs were reported; chemical analysis approval SOP was not followed; records were not properly retained and unable to be produced for inspection
7/25/2023	West Point	Art Brass Plating Inc.	6/15/2023	NOV issued for violating instantaneous (grab) limit for cadmium (post-violation sampling)
8/17/2023	West Point	Auto-Chlor System	7/31/2023	NOV issued for violating daily average limit for zinc
10/17/2023	West Point	Art Brass Plating Inc.	8/1/2023	NOV issued for violating monthly average limit for cadmium
10/25/2023	West Point	Slurry Waste Solutions - Bay Area Concrete	9/15/2023 and 10/15/2023	Final Notice issued for failure to submit required reports (August and September self-monitoring)

Note:

Listing of industrial users that were at any time during the reporting period not complying with federal, state, or local pretreatment standards or with applicable compliance schedules for achieving those standards.

Appendix B: WTD Source Tracing Combined Sewer Solids Dataset

Table B-1. King County LDW CSO Source Tracing Sample Locators and Associated Coordinates and Sample Types for 2023

Locator	Description	Xplan	Yplan	Latitude	Longitude	Samples Collected	Sample Type
S071308	8th Ave S. Regulator - (WE*WDUWAM.W14-317)	1272454	198140	47.53344	-122.32298	6/14/2023	In-line grab
ST_A4007_L	S.Michigan Street Regulator Station	1270402	202321	47.32412	-122.19538	6/14/2023	Sediment trap

X/Y Coordinates are in NAD1983 WA State Plane North.

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Table B-2. Combined Sewer System Solids Sampling Results for 2023.

Project: 423589-340-4 Locator: S071308 Descrip: 8TH AVE. SO. REGUL Sample: L81697-1 Matrix: SH IN-LINESED ColDate: 6/14/23 12:13 TotalSolid: 69.5 DRY Weight Basis						Project: 423589-340-4 Locator: S071308 Descrip: 8TH AVE. SO. REGUL Sample: L81697-3 Matrix: SH IN-LINESED ColDate: 6/14/23 12:13 TotalSolid: 70.1 DRY Weight Basis					
Parameters	Value	Qual	MDL	RDL	Units	Value	Qual	MDL	RDL	Units	
CV ASTM D422											
Clay*	5.8	J	1	1.9	%	2.9	J	0.7	1.4	%	
Fines*	14.6		1	1.9	%	3.6		0.7	1.4	%	
Gravel*	3.1	J	0.2	1.9	%	21.3		0.1	1.4	%	
p+0.00*	6.4		0.2	1.9	%	9.7		0.1	1.4	%	
p+1.00*	13.7		0.2	1.9	%	21.3		0.1	1.4	%	
p+10.0(equal/more than)*	4.9		1	1.9	%	2.2		0.7	1.4	%	
p+2.00*	33.3		0.2	1.9	%	34.2		0.1	1.4	%	
p+3.00*	23.9		0.2	1.9	%	11		0.1	1.4	%	
p+4.00*	9.1		0.2	1.9	%	1.4	RDL	0.1	1.4	%	
p+5.00*	6.8		1	1.9	%	0.7	<RDL	0.7	1.4	%	
p+6.00*	1	<RDL	1	1.9	%		<MDL	0.7	1.4	%	
p+7.00*	1	<RDL	1	1.9	%		<MDL	0.7	1.4	%	
p+8.00*		<MDL	1	1.9	%		<MDL	0.7	1.4	%	
p+9.00*	1	<RDL	1	1.9	%	0.7	<RDL	0.7	1.4	%	
p-1.00*	2.3		0.2	1.9	%	5.5		0.1	1.4	%	
p-2.00(less than)*	0.8	<RDL	0.2	1.9	%	15.1		0.1	1.4	%	
p-2.00*		<MDL	0.2	1.9	%	0.7	<RDL	0.1	1.4	%	
Sand*	86.3		0.2	1.9	%	77.6		0.1	1.4	%	
Silt*	8.8		1	1.9	%	0.7	<RDL	0.7	1.4	%	
CV ASTM D422/D3977-97											
500 Micron (equal to/more than)*											
CV ISO 13320:2009(E)											
Clay*											
Fines*											
p+1.00*											
p+10.0(more than)*											
p+10.0*											
p+2.00*											
p+3.00*											
p+4.00*											
p+5.00*											
p+6.00*											
p+7.00*											
p+8.00*											
p+9.00*											
Sand<1000*											
Silt*											
CV SM2540-G											
Total Solids*	69.5		0.005	0.01	%	70.1		0.005	0.01	%	
CV SW846 9060 PSEP96											
Total Organic Carbon	9830		2750	2750	mg/Kg	12300		1950	1950	mg/Kg	
ES NONE											
Field Personnel*	DR / JG				none	DR / JG				none	
Sample Code*	G				none	G				none	
Sample Function*	AREP				none	FREP@L81697-1				none	
Sample Information*	In-Line Grab at 8th Ave S. and S. Portland Street.				none	In-Line Grab at 8th Ave S. and S. Portland Street.				none	
MT SW846 3050B(MODSB)*SW846 6020B											
Arsenic, Total, ICP-MS	6.91		0.0181	0.0181	mg/Kg	21.7		0.0175	0.0175	mg/Kg	
Cadmium, Total, ICP-MS	0.6		0.0181	0.0181	mg/Kg	0.35		0.0175	0.0175	mg/Kg	
Chromium, Total, ICP-MS	321		0.145	0.145	mg/Kg	22.8		0.0699	0.0699	mg/Kg	
Copper, Total, ICP-MS	45.6		0.0725	0.0725	mg/Kg	39.4		0.0699	0.0699	mg/Kg	

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Table B-2. Combined Sewer System Solids Sampling Results for 2023.

Project: 423589-340-4 Locator: S071308 Descrip: 8TH AVE. SO. REGUL Sample: L81697-1 Matrix: SH IN-LINESED ColDate: 6/14/23 12:13 TotalSolid: 69.5 DRY Weight Basis						Project: 423589-340-4 Locator: S071308 Descrip: 8TH AVE. SO. REGUL Sample: L81697-3 Matrix: SH IN-LINESED ColDate: 6/14/23 12:13 TotalSolid: 70.1 DRY Weight Basis					
Parameters	Value	Qual	MDL	RDL	Units	Value	Qual	MDL	RDL	Units	
Lead, Total, ICP-MS	32.8		0.0363	0.0363	mg/Kg	55.8		0.0699	0.0699	mg/Kg	
Nickel, Total, ICP-MS	17.6		0.0363	0.0363	mg/Kg	19.7		0.035	0.035	mg/Kg	
Silver, Total, ICP-MS	1.27		0.0145	0.0145	mg/Kg	0.21		0.014	0.014	mg/Kg	
Vanadium, Total, ICP-MS	25.2		0.0272	0.0272	mg/Kg	21		0.0262	0.0262	mg/Kg	
Zinc, Total, ICP-MS	268		0.363	0.363	mg/Kg	301		0.35	0.35	mg/Kg	
MT SW846 7471B											
Mercury, Total, CVAA	0.18		0.00714	0.00714	mg/Kg	0.114		0.00712	0.00712	mg/Kg	
OR SW846 3550C*SW846 8082A											
Aroclor 1016		<QL	1.8	1.8	ug/Kg		<QL	1.78	1.78	ug/Kg	
Aroclor 1221		<QL	5.4	5.4	ug/Kg		<QL	5.35	5.35	ug/Kg	
Aroclor 1232		<QL	5.4	5.4	ug/Kg		<QL	5.35	5.35	ug/Kg	
Aroclor 1242		<QL	1.8	1.8	ug/Kg		<QL	3.57	3.57	ug/Kg	
Aroclor 1248		<QL	1.8	1.8	ug/Kg		<QL	1.78	1.78	ug/Kg	
Aroclor 1254	7.57		1.8	1.8	ug/Kg	8.12		1.78	1.78	ug/Kg	
Aroclor 1260	5.22		1.8	1.8	ug/Kg	5.11		1.78	1.78	ug/Kg	
Total Aroclors	12.8		1.8	1.8	ug/Kg	13.2		1.78	1.78	ug/Kg	
OR SW846 3550C*SW846 8270E											
1,2,4-Trichlorobenzene		<QL	18	36	ug/Kg		<QL	17.8	35.7	ug/Kg	
1,2-Dichlorobenzene		<QL	18	36	ug/Kg		<QL	17.8	35.7	ug/Kg	
1,4-Dichlorobenzene	512		18	36	ug/Kg	524		17.8	35.7	ug/Kg	
1-Methylnaphthalene		<QL	18	36	ug/Kg		<QL	17.8	35.7	ug/Kg	
2-Methylnaphthalene		<QL	36	71.9	ug/Kg		<QL	35.7	71.3	ug/Kg	
2-Methylphenol		<QL	71.9	180	ug/Kg		<QL	71.3	178	ug/Kg	
3-,4-Methylphenol	1470		71.9	180	ug/Kg	1460		71.3	178	ug/Kg	
Acenaphthene		<QL	18	36	ug/Kg		<QL	17.8	35.7	ug/Kg	
Acenaphthylene		<QL	18	36	ug/Kg		<QL	17.8	35.7	ug/Kg	
Anthracene		<QL	36	71.9	ug/Kg		<QL	35.7	71.3	ug/Kg	
Benzo(a)anthracene	60.4	<QL,J	36	71.9	ug/Kg	46.6	<QL,J	35.7	71.3	ug/Kg	
Benzo(a)pyrene	52.5		18	36	ug/Kg	21.7	<QL,J	17.8	35.7	ug/Kg	
Benzo(b,j,k)fluoranthene	88.3	<QL,J	54	108	ug/Kg		<QL	53.5	107	ug/Kg	
Benzo(g,h,i)perylene		<QL,TA	75.5	75.5	ug/Kg		<QL,TA	35.7	35.7	ug/Kg	
Benzyl Butyl Phthalate		<QL	71.9	71.9	ug/Kg		<QL	71.3	71.3	ug/Kg	
Bis(2-Ethylhexyl)Phthalate	604		180	180	ug/Kg	541		178	178	ug/Kg	
Carbazole		<QL	36	71.9	ug/Kg		<QL	35.7	71.3	ug/Kg	
Chrysene	60.6		18	36	ug/Kg	32.4	<QL,J	17.8	35.7	ug/Kg	
Dibenzo(a,h)anthracene		<QL,J	36	71.9	ug/Kg		<QL,J	35.7	71.3	ug/Kg	
Dibenzofuran		<QL	18	36	ug/Kg		<QL	17.8	35.7	ug/Kg	
Diethyl Phthalate		<QL	71.9	180	ug/Kg		<QL	71.3	178	ug/Kg	
Dimethyl Phthalate		<QL	36	71.9	ug/Kg		<QL	35.7	71.3	ug/Kg	
Di-N-Butyl Phthalate		<QL,TA	71.9	71.9	ug/Kg		<QL	35.7	71.3	ug/Kg	
Di-N-Octyl Phthalate		<QL	180	180	ug/Kg		<QL	178	178	ug/Kg	
Fluoranthene	100		18	36	ug/Kg	75.9		17.8	35.7	ug/Kg	
Fluorene		<QL	36	71.9	ug/Kg		<QL	35.7	71.3	ug/Kg	
Indeno(1,2,3-Cd)Pyrene	56.8		18	36	ug/Kg	33	<QL,J	17.8	35.7	ug/Kg	
Naphthalene		<QL	36	71.9	ug/Kg		<QL	35.7	71.3	ug/Kg	
Pentachlorophenol		<QL,TA	180	180	ug/Kg		<QL,TA	178	178	ug/Kg	
Phenanthrene		<QL,TA	71.9	71.9	ug/Kg		<QL,TA	71.3	71.3	ug/Kg	
Phenol	289		71.9	180	ug/Kg	281		71.3	178	ug/Kg	
Pyrene		<QL,TA	180	180	ug/Kg		<QL,TA	107	107	ug/Kg	
Total HPAHS (calc)	418.6					209.6					
Total LPAHs (calc)	0					0					

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Table B-2. Combined Sewer System Solids Sampling Results for 2023.

Project: 423589-340-4 Locator: S071308 Descrip: 8TH AVE. SO. REGUL Sample: L81697-1 Matrix: SH IN-LINESED ColDate: 6/14/23 12:13 TotalSolid: 69.5 DRY Weight Basis						Project: 423589-340-4 Locator: S071308 Descrip: 8TH AVE. SO. REGUL Sample: L81697-3 Matrix: SH IN-LINESED ColDate: 6/14/23 12:13 TotalSolid: 70.1 DRY Weight Basis					
Parameters	Value	Qual	MDL	RDL	Units	Value	Qual	MDL	RDL	Units	
OR SW846 3550C*SW846 8270E SIM											
2,4-Dimethylphenol		<QL	36	71.9	ug/Kg		<QL	35.7	71.3	ug/Kg	
Benzoic Acid		<QL	1440	1800	ug/Kg		<QL	1430	1780	ug/Kg	
Benzyl Alcohol		<QL,TA	71.9	71.9	ug/Kg		<QL,TA	71.3	71.3	ug/Kg	
Hexachlorobenzene		<QL	3.6	7.19	ug/Kg		<QL	3.57	7.13	ug/Kg	
Hexachlorobutadiene		<QL	7.19	18	ug/Kg		<QL	7.13	17.8	ug/Kg	
N-Nitrosodiphenylamine		<QL	18	36	ug/Kg		<QL	17.8	35.7	ug/Kg	

* Not converted to dry weight basis

MDL - method detection limit

RDL - reporting detection limit

QL - quantitation limit

J - estimated value

TA - text available in KC LIMS

Shaded and underlined value > source control screening

benchmarks for combined sewer system.

Shaded value > benthic CSL or 2LAET

see Appendix B of King County 2019

1. Total LPAHs were calculated as the sum of detected

acenaphthene, acenaphthylene, anthracene, fluorene,

naphthalene, and phenanthrene

2. Total HPAHs were calculated as the sum of detected

benzo(a)anthracene, benzo(a)pyrene, benzo(g,h,i)perylene,

total benzofluoranthenes, chrysene,

dibenzo(a,h)anthracene, fluoranthene, indeno(1,2,3-

cd)pyrene, and pyrene

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Table B-2. Combined Sewer System Solids Sampling Results for 2023.

Project: 423589-340-4 Locator: ST_A4007_L Descrip: LOWER SEDIMENT TRA Sample: L81858-1 Matrix: SH IN-LINESED ColDate: 6/14/23 0:00 TotalSolid: 53.3 DRY Weight Basis						Project: 423589-340-4 Locator: ST_A4007_L Descrip: LOWER SEDIMENT TRA Sample: L81858-2 Matrix: SH IN-LINESED ColDate: 6/14/23 0:00 TotalSolid: 52.5 DRY Weight Basis					
Parameters	Value	Qual	MDL	RDL	Units	Value	Qual	MDL	RDL	Units	
CV ASTM D422											
Clay*											
Fines*											
Gravel*											
p+0.00*											
p+1.00*											
p+10.0(equal/more than)*											
p+2.00*											
p+3.00*											
p+4.00*											
p+5.00*											
p+6.00*											
p+7.00*											
p+8.00*											
p+9.00*											
p-1.00*											
p-2.00(less than)*											
p-2.00*											
Sand*											
Silt*											
CV ASTM D422/D3977-97											
500 Micron (equal to/more than)*	8.13	TA	0.005	0.01	%						
CV ISO 13320:2009(E)											
Clay*	2.04	TA	0.01	0.01	% Volume						
Fines*	39.15	TA	0.01	0.01	% Volume						
p+1.00*	4.1	TA	0.01	0.01	% Volume						
p+10.0(more than)*		<MDL,TA	0.01	0.01	% Volume						
p+10.0*	0.53	TA	0.01	0.01	% Volume						
p+2.00*	13.91	TA	0.01	0.01	% Volume						
p+3.00*	16.86	TA	0.01	0.01	% Volume						
p+4.00*	17.85	TA	0.01	0.01	% Volume						
p+5.00*	13.41	TA	0.01	0.01	% Volume						
p+6.00*	12.68	TA	0.01	0.01	% Volume						
p+7.00*	6.77	TA	0.01	0.01	% Volume						
p+8.00*	4.24	TA	0.01	0.01	% Volume						
p+9.00*	1.51	TA	0.01	0.01	% Volume						
Sand<1000*	52.72	TA	0.01	0.01	% Volume						
Silt*	37.11	TA	0.01	0.01	% Volume						
CV SM2540-G											
Total Solids*	53.3		0.005	0.01	%	52.5		0.005	0.01	%	
CV SW846 9060 PSEP96											
Total Organic Carbon											
ES NONE											
Field Personnel*	D. Robinson				none	D. Robinson				none	
Sample Code*	Sediment Trap				none	Sediment Trap				none	
Sample Function*	AREP				none	FREP@ST_A01903; L81858-1				none	
Sample Information*	None				none	Hg FREP split at lab				none	
MT SW846 3050B(MODSB)*SW846 6020B											
Arsenic, Total, ICP-MS	7.5		0.0236	0.0236	mg/Kg						
Cadmium, Total, ICP-MS	2.18		0.0236	0.0236	mg/Kg						
Chromium, Total, ICP-MS	45		0.0946	0.0946	mg/Kg						
Copper, Total, ICP-MS	150		0.0946	0.0946	ma/Ka						

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Table B-2. Combined Sewer System Solids Sampling Results for 2023.

Project: 423589-340-4 Locator: ST_A4007_L Descrip: LOWER SEDIMENT TRA Sample: L81858-1 Matrix: SH IN-LINESED ColDate: 6/14/23 0:00 TotalSolid: 53.3 DRY Weight Basis						Project: 423589-340-4 Locator: ST_A4007_L Descrip: LOWER SEDIMENT TRA Sample: L81858-2 Matrix: SH IN-LINESED ColDate: 6/14/23 0:00 TotalSolid: 52.5 DRY Weight Basis					
Parameters	Value	Qual	MDL	RDL	Units	Value	Qual	MDL	RDL	Units	
Lead, Total, ICP-MS	136		0.236	0.236	mg/Kg						
Nickel, Total, ICP-MS	33.2		0.0473	0.0473	mg/Kg						
Silver, Total, ICP-MS	1.75		0.0189	0.0189	mg/Kg						
Vanadium, Total, ICP-MS	40		0.0355	0.0355	mg/Kg						
Zinc, Total, ICP-MS	856		1.18	1.18	mg/Kg						
MT SW846 7471B											
Mercury, Total, CVAA	0.313	J	0.00953	0.00953	mg/Kg	7.83	J	0.0463	0.0463	mg/Kg	
OR SW846 3550C*SW846 8082A											
Aroclor 1016		<QL	23.5	23.5	ug/Kg						
Aroclor 1221		<QL	70.4	70.4	ug/Kg						
Aroclor 1232		<QL	70.4	70.4	ug/Kg						
Aroclor 1242	257		23.5	23.5	ug/Kg						
Aroclor 1248		<QL	23.5	23.5	ug/Kg						
Aroclor 1254	218		23.5	23.5	ug/Kg						
Aroclor 1260	72.6		23.5	23.5	ug/Kg						
Total Aroclors	547		23.5	23.5	ug/Kg						
OR SW846 3550C*SW846 8270E											
1,2,4-Trichlorobenzene											
1,2-Dichlorobenzene											
1,4-Dichlorobenzene											
1-Methylnaphthalene											
2-Methylnaphthalene											
2-Methylphenol											
3-,4-Methylphenol											
Acenaphthene											
Acenaphthylene											
Anthracene											
Benzo(a)anthracene											
Benzo(a)pyrene											
Benzo(b,j,k)fluoranthene											
Benzo(g,h,i)perylene											
Benzyl Butyl Phthalate											
Bis(2-Ethylhexyl)Phthalate											
Carbazole											
Chrysene											
Dibenzo(a,h)anthracene											
Dibenzofuran											
Diethyl Phthalate											
Dimethyl Phthalate											
Di-N-Butyl Phthalate											
Di-N-Octyl Phthalate											
Fluoranthene											
Fluorene											
Indeno(1,2,3-Cd)Pyrene											
Naphthalene											
Pentachlorophenol											
Phenanthrene											
Phenol											
Pyrene											
Total HPAHS (calc)											
Total LPAHs (calc)											

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Table B-2. Combined Sewer System Solids Sampling Results for 2023.

<div>Project: 423589-340-4 Locator: ST_A4007_L Descrip: LOWER SEDIMENT TRA Sample: L81858-1 Matrix: SH IN-LINESED ColDate: 6/14/23 0:00 TotalSolid: 53.3 DRY Weight Basis</div>						<div>Project: 423589-340-4 Locator: ST_A4007_L Descrip: LOWER SEDIMENT TRA Sample: L81858-2 Matrix: SH IN-LINESED ColDate: 6/14/23 0:00 TotalSolid: 52.5 DRY Weight Basis</div>					
Parameters	Value	Qual	MDL	RDL	Units	Value	Qual	MDL	RDL	Units	
OR SW846 3550C*SW846 8270E SIM											
2,4-Dimethylphenol											
Benzoic Acid											
Benzyl Alcohol											
Hexachlorobenzene											
Hexachlorobutadiene											
N-Nitrosodiphenylamine											

* Not converted to dry weight basis

MDL - method detection limit

RDL - reporting detection limit

QL - quantitation limit

J - estimated value

TA - text available in KC LIMS

Shaded and underlined value > source control screening

benchmarks for combined sewer system.

Shaded value > benthic CSL or 2LAET

see Appendix B of King County 2019

1. Total LPAHs were calculated as the sum of detected

acenaphthene, acenaphthylene, anthracene, fluorene,

naphthalene, and phenanthrene

2. Total HPAHs were calculated as the sum of detected

benzo(a)anthracene, benzo(a)pyrene, benzo(g,h,i)perylene,

total benzofluoranthenes, chrysene,

dibenzo(a,h)anthracene, fluoranthene, indeno(1,2,3-

cd)pyrene, and pyrene

Table B-3. Combined Sewer System Solids Dioxin/Furan Sampling Results for 2023.

Locator	ST_A4007_L						
Description	LOWER SEDIMENT TRAP						
KC Sample ID	L81858-1						
Sample type	SH IN-LINESED						
Collect Date	6/14/2023						
SGS-Axys Analytical Workgroup	WG88188						
SGS-Axys Analytical Sample ID	L39811-4						
COMPOUND	CONC_FOUND ng/kg dw	Lab Qualifier	Validation Qualifier	SDL pg/g dw	LOQ pg/g dw	TEF Unitless	TEQ ng TEQ/kg dw
<u>Dioxin</u>							
2,3,7,8-TCDD	1.57	J		0.117	1.87	1	1.57
1,2,3,7,8-PeCDD	8.86			0.129	5.84	1	8.86
1,2,3,4,7,8-HxCDD	14.1			0.204	5.84	0.1	1.41
1,2,3,6,7,8-HxCDD	44.7			0.204	5.84	0.1	4.47
1,2,3,7,8,9-HxCDD*	28.5			0.117	5.84	0.1	2.85
1,2,3,4,6,7,8-HpCDD	1100	B		0.311	5.84	0.01	11
OCDD	10700	B		0.346	11.7	0.0003	3.21
<u>Furan</u>							
2,3,7,8-TCDF*	5.68			0.117	1.17	0.1	0.568
1,2,3,7,8-PeCDF	3.86	B J		0.184	5.84	0.03	0.1158
2,3,4,7,8-PeCDF	6.99			0.184	5.84	0.3	2.097
1,2,3,4,7,8-HxCDF	13.7			0.156	5.84	0.1	1.37
1,2,3,6,7,8-HxCDF	10.6			0.156	5.84	0.1	1.06
1,2,3,7,8,9-HxCDF	0.685	J		0.156	5.84	0.1	0.0685
2,3,4,6,7,8-HxCDF	7.31			0.156	5.84	0.1	0.731
1,2,3,4,6,7,8-HpCDF	163			0.242	5.84	0.01	1.63
1,2,3,4,7,8,9-HpCDF	10.8			0.242	5.84	0.01	0.108
OCDF	275	B		0.341	11.7	0.0003	0.0825
TOTAL (TEQ ND=DL)							41.20

*Results from GC Column DB-225 are shown.

Per data validation results from GC Column DB-225 are more useable; results from DB-5 are flagged as "do not report"

J = estimated value; lab qualifier- concentration less than limit of quantification

B = analyte found in sample and the associated blank

SDL = sample detection limit

LOQ = limit of quantification

TEF = toxicity equivalency factor

TEQ = toxic equivalent

TEF based on 2005 World Health Organization reevaluation of human and mammalian toxic equivalency factors for dioxins and dioxin-like compounds.

Table B-3. Combined Sewer System Solids Dioxin/Furan Sampling Results for 2023.

Locator	S071308						
Description	8TH AVE. SO. REGUL						
KC Sample ID	L81697-1						
Sample type	SH IN-LINESED						
Collect Date	6/14/2023						
SGS-Axys Analytical Workgroup	WG88188						
SGS-Axys Analytical Sample ID	L39811-3 (A)						
				Reporting			
	CONC_FOUND	Lab	Validation	Limit	LOQ	TEF	TEQ
COMPOUND	ng/kg dw	Qualiifer	Qualifer	pg/g dw	pg/g dw	Unitless	ng TEQ/kg dw
Dioxin							
2,3,7,8-TCDD	0.104	J		0.0748	0.767	1	0.104
1,2,3,7,8-PeCDD	0.479	J		0.0958	2.4	1	0.479
1,2,3,4,7,8-HxCDD	0.691	J	J	0.053	2.4	0.1	0.0691
1,2,3,6,7,8-HxCDD	2.03	J	J	0.053	2.4	0.1	0.203
1,2,3,7,8,9-HxCDD*	1.27	J		0.0479	2.4	0.1	0.127
1,2,3,4,6,7,8-HpCDD	48.8	B	J	0.0816	2.4	0.01	0.488
OCDD	645	B	J	0.0981	4.79	0.0003	0.1935
Furan							
2,3,7,8-TCDF*	0.269	J		0.0479	0.479	0.1	0.0269
1,2,3,7,8-PeCDF	0.17	B J	U	0.0942	2.4	0.03	0.0051
2,3,4,7,8-PeCDF	0.242	J		0.0942	2.4	0.3	0.0726
1,2,3,4,7,8-HxCDF	0.574	J		0.0677	2.4	0.1	0.0574
1,2,3,6,7,8-HxCDF	0.486	J		0.0677	2.4	0.1	0.0486
1,2,3,7,8,9-HxCDF		U		0.0677	2.4	0.1	0.00677
2,3,4,6,7,8-HxCDF	0.357	J		0.0677	2.4	0.1	0.0357
1,2,3,4,6,7,8-HpCDF	9.31			0.0721	2.4	0.01	0.0931
1,2,3,4,7,8,9-HpCDF	0.691	J		0.0721	2.4	0.01	0.00691
OCDF	26.9	B	J	0.105	4.79	0.0003	0.00807
TOTAL (TEQ ND=DL)							2.02

*Results from GC Column DB-225 are shown.

Per data validation results from GC Column DB-225 are more useable; results from DB-5 are flagged as "do not report"

J = estimated value; lab qualifier- concentration less than limit of quantification

U = less than reporting limit

B = analyte found in sample and the associated blank

SDL = sample detection limit

LOQ = limit of quantification

TEF = toxicity equivalency factor

TEQ = toxic equivalent

TEF based on 2005 World Health Organization reevaluation of human and mammalian toxic equivalency factors for dioxins and dioxin-like compounds.

Appendix C: SWS Source Tracing Storm Drain Solids Dataset

Table C-1. King County LDW Separated Stormdrain Source Tracing Sample Locators and Associated Coordinates and Sample Types for 2023

Locator	Sample Type	FeatureType	X	Y	Description
96-ST1	Sediment Trap	Sump	1275076	192295.6	Traps in 8-ft-deep, type 2 catch basin with slotted lid, just east of the lawn of the Delta Marine admin building and just north of S 96th St.
96-ST2	Sediment Trap	Sump	1274675	192705	Traps in 14-foot-deep, type 2 CB with vaned, slotted lid near NE corner of 15th S. and S. 95th. Down-pipe drain system from 96-ST3.
96-ST3	Sediment Trap	Pond/Vault	1270741	192246.7	Traps on south wall of 13-ft deep stormwater vault at corner of 4th Ave S and S 96th St. Up-pipe drain system from 96-ST2.

X/Y Coordinates are in NAD1983 WA State Plane North.

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Table C-2. Stormwater System Solids Sampling Results for 2023.

Project: 421195-590 Locator: 96-ST1 Descr: SUMP 2219. THIS IS Sample: L81800-1 Matrix: SE FRSHWTRSED ColDate: 6/13/23 11:50 TotalSolid: 39.2 DRY Weight Basis						Project: 421195-590 Locator: 96-ST2 Descr: SUMP 2228. THIS IS Sample: L81800-2 Matrix: SE FRSHWTRSED ColDate: 6/13/23 11:15 TotalSolid: 51.9 DRY Weight Basis						Project: 421195-590 Locator: 96-ST3 Descr: POND/VAULT 144. TH Sample: L81800-3 Matrix: SE FRSHWTRSED ColDate: 6/13/23 10:30 TotalSolid: 56.7 DRY Weight Basis					
Parameters	Value	Qual	MDL	RDL	Units	Value	Qual	MDL	RDL	Units	Value	Qual	MDL	RDL	Units		
CV ASTM D422																	
Clay*	10	TA	1.2	2.5	%	8.5	TA	1.1	2.1	%	0.8	<RDL,TA	0.8	1.7	%		
Fines*	31.1	TA	1.2	2.5	%	30.7	TA	1.1	2.1	%	22.4	TA	0.8	1.7	%		
Gravel*	7.5	TA	0.2	2.5	%	5.3	TA	0.2	2.1	%	0.7	<RDL,TA	0.2	1.7	%		
p+0.00*	6.1	TA	0.2	2.5	%	4.7	TA	0.2	2.1	%	1	<RDL,TA	0.2	1.7	%		
p+1.00*	13.5	TA	0.2	2.5	%	5.9	TA	0.2	2.1	%	4.6	TA	0.2	1.7	%		
p+10.0(equal/more than)*	6.2	TA	1.2	2.5	%	5.3	TA	1.1	2.1	%		<MDL,TA	0.8	1.7	%		
p+2.00*	23.9	TA	0.2	2.5	%	15.7	TA	0.2	2.1	%	24.9	TA	0.2	1.7	%		
p+3.00*	4.3	TA	0.2	2.5	%	21.3	TA	0.2	2.1	%	25.1	TA	0.2	1.7	%		
p+4.00*	3.9	TA	0.2	2.5	%	12	TA	0.2	2.1	%	14.5	TA	0.2	1.7	%		
p+5.00*	11.2	TA	1.2	2.5	%	14.8	TA	1.1	2.1	%	18.3	TA	0.8	1.7	%		
p+6.00*	2.5	RDL,TA	1.2	2.5	%	3.2	TA	1.1	2.1	%	1.7	RDL,TA	0.8	1.7	%		
p+7.00*	3.7	TA	1.2	2.5	%	2.1	RDL,TA	1.1	2.1	%	0.8	<RDL,TA	0.8	1.7	%		
p+8.00*	3.7	TA	1.2	2.5	%	2.1	RDL,TA	1.1	2.1	%	0.8	<RDL,TA	0.8	1.7	%		
p+9.00*	3.7	TA	1.2	2.5	%	3.2	TA	1.1	2.1	%	0.8	<RDL,TA	0.8	1.7	%		
p-1.00*	3.9	TA	0.2	2.5	%	2.3	TA	0.2	2.1	%	0.4	<RDL,TA	0.2	1.7	%		
p-2.00(less than)*	2.8	TA	0.2	2.5	%	2.6	TA	0.2	2.1	%	0.3	<RDL,TA	0.2	1.7	%		
p-2.00*	0.8	<RDL,TA	0.2	2.5	%	0.3	<RDL,TA	0.2	2.1	%		<MDL,TA	0.2	1.7	%		
Sand*	51.7	TA	0.2	2.5	%	59.7	TA	0.2	2.1	%	70.1	TA	0.2	1.7	%		
Silt*	21.2	TA	1.2	2.5	%	22.2	TA	1.1	2.1	%	21.6	TA	0.8	1.7	%		
CV SM2540-G																	
Total Solids*	39.2	TA	0.005	0.01	%	51.9		0.005	0.01	%	56.7		0.005	0.01	%		
CV SW846 9060 PSEP96																	
Total Organic Carbon	58400		5230	5230	mg/Kg	49900		6720	6720	mg/Kg	57100		6370	6370	mg/Kg		
MT SW846 3050B(MODSB)*SW846 6020B																	
Arsenic, Total, ICP-MS	47.2		0.0316	0.0316	mg/Kg	14.6		0.0243	0.0243	mg/Kg	7.71		0.0219	0.0219	mg/Kg		
Cadmium, Total, ICP-MS	0.972		0.0316	0.0316	mg/Kg	0.933		0.0243	0.0243	mg/Kg	0.293		0.0219	0.0219	mg/Kg		
Chromium, Total, ICP-MS	28.6		0.126	0.126	mg/Kg	82.5		0.0971	0.0971	mg/Kg	28.6		0.0877	0.0877	mg/Kg		
Copper, Total, ICP-MS	58.2		0.126	0.126	mg/Kg	56.6		0.0971	0.0971	mg/Kg	27.9		0.0877	0.0877	mg/Kg		
Lead, Total, ICP-MS	52.3		0.063	0.063	mg/Kg	71.9		0.243	0.243	mg/Kg	26.1		0.0439	0.0439	mg/Kg		
Nickel, Total, ICP-MS	49.2		0.063	0.063	mg/Kg	44.7		0.0486	0.0486	mg/Kg	36		0.0439	0.0439	mg/Kg		
Silver, Total, ICP-MS	0.134		0.0252	0.0252	mg/Kg	0.107		0.0195	0.0195	mg/Kg	0.0776		0.0175	0.0175	mg/Kg		
Vanadium, Total, ICP-MS	50.5		0.0472	0.0472	mg/Kg	40.8		0.0364	0.0364	mg/Kg	37.2		0.0328	0.0328	mg/Kg		
Zinc, Total, ICP-MS	724		1.58	1.58	mg/Kg	908		1.21	1.21	mg/Kg	533		1.1	1.1	mg/Kg		
OR SW846 3550C*SW846 8270E SIM																	
2,4-Dimethylphenol		<QL	42.6	84.9	ug/Kg		<QL	32.2	64.2	ug/Kg		<QL	29.5	58.7	ug/Kg		
Benzoic Acid		<QL	1700	2130	ug/Kg	1310	<QL,J	1290	1610	ug/Kg	1310	<QL,J	1180	1470	ug/Kg		
Benzyl Alcohol	67.3	<QL,J	42.6	84.9	ug/Kg	170	J	32.2	64.2	ug/Kg	87.5	J	29.5	58.7	ug/Kg		
Hexachlorobenzene		<QL	4.26	8.49	ug/Kg		<QL	3.22	6.42	ug/Kg		<QL	2.95	5.87	ug/Kg		
Hexachlorobutadiene		<QL	8.49	21.3	ug/Kg		<QL	6.42	16.1	ug/Kg		<QL	5.87	14.7	ug/Kg		
N-Nitrosodiphenylamine		<QL	21.3	42.6	ug/Kg		<QL	16.1	32.2	ug/Kg		<QL	14.7	29.5	ug/Kg		
OR SW846 3550C*SW846 8270E																	
1,2,4-Trichlorobenzene		<QL	21.3	42.6	ug/Kg		<QL	16.1	32.2	ug/Kg		<QL	14.7	29.5	ug/Kg		
1,2-Dichlorobenzene		<QL	21.3	42.6	ug/Kg		<QL	16.1	32.2	ug/Kg		<QL	14.7	29.5	ug/Kg		
1,4-Dichlorobenzene		<QL	21.3	42.6	ug/Kg		<QL	16.1	32.2	ug/Kg		<QL	14.7	29.5	ug/Kg		
1-Methylnaphthalene		<QL	21.3	42.6	ug/Kg	24.9	<QL,J	16.1	32.2	ug/Kg		<QL	14.7	29.5	ug/Kg		
2-Methylnaphthalene		<QL	42.6	84.9	ug/Kg		<QL	32.2	64.2	ug/Kg		<QL	29.5	58.7	ug/Kg		
2-Methylphenol		<QL	84.9	213	ug/Kg		<QL	64.2	161	ug/Kg		<QL	58.7	147	ug/Kg		

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Table C-2. Stormwater System Solids Sampling Results for 2023.

Project: 421195-590 Locator: 96-ST1 Descrip: SUMP 2219. THIS IS Sample: L81800-1 Matrix: SE FRSHWTRSED ColDate: 6/13/23 11:50 TotalSolid: 39.2 DRY Weight Basis						Project: 421195-590 Locator: 96-ST2 Descrip: SUMP 2228. THIS IS Sample: L81800-2 Matrix: SE FRSHWTRSED ColDate: 6/13/23 11:15 TotalSolid: 51.9 DRY Weight Basis						Project: 421195-590 Locator: 96-ST3 Descrip: POND/VAULT 144. TH Sample: L81800-3 Matrix: SE FRSHWTRSED ColDate: 6/13/23 10:30 TotalSolid: 56.7 DRY Weight Basis					
Parameters	Value	Qual	MDL	RDL	Units	Value	Qual	MDL	RDL	Units	Value	Qual	MDL	RDL	Units		
3-,4-Methylphenol		<QL	84.9	213	ug/Kg	87.5	<QL,J	64.2	161	ug/Kg	64	<QL,J	58.7	147	ug/Kg		
Acenaphthene	41.8	<QL,J	21.3	42.6	ug/Kg	32.4	J	16.1	32.2	ug/Kg		<QL	14.7	29.5	ug/Kg		
Acenaphthylene		<QL	21.3	42.6	ug/Kg		<QL	16.1	32.2	ug/Kg		<QL	14.7	29.5	ug/Kg		
Anthracene	200	J	42.6	84.9	ug/Kg	118	J	32.2	64.2	ug/Kg		<QL	29.5	58.7	ug/Kg		
Benzo(a)anthracene	679	J	42.6	84.9	ug/Kg	457	J	32.2	64.2	ug/Kg		<QL	58.7	58.7	ug/Kg		
Benzo(a)pyrene	579	J	21.3	42.6	ug/Kg	445	J	16.1	32.2	ug/Kg	42.7	J	14.7	29.5	ug/Kg		
Benzo(b,j,k)fluoranthene	1170	J	63.8	128	ug/Kg	971	J	48.2	96.3	ug/Kg	107	J	44.1	88.2	ug/Kg		
Benzo(g,h,i)perylene	298	J	21.3	42.6	ug/Kg	245	J	16.1	32.2	ug/Kg	38.1	J	14.7	29.5	ug/Kg		
Benzyl Butyl Phthalate	109		84.9	84.9	ug/Kg	252		64.2	64.2	ug/Kg	189		58.7	58.7	ug/Kg		
Bis(2-Ethylhexyl)Phthalate	2330		213	213	ug/Kg	2020	J	161	161	ug/Kg	862		147	147	ug/Kg		
Carbazole	148	J	42.6	84.9	ug/Kg	89.6	J	32.2	64.2	ug/Kg		<QL	29.5	58.7	ug/Kg		
Chrysene	801	J	21.3	42.6	ug/Kg	592	J	16.1	32.2	ug/Kg	71.8	J	14.7	29.5	ug/Kg		
Dibenzo(a,h)anthracene	114	JG,J	42.6	84.9	ug/Kg	87.7	J,JG	32.2	64.2	ug/Kg		<QL,JG	29.5	58.7	ug/Kg		
Dibenzofuran		<QL	21.3	42.6	ug/Kg	20.8	<QL,J	16.1	32.2	ug/Kg		<QL	14.7	29.5	ug/Kg		
Diethyl Phthalate		<QL	84.9	213	ug/Kg		<QL	64.2	161	ug/Kg		<QL	58.7	147	ug/Kg		
Dimethyl Phthalate	615	JG	42.6	84.9	ug/Kg	53.6	<QL,J,JG	32.2	64.2	ug/Kg		<QL,JG	29.5	58.7	ug/Kg		
Di-N-Butyl Phthalate		<QL	128	128	ug/Kg		<QL	96.3	96.3	ug/Kg		<QL	88.2	88.2	ug/Kg		
Di-N-Octyl Phthalate		<QL	213	213	ug/Kg		<QL	161	161	ug/Kg		<QL	147	147	ug/Kg		
Fluoranthene	1630	J	21.3	42.6	ug/Kg	1180	J	16.1	32.2	ug/Kg	108	J	14.7	29.5	ug/Kg		
Fluorene	63.8	<QL,J	42.6	84.9	ug/Kg	51.1	<QL,J	32.2	64.2	ug/Kg		<QL	29.5	58.7	ug/Kg		
Indeno(1,2,3-Cd)Pyrene	403	J	21.3	42.6	ug/Kg	337	J	16.1	32.2	ug/Kg	46.6	J	14.7	29.5	ug/Kg		
Naphthalene		<QL	42.6	84.9	ug/Kg		<QL	32.2	64.2	ug/Kg		<QL	29.5	58.7	ug/Kg		
Pentachlorophenol		<QL,JG	84.9	213	ug/Kg	91.9	<QL,J,JG	64.2	161	ug/Kg		<QL,JG	58.7	147	ug/Kg		
Phenanthrene	898	J	42.6	84.9	ug/Kg	618	J	32.2	64.2	ug/Kg	52.2	<QL,J	29.5	58.7	ug/Kg		
Phenol		<QL	84.9	213	ug/Kg		<QL	161	161	ug/Kg		<QL	58.7	147	ug/Kg		
Pyrene	1490	J	21.3	42.6	ug/Kg	1000	J	16.1	32.2	ug/Kg	103	J	14.7	29.5	ug/Kg		
Total HPAHs (calc)		J			ug/Kg		J			ug/Kg		J			ug/Kg		
Total LPAHs (calc)		J			ug/Kg		J			ug/Kg		J			ug/Kg		

* Not converted to dry weight basis

MDL - method detection limit

RDL - reporting detectin limit

QL - quantitation limit

J - estimated value

JG - estimated value; probable low bias

TA - narrative info available

Shaded value > LAET/SQS

Shaded/underlined value > 2LAET/CSL

Total LPAHs were calculated as the sum of detected acenaphthene, acenaphthylene, anthracene, fluorene, naphthalene, and phenanthrene

Total HPAHs were calculated as the sum of detected benzo(a)anthracene, benzo(a)pyrene, benzo(g,h,i)perylene, total benzofluoranthenes, chrysene, dibenzo(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene, and pyrene

SQS/LAET and CSL/2LAET are source tracing benchmarks (See Appendix B of King County 2019)

Appendix D: KCIA Source Tracing Storm Drain Solids Dataset

Table D-1. Slip 4 Drainage Basin Stormdrain Solids Sample Results for 2023.

Location	SQS LAET	CSL 2LAET	SL4-T5C Grab		SL4-T4B Grab		SL4-T3A Trap		SL4-T3A Grab		SL4-T2A Trap		SL4-T2A Grab	
Sampled By			KCIA		KCIA		KCIA		KCIA		KCIA		KCIA	
Date			12/19/2023		12/19/2023		12/19/2023		12/19/2023		12/19/2023		12/19/2023	
Description			North Lateral		N. Central Lateral		S. Central Lateral		S. Central Lateral		South Lateral		South Lateral	
			Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual
METALS (mg/kg dw)														
Arsenic (total)	57	93	4.1		21.8		NS		5.6		NS		79.9	
Copper	390	390	15.1		84.1		NS		17.9		NS		268	
Lead	450	530	31.1		55.5		NS		14.6	J	NS		314	
Mercury	0.41	0.59	0.03	J	NA		NS		NA		NS		0.216	J
Zinc	410	960	75.2		2,180		NS		48.5		NS		1,250	
PCB (ug/kg)														
pcb - Aroclor 1016	---	---	26.4	U	25.3	U	NS		28.9	U	NS		30.40	U
pcb - Aroclor 1221	---	---	26.4	U	25.3	U	NS		28.9	U	NS		30.40	U
pcb - Aroclor 1232	---	---	26.4	U	25.3	U	NS		28.9	U	NS		30.40	U
pcb - Aroclor 1242	---	---	26.4	U	25.3	U	NS		28.9	U	NS		30.40	U
pcb - Aroclor 1248	---	---	26.4	U	25.3	U	NS		28.9	U	NS		30.40	U
pcb - Aroclor 1254	---	---	26.4	U	25.3	U	NS		28.9	U	NS		30.40	U
pcb - Aroclor 1260	---	---	26.4	U	25.3	U	NS		28.9	U	NS		74.2	
Total PCB	130	1,000	26.4	U	26.3	U	NS		28.9	U	NS		74.2	
LPAH (ug/kg)														
acenaphthene	500	500	40.1		10.3	J	NS		44.6	U	106		24.5	J
acenaphthylene	1,300	1,300	23.2	J	39.2	U	NS		44.6	U	46.0		46.0	U
anthracene	960	960	253		45.9		NS		44.6	U	260		109	
fluorene	540	540	67.7		83.9	J	NS		13.5	J	114.0		46.1	
methylnaphthalene, 2-	670	670	39.1	U	39.2	U	NS		40.4	U	47.8		46.0	U
naphthalene	2,100	2,100	26.7	J	52.2	U	NS		44.6	U	44.7		61.4	U
phenanthrene	1,500	1,500	1,620		298		NS		335		3,240		833	
Total LPAH ¹	5,200	5,200	2,031	J	438	J	NS		349	J	3859		1013	J
HPAH (ug/kg)														
benzo[a]anthracene	1,300	1,600	1,620		172		NS		287	J	2,140		670	
benzo[a]pyrene	1,600	1,600	2,330		262		NS		441	J	2,940		985	
Total Benzo[fluoranthenes	3,200	3,600	607		637		NS		636	J	9,750		2,490	
benzo(g,h,i)perylene	670	720	187		187		NS		306		683		207	
chrysene	1,400	2,800	2,670		299		NS		518	J	4,330		1,120	
dibenz[a,h]anthracene	230	230	706		94.5	J	NS		145	J	890		296	
fluoranthene	1,700	2,500	4,480		559		NS		945	J	9,020		1,960	
indeno[1,2,3-cd]pyrene	600	690	1,850		224	J	NS		368		2,250		757	
pyrene	2,600	3,300	3,520		458		NS		705	J	6,650		1,580	
Total HPAH ²	12,000	17,000	17,970		2,893				4,351	J	38,653		10,065	
PHTHALATES (ug/kg)														
bis(2-ethylhexyl) phthalate	1,300	1,900	109		202		NS		120		3,410		473	
butyl benzyl phthalate	63	900	23.0	J	65.3	U	NS		74.4	U	477		76.7	U
diethyl phthalate	200	1,200	97.8	U	979	U	NS		1120	U	26.0	J	118	
dimethyl phthalate	71	160	4,560	U	4,570	U	NS		5210	U	3,630	U	3,860	U
di-butyl phthalate (di-n-butyl phth.)	1,400	1,400	39.1	U	24.6	J	NS		44.6	U	33.0	U	88.5	

Table D-1. Slip 4 Drainage Basin Stormdrain Solids Sample Results for 2023.

Location	SQS LAET	CSL 2LAET	SL4-T5C Grab		SL4-T4B Grab		SL4-T3A Trap		SL4-T3A Grab		SL4-T2A Trap		SL4-T2A Grab	
Sampled By			KCIA		KCIA		KCIA		KCIA		KCIA		KCIA	
Date			12/19/2023		12/19/2023		12/19/2023		12/19/2023		12/19/2023		12/19/2023	
Description			North Lateral		N. Central Lateral		S. Central Lateral		S. Central Lateral		South Lateral		South Lateral	
			Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual
di-n-octyl phthalate	6,200	6,200	97.8	U	315		NS		112	U	165		115	U
TPH (mg/kg dw)														
Diesel (MTCA A)	2,000	2,000	49.8	U	49.2	U	NS		49.7	U	NS		28.8	J
Heavy Oil (Motor Oil MTCA A)	2,000	2,000	281		107		NS		137		NS		473	
Conventionals (%)														
Solids, Total	---	---	70.3	J	73.8	J	NS		66.9	J	NS		65.1	J
Total Organic Carbon	---	---	0.415		0.791		NS		0.864		NS		2.28	
Gravel, >2000 micron	---	---	0.3		NS		NS		1.1		NS		55.0	
Very Coarse Sand, 850-2000 micron	---	---	0.8		NS		NS		1.8		NS		17.2	
Coarse Sand, 425-850 micron	---	---	18.3		NS		NS		15.1		NS		14.7	
Medium Sand, 250-425 micron	---	---	50.7		NS		NS		30.7		NS		7.1	
Fine Sand, 106-250 micron	---	---	27.5		NS		NS		36.1		NS		3.4	
Very Fine Sand, 75-106 micron	---	---	1.7		NS		NS		10.1		NS		1.1	
Coarse Silt, 45-75 micron	---	---	0.2		NS		NS		1.6		NS		0.3	
Medium Silt, 34-45 micron	---	---	0.2		NS		NS		1.8		NS		0.5	
Fine Silt to clay, < 34 micron	---	---	0.3		NS		NS		1.7		NS		0.6	
Total Fines			0.7		NS		NS		5.1		NS		1.5	

Small sample mass or low total solids results in elevated detection limits when covert to dry weight value
There were no solids to collect at trap or grab sample at SL4-T2A.

Indicates > than the SQS/LAET

Indicates > than the CSL/2LAET

- NA = Not Analyzed
NS = No Sample
U - Not detected
J - Estimated value

Chemistry results are in dry weight
1. Total LPAHs were calculated as the sum of detected acenaphthene, acenaphthylene, anthracene, fluorene, naphthalene, and phenanthrene
2. Total HPAHs were calculated as the sum of detected benzo(a)anthracene, benzo(a)pyrene, benzo(g,h,i)perylene, total benzofluoranthenes, chrysene, dibenzo(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene, and pyrene

SQS/LAET - Sediment Quality Standards/Lowest Apparent Effects Threshold
CSL/2LAET - Cleanup Screening Level/Second Lowest Apparent Effects Threshold
SQS/LAET and CSL/2LAET are source tracing benchmarks (See Appendix B of Kiing County 2019)

Table D-2. Former Slip 5 Drainage Basin Stormdrain Solids Sample Results for 2023

Location	SQS LAET	CSL 2LAET	KCIA2 Trap		KCIA2 Grab		SPS Grab	
Sampled By			KCIA		KCIA		KCIA	
Date			12/19/2023		12/19/2023		12/19/2023	
			Results	Qual	Results	Qual	Results	Qual
METALS (mg/kg)								
Arsenic (total)	57	93	9.38		2.46		5.23	
Copper	390	390	19.8		37.3		22.0	
Lead	450	530	17.1		5.50		13.6	
Mercury	0.41	0.59	0.02	J	0.03	J	0.08	J
Zinc	410	960	119		89.1		120	
PCB (ug/kg)								
pcb - Aroclor 1016	---	---	19	U	22	U	24	U
pcb - Aroclor 1221	---	---	19	U	22	U	24	U
pcb - Aroclor 1232	---	---	19	U	22	U	24	U
pcb - Aroclor 1242	---	---	19	U	22	U	24	U
pcb - Aroclor 1248	---	---	19	U	22	U	24	U
pcb - Aroclor 1254	---	---	19	U	22	U	24	U
pcb - Aroclor 1260	---	---	19	U	22	U	24	U
Total PCB	130	1000	19	U	22	U	24	U
LPAH (ug/kg)								
acenaphthene	500	500	31.1	U	10.1	J	34.5	U
acenaphthylene	1300	1300	31.1	U	33.3	U	34.5	U
anthracene	960	960	21.0	J	79.3		34.5	U
fluorene	540	540	9.9		20.7	J	34.5	U
methylnaphthalene, 2-	670	670	31.1	U	33.3	U	34.5	U
naphthalene	2100	2100	41.5	U	44.5	U	46.0	U
phenanthrene	1500	1500	174		55.6		89.2	
Total LPAH¹	5200	5200	204.9		165.7		89.2	
HPAH (ug/kg)								
benzo[a]anthracene	1300	1600	132		464		137	
benzo[a]pyrene	1600	1600	20		58		194	
Total Benzofluoranthenes	3200	3600	658		2088		820	
benzo(g,h,i)perylene	670	720	207		411		168	
chrysene	1400	2800	544		219		221	
dibenz[a,h]anthracene	230	230	81	J	176		74	J
fluoranthene	1700	2500	414		1290		359	
indeno[1,2,3-cd]pyrene	600	690	197	J	421		163	J
pyrene	2600	3300	324		983		287	
Total HPAH²	12000	17000	2577		6110		2423	

Table D-2. Former Slip 5 Drainage Basin Stormdrain Solids Sample Results for 2023

Location	SQS LAET	CSL 2LAET	KCIA2 Trap		KCIA2 Grab		SPS Grab	
Sampled By			KCIA		KCIA		KCIA	
Date			12/19/2023		12/19/2023		12/19/2023	
			Results	Qual	Results	Qual	Results	Qual
PHTHALATES (ug/kg)								
bis(2-ethylhexyl) phthalate	1300	1900	207	U	222	U	230	U
butyl benzyl phthalate	63	900	18	J	56	U	58	U
diethyl phthalate	200	1200	777	U	834	U	81	
dimethyl phthalate	71	160	3630	U	3890	U	4030	U
di-butyl phthalate (di-n-butyl phth.)	1400	1400	13	J	33	U	15	J
di-n-octyl phthalate	6200	6200	47	J	83	U	86	U
TPH (mg/kg)								
Diesel (MTCA A)	2000	2000	50	U	49	U	26	J
Heavy Oil (Motor Oil MTCA A)	2000	2000	100	U	306		484	
Conventionals (%)								
Solids, Total			25.8	J	84.6	J	84.4	J
Total Organic Carbon			0.95		0.14	J	0.40	
Gravel, >2000 micron			1.6		74.8		53.7	
Very Coarse Sand, 850-2000 micron			2.8		6.2		6.9	
Coarse Sand, 425-850 micron			15.6		12.7		18.5	
Medium Sand, 250-425 micron			27.2		5.1		12.9	
Fine Sand, 106-250 micron			36.5		1.1		5.8	
Very Fine Sand, 75-106 micron			9.9		0.1		1.5	
Coarse Silt, 45-75 micron			2.1		0.0		0.3	
Medium Silt, 34-45 micron			2.5		0.0		0.2	
Fine Silt to clay, < 34 micron			1.9		0.0		0.2	
Total Fines			6.5		0.1		0.7	

Indicates > than the SQS/LAET

Indicates > than the CSL/2LAET

NA = Not Analyzed Chemistry results are in dry weight

U = not detected

J = Estimated Value

T = value between method detection limit and reporting limit

1. Total LPAHs were calculated as the sum of detected 2-methylnaphthalene, acenaphthene, acenaphthylene, anthracene, fluorene, naphthalene, and phenanthrene

2. Total HPAHs were calculated as the sum of detected benzo(a)anthracene, benzo(a)pyrene, benzo(g,h,i)perylene, total benzofluoranthenes, chrysene, dibenzo(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene, and pyrene

SQS/LAET - Sediment Quality Standards/Lowest Apparent Effects Threshold

CSL/2LAET - Cleanup Screening Level/Second Lowest Apparent Effects Threshold

SQS/LAET and CSL/2LAET are source tracing screening benchmarks (See Appendix B of King County 2019)

Table D-3. Slip 6 Drainage Basin Stormdrain Solids Sample Results for 2023.

Location	SQS LAET	CSL 2LAET	KCIA1A Trap		KCIA1A Grab		KCIA1UP Grab	
Sampled By			KCIA		KCIA		KCIA	
Date			12/19/2023		12/19/2023		12/19/2023	
			Results	Qual	Results	Qual	Results	Qual
METALS (mg/kg)								
Arsenic (total)	57	93	NS		23.1		49.9	
Copper	390	390	NS		78.9		75.8	
Lead	450	530	NS		74.1		101	
Mercury	0.41	0.59	NS		0.13	J	0.03	J
Zinc	410	960	NS		651		339	
PCB (ug/kg)								
pcb - Aroclor 1016	---	---	NS		36.1	U	25.2	U
pcb - Aroclor 1221	---	---	NS		36.1	U	25.2	U
pcb - Aroclor 1232	---	---	NS		36.1	U	25.2	U
pcb - Aroclor 1242	---	---	NS		36.1	U	25.2	U
pcb - Aroclor 1248	---	---	NS		36.1	U	25.2	U
pcb - Aroclor 1254	---	---	NS		36.1	U	25.2	U
pcb - Aroclor 1260	---	---	NS		36.1	U	10.2	J
Total PCB	130	1,000			36.1	U	10.2	J
LPAH (ug/kg)								
acenaphthene	500	500	NS		95.3		37.4	U
acenaphthylene	1,300	1,300	NS		28.0	J	37.4	U
anthracene	960	960	NS		279		55.5	
fluorene	540	540	NS		130		10.6	J
methylnaphthalene, 2-	670	670	NS		56.5	U	37.4	U
naphthalene	2,100	2,100	NS		75.3	U	49.8	U
phenanthrene	1,500	1,500	NS		2,390		389	
Total LPAH ¹	5,200	5,200			2,922	J	455	J
HPAH (ug/kg)								
benzo[a]anthracene	1,300	1,600	NS		1,840		286	
benzo[a]pyrene	1,600	1,600	NS		2,760		362	
Total Benzofluoranthenes	3,200	3,600	NS		11,530		821	
benzo(g,h,i)perylene	670	720	NS		2,150		214	
chrysene	1,400	2,800	NS		3,010		452	
dibenz[a,h]anthracene	230	230	NS		860		97.8	J
fluoranthene	1,700	2,500	NS		5,690		916	
indeno[1,2,3-cd]pyrene	600	690	NS		2,240		258	
pyrene	2,600	3,300	NS		4,170		686	
Total HPAH ²	12,000	17,000			34,250		4093	J

Table D-3. Slip 6 Drainage Basin Stormdrain Solids Sample Results for 2023.

Location	SQS LAET	CSL 2LAET	KCIA1A Trap		KCIA1A Grab		KCIA1UP Grab	
Sampled By			KCIA		KCIA		KCIA	
Date			12/19/2023		12/19/2023		12/19/2023	
			Results	Qual	Results	Qual	Results	Qual
PHTHALATES (ug/kg)								
bis(2-ethylhexyl) phthalate	1,300	1,900	NS		623		44.1	J
butyl benzyl phthalate	63	900	NS		61.2	J	62.3	U
diethyl phthalate	200	1,200	NS		1410	U	934	U
dimethyl phthalate	71	160	NS		6590	U	4360	U
di-butyl phthalate (di-n-butyl phth.)	1,400	1,400	NS		56.5	U	37.4	U
di-n-octyl phthalate	6,200	6,200	NS		140	U	93.4	U
TPH (mg/kg)								
Diesel (MTCA A)	2,000	2,000	NS		49.9	U	48.9	U
Heavy Oil (Motor Oil MTCA A)	2,000	2,000	NS		419	J	127	
Conventionals (%)								
Solids, Total	---	---	NS		2.8		0.7	
Total Organic Carbon	---	---	NS		47.3	J	76.2	J
Gravel, >2000 micron	---	---	NS		56.2		49.2	
Very Coarse Sand, 850-2000 micron	---	---	NS		12.7		13.2	
Coarse Sand, 425-850 micron	---	---	NS		13.7		18.1	
Medium Sand, 250-425 micron	---	---	NS		7.3		12.3	
Fine Sand, 106-250 micron	---	---	NS		5.4		4.3	
Very Fine Sand, 75-106 micron	---	---	NS		2.1		1.1	
Coarse Silt, 45-75 micron	---	---	NS		0.4		0.1	
Medium Silt, 34-45 micron	---	---	NS		1.1		0.8	
Fine Silt to clay, < 34 micron	---	---	NS		1.1		1.0	
Total Fines	---	---	NS		2.6		1.9	

There were no solids to collect at trap sample at KCIA1A Trap.

Indicates > than the SQS/LAET

Indicates > than the CSL/2LAET

NA = Not Analyzed

NS = No Sample

U = not detected

Chemistry results are in dry weight

1. Total LPAHs were calculated as the sum of detected acenaphthene, acenaphthylene, anthracene, fluorene, naphthalene, and phenanthrene
2. Total HPAHs were calculated as the sum of detected benzo(a)anthracene, benzo(a)pyrene, benzo(g,h,i)perylene, total benzofluoranthenes, chrysene, dibenzo(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene, and pyrene

SQS/LAET - Sediment Quality Standards/Lowest Apparent Effects Threshold
CSL/2LAET - Cleanup Screening Level/Second Lowest Apparent Effects Threshold
SQS/LAET and CSL/2LAET are source tracing screening benchmarks (See Appendix B of King County 2019)