

APPENDIX 13 – Adaptive Management Requirements

Additional permit requirements in this appendix reflect approved adaptive management response plans in accordance with Special Condition S4.F.3. Affected Permittees shall comply with the specific requirements identified.

Name of Adaptive Management Response Plan	Lower Duwamish Waterway (LDW) Source Control
Reference Document(s)	<p><i>Seattle’s Source Control Plan for the Lower Duwamish Waterway (2015-2020)</i>, City of Seattle 2016. http://www.seattle.gov/util/forbusinesses/drainagesewerbusinesses/pollutioncontrol/lowerduwamishwaterway/</p> <p><i>Lower Duwamish Waterway Source Control Strategy</i>, Publication No. 16-09-339, Ecology 2016.</p> <p><i>Source Tracing in the Lower Duwamish Waterway, Quality Assurance Project Plan</i>, Prepared by Seattle Public Utilities, August 2018.</p>
Receiving Waterbody	Lower Duwamish Waterway in the Duwamish River estuary (from the southern tip of Harbor Island upriver approximately 5 river miles)
Applicable Area	Refer to Table 1 and Table 2 below.
Parameter(s)	<p>Metals: arsenic, copper, lead, mercury, zinc</p> <p>Total polychlorinated biphenyls (PCBs)</p> <p>Semi-volatile organic compounds (SVOCs) including phthalate esters and polycyclic aromatic hydrocarbons (PAHs)</p> <p>Total petroleum hydrocarbons (TPH)</p>
MS4 Permittee	Phase I Permit: City of Seattle

ACTIONS REQUIRED

Source Tracing & Sampling Program: The Permittee shall implement a Source Tracing & Sampling Program to find and eliminate priority contaminant sources to the MS4. The Permittee shall implement the schedules and activities identified in S5.C.7 and S5.C.8 of the Phase I permit in response to identified sources.

The source tracing sampling program shall result in the collection of storm solids, via grab sampling from catch basins or inline pipes and via sediment traps, and associated chemical analyses. When applicable, source tracing sampling shall include resampling following line cleaning. Source tracing sampling shall be performed to fill data gaps in areas as noted in Tables 1 and 2. Where feasible and effective, source tracing shall involve use of a canine trained in the identification of PCB sources.

The source tracing sampling program shall be implemented in accordance with an approved Quality Assurance Project Plan (QAPP). The existing QAPP dated December 2017 and referenced above is the current Ecology-approved QAPP. QAPP amendments, if necessary, must be submitted to Ecology for review and approval.

Effectiveness Monitoring Program: The Permittee shall implement an effectiveness monitoring program to track and evaluate contaminant concentration trends in MS4 discharges and to inform priorities for the implementation of Best Management Practices (BMPs) across the different MS4 drainage basins subject to this adaptive management response.

The effectiveness monitoring program shall result in the operation of routine monitoring locations to measure contaminant concentrations in storm solids at the outfalls (or near-end-of-pipes) subject to this adaptive management response as noted in Tables 1 and 2.

The effectiveness monitoring program shall be implemented in accordance with an approved Quality Assurance Project Plan (QAPP). The existing QAPP dated December 2017 and referenced above is the current Ecology-approved QAPP. QAPP amendments, if necessary, must be submitted to Ecology for review and approval.

At a minimum, the effectiveness monitoring program shall:

- Collect at least one sample per calendar year from each outfall/near-end-of-pipe location as noted in Tables 1 and 2.

- Submit available data to the Environmental Information Management (EIM) database by May 31 of each year.
- Be documented in a QAPP consistent with *Guidelines for Preparing Quality Assurance Project Plans for Environmental Studies*, July 2004, Ecology Publication No. 04-03-030.

Operations & Maintenance:

1. The Permittee shall implement a Line Cleaning Program in the area subject to this adaptive management response. The purpose of the Line Cleaning Program is to remove storm solids that have accumulated in the conveyance system, assess pipe condition, and provide a “clean slate” for source tracing. The Permittee shall prioritize conveyance lines for cleaning on an annual basis based on source tracing data, effectiveness monitoring data, and other considerations. The Permittee shall clean, on average, 4,000 linear feet each calendar year.
2. The Permittee shall continue to implement the following stormwater management operations and maintenance actions in the S. Myrtle Street basin until such time as this basin is identified as no longer a priority in accordance with the Annual Prioritization (described below):
 - a. Weekly sweeping of S. Myrtle Street from 8th westward to street end.
 - b. Quarterly maintenance inspection of S. Myrtle Street catch basins.
 - c. Quarterly maintenance inspections of the S. Myrtle Street mainline maintenance holes.

Structural Controls: The Permittee shall implement the compliance schedule provided below associated with the following approved Integrated Plan projects: South Park Water Quality Stormwater Treatment Facility and Street Sweeping Expansion-Arterials.

A. South Park Water Quality Stormwater Treatment Facility		
1.	Submit a status report documenting progress on capital stormwater infrastructure project planning and implementation designed to achieve stormwater pollutant load reduction targets identified in the Integrated Plan.	Each Annual Report

B. Street Sweeping Expansion-Arterials		
1.	Provide the following details for the MS4 drainage basins subject to this adaptive management response: routes swept, road miles swept, frequency of sweeping, and any problems encountered that would hinder the effectiveness of this BMP in the LDW.	Each Annual Report

Annual Prioritization: In addition to the annual reporting required under S4.F.3.d, the Permittee shall provide an assessment of priorities (planned actions and target locations) for the following year. This annual prioritization update shall affirm previous priorities or identify and justify changed priorities. Analytical results from source tracing sampling and effectiveness monitoring, together with figures showing the locations of the samples, will be presented to inform the annual prioritization of program activities across the area subject to this adaptive management response. This information shall be provided with each annual report except for the annual report due March 31, 2020. Refer to the Source Control Implementation Plan Update requirement, below, for information about the required report due March 31, 2020.

Source Control Implementation Plan Update: No later than March 31, 2020, the Permittee shall submit for Ecology's approval a draft revised Source Control Implementation Plan (SCIP) covering the 2021-2026 time period. The draft revised SCIP must build upon the 2015-2020 SCIP, provide an updated assessment of source tracing and program effectiveness data, and identify planned operations, maintenance and capital projects to address Duwamish source control needs.

Table 1: Seattle-Owned Applicable Outfalls

Storm Drain (SD) Outfall Name	Separated Stormwater Drainage Basin Area (acres)	Outfall Diameter (inches)	Effectiveness Monitoring Location	Sample to Fill Data Gap
<i>East side of waterway</i>				
S Nevada St	23	18		
Diagonal Ave S ^a	2,664	144	Yes	
S River St	6.5	8	Yes	
S Brighton St	17	30	Yes	
S Myrtle St	6.2	30	Yes	
North Boeing Field	c	24		
Georgetown	5.9	24	Yes	
<i>West side of waterway</i>				
SW Dakota St	54 ^d	30	Yes	
SW Idaho St	423	72	Yes	
SW Kenny St ^b	154	48	Yes	
Highland Park Wy SW	289 ^e	72	Yes	
S Webster St	f	6		Yes
7th Ave S	238	72	Yes	
17 th Ave S	2.9	18	Yes	
Duwamish substation SD#1	0.6	8		
Duwamish substation SD#2	1.3	8		
Duwamish substation SD#3	1.9	8		
Herrings House	6.07	30		Yes

Note: outfalls are listed in order from downstream end of waterway to upstream end of waterway starting with outfalls located on the east side followed by those on the west side of the waterway

- a. SPU's CSO #111 and King County's Hanford #1 CSO also discharge to this outfall.
- b. King County's T115 CSO discharges to this outfall (100 acres)
- c. Based on recent video inspection findings, there are no longer active connections to this system.
- d. 44.8 acres drains to the Seattle-owned SW Dakota St SD system. An additional 9 acres drains to the constructed channel that discharges to the LDW downstream (i.e., east) of Seattle's outfall.
- e. Does not include the approximately 7.3 acre overlap within the 1st Ave S drainage basin.
- f. A single catch basin in S Riverside Dr is connected to this outfall.

TABLE 2: APPLICABLE OUTFALLS OWNED OR INSTALLED BY OTHERS TO WHICH SEATTLE MS4 DISCHARGES

Storm Drain (SD) Outfall Location	Owned or Installed by	Separated Stormwater Drainage Basin Area (acres)	Outfall Diameter (inches)	Effectiveness Monitoring Location	Sample to Fill Data Gap
<i>East side of waterway</i>					
Head of Slip 2	Private	12	24	Yes	Yes
S Garden St ^a	Private	12	30	Yes	
I5 SD at Slip 4	WSDOT	150 ^d	72	Yes	
16th Ave S, east	Tukwila	12	12		
KCIA #1	King County	192 ^e	30		Yes
S Norfolk St ^b	Tukwila	676 ^b	84	Yes	
I5 SD at S Ryan St ^c	WSDOT	617 ^c	60		
1st Ave S (east)	WSDOT	15	36	Yes	
<i>West side of waterway</i>					
1st Ave S (west)	WSDOT	603	open channel	Yes	
2nd Ave S	Private	38	24		
S 96th St	Unknown	1,050 ^f	72		
W Marginal Pl SW	Unknown	4.6 ^g	36		

Note: outfalls are listed in order from downstream end of waterway to upstream end of waterway starting with outfalls located on the east side followed by those on the west side of the waterway.

- a. Outfall ownership transferred to Seattle Iron and Metals Company in 2012.
- b. King County's S. Norfolk CSO discharges to this outfall.

- c. Seattle installed a high flow bypass to the S Ryan St system in 1992, to divert excess stormwater flow from the S Norfolk St drainage system to prevent flooding during large storm events.
- d. Approximately 65 acres are served by Seattle-owned storm drains. The remainder is I-5 and railroad right-of-way drainage.
- e. Approximately 86 acres are served by Seattle-owned storm drains. The remainder is I-5 right-of-way and King County Airport property.
- f. Approximately 83 acres are served by Seattle-owned storm drains. The remainder is in unincorporated King County.
- g. Seattle-owned drainage only.