WSDOT NPDES Municipal Stormwater Permit Rest Areas, Maintenance Facilities, and Ferry Terminals Stormwater Monitoring Report (S7.D) Water Years 2012 and 2013

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Prepared by

Stormwater and Watersheds Program

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Stormwater Monitoring Report

Rest Areas, Maintenance Facilities, and Ferry Terminals
Water Years 2012 and 2013

Approved by:

I certify under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for willful violations.

Signature: ______________________________ Date: ______________

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Signatures are not available on the Internet version.

WSDOT = Washington State Department of Transportation

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Contents

List of Tables

List of Figures

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1 Introduction

1.1 Permit Overview

In February 2009, the Washington State Department of Ecology (Ecology) issued a National Pollutant Discharge and Elimination System (NPDES) and State Waste Discharge Permit (permit) (Ecology 2009a) to the Washington State Department of Transportation (WSDOT) (Permit #WAR043000A). Under Special Condition S7 of the permit, WSDOT must collect baseline stormwater monitoring data from its highways, rest areas, ferry terminals, and maintenance facilities. In addition, the department must evaluate the effectiveness of stormwater treatment and hydrologic (flow control) best management practices (BMPs) following guidelines from Ecology's *Guidance for Evaluating Emerging Stormwater Treatment Technologies, Technology Assessment Protocol – Ecology* (TAPE) (Ecology 2008).

Under Special Condition S8.F of the permit, a final water quality report for each monitoring program outlined in Special Condition S7 must be submitted within one month prior to the end of the permit expiration date. The following report helps satisfy this requirement and provides a summary of monitoring activities completed at WSDOT rest areas, maintenance facilities, and ferry terminal through September 30, 2013. This report includes data collected from October 1, 2011, through September 30, 2012 (water year 2012), and October 1, 2012, through September 30, 2013 (water year 2013). A separate status report covers ongoing monitoring activities completed at WSDOT highway and BMP monitoring sites during this same period.

1.2 Monitoring Requirements (S7.D)

WSDOT collected baseline water quality data for stormwater runoff from transportation facilities at the following locations:

- Two high-use rest areas
- One high-use ferry terminal
- Six maintenance facilities, one in each WSDOT region

For each facility, sampling locations were established to capture runoff from most of the site and were located downgradient from major pollutant-generating activities. Composite samples were required from seven storm events; five in the wet season, one in the dry season, and one representing the seasonal first flush.

1.3 Monitoring Schedule

In accordance with Special Condition S7.G.1.c, WSDOT submitted a *Quality Assurance Project Plan (QAPP) for Baseline Stormwater Monitoring of WSDOT Maintenance Facilities, Rest Areas, and Ferry Terminals* (WSDOT 2011a) for approval to Ecology on September 2, 2011. The department received a QAPP approval letter from Ecology on September 16, 2011. The QAPP describes the objectives of the facilities monitoring program and the procedures used to ensure the quality and integrity of collected data. The QAPP also identifies project timelines and schedules.

Under Special Condition S7.G.1.d, the permit required full implementation of the monitoring program no later than September 6, 2011. On October 20, 2011, as required under General Condition G20 in the permit, the department notified Ecology that it would be unable to fully comply with this deadline due primarily to government hiring and equipment purchase freezes in effect through early summer 2011.

In a letter to Ecology on November 29, 2011, the department explained that it would use a phased approach to fully implement the monitoring program. Sampling would begin at three facility monitoring sites on November 30, 2011, with the remainder of the sites fully operational by February 27, 2012. WSDOT successfully met the revised timelines and schedules.

Appendix A provides copies of the G20 notification letters to Ecology.

2 Facility Sampling Sites

2.1 Site Selection

Fifteen maintenance facilities, six ferry terminals, and six rest areas were evaluated as potential monitoring sites. At some facilities, selecting an appropriate sampling location was relatively straightforward. In other cases, sampling locations were identified by minimizing complicating factors. Typically, the first step in identifying suitable sampling locations involved evaluating the site's stormwater drainage areas.

At most facilities, the largest drainage area was the preferred and most appropriate location. However, at some facilities multiple discharge points and the orientation of activities away from a single stormwater discharge point made monitoring from the largest drainage areas not representative of site activities. In these situations, sampling from smaller drainage areas with runoff that was isolated and representative of typical facility activities became the preferred strategy. In other cases, retrofitting existing site infrastructure or installing new structures to direct stormwater runoff occurred to meet the need to monitor representative site activities.

Six maintenance facilities, two rest areas, and one ferry terminal were selected for monitoring. These sites are listed in Table 1 and shown on the following map (Figure 1).

Table 1 Selected maintenance facilities, rest areas, and ferry terminals.

WSDOT Region	Facility Name	Facility Location
Maintenance Facilities		
Northwest	Ballinger	City of Shoreline
Olympic	Lakeview	City of Lakewood
South Central	Clarkston	City of Clarkston
Southwest	Vancouver	City of Vancouver
North Central	Euclid	City of Wenatchee
Eastern	Geiger	City of Spokane
Rest Areas		
Northwest	Smokey Point Northbound	North of Marysville (Snohomish County)
Northwest	Smokey Point Southbound	North of Marysville (Snohomish County)
Ferry Terminal		
Ferries Division	Bainbridge Island Terminal	City of Bainbridge Island

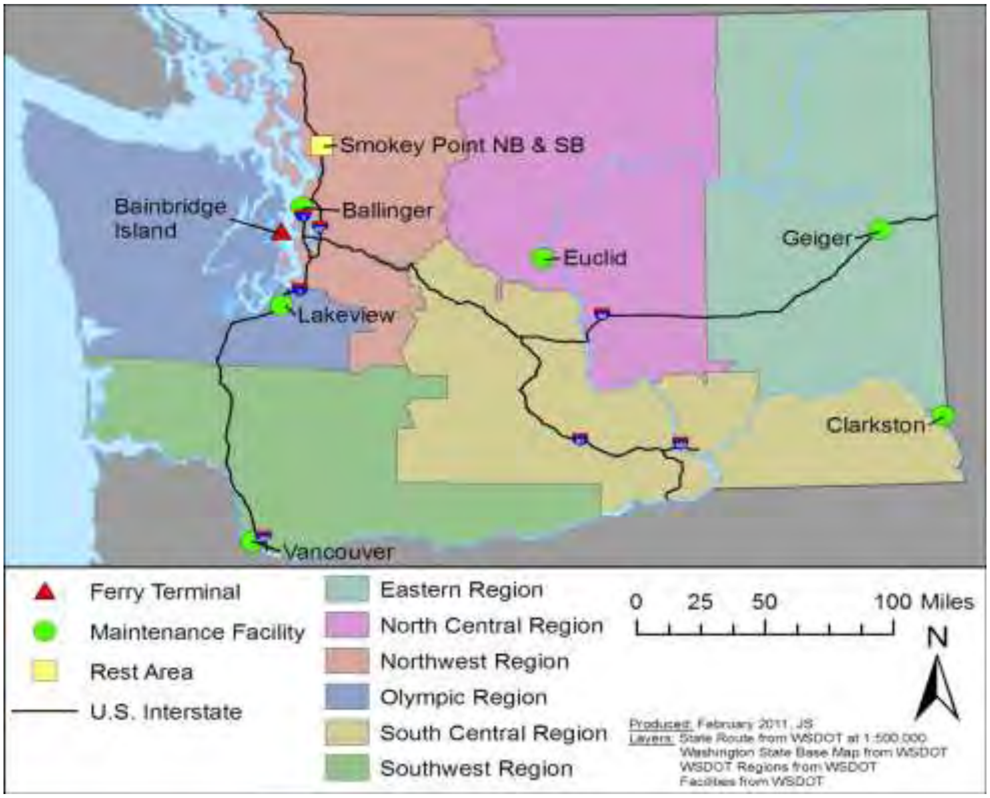

Figure 1

WSDOT regions and facilities selected for monitoring.

2.2 Rest Areas

WSDOT used the following criteria to select rest area monitoring locations:

- Location within the permit coverage area
- High-use as defined by a minimum 81,000 annual average daily traffic (AADT) on the highway that the rest area serves
- Site representativeness
- Site topography
- Hydraulic characteristics
- Adequate drainage area
- Absence of a high groundwater table
- Lack of runoff from off-site locations
- Ease of access for sampling

Although WSDOT rest areas are located across the state, only sites west of the Cascades fall within the permit coverage area and meet AADT criteria. Thus, WSDOT selected the Smokey Point Rest Areas along the northbound and southbound lanes of Interstate 5 (I-5) near Marysville for monitoring.

Sampling site access, large drainage areas, and close proximity to other WSDOT monitoring sites made both Smokey Point Rest Areas good choices for sampling. Potential pollutant-generating activities at the rest areas include vehicle traffic, truck and recreational vehicle (RV) parking, sewage holding tanks, runoff from buildings, and various groundskeeping activities. Potential pollutants from landscaped areas include pet waste, fertilizers, herbicides, and soils that wash off planted and unplanted areas.

2.2.1 Smokey Point Rest Area (Northbound I-5)

The northbound (NB) Smokey Point Rest Area lies east of I-5 near Marysville, approximately one-half mile north of Exit 206. The drainage area selected for monitoring is 4.89 acres in size and includes catch basins that collect stormwater from paved parking and some landscaped areas. Stormwater is then piped to an oil/water separator that drains to a stormwater pond. Sample collection occurred mid-system at the outlet oil/water separator tee, and before stormwater discharged into the pond.[1]

Figure B-1 in Appendix B shows the sampling point and drainage area at the NB Smokey Point Rest Area.

2.2.2 Smokey Point Rest Area (Southbound I-5)

The southbound (SB) Smokey Point Rest Area lies west of I-5 just north of Marysville, approximately one mile south of Exit 208. The drainage area selected for monitoring is approximately 6.70 acres in size and collects stormwater runoff from buildings, vehicle traffic lanes, and vehicle parking areas. Runoff from the drainage area flows through a catch basin system to an oil/water separator that discharges to a small creek. Sample collection occurred at the outlet of the oil/water separator before the stormwater discharged.

Figure B-2 in Appendix B shows the sampling point and drainage area at the SB Smokey Point rest area.

[1] At the rest areas and two maintenance facilities (Lakeview and Euclid), sampling prior to oil/water separators was not possible. At these facilities, Ecology and WSDOT agreed during the QAPP approval process that sampling at the outlet of the oil/water separator was the most practicable and representative location. Oil/water separators are designed to separate oil from water, and will have an effect on TPH monitoring results.

2.3 Maintenance Facilities

For each of the maintenance facilities selected, WSDOT identified the most representative and suitable locations for stormwater monitoring. In most cases, WSDOT chose stormwater sample collection points located prior to stormwater treatment structures, such as on-site bioswales and stormwater detention or retention ponds. Therefore, chemical constituent data should not be characterized as effluent discharges or regulatory outfalls.

Due to climatic variation, stormwater treatment strategies in eastern and western Washington vary. Oil/water separators and detention ponds are typically used for treatment west of the Cascades, whereas evaporation ponds or retention ponds and containment strategies are more common in the east.

Table 2 lists potential pollutant-generating materials and maintenance facility activities occurring within drainage areas of the monitoring sites.

Table 2 Maintenance facility monitoring locations and materials/activities matrix.

Region	Facility	Materials and Activities														
		Galvanized Metals	Treated Lumber	Prewash Pad	Sand Storage	Salt	Deicer Storage	Road Sweepings	Landscaping	Truck Parking	Storage Buildings	Maintenance Buildings	Vehicle Maintenance Shop	Offices	Fuel Station	Herbicide/Fertilizer[2]
Northwest	Ballinger			x[1]	x	x		x	x	x		x	x	x	x	x[1]
Olympic	Lakeview	x	x	x[1]			x		x	x	x	x	x	x	x	x[1]
Southwest	Vancouver								x	x	x	x	x	x	x	x[1]
North Central	Euclid	x				x				x	x	x	x			x[1]
Eastern	Geiger		x	x[1]	x					x	x	x	x	x	x	x[1]
South Central	Clarkston			x			x					x		x	x[1]	

[1] Possible vehicle track-out of contaminants only. It was possible to collect some, but not all, of the runoff from this activity.

[2] Herbicides and fertilizers (those listed in S7.B.4) are stored, used, or in trucks parked within the drainage area of the monitoring station.

2.3.1 Ballinger (Northwest Region)

The Ballinger Maintenance Facility is located in Shoreline, just north of the City of Seattle. Residential areas border the facility to the south and east, with a shopping center located to the west. A four-lane city street runs along the north side of the site.

Ballinger is a small facility with a consolidated stormwater control system that collects stormwater runoff from most of the facility. Runoff then discharges from a central catch basin to ponds that function as a treatment system.

Monitoring occurred mid-system, after flow through the central catch basin and prior to discharge into the detention ponds. Figure B-3 in Appendix B shows the central catch basin and outlines an area approximately 0.79 acre in size that ultimately drains to the stormwater detention ponds.

2.3.2 Lakeview (Olympic Region)

The Lakeview Maintenance Facility is in the City of Lakewood, just south of Tacoma. The facility is bordered by Interstate 5 (I-5) to the east and surrounded by side streets and commercial properties in all other directions. Lakeview is a midsized maintenance facility, with a stormwater system that collects runoff from nearly the entire site.

Monitoring occurred mid-system, at the outlet of a large catch basin with an integrated oil/water separator. This catch basin then discharges to a swale and retention pond. Figure B-4 in Appendix B shows the catch basin and drainage area of approximately 4.01 acres in size.

2.3.3 Vancouver (Southwest Region)

The Vancouver Maintenance Facility in Vancouver, Washington, is a large facility bordered by a residential street to the east and high-density housing in all other directions. Figure B-5 in Appendix B shows the sampling location in a catch basin outlet near the main entrance to the facility. This location collects stormwater runoff from most of the site with a discharge area approximately 5.48 acres in size. Runoff from this facility drains to the City of Vancouver storm sewer system.

2.3.4 Euclid (North Central Region)

The Euclid Maintenance Facility is in the City of Wenatchee. An undeveloped property borders the facility to the west, and the Wenatchee Apple Commission building and its adjoining property borders the site to the east. A city street and a major highway run along the south and north sides of the site, respectively.

WSDOT monitored stormwater from a catch basin draining the northern portion of the facility (Figure B-6 in Appendix B). Mid-system sample collection occurred at the outlet of an oil/water separator before stormwater discharges to a retention pond. A building in the drainage area contains materials storage and offices, as well as a carpenter shop, materials lab, and vehicle maintenance shop. This monitoring location represents most of the typical activities for this facility and has a drainage area of approximately 3.20 acres.

2.3.5 Geiger (Eastern Region)

The Geiger Maintenance Facility is near the Spokane International Airport west of the City of Spokane. Open areas border the site to the east and west, and county roads run along the north and south sides of the facility. Figure B-7 in Appendix B shows the mid-system monitoring location at a catch basin outlet that then discharges stormwater to a retention pond northwest of the fuel station. WSDOT collected stormwater runoff from a discharge area approximately 1.16 acres in size that includes a diesel fueling station and vehicle and materials storage areas.

2.3.6 Clarkston (South Central Region)

The Clarkston Maintenance Facility is near the western edge of the City of Clarkston. The Clarkston Golf and Country Club borders the facility to the west, and residential housing and small commercial properties border the site to the south and east. A major city street runs along the north side of the facility.

WSDOT monitored untreated stormwater from the northeast corner of the facility (Figure B-8 in Appendix B), where the majority of runoff from the facility flows to the edge of an asphalt parking area and collects in a shallow paved depression. The drainage area is approximately 5.48 acres.

2.4 Ferry Terminal

In accordance with the permit, WSDOT collected baseline water quality samples from one high-use ferry terminal. The term “high use” is not defined in the permit. Therefore, the department used ridership values from the 2009 Washington State Ferries Traffic Statistics Rider Segment Reports (WSDOT 2009) to identify a suitable site for sampling consistent with the term “high use.”

The following criteria were used to select the ferry terminal monitoring location:

- Within the permit coverage area
- High use as defined by ridership levels
- Site representativeness
- Site topography
- Hydraulic characteristics
- Adequate drainage area

- Lack of runoff from off-site locations
- Ease of access for sampling
- Adequate space for monitoring equipment
- Equipment security
- Sampling would not interfere with normal ferry terminal operations

WSDOT evaluated six ferry terminals in the permit coverage area to determine their suitability for monitoring. All of the terminals under consideration were similar in function, but had very different orientations and site plans. Most of the terminals were unsuitable for monitoring without extensive site reconfiguration or modification.

Several other attributes common to most WSDOT ferry terminals pose distinct challenges to stormwater monitoring. These include extremely steep or flat topography; parking lots and holding lanes with multiple discharge points; terminal piers built with flow-through drains; and on-site flows from adjacent commercial development, city streets, and residential areas.

2.4.1 Bainbridge Island Ferry Terminal

WSDOT identified the Bainbridge Island Ferry Terminal as the most suitable site for monitoring. The ferry terminal is on Eagle Harbor along the east shoreline of Bainbridge Island. High-occupancy vehicle parking lots border the facility to the north and northeast. Eagle Harbor (part of Puget Sound) borders the site to the south and southeast, with residential development surrounding the terminal to the west and east.

WSDOT sampled stormwater runoff from an asphalt drainage area at the south end of the vehicle holding lanes, just above the ferry terminal pier. The drainage area is approximately 1.77 acres in size and includes a central stormwater conveyance system. The stormwater conveyance system has three catch basins located along the center lanes of the vehicle holding area and a pipe that discharges down a vegetated slope to Puget Sound. WSDOT collected samples from the pipe discharge point. Figure B-9 in Appendix B shows the drainage area and sampling location.

The ferry terminal monitoring site has a moderate slope that collects runoff from outside the usual drainage area during high-intensity rainfall. Stormwater runoff during large storm events can run onto the vehicle holding lanes from the highway and parking lots near the ferry terminal.

3 Sampling and Monitoring Procedures

3.1 Monitoring Stations

Monitoring stations at the rest areas, maintenance facilities, and ferry terminal typically included a concrete pad, equipment enclosure (cabinet) with lock, Global Positioning System (GPS), antenna, solar panel, and rain gage. The antenna, solar panel, and rain gage were attached to a mounting pole installed on the side of the equipment enclosure. Where electric power was available, an alternating current (AC) connection eliminated the need for the solar panel.

The equipment enclosure housed a data logger, refrigerated automatic sampler, sample tubing, an analog module to run a thermistor (temperature sensor) and float switch, and a 12-volt battery. Sample tubing ran from the automatic sampler through protective conduit located outside the enclosure to the designated sampling point. The locked enclosure provided a secure location for equipment as well as protection from the wind, rain, and snowfall.

3.1.1 Precipitation Measurement

At each monitoring station, WSDOT installed a tipping bucket rain gage to accurately capture on-site rainfall measurements. Each rain gage was leveled and installed in a secure location where no trees, buildings, overpasses, or other objects obstructed or diverted precipitation prior to entering the rain gage. WSDOT referenced National Weather Service criteria as guidance for rain gage installation (NWS 2010).

WSDOT collected rain gage data every 15 minutes and stored it in the data logger’s memory. Staff used these data, transmitted via telemetry to a WSDOT database, to track and record site-specific precipitation measurements.

3.1.2 Runoff Verification

A float switch was installed at the sampling point of every monitoring station to indicate the presence of flowing water. Once sufficient rainfall was received, the data logger waited for the float switch to activate before sending a sampling command to the automatic sampler. If the float switch did not activate after 20 minutes, the data logger’s programming ignored the float switch and initiated sampling. The data logger override allowed for sample collection if damage occurred to the float switch.

3.1.3 Temperature Measurement

Water temperature measurements were recorded to fulfill permit requirements and monitor freezing conditions at each of the facility monitoring sites. Sensors were installed at the sampling point of every station to record temperature measurements continuously. These data were recorded by the data logger every 15 minutes and transmitted hourly to WSDOT's hydrologic database. If temperatures approached freezing, the data logger discontinued sample collection.

Storm event tables in Appendix C provide minimum and maximum temperature values recorded during sampling events.

3.2 Weather Tracking

WSDOT monitoring staff used weather information – from satellite imagery, prediction models, the National Oceanic and Atmospheric Administration (NOAA) National Weather Service (NWS), and private forecasters – to forecast potentially qualifying storm events on a daily basis. As candidate storms approached, radar observations and hourly reports from land-based weather stations helped track and evaluate storm potential. Staff used telemetered data transmitted from individual monitoring stations to track the progress of a storm event and the beginning of runoff. The stormwater monitoring team used this information to direct field team deployments for sample collection.

To qualify, storms had to meet minimum rainfall depth and antecedent dry period criteria as defined by the permit. Table 3 lists the storm event criteria for facilities monitoring.

Table 3 Storm event criteria for facilities monitoring.

Criteria	Wet Season	Dry Season
Monitoring Period	Western WA (Oct 1 – Apr 30); Eastern WA (Oct 1 – Jun 30)	Western WA (May 1 – Sep 30); Eastern WA (Jul 1 – Sep 30)
Rainfall Depth	0.20" minimum; no fixed maximum	0.20" minimum; no fixed maximum
Rainfall Duration	No fixed minimum or maximum	No fixed minimum or maximum
Antecedent Dry Period	< 0.02" rain or no surface runoff in the previous 24 hours	< 0.02" rain in the previous 72 hours
Inter-Event Dry Period	6 hours	6 hours
Intensity	Not specified	Not specified

At each of the facility monitoring sites, the permit required sampling at least five qualifying storm events in the wet season (over a minimum 20-day period), one event in the dry season, and one event that represented the seasonal first flush. The permit required a one-week antecedent dry period prior to the seasonal first flush event. The seasonal first flush sampling event could not occur prior to August 1 each year.

The permit required sampling to consist of a minimum of five individual subsamples (aliquots) equally spaced in time and collected within the first hour of runoff at WSDOT rest areas, maintenance facilities, and the ferry terminal (S7.D.3). Since less than 0.20-inch of rainfall was sufficient to generate an hour's worth of flow, the rainfall depth requirement (i.e., 0.20-inch minimum) was less important for facilities monitoring than for other types of stormwater monitoring that require sampling the entire storm.

Ecology approved a subsequent change to the rainfall depth criterion through written communication with WSDOT's permit administrator after permit issuance (Foroozan Labib, Department of Ecology, written communication, March 30, 2012):

> *WSDOT may collect and report data from up to two storm events that were forecast qualifying storms but which did not meet the qualifying storm event criterion for rainfall depth (0.20-inch minimum). These two non-qualifying storm events may be collected and counted as part of the seven required storm events.*

With this change, WSDOT retained stormwater samples from forecast qualifying storms that just missed, but did not meet the 0.20-inch rainfall depth criterion. The change improved WSDOT's ability to meet permit requirements.

3.3 Sampling Parameters

The permit identified a unique suite of sampling parameters for each land use type (i.e., rest areas, maintenance facilities, and the ferry terminal). Table 4 lists the parameters as indicated in order of priority, from top to bottom, if sufficient volume exists.

Table 4 Sampling water quality parameters listed in order of priority.

Rest Areas	Maintenance Facilities	Ferry Terminal
TPH: NWTPH-Dx and NWTPH-Gx[1]	TSS	PAHs
Total recoverable and dissolved metals (copper, zinc, cadmium, and lead)	TPH: NWTPH-Dx and NWTPH-Gx[1]	TPH: NWTPH-Dx and NWTPH-Gx[1]
Polycyclic Aromatic Hydrocarbons (PAHs)	Polycyclic Aromatic Hydrocarbons (PAHs)	Total recoverable and dissolved metals (copper, zinc, cadmium, and lead)
Total suspended solids (TSS)	Herbicides[5]: Triclopyr, 2,4-D, Clopyralid, Diuron, Dichlobenil Picloram, and Glyphosate	Methylene blue active substances (MBAS)
Herbicides[5]: Triclopyr, 2,4-D, Clopyralid, Diuron, Dichlobenil Picloram, and Glyphosate	Nutrients[6]: Total phosphorus, nitrate/nitrite, orthophosphate, and total Kjeldahl nitrogen	Total suspended solids (TSS)
Nutrients[6]: Total phosphorus, nitrate/nitrite, orthophosphate, and total Kjeldahl nitrogen	Total recoverable and dissolved metals (copper, zinc, cadmium, and lead)	Fecal coliform[1]
Chlorides	Methylene blue active substances (MBAS)	Temperature
Phthalates	Chlorides	Hardness[3]
Fecal coliform[1]	Temperature[2]	Chlorides[4]
Temperature	Hardness[3]	
Hardness[3]		

[1] Collected as a grab sample.

[2] Temperature is not a permit-required parameter at maintenance facilities. WSDOT used temperature, measured by in situ probe, as a threshold for triggering autosamplers.

[3] Hardness is not a permit-required parameter. Ecology recommended its inclusion in the list of parameters because of its effect on the bioavailability of metals in solution.

[4] Chlorides, while not a permit-required parameter for ferry terminals, were sampled at the ferry terminal to provide additional information for maintenance.

[5] For only those that WSDOT applies on site, stores on site, or applies by vehicles parked on site.

[6] Where fertilizers are applied on site, stored on site, or applied by vehicles parked on site.

3.4 Grab Samples

The permit required WSDOT to collect grab samples during the first 20 minutes of a qualifying storm event at the selected rest areas, maintenance facilities, and ferry terminal. Grab samples were collected at or close to the collection point for composite samples. If initial attempts to collect grab samples were unsuccessful, Ecology approved grab sample collection during separate qualifying or nonqualifying events (WSDOT 2011a).

WSDOT collected grab samples for total petroleum hydrocarbons (TPH) and fecal coliform bacteria with a pole sampler, bailer, or by hand following methods described in the *Standard Operating Procedures for Collecting Grab Samples from Stormwater Discharges* (Ecology 2009b).

3.5 Composite Sampling

WSDOT used refrigerated autosamplers to collect time-weighted composite samples. WSDOT programmed each station's data logger with a step-triggering system that collected environmental data (e.g., rainfall and water temperature) to determine whether a storm event qualified. The data logger prompted the autosampler to initiate sample collection upon meeting the programmed rainfall threshold (i.e., 0.02-inch of rain). The autosampler collected programmed sample volumes in accordance with permit requirements and analytical needs. The permit described time-weighted sampling as a minimum of five equally spaced stormwater aliquots (individual, discrete sample volumes) within the first hour of runoff.

Each type of stormwater sampling required different bottle combinations depending on sample volume requirements, planned duplicates, field blanks, or storm size. Table 5 lists the minimum targeted volumes for composite sample collection.

Table 5 Minimum targeted volumes for composite sample collection.

Recommendations	Rest Areas	Maintenance Facilities	Ferry Terminals
Minimum volume of sample needed to analyze all parameters except herbicides[1][2]	4.3 liters	3.7 liters	3.2 liters
Minimum volume of sample needed to analyze all parameters including herbicides[1][2]	7.4 liters	6.8 liters	N/A
Maximum additional sample volume needed for quality control (QC) analyses	Dependent on QC samples and parameters of interest up to 7.4 liters	Dependent on QC samples and parameters of interest up to 6.8 liters	Dependent on QC samples and parameters of interest up to 3.2 liters
Recommended compositor bottle size (glass)	9.4 liters	9.4 liters	9.4 or 3.8 liters

[1] Herbicide sampling was only required if herbicides were used, stored, or in trucks parked at the facility. Therefore, some facilities did not require collection of these parameters.

[2] Estimates do not include needed volumes for quality control (QC) samples.

WSDOT used a modified version of the U.S. Environmental Protection Agency's "clean hands/dirty hands" protocol (USEPA 1996) for low-level detection of metals as a guideline for sample collection procedures. Field staff used nitrile gloves and followed standard health and safety procedures during sample collection. Upon collection of the time-weighted composite sample, combined aliquots were split into laboratory sample bottles with proper preservatives and filtration (if applicable). Sample bottles were then placed in coolers with bubble wrap and freezer packs or ice for shipping to analytical laboratories. Chain of custody (COC) forms were completed and shipped with the coolers.

After a sampling event, staff inspected and cleaned the autosampler in preparation for subsequent events. Staff checked the sample collection tubing, and replaced it if necessary. WSDOT followed standard operating procedures (SOPs) during the autosampler inspection and cleaning processes (Ecology 2009c; WSDOT 2011b and 2011c).

3.6 Station Maintenance

WSDOT field staff completed monitoring station maintenance after sampled storm events or at regular six- to eight-week intervals. Monitoring staff performed a visual inspection of the monitoring site to identify possible damage to equipment and any new or unsafe conditions. Staff inspected equipment enclosures for signs of tampering or forced entry. Unusual odors and the presence of water or debris were recorded and addressed through further investigation and site retrofit or rehabilitation, if necessary. Staff also inspected and cleaned outlet pipes, sampling basins, and conveyance systems.

Following the *Standard Operating Procedure for Equipment Maintenance and Cleaning* (WSDOT 2011c), WSDOT field staff conducted station maintenance visits that included equipment inventory, inspections, testing, and replacement of worn or missing parts. Staff inspected internal wires and cables to evaluate wear and ensure cable connections to the data logger were in good operating condition. WSDOT checked station antennae declinations and bearings. Solar panels were cleaned as needed to remove accumulated debris. Monitoring staff followed manufacturers' specifications and conducted servicing and calibration of equipment on site or in a controlled environment, as appropriate. Out-of-specification equipment was returned to the manufacturer for repair.

3.6.1 Equipment Decontamination

Pump tubing used for sample splitting, churners, and sample containers, as well as filters or other materials that contacted sampled stormwater, were decontaminated prior to each use or were certified as precleaned from the equipment source. WSDOT staff or a contract laboratory cleaned intake tubing prior to installation, and changed tubing once a year after the collection of blank samples.

3.7 Monitoring Costs

Implementing a monitoring program to satisfy requirements in Special Condition S7 of the permit was a complex and costly endeavor. WSDOT developed several strategies to reduce costs, conserve resources, and address logistical challenges in implementing the WSDOT monitoring program.

Appendix D provides an overview of the monitoring program implementation plan, and an estimate of labor, equipment, infrastructure, and analytical costs. The discussion includes costs to implement the highway runoff characterization and BMP effectiveness monitoring programs as well as the facilities monitoring program.

4 Quality Assurance and Quality Control

Comprehensive descriptions of quality assurance and control activities can be found in the *Quality Assurance Project Plan for Baseline Stormwater Monitoring of WSDOT Maintenance Facilities, Rest Areas, and Ferry Terminals* (WSDOT 2011a).

During the WY12 and WY13 sampling seasons, quality control (QC) procedures were implemented throughout all phases of work. Quality control procedures encompass field collection and laboratory processing for all permit-required samples. Additionally, verification and validation of both field- and lab-generated data occur during data management activities. These procedures were conducted throughout the duration of the study. The quality of raw, unprocessed, and processed data is subject to review and management using established protocols and includes the following areas of work:

1. Field quality control
    - Implementation of standard operating procedures
    - Field instrument inspection, calibration, and maintenance
    - Collection of field notes and maintenance documentation
    - Collection of composite field duplicate/grab field replicate samples
    - Collection of field blanks
2. Laboratory quality control
    - Laboratory instrument maintenance and calibration
    - Analysis of laboratory duplicate/split samples
    - Analysis of laboratory matrix spike and matrix spike duplicate samples
    - Analysis of laboratory blanks and standards
3. Data Management
    - Hydrology data review and verification
    - Field data review and verification
    - Laboratory data review and validation
    - Self-assessment and audit of project processes

As part of data management and in addition to implementing field and laboratory quality control activities, WSDOT utilized third-party data validators to perform validation on the analytical data.

An analytical data quality assessment report (Appendix E) was prepared for WSDOT by one of the third-party validators. This report provides an overview of the analytical scheme, data verification and validation procedures, and the quality of analytical data collected. The quality of data is assessed and discussed in terms of Measurement Quality Objectives (i.e., precision, accuracy, representativeness, comparability, sensitivity, and completeness). Data collected from WSDOT facility monitoring sites, as well as the department's highway runoff characterization and best management practice (BMP) effectiveness monitoring sites, are included in the analytical data quality assessment report.

5 Monitoring Results

WSDOT successfully completed analyses for 107 sampled storms at WSDOT's rest areas, maintenance facilities, and ferry terminal during WY12 and WY13. The stormwater monitoring team made a total of 225 attempts at collecting stormwater samples. Of the 225 sampling attempts, 107 were successfully sampled, 93 were failed attempts, and 24 were missed events. Appendix F details the storm sampling attempt records for WY12 and WY13 at each monitoring site.

Appendix G provides cumulative water quality results for each of WSDOT's rest area, maintenance facility, and ferry terminal monitoring sites. Appendix H includes the analytical data summary tables for the parameters of concern. WSDOT will use results from WY12 and WY13 monitoring to evaluate whether the department's Stormwater Pollution Prevention Plans (SWPPPs) for maintenance and operations require any changes.

An attempt has been made to include narrative in this chapter regarding the significance of these monitoring results. For example, where appropriate, it is noted whether results were below reporting and detection limits and whether numbers were elevated. Potential sources for elevated values are identified in some cases. As to the potential effect of monitored stormwater discharges on the environment, there are simply too many variables between discharge points and receiving water bodies to state or even speculate as to the environmental effect.

Comparability and transferability of WSDOT's facilities monitoring data to other sites is limited due to each site's unique pollutant-generating sources, operational activities, climactic variability between regions, variations in adjacent land uses, and varying facility maintenance practices. The data can inform site-specific trends, but comparing data between highly variable sites would be misleading and nonrepresentative.

5.1 Rest Areas

5.1.1 Smokey Point Rest Area (Northbound I-5)

Water Year 2012 (WY12)

WSDOT initiated sampling attempts at the northbound (NB) I-5 Smokey Point Rest Area on November 30, 2011, but did not collect the first successful sample until March 2012 due to equipment failures and storm forecast variability. Of 15 attempted storms in WY12, staff sampled three qualified wet season events and one qualified dry season event. Grab samples were attempted during three of the four storms, but were missed each time due to staff arriving on site after the 20-minute permit-specified window. We attribute these delays in part to the difficulty in predicting storm start times, challenges in mobilizing monitoring staff on short notice, and travel times.

- Conventional parameters, nutrients, and metals (total and dissolved) were detected in most of the samples collected. For metals, copper and zinc exhibited higher values than lead and cadmium. Most metals samples were found above reporting limits.
- Nearly all polycyclic aromatic hydrocarbons (PAHs) and phthalate compounds exhibited values below reporting limits, many of them additionally below detection limits. Similarly, all herbicides were below reporting limits and detection limits except one measured value of dichlobenil (0.059ug/L) in a storm on March 9, 2012.

Water Year 2013 (WY13)

For WY13, WSDOT collected its first successful sample at the NB Smokey Point Rest Area on October 12, 2012. Of 12 attempted storms in WY13, staff sampled one qualified and one nonqualified first flush event, four qualified wet season events, and one qualified dry season event. Staff attempted to collect grab samples during all seven storms; two were successfully collected and five were missed due to staff arriving on site after the 20-minute permit-specified window. We attribute these delays in part to the difficulty in predicting storm start times, challenges in mobilizing monitoring staff on short notice, and travel times. The two grab samples were collected in October for fecal coliform bacteria and petroleum hydrocarbons (TPH-Dx/Gx).

- The analyses detected conventional parameters, nutrients, and metals (total and dissolved) in most of the storm events sampled, with the highest values detected in the January 23, 2013, storm. For metals, copper and zinc exhibited higher values than lead and cadmium in most instances. Most metals samples were found above reporting limits.
- Nearly all PAHs and phthalate compounds exhibited values below reporting limits, many of them below detection limits. Similarly, all herbicides were below reporting limits and detection limits except one measured value of 2,4-D (0.2ug/L) and one measured value of triclopyr (0.18ug/L) in a storm on February 28, 2013.

5.1.2 Smokey Point Rest Area (Southbound I-5)

Water Year 2012 (WY12)

WSDOT initiated sampling attempts at the southbound (SB) Smokey Point Rest Area at the end of February 2012. Of 15 attempted storms in WY12, staff sampled three qualified wet season events and one qualified dry season event. Grab samples were attempted at three of the four storms, but were missed each time due to staff arriving on site after the 20-minute permit-specified window. We attribute these delays in part to the difficulty in predicting storm start times, challenges in mobilizing monitoring staff on short notice, and travel times. Staff collected no total petroleum hydrocarbon or fecal coliform samples due to the missed grab samples.

- The analyses detected conventional parameters, nutrients, and metals (total and dissolved) in most samples collected during WY12. Total recoverable cadmium exhibited values below reporting and detection limits in both the April 30 and May 21, 2012, storm events. For other metals, copper and zinc values were more prevalent than lead and cadmium. Most metals samples were found above reporting limits.
- In the majority of samples, polycyclic aromatic hydrocarbons (PAHs) and phthalate compounds exhibited values below reporting limits, many of them additionally below detection limits. Similarly, all herbicides were below reporting and detection limits.

Water Year 2013 (WY13)

For WY13, WSDOT initiated sampling attempts at the SB Smokey Point Rest Area in October 2012. Of 15 attempted storms in WY13, staff sampled one nonqualified and one qualified first flush events, five qualified wet season events, and one qualified dry season event. Grab samples were attempted during all of the eight sampled storms, successfully collected during three events, and missed during five events due to staff arriving on site after the 20-minute permit-specified window. We attribute these delays in part to the difficulty in predicting storm start times, challenges in mobilizing monitoring staff on short notice, and travel times.

- Analyses detected conventional parameters, nutrients, and metals (total and dissolved) in most of the storm events sampled, with the highest values detected in the January 23, 2013, storm. Staff collected two grab samples in October for fecal coliform bacteria and TPH-Dx/Gx. An additional fecal coliform bacteria sample was collected in December. For metals, copper and zinc exhibited higher values than lead and cadmium. Most metals samples were found above reporting limits.
- Nearly all PAHs and phthalate compounds exhibited values below reporting limits, many of them additionally below detection limits. Similarly, all herbicides were below reporting limits and detection limits except one measured value of 2,4-D (0.097ug/L).

5.2 Maintenance Facilities

5.2.1 Ballinger (Northwest Region)

Water Year 2012 (WY12)

WSDOT initiated sampling attempts at the Ballinger Maintenance Facility on November 30, 2011. Of 15 attempted storms in WY12, staff sampled five qualified wet season events, one nonqualifying event (0.17" of rainfall), and one qualified dry season event. Staff successfully collected grab samples at two of the seven storms, but they were missed in all other attempts due to staff arriving on site after the 20-minute permit-specified window. We attribute these delays in part to the difficulty in predicting storm start times, challenges in mobilizing monitoring staff on short notice, and travel times. Of the grab sample analytical results, TPH-Gx (gasoline) was detected under the reporting limit and both TPH-Dx (diesel) samples were detected in the lube oil fraction. The diesel fuel fraction was detected below the reporting limit.

- Of the conventional parameters collected in WY12, the analyses detected total suspended solids (TSS) in all events, and chlorides were detected in five events. The analyses detected total and dissolved zinc, copper, lead, and dissolved cadmium above reporting limits in most wet season samples. Total recoverable cadmium was detected in samples collected in January and February, but not in samples collected in April.
- Analyses identified polycyclic aromatic hydrocarbon (PAH) compounds in samples from six of the seven storms. Staff collected one phthalates sample on February 28, 2012. While the permit does not require sampling for these analytes, we reported the analyses in this instance since they were inadvertently collected and analyzed. All herbicides were below reporting and detection limits except dichlobenil, which was present in three of the seven storm samples. Methylene blue active substances (MBAS) samples were collected in three of the seven storms. Detectable values of MBAS were found in each sample.
- Permit-specified nutrients were present in each storm sampled.
- Chloride concentrations were consistently elevated throughout the water year. Stormwater samples at Ballinger were collected from a catch basin in close proximity to a salt storage shed. WSDOT's Stormwater Pollution Prevention Plan (SWPPP) program revealed a deficiency in the Ballinger salt shed that allowed runoff to pass through the shed and into the sampling catch basin. Ballinger staff identified and tried to remedy this deficiency after WY12 monitoring was completed.

Water Year 2013 (WY13)

For WY13, WSDOT initiated sampling attempts at the Ballinger Maintenance Facility on October 1, 2012. Of 10 attempted storms in WY13, staff sampled one qualified first flush event, three qualified and three nonqualified wet season events, and one qualified and one nonqualified dry season event. Staff successfully collected grab samples at three of the eight sampled storms, but failed in all other attempts due to staff arriving on site after the 20-minute permit-specified window. We attribute these delays in part to the difficulty in predicting storm start times, challenges in mobilizing monitoring staff on short notice, and travel times.

- In collected grab samples, analyses detected TPH-Gx (gasoline) under the reporting limit. One of the TPH-Dx (diesel) samples was detected in the lube oil fraction. The diesel fuel fraction sample was detected below the reporting limit.
- Of the conventional parameters collected in WY13, the analyses detected TSS, hardness, and chlorides in all sampled events, with the highest values exhibited during the January 23, 2013, event.
- Analyses detected total and dissolved zinc and copper in all sampled events, with their highest values detected during the January 23, 2013, event. The January 23, 2013, event also exhibited the highest total recoverable lead values. Total recoverable cadmium was detected from samples collected in October and December, but was not detected in half of the collected wet season samples. Most metals samples were found above reporting limits.
- Analyses identified PAH compounds in samples from seven of the eight storms. All herbicides exhibited values below reporting and detection limits except 2,4-D, which was detected in four of the eight storm samples, and triclopyr, which was detected in seven of the eight storm samples. MBAS were present in seven of the eight storms sampled.
- Permit-specified nutrients were present in each sampled storm, with the highest values detected during the January 23, 2013, event.
- Chloride values were found to be consistently elevated throughout the water year, with the highest level detected during the January 23, 2013, storm event. Stormwater samples were collected from a catch basin that is in close proximity to a salt storage shed.
- Chloride levels at Ballinger in WY13 appeared to trend lower than in WY12, excluding the samples collected from the January 23, 2013, storm. High chloride levels in January 2013 may be due to elevated deicing activities at this facility during the months of December and January and can most likely be attributed to vehicle track-out of deicing agents rather than storage. This is bolstered by elevated hardness values that further support an increase in deicing activities between the December 11, 2012, and January 23, 2013, storms.

5.2.2 Lakeview (Olympic Region)

Water Year 2012 (WY12)

WSDOT initiated sampling attempts at the Lakeview Maintenance Facility toward the end of February 2012. Of 14 attempted storms in WY12, staff sampled four qualified and one nonqualified (0.18" rain) wet season events and one qualified dry season event. Staff successfully collected grab samples during only one of the six storms. Grabs were missed in all other attempts due to staff arriving on site after the 20-minute permit-specified window. We attribute these delays in part to the difficulty in predicting storm start times, challenges in mobilizing monitoring staff on short notice, and travel times.

- In collected grab samples, the TPH-Gx (gasoline) level was found below the reporting limit. The TPH-Dx (diesel) level was detected in the lube oil fraction, but the diesel fuel fraction level was detected below the reporting limit.
- Analyses detected all conventional parameters in two of the six sampling events. Total suspended solids (TSS) were detected in all collected storms.
- Analyses detected total and dissolved metals above reporting limits in all wet season samples. Total and dissolved metals were not collected during the dry season event.
- Analyses detected polycyclic aromatic hydrocarbon (PAH) compounds in all six of the sampling events, but were consistently below the reporting limits. The herbicide, dichlobenil, was detected in four of the six storms, and triclopyr was detected in every storm sampled at the Lakeview Maintenance Facility.
- Nutrients, including total phosphorus, total Kjeldahl nitrogen, and nitrate+nitrite, were detected in most samples collected, while orthophosphate was detected from only one sample. Methylene blue active substances (MBAS) were found in one of the six storms sampled.

Water Year 2013 (WY13)

For WY13, WSDOT initiated sampling attempts at the Lakeview Maintenance Facility October 1, 2012. Of 18 attempted storms in WY13, staff sampled one qualified and one nonqualified first flush events, two qualified and four nonqualified (one event = 0.19" rain) wet season events, and one nonqualified dry season event. Staff successfully collected grab samples during five of the nine storms. Grabs were missed in all other attempts due to staff arriving on site after the 20-minute permit-specified window. We attribute these delays in part to the difficulty in predicting storm start times, challenges in mobilizing monitoring staff on short notice, and travel times.

- For collected grab samples, TPH-Gx (gasoline) values were found below the reporting limit. Two of the three TPH-Dx (diesel) samples were detected in the lube oil fraction, but the diesel fuel fraction was detected below the reporting limit.

- Analyses detected conventional parameters in nearly all WY13 sampling events at Lakeview, with TSS detected in all sampled events. The analyses detected nutrients, including total phosphorus, orthophosphate, total Kjeldahl nitrogen, and nitrate+nitrite, in nearly all samples. Total and dissolved metals were detected in nearly all sampled events, with the exception of one nondetect dissolved lead sample in the January 23, 2013, storm.
- PAH compounds were detected in all sampled events, with many samples at values below the reporting limits. Analyses detected the herbicides dichlobenil, triclopyr, 2,4-D, and glyphosate sporadically throughout WY13, while triclopyr was detected in eight of the nine storms sampled. MBAS occurred in five of the nine storms sampled.

5.2.3 Vancouver (Southwest Region)

Water Year 2012 (WY12)

WSDOT initiated sampling attempts at the Vancouver Maintenance Facility at the end of February 2012. Of 12 attempted storms, staff sampled one nonqualified and three qualified wet season events and one qualified dry season event. Staff successfully collected grab samples at three of the five storms, but grabs were missed in the other two attempts due to staff arriving on site after the 20-minute permit-specified window. We attribute these delays in part to forecasting errors, the difficulty in predicting storm start times, challenges in mobilizing monitoring staff on short notice, and travel times.

- For collected grab samples, these analyses detected TPH-Gx (gasoline) with values below the reporting limit in all samples. All TPH-Dx (diesel) samples had detectable values in the lube oil fraction, while all diesel fuel fraction values were detected below the reporting limit.
- Analyses detected conventional parameters in all samples collected.
- Total and dissolved metals were detected in all wet season samples. All metals samples were found above reporting limits. A dry season metals sample was not collected.
- Analyses consistently detected polycyclic aromatic hydrocarbon (PAH) compounds at levels near or below their respective reporting limits. The herbicide triclopyr was detected in each sample collected. Dichlobenil was detected in two events, while diuron was detected in just one sampling event.
- Except for orthophosphate, analyses detected all other nutrients in the samples collected. Orthophosphate was not detected in any of the samples collected. Methylene blue active substances (MBAS) were detected in two of the five storms.

Water Year 2013 (WY13)

For WY13, WSDOT initiated sampling attempts at the Vancouver Maintenance Facility in October 2012. Of 12 attempted storms, staff sampled one qualified first flush event, three qualified and two nonqualified wet season events, and one qualified dry season event. Staff successfully collected grab samples at three of the seven storms. Grabs were missed in the other four attempts due to staff arriving on site after the 20-minute permit-specified window. We attribute these delays in part to forecasting errors, the difficulty in predicting storm start times, challenges in mobilizing monitoring staff on short notice, and travel times.

- For collected grab samples, the analyses detected TPH-Gx (gasoline) in the October 12, 2012, storm. Of the two TPH-Dx (diesel) samples collected, only one sample showed detectable values in the lube oil fraction.
- With the exception of total suspended solids (TSS), analyses detected all conventional parameters in the samples collected. Total and dissolved metals were detected in four of the seven samples. All metals samples were found above reporting limits. Except for total Kjeldahl nitrogen (TKN) and orthophosphate, analyses detected all the other target nutrients in the samples collected.
- Analyses detected PAH compounds at levels near or below their respective reporting limits. The highest detected value for PAHs was 0.086ug/L.
- The herbicide triclopyr was detected in each sample collected, dichlobenil was detected in four events, and diuron was detected in two sampling events. MBAS were collected and found present in four of the seven sampled storms.

5.2.4 Euclid (North Central Region)

Water Year 2012 (WY12)

WSDOT initiated sampling attempts at the Euclid Maintenance Facility toward the end of February 2012. Six sampling attempts were made during WY12. Staff sampled two qualified wet season events and one qualified dry season event. Three storm events were missed due to inaccurate forecast data and a reduced availability of staff at this site. Staff successfully collected grab samples during two of the three storms, but missed in the other attempt because staff were not available to sample within the 20-minute permit-specified window.

- For collected grab samples, the analyses detected TPH-Gx (gasoline) below the reporting limit in both samples. Both of the TPH-Dx (diesel) samples had detections in the lube oil fraction. The analyses detected diesel fuel fraction, but at levels below the reporting limit.
- The analyses detected all conventional parameters in samples collected on June 7, 2012.

- Total suspended solids (TSS) were the only conventional parameters sampled from a storm on April 25, 2013. Except for total recoverable cadmium, the analyses detected all other metals (total and dissolved) from samples collected on April 25 and June 7, 2013. Total recoverable cadmium values were below the reporting limit for these two storms. Most metals samples were found above reporting limits.
- The analyses detected polycyclic aromatic hydrocarbon (PAH) compounds above reporting limits in two of the three samples collected. Nutrients and three herbicides (2,4-D, picloram, and diuron) were detected in two storms. No methylene blue active substance (MBAS) samples were collected in WY12.

Water Year 2013 (WY13)

Eleven sampling attempts were made at the Euclid Maintenance Facility during WY13. Staff sampled one nonqualified first flush event, and one nonqualified and four qualified wet season events. Dry season sampling did not occur during the only two possible qualifying storms in WY13, because they were not forecast to qualify and occurred outside Quality Assurance Project Plan (QAPP)-approved staff operating hours (i.e., during a weekend). Staff did not collect any grab samples. Grab samples were missed due to the lack of staff present to sample within the 20-minute permit-specified window.

- Total suspended solids (TSS) were the only conventional parameters sampled from all wet season storms. Analyses detected all of the conventional parameters in samples collected on June 19, 2013. Except for total and dissolved cadmium, all other metals (total and dissolved) were detected from the samples collected. Most metals samples were found above reporting limits. Nutrients also occurred in the collected samples.
- The herbicides 2,4-D, dichlobenil, triclopyr, and diuron were detected in varying concentrations throughout the water year. However, many of these concentrations were below reporting limits. PAH compounds were detected in five of the six storm events with some PAH analytes above reporting limits.

5.2.5 Geiger (Eastern Region)

Water Year 2012 (WY12)

WSDOT initiated sampling attempts at the Geiger Maintenance Facility toward the end of February 2012. Staff made sampling attempts for 10 storms in WY12 and successfully sampled two qualified and two nonqualified wet season storms and one nonqualified dry season event. Staff successfully collected grab samples during only one of the five storms. Staff missed grabs in all other attempts because they arrived on site after the 20-minute permit-specified window. We attribute staff delays in part to the difficulty in predicting storm start times, challenges in mobilizing monitoring staff on short notice, and travel times.

- From the collected grab samples, analyses detected TPH-Gx (gasoline) at values below the reporting limit. TPH-Dx (diesel) was detected in the lube oil fraction, but the diesel fuel fraction was detected at values below the reporting limit.
- All conventional parameters were detected in three of the five storms. Analyses detected total suspended solids (TSS) in all five storms.
- Analyses detected total recoverable copper, lead, cadmium, and zinc in four of the five wet season storms. Dissolved metals were collected from only three of the storms. Most metals samples were found above reporting limits. Dissolved lead and cadmium were undetected in the storm on March 20, 2012.
- Polycyclic aromatic hydrocarbons (PAHs) were detected in each of the samples collected with some values above reporting limits. Analyses also detected the herbicides 2,4-D, picloram, dichlobenil, triclopyr, and diuron, but the herbicides clopyralid and glyphosate were not detected. Total phosphorous, orthophosphate, total Kjeldahl nitrogen, and nitrate+nitrite were detected in four of the five samples. Methylene blue active substances (MBAS) were detected in just one of the wet season storms.

Water Year 2013 (WY13)

Staff deployed for 14 storms at the Geiger Maintenance Facility in WY13. Field teams successfully sampled one nonqualified first flush event, and one nonqualified and two qualified wet season events. One qualified dry season event was also sampled. Grab samples were successfully collected during only one of the five storms. Staff missed grabs in all other attempts due to staff arriving on site after the 20-minute permit-specified window. We attribute staff delays in part to the difficulty in predicting storm start times, challenges in mobilizing monitoring staff on short notice, and travel times.

- From the grab samples, analyses detected TPH-Gx (gasoline) at values below the reporting limit. TPH-Dx (diesel) was detected in the lube oil fraction, while the diesel fuel fraction was detected at values below the reporting limit.
- Except for chloride, analyses detected all conventional parameters at or above reporting limits in the five storms sampled. Analyses detected total recoverable copper, lead, cadmium, and zinc in three of the four wet season storms. Most metals samples were found above reporting limits. Nondetects occurred for dissolved zinc and cadmium in the March 20, 2013, storm event, and for dissolved cadmium in the September 5, 2013, event. Except for orthophosphate in the April 4, 2013, event, analyses detected all other target nutrients in the five storms sampled.
- Analyses detected PAHs in each of the samples collected with values not exceeding concentrations above 0.2 ug/L. All herbicides were detected in WY13 storm events in varying concentrations.
- MBAS were detected in one of the wet season storms.

5.2.6 Clarkston (South Central Region)

Water Year 2012 (WY12)

WSDOT initiated sampling attempts at the Clarkston Maintenance Facility toward the end of February 2012. Staff made 12 sampling attempts, sampling four qualified wet season events. Due to forecasting inaccuracies, no dry season events were collected. Field teams successfully collected grab samples at two of the four storms. Staff missed grabs in the other attempts due to inability to sample within the 20-minute permit-specified window.

- Analyses detected TPH-Gx (gasoline) at values below the reporting limit in both grab samples. Detections occurred in the lube oil fraction for both of the TPH-Dx (diesel) samples. Analyses detected the diesel fuel fraction at values below the reporting limit.
- Analyses detected all conventional parameters in three of the four storms. Only chlorides were detected in the sample collected on March 15, 2012.
- Total recoverable copper, lead, cadmium, and zinc were detected from three of the four storms, while dissolved metals were collected and detected from just two storms. Most metals samples were found above reporting limits.
- Polycyclic aromatic hydrocarbons (PAHs) were detected in each of the samples collected with some of the analytes above reporting limits. The nutrients total phosphorous, orthophosphate, total Kjeldahl nitrogen, and nitrate+nitrite were detected in three of the four collected samples.
- The herbicides dichlobenil and 2,4-D were detected in a few of the samples collected above reporting limits. Diuron, clopyralid, picloram, triclopyr, and glyphosate were detected, but below reporting limits in most cases. Methylene blue active substances (MBAS) were detected in two of the four storms.

Water Year 2013 (WY13)

Staff made 16 sampling attempts in WY13, successfully sampling four qualified and one non-qualified wet season event, and one nonqualified dry season event. The first flush event was missed due to staff unavailability. Staff did not collect grab samples in WY13. Staff missed grabs due to an inability to sample within the 20-minute permit-specified window.

- Analyses detected conventional parameters in all six storms. Total and dissolved copper, lead, and zinc were collected and detected in four of the six storms. Dissolved cadmium was present but did not occur above detection limits in two storms. Most metals samples were found above reporting limits.
- Analyses detected total phosphorous, total Kjeldahl nitrogen, and nitrate+nitrite in five of the samples collected, while orthophosphate was detected in two samples.

- Staff collected samples for PAH analyses in four of the six storm events, and detected their presence in three of the samples. The herbicide 2,4-D was detected in five of the six samples, and glyphosate was detected in two of five samples. MBAS were detected in two of the six storms.

5.3 Ferry Terminal

5.3.1 Bainbridge Island Ferry Terminal

Water Year 2012 (WY12)

WSDOT successfully sampled seven of the nine storms attempted in WY12. These seven storms included the first flush event in September, one nonqualified and four qualified wet season events, and one qualified dry season event. Grab samples were successfully collected at four of the seven storms. Staff missed grabs in the other attempts because they were unable to sample within the 20-minute permit-specified window.

- From the grab samples, TPH-Gx (gasoline) was detected at values below the reporting limit in all samples. All TPH-Dx (diesel) samples had detections in the lube oil fraction, while the diesel fuel fraction was detected below the reporting limit. One fecal coliform sample was collected in the January 24, 2012, storm event and had detectable values of bacteria.
- Conventional parameters were detected at this site above reporting limits for all collected samples, excluding the first flush storm, which did not collect chlorides or hardness.
- Total and dissolved metals were detected in samples from all storms in which metals were successfully collected. Total recoverable cadmium samples collected from two separate events in February exhibited values below the reporting limits. Most metals samples were found above reporting limits.
- A high chloride level was measured from the storm on January 24, 2012. This measurement is most likely attributed to the ferry staff deicing the parking lot after a previous snow event. Polycyclic aromatic hydrocarbon (PAH) compounds were detected in each storm, many above reporting limits. Methylene blue active substances (MBAS) were collected and detected in four of the seven storms.

Water Year 2013 (WY13)

WSDOT successfully sampled seven of 12 storms attempted in WY13. These storms included a nonqualified first flush event, one nonqualified and four qualified wet season events, and one qualified dry season event. Grab samples were only collected at one wet season event. Staff missed grabs in all other attempts because they were unable to sample within the 20-minute permit-specified window.

- From the grab sample, TPH-Gx (gasoline) was detected at values below the reporting limit. The TPH-Dx (diesel) sample was detected in the lube oil fraction. The diesel fuel fraction was detected at values below the reporting limit. One fecal coliform sample was collected and exhibited detectable values of bacteria.
- Conventional parameters were detected at this site for all collected samples. Total metals were collected in each of the storms sampled, while dissolved metals were collected in six of the seven storms. Three total recoverable and three dissolved cadmium samples were below the reporting limits. Most other metals were found above reporting limits. PAH compounds were detected in each sampled storm, many above reporting limits.
- MBAS were collected and detected in all seven storms.

Glossary

accuracy – The degree to which a measured value agrees with the true value of the measured property. EPA recommends that this term not be used, and that the terms *precision* and *bias* be used to convey the information associated with the term *accuracy* (USGS 1998).

analyte – An element, ion, compound, or chemical moiety (pH, alkalinity) that is to be determined. For our purposes, this definition was expanded to include organisms, such as fecal coliform (Kammin 2010).

annual average daily traffic (AADT) – The average, over a year, of the number of vehicles passing a point on a highway in both directions each day (Mohamad et al., 1998). Counts are estimated using Trip Generation, published by the Institute of Transportation Engineers, or using a traffic study prepared by a professional engineer or transportation specialist with expertise in traffic volume estimation (WSDOT 2011d).

aliquots – Individual, discrete sample volumes that are taken at set intervals (flow, time, or precipitation) or otherwise composited together to form a representative sample of a monitoring period flow (Caltrans 2003).

audit – A systematic and independent examination to determine whether quality activities and related results comply with planned arrangements and whether these arrangements are implemented effectively and are suitable to achieve objectives (USEPA 2000 & 2002).

best management practices (BMPs) – The schedules of activities, prohibitions of practices, maintenance procedures, and structural and/or managerial practices approved by Ecology that, when used singly or in combination, prevent or reduce the release of pollutants and other adverse impacts to waters of Washington State (Ecology 2009a).

bias – The difference between the population mean and the true value. Bias usually describes a systematic difference reproducible over time, and is characteristic of both the measurement system and the analyte(s) being measured. Bias is a commonly used data quality indicator (DQI) (Ecology 2004; Kammin 2010).

blank – A sample prepared to contain none (or as little as possible) of the analyte of interest. For example, in water analysis, pure water is used for the blank. In chemical analysis, a blank is used to estimate the analytical response to all factors other than the analyte in the sample. In general, blanks are used to assess possible contamination or inadvertent introduction of an analyte during various stages of the sampling and analytical process (USGS 1998).

calibration – The process of establishing the relationship between the response of a measurement system and the concentration of the parameter being measured. The most important aspect of any calibration method is its ability to obtain accurate results with a high degree of certainty and repeatability (Ecology 2004; Kammin 2010).

catch basin – A chamber or well, usually built at the curb line of a street, for the admission of surface water to a sewer or subdrain, having at its base a sediment sump designed to retain grit and detritus below the point of overflow (WSDOT 2011d).

chain of custody (COC) – A systematic procedure for tracking a sample or datum from its origin to its final use. The COC provides chronological documentation of the transfer and custody of a sample.

churner – A device used to homogenize stormwater samples during storm event sample processing.

data quality objectives (DQOs) – Qualitative and quantitative statements derived from systematic planning processes that clarify study objectives, define the appropriate type of data, and specify tolerable levels of potential decision errors that will be used as the basis for establishing the quality and quantity of data needed to support decisions (USEPA 2006).

data validation – An analyte- and sample-specific process that extends the evaluation of data beyond method, procedural, or contractual compliance (i.e., data verification) to determine the analytical quality of a specific data set (Ecology 2004). Data validation criteria are based upon the measurement quality objectives developed in the QA Project Plan or similar planning document, or presented in the sampling or analytical method. Data validation includes a determination, where possible, of the reasons for any failure to meet method, procedural, or contractual requirements, and an evaluation of the impact of such failure on the overall data set. Data validation applies to activities in the field as well as in the analytical laboratory (USEPA, 2002a). Data validation follows data verification (USEPA 2006). Ecology considers four key criteria to determine whether data validation has actually occurred. These are:

- Use of raw or instrument data for evaluation
- Use of third-party assessors
- Data set is complex
- Use of EPA *Functional Guidelines* or equivalent for review

Examples of data types commonly validated would be:

- Gas Chromatography (GC)
- Gas Chromatography-Mass Spectrometry (GC-MS)
- Inductively Coupled Plasma (ICP)

The end result of a formal validation process is a determination of usability that assigns qualifiers to indicate usability status for every measurement result (Ecology 2004; Kammin 2010).

data verification – The process of evaluating the completeness, correctness, and conformance/compliance of a specific data set against the method, procedural, or contractual requirements. Again, the goal of data verification is to ensure and document that the data are what they purport to be, that is, that the reported results reflect what was actually done. When deficiencies in the data are identified, then those deficiencies should be documented for the data user's review and, where possible, resolved by corrective action. Data verification applies to activities in the field as well as in the laboratory (USEPA 2002a). Data verification precedes data validation (USEPA 2006).

detection limit (limit of detection) – The concentration or amount of an analyte that can be determined to a specified level of certainty to be greater than zero (Ecology 2004).

detention pond – A pond that temporarily stores stormwater runoff and subsequently releases it at a slower rate than is collected by the drainage facility system (WSDOT 2011d).

duplicate samples – Two samples taken from and representative of the same population, and carried through the steps of the sampling and analytical procedures in an identical manner. Duplicate samples are used to assess the variability of all method activities, including sampling and analysis (USEPA 1997).

fecal coliform – That portion of the coliform group that is present in the intestinal tracts and feces of warm-blooded animals as detected by the product of acid or gas from lactose in a suitable culture medium within 24 hours at 44.5 plus or minus 0.2 degrees Celsius (WAC 173-201A-20).

field blank – Blanks that are analyzed to determine whether there is contamination during sampling. For water sampling, these consist of pure (e.g., deionized, microfiltered) water that is subjected to all aspects of sample collection, field processing, preservation, transportation, and laboratory handling as an environmental sample. The pure water must be obtained from the laboratory or other reliable supplier (Ecology 2004). Field blanks include the following types:

> ***equipment rinsate blank*** – Pure (deionized, micro-filtered) water that is run through the sample pickup, tubing, and collection apparatus of the automated sampler, and is otherwise subjected to all subsequent aspects of sample collection, field processing, preservation, transportation, and laboratory handling as an environmental sample. If the equipment is not cleaned or rinsed with pure water before each environmental sample is drawn, then the equipment should not be cleaned or rinsed with pure water before collecting the rinsate blank.
>
> ***filter blank*** – A special case of a rinsate blank prepared by filtering pure water through the filtration apparatus after routine cleaning. The filter blank may detect contamination from the filter or other part of the filtration apparatus (Ecology 2004). This is only applicable if filtration is done in the field.

transfer blank – Prepared by filling a sample container with pure water during routine sample collection to check for possible contamination from the surroundings. The transfer blank will also detect contamination from the containers or from cross-contamination during transportation and storage of the samples (Ecology 2004).

transport blank – A container of pure water that is prepared at the lab and carried unopened to the field and back with the other sample containers to check for possible contamination in the containers or for cross-contamination during transportation, storage of the samples (Ecology 2004).

first flush of an event – Typically, the first 30 to 60 minutes of runoff from an individual rainfall event (Caltrans 2003). A seasonal first flush rain event for facilities is defined in Special Condition S7.D.4 of the permit as the first qualifying rain event that occurs seasonally after July 31 with a one-week antecedent dry period (Ecology 2009a).

laboratory control sample (LCS) – A sample of known composition prepared using contaminant-free water or an inert solid that is spiked with analytes of interest at the midpoint of the calibration curve or at the level of concern. It is prepared and analyzed in the same batch of regular samples using the same sample preparation method, reagents, and analytical methods employed for regular samples (USEPA 1997).

matrix spike – A QC sample prepared by adding a known amount of the target analyte(s) to an aliquot of a sample to check for bias due to interference or matrix effects (Ecology 2004).

measurement quality objectives (MQOs) – A subset of data quality objectives (DQOs) that specify how good the data must be in order to meet the objectives of a project (Ecology 2004). The acceptance thresholds or goals for a project's data are usually based on the individual data quality indicators (DQIs) for each matrix and analyte group or analyte. These include bias, precision, accuracy, representativeness, comparability, completeness, and sensitivity (USEPA 2006).

method blank – A blank prepared to represent the sample matrix, prepared and analyzed with a batch of samples. A method blank will contain all reagents used in the preparation of a sample, and the same preparation process is used for the method blank and samples (Kammin 2010; Ecology 2004).

method detection limit (MDL) – The minimum concentration of an analyte that, in a given matrix and with a specific method, has a 99 percent probability of being identified and reported to be greater than zero (40 CFR 136).

National Pollutant Discharge Elimination System (NPDES) – The national program for issuing, modifying, revoking and reissuing, terminating, monitoring, and enforcing permits, and imposing and enforcing pretreatment requirements, under sections 307, 402, 318, and 405 of the federal Clean Water Act, for the discharge of pollutants to surface waters of the state from point sources. These permits are referred to as NPDES permits and, in Washington State, are administered by the Washington State Department of Ecology (Ecology 2009a).

nutrient – A substance such as carbon, nitrogen, or phosphorus used by organisms to live and grow. Too many nutrients in the water can promote algal blooms and rob the water of oxygen vital to aquatic organisms.

oil/water separator – A vault, usually underground, designed to provide a quiescent environment to separate oil from water (WSDOT 2011d).

parameter – A specified characteristic of a population or sample. Also, an analyte or grouping of analytes. Benzene, nitrate/nitrite, and anions are all parameters (Ecology 2004; Kammin 2010).

precision – The extent of random variability among replicate measurements of the same property; a data quality indicator (USGS 1998). Usually expressed as relative percent difference (RPD) or relative standard deviation (RSD) (Ecology 2004).

quality assurance (QA) – A set of activities designed to establish and document the reliability and usability of measurement data (Kammin 2010).

Quality Assurance Project Plan (QAPP) – A document that describes the objectives of a monitoring project and the procedures necessary to ensure the quality and integrity of the collected data (Ecology 2004).

quality control (QC) – The routine application of measurement and statistical procedures to assess the accuracy of measurement data (Ecology 2004).

replicate samples – Two or more samples taken from the environment at the same time and place, using the same protocols. Replicates are used to estimate the random variability of the material sampled (USGS 1998).

reporting limit – (1) The minimum value below which data are documented as nondetects; (2) The minimum value of the calibration range. Analyte detections between the detection limit and the reporting limit are reported as having estimated concentrations (EPA Environmental Measurement Glossary 2010) (USEPA 2010).

representativeness – The state or quality of being accurately representative of something. Expresses the degree to which sample data accurately and precisely represent a characteristic of a population, parameter variations at the sampling point, or an environmental condition (USEPA 2006).

retention pond – A retention pond is designed to collect and hold stormwater runoff for a considerable length of time and then release it by evaporation, plant transpiration, or infiltration (WSDOT 2011d).

self-assessment – The assessments of work conducted by individuals, groups, or organizations directly responsible for overseeing and/or performing the work (USEPA 2002).

sensitivity – In general, denotes the rate at which the analytical response (e.g., absorbance, volume, or meter reading) varies with the concentration of the parameter being determined. In a specialized sense, it has the same meaning as the detection limit (Ecology 2004).

spiked blank – A specified amount of reagent blank fortified with a known mass of the target analyte(s); usually used to assess the recovery efficiency of the method (USEPA 1997).

spiked sample – A sample prepared by adding a known mass of target analyte(s) to a specified amount of matrix sample for which an independent estimate of target analyte(s) concentration is available. Spiked samples can be used to determine the effect of the matrix on a method's recovery efficiency (USEPA 1997).

split sample – This term denotes when a discrete sample is further subdivided into portions, usually duplicates (Kammin 2010).

standard operating procedure (SOP) – Describes in detail the approved method for performing a routine procedure (Ecology 2004).

stormwater – That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a stormwater drainage system into a defined surface water body or a constructed infiltration facility (WSDOT 2011d).

surrogate – For environmental chemistry, a surrogate is a substance with properties similar to those of the target analyte(s). Surrogates are unlikely to be native to environmental samples. They are added to environmental samples for quality control purposes, to track extraction efficiency and/or measure analyte recovery. Deuterated organic compounds are examples of surrogates commonly used in organic compound analysis (Kammin 2010).

time-weighted compositing – Samples of equal volume are taken at equal increments of time and composited to make an average sample (Ecology 2009c).

water year (WY) – The 12-month period beginning October 1 for any given year through September 30 of the following year. The water year is designated by the calendar year in which it ends. For example, the water year ending September 30, 2012, is called the "2012" water year (USGS 2013).

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Laws, Regulations, Glossary Sources

Clean Water Act (CWA) – A federal act passed in 1972, formerly referred to as the Federal Water Pollution Control Act, which contains provisions to restore and maintain the quality of the nation's waters. Major amendments to the CWA in 1987 addressed stormwater pollution by extending the National Pollutant Discharge Elimination System (NPDES) permit program to include stormwater discharges. Section 402 of the CWA governs the NPDES permit program. Section 303(d) of the CWA establishes the Total Maximum Daily Load (TMDL) program. Pub.L.92-500, as amended Pub.L.95-217, Pub.L.95-576, Pub.L. (6-483 and Pub.L.97-117, 33 USC 1251et.seq)

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Acronyms, Abbreviations, and Units of Measurement

Acronyms and Abbreviations

AADT	annual average daily traffic
AC	alternating current
BMP	best management practice
Cd	cadmium
COC	chain of custody
Cu	copper
Ecology	Washington State Department of Ecology
EDDN	Emergency Data Distribution Network
ESO	Environmental Services Office
GOES DCS	Geosynchronous Operational Environmental Satellite Data Collection System
GPS	Global Positioning System
I-5	Interstate 5
I-90	Interstate 90
MBAS	methylene blue active substances
MQO	measurement quality objectives
MP	milepost
NB	northbound
NPDES	National Pollutant Discharge Elimination System
NOAA	National Oceanic and Atmospheric Administration
NWS	Northwest Weather Service
PAH	polycyclic aromatic hydrocarbons
Pb	lead
QAPP	Quality Assurance Project Plan
QA	quality assurance
QC	quality control
RV	recreational vehicle
SB	southbound

SOP	standard operating procedure
SR	state route
SWPPP	Stormwater Pollution Prevention Plan
TAPE	Technology Assessment Protocol – Ecology (TAPE)
TPH	total petroleum hydrocarbon
TSS	total suspended solids
WSDOT	Washington State Department of Transportation
WY	water year
Zn	zinc

Units of Measurement

°C	degrees centigrade
°F	degrees Fahrenheit
ft	feet
g	gram, a unit of mass
in	inch
gal/min	gallons per minute
L/min	liters per minute
mg	milligrams
mg/Kg	milligrams per kilogram (parts per million)
mg/L	milligrams per liter (parts per million)
mL	milliliters
µg/Kg	micrograms per kilogram (parts per billion)
µg/L	micrograms per liter (parts per billion)
µm	micrometer
oz	ounce

Appendix A: Special Condition G20 Letters Submitted to the Washington State Department of Ecology

Washington State Department of Transportation
Paula J. Hammond, P.E.
Secretary of Transportation

Transportation Building
310 Maple Park Avenue SE
Olympia, WA 98504-7300
360-705-7000
TTY: 1-800-833-6388
www.wsdot.wa.gov

October 20, 2011

Mr. Foroozan Labib
WSDOT Municipal Stormwater Permit Manager
Washington State Department of Ecology
Water Quality Program
P. O. Box 47600
Olympia, WA 98504-7996

RE: NPDES and State Waste Discharge Permit for Municipal Stormwater, G20 Notification for Non-Compliance with Special Conditions S7.C.1 and S7.G.1.d.

Dear Mr. Labib:

In accordance with General Condition 20 (G20) of the 2009 WSDOT NPDES and State Waste Discharge Permit for Municipal Stormwater (permit), this letter provides notification to the Washington State Department of Ecology (Ecology) that WSDOT will be unable to fully comply with terms in Special Conditions S7.C.1 and S7.G.1.d. WSDOT became aware that it would be unable to fully comply with these requirements on October 13, 2011. WSDOT alerted Ecology by phone and email on October 17, 2011.

S7.G.1.d requires that, "WSDOT shall begin full implementation of the monitoring program no later than September 6, 2011." Due to recent state government hiring and equipment purchase freezes, there have been delays in hiring and training monitoring support staff, and in establishing fully functional monitoring sites.

To remedy this situation, WSDOT will use information from three Ecology-approved, WSDOT quality assurance project plans to deliver sampling instructions to region support staff in an online training session scheduled for October 26, 2011. This training will be followed by hands-on trainings at facility, highway, and BMP monitoring study sites in October, November, and December 2011.

In addition, WSDOT will complete final testing and installation of sampling equipment at one ferry terminal, two rest areas, and six maintenance facilities in November 2011. Monitoring will begin at these facilities no later than November 30, 2011.

Grass establishment at best management practices (BMP) effectiveness monitoring sites has been difficult this year due to the need to reapply compost, an extended dry period this past summer, and impacts from a high-fiber optic cable installation project. During the week of October 24, 2011, WSDOT will reseed unvegetated areas and apply clear, plastic covering to improve growing conditions.

WSDOT will complete installation and testing of equipment at baseline highway and BMP effectiveness monitoring sites along Interstate 5 (I-5), State Route 9 (SR 9), and I-90 in

December 2011. Monitoring will begin for highway sites no later than January 15, 2012. For BMP effectiveness monitoring sites, sampling will begin when vegetation is fully established. Special Condition S7.C.1 requires that, "WSDOT shall collect six toxicity screening samples and associated chemical analysis at least once per monitoring year in August or September. Samples shall be collected with at least a one-week antecedent dry period (or in October, irrespective of antecedent dry period, if unsuccessful in August or September)."

WSDOT tracked storms since implementation of the monitoring program on September 6, 2011. This year, no forecasted storms qualified for toxicity sampling in September due to the lack of a one-week antecedent dry period. In regard to toxicity sampling thus far in October, our sites are not fully functional and, in our view, we have missed the first flush event due to rainfall. WSDOT would like to delay collecting toxicity screening samples until all monitoring sites are fully established and next season's first-flush sampling is possible in August 2012.

WSDOT will make every effort to keep Ecology informed of the status of the agency's stormwater monitoring program. If you have questions or require additional information regarding this matter, please contact Fred Bergdolt, Stormwater Monitoring and Research Coordinator, at bergdof@wsdot.wa.gov or 360-570-6648.

I certify under penalty of law, that this document was prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for willful violations.

Sincerely,

Megan White, P.E., Director
Environmental Services Office

MW:pf
FB

cc: Kenneth M. Stone, WSDOT, Resource Programs Branch Manager
Fred Bergdolt, WSDOT, Stormwater Monitoring and Research Coordinator
NPDES Municipal Permit File

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
PO Box 47600 • Olympia, WA 98504-7600 • 360-407-6000
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November 1, 2011

Megan White
Director
WSDOT Environmental Services Office
Transportation Building
310 Maple Park Avenue SE
PO Box 47331
Olympia, WA 98504-7331

RE: WSDOT NPDES Municipal Stormwater Permit, G20 Notification for Non-Compliance with Special Conditions S7.C.1 and S7.G.1.d.

Dear Ms. White:

The Washington State Department of Ecology (Ecology) received your notification letter, dated October 24, 2011, for non-compliance with the terms in Special Conditions S7.C.1 and S7.G.1.d of the 2009 WSDOT NPDES and State Waste Discharge Permit for Municipal Stormwater (permit). Your letter explains that recent state government hiring and equipment purchase freezes have caused delays in hiring and training monitoring support staff and in establishing fully functional monitoring sites. You indicate that monitoring equipment at a ferry terminal, rest areas, and maintenance facility sites will be fully functional by the end of November 2011 and those at the baseline highway and BMP sites will be ready to begin monitoring by January 15, 2012.

You also indicate that the establishment of grass at the BMP effectiveness monitoring sites has been difficult; however, WSDOT will have the monitoring equipment ready at the BMP sites by January 15, 2012 and will begin sampling when vegetation is fully established.

This letter is to inform you that Ecology expects WSDOT to be ready to begin monitoring at the ferry terminal, rest areas, and maintenance facility sites by the end of November 2011 and those at the baseline highway and BMP sites by January 15, 2012.

We understand that the opportunity for WSDOT to conduct first-flush toxicity sampling by October 2011 has passed due to delays in establishing the monitoring program. WSDOT shall proceed with the first-flush sampling in August 2012, in accordance with the 2011 approved Quality Assurance Project Plan.

Please contact me at (360) 407-6439, or foroozan.labib@ecy.wa.gov if you have any questions.

Sincerely,

Foroozan Labib, Permit Manager
Program Development Services Section

cc: Ecology HQ Permit file

Washington State Department of Transportation
Paula J. Hammond, P.E.
Secretary of Transportation

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November 29, 2011

Foroozan Labib
WSDOT Municipal Stormwater Permit Manager
Washington State Department of Ecology
Water Quality Program
P. O. Box 47600
Olympia, WA 98504-7996

RE: NPDES and State Waste Discharge Permit for Municipal Stormwater, Revision to the October 20, 2011 G20 Notification of Non-Compliance with Special Condition S7.G.1.d.

Dear Mr. Labib:

WSDOT became aware on November 21, 2011 that it will be unable to fully comply with commitments made in the October 20, 2011 G20 notification letter. Extensions to these commitment timelines are needed to be able to fully implement the monitoring program per Special Condition S7.G.1.d and "to produce scientifically credible data that represents discharges from WSDOT's various land uses" per S7.A.1. Delayed implementation means WSDOT will also be unable to meet the conditions of S7.B.6, S7.D.4, and S7.E.4.b that specify the number of storms to be sampled per year.

The October 20, 2011 G20 notification letter stated that monitoring will begin at facilities study sites no later than November 30, 2011. On November 30, 2011, WSDOT plans to initiate monitoring at one rest area, one maintenance facility, and one ferry terminal study site. In order to produce representative and scientifically credible data from facilities monitoring sites, we have determined that it is necessary to implement a phased approach to facility monitoring start-up. This is necessary in order to establish the stormwater monitoring process from sample collection through generation of usable data. This approach provides the ability to troubleshoot unanticipated problems as we progress to full compliance. Facilities study sites will be added to the monitoring program as the process is established and problems are resolved. We anticipate full implementation of the monitoring program at all nine facilities study sites by March 1, 2012. It is WSDOT's goal to sample a minimum of two qualifying storm events during the remainder of the 2011-12 wet season for facilities monitoring.

It has also become apparent that WSDOT will be unable to begin baseline highway and BMP effectiveness monitoring by January 15, 2012, as stated in the October 20, 2011 G20 notification. This delay is due to recent equipment testing that identified major deficiencies. Prior to January 15, 2012, WSDOT will provide Ecology with a revised schedule for initiating highway and BMP monitoring. An explanation of the steps needed to fully implement this portion of the monitoring program will also be included.

Our expectation that toxicity/first flush monitoring will begin in August 2012 remains unchanged.

WSDOT will make every effort to keep Ecology informed of the status of the agency's stormwater monitoring program. If you have questions or require additional information regarding this matter, please contact Fred Bergdolt, Stormwater Monitoring and Research Coordinator, at bergdof@wsdot.wa.gov or 360-570-6648.

I certify under penalty of law, that this document was prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for willful violations.

Sincerely,

Megan White, P.E., Director
Environmental Services Office

MW:pf

cc: Kenneth M. Stone, Resource Programs Branch Manager, WSDOT
Richard A. Gersib, Stormwater and Watersheds Program Manager, WSDOT
NPDES Municipal Permit File

Sean -
send to
Larry S
Dick G
Ken S

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January 10, 2012

Ms. Megan White
Director
WSDOT Environmental Services Office
Transportation Building
310 Maple Park Avenue SE
Olympia, WA 98504-7300

RE: WSDOT National Pollutant Elimination System (NPDES) Municipal Stormwater Permit, G20 Notification for Non-Compliance with Monitoring Timelines in Special Conditions S7

Dear Ms. White:

The Washington State Department of Ecology (Ecology) received your notification letter dated November 29, 2011, for non-compliance with the terms in Special Condition S7 of the 2009 WSDOT NPDES and State Waste Discharge Permit for Municipal Stormwater (permit). It states the reasons for delays in the start of the monitoring program and revises the projected timelines from an earlier G20 notification letter dated October 20, 2011. Your letter explains that WSDOT is implementing a phased approach to facility monitoring start-up and making progress in fully implementing the monitoring program at all nine facilities by March 1, 2012. Delays in the start of the monitoring program could affect the number of qualifying samples for the 2011-2012 wet season. These delays also affected baseline and BMP monitoring timelines.

This letter is to inform you that Ecology expects WSDOT to make their best effort toward fully establishing the monitoring program and meet sampling of the qualified storms specified in the permit.

Ecology understands that the opportunity for WSDOT to conduct first-flush toxicity sampling by October 2011 has passed due to delays in establishing the monitoring program. WSDOT shall proceed with the first-flush sampling in August 2012, in accordance with the 2011 approved Quality Assurance Project Plan.

Please contact me at foroozan.labib@ecy.wa.gov / (360) 407-6439 if you have any questions.

Sincerely,

Foroozan Labib
Permit Manager
Program Development Services Section

cc: Ecology HQ Permit file

Appendix B: Monitoring Sites at WSDOT Facilities

Rest Areas

Figure B-1

Smokey Point (NB) Rest Area sampling location and drainage area.

Rest Areas (continued)

Figure B-2

Smokey Point (SB) Rest Area sampling location and drainage area.

Maintenance Facilities

Figure B-3

Ballinger sampling location and contributing drainage area.

Maintenance Facilities (continued)

Figure B-4 Lakeview sampling location and contributing drainage area.

Maintenance Facilities (continued)

Figure B-5 Vancouver sampling location and contributing drainage area.

Maintenance Facilities (continued)

Figure B-6 Euclid sampling location and contributing drainage area.

Maintenance Facilities (continued)

Figure B-7 Geiger sampling location and contributing drainage area.

Maintenance Facilities (continued)

Figure B-8 Clarkston sampling location and contributing drainage area.

Ferry Terminal

Figure B-9 Bainbridge Island Ferry Terminal sampling location and drainage area.

Appendix C:
Hydrologic Data Quality Storm Reports

Rest Areas

Smokey Point Northbound													
Precipitation						**Water Temp**		**Aliquot**					
Start Time (PST/PDT)	**End Time (PST/PDT)**	**Total (in.)**	**Duration (hours)**	**Antecedent (hours)**	**Antecedent Met?**	**Min (°C)**	**Max (°C)**	**Samples Collected**	**First Sample (PST/PDT)**	**Last Sample (PST/PDT)**	**Aliquot Volume (mL)**	**Total Sample Volume (mL)**	**Qualifier**
3/9/2012 12:30	3/10/2012 08:30	0.55	20	24	Y	5.8	7.6	5	3/9/2012 14:00	3/9/2012 15:00	1840	9200	
4/3/2012 10:15	4/3/2012 18:00	0.57	7.75	24	Y	7.7	9.5	5	4/3/2012 10:45	4/3/2012 11:45	1840	9200	
4/29/2012 23:30	5/2/2012 07:30	1.75	56	24	Y	9.3	13.4	5	4/29/2012 23:45	4/30/2012 00:45	1840	9200	
5/20/2012 11:30	5/20/2012 21:45	0.32	10.25	72	Y	11.2	16.1	5	5/20/2012 12:00	5/20/2012 13:00	1840	9200	
10/12/2012 10:00	10/12/2012 12:00	0.04[1]	2	168	Y	12.5	13	5	10/12/2012 10:31	10/13/2013 11:31	1840	9200	J
10/18/2012 16:45	10/18/2012 22:00	0.8	5.25	24	Y	12.3	13.6	5	10/18/2012 17:45	10/18/2012 18:45	1840	9200	
1/23/2013 10:45	1/24/2013 06:30	0.48	19.75	24	Y	4	6.5	5	1/23/2013 11:15	1/23/2013 12:15	1840	9200	
2/28/2013 06:00	2/28/2013 23:15	0.38	17.25	24	N[2]	6.4	7.8	5	2/28/2013 09:15	2/28/2013 10:15	1840	9200	R
3/2/2013 14:30	3/2/2013 17:45	0.29	3.25	24	Y	7.1	9.4	5	3/2/2013 15:00	3/2/2013 16:00	1840	9200	
3/6/2013 08:30	3/7/2013 16:45	0.71	32.25	24	Y	6	8.3	5	3/6/2013 9:45	3/6/2013 10:45	1840	9200	

Smokey Point Northbound (cont.)													
Precipitation						**Water Temp**		**Aliquot**					
Start Time (PST/PDT)	**End Time (PST/PDT)**	**Total (in.)**	**Duration (hours)**	**Antecedent (hours)**	**Antecedent Met?**	**Min (°C)**	**Max (°C)**	**Samples Collected**	**First Sample (PST/PDT)**	**Last Sample (PST/PDT)**	**Aliquot Volume (mL)**	**Total Sample Volume (mL)**	**Qualifier**
9/15/2013 18:00	9/15/2013 23:15	0.25	5.25	168	Y	16.9	19	5	9/15/2013 18:15	9/15/2013 19:15	1840	9200	

[1] Did not meet rainfall requirement.

[2] Did not meet antecedent requirement. Sample collected after the first hour of runoff.

Smokey Point Southbound

Precipitation						Water Temp		Aliquot					
Start Time (PST/PDT)	End Time (PST/PDT)	Total (in.)	Duration (hours)	Antecedent (hours)	Antecedent Met?	Min (°C)	Max (°C)	Samples Collected	First Sample (PST/PDT)	Last Sample (PST/PDT)	Aliquot Volume (mL)	Total Sample Volume (mL)	Qualifier
3/9/2012 12:45	3/10/2012 08:45	0.57	20	24	Y	6.8	7.5	5	3/9/2012 12:45	3/9/2012 13:45	1840	9200	
4/3/2012 10:15	4/3/2012 17:30	0.58	7	24	Y	8.1	8.9	5	4/3/2012 10:30	4/3/2012 11:30	1840	9200	
4/29/2012 23:30	5/2/2012 04:45	1.79	53.25	24	Y	9	12.7	5	4/29/2012 23:45	4/30/2012 00:45	1840	9200	
5/20/2012 11:30	5/21/2012 22:45	0.38	11.25	72	Y	13.8	15.5	5	5/20/2012 11:45	5/20/2012 12:45	1840	9200	
10/12/2012 09:45	10/12/2012 11:45	0.04[1]	2	168	Y	13.5	13.8	5	10/12/2012 10:32	10/12/2012 11:32	1840	9200	J
10/18/2012 16:45	10/18/2012 22:15	0.83	5.5	24	Y	11.9	13.3	5	10/18/2012 17:48	10/18/2012 18:48	1840	9200	
12/11/2012 12:00	12/12/2012 13:15	0.75	25.25	24	Y	6	8.8	5	12/11/2012 13:58[3]		1840	9200	
1/23/2013 10:45	1/24/2013 09:30	0.5	22.75	24	Y	4.2	5.7	5	1/23/2013 11:15	1/23/2013 12:15	1840	9200	
4/4/2013 11:45	4/5/2013 08:30	0.53	20.75	24	Y	10	12.5	5	4/4/2013 12:30	4/4/2013 13:30	1840	9200	
4/10/2013 09:00	4/10/2013 14:15	0.24	5.25	24	Y	10	11.1	5	4/10/2013 09:21	4/10/2013 10:21	1840	9200	
4/12/2013 13:30	4/13/2013 17:15	0.62	27.75	24	Y	7.7	10.1	5	4/12/2013 13:46	4/12/2013 14:46	1840	9200	

Smokey Point Southbound (cont.)													
Precipitation						**Water Temp**		**Aliquot**					
Start Time (PST/PDT)	**End Time (PST/PDT)**	**Total (in.)**	**Duration (hours)**	**Antecedent (hours)**	**Antecedent Met?**	**Min (°C)**	**Max (°C)**	**Samples Collected**	**First Sample (PST/PDT)**	**Last Sample (PST/PDT)**	**Aliquot Volume (mL)**	**Total Sample Volume (mL)**	**Qualifier**
9/15/2013 17:00	9/15/2013 22:45	0.25	4.75	168	Y	18.4	19	5	9/15/2013 18:18	9/15/2013 19:18	1840	9200	

[1] Did not meet rainfall requirement.

[3] Only grab samples collected.

Maintenance Facilities

Ballinger, Northwest Region													
Precipitation						**Water Temp**		**Aliquot**					
Start Time (PST/PDT)	**End Time (PST/PDT)**	**Total (in.)**	**Duration (hours)**	**Antecedent (hours)**	**Antecedent Met?**	**Min (°C)**	**Max (°C)**	**Samples Collected**	**First Sample (PST/PDT)**	**Last Sample (PST/PDT)**	**Aliquot Volume (mL)**	**Total Sample Volume (mL)**	**Qualifier**
1/24/2012 07:00	1/24/2012 17:30	0.21	10.5	24	Y	2.8	4.9	5	1/24/2012 07:30	1/24/2012 08:30	1840	9200	
2/24/2012 14:30	2/26/2012 01:00	0.2	27.5	24	Y	1.4	6.7	5	2/24/2012 15:00	2/25/2012 16:00	1840	9200	
2/28/2012 17:15	2/29/2012 11:00	0.68	17.75	24	Y	0.9	5	5	2/28/2012 17:30	2/28/2012 18:30	1840	9200	
3/9/2012 13:00	3/10/2012 07:00	0.37	17.25	24	Y	6	8.4	5	3/9/2012 13:15	3/9/2012 14:15	1840	9200	
4/3/2012 09:15	4/4/2012 18:15	0.17	9	24	Y	7.8	10	5	4/3/2012 10:00	4/3/2012 11:00	1840	9200	
4/29/2012 23:00	4/30/2012 05:45	0.28	6.75	24	Y	10.5	13.1	5	4/29/2012 23:15	4/30/2012 00:15	1840	9200	
6/22/2012 10:30	6/23/2012 02:15	0.92	15.75	72	Y	13.2	17.4	5	6/22/2012 11:15	6/22/2012 12:15	1840	9200	
10/18/2012 18:45	10/18/2012 23:30	0.53	4.75	168	N[1]	11.9	13.9	5	10/18/2012 18:46	10/18/2012 19:46	1840	9200	R
11/28/2012 14:00	11/29/2012 00:15	0.21	10.25	24	Y	6.8	7.7	5	11/28/2012 14:04	11/28/2012 15:04	1840	9200	
12/11/2012 14:00	12/12/2012 18:45	0.41	28.75	24	Y	5.7	8	5	12/11/2012 18:11[2]	12/11/2012 19:11	1840	9200	R

Ballinger, Northwest Region (cont.)														
Precipitation						**Water Temp**		**Aliquot**						
Start Time (PST/PDT)	**End Time (PST/PDT)**	**Total (in.)**	**Duration (hours)**	**Antecedent (hours)**	**Antecedent Met?**	**Min (°C)**	**Max (°C)**	**Samples Collected**	**First Sample (PST/PDT)**	**Last Sample (PST/PDT)**	**Aliquot Volume (mL)**	**Total Sample Volume (mL)**	**Qualifier**	
1/8/2013 07:15	1/9/2013 22:00	1.87	38.75	24	Y	3	8.2	5	1/8/2013 09:12[3]		1840	9200	R	
1/23/2013 10:30	1/23/2013 20:45	0.3	10.25	24	Y	2.6	4.8	5	1/23/2013 11:00	1/23/2013 12:00	1840	9200		
2/20/2013 14:45	2/20/2013 19:15	0.14[4]	4.5	24	Y	6.2	7	5	2/20/2013 15:30	2/20/2013 16:30	1840	9200	J	
3/6/2013 10:15	3/7/2013 09:30	0.74	23.25	24	Y	5.4	7.8	5	3/6/2013 10:36	3/6/2013 11:36	1840	9200		
5/21/2013 02:15	5/21/2013 15:30	0.38	13.25	72	Y	10	16.9	4[5]	5/21/2013 02:43	5/21/2013 3:43	1840	7360	R	
9/15/2013 08:30	9/15/2013 19:15	0.32	10.75	168	Y	13.9	19.7	5	9/15/2013 16:35	9/15/2013 17:35	1840	9200		

[1] Did not meet antecedent requirement.

[2] Sampled after the first hour of runoff.

[3] Only grab samples collected. Samples collected after the first 20 minutes of runoff.

[4] Did not meet rainfall requirement.

[5] Only four aliquots collected.

Lakeview, Olympic Region													
Precipitation						**Water Temp**		**Aliquot**					
Start Time (PST/PDT)	**End Time (PST/PDT)**	**Total (in.)**	**Duration (hours)**	**Antecedent (hours)**	**Antecedent Met?**	**Min (°C)**	**Max (°C)**	**Samples Collected**	**First Sample (PST/PDT)**	**Last Sample (PST/PDT)**	**Aliquot Volume (mL)**	**Total Sample Volume (mL)**	**Qualifier**
4/3/2012 08:15	4/3/2012 12:30	0.18[1]	4.25	24	Y	7.2	9.6	5	4/3/2012 09:45	4/3/2012 10:45	1840	9200	J
4/16/2012 01:00	4/16/2012 07:00	0.34	6	24	Y	9.5	12.5	5	4/16/2012 01:15	4/16/2012 02:15	1840	9200	
4/17/2012 15:15	4/18/2012 16:45	0.24	25.5	24	Y	8.6	12.8	5	4/17/2012 15:30	4/17/2012 16:30	1840	9200	
4/25/2012 10:30	4/26/2012 22:15	0.84	35.75	24	Y	11.1	15.9	5	4/25/2012 11:15	4/25/2012 12:15	1840	9200	
4/29/2012 22:30	4/30/2012 17:00	0.45	18.5	24	Y	11.2	13.9	5	4/29/2012 11:00	4/30/2012 12:00	1840	9200	
6/22/2012 10:45	6/23/2012 3:30	0.22	16.75	72	Y	13.7	18	5	6/22/2012 11:00	6/22/2012 12:00	1840	9200	
10/12/2012 08:00	10/12/2012 13:15	0.07[1]	5.25	168	Y	N/A	N/A	5	10/12/2012 12:29	10/12/2012 13:29	1840	9200	J
10/18/2012 19:30	10/19/2012 09:15	0.43	13.75	24	Y	12.92	15.25	5	10/18/2012 19:39	10/18/2012 20:39	1840	9200	
11/16/2012 13:30	11/17/2012 01:45	0.12[2]	12.25	24	Y	0.7	11.5	5	11/16/2012 15:43	11/16/2012 16:43	1840	2300	J
1/23/2013 11:00	1/23/2013 16:15	0.15[1]	5.25	24	Y	3.6	6.67	5	1/23/2013 11:28	1/23/2013 12:28	1840	9200	J
3/19/2013 16:30	3/20/2013 14:45	0.93	22.25	24	Y	7.49	11.17	5	3/19/2013 16:46	3/19/2013 17:46	1840	9200	

Lakeview, Olympic Region (cont.)

Precipitation						Water Temp		Aliquot					
Start Time (PST/PDT)	End Time (PST/PDT)	Total (in.)	Duration (hours)	Antecedent (hours)	Antecedent Met?	Min (°C)	Max (°C)	Samples Collected	First Sample (PST/PDT)	Last Sample (PST/PDT)	Aliquot Volume (mL)	Total Sample Volume (mL)	Qualifier
3/28/2013 03:30	3/28/2013 05:00	0.10[1]	1.5	24	Y	6.88	9.21	5	3/28/2013 04:03	3/28/2013 05:03	1840	9200	J
4/4/2013 09:00	4/4/2013 17:15	0.19[1]	8.25	24	Y	9.64	14.41	5	4/4/2013 09:48	4/4/2013 10:48	1840	9200	J
4/10/2013 08:30	4/10/2013 11:15	0.21	2.75	24	Y	10.33	12.37	5	4/10/2013 08:44	4/10/2013 09:44	1840	9200	
9/15/2013 08:45	9/15/2013 17:00	0.06[1]	8.25	168	Y	15.56	18.93	5	9/15/2013 08:47	9/15/2013 09:47	1840	9200	J

[1] Did not meet rainfall requirement.

[2] Sediment in rain gage. Used weather data from Lake Spanaway. Samples collected late and jar only 25 percent full.

Vancouver, Southwest Region													
Precipitation						Water Temp		Aliquot					
Start Time (PST/PDT)	End Time (PST/PDT)	Total (in.)	Duration (hours)	Antecedent (hours)	Antecedent Met?	Min (°C)	Max (°C)	Samples Collected	First Sample (PST/PDT)	Last Sample (PST/PDT)	Aliquot Volume (mL)	Total Sample Volume (mL)	Qualifier
2/28/2012 12:00	2/29/2012 14:45	0.54	26.75	24	Y	6.1	7.4	5	2/28/2012 14:45	2/28/2012 15:45	1840	9200	
4/3/2012 07:00	4/3/2012 13:00	0.26	6	24	Y	8.2	8.9	5	4/3/2012 08:00	4/3/2012 09:00	1840	9200	
4/17/2012 14:00	4/18/2012 05:45	0.2	15.75	24	Y	8.8	9.2	5	4/17/2012 14:45	4/17/2012 15:45	1840	9200	
4/25/2012 07:45	4/25/2012 09:00	0.04[1]	1.25	24	Y	10.3	10.6	5	4/25/2012 09:15	4/25/2012 10:15	1840	9200	J
6/22/2012 18:00	6/23/2012 15:45	0.83	21.75	72	Y	13.9	17.3	5	6/22/2012 18:30	6/22/2012 19:30	1840	9200	
10/12/2012 09:45	10/12/2012 22:30	1.19	12.75	168	Y	13.62	16.47	5	10/12/2012 09:58	10/12/2012 10:58	1840	9200	
12/8/2012 15:15	12/9/2012 00:30	0.12[1]	9.25	24	Y	9.43	10.51	5	12/8/2012 15:45	12/8/2012 16:45	1840	9200	J
1/23/2013 12:30	1/23/2013 16:45	0.22	4.25	24	Y	6.21	7.03	5	1/23/2013 13:09	1/23/2013 14:09	1840	9200	
3/19/2013 14:00	3/20/2013 08:45	0.83	18.75	24	Y	7.93	8.66	5	3/19/2013 17:30	3/19/2013 18:30	1840	9200	
4/4/2013 08:45	4/4/2013 21:45	0.23	13	24	Y	9.1	10.56	5	4/4/2013 09:53	4/4/2013 10:53	1840	9200	
4/5/2013 15:30	4/6/2013 06:15	0.24	14.75	24	Y	9.7	10.4	5	4/5/2013 16:07	4/5/2013 17:07	1840	9200	

Vancouver, Southwest Region (cont.)													
Precipitation						**Water Temp**		**Aliquot**					
Start Time (PST/PDT)	**End Time (PST/PDT)**	**Total (in.)**	**Duration (hours)**	**Antecedent (hours)**	**Antecedent Met?**	**Min (°C)**	**Max (°C)**	**Samples Collected**	**First Sample (PST/PDT)**	**Last Sample (PST/PDT)**	**Aliquot Volume (mL)**	**Total Sample Volume (mL)**	**Qualifier**
9/21/2013 12:00	9/22/2013 00:45	0.43	12.75	168	N[2]	18.14	20.24	5	9/21/2013 12:20	9/21/2013 13:20	1840	9200	R

[1] Did not meet rainfall requirement.

[2] Did not meet antecedent requirement.

Euclid, North Central Region

Precipitation						Water Temp		Aliquot						
Start Time (PST/PDT)	**End Time (PST/PDT)**	**Total (in.)**	**Duration (hours)**	**Antecedent (hours)**	**Antecedent Met?**	**Min (°C)**	**Max (°C)**	**Samples Collected**	**First Sample (PST/PDT)**	**Last Sample (PST/PDT)**	**Aliquot Volume (mL)**	**Total Sample Volume (mL)**	**Qualifier**
3/27/2012 14:45	3/28/2012 00:45	0.35	10	24	Y	6.4	8.3	5	3/27/2012 18:00	3/27/2012 19:00	1840	9200	
4/25/2012 16:15	4/25/2012 20:45	0.33	4.5	24	Y	9.6	19.1	5	4/25/2012 16:30	4/25/2012 17:30	1840	9200	
6/7/2012 08:30	6/7/2012 19:00	0.25	10.5	24	Y	12.8	16	5	6/7/2012 10:15	6/7/2012 11:15	1840	9200	
10/15/2012 18:00	10/15/2012 19:45	0.07[1]	1.75	168	N[2]	15.83	18.37	5	10/15/2012 19:00	10/15/2012 20:00	1840	9200	R
12/4/2012 02:00	12/4/2012 05:30	0.11[1]	3.5	24	Y	5.77	10.49	5	12/4/2012 02:47	12/4/2012 03:47	1840	9200	J
3/6/2013 01:45	3/6/2013 12:30	0.3	10.75	24	Y	3.2	6.2	5	3/6/2013 05:33	3/6/2013 06:33	1840	9200	
3/19/2013 19:30	3/20/2013 00:00	0.4	4.5	24	Y	4.7	7.5	5	3/19/2013 20:16	3/19/2013 21:16	1840	9200	
5/21/2013 07:15	5/21/2013 12:45	0.45	5.5	24	Y	13.65	15.18	5	5/21/2013 08:46	5/21/2013 09:46	1840	9200	
6/19/2013 07:15	6/19/2013 09:30	0.35	2.25	24	Y	14.5	16.5	5	6/19/2013 07:42	6/19/2013 08:42	1840	9200	

[1] Did not meet rainfall requirement.

[2] Did not meet antecedent requirement..

Geiger, Eastern Region													
Precipitation						**Water Temp**		**Aliquot**					
Start Time (PST/PDT)	**End Time (PST/PDT)**	**Total (in.)**	**Duration (hours)**	**Antecedent (hours)**	**Antecedent Met?**	**Min (°C)**	**Max (°C)**	**Samples Collected**	**First Sample (PST/PDT)**	**Last Sample (PST/PDT)**	**Aliquot Volume (mL)**	**Total Sample Volume (mL)**	**Qualifier**
3/14/2012 18:00	3/15/2012 23:00	1.22	29	24	Y	3.5	7.7	5	3/14/2012 19:00	3/14/2012 20:00	1840	9200	
3/20/2012 09:00	3/20/2012 15:30	0.16[1]	6.5	24	Y	0.03	6.5	5	3/20/2012 09:15	3/20/2012 10:15	1840	9200	J
3/26/2012 06:45	3/26/2012 16:15	0.63	9.5	24	Y	3.8	9.1	5	3/26/2012 14:15	3/26/2012 15:15	1840	9200	
5/2/2012 03:15	5/2/2012 09:00	0.1[1]	5.75	24	Y	6.3	12.4	5	5/2/2012 03:30	5/2/2012 04:30	1840	9200	J
6/24/2012 19:30	6/24/2012 23:15	0.15[1]	3.75	72	Y	18.1	24.6	5	6/22/2012 22:15	6/22/2012 23:15	1840	9200	J
10/22/2012 16:15	10/22/2012 19:15	0.16[1]	3	168	N[2]	5	6.8	5	10/22/2012 16:30	10/22/2012 17:30	1840	9200	R
3/20/2013 01:00	3/20/2013 18:00	0.57	17	24	Y	1.92	14.5	5	3/20/2013 01:15	3/20/2013 02:15	1840	9200	
4/4/2013 13:45	4/4/2013 19:00	0.12[1]	5.25	24	Y	11.62	14.87	5	4/4/2012 14:04	4/4/2013 15:04	1840	9200	J
5/13/2013 12:45	5/13/2013 16:15	0.26	3.5	24	Y	15.32	17.98	5	5/13/2013 13:00	5/13/2013 14:00	1840	9200	
9/4/2013 22:15	9/5/2013 07:15	0.2	9	168	Y	18.21	22.41	5	9/4/2013 22:26	9/4/2013 23:26	1840	9200	

[1] Did not meet rainfall requirement.
[2] Did not meet antecedent requirement.

Clarkston, South Central Region													
Precipitation						**Water Temp**		**Aliquot**					
Start Time (PST/PDT)	**End Time (PST/PDT)**	**Total (in.)**	**Duration (hours)**	**Antecedent (hours)**	**Antecedent Met?**	**Min (°C)**	**Max (°C)**	**Samples Collected**	**First Sample (PST/PDT)**	**Last Sample (PST/PDT)**	**Aliquot Volume (mL)**	**Total Sample Volume (mL)**	**Qualifier**
3/15/2012 19:15	3/16/2012 10:00	0.35	14.75	24	Y	8.2	9.6	5	3/15/2012 20:15	3/15/2012 21:15	1840	9200	
3/20/2012 14:45	3/21/2012 21:30	0.94	30.75	24	Y	5.8	8.7	5	3/20/2012 16:00	3/20/2012 17:00	1840	9200	
4/4/2012 05:30	4/4/2012 12:45	0.32	7.25	24	Y	6.6	8.2	5	4/4/2012 06:30	4/4/2012 07:30	1840	9200	
4/26/2012 06:45	4/26/2012 13:45	0.22	7	24	Y	16.6	19.6	5	4/26/2012 10:00	4/26/2012 11:00	1840	9200	
2/7/2013 12:45	2/8/2013 01:15	0.35	12.5	24	Y	5.7	7.4	5	2/7/2013 13:45	2/7/2013 14:45	1840	9200	
4/4/2013 21:00	4/4/2013 21:45	0.07[1]	0.75	24	Y	13.19	13.53	5	4/4/2013 21:02	4/4/2013 22:02	1840	9200	J
4/19/2013 03:30	4/19/2013 12:45	0.22	9.25	24	Y	11.17	11.98	5	4/19/2013 03:51	4/19/2013 04:51	1840	9200	
5/21/2013 16:45	5/21/2013 18:45	0.2	2	24	Y	15.11	16.69	5	5/21/2013 16:58	5/21/2013 17:58	1840	9200	
6/24/2013 03:45	6/24/2013 20:45	0.24	24	24	Y	20.52	22.09	5	6/24/2013 04:48	6/24/2013 05:48	1840	9200	
9/3/2013 12:15	9/3/2013 14:30	0.08[1]	2.25	168	Y	25.22	25.68	5	9/3/2013 12:30	9/3/1930 13:30	1840	9200	J

[1] Did not meet rainfall requirement.

Ferry Terminal

Bainbridge Island Ferry Terminal														
Precipitation						**Water Temp**		**Aliquot**						
Start Time (PST/PDT)	**End Time (PST/PDT)**	**Total (in.)**	**Duration (hours)**	**Antecedent (hours)**	**Antecedent Met?**	**Min (°C)**	**Max (°C)**	**Samples Collected**	**First Sample (PST/PDT)**	**Last Sample (PST/PDT)**	**Aliquot Volume (mL)**	**Total Sample Volume (mL)**	**Qualifier**	
9/17/2011 11:45	9/17/2011 22:30	0.32	10.75	168	Y	13.7	18.6	5	9/17/2011 12:00	9/17/2011 13:00	1840	9200		
1/24/2012 06:15	1/24/2012 20:30	0.33	14.25	24	Y	2.3	4.6	5	1/24/2012 07:15	1/24/2012 08:15	1840	9200		
2/17/2012 14:00	2/17/2012 18:00	0.24	4	24	N	7.8	9.5	5	2/17/2012 14:30	2/17/2012 15:30	1840	9200		
2/28/2012 16:45	2/29/2012 01:30	0.27	8.75	24	Y	4.4	6.4	5	2/28/2012 17:30	2/28/2012 18:30	1840	9200		
3/9/2012 14:15	3/10/2012 05:30	0.21	15.25	24	Y	7.1	8.4	5	3/9/2012 19:00	3/9/2012 20:00	1840	9200		
3/19/2012 22:30	3/20/2012 03:00	0.19[1]	4.5	24	Y	6.2	6.9	5	3/20/2012 00:15	3/20/2012 01:15	1840	9200	J	
5/17/2012 17:45	5/18/2012 01:15	0.39	7.5	72	Y	12.1	21.1	5	5/17/2012 18:30	5/17/2012 19:30	1840	9200		
10/18/2012 18:45	10/19/2012 04:15	0.45	9.5	168	N[2]	12.3	14.7	4[3]	10/18/2012 18:51	10/18/12 19:51	1840	7360	R	
11/28/2012 13:15	11/28/2012 20:45	0.2	7.5	24	Y	7.6	9.5	5	11/28/2012 14:07	11/28/2012 15:07	1840	9200		
1/8/2013 07:30	1/9/2013 09:30	1.36	26.5	24	Y	4.4	6.9	5	1/8/2013 07:23	1/8/2013 08:23	1840	9200		

Bainbridge Island Ferry Terminal (cont.)													
Precipitation						Water Temp		Aliquot					
Start Time (PST/PDT)	End Time (PST/PDT)	Total (in.)	Duration (hours)	Antecedent (hours)	Antecedent Met?	Min (°C)	Max (°C)	Samples Collected	First Sample (PST/PDT)	Last Sample (PST/PDT)	Aliquot Volume (mL)	Total Sample Volume (mL)	Qualifier
2/20/2013 15:15	2/20/2013 18:15	0.12[1]	3	24	Y	7.6	8.5	5	2/20/2013 15:36	2/20/2013 16:36	1840	9200	J
2/27/2013 14:30	2/28/2013 11:00	0.45	20.5	24	Y	7.2	8.6	5	2/27/2013 17:50	2/27/2013 18:50	1840	9200	
3/19/2013 16:15	3/20/2013 12:15	1.07	20	24	Y	8.2	11.4	5	3/19/2013 16:48	3/19/2013 17:48	1840	9200	
5/21/2013 00:45	5/21/2013 07:00	0.41	6.25	72	Y	11.5	15.7	5	5/21/2013 01:17	5/21/2013 02:17	1840	9200	

[1] Did not meet rainfall requirement.

[2] Did not meet antecedent requirement.

[3] Only 4 aliquots collected.

Appendix D:
Monitoring Costs

Monitoring Costs

Introduction

In February 2009, the Washington State Department of Ecology (Ecology) issued a National Pollutant Discharge and Elimination System (NPDES) and State Waste Discharge Municipal Stormwater Permit (permit) (Ecology 2009a) to the Washington State Department of Transportation (WSDOT).

Under Special Condition S7 of the permit, WSDOT collected baseline stormwater monitoring data from its highways, rest areas, ferry terminals, and maintenance facilities. In addition, the department evaluated the effectiveness of stormwater treatment and hydrologic (flow control) best management practices (BMPs).

Implementing a monitoring program to satisfy all of these permit requirements was a complex and expensive endeavor.

Program Implementation and Cost Containment Strategies

To reduce costs, conserve resources, and address logistical challenges in implementing the WSDOT stormwater monitoring program, WSDOT developed a strategy to limit the total number of monitoring sites needed to meet permit requirements. For example, three of five highway runoff characterization monitoring stations were co-located with BMP effectiveness monitoring study sites along Interstate 5 (I-5) north of Everett. In addition, a monitoring station established along State Route 9 (SR 9) near Marysville combined a rural highway runoff characterization and BMP toxicity sampling station to consolidate two sites to one. Co-locating BMP effectiveness and highway runoff characterization monitoring sites decreased costs and the level of staff resources needed by reducing the total number of sites from 20 to 16.

WSDOT also made efforts to consolidate monitoring activities to a minimum number of locations across the state. For example, the two high-use rest area characterization sites, all BMP effectiveness sites, and four of five highway runoff characterization monitoring stations were clustered in an area just north of Everett. Clustering sites helped address logistical challenges and reduced monitoring team mobilization costs by minimizing staff travel time and costs. Travel times between the rest area characterization, BMP effectiveness, and highway characterization monitoring sites north of Everett were less than 30 minutes.

Figure D-1 shows the location of monitoring sites across the state.

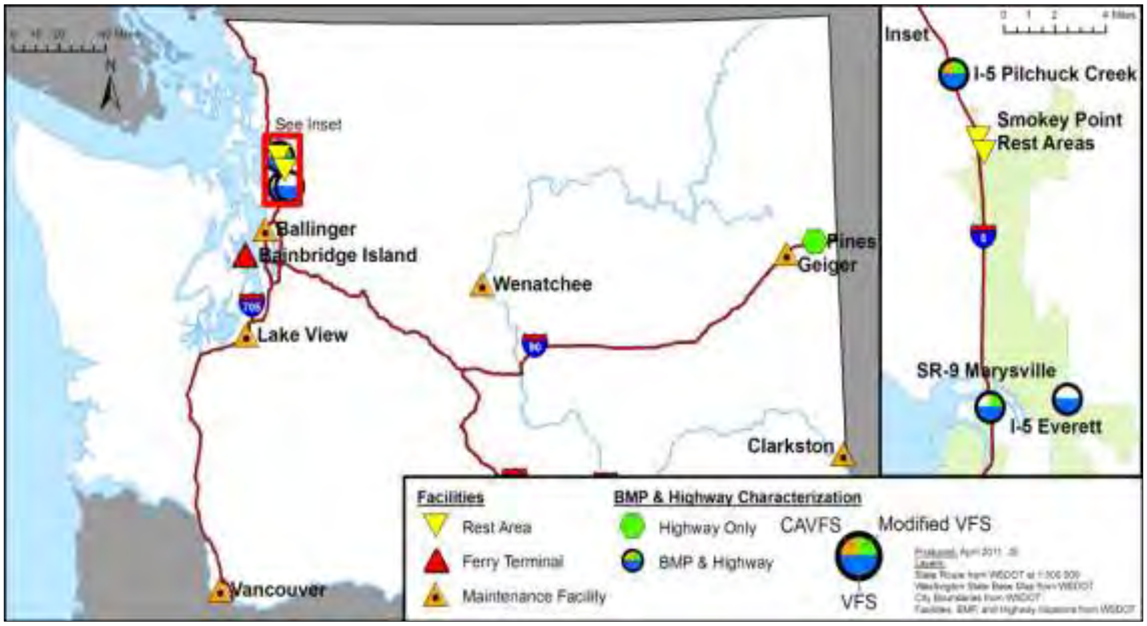

Figure D-1 **Monitoring Site Locations**

During the monitoring site selection process, the department carefully considered opportunities to combine internal research interests at WSDOT with permit-required obligations. For example, BMP study sites along I-5 north of Everett support the department's stormwater research priorities and provide a paired BMP effectiveness study of a low-impact development (LID) approach that also satisfies the permit's BMP effectiveness monitoring requirements. Monitoring resources and expenses are shared by the department's Stormwater and Watersheds and Highway Runoff Programs. This collaborative partnership helps achieve additional savings for WSDOT.

Other cost containment strategies include automating data collection platforms (DCPs) to the maximum extent possible to reduce staff needs and address the logistics of a monitoring program that is required to span the state. WSDOT used an existing monitoring station and monitoring infrastructure from a previous stormwater study at the Bainbridge Island ferry terminal to realize further cost reductions.

Monitoring Program Budget

Costs associated with planning and implementing the WSDOT stormwater monitoring program included the following:

Planning (≈ 20% of budget)

- Background research (e.g., previous, similar studies)
- Developing a site selection strategy
- Field reconnaissance for final site selection
- Developing project scope and sampling designs

- Developing monitoring Quality Assurance Project Plans (QAPPs)

Implementation (≈ 80% of budget)

- Equipment and supplies (purchase, installation, maintenance, and replacement)
- Database development and implementation
- Training
- Logistics (e.g., pre-storm preparation and post-storm sample transfer)
- Sample collection (e.g., staff time and travel expenses)
- Laboratory analysis
- Verification and validation (data quality assurance and quality control)
- Data management
- Data analyses and report writing

Labor Costs

To address logistical challenges in implementing a statewide monitoring program, WSDOT used Stormwater and Watersheds Program staff in the headquarters Environmental Services Office (ESO) and staff from region offices to implement its highway runoff characterization, BMP effectiveness, and facilities characterization monitoring programs.

Eight staff from the headquarters ESO played key roles in implementing the stormwater monitoring program. These staff included:

- a monitoring program coordinator,
- field lead,
- data steward,
- data management lead,
- quality assurance officer,
- two monitoring field specialists, and
- a team logistics specialist.

Thirty-six staff from regional offices across the state supported ESO efforts on a part-time basis and participated in stormwater monitoring at different levels. Personnel included:

- maintenance facility staff (technicians, engineers, specialists),
- a vessel project engineer,
- electronic communications systems technician, and
- a building engineer.

In addition, consultants assisted the site selection process, QAPP and quality systems development, monitoring station construction, third-party data validation, database development and implementation, preparation of standard operating procedures (SOPs), and monitoring report technical review.

Equipment, Materials, and Laboratory Analytical Costs

Monitoring start-up costs included costs associated with planning the monitoring program and an initial purchase of equipment for $415,000 (automatic samplers, data loggers, gas bubblers, pressure transducers, connecting cables, and solar panels). Other significant expenditures included:

- Truck purchase
- Chemistry and hydrology databases (purchase, license, and maintenance fees)
- Equipment storage, staging, and cleaning facilities
- Ruggedized laptops and portable printers
- Tools for station construction and installation
- Sample bottles, coolers, freezer, and icemaker
- Consumables (nitrile gloves, wash brushes, packing supplies)

Data collection platforms (DCPs) at the rest areas, maintenance facilities, and ferry terminal monitoring sites averaged $21,000, including approximately $17,000 for equipment and $4,000 for construction. A combined highway runoff characterization and BMP monitoring study site averaged $69,000, including $43,000 for equipment and $26,000 in site construction costs.

Laboratory analytical costs varied depending on the number of samples successfully collected and the number of samples needed for quality assurance and quality control. Six laboratories conducted the analyses for WSDOT.

Toxicity sampling results in 2012 and 2013 showed no significant effect and a high survival rate for the target species. WSDOT incurred costs for toxicity testing, but no follow-up actions and additional expenditures were required.

Monitoring Cost Summary

Table D-1 summarizes WSDOT's costs for stormwater monitoring under Special Condition S7 of the 2009 NPDES municipal permit.[2] While the highway runoff characterization and BMP effectiveness monitoring programs are ongoing, the facilities and toxicity monitoring programs were completed in October 2013.

[2] Monitoring costs are based on *actual* expenditures from March 2009 through February 2014. Values are not equivalent to the *estimated* monitoring expenditures detailed in WSDOT NPDES municipal stormwater permit annual reports.

Table D-1 Monitoring Equipment, Materials, and Laboratory Costs

Category	Monitoring Program Costs Term of Permit (5 years)
Labor costs for ESO headquarters staff	$2,009,600
Labor costs for region field staff	$345,300
Consultant costs	$710,300
Equipment purchase and construction costs	$1,085,000
Laboratory analytical costs	$355,600
Toxicity testing and follow-up actions	$8,700
Total costs	**$4,514,500**

Appendix E: Analytical Data Quality Assessment Report

Analytical Data Quality Assessment Report

Washington State Department of Transportation

NPDES Stormwater Monitoring Program

for

Data Collected during October 12, 2012 through September 21, 2013

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February 27, 2014

Executive Summary

This Data Quality Assessment Report (DQAR) presents an overview of the analytical scheme, data verification and validation procedures, and the quality of analytical data collected during the stormwater monitoring year 2013 (October 12, 2012 through September 21, 2013) under the Washington State Department of Transportation's (WSDOT) National Pollution Discharge Elimination System (NPDES) Stormwater Monitoring Program (Program). The quality of data was assessed and discussed in terms of Measurement Quality Objectives (MQOs), *i.e.*, precision, accuracy, representativeness, comparability, sensitivity, and completeness.

A total of 189 stormwater and eight sediment samples were collected during this monitoring year. Sample analyses were primarily performed by the Washington State Department of Ecology (Ecology) Manchester Environmental Laboratory (MEL) with specialty analyses performed by AmTest Laboratories, Inc. (surfactants and fecal coliform), and TestAmerica Laboratories, Inc. (total Kjeldahl nitrogen [TKN] and glyphosate).

A Stage 2A and 2B data validation was performed on 90 percent of the analytical data, and a Stage 3+4 validation on 10 percent of the data. Based on the on-going oversight of the laboratory performance and the outcome of the data validation, completeness of the data collection effort was calculated as 98.7 percent, thus achieving the monitoring goal of 95%. Significant observations and results of the analytical data quality assessment are summarized as follows:

1. The sample filtration for dissolved metals and *ortho*-phosphate was to be conducted within 15 minutes of collection, according to 40CFR, Part 136. Due to technical difficulty, most of the samples were filtered outside the 15-minute window, yet within 24 hours of collection. The delay in filtration was not expected to result in significant effects on data quality. Dissolved metals and *ortho*-phosphate results were footnoted in the Annual Report for these cases.

2. The reporting limits (RLs) for semi-volatile organic compounds (SVOCs) in sediment samples were elevated three to eight times from the project goal for method RLs. This range of elevations resulted from the required dilution of sample extracts to overcome the oily nature of the samples. The reported sample-specific RLs were considered the best-possible RLs given the conditions of the samples. No further actions were feasible other than noting the incident in this document.

3. The initial calibration verification (ICV) analysis (using a second source standard) was not performed for herbicides (Triclopyr, 2,4-D, clopyralid, and picloram) analyses with SW846 Method 8270D. The laboratory instead reported the back-calculated recovery of each initial calibration standard. The second-source verification was evaluated with the laboratory control sample (LCS) and LCS duplicate (LCSD) results reported for each sample preparation batch. The lack of ICV analysis was noted as a deviation from analytical procedures and subject to a corrective action for method compliance.

4. The recovery of all surrogate spikes for the polycyclic aromatic hydrocarbon (PAH) analyses was less than 10% or the lower control limits in two stormwater samples, indicating a potential of unsuccessful extraction of these samples. The PAH detections in these samples were qualified as estimated values and the non-detects were rejected.

5. A total of 160 stormwater samples were analyzed for TKN. The results for 72 samples were affected by one or multiple quality control (QC) anomalies, including detections of the analyte in method blanks and/or equipment rinsate blanks, biased-low recovery in matrix spike analyses, and/or biased-low calibration verification recovery. As a result, the affected data were qualified as non-detects or estimates, which collectively affected the TKN data usability. The field and laboratory procedures for TKN are subjected to review and corrective actions follow as needed to improve TKN data quality in the future.

6. At least one set of field duplicate and equipment rinsate blank were collected from each monitored facility for the analyses of the facility's respective monitoring parameters. Among all target analytes, PAH results showed higher variability than other analytes within selected field duplicate pairs, likely due to the presence of particulates in these stormwater samples. Low-level total lead and total/dissolved zinc were present in equipment rinsate blanks more frequently than other target analytes. However, no significant deficiency relative to field procedures was identified based on the field duplicate and equipment rinsate blank results.

7. As part of this overall data quality assessment, the correlation between total and dissolved metal concentrations for each metal/sample was evaluated. Metals results were considered "uncorrelated" and the usability of the results affected if the "total" concentration for a metal was less than its "dissolved" concentration in a sample and the concentration difference was beyond experimental errors (i.e., relative percent

difference [RPD] value was >10%, or concentration difference value was >RL). No significant "uncorrelated" metals results were found.

8. Selected herbicides (i.e., 2,4-D, clopyralid, and pycloram) consistently showed low recovery in the LCS and LCSD associated with water sample analyses. As a result, the usability for a great number of herbicides data was affected. For instance, clopyralid results for 42 samples and pycloram results for 26 samples out of the 67 samples collected for herbicides analyses were qualified as estimated. The laboratory procedures for herbicides extraction and analysis are subjected to review and corrective actions followed as needed to address the low LCS/LCSD recovery issue.

9. Benzoic acid, benzyl alcohol, 2,4-dimethylphenol, 2,-methylphenol, and pentachlorophenol consistently showed lower recovery (i.e., percent recovery [%R] values were less than 10% or their lower control limits) in the LCS and LCSD associated with sediment samples. These compounds were not detected in any of the sediment samples; results were therefore qualified (R) and rejected or (UJ) as estimated for all eight sediment samples. These compounds are known "poor" responders to the specified extraction and analytical methods; no corrective action was called for other than noting the observations herein.

10. As noted by the laboratory, detections of selected herbicides, PAHs, and phthalates in a great number of samples - particularly 2,4-D (13 samples), benzo(a)anthracene (19 samples), benzo(a)pyrene (28 samples), and di-*n*-octylphthalate (12 samples), could not be definitively identified and accurately quantitated because the ion abundance ratios for these detections did not meet the method criteria for compound identification.

3

Table of Contents

Acronyms and Abbreviations

%D	percent difference
%D_f	percent drift
%R	percent recovery
ASTM	American Society of Testing and Materials
CCB	continuing calibration blank
CCV	continuing calibration verification
CLP	U.S. EPA Contract Laboratory Program
COC	chain of custody
CS1	recovery of the first (lowest concentration) initial calibration standard
DQAR	data quality assessment report
DQO	data quality objective
DVR	data validation report
Ecology	Washington State Department of Ecology
EPA	U.S. Environmental Protection Agency
ICAL	initial calibration
ICB	initial calibration blank
ICP	inductively coupled plasma
ICV	initial calibration verification
LCL	lower control limit
LCS	laboratory control sample
LCSD	laboratory control sample duplicate
MBAS	methylene blue active substances
MDL	method detection limit
MEL	Washington State Department of Ecology Manchester Environmental Laboratory
MQO	measurement quality objective
MS	matrix spike
MSD	matrix spike duplicate
NPDES	National Pollution Discharge Elimination System
OP	*ortho*-phosphate
PAH	polycyclic aromatic hydrocarbon
PQL	practical quantitation limit
Permit	WSDOT NPDES and State Waste Discharge Permit for Municipal Stormwater

Program	NPDES Stormwater Monitoring Program
PSEP	Puget Sound Estuary Program
QAPP	quality assurance project plan
QC	quality control
RL	reporting limit
RPD	relative percent difference
SIM	selective ion monitoring
SMS	Washington State Sediment Management Standards
SVOCs	semi-volatile organic compounds
TAL	TestAmerica Laboratories, Inc.
TKN	total Kjeldahl nitrogen
TOC	total organic carbon
TP	total phosphorus
TPH	total petroleum hydrocarbon
TSS	total suspended solids
WSDOT	Washington State Department of Transportation

1.0 SAMPLE COLLECTION AND ANALYTICAL PROGRAM

1.1 Field Sampling Program

Sample collection for the Washington State Department of Transportation (WSDOT) National Pollution Discharge Elimination System (NPDES) Stormwater Monitoring Program (Program) was conducted during October 12, 2012 through September 21, 2013 by WSDOT personnel, following the *Quality Assurance Project Plans* (QAPPs; WSDOT 2011a, 2011b, and 2011c). A total of 189 stormwater and eight sediment samples were collected during this period of monitoring.

1.2 Laboratory Analysis Program

Sample analyses were primarily performed by the Washington State Department of Ecology (Ecology) Manchester Environmental Laboratory (MEL) for semi-volatile organic compounds (SVOCs), polycyclic aromatic hydrocarbons (PAHs), phthalates, pesticides (triclopyr, 2,4-D, clopyralid, and picloram), herbicides (diuron and dichlobenil), gasoline range total petroleum hydrocarbon (TPH), diesel/motor oil range TPH, metals (total and dissolved cadmium copper, lead, and zinc), and inorganic parameters (total suspended solids, hardness, chloride, nitrate/nitrite, *ortho*-phosphate (OP), and total phosphorus (TP). Selected specialty analyses were performed by AmTest Laboratories, Inc. (surfactants), TestAmerica Laboratories, Inc. (total Kjeldahl nitrogen and glyphosate), and Analytical Resources, Inc. (particle size and distribution in water).

Sample analysis schedule is summarized in **Table 1-1**.

8

2.0 DATA VERIFICATION AND VALIDATION

2.1 Data Quality Objectives

Data quality objectives (DQOs) for the Program were defined to meet the WSDOT NPDES and State Waste Discharge Permit for Municipal Stormwater (Permit), which was issued by Ecology on February 4, 2009 (Permit No. WAR043000A). Specific data quality goals (i.e., measurement quality objectives [MQOs] commonly presented as precision, accuracy, representativeness, comparability, sensitivity, and completeness) are defined in the *QAPPs* (WSDOT 2011a, 2011b, and 2011c).

2.2 Data Verification Procedures

Data verification was performed to ensure completeness of the hardcopy and electronic analytical data reported and archived. A complete crosschecking of laboratory identification numbers with field identification numbers was performed to ensure that analyses had been performed as specified by the chain of custody (COC) documentation.

Hardcopy laboratory reports were inventory checked for sample result forms, instrument run logs, instrument initial calibration and continuing calibration verifications, associated quality control (QC) analyses, and supporting documents.

2.3 Data Validation Procedures

A Stage 2A and 2B data validation was performed on 90 percent of the data, and a Stage 3+4 validation on 10 percent of the data. The validation followed the procedures specified in U.S. Environmental Protection Agency (EPA) Contract Laboratory Program (CLP) National Functional Guidelines for Data Review (USEPA 2008–Organics; USEPA 2010–Inorganics), with modifications to accommodate program and analytical method requirements as specified in the WSDOT Stormwater Monitoring Chemical Data Validation Guidance and Criteria, Version 1.2 (WSDOT 2013).

2.4 Data Assessment Results

As a result of the data validation, data qualifiers were appended to the affected data as:

- J - The result is an estimated quantity. The associated numerical value is approximate concentration of the analyte in the sample.

- **R** - The data are unusable due to deficiencies in the ability to analyze the sample and meet QC criteria.
- **U** - The analyte was analyzed for, but not detected. The associated numerical value is at or below the method reporting limit (RL).
- **UJ** - The analyte was analyzed for, but not detected. The method detection limit (MDL) and practical quantitation limit (PQL) are estimated values.

Detailed scope of the data validation, validation findings, and data qualification were presented in the data validation reports (DVRs).

3.0 DATA QUALITY AND USABILITY ASSESSMENT

Based on the outcomes of the validation, the following sections present a data quality overview for analytical data collected during the stormwater monitoring year 2013. The following sections address accuracy, precision, representativeness, comparability, sensitivity, and completeness. Quality control parameters applied to evaluating each of the MQOs are summarized in **Table 3-1**.

3.1 Accuracy

Accuracy is a statistical measurement of correctness and includes components of random and systematic errors. It is quantified as the degree of agreement between a measurement with a known reference. Analytical accuracy is evaluated via the percent recovery (%R), percent difference (%D), or percent drift ($\%D_f$) values of initial and continuing calibration, internal standards, surrogate spikes, matrix spike (MS)/matrix spike duplicate (MSD), laboratory control sample (LCS)/ laboratory control sample duplicate (LCSD), in conjunction with results of method blanks, calibration blanks, and trip blanks. Results of blanks assist in identifying the type and magnitude of effects on system errors introduced via field and/or laboratory procedures.

Quality control anomalies affecting data accuracy were identified as follows:

3.1.1 Sample Preservation and Holding Times

- The temperature of the coolers containing samples VANCOUVER-01-WY11-06-02 and PINES-01-A004 arrived at the analytical laboratory exceeding the control criteria (>6°C); analytical results for all parameters requested for these samples were qualified as estimated.
- The OP analyses were performed one to two days past the method recommended holding time for 11 samples. These results were qualified as estimated values, according to the data validation.
- Sample CLARKSTON-01-A002 arrived at the laboratory with limited holding time remaining for herbicides and PAHs extraction. The extraction/analysis of the sample proceeded and the herbicides and PAH results were qualified as estimated for this sample.

Data qualified as a result of sample preservation and holding time violations are summarized in **Table 3-2**.

3.1.2 Calibration Verification

Initial and continuing calibration verification (ICV and CCV) analyses verify accuracy of the initial calibration (ICAL) and current instrument condition prior to sample analyses. The recovery of the first (lowest concentration) ICAL standard (CS1) was evaluated to verify the ICAL validity at the RL level. ICV, CCV, and CS1 (for organic analyses only) results are presented as %D or $\%D_f$ values; excessive bias of a %D or $\%D_f$ value indicates a potential bias of the analytical results associated with these verification analyses.

- Total Kjeldahl nitrogen (TKN) results for 16 water samples were qualified as estimated as a result of biased-low recovery of the associated CCVs (i.e., %R value was less than the lower control limit of 90-110%).
- PAH results for water samples that were more frequently affected by biased-low CCV recovery included benzo(a)anthracene, benzo(a)pyrene, and fluorene; 10 stormwater samples were affected in this manner. Benzyl alcohol results were frequently affected by biased-low CCV recovery for sediment samples (six out of the eight samples).
- Herbicides results, specifically dichlobenil and picloram, in water samples were more frequently affected by biased-low CCV recovery; 13 samples were affected in this manner.
- The recovery of CS1 was biased-low for dibenzo(a,h)anthracene and bis(2-ethylehxyl)phthalate in one of the initial calibrations. As a conservative measure, dibenzo(a,h)anthracene and *bis*(2-ethylehxyl)phthalate results for the two samples associated with this ICAL were qualified as estimated.

Data usability affected by outlying CS1, ICV, and CCV results was summarized in **Table 3-3**.

3.1.3 Blanks

Two types of blanks, method blanks and equipment rinsate blanks, were evaluated. Presence of target analytes in method (preparation) blanks indicated potential effects on results for the analytes in samples prepared/analyzed with these blanks, and the accuracy of the results might have been skewed. Equipment rinsate blanks are collected and analyzed for parameters of concerns to evaluate the potential of cross-contamination associated with the sampling equipment.

- TKN was consistently detected in method blanks and equipment rinsate blanks at levels greater than their MDLs but less than their RLs; as a result, 32 samples were affected and qualified as estimated.

- Low-level total lead and total/dissolved zinc were present in equipment rinsate blanks; the effects on metals data usability were considered minimum.

- *bis*(2-Ethylehxyl)phthalate, diethylphthalate, di-*n*-octylphthalate, and naphthalene were occasionally present in method blanks; affected data were qualified as estimated or as non-detects at their RLs.

Data qualified due to detections in method blanks and equipment rinsate blanks are summarized in **Table 3-4**.

3.1.4 Laboratory Control Sample Recovery

- Diesel and lube oil results for 13 water samples were qualified as estimated due to low recovery of LCS and LCSD.

- *bis*(2-Ethylehxyl)phthalate and di-*n*-octylphthalate for 18 stormwater samples were qualified as estimated as a result of low-bias LCS/LCSD recovery.

- Benzoic acid, benzyl alcohol, 2,4-dimethylphenol, 2,-methylphenol, and pentachlorophenol consistently showed lower recovery (i.e., %R values were less than 10% or their lower control limits) in the LCS and LCSD associated with sediment samples. These compounds were not detected in any of the sediment samples; results were therefore qualified as rejected or estimated for all eight sediment samples.

- Herbicides, specifically 2,4-D, clopyralid, and pycloram, consistently showed low recovery in the LCS and LCSD associated with water sample analyses. As a result, the usability for a great number of herbicides data was affected. For instance, out of the 67 samples collected for herbicides analyses, clopyralid results for 42 samples and pycloram results for 26 samples were qualified as estimated.

Data affected by biased LCS and LCSD recovery are summarized in **Table 3-5**.

3.1.5 Matrix Spike and MS Duplicate Recovery

The %R values for MS and MSD analyses indicate levels of potential effects on a given analytical system resulting from the nature of a sample.

- The %R values for TKN the MS analyses performed on water samples were consistently outside the control limits; TKN results for 50 samples were affected and qualified as estimated (rejected in one case due to %R <10%).
- The %R values for total copper and total lead in the MS/MSD analyses performed on a water sample were less than the lower control limit (75-125%); total copper and total lead results for the eight samples associated with this MS/MSD pair were qualified as estimated.
- Benzyl alcohol, benzoic acid, and pentachlorophenol were not recovered (%R = 0) from the MS/MSD analyses performed on sediment sample SED-PINES-02-WY11-01-01. Benzyl alcohol, benzoic acid, and pentachlorophenol results for sample SED-PINES-02-WY11-01-01 were rejected.

Sample results affected by outlying MS and/or MSD recovery are summarized in **Table 3-6**.

3.1.6 Surrogate Spike Recovery

Surrogate spike recovery indicates the efficiency of sample extraction.

- The %R values for all surrogate spikes for PAHs (and phthalates for one sample) in six samples were less than their lower control limits and the PAH results were considered estimated. Surrogate spike %R values were less than the lower control limits or 10% in two of the samples (EUCLID-01-WY11-05-01 and VANCOUVER-01-WY11-06-01), indicating a potential of unsuccessful extraction of these samples. The PAH detections in these samples were qualified as estimated values and the non-detects were rejected.

Data usability affected by outlying surrogate spike recovery are summarized in **Table 3-7**.

3.2 Precision

Precision is defined as the degree of mutual agreement among independent measurements as the result of repeated application of the same process under similar conditions. Analytical precision is evaluated via the relative percent difference (RPD) values of LCS/LCSD analyses, MS/MSD analyses, and concentrations obtained from the two analytical columns for dual column methodologies. In addition, the level of variability for field duplicates represents the combined precision of sample collection and analysis procedures, as well as sample homogeneity.

3.2.1 Laboratory Duplicates

The RPD or concentration difference values for an LCS/LCSD, and MS/MSD pair, or a laboratory duplicate analyses indicate the variability (imprecision) resulting from the sample matrix and/or analytical system. Notable anomalies relative to laboratory duplicate analyses are discussed below:

- The RPD values for total copper and total lead in the laboratory duplicate analyses performed on a water sample exceeded the control limit (<20%). Total copper and total lead results for the five associated samples were qualified as estimated.
- Benzyl alcohol, naphthalene, and phenol results for five sediment samples were qualified as estimated due to the elevated variability (RPD value was >20%) for the LCS/LCSD analyses.
- Clopyralid and picloram results for 13 samples were affected by the elevated variability (RPD value was >20%) for the LCS/LCSD analyses.

3.2.2 Field Duplicates

At least one set of field duplicate was collected from each monitored facility for the analyses of the facility's respective monitoring parameters. Among all target analytes, PAH results showed higher variability than other analytes within selected field duplicate pairs, likely due to the presence of particulates in these stormwater samples. No significant imprecision relative to field procedures was identified based on the field duplicate results.

Data qualified as a result of outlying laboratory and field duplicate variability are presented in **Table 3-8.**

3.3 Representativeness

Representativeness is the level of confidence that the analytical data reflect the actual field condition. Representativeness is ensured by maintaining sample integrity during collection, preparation, and analysis. The evaluation of associated method and field blanks also assists in identifying artifacts that may skew the representativeness of the samples. As part of this data quality assessment, the correlation between total and dissolved metal concentrations for each metal/sample was evaluated.

No anomalies were identified in sample preservation, handling, preparation, and analysis that affected data representativeness, except for the QC anomalies affecting accuracy (Section 3.1) and precision (Section 3.2) as discussed above.

Metals results were considered "uncorrelated" and the usability of the results affected if the "total" concentration for a metal was less than its "dissolved" concentration in a sample and the concentration difference was beyond experimental errors (i.e., RPD value was >10%, or concentration difference value was >RL). No significant "uncorrelated" metals results were found. Data affected by the uncorrelated total and dissolved metals results are summarized in **Table 3-9.**

The data quality potentially resulting from these anomalies were evaluated and determined to have no significant effects on the data representativeness.

3.4 Comparability

Comparability is the confidence with which one data set can be compared to another data set. Using standard methods throughout the data generation processes ensures the comparability of data generated in separate sampling days or events.

All samples collected during monitoring year 2013 were analyzed using standardized analytical methodologies. Data generated in monitoring year 2012 and from upcoming stormwater monitoring events are expected to be comparable to data generated in 2013. For data to be collected, this will hold true as long as the same or equivalent sampling protocols and analytical methodologies are applied to future sample collection activities and laboratory analysis.

3.5 Sensitivity

Sensitivity depicts the level of ability for an analytical system (*i.e.*, sample preparation and instrumental analysis) to detect a target component in a given sample matrix with a defined level of confidence. Factors affecting the sensitivity of an analytical system include: analytical system background (*e.g.*, laboratory artifact or method blank contamination), sample matrix (*e.g.*, mass spectrometry ion ratio change, co-elution of peaks, or baseline elevation) and instrument instability.

To evaluate if the analytical sensitivity achieved the project expectation, sample-specific PQLs were compared against the RL goals set forth in the QAPPs. In addition, sample results were compared to detections of target analytes in method blanks to identify potential effects of laboratory background on sensitivity.

The blank-related effects are discussed above in Section 3.1. Sample results affected by the detections in the blanks were qualified as non-detects at the standard PQLs, which sufficed the project PQL goals.

3.5.1 Sample Matrix Interference

The presence of target or non-target chemicals or subjects in samples may affect the ability of an analytical system to accurately quantitate the target analyte at the expected sensitivity

As noted by the laboratory, detections of selected herbicides, PAHs, and phthalates in a great number of samples (specifically, 2,4-D [13 samples], benzo(a)anthracene [19 samples], benzo(a)pyrene [28 samples], and di-*n*-octylphthalate [12 samples]), could not be definitively identified and accurately quantitated because the ion abundance ratios for these detections did not meet the method criteria for compound identification. Qualified data are presented in **Table 3-10**.

3.5.2 Sample-Specific Quantitation Limits

The RLs for SVOCs in sediment samples were elevated three to eight times from the project goal for method RLs. This range of elevations resulted from the required dilution of sample extracts to overcome the oily nature of the samples. The reported sample-specific RLs were considered the best-possible RLs given the conditions of the samples. No further actions were feasible other than noting the incident in this document.

3.6 Completeness and Data Usability

Completeness is defined as the percentage of usable data over the total amount of data collected. Data qualified (R)[7] and target analytes that were not analyzed or reported by the laboratory were counted as unusable data and factored in the completeness determination.

3.6.1 Overall Data Completeness

A total of 5,641 data points were collected, within which 74 of the data points were qualified (R) and rejected. The overall analytical data completeness for WSDOT's NPDES Stormwater Monitoring Program during monitoring year 2013 was calculated at 98.7 percent, achieving the project goal of 95 percent.

[7] R - The data are unusable due to deficiencies in the ability to analyze the sample and meet QC criteria

REFERENCES

United States Environmental Protection Agency (USEPA) 1988. *USEPA Methods for the Determination of Organic Compounds in Drinking Water*, U.S. Environmental Protection Agency, December 1988 and Supplements I, II, and III, EPA 600/4-88/039.

USEPA 1996. *USEPA Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, SW-846, Third Edition, December 1996.

USEPA 2008. *USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review*, Office of Superfund Remediation and Technology Innovation, U.S. Environmental Protection Agency, June 2008, EPA-540-R-08-01.

USEPA 2010. *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review*, Office of Superfund Remediation and Technical Innovation, U.S. Environmental Protection Agency, January 2010, USEPA 540/R-10/011.

Washington Department of Transportation (WSDOT) 2013. *Stormwater Monitoring: Chemical Data Validation Guidance and Criteria, Version 1.2.* Pyron Environmental, Inc., April 24, 2013.

WSDOT 2011a. *QAPP for Baseline Monitoring of WSDOT Highway Run-off*. Working draft, February 2011.

WSDOT 2011b. *QAPP for Baseline Monitoring of WSDOT Maintenance Facilities, Rest Area, and Ferry Terminals*. Working draft, February 2011.

WSDOT 2011c. *QAPP for WSDOT Roadway Stormwater Treatment Evaluation: Best Management Practices*. Working draft, March 2011.

TABLES

Table 1-1 Sample Analysis Schedule

Stormwater			
Parameter	**Analytical Method**	**Number of Samples**	**Analytical Laboratory**
Total Chloride	EPA 300.0	107	Washington State Department of Ecology, Manchester Environmental Laboratory (MEL), Manchester, WA
Total Suspended Solids (TSS)	SM 2540D	189	
Nitrate/Nitrite	SM 4500 NO₃-I	167	
Ortho-phosphate (OP)	SM 4500 P-G	118	
Total Phosphorus (TP)	SM 4500 P-F	176	
Total & Dissolved Metals (Cd, Cu, Pb, Zn)	EPA 200.8	169*	
Hardness	SM 2340B	179	
TPH-Diesel & Motor Oil	NWTPH-Dx	67	
TPH-Gasoline	NWTPH-Gx	68	
Polycyclic Aromatic Hydrocarbons (PAHs)	SW8270D-SIM	107	
Phthalates	SW8270D-SIM	48	
Triclopyr (total formula), 2,4-D, Clopyralid, Picloram	SW8270D	67	
Diuron & Dichlobenil	SW8270D	66	
Glyphosate (non-aquatic formula)	USEPA 547	101	TestAmerica Laboratories, Inc. (TAL) – Savannah, GA
Total Kjeldahl Nitrogen (TKN)	USEPA 351.2	160	TAL – Denver, CO
Methylene Blue Active Substances (MBAS)	SM 5540C	36	AmTest Laboratories, Inc. Kirkland, Washington
Fecal Coliform	SM 9222D	40	
Sediment			
Parameter	**Analytical Method**	**Number of Samples**	**Analytical Laboratory**
Grain Size	ASTM D422	8	TAL – Seattle, WA
Total Solids	SM 2540G	8	MEL – Manchester, WA
Total Organic Carbon (TOC)	PSEP Protocols	8	
Metals (Cd, Cu, Pb, Zn)	EPA 200.8	8	
TPH-Diesel & Motor Oil	NWTPH-Dx	8	
Triclopyr (total formula) & Picloram	SW8270D-SIM	6	
SVOCs (SMS compounds)	SW8270D-SIM	8	

Notes:

* – The number was based on dissolved zinc analysis; the number of samples for other metals species might be less than this number as samples might be analyzed for selected metals than the full suit total and dissolved cadmium, copper, lead, and zinc.

SM – *Standard Methods for the Examination of Water and Wastewater*, American Public Health Association, 20th Edition, 1995

EPA Methods – *USEPA Methods for Chemical Analysis of Water and Wastes*, EPA-600/4-79-020, March 1983 Revision

21

SW Methods – *USEPA Test Methods for Evaluating Solid Waste, Physical/Chemical Methods,* SW-846, Third Edition, December 1996

NWTPH – *Analytical Methods for Petroleum Hydrocarbons,* ECY 97-602, Washington State Department of Ecology, June 1997

ASTM – American Society of Testing and Materials

PSEP – Puget Sound Estuary Program

SIM – Selective ion monitoring

SMS – Washington State Sediment Management Standards

22

Table 3-1 Quality Control Parameters Corresponding to Measurement Quality Objectives

MQOs	QC Parameters
Precision	**RPD or Concentration Difference Values of:** LCS/LCSD MS/MSD (or Laboratory Duplicate) Dual Column Confirmation
Accuracy	Holding Time **%RPD, %R, %D, or %D$_r$ Values of:** Calibration Verification (CS1, ICV, CCV) Surrogate Spikes Internal Standards LCS and LCSD MS and MSD Interference Check Sample for Metals Analyzed with ICP Methodologies Serial Dilution for Metals Analyzed with ICP Methodologies **Results of:** Instrument and Calibration Blanks (ICB/CCB) Method (Preparation) Blanks Trip Blanks
Representativeness	Results of All Blanks Sample Integrity Holding Times
Comparability	Sample-specific PQLs Sample Collection Methodologies Sample Preparation and Analytical Methodologies
Completeness	Data Qualifiers Laboratory Deliverables and Analyte Lists Requested/Reported Valid Results Number of Rejected Results
Sensitivity	Sample-specific MDLs and PQLs

Notes:

%R – Percent recovery
%D – Percent difference
%D$_r$ – Percent drift
%RPD – Percent relative percent difference
CCB – Continuing calibration blank
CCV – Continuing calibration verification
CS1 – First (lowest) initial calibration standard
ICB – Initial calibration blank
ICP – Inductively coupled plasma
ICV – Initial calibration verification
LCS – Laboratory control sample
LCSD – Laboratory control sample duplicate
MS – Matrix spike
MSD – Matrix spike duplicate
PQL – Practical quantitation limit
RPD – Relative percent difference

Table 3-2 Data Affected by Sample Preservation and Holding Time Anomalies

Field Sample ID	Laboratory Sample ID	Sample Matrix	Analyte	Qualifier	Reason Code
VANCOUVER-01-WY11-06-01	1210066-01	W	Chloride	J	Cooler Temp.
VANCOUVER-01-WY11-06-01	1210066-01	W	Total Suspended Solids	J	Cooler Temp.
VANCOUVER-01-WY11-06-01	1210066-01	W	Nitrite-Nitrate	J	Cooler Temp.
VANCOUVER-01-WY11-06-01	1210066-01	W	Total Phosphorus	J	Cooler Temp.
VANCOUVER-01-WY11-06-01	1210066-01	W	Dichlobenil	UJ	Cooler Temp.
VANCOUVER-01-WY11-06-01	1210066-01	W	Diuron	UJ	Cooler Temp.
VANCOUVER-01-WY11-06-01	1210066-01	W	Clopyralid	UJ	Cooler Temp.
VANCOUVER-01-WY11-06-01	1210066-01	W	Picloram	UJ	Cooler Temp.
VANCOUVER-01-WY11-06-01	1210066-01	W	Triclopyr	J	Cooler Temp.
VANCOUVER-01-WY11-06-01	1210066-01	W	2,4-D	UJ	Cooler Temp.
VANCOUVER-01-WY11-06-02	1210066-02	W	#2 Diesel	UJ	Cooler Temp.
VANCOUVER-01-WY11-06-02	1210066-02	W	Lube Oil	J	Cooler Temp.
VANCOUVER-01-WY11-06-02	1210066-02	W	Gasoline	J	Cooler Temp.
PINES-01-A004	1306051-04	W	Chloride	J	Cooler Temp.
PINES-01-A004	1306051-04	W	Total Suspended Solids	J	Cooler Temp.
PINES-01-A004	1306051-04	W	Nitrite-Nitrate	J	Cooler Temp.
PINES-01-A004	1306051-04	W	Total Phosphorus	J	Cooler Temp.
PINES-01-A004	1306051-04	W	*bis*(2-Ethylhexyl) phthalate	J	Cooler Temp.
PINES-01-A004	1306051-04	W	Di-n-octyl phthalate	J	Cooler Temp.
PINES-01-A004	1306051-04	W	Anthracene	J	Cooler Temp.
PINES-01-A004	1306051-04	W	Pyrene	J	Cooler Temp.
PINES-01-A004	1306051-04	W	Dimethyl phthalate	UJ	Cooler Temp.
PINES-01-A004	1306051-04	W	Benzo(ghi)perylene	J	Cooler Temp.
PINES-01-A004	1306051-04	W	Indeno(1,2,3-cd)pyrene	J	Cooler Temp.
PINES-01-A004	1306051-04	W	Benzo(b)fluoranthene	J	Cooler Temp.
PINES-01-A004	1306051-04	W	Fluoranthene	J	Cooler Temp.
PINES-01-A004	1306051-04	W	Benzo(k)fluoranthene	J	Cooler Temp.
PINES-01-A004	1306051-04	W	Acenaphthylene	UJ	Cooler Temp.
PINES-01-A004	1306051-04	W	Chrysene	J	Cooler Temp.
PINES-01-A004	1306051-04	W	Benzo(a)pyrene	J	Cooler Temp.
PINES-01-A004	1306051-04	W	Dibenzo(a,h)anthracene	J	Cooler Temp.
PINES-01-A004	1306051-04	W	Benzo(a)anthracene	UJ	Cooler Temp.
PINES-01-A004	1306051-04	W	Acenaphthene	UJ	Cooler Temp.
PINES-01-A004	1306051-04	W	Diethyl phthalate	J	Cooler Temp.
PINES-01-A004	1306051-04	W	Di-n-butylphthalate	J	Cooler Temp.
PINES-01-A004	1306051-04	W	Phenanthrene	J	Cooler Temp.
PINES-01-A004	1306051-04	W	Butyl benzyl phthalate	J	Cooler Temp.
PINES-01-A004	1306051-04	W	Fluorene	UJ	Cooler Temp.
PINES-01-A004	1306051-04	W	Naphthalene	J	Cooler Temp.
CLARKSTON-01-A002	1302036-01	W	Clopyralid	UJ	Holding Time
VANCOUVER-01-A032	580-37671-1	W	Glyphosate	UJ	Holding Time
PIL-01-VEP-A037	580-37288-9	W	Gasoline	UJ	Holding Time
SMKYPT-02-WY12-05-01	1210065-01	W	Ortho-Phosphate	J	Holding Time

24

Field Sample ID	Laboratory Sample ID	Sample Matrix	Analyte	Qualifier	Reason Code
LAKEVIEW-01-WY11-07-01	1210065-03	W	*Ortho*-Phosphate	J	Holding Time
SMKYPT-01-WY11-05-01	1210065-05	W	*Ortho*-Phosphate	J	Holding Time
PIL-02-V2M-A001	1210072-05	W	*Ortho*-Phosphate	J	Holding Time
PIL-05-C4M-A001	1210072-06	W	*Ortho*-Phosphate	J	Holding Time
SMKYPT-02-A002	1210072-10	W	*Ortho*-Phosphate	J	Holding Time
PIL-03-V4M-A001	1210072-11	W	*Ortho*-Phosphate	J	Holding Time
SMKYPT-01-A002	1210072-13	W	*Ortho*-Phosphate	J	Holding Time
BALLINGER-A002	1210072-14	W	*Ortho*-Phosphate	J	Holding Time
PIL-01-VEP-A002	1210072-16	W	*Ortho*-Phosphate	J	Holding Time
LAKEVIEW-01-A044	1309057-13	W	*Ortho*-Phosphate	J	Holding Time
CLARKSTON-01-A002	1302036-01	W	Picloram	UJ	Holding Time
CLARKSTON-01-A002	1302036-01	W	Triclopyr	UJ	Holding Time
CLARKSTON-01-A002	1302036-01	W	2,4-D	J	Holding Time
CLARKSTON-01-A002	1302036-01	W	Anthracene	UJ	Holding Time
CLARKSTON-01-A002	1302036-01	W	Pyrene	J	Holding Time
CLARKSTON-01-A002	1302036-01	W	Benzo[ghi]perylene	J	Holding Time
CLARKSTON-01-A002	1302036-01	W	Indeno[1,2,3-cd]pyrene	UJ	Holding Time
CLARKSTON-01-A002	1302036-01	W	Benzo(b)fluoranthene	J	Holding Time
CLARKSTON-01-A002	1302036-01	W	Fluoranthene	J	Holding Time
CLARKSTON-01-A002	1302036-01	W	Benzo(k)fluoranthene	UJ	Holding Time
CLARKSTON-01-A002	1302036-01	W	Acenaphthylene	UJ	Holding Time
CLARKSTON-01-A002	1302036-01	W	Chrysene	J	Holding Time
CLARKSTON-01-A002	1302036-01	W	Benzo(a)pyrene	UJ	Holding Time
CLARKSTON-01-A002	1302036-01	W	Dibenzo(a,h)anthracene	UJ	Holding Time
CLARKSTON-01-A002	1302036-01	W	Benzo[a]anthracene	UJ	Holding Time
CLARKSTON-01-A002	1302036-01	W	Acenaphthene	UJ	Holding Time
CLARKSTON-01-A002	1302036-01	W	Phenanthrene	UJ	Holding Time
CLARKSTON-01-A002	1302036-01	W	Fluorene	UJ	Holding Time
CLARKSTON-01-A002	1302036-01	W	Naphthalene	UJ	Holding Time

Notes:

Cooler Temp. – The temperature of the cooler containing this sample arrived at the analytical laboratory exceeding the control criteria (>6°C) and the analysis was determined affected by the raised cooler temperature.

Holding Time – The preparation or analysis of the sample was performed past the method required holding time.

J – The analyte was detected in the sample and the reported value was considered as estimated.

UJ – The analyte was not detected in the sample, and the reported quantitation limit associated with this analyte was considered as estimated.

W – Water

25

Table 3-3 Data Affected by Calibration Verification Outliers

Field Sample ID	Laboratory Sample ID	Sample Matrix	Analyte	Qualifier	Comment
SR9-01-A004	1307055-02	W	Cadmium	UJ	
SR518-03-A007	1304055-04	W	Lead	J	
BAINBRIDGE-01-A004	1305068-03	W	Zinc	UJ	
BALLINGER-01-A044	1305068-01	W	Zinc	J	
CLARKSTON-01-A004	580-37808-2	W	Nitrogen, Total Kjeldahl	UJ	
EUCLID-01-A004	580-37046-3	W	Nitrogen, Total Kjeldahl	UJ	
EV-01-VEP-A002	580-35871-4	W	Nitrogen, Total Kjeldahl	UJ	
EV-04-MEP-A014	580-37130-1	W	Nitrogen, Total Kjeldahl	J	
LAKEVIEW-01-A026	580-37880-1	W	Nitrogen, Total Kjeldahl	J	
PIL-01-VEP-A026	580-37130-3	W	Nitrogen, Total Kjeldahl	UJ	
PIL-01-VEP-A032	580-37270-1	W	Nitrogen, Total Kjeldahl	UJ	
PIL-03-V4M-A007	580-35871-3	W	Nitrogen, Total Kjeldahl	UJ	
PIL-05-C4M-A007	580-37270-3	W	Nitrogen, Total Kjeldahl	J	
PIL-06-MEP-A010	580-37130-2	W	Nitrogen, Total Kjeldahl	J	
PIL-06-MEP-A013	580-37270-4	W	Nitrogen, Total Kjeldahl	J	
SMKYPT-02-A050	580-37935-7	W	Nitrogen, Total Kjeldahl	J	
SR9-01-A008	580-35871-1	W	Nitrogen, Total Kjeldahl	UJ	
VANCOUVER-01-A014	580-37046-1	W	Nitrogen, Total Kjeldahl	UJ	
VANCOUVER-01-A026	580-37880-3	W	Nitrogen, Total Kjeldahl	UJ	
VANCOUVER-01-A038	580-37935-5	W	Nitrogen, Total Kjeldahl	UJ	
CLARKSTON-01-A014	1304048-10	W	Dichlobenil	UJ	
GEIGER-01-A014	1304048-12	W	Dichlobenil	UJ	
LAKEVIEW-01-A026	1304047-03	W	Dichlobenil	J	
LAKEVIEW-01-A038	1304054-03	W	Dichlobenil	J	
LAKEVIEW-01-A042	1304054-04	W	Dichlobenil	J	
SMKYPT-02-A050	1304048-06	W	Dichlobenil	UJ	
SMKYPT-02-A056	1304055-01	W	Dichlobenil	UJ	
SMKYPT-02-A062	1304068-01	W	Dichlobenil	J	
VANCOUVER-01-A026	1304047-01	W	Dichlobenil	J	
VANCOUVER-01-A038	1304048-08	W	Dichlobenil	J	
EUCLID-01-A004	1302030-02	W	Diuron	UJ	
VANCOUVER-01-A014	1301055-02	W	Diuron	J	
BALLINGER-01-A050	1309057-06	W	Picloram	UJ	

Field Sample ID	Laboratory Sample ID	Sample Matrix	Analyte	Qualifier	Comment
CLARKSTON-01-A031	1309047-01	W	Picloram	UJ	
EUCLID-01-A008	1303081-06	W	Picloram	UJ	
GEIGER-01-A008	1303081-05	W	Picloram	UJ	
GEIGER-01-A026	1309055-01	W	Picloram	UJ	
LAKEVIEW-01-A020	1303081-03	W	Picloram	UJ	
LAKEVIEW-01-A032	1303088-01	W	Picloram	UJ	
LAKEVIEW-01-A044	1309057-13	W	Picloram	UJ	
SMKYPT-01-A004	1309057-12	W	Picloram	UJ	
SMKYPT-01-A044	1309057-07	W	Picloram	UJ	
SMKYPT-02-A068	1309057-09	W	Picloram	UJ	
VANCOUVER-01-A032	1303081-01	W	Picloram	UJ	
VANCOUVER-01-A044	1309064-01	W	Picloram	UJ	
EV-01-VEP-A032	1304068-06	W	Benzo(a)anthracene	J	
EV-01-VEP-A036	1304068-07	W	Benzo(a)anthracene	J	
GEIGER-01-A018	1304048-13	W	Benzo(a)anthracene	J	
LAKEVIEW-01-A026	1304047-03	W	Benzo(a)anthracene	J	
LAKEVIEW-01-A030	1304047-04	W	Benzo(a)anthracene	J	
PIL-01-VEP-A080	1304068-08	W	Benzo(a)anthracene	J	
SMKYPT-02-A056	1304055-01	W	Benzo(a)anthracene	J	
SR9-01-A044	1304048-04	W	Benzo(a)anthracene	J	
SR9-01-A050	1304068-05	W	Benzo(a)anthracene	J	
VANCOUVER-01-A026	1304047-01	W	Benzo(a)anthracene	UJ	
BAINBRIDGE-01-WY11-08-01	1210072-03	W	Benzo(a)pyrene	J	
BALLINGER-A002	1210072-14	W	Benzo(a)pyrene	J	
EV-01-VEP-A032	1304068-06	W	Benzo(a)pyrene	J	
EV-01-VEP-A036	1304068-07	W	Benzo(a)pyrene	J	
LAKEVIEW-01-A002	1210072-02	W	Benzo(a)pyrene	J	
PIL-01-VEP-A002	1210072-16	W	Benzo(a)pyrene	J	
PIL-01-VEP-A080	1304068-08	W	Benzo(a)pyrene	J	
PINES-01-A004	1306051-04	W	Benzo(a)pyrene	J	
SMKYPT-02-A056	1304055-01	W	Benzo(a)pyrene	J	
SR9-01-A050	1304068-05	W	Benzo(a)pyrene	J	
LAKEVIEW-01-A044	1309057-13	W	Benzo(b)fluoranthene	J	
SMKYPT-02-A068	1309057-09	W	Benzo(b)fluoranthene	J	
VANCOUVER-01-A044	1309064-01	W	Benzo(b)fluoranthene	J	

Field Sample ID	Laboratory Sample ID	Sample Matrix	Analyte	Qualifier	Comment
PIL-01-VEP-A002	1210072-16	W	*bis*(2-Ethylhexyl)phthalate	J	
PIL-01-VEP-A004	1307053-02	W	*bis*(2-Ethylhexyl)phthalate	UJ	
SMKYPT-01-A002	1210072-13	W	*bis*(2-Ethylhexyl)phthalate	J	
SMKYPT-02-A002	1210072-10	W	*bis*(2-Ethylhexyl)phthalate	J	
PIL-01-VEP-A002	1210072-16	W	Butyl benzyl phthalate	J	
SMKYPT-01-A002	1210072-13	W	Butyl benzyl phthalate	J	
BAINBRIDGE-01-WY11-08-01	1210072-03	W	Dibenzo(a,h)anthracene	J	
LAKEVIEW-01-A002	1210072-02	W	Dibenzo(a,h)anthracene	J	
PINES-01-A004	1306051-04	W	Dibenzo(a,h)anthracene	J	
PIL-01-VEP-A002	1210072-16	W	Di-*n*-octyl Phthalate	J	
EV-01-VEP-A032	1304068-06	W	Fluoranthene	J	
EV-01-VEP-A036	1304068-07	W	Fluoranthene	J	
PIL-01-VEP-A080	1304068-08	W	Fluoranthene	J	
SMKYPT-02-A056	1304055-01	W	Fluoranthene	J	
SMKYPT-02-A062	1304068-01	W	Fluoranthene	J	
SR9-01-A050	1304068-05	W	Fluoranthene	J	
BALLINGER-A002	1210072-14	W	Fluorene	J	
EV-01-VEP-A004	1307055-05	W	Fluorene	UJ	
EV-04-MEP-A004	1307055-09	W	Fluorene	UJ	
GEIGER-01-A004	1306051-06	W	Fluorene	UJ	
LAKEVIEW-01-A002	1210072-02	W	Fluorene	J	
PIL-01-VEP-A002	1210072-16	W	Fluorene	J	
PINES-01-A004	1306051-04	W	Fluorene	UJ	
PINES-01-A031	1306051-02	W	Fluorene	UJ	
SR9-01-A004	1307055-02	W	Fluorene	UJ	
PINES-01-A004	1306051-04	W	Indeno(1,2,3-cd)pyrene	J	
SED-PINES-01-WY11-01-01	1211039-01	S	Benzoic Acid	UJ	
SED-PINES-02-WY11-01-01	1211039-02	S	Benzoic Acid	UJ	
SED-EVERETT-01-A001	1305065-01	S	Benzyl Alcohol	UJ	
SED-EVERETT-04-A001	1306058-01	S	Benzyl Alcohol	UJ	
SED-PILCHUCK-01-A001	1306058-02	S	Benzyl Alcohol	UJ	
SED-PILCHUCK-01-A002	1306058-03	S	Benzyl Alcohol	UJ	
SED-PINES-01-A001	1306053-01	S	Benzyl Alcohol	UJ	
SED-SR09-01-A001	1305050-01	S	Benzyl Alcohol	UJ	
SED-PINES-01-WY11-01-01	1211039-01	S	*bis*(2-Ethylhexyl)phthalate	J	

28

Field Sample ID	Laboratory Sample ID	Sample Matrix	Analyte	Qualifier	Comment
SED-PINES-02-WY11-01-01	1211039-02	S	*bis*(2-Ethylhexyl)phthalate	J	
SED-PINES-01-WY11-01-01	1211039-01	S	Dibenzo(a,h)anthracene	UJ	
SED-PINES-02-WY11-01-01	1211039-02	S	Dibenzo(a,h)anthracene	UJ	
SED-EVERETT-01-A001	1305065-01	S	Picloram	UJ	
SED-EVERETT-04-A001	1306058-01	S	Picloram	UJ	
SED-PINES-01-A001	1306053-01	S	Picloram	UJ	
SED-SR09-01-A001	1305050-01	S	Picloram	UJ	

Notes:

Calibration verification outliers include violation of initial calibration verification (ICV), exceedance of continuing calibration verification (CCV) percent difference (%D) values (±10% for inorganics, ±20% for organics), and failure in meeting the percent recovery (70-130%) for the first (lowest) initial calibration standard (CS1) for organic analyses.

J – The analyte was detected in the sample and the reported value was considered as estimated.

S - Sediment

UJ – The analyte was not detected in the sample, and the reported quantitation limit associated with this analyte was considered as estimated.

W – Water

29

Table 3-4 Data Affected by Detections in Blanks

Field Sample ID	Laboratory Sample ID	Sample Matrix	Analyte	Qualifier	Comment
BALLINGER-01-A032	580-37179-1	W	Nitrogen, Total Kjeldahl	J	MB
BALLINGER-01-A038	580-37390-1	W	Nitrogen, Total Kjeldahl	J	MB
BALLINGER-01-A042	580-37390-2	W	Nitrogen, Total Kjeldahl	J	MB
CLARKSTON-01-A004	580-37808-2	W	Nitrogen, Total Kjeldahl	U	MB
EUCLID-01-A004	580-37046-3	W	Nitrogen, Total Kjeldahl	U	MB
EV-01-VEP-A002	580-35871-4	W	Nitrogen, Total Kjeldahl	U	MB
EV-04-MEP-A014	580-37130-1	W	Nitrogen, Total Kjeldahl	J	MB
LAKEVIEW-01-A008	580-36016-1	W	Nitrogen, Total Kjeldahl	U	MB
PIL-01-VEP-A026	580-37130-3	W	Nitrogen, Total Kjeldahl	U	MB
PIL-01-VEP-A032	580-37270-1	W	Nitrogen, Total Kjeldahl	U	MB
PIL-01-VEP-A050	580-37300-8	W	Nitrogen, Total Kjeldahl	J	MB
PIL-02-V2M-A010	580-37300-5	W	Nitrogen, Total Kjeldahl	U	MB
PIL-03-V4M-A007	580-35871-3	W	Nitrogen, Total Kjeldahl	U	MB
PIL-03-V4M-A019	580-37300-4	W	Nitrogen, Total Kjeldahl	U	MB
PIL-05-C4M-A007	580-37270-3	W	Nitrogen, Total Kjeldahl	J	MB
PIL-06-MEP-A010	580-37130-2	W	Nitrogen, Total Kjeldahl	J	MB
PIL-06-MEP-A013	580-37270-4	W	Nitrogen, Total Kjeldahl	J	MB
PIL-06-MEP-A016	580-37288-4	W	Nitrogen, Total Kjeldahl	U	MB
PIL-06-MEP-A019	580-37300-1	W	Nitrogen, Total Kjeldahl	U	MB
PIL-06-MEP-A021	580-37300-2	W	Nitrogen, Total Kjeldahl	J	MB
SMKYPT-01-A044	580-40340-4	W	Nitrogen, Total Kjeldahl	U	MB
SMKYPT-02-A050	580-37935-7	W	Nitrogen, Total Kjeldahl	J	MB
SR9-01-A008	580-35871-1	W	Nitrogen, Total Kjeldahl	U	MB
VANCOUVER-01-A014	580-37046-1	W	Nitrogen, Total Kjeldahl	U	MB
VANCOUVER-01-A026	580-37880-3	W	Nitrogen, Total Kjeldahl	U	MB
VANCOUVER-01-A038	580-37935-5	W	Nitrogen, Total Kjeldahl	U	MB
EV-01-VEP-A050	1305079-06	W	Benzo(a)anthracene	J	MB
LAKEVIEW-01-A020	1303081-03	W	Benzo(g,h,i)perylene	J	MB
EV-01-VEP-A004	1307055-05	W	*bis*(2-Ethylhexyl)phthalate	U	MB
EV-04-MEP-A004	1307055-09	W	*bis*(2-Ethylhexyl)phthalate	U	MB
PINES-01-A031	1306051-02	W	*bis*(2-Ethylhexyl)phthalate	J	MB
SMKYPT-01-A044	1309057-07	W	*bis*(2-Ethylhexyl)phthalate	J	MB
SMKYPT-02-A010	1305044-02	W	*bis*(2-Ethylhexyl)phthalate	J	MB

Field Sample ID	Laboratory Sample ID	Sample Matrix	Analyte	Qualifier	Comment
SR9-01-A004	1307055-02	W	*bis*(2-Ethylhexyl)phthalate	U	MB
EV-01-VEP-A032	1304068-06	W	Diethyl phthalate	J	MB
EV-01-VEP-A036	1304068-07	W	Diethyl phthalate	J	MB
PINES-01-A020	1304078-04	W	Diethyl phthalate	J	MB
SR9-01-A032	1303082-01	W	Diethyl phthalate	J	MB
SR9-01-A036	1303082-02	W	Diethyl phthalate	J	MB
SR9-01-A050	1304068-05	W	Diethyl phthalate	J	MB
SR9-01-A056	1304078-02	W	Diethyl phthalate	U	MB
PINES-01-A004	1306051-04	W	Di-*n*-butylphthalate	J	MB
EV-01-VEP-A032	1304068-06	W	Di-*n*-octyl Phthalate	J	MB
EV-01-VEP-A036	1304068-07	W	Di-*n*-octyl Phthalate	J	MB
EV-04-MEP-A044	1304078-01	W	Di-*n*-octyl Phthalate	J	MB
PINES-01-A014	1304079-02	W	Di-*n*-octyl Phthalate	J	MB
PINES-01-A018	1304079-03	W	Di-*n*-octyl Phthalate	J	MB
EV-01-VEP-A002	1211042-05	W	Indeno(1,2,3-cd)pyrene	J	MB
LAKEVIEW-01-A008	1211055-01	W	Indeno(1,2,3-cd)pyrene	J	MB
BALLINGER-01-A014	1212040-13	W	Naphthalene	J	MB
EUCLID-01-A002	1212029-01	W	Naphthalene	J	MB
EV-01-VEP-A002	1211042-05	W	Naphthalene	J	MB
GEIGER-01-A002	1305058-01	W	Naphthalene	J	MB
SR9-01-A004	1307055-02	W	Naphthalene	U	MB
SR9-01-A008	1211042-06	W	Naphthalene	J	MB
SMKYPT-02-WY12-05-01	1210065-01	W	Copper, Total	J	EB
SMKYPT-02-A068	1309057-09	W	Copper, Dissolved	J	EB
SMKYPT-02-A072	1309057-10	W	Copper, Dissolved	J	EB
SMKYPT-02-WY12-05-01	1210065-01	W	Copper, Dissolved	J	EB
GEIGER-01-A002	1305058-01	W	Lead, Total	J	EB
GEIGER-01-A006	1305058-02	W	Lead, Total	J	EB
SMKYPT-01-A002	1210072-13	W	Lead, Total	J	EB
SMKYPT-01-A043	1303041-01	W	Lead, Total	J	EB
SMKYPT-01-A044	1309057-07	W	Lead, Total	J	EB
SMKYPT-01-WY11-05-01	1210065-05	W	Lead, Total	J	EB
SMKYPT-01-A002	1210072-13	W	Zinc, Total	J	EB
SMKYPT-01-A043	1303041-01	W	Zinc, Total	J	EB
SMKYPT-01-A044	1309057-07	W	Zinc, Total	J	EB

Field Sample ID	Laboratory Sample ID	Sample Matrix	Analyte	Qualifier	Comment
SMKYPT-01-WY11-05-01	1210065-05	W	Zinc, Total	J	EB
BAINBRIDGE-01-A014	1301034-02	W	Zinc, Dissolved	J	EB
BAINBRIDGE-01-A018	1301034-04	W	Zinc, Dissolved	J	EB
BAINBRIDGE-01-A020	1302057-01	W	Zinc, Dissolved	J	EB
BAINBRIDGE-01-A026	1302064-10	W	Zinc, Dissolved	J	EB
BAINBRIDGE-01-A032	1303079-01	W	Zinc, Dissolved	J	EB
BAINBRIDGE-01-A038	1305066-01	W	Zinc, Dissolved	J	EB
BAINBRIDGE-01-WY11-08-01	1210072-03	W	Zinc, Dissolved	J	EB
SMKYPT-01-A043	1303041-01	W	Zinc, Dissolved	J	EB
SMKYPT-01-A044	1309057-07	W	Zinc, Dissolved	J	EB
SMKYPT-01-WY11-05-01	1210065-05	W	Zinc, Dissolved	J	EB
SMKYPT-01-A002	580-35584-5	W	Nitrogen, Total Kjeldahl	J	EB
SMKYPT-01-A008	580-36801-2	W	Nitrogen, Total Kjeldahl	J	EB
SMKYPT-01-A020	580-37326-8	W	Nitrogen, Total Kjeldahl	J	EB
SMKYPT-01-A043	580-37378-1	W	Nitrogen, Total Kjeldahl	J	EB
SMKYPT-01-WY11-05-01	580-35509-2	W	Nitrogen, Total Kjeldahl	J	EB
SMKYPT-02-A032	580-37300-7	W	Nitrogen, Total Kjeldahl	J	EB
EUCLID-01-A008	1303081-06	W	Nitrite-Nitrate	J	EB
EUCLID-01-A020	1303046-01	W	Nitrite-Nitrate	J	EB
EUCLID-01-A024	1303046-02	W	Nitrite-Nitrate	J	EB
EUCLID-01-A032	1306077-01	W	Nitrite-Nitrate	J	EB
SMKYPT-01-WY11-05-01	1210065-05	W	Nitrite-Nitrate	J	EB
CLARKSTON-01-A019	1304079-01	W	Dichlobenil	U	EB
CLARKSTON-01-A026	1306077-02	W	Dichlobenil	U	EB
EUCLID-01-A002	1212029-01	W	Dichlobenil	J	EB
SMKYPT-01-A044	1309057-07	W	Dichlobenil	J	EB
SMKYPT-02-A062	1304068-01	W	Dichlobenil	J	EB
SMKYPT-02-A062	1304068-01	W	*bis*(2-Ethylhexyl)phthalate	J	EB

Notes:

EB – The analyte was detected in the associated equipment rinsate blank and the sample result was affected.
J – The analyte was detected in the sample and the reported value was considered as estimated.
MB – The analyte was detected in method blank and sample result was affected.
S – Sediment
U – The analyte was not detected at or above the associated quantitation limit.
W – Water

Table 3-5 Data Affected by Laboratory Control Sample Outliers

Field Sample ID	Laboratory Sample ID	Sample Matrix	Analyte	Qualifier	Comment
BAINBRIDGE-01-A003	1305068-02	W	#2 Diesel	UJ	LCS %R <LCL
BALLINGER-01-A037	1303041-06	W	#2 Diesel	UJ	LCS %R <LCL
EUCLID-01-A003	1302030-01	W	#2 Diesel	UJ	LCS %R <LCL
EV-01-A031	1303041-02	W	#2 Diesel	UJ	LCS %R <LCL
EV-01-VEP-A049	1305079-05	W	#2 Diesel	UJ	LCS %R <LCL
EV-04-A037	1303041-03	W	#2 Diesel	UJ	LCS %R <LCL
EV-04-MEP-A055	1305079-01	W	#2 Diesel	UJ	LCS %R <LCL
EVERETT-01-A013	1302034-02	W	#2 Diesel	UJ	LCS %R <LCL
PIL-01-A067	1303041-04	W	#2 Diesel	UJ	LCS %R <LCL
PIL-01-VEP-A019	1302034-01	W	#2 Diesel	UJ	LCS %R <LCL
PINES-01-A007	1212030-01	W	#2 Diesel	UJ	LCS %R <LCL
SR09-A037	1303041-05	W	#2 Diesel	UJ	LCS %R <LCL
SR9-01-A061	1305079-08	W	#2 Diesel	UJ	LCS %R <LCL
BAINBRIDGE-01-A003	1305068-02	W	Lube Oil	UJ	LCS %R <LCL
BALLINGER-01-A037	1303041-06	W	Lube Oil	UJ	LCS %R <LCL
EUCLID-01-A003	1302030-01	W	Lube Oil	UJ	LCS %R <LCL
EV-01-A031	1303041-02	W	Lube Oil	J	LCS %R <LCL
EV-01-VEP-A049	1305079-05	W	Lube Oil	J	LCS %R <LCL
EV-04-A037	1303041-03	W	Lube Oil	J	LCS %R <LCL
EV-04-MEP-A055	1305079-01	W	Lube Oil	J	LCS %R <LCL
EVERETT-01-A013	1302034-02	W	Lube Oil	J	LCS %R <LCL
PIL-01-A067	1303041-04	W	Lube Oil	J	LCS %R <LCL
PIL-01-VEP-A019	1302034-01	W	Lube Oil	J	LCS %R <LCL
PINES-01-A007	1212030-01	W	Lube Oil	UJ	LCS %R <LCL
SR09-A037	1303041-05	W	Lube Oil	J	LCS %R <LCL
SR9-01-A061	1305079-08	W	Lube Oil	J	LCS %R <LCL
BALLINGER-01-A008	1211064-01	W	2,4-D	UJ	LCS %R <LCL
BALLINGER-A002	1210072-14	W	2,4-D	J	LCS %R <LCL
CLARKSTON-01-A026	1306077-02	W	2,4-D	UJ	LCS %R <LCL
EUCLID-01-A032	1306077-01	W	2,4-D	J	LCS %R <LCL
EUCLID-01-WY11-05-01	1210071-01	W	2,4-D	J	LCS %R <LCL
GEIGER-01-WY11-07-01	1210077-01	W	2,4-D	U	LCS %R <LCL
LAKEVIEW-01-A002	1210072-02	W	2,4-D	J	LCS %R <LCL

Field Sample ID	Laboratory Sample ID	Sample Matrix	Analyte	Qualifier	Comment
LAKEVIEW-01-WY11-07-01	1210065-03	W	2,4-D	UJ	LCS %R <LCL
SMKYPT-01-A002	1210072-13	W	2,4-D	U	LCS %R <LCL
SMKYPT-01-A020	1303034-03	W	2,4-D	UJ	LCS %R <LCL
SMKYPT-01-A032	1303033-11	W	2,4-D	J	LCS %R <LCL
SMKYPT-01-A036	1303033-12	W	2,4-D	J	LCS %R <LCL
SMKYPT-01-WY11-05-01	1210065-05	W	2,4-D	UJ	LCS %R <LCL
SMKYPT-02-A002	1210072-10	W	2,4-D	U	LCS %R <LCL
SMKYPT-02-WY12-05-01	1210065-01	W	2,4-D	UJ	LCS %R <LCL
VANCOUVER-01-WY11-06-01	1210066-01	W	2,4-D	UJ	LCS %R <LCL
BALLINGER-01-A008	1211064-01	W	Clopyralid	UJ	LCS %R <LCL
BALLINGER-01-A014	1212040-13	W	Clopyralid	UJ	LCS %R <LCL
BALLINGER-01-A020	1301055-09	W	Clopyralid	UJ	LCS %R <LCL
BALLINGER-01-A032	1302059-01	W	Clopyralid	UJ	LCS %R <LCL
BALLINGER-01-A036	1302059-02	W	Clopyralid	UJ	LCS %R <LCL
BALLINGER-01-A038	1303045-01	W	Clopyralid	UJ	LCS %R <LCL
BALLINGER-01-A050	1309057-06	W	Clopyralid	UJ	LCS %R <LCL
CLARKSTON-01-A002	1302036-01	W	Clopyralid	UJ	LCS %R <LCL
CLARKSTON-01-A014	1304048-10	W	Clopyralid	UJ	LCS %R <LCL
CLARKSTON-01-A026	1306077-02	W	Clopyralid	UJ	LCS %R <LCL
EUCLID-01-A002	1212029-01	W	Clopyralid	UJ	LCS %R <LCL
EUCLID-01-A008	1303081-06	W	Clopyralid	UJ	LCS %R <LCL
EUCLID-01-A020	1303046-01	W	Clopyralid	UJ	LCS %R <LCL
EUCLID-01-A024	1303046-02	W	Clopyralid	UJ	LCS %R <LCL
EUCLID-01-A032	1306077-01	W	Clopyralid	UJ	LCS %R <LCL
GEIGER-01-A004	1306051-06	W	Clopyralid	UJ	LCS %R <LCL
GEIGER-01-A008	1303081-05	W	Clopyralid	UJ	LCS %R <LCL
GEIGER-01-A014	1304048-12	W	Clopyralid	J	LCS %R <LCL
GEIGER-01-A026	1309055-01	W	Clopyralid	UJ	LCS %R <LCL
LAKEVIEW-01-A014	1301053-02	W	Clopyralid	UJ	LCS %R <LCL
LAKEVIEW-01-A020	1303081-03	W	Clopyralid	UJ	LCS %R <LCL
LAKEVIEW-01-A026	1304047-03	W	Clopyralid	UJ	LCS %R <LCL
LAKEVIEW-01-A032	1303088-01	W	Clopyralid	UJ	LCS %R <LCL
LAKEVIEW-01-A044	1309057-13	W	Clopyralid	UJ	LCS %R <LCL
SMKYPT-01-A004	1309057-12	W	Clopyralid	UJ	LCS %R <LCL
SMKYPT-01-A008	1301055-07	W	Clopyralid	UJ	LCS %R <LCL

Field Sample ID	Laboratory Sample ID	Sample Matrix	Analyte	Qualifier	Comment
SMKYPT-01-A020	1303034-03	W	Clopyralid	UJ	LCS %R <LCL
SMKYPT-01-A032	1303033-11	W	Clopyralid	UJ	LCS %R <LCL
SMKYPT-01-A036	1303033-12	W	Clopyralid	UJ	LCS %R <LCL
SMKYPT-01-A043	1303041-01	W	Clopyralid	UJ	LCS %R <LCL
SMKYPT-01-A044	1309057-07	W	Clopyralid	UJ	LCS %R <LCL
SMKYPT-02-A008	1301055-05	W	Clopyralid	UJ	LCS %R <LCL
SMKYPT-02-A050	1304048-06	W	Clopyralid	UJ	LCS %R <LCL
SMKYPT-02-A068	1309057-09	W	Clopyralid	UJ	LCS %R <LCL
VANCOUVER-01-A002	1212031-01	W	Clopyralid	UJ	LCS %R <LCL
VANCOUVER-01-A014	1301055-02	W	Clopyralid	UJ	LCS %R <LCL
VANCOUVER-01-A026	1304047-01	W	Clopyralid	UJ	LCS %R <LCL
VANCOUVER-01-A032	1303081-01	W	Clopyralid	UJ	LCS %R <LCL
VANCOUVER-01-A038	1304048-08	W	Clopyralid	UJ	LCS %R <LCL
VANCOUVER-01-A042	1304048-09	W	Clopyralid	UJ	LCS %R <LCL
VANCOUVER-01-A044	1309064-01	W	Clopyralid	UJ	LCS %R <LCL
CLARKSTON-01-A20	1305081-02	W	Dichlobenil	R	LCS %R <10%
BALLINGER-01-A032	1302059-01	W	Diuron	R	LCS %R <10%
BALLINGER-01-A038	1303045-01	W	Diuron	UJ	LCS %R <LCL
BALLINGER-01-A042	1303045-02	W	Diuron	UJ	LCS %R <LCL
SMKYPT-01-A043	1303041-01	W	Diuron	UJ	LCS %R <LCL
BALLINGER-01-A008	1211064-01	W	Picloram	UJ	LCS %R <LCL
BALLINGER-01-A020	1301055-09	W	Picloram	UJ	LCS %R <LCL
BALLINGER-01-A038	1303045-01	W	Picloram	UJ	LCS %R <LCL
BALLINGER-01-A050	1309057-06	W	Picloram	UJ	LCS %R <LCL
CLARKSTON-01-A026	1306077-02	W	Picloram	UJ	LCS %R <LCL
EUCLID-01-A002	1212029-01	W	Picloram	UJ	LCS %R <LCL
EUCLID-01-A008	1303081-06	W	Picloram	UJ	LCS %R <LCL
EUCLID-01-A020	1303046-01	W	Picloram	UJ	LCS %R <LCL
EUCLID-01-A024	1303046-02	W	Picloram	UJ	LCS %R <LCL
EUCLID-01-A032	1306077-01	W	Picloram	UJ	LCS %R <LCL
GEIGER-01-A008	1303081-05	W	Picloram	UJ	LCS %R <LCL
LAKEVIEW-01-A014	1301053-02	W	Picloram	UJ	LCS %R <LCL
LAKEVIEW-01-A020	1303081-03	W	Picloram	UJ	LCS %R <LCL
LAKEVIEW-01-A032	1303088-01	W	Picloram	UJ	LCS %R <LCL
LAKEVIEW-01-A044	1309057-13	W	Picloram	UJ	LCS %R <LCL

35

Field Sample ID	Laboratory Sample ID	Sample Matrix	Analyte	Qualifier	Comment
SMKYPT-01-A004	1309057-12	W	Picloram	UJ	LCS %R <LCL
SMKYPT-01-A008	1301055-07	W	Picloram	UJ	LCS %R <LCL
SMKYPT-01-A020	1303034-03	W	Picloram	UJ	LCS %R <LCL
SMKYPT-01-A032	1303033-11	W	Picloram	UJ	LCS %R <LCL
SMKYPT-01-A036	1303033-12	W	Picloram	UJ	LCS %R <LCL
SMKYPT-01-A043	1303041-01	W	Picloram	UJ	LCS %R <LCL
SMKYPT-01-A044	1309057-07	W	Picloram	UJ	LCS %R <LCL
SMKYPT-02-A008	1301055-05	W	Picloram	UJ	LCS %R <LCL
SMKYPT-02-A068	1309057-09	W	Picloram	UJ	LCS %R <LCL
VANCOUVER-01-A014	1301055-02	W	Picloram	UJ	LCS %R <LCL
VANCOUVER-01-A032	1303081-01	W	Picloram	UJ	LCS %R <LCL
EUCLID-01-WY11-05-01	1210071-01	W	Acenaphthylene	J	LCS %R <LCL
EV-01-VEP-A004	1307055-05	W	*bis*(2-Ethylhexyl)phthalate	UJ	LCS %R <LCL
EV-04-MEP-A004	1307055-09	W	*bis*(2-Ethylhexyl)phthalate	UJ	LCS %R <LCL
EV-04-MEP-A014	1302054-02	W	*bis*(2-Ethylhexyl)phthalate	J	LCS %R <LCL
PIL-01-VEP-A026	1302054-04	W	*bis*(2-Ethylhexyl)phthalate	J	LCS %R <LCL
PIL-01-VEP-A050	1303033-01	W	*bis*(2-Ethylhexyl)phthalate	J	LCS %R <LCL
PINES-01-A004	1306051-04	W	*bis*(2-Ethylhexyl)phthalate	J	LCS %R <LCL
PINES-01-A026	1305081-01	W	*bis*(2-Ethylhexyl)phthalate	J	LCS %R <LCL
PINES-01-A031	1306051-02	W	*bis*(2-Ethylhexyl)phthalate	J	LCS %R <LCL
SMKYPT-01-A004	1309057-12	W	*bis*(2-Ethylhexyl)phthalate	UJ	LCS %R <LCL
SMKYPT-01-A008	1301055-07	W	*bis*(2-Ethylhexyl)phthalate	J	LCS %R <LCL
SMKYPT-01-A032	1303033-11	W	*bis*(2-Ethylhexyl)phthalate	J	LCS %R <LCL
SMKYPT-01-A043	1303041-01	W	*bis*(2-Ethylhexyl)phthalate	UJ	LCS %R <LCL
SMKYPT-01-A044	1309057-07	W	*bis*(2-Ethylhexyl)phthalate	J	LCS %R <LCL
SMKYPT-01-WY11-05-01	1210065-05	W	*bis*(2-Ethylhexyl)phthalate	UJ	LCS %R <LCL
SMKYPT-02-A008	1301055-05	W	*bis*(2-Ethylhexyl)phthalate	UJ	LCS %R <LCL
SMKYPT-02-A068	1309057-09	W	*bis*(2-Ethylhexyl)phthalate	UJ	LCS %R <LCL
SMKYPT-02-WY12-05-01	1210065-01	W	*bis*(2-Ethylhexyl)phthalate	UJ	LCS %R <LCL
SR9-01-A004	1307055-02	W	*bis*(2-Ethylhexyl)phthalate	UJ	LCS %R <LCL
EV-01-VEP-A004	1307055-05	W	Diethyl phthalate	UJ	LCS %R <LCL
EV-04-MEP-A004	1307055-09	W	Diethyl phthalate	J	LCS %R <LCL
PIL-01-VEP-A050	1303033-01	W	Diethyl phthalate	UJ	LCS %R <LCL
PINES-01-A080	1308053-01	W	Diethyl phthalate	UJ	LCS %R <LCL
SMKYPT-01-A008	1301055-07	W	Diethyl phthalate	UJ	LCS %R <LCL

Field Sample ID	Laboratory Sample ID	Sample Matrix	Analyte	Qualifier	Comment
SMKYPT-01-A032	1303033-11	W	Diethyl phthalate	UJ	LCS %R <LCL
SMKYPT-01-A043	1303041-01	W	Diethyl phthalate	UJ	LCS %R <LCL
SMKYPT-02-A008	1301055-05	W	Diethyl phthalate	UJ	LCS %R <LCL
SR9-01-A004	1307055-02	W	Diethyl phthalate	UJ	LCS %R <LCL
PIL-01-VEP-A050	1303033-01	W	Dimethyl phthalate	UJ	LCS %R <LCL
PINES-01-A004	1306051-04	W	Dimethyl phthalate	UJ	LCS %R <LCL
PINES-01-A031	1306051-02	W	Dimethyl phthalate	UJ	LCS %R <LCL
SMKYPT-01-A032	1303033-11	W	Dimethyl phthalate	UJ	LCS %R <LCL
EV-01-VEP-A004	1307055-05	W	Di-*n*-butylphthalate	UJ	LCS %R <LCL
EV-04-MEP-A004	1307055-09	W	Di-*n*-butylphthalate	UJ	LCS %R <LCL
SR9-01-A004	1307055-02	W	Di-*n*-butylphthalate	UJ	LCS %R <LCL
EV-01-VEP-A004	1307055-05	W	Di-*n*-octylphthalate	UJ	LCS %R <LCL
EV-04-MEP-A004	1307055-09	W	Di-*n*-octylphthalate	UJ	LCS %R <LCL
EV-04-MEP-A014	1302054-02	W	Di-*n*-octylphthalate	J	LCS %R <LCL
PIL-01-VEP-A026	1302054-04	W	Di-*n*-octylphthalate	J	LCS %R <LCL
PIL-01-VEP-A050	1303033-01	W	Di-*n*-octylphthalate	J	LCS %R <LCL
PINES-01-A004	1306051-04	W	Di-*n*-octylphthalate	J	LCS %R <LCL
PINES-01-A026	1305081-01	W	Di-*n*-octylphthalate	J	LCS %R <LCL
PINES-01-A031	1306051-02	W	Di-*n*-octylphthalate	UJ	LCS %R <LCL
SMKYPT-01-A004	1309057-12	W	Di-*n*-octylphthalate	UJ	LCS %R <LCL
SMKYPT-01-A008	1301055-07	W	Di-*n*-octylphthalate	UJ	LCS %R <LCL
SMKYPT-01-A032	1303033-11	W	Di-*n*-octylphthalate	UJ	LCS %R <LCL
SMKYPT-01-A043	1303041-01	W	Di-*n*-octylphthalate	UJ	LCS %R <LCL
SMKYPT-01-A044	1309057-07	W	Di-*n*-octylphthalate	UJ	LCS %R <LCL
SMKYPT-01-WY11-05-01	1210065-05	W	Di-*n*-octylphthalate	UJ	LCS %R <LCL
SMKYPT-02-A008	1301055-05	W	Di-*n*-octylphthalate	UJ	LCS %R <LCL
SMKYPT-02-A068	1309057-09	W	Di-*n*-octylphthalate	UJ	LCS %R <LCL
SMKYPT-02-WY12-05-01	1210065-01	W	Di-*n*-octylphthalate	UJ	LCS %R <LCL
SR9-01-A004	1307055-02	W	Di-*n*-octylphthalate	UJ	LCS %R <LCL
EUCLID-01-WY11-05-01	1210071-01	W	Fluoranthene	J	LCS %R <LCL
EV-01-VEP-A032	1304068-06	W	Fluoranthene	J	LCS %R <LCL
EV-01-VEP-A036	1304068-07	W	Fluoranthene	J	LCS %R <LCL
LAKEVIEW-01-A032	1303088-01	W	Fluoranthene	J	LCS %R <LCL
LAKEVIEW-01-A038	1304054-03	W	Fluoranthene	J	LCS %R <LCL
PIL-01-VEP-A080	1304068-08	W	Fluoranthene	J	LCS %R <LCL

37

Field Sample ID	Laboratory Sample ID	Sample Matrix	Analyte	Qualifier	Comment
SMKYPT-02-A056	1304055-01	W	Fluoranthene	J	LCS %R <LCL
SMKYPT-02-A062	1304068-01	W	Fluoranthene	J	LCS %R <LCL
SR9-01-A050	1304068-05	W	Fluoranthene	J	LCS %R <LCL
BAINBRIDGE-01-A008	1211063-01	W	Indeno(1,2,3-cd)pyrene	J	LCS %R <LCL
BALLINGER-01-A014	1212040-13	W	Indeno(1,2,3-cd)pyrene	J	LCS %R <LCL
EUCLID-01-A002	1212029-01	W	Indeno(1,2,3-cd)pyrene	J	LCS %R <LCL
PINES-01-A008	1212030-02	W	Indeno(1,2,3-cd)pyrene	J	LCS %R <LCL
EUCLID-01-WY11-05-01	1210071-01	W	Phenanthrene	J	LCS %R <LCL
LAKEVIEW-01-A032	1303088-01	W	Phenanthrene	J	LCS %R <LCL
EUCLID-01-WY11-05-01	1210071-01	W	Pyrene	J	LCS %R <LCL
LAKEVIEW-01-A032	1303088-01	W	Pyrene	J	LCS %R <LCL
SED-EVERETT-01-A001	1305065-01	S	2,4-Dimethylphenol	UJ	LCS %R <LCL
SED-EVERETT-04-A001	1306058-01	S	2,4-Dimethylphenol	UJ	LCS %R <LCL
SED-PILCHUCK-01-A001	1306058-02	S	2,4-Dimethylphenol	UJ	LCS %R <LCL
SED-PILCHUCK-01-A002	1306058-03	S	2,4-Dimethylphenol	UJ	LCS %R <LCL
SED-PINES-01-A001	1306053-01	S	2,4-Dimethylphenol	UJ	LCS %R <LCL
SED-SR09-01-A001	1305050-01	S	2,4-Dimethylphenol	UJ	LCS %R <LCL
SED-EVERETT-01-A001	1305065-01	S	2-Methylphenol	UJ	LCS %R <LCL
SED-EVERETT-04-A001	1306058-01	S	2-Methylphenol	UJ	LCS %R <LCL
SED-PILCHUCK-01-A001	1306058-02	S	2-Methylphenol	UJ	LCS %R <LCL
SED-PILCHUCK-01-A002	1306058-03	S	2-Methylphenol	UJ	LCS %R <LCL
SED-PINES-01-A001	1306053-01	S	2-Methylphenol	UJ	LCS %R <LCL
SED-SR09-01-A001	1305050-01	S	2-Methylphenol	UJ	LCS %R <LCL
SED-EVERETT-01-A001	1305065-01	S	Benzoic Acid	R	LCS %R <10%
SED-EVERETT-04-A001	1306058-01	S	Benzoic Acid	R	LCS %R <10%
SED-PILCHUCK-01-A001	1306058-02	S	Benzoic Acid	R	LCS %R <10%
SED-PILCHUCK-01-A002	1306058-03	S	Benzoic Acid	R	LCS %R <10%
SED-PINES-01-A001	1306053-01	S	Benzoic Acid	R	LCS %R <10%
SED-PINES-01-WY11-01-01	1211039-01	S	Benzoic Acid	R	LCS %R <10%
SED-PINES-02-WY11-01-01	1211039-02	S	Benzoic Acid	R	LCS %R <10%
SED-SR09-01-A001	1305050-01	S	Benzoic Acid	R	LCS %R <10%
SED-EVERETT-01-A001	1305065-01	S	Benzyl Alcohol	UJ	LCS %R <LCL
SED-EVERETT-04-A001	1306058-01	S	Benzyl Alcohol	UJ	LCS %R <LCL
SED-PILCHUCK-01-A001	1306058-02	S	Benzyl Alcohol	UJ	LCS %R <LCL
SED-PILCHUCK-01-A002	1306058-03	S	Benzyl Alcohol	UJ	LCS %R <LCL

38

Field Sample ID	Laboratory Sample ID	Sample Matrix	Analyte	Qualifier	Comment
SED-PINES-01-A001	1306053-01	S	Benzyl Alcohol	UJ	LCS %R <LCL
SED-PINES-01-WY11-01-01	1211039-01	S	Benzyl Alcohol	R	LCS %R <10%
SED-PINES-02-WY11-01-01	1211039-02	S	Benzyl Alcohol	R	LCS %R <10%
SED-SR09-01-A001	1305050-01	S	Benzyl Alcohol	UJ	LCS %R <LCL
SED-EVERETT-01-A001	1305065-01	S	Naphthalene	UJ	LCS %R <LCL
SED-EVERETT-04-A001	1306058-01	S	Naphthalene	UJ	LCS %R <LCL
SED-PILCHUCK-01-A001	1306058-02	S	Naphthalene	UJ	LCS %R <LCL
SED-PILCHUCK-01-A002	1306058-03	S	Naphthalene	UJ	LCS %R <LCL
SED-PINES-01-A001	1306053-01	S	Naphthalene	UJ	LCS %R <LCL
SED-SR09-01-A001	1305050-01	S	Naphthalene	UJ	LCS %R <LCL
SED-EVERETT-01-A001	1305065-01	S	Pentachlorophenol	UJ	LCS %R <LCL
SED-EVERETT-04-A001	1306058-01	S	Pentachlorophenol	UJ	LCS %R <LCL
SED-PILCHUCK-01-A001	1306058-02	S	Pentachlorophenol	UJ	LCS %R <LCL
SED-PILCHUCK-01-A002	1306058-03	S	Pentachlorophenol	UJ	LCS %R <LCL
SED-PINES-01-A001	1306053-01	S	Pentachlorophenol	UJ	LCS %R <LCL
SED-PINES-01-WY11-01-01	1211039-01	S	Pentachlorophenol	R	LCS %R <10%
SED-PINES-02-WY11-01-01	1211039-02	S	Pentachlorophenol	R	LCS %R <10%
SED-SR09-01-A001	1305050-01	S	Pentachlorophenol	UJ	LCS %R <LCL
SED-EVERETT-01-A001	1305065-01	S	Phenol	UJ	LCS %R <LCL
SED-EVERETT-04-A001	1306058-01	S	Phenol	UJ	LCS %R <LCL
SED-PILCHUCK-01-A001	1306058-02	S	Phenol	UJ	LCS %R <LCL
SED-PILCHUCK-01-A002	1306058-03	S	Phenol	UJ	LCS %R <LCL
SED-PINES-01-A001	1306053-01	S	Phenol	UJ	LCS %R <LCL
SED-SR09-01-A001	1305050-01	S	Phenol	UJ	LCS %R <LCL

Notes:

%R – Percent recovery

J – The analyte was detected in the sample and the reported value was considered as estimated.

LCL – Lower control limit

LCS – Laboratory control sample

R – The result was rejected and could not be used. An analyte result was qualified (R) where the LCS %R value was <10% and the analyte was not detected in the sample associated with the LCS.

S – Sediment

U – The analyte was not detected at or above the quantitation limit.

UJ – The analyte was not detected in the sample, and the reported quantitation limit associated with this analyte was considered as estimated.

W – Water

Table 3-6 Data Affected by Matrix Spike Recovery Outliers

Field Sample ID	Laboratory Sample ID	Sample Matrix	Analyte	Qualifier	Comment
BALLINGER-01-A004	580-37466-2	W	Nitrogen, Total Kjeldahl	J	
BALLINGER-01-A008	580-36155-1	W	Nitrogen, Total Kjeldahl	J	
BALLINGER-01-A014	580-36358-1	W	Nitrogen, Total Kjeldahl	J	
BALLINGER-01-A044	580-38618-7	W	Nitrogen, Total Kjeldahl	J	
CLARKSTON-01-A019	580-38220-1	W	Nitrogen, Total Kjeldahl	J	
CLARKSTON-01-A031	580-40201-1	W	Nitrogen, Total Kjeldahl	J	
CLARKSTON-01-A038	580-38644-1	W	Nitrogen, Total Kjeldahl	J	
EUCLID-01-A008	580-37626-1	W	Nitrogen, Total Kjeldahl	J	
EUCLID-01-WY11-05-01	580-35550-1	W	Nitrogen, Total Kjeldahl	J	
EV-01-VEP-A038	580-38446-1	W	Nitrogen, Total Kjeldahl	J	
EV-01-VEP-A042	580-38446-2	W	Nitrogen, Total Kjeldahl	J	
EV-01-VEP-A050	580-38618-2	W	Nitrogen, Total Kjeldahl	J	
EV-01-VEP-A054	580-38618-3	W	Nitrogen, Total Kjeldahl	J	
EV-02-V2M-A013	580-38618-6	W	Nitrogen, Total Kjeldahl	J	
EV-02-V2M-A015	580-38618-5	W	Nitrogen, Total Kjeldahl	J	
EV-03-V4M-A004	580-36358-3	W	Nitrogen, Total Kjeldahl	J	
EV-04-MEP-A056	580-38618-4	W	Nitrogen, Total Kjeldahl	J	
EV-05-M2M-A016	580-38618-1	W	Nitrogen, Total Kjeldahl	J	
GEIGER-01-A002	580-38486-1	W	Nitrogen, Total Kjeldahl	J	
GEIGER-01-A004	580-38769-4	W	Nitrogen, Total Kjeldahl	R	MS/MSD %R <10%
GEIGER-01-A026	580-40201-2	W	Nitrogen, Total Kjeldahl	J	
GEIGER-01-WY11-07-01	580-35657-1	W	Nitrogen, Total Kjeldahl	J	
LAKEVIEW-01-A008	580-36016-1	W	Nitrogen, Total Kjeldahl	UJ	
LAKEVIEW-01-A026	580-37880-1	W	Nitrogen, Total Kjeldahl	J	
LAKEVIEW-01-A030	580-37880-2	W	Nitrogen, Total Kjeldahl	J	
LAKEVIEW-01-A032	580-37769-1	W	Nitrogen, Total Kjeldahl	J	
PIL-01-VEP-A004	580-39221-7	W	Nitrogen, Total Kjeldahl	J	
PIL-02-V2M-A002	580-39221-4	W	Nitrogen, Total Kjeldahl	J	
PIL-03-V4M-A002	580-39221-2	W	Nitrogen, Total Kjeldahl	J	
PIL-03-V4M-A013	580-37288-2	W	Nitrogen, Total Kjeldahl	J	
PIL-03-V4M-A014	580-36358-4	W	Nitrogen, Total Kjeldahl	J	
PIL-04-C2M-A002	580-39221-3	W	Nitrogen, Total Kjeldahl	J	
PIL-05-C4M-A002	580-39221-6	W	Nitrogen, Total Kjeldahl	J	

Field Sample ID	Laboratory Sample ID	Sample Matrix	Analyte	Qualifier	Comment
PIL-05-C4M-A013	580-37288-3	W	Nitrogen, Total Kjeldahl	J	
PIL-06-MEP-A002	580-39221-5	W	Nitrogen, Total Kjeldahl	J	
PIL-06-MEP-A016	580-37288-4	W	Nitrogen, Total Kjeldahl	UJ	
PIL-07-M2M-A010	580-37935-6	W	Nitrogen, Total Kjeldahl	J	
PIL-08-M4M-A002	580-39221-1	W	Nitrogen, Total Kjeldahl	J	
PINES-01-A004	580-38769-2	W	Nitrogen, Total Kjeldahl	J	
PINES-01-A031	580-38769-3	W	Nitrogen, Total Kjeldahl	R	MS/MSD %R <10%
SMKYPT-01-A043	580-37378-1	W	Nitrogen, Total Kjeldahl	J	
SMKYPT-01-WY11-05-01	580-35509-2	W	Nitrogen, Total Kjeldahl	J	
SMKYPT-02-A056	580-38038-1	W	Nitrogen, Total Kjeldahl	J	
SR518-01-A007	580-38038-4	W	Nitrogen, Total Kjeldahl	J	
SR518-02-A007	580-38038-3	W	Nitrogen, Total Kjeldahl	J	
SR518-03-A007	580-38038-5	W	Nitrogen, Total Kjeldahl	J	
SR518-04-A007	580-38038-2	W	Nitrogen, Total Kjeldahl	J	
VANCOUVER-01-A026	580-37880-3	W	Nitrogen, Total Kjeldahl	UJ	
VANCOUVER-01-A032	580-37671-1	W	Nitrogen, Total Kjeldahl	J	
VANCOUVER-01-WY11-06-01	580-35509-1	W	Nitrogen, Total Kjeldahl	J	
LAKEVIEW-01-A014	1301053-02	W	Total Phosphorus	J	
EV-04-MEP-A050	1304068-03	W	Total Phosphorus	J	
EV-05-M2M-A013	1304068-09	W	Total Phosphorus	J	
PIL-01-VEP-A080	1304068-08	W	Total Phosphorus	J	
PIL-05-C4M-A022	1304068-04	W	Total Phosphorus	J	
PIL-06-MEP-A031	1304068-11	W	Total Phosphorus	J	
SMKYPT-02-A062	1304068-01	W	Total Phosphorus	J	
SR9-01-A050	1304068-05	W	Total Phosphorus	J	
SED-EVERETT-04-A001	1306058-01	S	Copper, Total	J	
SED-PILCHUCK-01-A001	1306058-02	S	Copper, Total	J	
SED-PILCHUCK-01-A002	1306058-03	S	Copper, Total	J	
SED-PINES-01-A001	1306053-01	S	Copper, Total	J	
SED-PINES-01-WY11-01-01	1211039-01	S	Copper, Total	J	
SED-PINES-02-WY11-01-01	1211039-02	S	Copper, Total	J	
SED-SR09-01-A001	1305050-01	S	Copper, Total	J	
SED-EVERETT-04-A001	1306058-01	S	Lead, Total	J	
SED-PILCHUCK-01-A001	1306058-02	S	Lead, Total	J	
SED-PILCHUCK-01-A002	1306058-03	S	Lead, Total	J	

Field Sample ID	Laboratory Sample ID	Sample Matrix	Analyte	Qualifier	Comment
SED-PINES-01-A001	1306053-01	S	Lead, Total	J	
SED-PINES-01-WY11-01-01	1211039-01	S	Lead, Total	J	
SED-PINES-02-WY11-01-01	1211039-02	S	Lead, Total	J	
SED-SR09-01-A001	1305050-01	S	Lead, Total	J	
SED-PINES-02-WY11-01-01	1211039-02	S	Benzoic Acid	R	MS/MSD %R <10%
SED-PINES-02-WY11-01-01	1211039-02	S	Benzyl Alcohol	R	MS/MSD %R <10%
SED-PINES-02-WY11-01-01	1211039-02	S	Butyl benzyl phthalate	J	
SED-PINES-02-WY11-01-01	1211039-02	S	Pentachlorophenol	R	MS/MSD %R <10%

Notes:

%R – Percent recovery

J – The analyte was detected in the sample and the reported value was considered as estimated.

MS – Matrix spike

MSD – Matrix spike duplicate

R – The result was rejected and could not be used. An analyte result was qualified (R) where the MS and/or MSD %R value was <10% and the analyte was not detected in the sample(s) associated with the MS and MSD analyses.

S – Sediment

UJ – The analyte was not detected in the sample, and the reported quantitation limit associated with this analyte was considered as estimated.

W – Water

42

Table 3-7 Data Affected by Surrogate Spike Recovery Outliers

Field Sample ID	Laboratory Sample ID	Sample Matrix	Analyte	Qualifier	Comment
EVERETT-01-A013	1302034-02	W	#2 Diesel	UJ	
EVERETT-01-A013	1302034-02	W	Lube Oil	J	
GEIGER-01-A008	1303081-05	W	Triclopyr	J	
LAKEVIEW-01-A026	1304047-03	W	2,4-D	J	
LAKEVIEW-01-A026	1304047-03	W	Triclopyr	J	
VANCOUVER-01-A026	1304047-01	W	2,4-D	J	
VANCOUVER-01-A026	1304047-01	W	Triclopyr	J	
BAINBRIDGE-01-A038	1305066-01	W	Acenaphthene	UJ	
BAINBRIDGE-01-A038	1305066-01	W	Acenaphthylene	UJ	
BAINBRIDGE-01-A038	1305066-01	W	Anthracene	UJ	
BAINBRIDGE-01-A038	1305066-01	W	Benzo(a)anthracene	J	
BAINBRIDGE-01-A038	1305066-01	W	Benzo(a)pyrene	J	
BAINBRIDGE-01-A038	1305066-01	W	Benzo(b)fluoranthene	J	
BAINBRIDGE-01-A038	1305066-01	W	Benzo(ghi)perylene	J	
BAINBRIDGE-01-A038	1305066-01	W	Benzo(k)fluoranthene	J	
BAINBRIDGE-01-A038	1305066-01	W	Chrysene	J	
BAINBRIDGE-01-A038	1305066-01	W	Dibenzo(a,h)anthracene	J	
BAINBRIDGE-01-A038	1305066-01	W	Fluoranthene	J	
BAINBRIDGE-01-A038	1305066-01	W	Fluorene	UJ	
BAINBRIDGE-01-A038	1305066-01	W	Indeno(1,2,3-cd)pyrene	J	
BAINBRIDGE-01-A038	1305066-01	W	Naphthalene	J	
BAINBRIDGE-01-A038	1305066-01	W	Phenanthrene	J	
BAINBRIDGE-01-A038	1305066-01	W	Pyrene	J	
EUCLID-01-WY11-05-01	1210071-01	W	Acenaphthene	R	Unsuccessful extraction
EUCLID-01-WY11-05-01	1210071-01	W	Acenaphthylene	J	Unsuccessful extraction
EUCLID-01-WY11-05-01	1210071-01	W	Anthracene	R	Unsuccessful extraction
EUCLID-01-WY11-05-01	1210071-01	W	Benzo(a)anthracene	R	Unsuccessful extraction
EUCLID-01-WY11-05-01	1210071-01	W	Benzo(a)pyrene	R	Unsuccessful extraction
EUCLID-01-WY11-05-01	1210071-01	W	Benzo(b)fluoranthene	R	Unsuccessful extraction
EUCLID-01-WY11-05-01	1210071-01	W	Benzo(ghi)perylene	R	Unsuccessful extraction
EUCLID-01-WY11-05-01	1210071-01	W	Benzo(k)fluoranthene	R	Unsuccessful extraction
EUCLID-01-WY11-05-01	1210071-01	W	Chrysene	R	Unsuccessful extraction
EUCLID-01-WY11-05-01	1210071-01	W	Dibenzo(a,h)anthracene	R	Unsuccessful extraction

43

Field Sample ID	Laboratory Sample ID	Sample Matrix	Analyte	Qualifier	Comment
EUCLID-01-WY11-05-01	1210071-01	W	Fluoranthene	J	Unsuccessful extraction
EUCLID-01-WY11-05-01	1210071-01	W	Fluorene	R	Unsuccessful extraction
EUCLID-01-WY11-05-01	1210071-01	W	Indeno(1,2,3-cd)pyrene	R	Unsuccessful extraction
EUCLID-01-WY11-05-01	1210071-01	W	Naphthalene	R	Unsuccessful extraction
EUCLID-01-WY11-05-01	1210071-01	W	Phenanthrene	J	Unsuccessful extraction
EUCLID-01-WY11-05-01	1210071-01	W	Pyrene	J	Unsuccessful extraction
GEIGER-01-A008	1303081-05	W	Acenaphthene	UJ	
GEIGER-01-A008	1303081-05	W	Acenaphthylene	UJ	
GEIGER-01-A008	1303081-05	W	Anthracene	UJ	
GEIGER-01-A008	1303081-05	W	Benzo(a)anthracene	UJ	
GEIGER-01-A008	1303081-05	W	Benzo(a)pyrene	UJ	
GEIGER-01-A008	1303081-05	W	Benzo(b)fluoranthene	J	
GEIGER-01-A008	1303081-05	W	Benzo(ghi)perylene	J	
GEIGER-01-A008	1303081-05	W	Benzo(k)fluoranthene	J	
GEIGER-01-A008	1303081-05	W	Chrysene	J	
GEIGER-01-A008	1303081-05	W	Dibenzo(a,h)anthracene	UJ	
GEIGER-01-A008	1303081-05	W	Fluoranthene	J	
GEIGER-01-A008	1303081-05	W	Fluorene	UJ	
GEIGER-01-A008	1303081-05	W	Indeno(1,2,3-cd)pyrene	J	
GEIGER-01-A008	1303081-05	W	Naphthalene	UJ	
GEIGER-01-A008	1303081-05	W	Phenanthrene	J	
GEIGER-01-A008	1303081-05	W	Pyrene	J	
GEIGER-01-A014	1304048-12	W	Acenaphthene	UJ	
GEIGER-01-A014	1304048-12	W	Acenaphthylene	UJ	
GEIGER-01-A014	1304048-12	W	Anthracene	UJ	
GEIGER-01-A014	1304048-12	W	Benzo(a)anthracene	UJ	
GEIGER-01-A014	1304048-12	W	Benzo(a)pyrene	UJ	
GEIGER-01-A014	1304048-12	W	Benzo(b)fluoranthene	J	
GEIGER-01-A014	1304048-12	W	Benzo(ghi)perylene	J	
GEIGER-01-A014	1304048-12	W	Benzo(k)fluoranthene	UJ	
GEIGER-01-A014	1304048-12	W	Chrysene	J	
GEIGER-01-A014	1304048-12	W	Dibenzo(a,h)anthracene	UJ	
GEIGER-01-A014	1304048-12	W	Fluoranthene	J	
GEIGER-01-A014	1304048-12	W	Fluorene	UJ	
GEIGER-01-A014	1304048-12	W	Indeno(1,2,3-cd)pyrene	UJ	

Field Sample ID	Laboratory Sample ID	Sample Matrix	Analyte	Qualifier	Comment
GEIGER-01-A014	1304048-12	W	Naphthalene	UJ	
GEIGER-01-A014	1304048-12	W	Phenanthrene	J	
GEIGER-01-A014	1304048-12	W	Pyrene	J	
LAKEVIEW-01-WY11-07-01	1210065-03	W	Acenaphthene	R	Surrogate %R <10%
LAKEVIEW-01-WY11-07-01	1210065-03	W	Acenaphthylene	J	
LAKEVIEW-01-WY11-07-01	1210065-03	W	Anthracene	R	Surrogate %R <10%
LAKEVIEW-01-WY11-07-01	1210065-03	W	Benzo(a)anthracene	R	Surrogate %R <10%
LAKEVIEW-01-WY11-07-01	1210065-03	W	Benzo(a)pyrene	J	
LAKEVIEW-01-WY11-07-01	1210065-03	W	Benzo(b)fluoranthene	J	
LAKEVIEW-01-WY11-07-01	1210065-03	W	Benzo(ghi)perylene	J	
LAKEVIEW-01-WY11-07-01	1210065-03	W	Benzo(k)fluoranthene	R	Surrogate %R <10%
LAKEVIEW-01-WY11-07-01	1210065-03	W	Chrysene	J	
LAKEVIEW-01-WY11-07-01	1210065-03	W	Dibenzo(a,h)anthracene	R	Surrogate %R <10%
LAKEVIEW-01-WY11-07-01	1210065-03	W	Fluoranthene	J	
LAKEVIEW-01-WY11-07-01	1210065-03	W	Fluorene	J	
LAKEVIEW-01-WY11-07-01	1210065-03	W	Indeno(1,2,3-cd)pyrene	J	
LAKEVIEW-01-WY11-07-01	1210065-03	W	Naphthalene	R	Surrogate %R <10%
LAKEVIEW-01-WY11-07-01	1210065-03	W	Phenanthrene	J	
LAKEVIEW-01-WY11-07-01	1210065-03	W	Pyrene	J	
SMKYPT-01-WY11-05-01	1210065-05	W	Acenaphthene	UJ	
SMKYPT-01-WY11-05-01	1210065-05	W	Acenaphthylene	J	
SMKYPT-01-WY11-05-01	1210065-05	W	Anthracene	UJ	
SMKYPT-01-WY11-05-01	1210065-05	W	Benzo(a)anthracene	UJ	
SMKYPT-01-WY11-05-01	1210065-05	W	Benzo(a)pyrene	UJ	
SMKYPT-01-WY11-05-01	1210065-05	W	Benzo(b)fluoranthene	UJ	
SMKYPT-01-WY11-05-01	1210065-05	W	Benzo(ghi)perylene	UJ	
SMKYPT-01-WY11-05-01	1210065-05	W	Benzo(k)fluoranthene	UJ	
SMKYPT-01-WY11-05-01	1210065-05	W	Bis(2-Ethylhexyl) Phthalate	UJ	
SMKYPT-01-WY11-05-01	1210065-05	W	Butyl benzyl phthalate	UJ	
SMKYPT-01-WY11-05-01	1210065-05	W	Chrysene	UJ	
SMKYPT-01-WY11-05-01	1210065-05	W	Dibenzo(a,h)anthracene	UJ	
SMKYPT-01-WY11-05-01	1210065-05	W	Diethyl phthalate	J	
SMKYPT-01-WY11-05-01	1210065-05	W	Dimethyl phthalate	UJ	
SMKYPT-01-WY11-05-01	1210065-05	W	Di-N-Butylphthalate	UJ	
SMKYPT-01-WY11-05-01	1210065-05	W	Di-N-Octyl Phthalate	UJ	

45

Field Sample ID	Laboratory Sample ID	Sample Matrix	Analyte	Qualifier	Comment
SMKYPT-01-WY11-05-01	1210065-05	W	Fluoranthene	UJ	
SMKYPT-01-WY11-05-01	1210065-05	W	Fluorene	UJ	
SMKYPT-01-WY11-05-01	1210065-05	W	Indeno(1,2,3-cd)pyrene	UJ	
SMKYPT-01-WY11-05-01	1210065-05	W	Naphthalene	UJ	
SMKYPT-01-WY11-05-01	1210065-05	W	Phenanthrene	UJ	
SMKYPT-01-WY11-05-01	1210065-05	W	Pyrene	J	
SMKYPT-02-WY12-05-01	1210065-01	W	Acenaphthene	UJ	
SMKYPT-02-WY12-05-01	1210065-01	W	Acenaphthylene	UJ	
SMKYPT-02-WY12-05-01	1210065-01	W	Anthracene	UJ	
SMKYPT-02-WY12-05-01	1210065-01	W	Benzo(a)anthracene	UJ	
SMKYPT-02-WY12-05-01	1210065-01	W	Benzo(a)pyrene	UJ	
SMKYPT-02-WY12-05-01	1210065-01	W	Benzo(b)fluoranthene	UJ	
SMKYPT-02-WY12-05-01	1210065-01	W	Benzo(ghi)perylene	UJ	
SMKYPT-02-WY12-05-01	1210065-01	W	Benzo(k)fluoranthene	UJ	
SMKYPT-02-WY12-05-01	1210065-01	W	*bis*(2-Ethylhexyl)phthalate	UJ	
SMKYPT-02-WY12-05-01	1210065-01	W	Butyl benzyl phthalate	UJ	
SMKYPT-02-WY12-05-01	1210065-01	W	Chrysene	UJ	
SMKYPT-02-WY12-05-01	1210065-01	W	Dibenzo(a,h)anthracene	UJ	
SMKYPT-02-WY12-05-01	1210065-01	W	Diethyl phthalate	UJ	
SMKYPT-02-WY12-05-01	1210065-01	W	Dimethyl phthalate	UJ	
SMKYPT-02-WY12-05-01	1210065-01	W	Di-N-Butylphthalate	UJ	
SMKYPT-02-WY12-05-01	1210065-01	W	Di-N-Octyl Phthalate	UJ	
SMKYPT-02-WY12-05-01	1210065-01	W	Fluoranthene	UJ	
SMKYPT-02-WY12-05-01	1210065-01	W	Fluorene	UJ	
SMKYPT-02-WY12-05-01	1210065-01	W	Indeno(1,2,3-cd)pyrene	UJ	
SMKYPT-02-WY12-05-01	1210065-01	W	Naphthalene	UJ	
SMKYPT-02-WY12-05-01	1210065-01	W	Phenanthrene	UJ	
SMKYPT-02-WY12-05-01	1210065-01	W	Pyrene	UJ	
VANCOUVER-01-WY11-06-01	1210066-01	W	Acenaphthene	R	Unsuccessful extraction
VANCOUVER-01-WY11-06-01	1210066-01	W	Acenaphthylene	R	Unsuccessful extraction
VANCOUVER-01-WY11-06-01	1210066-01	W	Anthracene	R	Unsuccessful extraction
VANCOUVER-01-WY11-06-01	1210066-01	W	Benzo(a)anthracene	R	Unsuccessful extraction
VANCOUVER-01-WY11-06-01	1210066-01	W	Benzo(a)pyrene	R	Unsuccessful extraction
VANCOUVER-01-WY11-06-01	1210066-01	W	Benzo(b)fluoranthene	R	Unsuccessful extraction
VANCOUVER-01-WY11-06-01	1210066-01	W	Benzo(ghi)perylene	R	Unsuccessful extraction

Field Sample ID	Laboratory Sample ID	Sample Matrix	Analyte	Qualifier	Comment
VANCOUVER-01-WY11-06-01	1210066-01	W	Benzo(k)fluoranthene	R	Unsuccessful extraction
VANCOUVER-01-WY11-06-01	1210066-01	W	Chrysene	R	Unsuccessful extraction
VANCOUVER-01-WY11-06-01	1210066-01	W	Dibenzo(a,h)anthracene	R	Unsuccessful extraction
VANCOUVER-01-WY11-06-01	1210066-01	W	Fluoranthene	R	Unsuccessful extraction
VANCOUVER-01-WY11-06-01	1210066-01	W	Fluorene	R	Unsuccessful extraction
VANCOUVER-01-WY11-06-01	1210066-01	W	Indeno(1,2,3-cd)pyrene	R	Unsuccessful extraction
VANCOUVER-01-WY11-06-01	1210066-01	W	Naphthalene	R	Unsuccessful extraction
VANCOUVER-01-WY11-06-01	1210066-01	W	Phenanthrene	R	Unsuccessful extraction
VANCOUVER-01-WY11-06-01	1210066-01	W	Pyrene	R	Unsuccessful extraction
SED-PILCHUCK-01-A001	1306058-02	S	Lube Oil	J	
SED-PILCHUCK-01-A002	1306058-03	S	Lube Oil	J	
SED-SR09-01-A001	1305050-01	S	Lube Oil	J	

Notes:

Unsuccessful extraction – Recovery of all surrogate spikes was less than the lower control limits or, in some cases, <10%, indicating a great potential of unsuccessful extraction of the sample. Detections in the samples were qualified (J) and non-detects qualified (R) and the results rejected.

%R – Percent recovery

J – The analyte was detected in the sample and the reported value was considered as estimated.

R – The result was rejected and could not be used. An analyte result was qualified (R) where the associated surrogate spike %R value was <10% and the analyte was not detected in the sample.

S – Sediment

UJ – The analyte was not detected in the sample, and the reported quantitation limit associated with this analyte was considered as estimated.

W – Water

Table 3-8 Data Affected by Precision Outliers

Field Sample ID	Laboratory Sample ID	Sample Matrix	Analyte	Qualifier	Comment
CLARKSTON-01-A014	1304048-10	W	Copper, Total	J	Laboratory Duplicate
SR518-01-A007	1304055-05	W	Copper, Total	J	Laboratory Duplicate
SR518-02-A007	1304055-07	W	Copper, Total	J	Laboratory Duplicate
SR518-03-A007	1304055-04	W	Copper, Total	J	Laboratory Duplicate
SR518-04-A007	1304055-06	W	Copper, Total	J	Laboratory Duplicate
CLARKSTON-01-A014	1304048-10	W	Lead, Total	J	Laboratory Duplicate
SR518-01-A007	1304055-05	W	Lead, Total	J	Laboratory Duplicate
SR518-02-A007	1304055-07	W	Lead, Total	J	Laboratory Duplicate
SR518-03-A007	1304055-04	W	Lead, Total	J	Laboratory Duplicate
SR518-04-A007	1304055-06	W	Lead, Total	J	Laboratory Duplicate
PINES-01-A007	1212030-01	W	#2 Diesel	UJ	Laboratory Duplicate
PINES-01-A007	1212030-01	W	Lube Oil	UJ	Laboratory Duplicate
SMKYPT-02-A002	1210072-10	W	Total Suspended Solids	J	Laboratory Duplicate
EV-03-V4M-A002	1307055-07	W	Total Phosphorus	J	Laboratory Duplicate
CLARKSTON-01-A026	1306077-02	W	2,4-D	UJ	Laboratory Duplicate
EUCLID-01-A032	1306077-01	W	2,4-D	J	Laboratory Duplicate
EUCLID-01-WY11-05-01	1210071-01	W	2,4-D	J	Laboratory Duplicate
SMKYPT-02-A010	1305044-02	W	2,4-D	UJ	Laboratory Duplicate
TOX-SR9-02-WY12-01-01	1210067-01	W	2,4-D	UJ	Laboratory Duplicate
BALLINGER-01-A020	1301055-09	W	Clopyralid	UJ	Laboratory Duplicate
CLARKSTON-01-A026	1306077-02	W	Clopyralid	UJ	Laboratory Duplicate
EUCLID-01-A002	1212029-01	W	Clopyralid	UJ	Laboratory Duplicate
EUCLID-01-A008	1303081-06	W	Clopyralid	UJ	Laboratory Duplicate
EUCLID-01-A032	1306077-01	W	Clopyralid	UJ	Laboratory Duplicate
GEIGER-01-A008	1303081-05	W	Clopyralid	UJ	Laboratory Duplicate
LAKEVIEW-01-A014	1301053-02	W	Clopyralid	UJ	Laboratory Duplicate
LAKEVIEW-01-A020	1303081-03	W	Clopyralid	UJ	Laboratory Duplicate
LAKEVIEW-01-A032	1303088-01	W	Clopyralid	UJ	Laboratory Duplicate
SMKYPT-01-A008	1301055-07	W	Clopyralid	UJ	Laboratory Duplicate
SMKYPT-02-A008	1301055-05	W	Clopyralid	UJ	Laboratory Duplicate
VANCOUVER-01-A014	1301055-02	W	Clopyralid	UJ	Laboratory Duplicate
VANCOUVER-01-A032	1303081-01	W	Clopyralid	UJ	Laboratory Duplicate
CLARKSTON-01-A004	1303088-03	W	Dichlobenil	J	Laboratory Duplicate
GEIGER-01-A002	1305058-01	W	Dichlobenil	UJ	Laboratory Duplicate
LAKEVIEW-01-A032	1303088-01	W	Dichlobenil	J	Laboratory Duplicate
SMKYPT-02-A056	1304055-01	W	Dichlobenil	UJ	Laboratory Duplicate
SMKYPT-02-A062	1304068-01	W	Dichlobenil	J	Laboratory Duplicate

48

Field Sample ID	Laboratory Sample ID	Sample Matrix	Analyte	Qualifier	Comment
BALLINGER-01-A038	1303045-01	W	Diuron	UJ	Laboratory Duplicate
BALLINGER-01-A042	1303045-02	W	Diuron	UJ	Laboratory Duplicate
BALLINGER-01-A044	1305068-01	W	Diuron	UJ	Laboratory Duplicate
EUCLID-01-A014	1305079-11	W	Diuron	UJ	Laboratory Duplicate
EUCLID-01-A020	1303046-01	W	Diuron	UJ	Laboratory Duplicate
SMKYPT-01-A043	1303041-01	W	Diuron	UJ	Laboratory Duplicate
BALLINGER-01-A020	1301055-09	W	Picloram	UJ	Laboratory Duplicate
CLARKSTON-01-A026	1306077-02	W	Picloram	UJ	Laboratory Duplicate
EUCLID-01-A008	1303081-06	W	Picloram	UJ	Laboratory Duplicate
EUCLID-01-A032	1306077-01	W	Picloram	UJ	Laboratory Duplicate
GEIGER-01-A008	1303081-05	W	Picloram	UJ	Laboratory Duplicate
LAKEVIEW-01-A014	1301053-02	W	Picloram	UJ	Laboratory Duplicate
LAKEVIEW-01-A020	1303081-03	W	Picloram	UJ	Laboratory Duplicate
SMKYPT-01-A008	1301055-07	W	Picloram	UJ	Laboratory Duplicate
SMKYPT-01-A020	1303034-03	W	Picloram	UJ	Laboratory Duplicate
SMKYPT-01-A032	1303033-11	W	Picloram	UJ	Laboratory Duplicate
SMKYPT-01-A036	1303033-12	W	Picloram	UJ	Laboratory Duplicate
SMKYPT-02-A008	1301055-05	W	Picloram	UJ	Laboratory Duplicate
SMKYPT-02-A010	1305044-02	W	Picloram	UJ	Laboratory Duplicate
VANCOUVER-01-A014	1301055-02	W	Picloram	UJ	Laboratory Duplicate
VANCOUVER-01-A032	1303081-01	W	Picloram	UJ	Laboratory Duplicate
SMKYPT-01-A020	1303034-03	W	Triclopyr	UJ	Laboratory Duplicate
SMKYPT-01-A032	1303033-11	W	Triclopyr	J	Laboratory Duplicate
SMKYPT-01-A036	1303033-12	W	Triclopyr	J	Laboratory Duplicate
EUCLID-01-WY11-05-01	1210071-01	W	Acenaphthylene	J	Laboratory Duplicate
EUCLID-01-WY11-05-01	1210071-01	W	Fluoranthene	J	Laboratory Duplicate
EUCLID-01-WY11-05-01	1210071-01	W	Phenanthrene	J	Laboratory Duplicate
EUCLID-01-WY11-05-01	1210071-01	W	Pyrene	J	Laboratory Duplicate
SED-PINES-01-WY11-01-01	1211039-01	S	Copper	J	Laboratory Duplicate
SED-PINES-02-WY11-01-01	1211039-02	S	Copper	J	Laboratory Duplicate
SED-SR09-01-A001	1305050-01	S	Copper	J	Laboratory Duplicate
SED-SR09-01-A001	1305050-01	S	Lead	J	Laboratory Duplicate
SED-SR09-01-A001	1305050-01	S	Zinc	J	Laboratory Duplicate
SED-EVERETT-01-A001	1305065-01	S	Benzyl Alcohol	UJ	Laboratory Duplicate
SED-EVERETT-04-A001	1306058-01	S	Benzyl Alcohol	UJ	Laboratory Duplicate
SED-PILCHUCK-01-A001	1306058-02	S	Benzyl Alcohol	UJ	Laboratory Duplicate
SED-PILCHUCK-01-A002	1306058-03	S	Benzyl Alcohol	UJ	Laboratory Duplicate
SED-PINES-01-A001	1306053-01	S	Benzyl Alcohol	UJ	Laboratory Duplicate
SED-SR09-01-A001	1305050-01	S	Benzyl Alcohol	UJ	Laboratory Duplicate

49

Field Sample ID	Laboratory Sample ID	Sample Matrix	Analyte	Qualifier	Comment
SED-PINES-02-WY11-01-01	1211039-02	S	Butyl benzyl phthalate	J	Laboratory Duplicate
SED-EVERETT-01-A001	1305065-01	S	Naphthalene	UJ	Laboratory Duplicate
SED-EVERETT-04-A001	1306058-01	S	Naphthalene	UJ	Laboratory Duplicate
SED-PILCHUCK-01-A001	1306058-02	S	Naphthalene	UJ	Laboratory Duplicate
SED-PILCHUCK-01-A002	1306058-03	S	Naphthalene	UJ	Laboratory Duplicate
SED-PINES-01-A001	1306053-01	S	Naphthalene	UJ	Laboratory Duplicate
SED-SR09-01-A001	1305050-01	S	Naphthalene	UJ	Laboratory Duplicate
SED-EVERETT-01-A001	1305065-01	S	Phenol	UJ	Laboratory Duplicate
SED-EVERETT-04-A001	1306058-01	S	Phenol	UJ	Laboratory Duplicate
SED-PILCHUCK-01-A001	1306058-02	S	Phenol	UJ	Laboratory Duplicate
SED-PILCHUCK-01-A002	1306058-03	S	Phenol	UJ	Laboratory Duplicate
SED-PINES-01-A001	1306053-01	S	Phenol	UJ	Laboratory Duplicate
SED-SR09-01-A001	1305050-01	S	Phenol	UJ	Laboratory Duplicate
BAINBRIDGE-01-A013	1301034-01	W	Fecal Coliforms	J	Field Duplicate
BAINBRIDGE-01-A017	1301034-03	W	Fecal Coliforms	J	Field Duplicate
BAINBRIDGE-01-A026	1302064-10	W	Benzo(a)anthracene	J	Field Duplicate
BAINBRIDGE-01-A026	1302064-10	W	Naphthalene	UJ	Field Duplicate
BAINBRIDGE-01-A030	1302064-11	W	Benzo(a)anthracene	J	Field Duplicate
BAINBRIDGE-01-A030	1302064-11	W	Naphthalene	J	Field Duplicate
BALLINGER-01-A020	1301055-09	W	Acenaphthene	UJ	Field Duplicate
BALLINGER-01-A020	1301055-09	W	Acenaphthylene	J	Field Duplicate
BALLINGER-01-A020	1301055-09	W	Anthracene	UJ	Field Duplicate
BALLINGER-01-A020	1301055-09	W	Benzo(a)anthracene	J	Field Duplicate
BALLINGER-01-A020	1301055-09	W	Benzo(a)pyrene	J	Field Duplicate
BALLINGER-01-A020	1301055-09	W	Benzo(b)fluoranthene	J	Field Duplicate
BALLINGER-01-A020	1301055-09	W	Benzo(ghi)perylene	J	Field Duplicate
BALLINGER-01-A020	1301055-09	W	Benzo(k)fluoranthene	J	Field Duplicate
BALLINGER-01-A020	1301055-09	W	Chrysene	J	Field Duplicate
BALLINGER-01-A020	1301055-09	W	Dibenzo(a,h)anthracene	UJ	Field Duplicate
BALLINGER-01-A020	1301055-09	W	Fluoranthene	J	Field Duplicate
BALLINGER-01-A020	1301055-09	W	Fluorene	J	Field Duplicate
BALLINGER-01-A020	1301055-09	W	Indeno(1,2,3-cd)pyrene	UJ	Field Duplicate
BALLINGER-01-A020	1301055-09	W	Naphthalene	J	Field Duplicate
BALLINGER-01-A020	1301055-09	W	Phenanthrene	J	Field Duplicate
BALLINGER-01-A020	1301055-09	W	Pyrene	J	Field Duplicate
BALLINGER-01-A024	1301055-10	W	Acenaphthene	UJ	Field Duplicate
BALLINGER-01-A024	1301055-10	W	Acenaphthylene	J	Field Duplicate
BALLINGER-01-A024	1301055-10	W	Anthracene	J	Field Duplicate
BALLINGER-01-A024	1301055-10	W	Benzo(a)anthracene	J	Field Duplicate

Field Sample ID	Laboratory Sample ID	Sample Matrix	Analyte	Qualifier	Comment
BALLINGER-01-A024	1301055-10	W	Benzo(a)pyrene	J	Field Duplicate
BALLINGER-01-A024	1301055-10	W	Benzo(b)fluoranthene	J	Field Duplicate
BALLINGER-01-A024	1301055-10	W	Benzo(ghi)perylene	J	Field Duplicate
BALLINGER-01-A024	1301055-10	W	Benzo(k)fluoranthene	J	Field Duplicate
BALLINGER-01-A024	1301055-10	W	Chrysene	J	Field Duplicate
BALLINGER-01-A024	1301055-10	W	Dibenzo(a,h)anthracene	J	Field Duplicate
BALLINGER-01-A024	1301055-10	W	Fluoranthene	J	Field Duplicate
BALLINGER-01-A024	1301055-10	W	Fluorene	J	Field Duplicate
BALLINGER-01-A024	1301055-10	W	Indeno(1,2,3-cd)pyrene	J	Field Duplicate
BALLINGER-01-A024	1301055-10	W	Naphthalene	J	Field Duplicate
BALLINGER-01-A024	1301055-10	W	Phenanthrene	J	Field Duplicate
BALLINGER-01-A024	1301055-10	W	Pyrene	J	Field Duplicate
BALLINGER-01-A032	1302059-01	W	2,4-D	J	Field Duplicate
BALLINGER-01-A036	1302059-02	W	2,4-D	UJ	Field Duplicate
CLARKSTON-01-A014	1304048-10	W	Benzo(ghi)perylene	J	Field Duplicate
CLARKSTON-01-A014	1304048-10	W	Indeno(1,2,3-cd)pyrene	J	Field Duplicate
CLARKSTON-01-A014	1304048-10	W	Naphthalene	J	Field Duplicate
CLARKSTON-01-A018	1304048-11	W	Benzo(ghi)perylene	J	Field Duplicate
CLARKSTON-01-A018	1304048-11	W	Indeno(1,2,3-cd)pyrene	J	Field Duplicate
CLARKSTON-01-A018	1304048-11	W	Naphthalene	J	Field Duplicate
CLARKSTON-01-A024	1305081-03	W	2,4-D	J	Field Duplicate
CLARKSTON-01-A026	1306077-02	W	Copper	J	Field Duplicate
CLARKSTON-01-A026	1306077-02	W	Lead, Total	J	Field Duplicate
CLARKSTON-01-A026	1306077-02	W	Zinc, Total	J	Field Duplicate
CLARKSTON-01-A030	1306077-03	W	Copper, Total	J	Field Duplicate
CLARKSTON-01-A030	1306077-03	W	Lead, Total	J	Field Duplicate
CLARKSTON-01-A030	1306077-03	W	Zinc, Total	J	Field Duplicate
CLARKSTON-01-A20	1305081-02	W	2,4-D	J	Field Duplicate
EUCLID-01-A002	1212029-01	W	Copper, Dissolved	J	Field Duplicate
EUCLID-01-A002	1212029-01	W	Lead, Dissolved	J	Field Duplicate
EUCLID-01-A006	1212029-02	W	Copper, Dissolved	J	Field Duplicate
EUCLID-01-A006	1212029-02	W	Lead, Dissolved	J	Field Duplicate
EUCLID-01-A014	1305079-11	W	Naphthalene	UJ	Field Duplicate
EUCLID-01-A018	1305079-12	W	Naphthalene	UJ	Field Duplicate
GEIGER-01-A002	1305058-01	W	Lead, Total	J	Field Duplicate
GEIGER-01-A002	1305058-01	W	Zinc, Total	J	Field Duplicate
GEIGER-01-A002	1305058-01	W	Benzo(a)anthracene	U	Field Duplicate
GEIGER-01-A002	1305058-01	W	Phenanthrene	U	Field Duplicate
GEIGER-01-A006	1305058-02	W	Lead, Total	J	Field Duplicate

Field Sample ID	Laboratory Sample ID	Sample Matrix	Analyte	Qualifier	Comment
GEIGER-01-A006	1305058-02	W	Zinc, Total	J	Field Duplicate
GEIGER-01-A014	1304048-12	W	Benzo(a)anthracene	UJ	Field Duplicate
GEIGER-01-A014	1304048-12	W	Benzo(a)pyrene	UJ	Field Duplicate
GEIGER-01-A014	1304048-12	W	Benzo(b)fluoranthene	J	Field Duplicate
GEIGER-01-A014	1304048-12	W	Benzo(ghi)perylene	J	Field Duplicate
GEIGER-01-A014	1304048-12	W	Benzo(k)fluoranthene	UJ	Field Duplicate
GEIGER-01-A014	1304048-12	W	Chrysene	J	Field Duplicate
GEIGER-01-A014	1304048-12	W	Fluoranthene	J	Field Duplicate
GEIGER-01-A014	1304048-12	W	Phenanthrene	J	Field Duplicate
GEIGER-01-A014	1304048-12	W	Pyrene	J	Field Duplicate
GEIGER-01-A018	1304048-13	W	Acenaphthene	UJ	Field Duplicate
GEIGER-01-A018	1304048-13	W	Acenaphthylene	UJ	Field Duplicate
GEIGER-01-A018	1304048-13	W	Benzo(a)anthracene	J	Field Duplicate
GEIGER-01-A018	1304048-13	W	Benzo(a)pyrene	J	Field Duplicate
GEIGER-01-A018	1304048-13	W	Benzo(b)fluoranthene	J	Field Duplicate
GEIGER-01-A018	1304048-13	W	Benzo(ghi)perylene	J	Field Duplicate
GEIGER-01-A018	1304048-13	W	Benzo(k)fluoranthene	J	Field Duplicate
GEIGER-01-A018	1304048-13	W	Chrysene	J	Field Duplicate
GEIGER-01-A018	1304048-13	W	Dibenzo(a,h)anthracene	UJ	Field Duplicate
GEIGER-01-A018	1304048-13	W	Fluoranthene	J	Field Duplicate
GEIGER-01-A018	1304048-13	W	Indeno(1,2,3-cd)pyrene	UJ	Field Duplicate
GEIGER-01-A018	1304048-13	W	Phenanthrene	J	Field Duplicate
GEIGER-01-A018	1304048-13	W	Pyrene	J	Field Duplicate
LAKEVIEW-01-A026	580-37880-1	W	Nitrogen, Total Kjeldahl	J	Field Duplicate
LAKEVIEW-01-A026	1304047-03	W	Acenaphthene	UJ	Field Duplicate
LAKEVIEW-01-A026	1304047-03	W	Acenaphthylene	UJ	Field Duplicate
LAKEVIEW-01-A026	1304047-03	W	Anthracene	J	Field Duplicate
LAKEVIEW-01-A026	1304047-03	W	Benzo(a)anthracene	J	Field Duplicate
LAKEVIEW-01-A026	1304047-03	W	Benzo(a)pyrene	J	Field Duplicate
LAKEVIEW-01-A026	1304047-03	W	Benzo(b)fluoranthene	J	Field Duplicate
LAKEVIEW-01-A026	1304047-03	W	Benzo(ghi)perylene	J	Field Duplicate
LAKEVIEW-01-A026	1304047-03	W	Benzo(k)fluoranthene	J	Field Duplicate
LAKEVIEW-01-A026	1304047-03	W	Chrysene	J	Field Duplicate
LAKEVIEW-01-A026	1304047-03	W	Dibenzo(a,h)anthracene	J	Field Duplicate
LAKEVIEW-01-A026	1304047-03	W	Fluoranthene	J	Field Duplicate
LAKEVIEW-01-A026	1304047-03	W	Fluorene	UJ	Field Duplicate
LAKEVIEW-01-A026	1304047-03	W	Indeno(1,2,3-cd)pyrene	J	Field Duplicate
LAKEVIEW-01-A026	1304047-03	W	Naphthalene	J	Field Duplicate
LAKEVIEW-01-A026	1304047-03	W	Phenanthrene	J	Field Duplicate

52

Field Sample ID	Laboratory Sample ID	Sample Matrix	Analyte	Qualifier	Comment
LAKEVIEW-01-A026	1304047-03	W	Pyrene	J	Field Duplicate
LAKEVIEW-01-A030	580-37880-2	W	Nitrogen, Total Kjeldahl	J	Field Duplicate
LAKEVIEW-01-A030	1304047-04	W	Nitrite-Nitrate	J	Field Duplicate
LAKEVIEW-01-A030	1304047-04	W	Acenaphthene	UJ	Field Duplicate
LAKEVIEW-01-A030	1304047-04	W	Acenaphthylene	J	Field Duplicate
LAKEVIEW-01-A030	1304047-04	W	Anthracene	J	Field Duplicate
LAKEVIEW-01-A030	1304047-04	W	Benzo(a)anthracene	J	Field Duplicate
LAKEVIEW-01-A030	1304047-04	W	Benzo(a)pyrene	J	Field Duplicate
LAKEVIEW-01-A030	1304047-04	W	Benzo(b)fluoranthene	J	Field Duplicate
LAKEVIEW-01-A030	1304047-04	W	Benzo(ghi)perylene	J	Field Duplicate
LAKEVIEW-01-A030	1304047-04	W	Benzo(k)fluoranthene	J	Field Duplicate
LAKEVIEW-01-A030	1304047-04	W	Chrysene	J	Field Duplicate
LAKEVIEW-01-A030	1304047-04	W	Dibenzo(a,h)anthracene	J	Field Duplicate
LAKEVIEW-01-A030	1304047-04	W	Fluoranthene	J	Field Duplicate
LAKEVIEW-01-A030	1304047-04	W	Fluorene	UJ	Field Duplicate
LAKEVIEW-01-A030	1304047-04	W	Indeno(1,2,3-cd)pyrene	J	Field Duplicate
LAKEVIEW-01-A030	1304047-04	W	Naphthalene	J	Field Duplicate
LAKEVIEW-01-A030	1304047-04	W	Phenanthrene	J	Field Duplicate
LAKEVIEW-01-A030	1304047-04	W	Pyrene	J	Field Duplicate
LAKEVIEW-01-A044	13-A013549	W	Surfactant (MBAS)	J	Field Duplicate
LAKEVIEW-01-A048	13-A013550	W	Surfactant (MBAS)	UJ	Field Duplicate
SMKYPT-02-A032	580-37300-7	W	Nitrogen, Total Kjeldahl	J	Field Duplicate
SMKYPT-02-A036	580-37300-6	W	Nitrogen, Total Kjeldahl	J	Field Duplicate
VANCOUVER-01-A032	580-37671-1	W	Nitrogen, Total Kjeldahl	J	Field Duplicate
VANCOUVER-01-A036	580-37671-3	W	Nitrogen, Total Kjeldahl	J	Field Duplicate
VANCOUVER-01-A044	1309064-01	W	Dichlobenil	UJ	Field Duplicate
VANCOUVER-01-A048	1309064-02	W	Dichlobenil	J	Field Duplicate

Notes:

Laboratory Duplicate – The RPD value for the laboratory duplicate, LCSS/LCSD, or MS/MSD analyses was outside the control criteria.

Field Duplicate – The RPD or concentration difference value for the field duplicates was outside the project advisory criteria (*i.e.*, RPD ≤20% if both values were >5xRL; concentration difference ≤RL if either of the values was <5xRL).

J – The analyte was detected in the sample and the reported value was considered as estimated.

MBAS – Methylene blue active substances

RPD – Relative percent difference

S – Sediment

UJ – The analyte was not detected in the sample, and the reported quantitation limit associated with this analyte was considered as estimated.

W – Water

Table 3-9 Data Qualified Due To Uncorrelated Total and Dissolved Metal Results

Field Sample ID	Laboratory Sample ID	Analyte	Qualifier	Comment
BAINBRIDGE-01-A004	1305068-03	Zinc, Total	UJ	
BAINBRIDGE-01-A004	1305068-03	Zinc, Dissolved	J	
BAINBRIDGE-01-WY11-08-01	1210072-03	Cadmium, Total	UJ	
BAINBRIDGE-01-WY11-08-01	1210072-03	Cadmium Dissolved	J	
BALLINGER-01-A004	1303059-02	Zinc, Total	UJ	
BALLINGER-01-A004	1303059-02	Zinc, Dissolved	J	
SMKYPT-02-WY12-05-01	1210065-01	Lead, Total	J	
SMKYPT-02-WY12-05-01	1210065-01	Lead, Dissolved	J	
SMKYPT-02-WY12-05-01	1210065-01	Zinc, Total	J	
SMKYPT-02-WY12-05-01	1210065-01	Zinc, Dissolved	J	

Notes:

Total and dissolved concentrations are considered "uncorrelated" for a metal in a given sample if the total metal concentration is less than its corresponding dissolved metal concentration and the relative percent difference (RPD) value was >10% (if both values were ≥5xRL) or the concentration difference value was >RL (if either of the values was <5xRL).

J – The analyte was detected in the sample and the reported value was considered as estimated.

RL – Reporting limit

UJ – The analyte was not detected in the sample, and the reported quantitation limit associated with this analyte was considered as estimated.

Table 3-10 Data Affected by Sample Matrix Interference

Field Sample ID	Laboratory Sample ID	Sample Matrix	Analyte	Qualifier	Comment
BALLINGER-01-A032	1302059-01	W	2,4-D	J	
BALLINGER-01-A044	1305068-01	W	2,4-D	J	
EUCLID-01-A008	1303081-06	W	2,4-D	J	
GEIGER-01-A002	1305058-01	W	2,4-D	J	
LAKEVIEW-01-A002	1210072-02	W	2,4-D	J	
LAKEVIEW-01-A014	1301053-02	W	2,4-D	J	
LAKEVIEW-01-A020	1303081-03	W	2,4-D	J	
LAKEVIEW-01-A044	1309057-13	W	2,4-D	J	
SMKYPT-01-A032	1303033-11	W	2,4-D	J	
SMKYPT-01-A036	1303033-12	W	2,4-D	J	
SMKYPT-02-A050	1304048-06	W	2,4-D	J	
SMKYPT-02-A056	1304055-01	W	2,4-D	J	
SMKYPT-02-A068	1309057-09	W	2,4-D	J	
SMKYPT-02-A068	1309057-09	W	Acenaphthylene	J	
BALLINGER-01-A050	1309057-06	W	Anthracene	J	
EUCLID-01-A014	1305079-11	W	Anthracene	J	
EUCLID-01-A018	1305079-12	W	Anthracene	J	
EUCLID-01-A032	1306077-01	W	Anthracene	J	
EV-04-MEP-A026	1303082-20	W	Anthracene	J	
LAKEVIEW-01-A026	1304047-03	W	Anthracene	J	
PIL-01-VEP-A050	1303033-01	W	Anthracene	J	
PINES-01-A004	1306051-04	W	Anthracene	J	
PINES-01-A026	1305081-01	W	Anthracene	J	
BALLINGER-01-A038	1303045-01	W	Benzo(a)anthracene	J	
EV-01-VEP-A032	1304068-06	W	Benzo(a)anthracene	J	
EV-01-VEP-A036	1304068-07	W	Benzo(a)anthracene	J	
EV-01-VEP-A050	1305079-06	W	Benzo(a)anthracene	J	
EV-04-MEP-A026	1303082-20	W	Benzo(a)anthracene	J	
EV-04-MEP-A030	1303082-21	W	Benzo(a)anthracene	J	
EV-04-MEP-A044	1304078-01	W	Benzo(a)anthracene	J	
PIL-01-VEP-A004	1307053-02	W	Benzo(a)anthracene	J	
PIL-01-VEP-A074	1303082-05	W	Benzo(a)anthracene	J	
PIL-01-VEP-A080	1304068-08	W	Benzo(a)anthracene	J	

Field Sample ID	Laboratory Sample ID	Sample Matrix	Analyte	Qualifier	Comment
PINES-01-A014	1304079-02	W	Benzo(a)anthracene	J	
PINES-01-A018	1304079-03	W	Benzo(a)anthracene	J	
PINES-01-A020	1304078-04	W	Benzo(a)anthracene	J	
SMKYPT-02-A056	1304055-01	W	Benzo(a)anthracene	J	
SR9-01-A032	1303082-01	W	Benzo(a)anthracene	J	
SR9-01-A036	1303082-02	W	Benzo(a)anthracene	J	
SR9-01-A044	1304048-04	W	Benzo(a)anthracene	J	
SR9-01-A050	1304068-05	W	Benzo(a)anthracene	J	
SR9-01-A056	1304078-02	W	Benzo(a)anthracene	J	
CLARKSTON-01-A014	1304048-10	W	Benzo(a)pyrene	J	
CLARKSTON-01-A018	1304048-11	W	Benzo(a)pyrene	J	
EV-01-VEP-A032	1304068-06	W	Benzo(a)pyrene	J	
EV-01-VEP-A036	1304068-07	W	Benzo(a)pyrene	J	
EV-01-VEP-A050	1305079-08	W	Benzo(a)pyrene	J	
EV-04-MEP-A026	1303082-20	W	Benzo(a)pyrene	J	
EV-04-MEP-A030	1303082-21	W	Benzo(a)pyrene	J	
EV-04-MEP-A044	1304078-01	W	Benzo(a)pyrene	J	
GEIGER-01-A002	1305058-01	W	Benzo(a)pyrene	J	
GEIGER-01-A018	1304048-13	W	Benzo(a)pyrene	J	
LAKEVIEW-01-A020	1303081-03	W	Benzo(a)pyrene	J	
LAKEVIEW-01-A030	1304047-04	W	Benzo(a)pyrene	J	
PIL-01-VEP-A050	1303033-01	W	Benzo(a)pyrene	J	
PIL-01-VEP-A074	1303082-05	W	Benzo(a)pyrene	J	
PIL-01-VEP-A080	1304068-08	W	Benzo(a)pyrene	J	
PINES-01-A014	1304079-02	W	Benzo(a)pyrene	J	
PINES-01-A018	1304079-03	W	Benzo(a)pyrene	J	
PINES-01-A020	1304078-04	W	Benzo(a)pyrene	J	
PINES-01-A026	1305081-01	W	Benzo(a)pyrene	J	
PINES-01-A080	1308053-01	W	Benzo(a)pyrene	J	
SMKYPT-01-A020	1303034-03	W	Benzo(a)pyrene	J	
SMKYPT-01-A032	1303033-11	W	Benzo(a)pyrene	J	
SMKYPT-02-A056	1304055-01	W	Benzo(a)pyrene	J	
SR9-01-A032	1303082-01	W	Benzo(a)pyrene	J	
SR9-01-A036	1303082-02	W	Benzo(a)pyrene	J	
SR9-01-A044	1304048-04	W	Benzo(a)pyrene	J	

Field Sample ID	Laboratory Sample ID	Sample Matrix	Analyte	Qualifier	Comment
SR9-01-A050	1304068-05	W	Benzo(a)pyrene	J	
SR9-01-A056	1304078-02	W	Benzo(a)pyrene	J	
PIL-01-VEP-A050	1303033-01	W	Benzo(k)fluoranthene	J	
PIL-01-VEP-A074	1303082-05	W	Benzo(k)fluoranthene	J	
PIL-01-VEP-A080	1304068-08	W	Benzo(k)fluoranthene	J	
PINES-01-A026	1305081-01	W	Butyl benzyl phthalate	J	
GEIGER-01-A014	1304048-12	W	Clopyralid	J	
EUCLID-01-A014	1305079-11	W	Dibenzo(a,h)anthracene	J	
PINES-01-A080	1308053-01	W	Dibenzo(a,h)anthracene	J	
SR9-01-A044	1304048-04	W	Dibenzo(a,h)anthracene	J	
SMKYPT-01-A044	1309057-07	W	Dichlobenil	J	
EV-01-VEP-A032	1304068-06	W	Diethyl phthalate	J	
EV-01-VEP-A036	1304068-07	W	Diethyl phthalate	J	
PINES-01-A004	1306051-04	W	Diethyl phthalate	J	
SMKYPT-01-A044	1309057-07	W	Diethyl phthalate	J	
SR9-01-A032	1303082-01	W	Diethyl phthalate	J	
SR9-01-A036	1303082-02	W	Diethyl phthalate	J	
SR9-01-A056	1304078-02	W	Diethyl phthalate	J	
EV-01-VEP-A032	1304068-06	W	Di-n-octyl Phthalate	J	
EV-01-VEP-A036	1304068-07	W	Di-n-octyl Phthalate	J	
EV-01-VEP-A050	1305079-06	W	Di-n-octyl Phthalate	J	
EV-04-MEP-A026	1303082-20	W	Di-n-octyl Phthalate	J	
EV-04-MEP-A030	1303082-21	W	Di-n-octyl Phthalate	J	
EV-04-MEP-A044	1304078-01	W	Di-n-octyl Phthalate	J	
PIL-01-VEP-A050	1303033-01	W	Di-n-octyl Phthalate	J	
PIL-01-VEP-A074	1303082-05	W	Di-n-octyl Phthalate	J	
PINES-01-A014	1304079-02	W	Di-n-octyl Phthalate	J	
PINES-01-A018	1304079-03	W	Di-n-octyl Phthalate	J	
SR9-01-A032	1303082-01	W	Di-n-octyl Phthalate	J	
SR9-01-A036	1303082-02	W	Di-n-octyl Phthalate	J	
GEIGER-01-A014	1304048-12	W	Fluoranthene	J	
GEIGER-01-A018	1304048-13	W	Fluoranthene	J	
SMKYPT-01-A044	1309057-07	W	Fluoranthene	J	
EV-01-VEP-A036	1304068-07	W	Fluorene	J	
GEIGER-01-A008	1303081-05	W	Phenanthrene	J	

Field Sample ID	Laboratory Sample ID	Sample Matrix	Analyte	Qualifier	Comment
LAKEVIEW-01-A020	1303081-03	W	Phenanthrene	J	
SMKYPT-01-A020	1303034-03	W	Phenanthrene	J	
SMKYPT-01-A043	1303041-01	W	Phenanthrene	J	
SMKYPT-01-A044	1309057-07	W	Phenanthrene	J	
SMKYPT-02-A050	1304048-06	W	Phenanthrene	J	
SMKYPT-02-A062	1304068-01	W	Phenanthrene	J	
CLARKSTON-01-A026	1306077-02	W	Pyrene	J	
BALLINGER-01-A032	1302059-01	W	Triclopyr	J	
BALLINGER-01-A036	1302059-02	W	Triclopyr	J	
BALLINGER-01-A038	1303045-01	W	Triclopyr	J	
EUCLID-01-A002	1212029-01	W	Triclopyr	J	
EUCLID-01-A008	1303081-06	W	Triclopyr	J	
EUCLID-01-WY11-05-01	1210071-01	W	Triclopyr	J	
GEIGER-01-A008	1303081-05	W	Triclopyr	J	
VANCOUVER-01-A014	1301055-02	W	Triclopyr	J	
SED-PILCHUCK-01-A001	1306058-02	S	Benzo(a)anthracene	J	
SED-EVERETT-01-A001	1305065-01	S	Benzo(a)pyrene	J	
SED-EVERETT-04-A001	1306058-01	S	Benzo(a)pyrene	J	
SED-PILCHUCK-01-A001	1306058-02	S	Benzo(a)pyrene	J	
SED-PILCHUCK-01-A002	1306058-03	S	Benzo(a)pyrene	J	
SED-PILCHUCK-01-A001	1306058-02	S	Benzo(b)fluoranthene	J	
SED-PILCHUCK-01-A002	1306058-03	S	Benzo(b)fluoranthene	J	
SED-PILCHUCK-01-A001	1306058-02	S	Benzo(k)fluoranthene	J	
SED-PILCHUCK-01-A002	1306058-03	S	Benzo(k)fluoranthene	J	

Notes:

Primary causes preventing accurate compound identification included: (1) matrix interference where non-target chemical/subject affect chromatographic resolution of the target compound; and (2) ion abundance ratio for the reported detection that did not meet method criteria for compound identification.

W – Water

S – Sediment

J – The analyte was detected in the sample and the reported value was considered as estimated.

58

Appendix F: Sampling Attempt Records

Water Year 2013 Storm Events			
Station	**Attempt Date**	**Outcome**	**Notes**
Bainbridge Island	10/18/2012	Successful Attempt	Qualified; grabs missed due to lack of staff available
Bainbridge Island	11/28/2012	Successful Attempt	Qualified; grabs missed due to lack of staff available
Bainbridge Island	1/8/2013	Successful Attempt	Qualified event collected
Bainbridge Island	1/22/2013	Failed Attempt	Equipment failure
Bainbridge Island	1/24/2013	Failed Attempt	Equipment failure
Bainbridge Island	2/4/2013	Failed Attempt	Unqualified actual precipitation
Bainbridge Island	2/20/2013	Successful Attempt	Unqualified; grabs missed due to lack of staff available
Bainbridge Island	2/28/2013	Successful Attempt	Qualified; grabs missed due to lack of staff available
Bainbridge Island	3/5/2013	Failed Attempt	Unqualified actual precipitation
Bainbridge Island	3/10/2013	Failed Attempt	Unqualified actual precipitation
Bainbridge Island	3/20/2013	Successful Attempt	Qualified; grabs missed due to lack of staff available
Bainbridge Island	5/21/2013	Successful Attempt	Qualified; grabs missed due to lack of staff available
Ballinger	10/18/2012	Successful Attempt	Qualified; grabs missed due to lack of staff available
Ballinger	11/28/2012	Successful Attempt	Qualified; grabs missed due to lack of staff available
Ballinger	12/11/2012	Successful Attempt	Qualified; grabs missed due to lack of staff available
Ballinger	1/8/2013	Successful Attempt	Unqualified event collected; grabs only
Ballinger	1/23/2013	Successful Attempt	Qualified; grabs missed due to lack of staff available
Ballinger	2/20/2013	Successful Attempt	Unqualified; grabs missed due to lack of staff available
Ballinger	2/22/2013	Failed Attempt	Unqualified actual precipitation
Ballinger	3/6/2013	Successful Attempt	Qualified event collected
Ballinger	5/21/2013	Successful Attempt	Sample collection error-only 4 aliquots collected
Ballinger	9/15/2013	Successful Attempt	Qualified; grabs missed due to lack of staff available
Clarkston	10/18/2012	Failed Attempt	Staff not available
Clarkston	11/7/2012	Failed Attempt	Staff not available
Clarkston	11/29/2012	Failed Attempt	Staff not available
Clarkston	12/4/2012	Failed Attempt	Unqualified actual precipitation
Clarkston	1/25/2012	Failed Attempt	Unqualified actual precipitation
Clarkston	2/7/2013	Successful Attempt	Qualified; grabs missed due to lack of staff available
Clarkston	2/22/2013	Failed Attempt	Unqualified actual precipitation
Clarkston	3/19/2013	Failed Attempt	Unqualified actual precipitation

Clarkston	4/4/2013	Successful Attempt	Unqualified; grabs missed due to lack of staff available
Clarkston	4/19/2013	Successful Attempt	Qualified; grabs missed due to lack of staff available
Clarkston	5/21/2013	Successful Attempt	Qualified; grabs missed due to lack of staff available
Clarkston	5/29/2013	Failed Attempt	Staff not available
Clarkston	6/18/2013	Failed Attempt	Equipment Failure
Clarkston	6/24/2013	Successful Attempt	Qualified; grabs missed due to lack of staff available
Clarkston	8/1/2013	Failed Attempt	Unqualified actual precipitation
Clarkston	9/3/2013	Successful Attempt	Unqualified event collected
Euclid	10/16/2012	Successful Attempt	Unqualified; grabs missed due to lack of staff available
Euclid	12/4/2012	Successful Attempt	Unqualified; grabs missed due to lack of staff available
Euclid	3/6/2013	Successful Attempt	Qualified; grabs missed due to lack of staff available
Euclid	3/20/2013	Successful Attempt	Qualified; grabs missed due to lack of staff available
Euclid	4/6/2013	Failed Attempt	Rainfall Inadequate
Euclid	5/21/2013	Successful Attempt	Qualified; grabs missed due to lack of staff available
Euclid	5/29/2013	Failed Attempt	Unqualified actual precipitation
Euclid	6/19/2013	Successful Attempt	Qualified event collected
Euclid	8/1/2013	Failed Attempt	Unqualified actual precipitation
Euclid	9/4/2013	Failed Attempt	Equipment failure
Euclid	9/15/2013	Failed Attempt	Staff not available
Geiger	10/22/2012	Successful Attempt	Unqualified; grabs missed due to lack of staff available
Geiger	11/28/2012	Failed Attempt	Unqualified actual precipitation
Geiger	2/27/2013	Failed Attempt	Unqualified actual precipitation
Geiger	3/6/2013	Failed Attempt	Unqualified actual precipitation
Geiger	3/11/2013	Failed Attempt	Unqualified actual precipitation
Geiger	3/20/2013	Successful Attempt	Qualified; grabs missed due to lack of staff available
Geiger	4/4/2013	Successful Attempt	Unqualified event collected
Geiger	4/18/2013	Failed Attempt	Unqualified actual precipitation
Geiger	5/13/2013	Successful Attempt	Qualified; grabs missed due to lack of staff available
Geiger	5/21/2013	Failed Attempt	Equipment failure
Geiger	5/29/2013	Failed Attempt	Staff not available
Geiger	6/18/2013	Failed Attempt	Unqualified actual precipitation
Geiger	8/1/2013	Failed Attempt	Unqualified actual precipitation

Geiger	9/5/2013	Successful Attempt	Qualified; grabs missed due to lack of staff available
Lakeview	10/12/2012	Successful Attempt	Unqualified event collected
Lakeview	10/18/2012	Successful Attempt	Qualified event collected
Lakeview	11/16/2012	Successful Attempt	Qualified; grabs missed due to lack of staff available
Lakeview	1/23/2013	Successful Attempt	Unqualified event collected
Lakeview	2/11/2013	Failed Attempt	Unqualified actual precipitation
Lakeview	2/12/2013	Failed Attempt	Unqualified actual precipitation
Lakeview	2/24/2013	Failed Attempt	Unqualified actual precipitation
Lakeview	2/27/2013	Failed Attempt	Unqualified actual precipitation
Lakeview	3/5/2013	Failed Attempt	Unqualified actual precipitation
Lakeview	3/10/2013	Failed Attempt	Unqualified actual precipitation
Lakeview	3/10/2013	Failed Attempt	Unqualified actual precipitation
Lakeview	3/14/2013	Failed Attempt	Unqualified actual precipitation
Lakeview	3/19/2013	Successful Attempt	Qualified; grabs missed due to lack of staff available
Lakeview	3/28/2013	Successful Attempt	Unqualified; grabs missed due to lack of staff available
Lakeview	4/4/2013	Successful Attempt	Unqualified event collected
Lakeview	4/10/2013	Successful Attempt	Qualified; grabs missed due to lack of staff available
Lakeview	5/12/2013	Failed Attempt	Unqualified actual precipitation
Lakeview	6/19/2013	Failed Attempt	Equipment Failure
Lakeview	9/15/2013	Successful Attempt	Unqualified event collected
Smokey Point NB	10/12/2012	Successful Attempt	Unqualified event collected
Smokey Point NB	10/18/2012	Successful Attempt	Qualified event collected
Smokey Point NB	11/28/2012	Failed Attempt	Unqualified actual precipitation
Smokey Point NB	1/23/2013	Successful Attempt	Qualified; grabs missed due to lack of staff available
Smokey Point	2/11/2013	Failed Attempt	Unqualified actual precipitation
Smokey Point NB	2/20/2013	Failed Attempt	Unqualified actual precipitation
Smokey Point NB	2/24/2013	Failed Attempt	Unqualified actual precipitation
Smokey Point NB	2/28/2013	Successful Attempt	Qualified; grabs missed due to lack of staff available
Smokey Point NB	3/2/2013	Successful Attempt	Qualified; grabs missed due to lack of staff available
Smokey Point NB	3/6/2013	Successful Attempt	Qualified; grabs missed due to lack of staff available
Smokey Point NB	3/10/2013	Failed Attempt	Equipment failure
Smokey Point NB	3/19/2013	Failed Attempt	Equipment failure
Smokey Point NB	9/15/2013	Successful Attempt	Qualified; grabs missed due to lack of staff available
Smokey Point SB	10/12/2012	Successful Attempt	Unqualified event collected

Smokey Point SB	10/18/2012	Successful Attempt	Qualified event collected
Smokey Point SB	11/28/2012	Failed Attempt	Unqualified actual precipitation
Smokey Point SB	12/11/2012	Successful Attempt	Qualified event collected; grabs only
Smokey Point SB	1/23/2013	Successful Attempt	Qualified; grabs missed due to lack of staff available
Smokey Point SB	2/20/2013	Failed Attempt	Unqualified actual precipitation
Smokey Point SB	2/24/2013	Failed Attempt	Unqualified actual precipitation
Smokey Point SB	2/28/2013	Failed Attempt	Equipment failure
Smokey Point SB	3/4/2013	Failed Attempt	Equipment failure
Smokey Point SB	3/6/2013	Failed Attempt	Equipment failure
Smokey Point SB	3/19/2013	Failed Attempt	Equipment failure
Smokey Point SB	4/4/2013	Successful Attempt	Qualified; grabs missed due to lack of staff available
Smokey Point SB	4/10/2013	Successful Attempt	Qualified; grabs missed due to lack of staff available
Smokey Point SB	4/12/2013	Successful Attempt	Qualified; grabs missed due to lack of staff available
Smokey Point SB	9/15/2013	Successful Attempt	Qualified; grabs missed due to lack of staff available
Vancouver	10/12/2012	Successful Attempt	Qualified event collected
Vancouver	11/28/2012	Failed Attempt	Unqualified actual precipitation
Vancouver	12/8/2012	Successful Attempt	Unqualified event collected
Vancouver	1/23/2013	Successful Attempt	Qualified event collected
Vancouver	2/12/2013	Failed Attempt	Equipment Failure
Vancouver	2/22/2013	Failed Attempt	Equipment Failure
Vancouver	3/5/2013	Failed Attempt	Missed storm event
Vancouver	3/19/2013	Successful Attempt	Qualified; grabs missed due to lack of staff available
Vancouver	4/4/2013	Successful Attempt	Qualified; grabs missed due to lack of staff available
Vancouver	4/5/2013	Successful Attempt	Qualified; grabs missed due to lack of staff available
Vancouver	6/23/2013	Failed Attempt	Equipment Failure
Vancouver	9/21/2013	Successful Attempt	Qualified; grabs missed due to lack of staff available

Water Year 2012 Storm Events			
Station	**Attempt Date**	**Outcome**	**Notes**
Bainbridge Island FT	9/17/2011	successful attempt	grabs missed due to lack of available staff
Bainbridge Island FT	12/8/2011	failed attempt	discarded sample: non-qualified event
Bainbridge Island FT	1/24/2012	successful attempt	qualified-grabs collected
Bainbridge Island FT	2/17/2012	successful attempt	qualified-grabs collected
Bainbridge Island FT	2/28/2012	successful attempt	qualified-grabs collected
Bainbridge Island FT	3/9/2012	successful attempt	qualified-grabs collected
Bainbridge Island FT	3/20/2012	successful attempt	actual precipitation did not qualify grabs missed due to lack of available staff
Bainbridge Island FT	5/17/2012	successful attempt	grabs missed due to lack of available staff
Bainbridge Island FT	6/1/2012	missed storm	antecedent not forecasted to qualify: did not attempt
Bainbridge Island FT	6/27/2012	missed event	not forecast to qualify: not attempted
Bainbridge Island FT	7/20/2012	missed event	not forecast to qualify: not attempted
Geiger MF	3/11/2012	missed event	not forecast to qualify: not attempted
Geiger MF	3/15/2012	successful attempt	grabs missed due to lack of available staff
Geiger MF	3/19/2012	successful attempt	grabs missed due to lack of available staff
Geiger MF	3/26/2012	successful attempt	qualified-grabs collected
Geiger MF	4/25/2012	failed attempt	discarded sample: non-qualified event
Geiger MF	4/30/2012	missed event	not forecast to qualify: not attempted
Geiger MF	5/3/2012	successful attempt	grabs missed due to lack of available staff
Geiger MF	6/3/2012	failed attempt	missed due to lack of available staff
Geiger MF	6/24/2012	successful attempt	grabs missed due to lack of available staff
Geiger MF	7/17/2012	missed event	not forecast to qualify: not attempted
Euclid MF	3/14/2012	failed attempt	equipment failure
Euclid MF	3/27/2012	successful attempt	grab samples only
Euclid MF	4/25/2012	successful attempt	qualified-grabs collected
Euclid MF	6/3/2012	failed attempt	missed due to lack of available staff
Euclid MF	6/7/2012	successful attempt	grabs missed due to lack of available staff
Euclid MF	6/22/2012	failed attempt	discarded sample: non-qualified event

Vancouver MF	2/28/2012	successful attempt	qualified-grabs collected
Vancouver MF	3/5/2012	failed attempt	discarded sample: non-qualified event
Vancouver MF	3/26/2012	failed attempt	discarded sample: non-qualified event
Vancouver MF	3/28/2012	failed attempt	discarded sample: non-qualified event
Vancouver MF	4/3/2012	successful attempt	qualified-grabs collected
Vancouver MF	4/16/2012	failed attempt	not forecast to qualify: not attempted
Vancouver MF	4/18/2012	successful attempt	grabs missed due to lack of available staff
Vancouver MF	4/19/2012	failed attempt	not forecast to qualify: not attempted
Vancouver MF	4/25/2012	successful attempt	non-qualified event
Vancouver MF	4/30/2012	missed event	staff unavailable to set sampler
Vancouver MF	5/21/2012	failed attempt	grabs missed due to lack of available staff
Vancouver MF	6/22/2012	successful attempt	grabs missed due to lack of available staff
Clarkston MF	3/9/2012	failed attempt	forecast to qualify: weather changed
Clarkston MF	3/15/2012	successful attempt	limited samples collected due to hold times
Clarkston MF	3/20/2012	successful attempt	qualified-grabs collected
Clarkston MF	3/26/2012	missed event	not forecast to qualify: not attempted
Clarkston MF	4/4/2012	successful attempt	grabs missed due to lack of available staff
Clarkston MF	4/26/2012	successful attempt	qualified-grabs collected
Clarkston MF	4/30/2012	missed event	not forecast to qualify: not attempted
Clarkston MF	5/3/2012	missed event	not forecast to qualify: not attempted
Clarkston MF	6/4/2012	missed event	not forecast to qualify: not attempted
Clarkston MF	6/7/2012	missed event	not forecast to qualify: not attempted
Clarkston MF	6/26/2012	missed event	not forecast to qualify: not attempted
Clarkston MF	7/19/2012	missed event	not forecast to qualify: not attempted
Lakeview MF	2/28/2012	failed attempt	equipment failure
Lakeview MF	3/4/2012	failed attempt	discarded sample: non-qualified event
Lakeview MF	3/19/2012	failed attempt	discarded sample: non-qualified event
Lakeview MF	3/20/2012	missed event	equipment failure
Lakeview MF	3/25/2012	missed event	discarded sample: non-qualified event
Lakeview MF	4/3/2012	successful attempt	actual precipitation did not qualify
Lakeview MF	4/11/2012	missed event	not forecast to qualify: not attempted
Lakeview MF	4/16/2012	successful attempt	grabs missed due to lack of available staff
Lakeview MF	4/17/2012	successful attempt	grabs missed due to lack of available staff
Lakeview MF	4/19/2012	missed event	not forecast to qualify: not attempted

Lakeview MF	4/25/2012	successful attempt	grabs missed due to lack of available staff
Lakeview MF	4/29/2012	successful attempt	grabs missed due to lack of available staff
Lakeview MF	5/21/2012	failed attempt	equipment failure
Lakeview MF	6/22/2012	successful attempt	grabs missed due to lack of available staff
Ballinger MF	1/24/2012	successful attempt	qualified-grabs collected
Ballinger MF	2/24/2012	successful attempt	grabs missed due to lack of available staff
Ballinger MF	2/28/2012	successful attempt	grabs missed due to lack of available staff
Ballinger MF	3/9/2012	successful attempt	grabs missed due to lack of available staff
Ballinger MF	3/19/2012	failed attempt	discarded sample: non-qualified event
Ballinger MF	3/26/2012	failed attempt	discarded sample: non-qualified event
Ballinger MF	4/3/2012	successful attempt	actual precipitation did not qualify
Ballinger MF	4/11/2012	failed attempt	discarded sample: non-qualified event
Ballinger MF	4/19/2012	missed event	not forecast to qualify: not attempted
Ballinger MF	4/24/2012	missed event	not forecast to qualify: not attempted
Ballinger MF	4/29/2012	successful attempt	grabs missed due to lack of available staff
Ballinger MF	5/21/2012	failed attempt	equipment failure
Ballinger MF	6/22/2012	successful attempt	grabs missed due to lack of available staff
Ballinger MF	9/9/2012	failed attempt	discarded sample: non-qualified event
Smokey Point NB RA	12/2/2011	failed attempt	not sampled: non-qualified event
Smokey Point NB RA	1/24/2012	failed attempt	no precipitation
Smokey Point NB RA	2/24/2012	failed attempt	equipment failure
Smokey Point NB RA	2/28/2012	failed attempt	discarded sample: non-qualified event
Smokey Point NB RA	3/9/2012	successful attempt	grabs missed due to lack of available staff
Smokey Point NB RA	3/26/2012	missed event	storm started before station was set to sample
Smokey Point NB RA	4/3/2012	successful attempt	grabs missed due to forecasting errors
Smokey Point NB RA	4/11/2012	failed attempt	discarded sample: non-qualified event
Smokey Point NB RA	4/16/2012	failed attempt	discarded sample: non-qualified event
Smokey Point NB RA	4/19/2012	failed attempt	equipment failure
Smokey Point NB RA	4/24/2012	missed event	not forecast to qualify

Smokey Point NB RA	4/29/2012	successful attempt	grabs missed due to lack of available staff
Smokey Point NB RA	5/20/2012	successful attempt	grabs missed due to lack of available staff
Smokey Point NB RA	9/9/2012	failed attempt	discarded sample: non-qualified event
Smokey Point SB RA	2/28/2012	failed attempt	discarded sample: non-qualified event
Smokey Point SB RA	3/9/2012	successful attempt	grabs missed due to lack of available staff
Smokey Point SB RA	3/26/2012	missed event	storm started before station was set to sample
Smokey Point SB RA	4/3/2012	successful attempt	grabs missed due to forecasting errors
Smokey Point SB RA	4/11/2012	failed attempt	discarded sample: non-qualified event
Smokey Point SB RA	4/16/2012	failed attempt	discarded sample: non-qualified event
Smokey Point SB RA	4/19/2012	failed attempt	equipment failure
Smokey Point SB RA	4/24/2012	missed event	not forecast to qualify: not attempted
Smokey Point SB RA	4/29/2012	successful attempt	grabs missed due to lack of available staff
Smokey Point SB RA	5/21/2012	successful attempt	grabs missed due to lack of available staff
Smokey Point SB RA	9/9/2012	failed attempt	discarded sample: non-qualified event

Appendix G:
Water Quality Data Tables

Smokey Point Rest Area Northbound											
Analyte	**3/9/12**	**4/3/12**	**4/29/12**	**5/20/12**	**10/12/12**	**10/18/12**	**1/23/13**	**2/28/13**	**3/2/13**	**3/6/13**	**9/15/13**
***Conventionals** (mg/L)*											
TSS	28	33	30 J	50	8	14	96	59	21	13	18
Chloride	60.5	6.97	7.76	88.6	14.1	8.88	1340	44.5	14.1	29.3	7.95
Hardness as $CaCO_3$	--	21.1	28.3	99.2	60.2	20.8	756	29.3	21.6	37.4	61.5
***Bacteria** (cfu/100mL)*											
Fecal coliform	--	--	--	--	4000	32	--	--	--	--	--
***Nutrient** (mg/L)s*											
Phosphorous, Total	--	0.181	0.361	1.84	1.1	0.491	0.511	0.357	0.243	0.175	0.619
Orthophosphate	--	0.0958	0.12 J	1.03 J	0.513 J	0.399 J	0.01 U	--	--	0.0669	0.175
Nitrogen, Total Kjeldahl	--	1.9	4.9	22	9.6 J	3.4 J	14 J	2.3 J	2.3 J	2.2 J	1 U
Nitrate-Nitrite	--	0.348	0.451	0.805	0.07 J	0.483	1.87	0.39	0.891	1.46	0.914
***Metals** (ug/L)*											
Copper, Total	--	16.5	19.1	82.9	9.68	15.9	9.05	--	--	16.9	20.6
Copper, Dissolved	--	8.7	13.4	65.1	3.29	12.1	3.21	--	--	13.7	9.55
Lead, Total	--	2.99	1.76	2.24	0.74 J	1.41 J	19.7	--	--	1.25 J	1.66 J
Lead, Dissolved	--	0.201	0.263	1.39	0.151	0.393	1 UJ	--	--	0.33	0.29
Cadmium, Total	--	0.14	0.14	0.55	0.1 U	0.11	1 U	--	--	0.14	0.14
Cadmium, Dissolved	--	0.065	0.083	0.424	0.039	0.061	1 UJ	--	--	0.136	0.1 U
Zinc, Total	--	96.8	72.9	253	45.9 J	86.9 J	2400	--	--	71.3 J	87.7 J
Zinc, Dissolved	--	47.2	47.2	235	18.6 J	66.6	413	--	--	59.2 J	39.5 J
***PAH Compounds** (ug/L)*											
Acenaphthene	0.0099 U	0.0097 U	0.027	0.06	0.01 UJ	0.0099 U	0.0097 U	0.011 U	0.011 U	0.01 UJ	0.01 U
Acenaphthylene	0.062 J	0.0097 U	0.0097 UJ	0.18 J	0.018 J	0.0099 U	0.0097 U	0.011 U	0.011 U	0.01 UJ	0.1
Anthracene	0.0099 U	0.0097 U	0.0097 U	0.0099 UJ	0.01 UJ	0.0099 U	0.0097 U	0.011 U	0.011 U	0.01 U	0.01 U
Benz(a)anthracene	0.0091 J	0.0097 U	0.0097 U	0.0099 UJ	0.01 UJ	0.0099 U	0.04	0.011 U	0.011 U	0.01 U	0.01 U
Benzo(b)fluoranthene	0.024	0.041 J	0.018 J	0.0099 UJ	0.01 UJ	0.013	0.08	0.036	0.021	0.012	0.01 U
Benzo(k)fluoranthene	0.0099 U	0.0097 UJ	0.0097 UJ	0.0099 UJ	0.01 UJ	0.0099 U	0.025	0.03	0.016	0.01 U	0.01 U
Benzo(ghi)perylene	0.019	0.024 J	0.0097 UJ	0.0099 UJ	0.01 UJ	0.021	0.073	0.085	0.043	0.02	0.012
Benzo(a)pyrene	0.015	0.018 J	0.0097 UJ	0.0099 UJ	0.01 UJ	0.0099 U	0.036	0.027 J	0.016 J	0.01	0.01 U
Chrysene	0.023	0.026	0.017	0.0099 U	0.01 UJ	0.0099 U	0.063	0.06	0.027	0.017	0.015
Dibenzo(a,h)anthracene	0.0099 U	0.0097 UJ	0.0097 UJ	0.0099 UJ	0.01 UJ	0.0099 U	0.0097 U	0.01	0.011 U	0.01 U	0.01 U
Fluoranthene	0.045	0.06	0.035	0.016	0.01 UJ	0.021	0.16	0.089	0.031	0.02	0.013 J
Fluorene	0.0099 U	0.0097 U	0.073	0.14 J	0.01 UJ	0.0099 U	0.032	0.011 UJ	0.011 UJ	0.01 UJ	0.01 U
Indeno(1,2,3-cd)pyrene	0.0091 J	0.01 J	0.0097 UJ	0.0099 UJ	0.01 UJ	0.0099 U	0.027	0.026	0.015	0.0085 J	0.01 U
Naphthalene	0.021	0.0097 U	0.25	0.74	0.01 UJ	0.014	0.0097 U	0.014	0.017	0.033	0.01 U
Phenanthrene	0.039	0.094	0.088	0.11	0.01 UJ	0.0099 U	0.13	0.051	0.024 J	0.022 J	0.023 J
Pyrene	0.092	0.14	0.07	0.068	0.013 J	0.042	0.42	0.16	0.062	0.048	0.04

Smokey Point Rest Area Northbound (continued)											
Analyte	3/9/12	4/3/12	4/29/12	5/20/12	10/12/12	10/18/12	1/23/13	2/28/13	3/2/13	3/6/13	9/15/13
Phthalates *(ug/L)*											
bis(2-Ethylhexyl)phthalate	1.8 U	2.3 J	1.7 J	1.2 J	4.8 UJ	1.8 J	2.8 J	2.4 J	1.6 UJ	0.92 UJ	0.97 J
Butyl benzyl phthalate	0.74	0.19 U	0.24	0.2 U	0.2 UJ	0.24 J	0.41	0.24	0.24	0.21 U	0.21 U
Di-n-butyl phthalate	0.32 U	0.36 UJ	0.23 UJ	0.2 U	0.2 UJ	0.41 UJ	0.22 UJ	0.22 U	0.21 U	0.21 U	0.21 U
Diethyl phthalate	0.2 J	0.19 U	0.19 U	0.39	0.054 J	0.17 J	0.19 UJ	0.22 UJ	0.21 UJ	0.21 UJ	0.11 J
Dimethyl phthalate	0.2 U	0.19 U	0.058 J	0.2 U	0.2 UJ	0.2 U	0.13 J	0.22 UJ	0.21 UJ	0.21 UJ	0.21 UJ
Di-n-octyl phthalate	0.55 J	0.19 UJ	0.52 J	0.2 UJ	0.2 UJ	0.2 U	0.19 UJ	0.22 UJ	0.21 UJ	0.21 UJ	0.21 UJ
Herbicides *(ug/L)*											
Dichlobenil	0.059	0.032 U	0.032 U	0.033 U	0.034 U	0.032 U	0.035 U	0.034 U	0.033 U	0.033 U	0.027 J
Diuron	0.049 U	0.049 UJ	0.049 UJ	0.05 U	0.052 U	0.049 U	0.054 U	0.052 U	0.05 U	0.05 UJ	0.052 U
2,4-D	0.062 U	0.061 UJ	0.062 U	0.062 UJ	0.061 UJ	0.062 U	0.062 U	0.2 J	0.063 UJ	0.064 U	0.063 U
Clopyralid	0.062 U	0.061 U	0.062 U	0.062 U	0.061 U	0.062 U	0.062 UJ	0.062 UJ	0.063 UJ	0.064 UJ	0.063 UJ
Picloram	0.062 U	0.061 U	0.062 U	0.062 U	0.061 U	0.062 U	0.062 UJ	0.062 UJ	0.063 UJ	0.064 UJ	0.063 UJ
Triclopyr	0.062 U	0.061 U	0.062 U	0.062 U	0.061 U	0.062 U	0.062 U	0.18 J	0.063 UJ	0.064 U	0.063 U
Glyphosate	—	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
Petroleum Hydrocarbons *(ug/L)*											
TPH-Diesel (NWTPH-Dx)	—	—	—	—	5.49	0.17	—	—	—	—	—
Diesel	—	—	—	—	0.79	0.05 U	—	—	—	—	—
Lube Oil	—	—	—	—	4.7	0.12 U	—	—	—	—	—
TPH-Gas (NWTPH-Gx)	—	—	—	—	0.07 U	0.07 U	—	—	—	—	—

Notes:

— Parameter not analyzed

U – Analyte not detected above reported result

J – Estimated value

UJ – Analyte not detected above reported result; value is an estimate

TPH-Diesel (NWTPH-Dx) values are calculated as the sum of the Diesel and Lube Oil concentrations.

Smokey Point Rest Area Southbound

Analyte	3/9/12	4/3/12	4/29/12	5/20/12	10/12/12	10/18/12	12/11/12	1/23/13	4/4/13	4/10/13	4/12/13	9/15/13
***Conventionals** (mg/L)*												
TSS	18	43	23 J	22	6 U	29 J	--	70	13	30	11	15
Chloride	45.2	10.3	20	16.2	12.1	11.4	--	315	13.5	9.06	9.65	2.25
Hardness as $CaCO_3$	--	32.7	47.4	54.5	99.3	23.3	--	255	54.3	34.5	36.8	41.4
***Bacteria** (cfu/100mL)*												
Fecal coliform	--	--	--	--	<10 U	3300	2200	--	--	--	--	--
***Nutrients** (mg/L)*												
Phosphorous, Total	--	0.143	0.107	0.186	0.472	0.241	--	0.137	0.0671	0.104	0.0772 J	0.331
Orthophosphate	--	0.0284	0.0106 J	0.0479	0.0167 J	0.172 J	--	0.0115	--	--	--	0.0135
Nitrogen, Total Kjeldahl	--	1.2 J	1.4 J	2.3	--	2.4 --	--	2.6	1 J	0.74 J	1	2.5
Nitrate-Nitrite	--	0.178	0.248	0.296	0.299	0.185	--	0.479	0.33	0.197	0.28	0.178
***Metals** (ug/L)*												
Copper, Total	--	36.9	7.63	11.6	2.77 J	10.2	--	16.3	--	--	--	4.28
Copper, Dissolved	--	3.03	4.66	9.05	1.85 J	7.01	--	10.7	--	--	--	1.3 J
Lead, Total	--	2.6	0.77	0.83	0.28 J	1.22	--	2.15	--	--	--	0.5
Lead, Dissolved	--	0.144	0.061	0.07	2.74 J	0.313	--	1 UJ	--	--	--	0.1 U
Cadmium, Total	--	0.26	0.1 U	0.1 U	0.1 U	0.1	--	0.83	--	--	--	0.1 U
Cadmium, Dissolved	--	0.043	0.035	0.048	0.02 U	0.065	--	0.41	--	--	--	0.1 U
Zinc, Total	--	91.9	39.4	65.8	13.9 J	86.9	--	254	--	--	--	27.2
Zinc, Dissolved	--	27.8	24.9	43.4	17 J	62.3	--	81.8	--	--	--	12.1
***PAH Compounds** (ug/L)*												
Acenaphthene	0.0097 U	0.01 U	0.01 U	0.0097 U	0.0098 UJ	0.01 U	--	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Acenaphthylene	0.081 J	0.01 U	0.01 UJ	0.073 J	0.0098 UJ	0.01 U	--	0.09	0.01 U	0.01 U	0.01 U	0.071 J
Anthracene	0.0097 U	0.01 U	0.01 U	0.0097 UJ	0.0098 UJ	0.01 U	--	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Benz(a)anthracene	0.0097 UJ	0.01 U	0.01 U	0.0097 UJ	0.0098 UJ	0.01 U	--	0.023	0.01 U	0.017 J	0.01 U	0.01 U
Benzo(b)fluoranthene	0.02 J	0.028	0.01 U	0.0097 U	0.0098 UJ	0.01 U	--	0.042	0.01 U	0.021	0.01 U	0.011 J
Benzo(k)fluoranthene	0.0049 J	0.0087 J	0.01 U	0.0097 U	0.0098 UJ	0.01 U	--	0.014	0.01 U	0.015	0.01 U	0.0029 J
Benzo(ghi)perylene	0.024	0.022	0.01 U	0.0097 U	0.0098 UJ	0.025	--	0.055	0.018	0.052	0.023	0.01 U
Benzo(a)pyrene	0.013 J	0.013	0.01 U	0.0097 UJ	0.0098 UJ	0.01 U	--	0.026	0.01 U	0.017 J	0.01 U	0.01 U
Chrysene	0.015	0.023	0.01 U	0.0097 U	0.0098 UJ	0.01 U	--	0.037	0.011	0.043	0.016	0.01 U
Dibenzo(a,h)anthracene	0.0097 U	0.01 U	0.01 U	0.0097 UJ	0.0098 UJ	0.01 U	--	0.0071 J	0.01 U	0.01 U	0.01 U	0.01 U
Fluoranthene	0.032	0.047	0.014	0.0071 J	0.0098 UJ	0.037	--	0.069	0.02 U	0.054 J	0.023 J	0.011
Fluorene	0.0097 U	0.01 U	0.01 U	0.0097 U	0.0098 UJ	0.01 U	--	0.01 U	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
Indeno(1,2,3-cd)pyrene	0.0096 J	0.01 U	0.01 U	0.0097 U	0.0098 UJ	0.011	--	0.022	0.01 U	0.016	0.01 U	0.01 U
Naphthalene	0.0043 J	0.0056 J	0.0059 J	0.0097 U	0.0098 UJ	0.018	--	0.024	0.01 U	0.01 U	0.01 U	0.015
Phenanthrene	0.023	0.03	0.0094 J	0.0097 U	0.0098 UJ	0.01 U	--	0.049	0.011 J	0.022	0.014 J	0.01 U
Pyrene	0.074	0.082	0.02	0.013	0.0098 UJ	0.055	--	0.18	0.028	0.087	0.037	0.017

Smokey Point Rest Area Southbound (continued)																								
Analyte	3/9/12		4/3/12		4/29/12		5/20/12		10/12/12		10/18/12		12/11/12		1/23/13		4/4/13		4/10/13		4/12/13		9/15/13	
Phthalates *(ug/L)*																								
bis(2-Ethylhexyl)phthalate	1.4	UJ	1.5	U	0.76	J	0.48	J	0.21	UJ	2	J	–		1.2	UJ	0.5	UJ	2	U	0.84	UJ	0.2	UJ
Butyl benzyl phthalate	0.59	J	0.2	U	0.21	U	0.19	U	0.2	UJ	0.2	U	–		0.17	J	0.2	U	0.2	U	0.2	U	0.2	U
Di-n-butyl phthalate	0.25	UJ	0.36	U	0.21	U	0.19	U	0.2	UJ	0.21	UJ	–		0.21	UJ	0.2	U	0.44	U	0.34	U	0.2	U
Diethyl phthalate	0.19	U	0.2	U	0.21	U	0.19	U	0.2	UJ	0.74		–		0.2	UJ	0.2	U	0.2	U	0.2	U	0.2	U
Dimethyl phthalate	0.19	U	0.2	U	0.21	U	0.19	U	0.2	UJ	0.2	U	–		0.2	UJ	0.2	U	0.11	J	0.2	U	0.2	U
Di-n-octyl phthalate	0.55	J	0.28	J	0.21	UJ	0.19	UJ	0.2	UJ	0.2	U	–		0.2	UJ	0.2	U	0.2	U	0.2	U	0.2	UJ
Herbicides *(ug/L)*																								
Dichlobenil	0.033	U	0.032	U	0.033	U	0.034	U	0.033	U	0.033	U	–		0.034	U	0.033	UJ	0.033	UJ	0.012	J	0.034	U
Diuron	0.05	U	0.049	UJ	0.05	UJ	0.051	U	0.05	U	0.051	U	–		0.051	U	0.05	U	0.05	U	0.05	U	0.052	U
2,4-D	0.061	U	0.062	UJ	0.061	U	0.062	UJ	0.062	UJ	0.062	U	–		0.061	U	0.097	J	0.06	J	0.062	U	0.066	J
Clopyralid	0.061	U	0.062	U	0.061	U	0.062	U	0.062	U	0.062	U	–		0.061	UJ	0.065	UJ	0.064	UJ	0.062	UJ	0.069	UJ
Picloram	0.061	U	0.062	U	0.061	U	0.062	U	0.062	U	0.062	U	–		0.061	UJ	0.065	U	0.064	U	0.062	U	0.069	UJ
Triclopyr	0.061	U	0.062	U	0.061	U	0.062	U	0.062	U	0.062	U	–		0.061	U	0.065	U	0.064	U	0.062	U	0.069	U
Glyphosate	–		25	U	25	U	25	U	25	U	25	U	–		25	U	25	U	25	U	25	U	25	U
Petroleum Hydrocarbons *(mg/L)*																								
TPH-Diesel (NWTPH-Dx)	–		–		–		–		0.17		0.27		–		–		–		–		–		–	
Diesel	–		–		–		–		0.05	U	0.05	U	–		–		–		–		–		–	
Lube Oil	–		–		–		–		0.12	U	0.22		–		–		–		–		–		–	
TPH-Gas (NWTPH-Gx)	–		–		–		–		0.07	U	0.07	U	–		–		–		–		–		–	

Notes:

- Parameter not analyzed

U – Analyte not detected above reported result

J – Estimated value

UJ – Analyte not detected above reported result; value is an estimate

TPH-Diesel (NWTPH-Dx) values are calculated as the sum of the Diesel and Lube Oil concentrations

Ballinger Maintenance Facility													
Analyte	1/24/12	2/24/12	2/28/12	3/9/12	4/3/12	4/29/12	6/22/12	10/18/12	11/28/12	12/11/12	1/8/13	1/23/13	2/20/13
***Conventionals** (mg/L)*													
TSS	215	1140 J	408 J	223	196 J	313 J	2990 J	205 J	40	37	--	463	102
Chloride	--	591	--	10600	6980	6550	2110	608	--	1410	--	12500	1230
Hardness as $CaCO_3$	--	--	--	--	182	232	166	43.6	--	56.7	--	2130	76.3
***Nutrients** (mg/L)*													
Phosphorous, Total	0.531	--	0.396	--	0.188	0.472	4.84	0.207	0.136	0.144	--	0.946	0.206
Orthophosphate	0.023 J	--	0.0726	--	0.0536	0.0234 J	--	0.0259 J	0.02	0.0383	--	0.0369	0.0422
Nitrogen, Total Kjeldahl	0.326	--	--	--	1.4 J	5	3.6 J	1.1	0.85 J	0.45 J	--	27	1.4 J
Nitrate-Nitrite	0.5	--	0.364	--	0.257	0.391	0.342	0.332	0.264	0.433	--	0.71	0.481
***Metals** (ug/L)*													
Copper, Total	58	--	43.3	--	28.3	61.8	--	43.3	19.4	17	--	20	24
Copper, Dissolved	20.5	--	49.1	--	14.8	9.99	--	6.09	9.3	5.64	--	8.71	6.91
Lead, Total	46.6	--	30.8	--	18.8	35	--	29.2	8.59	10.2	--	96.3	9.37
Lead, Dissolved	0.165	--	0.343	--	0.452	1.99	--	0.752	0.2 U	0.17	--	10 UJ	0.34
Cadmium, Total	0.71	--	1.14	--	1 U	1 U	--	0.18	1 U	0.22	--	1 U	0.2 U
Cadmium, Dissolved	0.62	--	1.1	--	0.674	0.483	--	0.084	0.322	0.148	--	1 UJ	0.2 U
Zinc, Total	237	--	212	--	108	208	--	149	201	65.7	--	1670	86.5
Zinc, Dissolved	63.2	--	111	--	27.8	35.5 J	--	34.7	140	31.4	--	907	20.4
***PAH Compounds** (ug/L)*													
Acenaphthene	0.0098 U	0.49	0.01 U	0.0097 U	0.01 U	--	0.085	0.0099 U	0.0098 U	0.0097 U	--	0.01 UJ	0.0098 U
Acenaphthylene	0.0098 U	0.034 J	0.041 J	0.15 J	0.01 U	--	0.043	0.029	0.0098 U	0.0097 U	--	0.21 J	0.034
Anthracene	0.035 J	1 J	0.037 J	0.018 J	0.01 U	--	0.32	0.015	0.0096 J	0.0097 U	--	0.01 UJ	0.0098 U
Benz(a)anthracene	0.061 J	2.5 J	0.17 J	0.045 J	0.048	--	1.3	0.045	0.018	0.021	--	0.2 J	0.031
Benzo(b)fluoranthene	0.16 J	4.4 J	0.48 J	0.14 J	0.14 J	--	2.2	0.11	0.069	0.068	--	0.6 J	0.068
Benzo(k)fluoranthene	0.053	1.3 J	0.13 J	0.041 J	0.045 J	--	0.99	0.034	0.024	0.025	--	0.58 J	0.029
Benzo(ghi)perylene	0.093 J	1.1 J	0.14 J	0.044 J	0.05 J	--	0.55	0.093	0.068 J	0.075 J	--	0.21 J	0.073
Benzo(a)pyrene	0.099 J	2.4 J	0.19 J	0.062 J	0.072 J	--	1.6	0.071 J	0.032	0.038	--	0.47 J	0.043
Chrysene	0.18	3	0.35	0.073	0.14	--	2.3	0.11	0.06	0.054	--	0.51 J	0.073
Dibenzo(a,h)anthracene	0.019 J	0.21 J	0.034 J	0.019 J	0.01 UJ	--	0.14	0.0099 U	0.0098 U	0.011 J	--	0.01 UJ	0.011
Fluoranthene	0.28	6.4	0.49	0.18	0.17	--	4	0.17	0.093	0.069	--	1 J	0.097
Fluorene	0.043	0.72	0.026 J	0.0097 U	0.012	--	0.15	0.015 J	0.01	0.0097 U	--	0.15 J	0.0098 U
Indeno(1,2,3-cd)pyrene	0.069 J	1.6 J	0.15 J	0.046 J	0.035 J	--	1.2	0.069	0.048 J	0.063 J	--	0.01 UJ	0.047
Naphthalene	0.045	0.11	0.037	0.055	0.023	--	0.062	0.023	0.045	0.021 J	--	0.092 J	0.011 U
Phenanthrene	0.19	5.2	0.25 J	0.14	0.085	--	2.3	0.086	0.046	0.036	--	0.56 J	0.038
Pyrene	0.36	6.2	0.6	0.26	0.22	--	3.8	0.16	0.12	0.094	--	1.5 J	0.13

Ballinger Maintenance Facility (continued)						
Analyte	**3/6/13**		**5/21/13**		**9/15/13**	
Conventionals *(mg/L)*						
TSS	50		57		254	
Chloride	1600		--		802	
Hardness as $CaCO_3$	95.7		--		81.1	
Nutrients *(mg/L)*						
Phosphorous, Total	0.146		0.231		0.329	
Orthophosphate	0.0145		0.0238		0.0109	
Nitrogen, Total Kjeldahl	1.2	J	2	J	2.8	
Nitrate-Nitrite	0.569		0.757		0.988	
Metals *(ug/L)*						
Copper, Total	16.1		24.1		65.9	
Copper, Dissolved	8.04		9.66		8.62	
Lead, Total	5.27		4.65		43.3	
Lead, Dissolved	1	U	0.56		1.34	
Cadmium, Total	0.19		0.28		0.55	
Cadmium, Dissolved	0.14		0.165		0.126	
Zinc, Total	66.7		75.9	J	370	
Zinc, Dissolved	50	U	37.9		58.7	
PAH Compounds *(ug/L)*						
Acenaphthene	0.011	U	0.01	U	0.01	
Acenaphthylene	0.011	U	0.01	U	0.01	
Anthracene	0.011	U	0.01	U	0.019	
Benz(a)anthracene	0.017	J	0.015	U	0.064	
Benzo(b)fluoranthene	0.037		0.026		0.15	
Benzo(k)fluoranthene	0.036		0.02		0.076	
Benzo(ghi)perylene	0.072		0.031		0.16	
Benzo(a)pyrene	0.031		0.022		0.085	
Chrysene	0.048		0.046		0.19	
Dibenzo(a,h)anthracene	0.012		0.014		0.029	
Fluoranthene	0.072		0.048		0.21	
Fluorene	0.011	UJ	0.01	UJ	0.019	
Indeno(1,2,3-cd)pyrene	0.032		0.022		0.081	
Naphthalene	0.011	U	0.02		0.018	
Phenanthrene	0.028		0.044		0.1	
Pyrene	0.095		0.055		0.26	

Ballinger Maintenance Facility (continued)													
Analyte	1/24/12	2/24/12	2/28/12	3/9/12	4/3/12	4/29/12	6/22/12	10/18/12	11/28/12	12/11/12	1/8/13	1/23/13	2/20/13
Phthalates *(ug/L)*													
bis(2-Ethylhexyl)phthalate	--	--	11 J	--	--	--	--	--	--	--	--	--	--
Butyl benzyl phthalate	--	--	0.2 U	--	--	--	--	--	--	--	--	--	--
Di-n-butyl phthalate	--	--	0.66 UJ	--	--	--	--	--	--	--	--	--	--
Diethyl phthalate	--	--	0.19 J	--	--	--	--	--	--	--	--	--	--
Dimethyl phthalate	--	--	0.2 U	--	--	--	--	--	--	--	--	--	--
Di-n-octyl phthalate	--	--	5.5 J	--	--	--	--	--	--	--	--	--	--
Herbicides *(ug/L)*													
Dichlobenil	0.028 J	--	0.61	0.17	0.19	--	0.074 J	0.033 U	0.028 J	0.032 U	--	0.036 U	0.083
Diuron	0.05 UJ	--	0.052 U	0.049 U	0.053 UJ	--	0.049 U	0.05 U	0.049 UJ	0.049 UJ	--	0.054 U	0.049 R
2,4-D	0.062 UJ	0.062 UJ	0.076 UJ	0.063 U	0.062 UJ	--	0.062 U	0.15 J	0.061 UJ	0.062 U	--	0.068 U	0.068 J
Clopyralid	0.062 UJ	0.062 UJ	0.076 UJ	0.063 U	0.062 U	--	0.062 U	0.062 U	0.061 UJ	0.062 UJ	--	0.068 UJ	0.061 UJ
Picloram	0.062 UJ	0.062 UJ	0.076 UJ	0.063 U	0.062 U	--	0.062 U	0.062 U	0.061 UJ	0.062 U	--	0.068 UJ	0.061 U
Triclopyr	0.062 U	0.062 UJ	0.076 UJ	0.61 J	0.062 U	--	0.13 J	0.16	0.66	0.085	--	0.068 U	0.1 J
Glyphosate	25 U	--	25 U	25 U	25 U	--	25 U	25 U	25 U	25 U	--	25 U	25 U
Petroleum Hydrocarbons *(mg/L)*													
TPH-Diesel (NWTPH-Dx)	3.25	--	--	--	0.88	--	--	--	--	--	1.35	--	--
Diesel	0.15 U	--	--	--	0.05 UJ	--	--	--	--	--	0.15 U	--	--
Lube Oil	3.1	--	--	--	0.83 J	--	--	--	--	--	1.2	--	--
TPH-Gas (NWTPH-Gx)	0.14 U	--	--	--	0.07 U	--	--	--	--	--	0.07 U	--	--
Surfactants *(mg/L)*													
Methylene blue active substances (MBAS)	0.036	--	--	--	0.108	0.466	--	0.237	0.083	0.088	--	0.458	0.251

Ballinger Maintenance Facility (continued)						
PARAMETER	**3/6/13**		**5/21/13**		**9/15/13**	
Phthalates *(ug/L)*						
bis(2-Ethylhexyl)phthalate	--		--		--	
Butyl benzyl phthalate	--		--		--	
Di-n-butyl phthalate	--		--		--	
Diethyl phthalate	--		--		--	
Dimethyl phthalate	--		--		--	
Di-n-octyl phthalate	--		--		--	
Herbicides *(ug/L)*						
Dichlobenil	0.1		0.072		0.034	
Diuron	0.051	UJ	0.05	UJ	0.051	U
2,4-D	0.066	U	0.5	J	0.4	
Clopyralid	0.066	UJ	0.062	UJ	0.063	UJ
Picloram	0.066	UJ	0.062	U	0.063	UJ
Triclopyr	0.061	J	0.65		1.1	
Glyphosate	25	U	25	U	25	U
Petroleum Hydrocarbons *(mg/L)*						
TPH-Diesel (NWTPH-Dx)	0.53		--		--	
Diesel	0.15	UJ	--		--	
Lube Oil	0.38	UJ	--		--	
TPH-Gas (NWTPH-Gx)	0.05	U	--		--	
Surfactants *(mg/L)*						
Methylene blue active substances (MBAS)	--		0.28		0.08	

Notes:

-- Parameter not analyzed

U – Analyte not detected above reported result

J – Estimated value

UJ – Analyte not detected above reported result; value is an estimate

TPH-Diesel (NWTPH-Dx) values are calculated as the sum of the Diesel and Lube Oil concentrations.

Lakeview Maintenance Facility

Analyte	4/3/12	4/16/12	4/17/12	4/25/12	4/29/12	6/22/12	10/12/12	10/18/12	11/16/12	1/23/13	3/19/13	3/28/13	4/4/13
Conventionals *(mg/L)*													
TSS	28	39	14	29	19	28	37	96 J	10	96	18	34	113
Chloride	--	--	--	--	1.89	5.7	21	103	13.1	618	10.7	92.2	56.4
Hardness as $CaCO_3$	--	--	--	--	3.75	19.9	43.5	15.2	--	243	13.7	96	69.8
Nutrients *(mg/L)*													
Phosphorous, Total	0.0816	--	--	0.0877	0.0403	0.0904	0.214	0.173	0.051	0.194 J	0.059	0.0727	0.209
Orthophosphate	0.01 U	0.01 U	0.01 U	0.0239	0.01 U	--	0.0568 J	0.0332	--	0.01 U	0.01 U	0.01 U	0.01 U
Nitrogen, Total Kjeldahl	0.62 J	--	--	--	0.75 J	1.6 J	4.7	1.1	0.67 UJ	2.9	0.68 J	0.97 J	1.2 J
Nitrate-Nitrite	0.159	--	--	--	0.205	0.665	2.44	0.255	0.673	0.958	0.262	0.552	1.02
Metals *(ug/L)*													
Copper, Total	10.6	22.8	15	15.7	9.77	--	57.8	24.3	--	31.4	14.3	19.3	52.7
Copper, Dissolved	5.65	14.5	12.3	15.3	6.62	--	46.1	9.29	--	15.5	10.4	12	21
Lead, Total	3.57	6.61	1.5	2.34	1.92	--	11.6	22.2	--	16.6	2.92	5.37	18.3
Lead, Dissolved	0.144	0.339	0.166	0.336	0.587	--	0.506	1.23	--	1 UJ	0.35	0.43	0.87
Cadmium, Total	0.19	0.25	0.19	0.24	0.16	--	0.82	0.67	--	3.19	0.25	0.66	0.48
Cadmium, Dissolved	0.133	0.178	0.163	0.18	0.128	--	0.578	0.357	--	2.89	0.205	0.573	0.254
Zinc, Total	286	420	364	376	275	--	1070	487	--	1830	394	821	504
Zinc, Dissolved	251	342	331	341	244	--	922	340	--	1660	360	760	322
PAH Compounds *(ug/L)*													
Acenaphthene	0.01 U	0.0099 U	0.0099 U	0.0098 U	0.0098 U	0.01 U	0.0014 R	0.01 U	0.0097 U	0.01 U	0.011 U	0.0099 U	0.01 UJ
Acenaphthylene	0.01 U	0.045	0.031	0.025 J	0.0098 UJ	0.092	0.16 J	0.01 U	0.022	0.11	0.011 U	0.0099 U	0.01 UJ
Anthracene	0.01 U	0.0099 U	0.0099 U	0.0098 U	0.0098 U	0.01 U	0.0024 R	0.028	0.0097 U	0.011	0.011 U	0.0099 U	0.012 J
Benz(a)anthracene	0.01 U	0.0099 U	0.0099 U	0.0098 U	0.0098 U	0.01 U	0.011 R	0.04	0.0097 U	0.032	0.011 U	0.0099 U	0.029 J
Benzo(b)fluoranthene	0.032	0.016	0.0071 J	0.0098 U	0.016	0.015	0.011 J	0.098	0.019	0.1	0.015	0.024	0.066 J
Benzo(k)fluoranthene	0.031	0.0099 U	0.0099 U	0.0098 U	0.0098 U	0.01 U	0.0013 R	0.029	0.0097 U	0.034	0.012	0.018	0.046 J
Benzo(ghi)perylene	0.023	0.0093 J	0.0099 U	0.0098 U	0.0098 U	0.021	0.01 J	0.087	0.025	0.088	0.025 J	0.046	0.092 J
Benzo(a)pyrene	0.015	0.0083 J	0.0099 U	0.0098 U	0.0098 U	0.01 U	0.012 J	0.054 J	0.011	0.044	0.014 J	0.017	0.039 J
Chrysene	0.01 U	0.01	0.0099 U	0.0098 U	0.0098 U	0.01 U	0.02 J	0.084	0.015	0.069	0.025	0.036	0.1 J
Dibenzo(a,h)anthracene	0.01 U	0.0099 U	0.0099 U	0.0098 U	0.0098 U	0.01 U	0.0016 R	0.016 J	0.0097 U	0.01 U	0.011 U	0.0099 U	0.016 J
Fluoranthene	0.045	0.022	0.013	0.014	0.019	0.025	0.013 J	0.12	0.026	0.15	0.033	0.042 J	0.12 J
Fluorene	0.01 U	0.0099 U	0.0099 U	0.0098 U	0.0098 U	0.01 U	0.012 J	0.02 J	0.011	0.012	0.011 U	0.0099 U	0.01 UJ
Indeno(1,2,3-cd)pyrene	0.013	0.0099 U	0.0099 U	0.0098 U	0.0098 U	0.01 U	0.0083 J	0.055	0.018 J	0.051	0.0096 J	0.021	0.041 J
Naphthalene	0.011	0.0088 J	0.012	0.011	0.0098 U	0.01 U	0.0012 R	0.026	0.058	0.032	0.022	0.024	0.016 J
Phenanthrene	0.029	0.022	0.013	0.015	0.014	0.018	0.017 J	0.094	0.035	0.094	0.023 J	0.038 J	0.062 J
Pyrene	0.049	0.024	0.012	0.015	0.015	0.026	0.015 J	0.11	0.034	0.27	0.035	0.051 J	0.15 J

Lakeview Maintenance Facility (continued)				
Analyte	**4/10/13**		**9/15/13**	
Conventionals *(mg/L)*				
TSS	32		51	
Chloride	--		285	
Hardness as $CaCO_3$	14.7		388	
Nutrients *(mg/L)*				
Phosphorous, Total	--		0.222	
Orthophosphate	0.0135		0.0114	
Nitrogen, Total Kjeldahl	--		11	
Nitrate-Nitrite	0.257		1.82	
Metals *(ug/L)*				
Copper, Total	13.3		27.5	
Copper, Dissolved	7.08		19.3	
Lead, Total	4.34		6.64	
Lead, Dissolved	0.17		1.09	
Cadmium, Total	0.19		0.98	
Cadmium, Dissolved	0.129		0.876	
Zinc, Total	291		963	
Zinc, Dissolved	220		899	
PAH Compounds *(ug/L)*				
Acenaphthene	0.01	U	0.01	U
Acenaphthylene	0.01	U	0.15	
Anthracene	0.01	U	0.01	U
Benz(a)anthracene	0.01	U	0.01	U
Benzo(b)fluoranthene	0.01	U	0.028	J
Benzo(k)fluoranthene	0.01	U	0.014	
Benzo(ghi)perylene	0.031		0.031	
Benzo(a)pyrene	0.01	U	0.01	J
Chrysene	0.01	U	0.026	
Dibenzo(a,h)anthracene	0.01	U	0.015	
Fluoranthene	0.032	J	0.023	
Fluorene	0.01	UJ	0.01	U
Indeno(1,2,3-cd)pyrene	0.01	J	0.017	
Naphthalene	0.01	U	0.022	
Phenanthrene	0.022		0.01	U
Pyrene	0.035		0.024	

Lakeview Maintenance Facility (continued)

Analyte	4/3/12	4/16/12	4/17/12	4/25/12	4/29/12	6/22/12	10/12/12	10/18/12	11/16/12	1/23/13	3/19/13	3/28/13	4/4/13
Herbicides *(ug/L)*													
Dichlobenil	0.039	0.12	0.079	0.056 J	0.063	0.033 U	0.032 U	0.034 U	–	0.1	0.063	0.066 J	0.048 J
Diuron	0.051 UJ	0.049 U	0.05 U	0.049 UJ	0.049 UJ	0.05 U	0.049 U	0.051 U	–	0.049 U	0.051 U	0.051 U	0.056 U
2,4-D	0.092 J	0.15 J	0.083 J	0.43 J	0.12 J	0.062 U	0.063 UJ	0.1 J	–	0.12	0.061 J	0.063 U	0.23 J
Clopyralid	0.065 U	0.062 U	0.077 U	0.062 U	0.061 U	0.062 U	0.063 U	0.071 U	–	0.062 UJ	0.062 UJ	0.063 UJ	0.066 UJ
Picloram	0.065 U	0.062 U	0.077 U	0.062 U	0.061 U	0.062 U	0.063 U	0.071 U	–	0.062 UJ	0.062 UJ	0.063 UJ	0.066 U
Triclopyr	0.41	0.64	0.38	3.6 J	0.52	1.4	31	3.4	–	1.9	4	2.5	14 J
Glyphosate	25 U	25 U	–	25 U	25 U	–	25 U	25 U	25 U	25 U	–	25 U	25 U
Petroleum Hydrocarbons *(mg/L)*													
TPH-Diesel (NWTPH-Dx)	0.64	–	–	–	–	–	1.25	7.35	–	0.5	–	–	–
Diesel	0.05 UJ	–	–	–	–	–	0.05 U	0.05 U	–	0.14 U	–	–	–
Lube Oil	0.59 J	–	–	–	–	–	1.2	7.3	–	0.36 U	–	–	–
TPH-Gas (NWTPH-Gx)	0.07 U	–	–	–	–	–	0.07 U	0.07 U	–	0.07 U	–	–	–
Surfactants *(mg/L)*													
Methylene blue active substances (MBAS)	–	–	–	–	0.071	–	0.549	0.103	–	–	1.84	0.372	–

Lakeview Maintenance Facility (continued)

Analyte	4/10/13	9/15/13
Herbicides *(ug/L)*		
Dichlobenil	0.023 J	0.033 U
Diuron	0.053 U	0.05 U
2,4-D	0.066 U	0.32 J
Clopyralid	0.066 UJ	0.073 UJ
Picloram	0.066 U	0.073 UJ
Triclopyr	0.6	2.2
Glyphosate	25 U	160
Petroleum Hydrocarbons *(mg/L)*		
TPH-Diesel (NWTPH-Dx)	–	–
Diesel	–	–
Lube Oil	–	–
TPH-Gas (NWTPH-Gx)	–	–
Surfactants *(mg/L)*		
Methylene blue active substances (MBAS)	–	0.058 J

Notes:

– Parameter not analyzed. U – Analyte not detected above reported result. J – Estimated value. UJ – Analyte not detected above reported result; value is an estimate. TPH-Diesel (NWTPH-Dx) values are calculated as the sum of the Diesel and Lube Oil concentrations.

Vancouver Maintenance Facility

Analyte	2/28/2012	4/3/2012	4/17/2012	4/25/2012	6/22/2012	10/12/12	12/8/12	1/23/13	3/19/13	4/4/13	4/5/13	9/21/13
Conventionals *(mg/L)*												
TSS	4	4	4	3	12	78 J	2 U	1 U	6	2 U	11	21
Chloride	--	52.5	49.2	39.1	31.4	1510 J	13.5	23.2	197	31.7	28.5	173
Hardness as $CaCO_3$	105	50.1	53.3	48	57.4	2080	21.3	33.4	281	48.3	46.8	257
Nutrients *(mg/L)*												
Phosphorous, Total	0.0251	0.0265	0.0285	0.0336	0.149	0.812 J	0.0403	0.0453	0.097	0.0685	0.0896	0.239
Orthophosphate	0.01 U	0.01 U	0.01 U	0.01 U	--	--	--	0.0257	0.01 U	0.03	--	--
Nitrogen, Total Kjeldahl	1.5	1.1 J	1.4	1.4	1.2	35 J	1 U	0.63 U	0.9 J	0.89 UJ	0.7 U	2.9
Nitrate-Nitrite	0.36	0.258	0.295	0.388	0.414	0.752 J	0.296	0.472	0.495	0.457	0.401	0.55
Metals *(ug/L)*												
Copper, Total	2.92	2.38	2.89	2.72	--	12.9	--	2.27	3.99	3.3	--	--
Copper, Dissolved	1.98	1.1	1.82	2.04	--	4.22	--	2.05	3.1	2.86	--	--
Lead, Total	4.51	3.61	6.95	--	--	17.6	--	0.78	4.99	4.27	--	--
Lead, Dissolved	0.893	0.626	1.59	1.15	--	0.776	--	0.26	1.01	1.62	--	--
Cadmium, Total	0.34	0.14	0.24	0.23	--	1.49	--	0.17	0.62	0.25	--	--
Cadmium, Dissolved	0.296	0.117	0.236	0.226	--	0.035	--	0.163	0.574	0.194	--	--
Zinc, Total	267	201	226	228	--	587	--	198	425	171	--	--
Zinc, Dissolved	258	219	225	225	--	293	--	193	415	169	--	--
PAH Compounds *(ug/L)*												
Acenaphthene	0.01 U	0.0098 U	0.01 U	0.0099 U	0.0098 U	0.0099 R	0.01 U	0.0097 U	0.011 U	0.01 U	0.011 U	0.01 U
Acenaphthylene	0.01 R	0.0098 U	0.01 U	0.0099 UJ	0.0098 U	0.0099 R	0.01 U	0.0097 U	0.011 U	0.01 U	0.011 U	0.086
Anthracene	0.01 UJ	0.0098 U	0.01 U	0.0099 U	0.0098 U	0.0099 R	0.01 U	0.0097 U	0.011 U	0.01 U	0.011 U	0.01 U
Benz(a)anthracene	0.01 U	0.0098 U	0.01 U	0.0099 U	0.0098 U	0.0099 R	0.01 U	0.0097 U	0.011 U	0.01 UJ	0.011 U	0.01 U
Benzo(b)fluoranthene	0.01 U	0.0098 U	0.01 U	0.0099 U	0.0098 U	0.0099 R	0.008 J	0.0097 U	0.011 U	0.01 U	0.014	0.014 J
Benzo(k)fluoranthene	0.01 U	0.0098 U	0.01 U	0.0099 U	0.0098 U	0.0099 R	0.01 U	0.0097 U	0.011 U	0.01 U	0.011 U	0.01 U
Benzo(ghi)perylene	0.01 U	0.0098 U	0.01 U	0.0099 U	0.0084 J	0.0099 R	0.01 U	0.0097 U	0.011 U	0.01 U	0.017	0.016
Benzo(a)pyrene	0.01 UJ	0.0098 U	0.01 U	0.0099 U	0.0098 U	0.0099 R	0.01 U	0.0097 U	0.011 U	0.01 U	0.013	0.01 U
Chrysene	0.01 U	0.0098 U	0.01 U	0.0099 U	0.0098 U	0.0099 R	0.01 U	0.0097 U	0.0071 J	0.01 U	0.025	0.023
Dibenzo(a,h)anthracene	0.01 U	0.0098 U	0.01 U	0.0099 U	0.0098 U	0.0099 R	0.01 U	0.0097 U	0.011 U	0.01 U	0.011 U	0.01 U
Fluoranthene	0.01 U	0.0098 U	0.01 U	0.0099 U	0.0098 U	0.0099 R	0.01 U	0.0097 U	0.011 U	0.01 U	0.026 U	0.01 U
Fluorene	0.01 U	0.0098 U	0.01 U	0.0099 U	0.0098 U	0.0099 R	0.01 U	0.0097 U	0.011 U	0.01 U	0.011 UJ	0.01 UJ
Indeno(1,2,3-cd)pyrene	0.01 U	0.0098 U	0.01 U	0.0099 U	0.0098 U	0.0099 R	0.01 U	0.0097 U	0.011 U	0.01 U	0.0083 J	0.01 U
Naphthalene	0.01 U	0.0045 J	0.01 U	0.0099 U	0.0098 U	0.0099 R	0.01 U	0.0097 U	0.011 U	0.01 U	0.011 U	0.01 U
Phenanthrene	0.01 U	0.0098 U	0.01 U	0.0099 U	0.0098 U	0.0099 R	0.01 U	0.0097 U	0.011 U	0.01 U	0.011 U	0.01 U
Pyrene	0.0074 J	0.0082 J	0.01 U	0.0099 U	0.0098 U	0.0099 R	0.01 U	0.0097 U	0.0086 J	0.01 U	0.031	0.014

Vancouver Maintenance Facility (continued)

Analyte	2/29/2012	4/3/2012	4/18/2012	4/25/2012	6/22/2012	10/12/12	12/8/12	1/23/13	3/19/13	4/4/13	4/5/13	9/21/13
***Herbicides** (ug/L)*												
Dichlobenil	0.062	0.032 U	0.034 U	0.033	0.032 U	0.032 U	0.034 U	0.027 J	0.048	0.032 J	0.072 J	0.033 UJ
Diuron	0.82	0.033 J	0.051 U	0.049 UJ	0.049 U	0.049 U	0.29 J	0.13 J	0.051 U	0.049 U	0.05 U	0.05 U
2,4-D	0.064 UJ	0.061 UJ	0.028 J	0.046 J	0.095 J	0.062 UJ	0.062 U	0.061 U	1.5	0.2 J	0.27	0.14
Clopyralid	0.064 UJ	0.061 U	0.062 U	0.064 U	0.061 U	0.062 U	0.062 UJ	0.061 UJ	0.064 UJ	0.062 UJ	0.065 UJ	0.063 UJ
Picloram	0.064 UJ	0.061 U	0.062 U	0.064 U	0.061 U	0.062 U	0.062 U	0.061 UJ	0.064 UJ	0.062 U	0.065 U	0.063 UJ
Triclopyr	0.16 J	0.47	0.19	0.13	1.2	0.52 J	0.11	0.036 J	49	12 J	7.1	0.32
Glyphosate	25 U	25 U	25 U	25 U	14 J	34 J	25 U	--	25 UJ	25 U	25 U	25 U
***Petroleum Hydrocarbons** (mg/L)*												
TPH-Diesel (NWTPH-Dx)	0.2	0.4	--	0.18	--							
Diesel	0.05 U	0.05 UJ	--	0.05 U	--							
Lube Oil	0.15	0.35 J	--	0.13	--							
TPH-Gas (NWTPH-Gx)	0.07 U	0.07 U	--	0.07 U	--				0.07 U			
***Surfactants** (mg/L)*												
Methylene blue active substances (MBAS)	0.052	--	--	0.049	--	0.449	--	0.055	0.066	0.057	--	--

Notes:

-- Parameter not analyzed

U – Analyte not detected above reported result

J – Estimated value

UJ – Analyte not detected above reported result; value is an estimate

TPH-Diesel (NWTPH-Dx) values are calculated as the sum of the Diesel and Lube Oil concentrations.

Euclid Maintenance Facility

Analyte	3/27/2012	4/25/2012	6/7/2012	10/15/12	12/4/12	3/6/13	3/19/13	5/21/13	6/19/13
***Conventionals** (mg/L)*									
TSS	–	308 J	32	37	25 J	13	49	58	73
Chloride	–	–	7.48	–	–	–	–	–	54.9
Hardness as $CaCO_3$	–	–	8.54	–	–	–	–	–	14.2
***Nutrients** (mg/L)*									
Phosphorous, Total	–	0.477	0.131	0.318	–	0.124	0.139	0.352	2.44
Orthophosphate	–	0.0721	0.0597 J	0.185	0.0497	–	0.0495	0.205	–
Nitrogen, Total Kjeldahl	–	2.8	0.99	1.9 J	–	0.94 J	0.38 J	–	1.3
Nitrate-Nitrite	–	0.612	0.268	0.519	–	0.239 J	0.236 J	0.736	0.231 J
***Metals** (ug/L)*									
Copper, Total	–	8.68	11.6	25.4	8.94	–	6.06	18	–
Copper, Dissolved	–	8.48	8.04	19.1	5.67 J	–	6.46	17.4	–
Lead, Total	–	0.29	3	5.77	3.73	–	0.11	0.45	–
Lead, Dissolved	–	0.27	0.278	0.291	1.4 J	–	0.16	0.46	–
Cadmium, Total	–	0.1 U	0.1 U	0.16	0.16	–	0.1 U	0.12	–
Cadmium, Dissolved	–	0.04	0.036	0.084	0.136	–	0.1 U	0.118	–
Zinc, Total	–	88.9	79.6	216	123	–	55.3	169	–
Zinc, Dissolved	–	84.2	58	177	103	–	56.7	162	–
***PAH Compounds** (ug/L)*									
Acenaphthene	–	0.0097 U	0.01 U	0.0097 R	0.011 U	0.01 U	–	0.01 U	0.01 U
Acenaphthylene	–	0.027 J	0.01 UJ	0.051 J	0.011 U	0.01 U	–	0.01 U	0.01 U
Anthracene	–	0.036	0.01 U	0.0097 R	0.011 U	0.01 U	–	0.017 J	0.016 J
Benz(a)anthracene	–	0.05	0.01 U	0.0097 R	0.017	0.01 U	–	0.016 U	0.021 UJ
Benzo(b)fluoranthene	–	0.18 J	0.014	0.0097 R	0.036	0.018	–	0.039	0.036
Benzo(k)fluoranthene	–	0.057 J	0.01 U	0.0097 R	0.013	0.014	–	0.02	0.022
Benzo(ghi)perylene	–	0.066 J	0.016	0.0097 R	0.045 J	0.019	–	0.032	0.044
Benzo(a)pyrene	–	0.066 J	0.01 U	0.0097 R	0.018	0.011	–	0.02	0.025
Chrysene	–	0.1	0.01 U	0.0097 R	0.032	0.019	–	0.067	0.073
Dibenzo(a,h)anthracene	–	0.0097 UJ	0.01 U	0.0097 R	0.011 U	0.01 U	–	0.013 J	0.015
Fluoranthene	–	0.17	0.018	0.016 J	0.044	0.01 U	–	0.039	0.039
Fluorene	–	0.068	0.01 U	0.0097 R	0.011 U	0.01 UJ	–	0.01 UJ	0.01 UJ
Indeno(1,2,3-cd)pyrene	–	0.043 J	0.01 U	0.0097 R	0.029 J	0.012	–	0.023	0.027
Naphthalene	–	0.036	0.01 U	0.0097 R	0.017 J	0.012 U	–	0.014 UJ	0.01 U
Phenanthrene	–	0.22	0.029	0.0095 J	0.064	0.022	–	0.054	0.055
Pyrene	–	0.2	0.022	0.01 J	0.078	0.025	–	0.063	0.073

Euclid Maintenance Facility

Analyte	3/27/2012	4/25/2012	6/7/2012	10/16/12	12/4/12	3/6/13	3/20/13	5/21/13	6/19/13
***Herbicides** (ug/L)*									
Dichlobenil	--	0.032 U	0.034 U	0.033 U	0.038 J	0.21	0.093	0.034 U	0.033 U
Diuron	--	0.049 UJ	16	0.3	0.049 UJ	0.051 UJ	0.05 U	0.052 UJ	0.049 U
2,4-D	--	3.5	0.53 J	2.1 J	0.58 J	0.16	0.11 J	1.1	15 J
Clopyralid	--	0.061 U	0.061 U	0.062 U	0.061 UJ	0.062 UJ	0.062 UJ	0.063 UJ	0.062 UJ
Picloram	--	0.061 U	0.33	0.062 U	0.061 UJ	0.062 UJ	0.062 UJ	0.063 U	0.062 UJ
Triclopyr	--	0.061 U	0.061 U	0.25 J	0.054 J	0.34	0.099 J	0.063 U	0.062 U
Glyphosate	--	25 U	25 U	25 U	25 U	25 U	25 U	25 U	12 J
***Petroleum Hydrocarbons** (mg/L)*									
TPH-Diesel (NWTPH-Dx)	0.88	24.49	--	--	--	--	--	--	--
Diesel	0.05 UJ	0.49 U	--	--	--	--	--	--	--
Lube Oil	0.83 J	24	--	--	--	--	--	--	--
TPH-Gas (NWTPH-Gx)	0.07 U	0.07 U	--	--	--	--	--	--	--
***Surfactants** (mg/L)*									
Methylene blue active substances (MBAS)	--	--	--	--	--	--	--	--	--

Notes:

-- Parameter not analyzed

U – Analyte not detected above reported result

J – Estimated value

UJ – Analyte not detected above reported result; value is an estimate

TPH-Diesel (NWTPH-Dx) values are calculated as the sum of the Diesel and Lube Oil concentrations.

Geiger Maintenance Facility

Analyte	3/14/2012	3/20/2012	3/26/2012	5/2/2012	6/24/2012	10/22/12	3/20/13	4/4/13	5/13/13	9/4/13
***Conventionals** (mg/L)*										
TSS	585	660	468	208	330	63	335	287	538	314
Chloride	--	--	1030	158	57.1	67.1	0.1 U	499	466	65.2
Hardness as $CaCO_3$	--	--	183	63.1	42.7	30.3	379	186	157	93.2
***Nutrients** (mg/L)*										
Phosphorous, Total	1.29	--	1.09	0.564	0.7	0.445	0.633	0.644	1.01	0.831
Orthophosphate	0.131	0.114	0.155 J	--	--	0.237	0.0472	--	0.109	0.236
Nitrogen, Total Kjeldahl	2.8	--	2.2 J	1.5	2.3	0.9 J	1.2	0.73 J	4.4 J	3.1 J
Nitrate-Nitrite	1.61	--	2.38	0.262	0.554	0.223	0.634	0.812	0.948	1.33
***Metals** (ug/L)*										
Copper, Total	79.2	79.3	49.8	31.3	--	16.7	34.1	--	25.1	46.3
Copper, Dissolved	11.5	14.8	16.4	--	--	8.77	19.7	--	24.6	22.7
Lead, Total	45.7	58	27.9	17.4	--	7.02	15.9	--	0.14 J	23.8
Lead, Dissolved	0.063	0.2 U	0.26	--	--	0.237	1.35	--	0.18	0.31
Cadmium, Total	0.6	0.55	0.39	0.31	--	0.15	0.49	--	0.12	0.56
Cadmium, Dissolved	0.058	0.2 U	0.092	--	--	0.089	<0.11 U	--	0.129	0.1 U
Zinc, Total	460	382	234	182	--	87.8	244	--	31.3 J	252
Zinc, Dissolved	11.6	24.9	23.3	--	--	27.7	50 U	--	30.9	33.5
***PAH Compounds** (ug/L)*										
Acenaphthene	0.01 U	0.011 U	0.01 U	0.0096 U	0.0099 U	0.011 U	0.01 UJ	0.01 UJ	0.01 U	0.011 U
Acenaphthylene	0.01 U	0.011 U	0.049	0.047 J	0.0099 U	0.011 U	0.01 UJ	0.01 UJ	0.01 U	0.011 U
Anthracene	0.01 U	0.011 U	0.01 U	0.0096 R	0.0099 U	0.011 U	0.01 UJ	0.01 UJ	0.01 U	0.011 U
Benz(a)anthracene	0.01 UJ	0.039 J	0.015	0.012 J	0.0099 U	0.014	0.01 UJ	0.01 UJ	0.026 UJ	0.011 U
Benzo(b)fluoranthene	0.21 J	0.18 J	0.07 J	0.044 J	0.032	0.048	0.02 J	0.017 J	0.071	0.059
Benzo(k)fluoranthene	0.01 UJ	0.036 J	0.01 UJ	0.011 J	0.0099 U	0.011 U	0.01 J	0.01 UJ	0.034	0.018
Benzo(ghi)perylene	0.2 J	0.086 J	0.037 J	0.025 J	0.034	0.042	0.027 J	0.014 J	0.052	0.019 U
Benzo(a)pyrene	0.063 J	0.051 J	0.023 J	0.016 J	0.0099 U	0.011 U	0.01 UJ	0.01 UJ	0.031 J	0.011 U
Chrysene	0.33 J	0.25	0.12	0.039	0.034	0.071	0.052 J	0.049 J	0.2	0.12
Dibenzo(a,h)anthracene	0.01 UJ	0.011 UJ	0.01 UJ	0.0096 UJ	0.0099 U	0.011 U	0.01 UJ	0.01 UJ	0.018	0.011 U
Fluoranthene	0.17	0.16	0.077	0.057	0.035	0.045	0.041 J	0.034 J	0.068	0.043
Fluorene	0.01 U	0.011 U	0.021	0.0096 U	0.0099 U	0.011 U	0.01 UJ	0.01 UJ	0.01 U	0.011 U
Indeno(1,2,3-cd)pyrene	0.11 J	0.047 J	0.016 J	0.011 J	0.014	0.011 U	0.009 J	0.01 UJ	0.028	0.011 U
Naphthalene	0.016	0.021	0.02	0.0096 U	0.0099 U	0.011 U	0.01 UJ	0.01 UJ	0.018 J	0.011 U
Phenanthrene	0.18	0.14	0.071	0.029	0.041	0.042	0.05 J	0.073 J	0.01 UJ	0.011 U
Pyrene	0.74	0.33	0.16	0.1	0.043	0.054	0.048 J	0.047 J	0.13	0.069

Geiger Maintenance Facility (continued)

Parameter	3/14/2012		3/20/2012		3/26/2012		5/3/2012		6/24/2012		10/22/12		3/20/13		4/4/13		5/13/13		9/5/13	
***Herbicides** (ug/L)*																				
Dichlobenil	0.013	J	0.16		0.084		0.75	J	0.033	U	0.033	U	0.18		0.035	UJ	0.036	UJ	0.035	U
Diuron	0.14	J	1.3		0.51		44	J	21	J	1.4		0.049	U	0.053	U	0.055	U	0.053	U
2,4-D	0.73		--		0.35	J	0.56		0.68		0.063	U	0.064	U	1.9		0.75	J	2.3	
Clopyralid	0.062	U	--		0.064	UJ	0.062	U	0.061	U	0.063	U	0.064	UJ	0.76	J	0.068	U	0.062	UJ
Picloram	1.3		--		1.1	J	0.91		9.2		7		0.064	UJ	0.063	U	0.068	U	0.062	UJ
Triclopyr	0.47		--		0.4	J	0.32		0.061	U	0.24		0.31	J	1.9		1.3		82	
Glyphosate	25	U	--		--		25	U	25	U	24	J	25	U	25	U	25	U	25	U
***Petroleum Hydrocarbons** (mg/L)*																				
TPH-Diesel (NWTPH-Dx)	--		--		2.45		--		--		--		--		3.75		--		--	
Diesel	--		--		0.05	UJ	--		--		--		--		0.15	U	--		--	
Lube Oil	--		--		2.4	J	--		--		--		--		3.6		--		--	
TPH-Gas (NWTPH-Gx)	--		--		0.07	U	--		--		--		--		0.07	U	--		--	
***Surfactants** (mg/L)*																				
Methylene blue active substances (MBAS)	0.085		--		--		--		--		--		--		--		--		2.13	

Notes:

-- Parameter not analyzed

U – Analyte not detected above reported result

J – Estimated value

UJ – Analyte not detected above reported result; value is an estimate

TPH-Diesel (NWTPH-Dx) values are calculated as the sum of the Diesel and Lube Oil concentrations.

Clarkston Maintenance Facility

Analyte	3/15/12	3/20/12	4/4/12	4/26/12	2/7/13	4/4/13	4/19/13	5/21/13	6/24/13	9/3/13
***Conventionals** (mg/L)*										
TSS	--	75	21	92	30	252	9	190	43	23
Chloride	17.9	11.2	4.28	17.7	71.9	21.3	2.24	11.8	8.02	5.42
Hardness as $CaCO_3$	--	13.5	9.29	21.7	--	55.6	39.6	18.7	22.3	121
***Nutrients** (mg/L)*										
Phosphorous, Total	--	0.239	0.107	0.35	--	0.762	0.143	0.527	0.179	0.28
Orthophosphate	--	0.0596 J	0.0363	--	--	--	--	--	0.0671	0.112
Nitrogen, Total Kjeldahl	--	1.2	0.99 J	2.5	--	4	2.3 J	2.1 J	1.3	2.3 J
Nitrate-Nitrite	--	0.326	0.328	0.427	--	1.38	0.281	0.863	0.554	0.811
***Metals** (ug/L)*										
Copper, Total	--	12.2	5.73	17.9	--	35.4 J	--	18.9	9.11	8.15
Copper, Dissolved	--	5.28	3.23	--	--	13.2	--	6.63	5.47	6.46
Lead, Total	--	8.86	3.48	12	--	27.8 J	--	14.5	6.37	2.25
Lead, Dissolved	--	0.211	0.26	--	--	0.84	--	0.36	2.08	0.28
Cadmium, Total	--	0.11	0.1 U	0.22	--	0.36	--	0.23	0.1 U	0.1 U
Cadmium, Dissolved	--	0.02	0.023	--	--	0.1 UJ	--	0.1 U	0.1 U	0.1 U
Zinc, Total	--	76.4	30.1	109	--	283	--	146	60.9	71.7
Zinc, Dissolved	--	17	17.9	--	--	81	--	51.6	40.3	53
***PAH Compounds** (ug/L)*										
Acenaphthene	--	0.01 U	0.0097 U	0.0098 U	0.011 R	0.01 U	0.01 U	--	0.01 U	0.011 U
Acenaphthylene	--	0.039	0.0097 U	0.0098 UJ	0.011 R	0.01 U	0.01 U	--	0.01 U	0.011 U
Anthracene	--	0.01 U	0.0097 U	0.0098 U	0.011 R	0.01 U	0.01 U	--	0.01 U	0.011 U
Benz(a)anthracene	--	0.01 UJ	0.0097 U	0.0098 U	0.011 R	0.01 U	0.01 U	--	0.01 U	0.011 U
Benzo(b)fluoranthene	--	0.04 J	0.017 J	0.074 J	0.028 R	0.07	0.01 U	--	0.013	0.011 U
Benzo(k)fluoranthene	--	0.01 UJ	0.0097 UJ	0.014 J	0.011 R	0.023	0.01 U	--	0.0044 J	0.011 U
Benzo(ghi)perylene	--	0.023 J	0.0097 UJ	0.04 J	0.014 R	0.047 J	0.01 U	--	0.01 U	0.011 U
Benzo(a)pyrene	--	0.01 UJ	0.0097 UJ	0.013 J	0.011 R	0.016 J	0.01 U	--	0.01 U	0.011 U
Chrysene	--	0.082	0.036	0.17	0.052 R	0.23	0.01 U	--	0.052	0.023
Dibenzo(a,h)anthracene	--	0.01 UJ	0.0097 UJ	0.0098 UJ	0.011 R	0.01 U	0.01 U	--	0.01 U	0.011 U
Fluoranthene	--	0.032	0.019	0.049	0.025 R	0.081	0.01 U	--	0.01 U	0.011 U
Fluorene	--	0.01 U	0.0097 U	0.0098 U	0.011 R	0.01 UJ	0.01 UJ	--	0.01 UJ	0.011 U
Indeno(1,2,3-cd)pyrene	--	0.01 UJ	0.0097 UJ	0.012 J	0.011 R	0.013 J	0.01 U	--	0.01 U	0.011 U
Naphthalene	--	0.01 U	0.012	0.0098 U	0.011 R	0.013 J	0.01 U	--	0.01 U	0.011 U
Phenanthrene	--	0.032	0.029	0.051	0.011 R	0.11	0.01 U	--	0.01 U	0.011 U
Pyrene	--	0.048	0.025	0.086	0.047 R	0.079	0.01 U	--	0.017 J	0.011 U

Clarkston Maintenance Facility (continued)

Analyte	3/15/12	3/20/12	4/4/12	4/26/12	2/7/13	4/4/13	4/19/13	5/21/13	6/24/13	9/3/13
***Herbicides** (ug/L)*										
Dichlobenil	--	0.066	0.032 U	0.032 U	--	0.035 UJ	0.031 U	0.034 R	0.014 U	0.038 U
Diuron	--	0.052 U	0.049 UJ	0.049 UJ	--	0.053 U	0.05 U	0.052 U	0.054 U	0.057 U
2,4-D	--	--	0.36 J	2.6	0.32 J	120	5.7	2.3 J	0.064 UJ	0.84
Clopyralid	--	--	0.061 U	0.062 U	0.069 UJ	0.063 UJ	0.063 UJ	0.065 UJ	0.064 UJ	0.063 UJ
Picloram	--	--	0.061 U	0.062 U	0.069 UJ	0.063 U	0.063 U	0.065 U	0.064 UJ	0.063 UJ
Triclopyr	--	--	0.061 U	0.062 U	0.069 UJ	0.063 U	0.063 U	0.065 U	0.064 U	0.063 U
Glyphosate	--	--	25 U	6.5 J	--	25 U	150	38	25 U	25 U
***Petroleum Hydrocarbons** (mg/L)*										
TPH-Diesel (NWTPH-Dx)	--	1.25	--	0.87	--	--	--	--	--	--
Diesel	--	0.15 U	--	0.05 U	--	--	--	--	--	--
Lube Oil	--	1.1	--	0.82	--	--	--	--	--	--
TPH-Gas (NWTPH-Gx)	--	0.05 U	--	0.07 U	--	--	--	--	--	--
***Surfactants** (mg/L)*										
Methylene blue active substances (MBAS)	--	0.166	--	0.489	--	--	--	--	0.959	1.11

Notes:

-- Parameter not analyzed

U – Analyte not detected above reported result

J – Estimated value

UJ – Analyte not detected above reported result; value is an estimate

TPH-Diesel (NWTPH-Dx) values are calculated as the sum of the Diesel and Lube Oil concentrations.

Bainbridge Island Ferry Terminal

Analyte	9/17/11	1/24/12	2/17/12	2/28/12	3/9/12	3/19/12	5/17/12	10/18/12	11/28/12	1/8/13	2/20/13	2/27/13	3/19/13	5/21/13
Conventionals *(mg/L)*														
TSS	76	106	281	53	44	41	23	19	31	48	26	46	31	614
Chloride	--	7980	32.7	26.9	301	680	30.7	6.5	155	23.4	48.2	11.3	15.1	13.9
Hardness as $CaCO_3$	--	349	15.8	11.5	72	97.5	29.6	16.2	61.6	11.5	31	9.85	15	57.3
Bacteria *(cfu/100mL)*														
Fecal coliform	--	47	--	--	--	--	--	--	--	280 J	--	--	--	--
Metals *(ug/L)*														
Copper, Total	--	27.7	19	19	--	16.8	--	17.5	16.6	19	24.5	26	21.9	171
Copper, Dissolved	--	8.41	--	--	--	6.81	--	15.8	7.08	6.5	18.7	11.2	--	8.08
Lead, Total	--	39.7	9	9	--	8.84	--	2.67	9.64	--	4.75	11.3	5.26	71.3
Lead, Dissolved	--	2.77	--	--	--	0.106	--	1.69	0.835	--	0.35	0.45	--	0.32
Cadmium, Total	--	3.19	0.1 U	0.1 U	--	0.5	--	0.1 UJ	0.19	--	0.1 U	0.1 U	<0.01 U	0.59
Cadmium, Dissolved	--	3.58	--	--	--	0.418	--	0.038 J	0.139	--	0.1 U	0.1 UJ	--	0.1 U
Zinc, Total	--	1160	129	129	--	555	--	54.4 J	292	116	92.3	170	106	804
Zinc, Dissolved	--	982	--	--	--	427	--	62.9 J	205	35.5 J	47.6 J	34.1 J	--	23.1 J
PAH Compounds *(ug/L)*														
Acenaphthene	0.011 U	0.0097 U	0.011	0.013	0.01 U	0.01 U	0.0098 U	0.01 U	0.0098 U	0.0098 U	0.0098 U	0.01 U	0.01 U	0.01 UJ
Acenaphthylene	0.011 U	0.0097 U	0.014 J	0.015 J	0.044 J	0.025	0.0098 UJ	0.01 U	0.047	0.0098 U	0.0098 U	0.01 U	0.01 U	0.01 UJ
Anthracene	0.031	0.019	0.043	0.0098 U	0.01 U	0.01 U	0.0098 UJ	0.01 U	0.0098 U	0.0098 U	0.0098 U	0.01 U	0.01 U	0.01 UJ
Benz(a)anthracene	0.18	0.089 J	0.26	0.2	0.028 J	0.033 J	0.012 J	0.041	0.023	0.034	0.019	0.042 J	0.027	0.12 J
Benzo(b)fluoranthene	0.89	0.53	1.6	0.32	0.21 J	0.21 J	0.11 J	0.14	0.091	0.15	0.085	0.21	0.09	0.44 J
Benzo(k)fluoranthene	0.23	0.16	0.43	0.084	0.052 J	0.053	0.028 J	0.037	0.032	0.042	0.024	0.051	0.058	0.3 J
Benzo(ghi)perylene	0.49	0.15	0.35	0.087	0.065 J	0.071	0.034 J	0.073	0.098 J	0.097	0.019	0.17	0.1	0.21 J
Benzo(a)pyrene	0.27	0.12 J	0.41	0.076 J	0.051 J	0.052 J	0.02 J	0.054 J	0.046	0.055	0.03	0.065	0.033	0.18 J
Chrysene	0.51	0.34	0.85	0.19	0.11	0.13	0.047	0.085	0.082	0.11	0.065	0.15	0.1	0.37 J
Dibenzo(a,h)anthracene	0.067	0.028 J	0.061	0.023	0.02 J	0.01 UJ	0.0098 UJ	0.016 J	0.0098 U	0.014	0.0098 U	0.01 U	0.014 U	0.056 J
Fluoranthene	0.43	0.34	0.78	0.19	0.13	0.13	0.091	0.11	0.096	0.11	0.07	0.19	0.11	0.27 J
Fluorene	0.011 U	0.015	0.021	0.032	0.01 U	0.01 U	0.0098 U	0.01 U	0.0098 U	0.0098 U	0.0098 U	0.01 U	0.01 U	0.01 UJ
Indeno(1,2,3-cd)pyrene	0.57	0.17 J	0.42	0.1	0.066 J	0.081 J	0.025 J	0.078	0.068 J	0.071	0.024	0.2	0.049	0.21 J
Naphthalene	0.011 U	0.02	0.026	0.025 J	0.015	0.013	0.0098 U	0.01 U	0.019	0.016	0.011 U	0.01 UJ	0.015 U	0.013 J
Phenanthrene	0.12	0.16	0.3	0.14	0.065	0.054	0.043	0.055	0.041	0.049	0.031	0.073	0.049	0.12 J
Pyrene	0.3	0.37	0.84	0.2	0.18	0.13	0.089	0.086	0.14	0.16	0.072	0.2	0.12	0.3 J

Bainbridge Island Ferry Terminal

Analyte	9/17/11	1/24/12	2/17/12	2/28/12	3/9/12	3/20/12	5/17/12	10/18/12	11/28/12	1/8/13	2/20/13	2/28/13	3/20/13	5/21/13
***Petroleum Hydrocarbons** (mg/L)*														
TPH-Diesel (NWTPH-Dx)	--	0.32	0.19	0.05 U	0.21	--	--	--	--	2.85	--	--	--	--
Diesel	--	0.05 U	0.05 U	0.05 U	0.05 UJ	--	--	--	--	0.15 U	--	--	--	--
Lube Oil	--	0.27 J	0.14	0.14	0.16 J	--	--	--	--	2.7	--	--	--	--
TPH-Gas (NWTPH-Gx)	--	0.14 U	0.07 U	0.07 U	0.07 U	--	--	--	--	0.07 U	--	--	--	--
***Surfactants** (mg/L)*														
Methylene blue active substances (MBAS)	--	0.025 U	0.095	0.095	--	0.065 J	--	0.192	0.049	0.077	0.148	0.101	0.103	0.26

Notes:

-- Parameter not analyzed

U – Analyte not detected above reported result

J – Estimated value

UJ – Analyte not detected above reported result; value is an estimate

TPH-Diesel (NWTPH-Dx) values are calculated as the sum of the Diesel and Lube Oil concentrations.

Appendix H:
Water Year 2012 and 2013
Analytical Data Summary Tables

Rest Areas

Smokey Point Rest Area Northbound					
Parameter	**Minimum**	**Maximum**	**Mean**	**Standard Dev.**	***n***
Conventional (mg/L)					
TSS	8	96	36	26	11
Chloride	6.97	1340	228.4	396.4	11
Hardness as CaCO3	20.8	756	159	227	10
Bacteria (cfu/100mL)					
Fecal coliform	32	4000	2016	2806	2
Nutrients (mg/L)					
Total Phosphorous	0.175	1.84	0.658	0.517	10
Orthophosphate	0.01	1.03	0.345	0.341	8
Total Kjeldahl Nitrogen	1	22	7.2	6.9	10
Nitrate-Nitrite	0.07	1.87	0.802	0.550	10
Metals (ug/L)					
Total Recoverable Copper	9.05	82.9	28.3	24.2	8
Dissolved Copper	3.21	65.1	19.7	20.2	8
Total Recoverable Lead	0.74	19.7	5.22	6.39	8
Dissolved Lead	0.151	1.39	0.556	0.446	8
Total Recoverable Cadmium	0.1	1	0.3	0.3	8
Dissolved Cadmium	0.039	1	0.29	0.33	8
Total Recoverable Zinc	45.9	2400	556.0	814.9	8
Dissolved Zinc	18.6	413	136	138	8
PAH Compounds (ug/L)					
Acenaphthene	0.0097	0.06	0.019	0.015	11
Acenaphthylene	0.0097	0.18	0.048	0.055	11
Anthracene	0.0097	0.011	0.010	0.00047	11
Benzo(a)anthracene	0.0091	0.04	0.015	0.0091	11
Benzo(b)fluoranthene	0.0099	0.08	0.028	0.021	11
Benzo(k)fluoranthene	0.0097	0.03	0.015	0.0072	11
Benzo(ghi)perylene	0.0097	0.085	0.032	0.026	11
Benzo(a)pyrene	0.0097	0.036	0.017	0.0086	11
Chrysene	0.0099	0.063	0.027	0.019	11
Dibenzo(a,h)anthracene	0.0097	0.011	0.010	0.00036	11
Fluoranthene	0.01	0.16	0.052	0.045	11
Fluorene	0.0097	0.14	0.037	0.041	11
Indeno(1,2,3-cd)pyrene	0.0085	0.027	0.014	0.0068	11
Naphthalene	0.0097	0.74	0.14	0.22	11
Phenanthrene	0.0099	0.13	0.057	0.043	11
Pyrene	0.013	0.42	0.12	0.11	11

Smokey Point Rest Area Northbound (cont.)					
Parameter	**Minimum**	**Maximum**	**Mean**	**Standard Dev.**	***n***
Phthalates (ug/L)					
bis(2-Ethylhexyl)phthalate	0.92	4.8	2.2	1.1	11
Butyl benzyl phthalate	0.19	0.74	0.31	0.16	11
Di-n-butyl phthalate	0.2	0.41	0.26	0.074	11
Diethyl phthalate	0.054	0.39	0.20	0.082	11
Dimethyl phthalate	0.058	0.22	0.18	0.048	11
Di-n-octyl phthalate	0.19	0.55	0.28	0.13	11
Dimethylphthalate-D6	0.197	0.339	0.258	0.0610	4
Herbicides (ug/L)					
Dichlobenil	0.027	0.059	0.036	0.0083	11
Diuron	0.049	0.054	0.051	0.0017	11
2,4-D	0.061	0.2	0.083	0.042	11
Clopyralid	0.061	0.064	0.062	0.00087	11
Picloram	0.061	0.064	0.062	0.00087	11
Triclopyr	0.061	0.18	0.080	0.036	11
Glyphosate	25	25	25	0	10
TPH (mg/L)					
TPH-Diesel (NWTPH-Dx)	0.17	5.49	2.83	3.76	2
Diesel	0.05	0.79	0.42	0.52	2
Lube Oil	0.12	4.7	2.4	3.2	2
TPH-Gas (NWTPH-Gx)	0.07	0.07	0.07	0	2

Smokey Point Rest Area Southbound					
Parameter	**Minimum**	**Maximum**	**Mean**	**Standard Dev.**	***n***
Conventionals (mg/L)					
TSS	6	70	25	18	11
Chloride	2.25	315	42.2	91.1	11
Hardness as CaCO3	23.3	255	67.9	69.0	10
Bacteria (cfu/100mL)					
Fecal coliform	2200	3300	2750	777.8	3
Nutrients (mg/L)					
Total Phosphorous	0.0671	0.472	0.187	0.129	10
Orthophosphate	0.0106	0.172	0.0429	0.0584	7
Total Kjeldahl Nitrogen	0.74	2.6	1.7	0.75	9
Nitrate-Nitrite	0.178	0.479	0.267	0.0936	10
Metals (ug/L)					
Total Recoverable Copper	2.77	36.9	12.8	11.6	7
Dissolved Copper	1.3	10.7	5.37	3.64	7
Total Recoverable Lead	0.28	2.6	1.2	0.87	7
Dissolved Lead	0.061	2.74	0.633	0.987	7
Total Recoverable Cadmium	0.1	0.83	0.23	0.27	7
Dissolved Cadmium	0.02	0.41	0.10	0.14	7
Total Recoverable Zinc	13.9	254	82.7	81.1	7
Dissolved Zinc	12.1	81.8	38.5	25.6	7
PAH Compounds (ug/L)					
Acenaphthene	0.0097	0.010	0.0099	0.00013	11
Acenaphthylene	0.0098	0.090	0.035	0.035	11
Anthracene	0.0097	0.010	0.0099	0.00013	11
Benzo(a)anthracene	0.0097	0.023	0.012	0.004	11
Benzo(b)fluoranthene	0.0097	0.042	0.017	0.011	11
Benzo(k)fluoranthene	0.0029	0.015	0.0095	0.0034	11
Benzo(ghi)perylene	0.0097	0.055	0.024	0.016	11
Benzo(a)pyrene	0.0097	0.026	0.013	0.005	11
Chrysene	0.0097	0.043	0.018	0.012	11
Dibenzo(a,h)anthracene	0.0071	0.010	0.0097	0.00086	11
Fluoranthene	0.0071	0.069	0.029	0.020	11
Fluorene	0.0097	0.010	0.0099	0.00013	11
Indeno(1,2,3-cd)pyrene	0.0096	0.022	0.012	0.0039	11
Naphthalene	0.0043	0.024	0.011	0.0058	11
Phenanthrene	0.0094	0.049	0.018	0.012	11
Pyrene	0.0098	0.18	0.055	0.050	11

Smokey Point Rest Area Southbound (cont.)					
Parameter	**Minimum**	**Maximum**	**Mean**	**Standard Dev.**	***n***
Phthalates (ug/L)					
bis(2-Ethylhexyl)phthalate	0.2	2	1	0.7	11
Butyl benzyl phthalate	0.17	0.59	0.23	0.12	11
Di-n-butyl phthalate	0.19	0.44	0.26	0.08	11
Diethyl phthalate	0.19	0.74	0.25	0.16	11
Dimethyl phthalate	0.11	0.21	0.19	0.027	11
Di-n-octyl phthalate	0.19	0.55	0.24	0.11	11
Dimethylphthalate-D6	0.32	0.398	0.352	0.0358	11
Herbicides (ug/L)					
Dichlobenil	0.012	0.034	0.031	0.0064	11
Diuron	0.049	0.052	0.050	0.00081	11
2,4-D	0.06	0.097	0.065	0.011	11
Clopyralid	0.061	0.069	0.063	0.0024	11
Picloram	0.061	0.069	0.063	0.0024	11
Triclopyr	0.061	0.069	0.063	0.0024	11
Glyphosate	25	25	25	0	11
TPH (mg/L)					
TPH-Diesel (NWTPH-Dx)	0.17	0.27	0.22	0.071	2
Diesel	0.05	0.05	0.05	0.000	2
Lube Oil	0.12	0.22	0.17	0.071	2
TPH-Gas (NWTPH-Gx)	0.07	0.07	0.07	0	2

Maintenance Facilities

Ballinger, Northwest Region					
Parameter	**Minimum**	**Maximum**	**Mean**	**Standard Dev.**	***n***
Conventionals (mg/L)					
TSS	37	2990	571.8	3349	15
Chloride	591	12500	4467.1	3709.0	10
Hardness as CaCO3	43.6	2130	476.1	674.1	9
Nutrients (mg/L)					
Total Phosphorous	0.136	4.84	0.917	0.957	13
Orthophosphate	0.0109	0.0726	0.0335	5.487	12
Total Kjeldahl Nitrogen	0.326	27	5.32	5.31	12
Nitrate-Nitrite	0.257	0.988	0.509	0.215	13
Metals (ug/L)					
Total Recoverable Copper	16.1	65.9	35.9	19.0	12
Dissolved Copper	5.64	49.1	15.2	21.3	12
Total Recoverable Lead	4.65	96.3	31.4	22.7	12
Dissolved Lead	0.165	10	1.96	1.97	12
Total Recoverable Cadmium	0.18	1.14	0.628	0.380	12
Dissolved Cadmium	0.084	1.1	0.42	0.35	12
Total Recoverable Zinc	65.7	1670	370.4	361.7	12
Dissolved Zinc	20.4	907	175	248	12
PAH Compounds (ug/L)					
Acenaphthene	0.0097	0.49	0.075	0.098	14
Acenaphthylene	0.0097	0.21	0.052	0.19	14
Anthracene	0.0096	1	0.16	0.54	14
Benzo(a)anthracene	0.015	2.5	0.44	0.99	14
Benzo(b)fluoranthene	0.026	4.4	0.82	0.92	14
Benzo(k)fluoranthene	0.02	1.3	0.29	0.35	14
Benzo(ghi)perylene	0.031	1.1	0.24	0.54	14
Benzo(a)pyrene	0.022	2.4	0.48	0.82	14
Chrysene	0.046	3	0.64	0.69	14
Dibenzo(a,h)anthracene	0.0098	0.21	0.047	1.4	14
Fluoranthene	0.048	6.4	1.2	1.4	14
Fluorene	0.0097	0.72	0.12	0.38	14
Indeno(1,2,3-cd)pyrene	0.01	1.6	0.32	0.36	14
Naphthalene	0.011	0.11	0.043	1.0	14
Phenanthrene	0.028	5.2	0.90	1.6	14
Pyrene	0.055	6.2	1.3	1.8	14
Phthalates (ug/L)					
bis(2-Ethylhexyl)phthalate	11	11	11	N/A	1

Ballinger, Northwest Region (cont.)					
Parameter	**Minimum**	**Maximum**	**Mean**	**Standard Dev.**	***n***
Phthalates (ug/L)					
Butyl benzyl phthalate	0.2	0.2	0.2	N/A	1
Di-n-butyl phthalate	0.66	0.66	0.66	N/A	1
Diethyl phthalate	0.19	0.19	0.19	N/A	1
Dimethyl phthalate	0.2	0.2	0.2	N/A	1
Di-n-octyl phthalate	5.5	5.5	5.5	N/A	1
Dimethylphthalate-D6	0.341	0.341	0.341	N/A	1
Herbicides (ug/L)					
Dichlobenil	0.028	0.61	0.24	0.14	5
Diuron	0.028	0.1	0.053	0.016	13
2,4-D	0.049	0.076	0.057	0.10	14
Clopyralid	0.061	0.5	0.15	0.10	14
Picloram	0.061	0.076	0.064	0.10	14
Triclopyr	0.061	0.61	0.14	0.15	14
Glyphosate	0.061	25	12	13	13
TPH (mg/L)					
TPH-Diesel (NWTPH-Dx)	0.3	3.25	1.38	1.080	4
Diesel	0.05	0.15	0.12	1.0	4
Lube Oil	0.15	3.1	1.2	1.0	4
TPH-Gas (NWTPH-Gx)	0.07	1.2	0.51	0.52	4
Surfactants (mg/L)					
Methylene blue active substances	0.036	0.466	0.222	11.6	3

Lakeview, Olympic Region					
Parameter	Minimum	Maximum	Mean	Standard Dev.	*n*
Conventional (mg/L)					
TSS	10	113	45.1	128	15
Chloride	1.89	618	152	160	10
Hardness as CaCO3	3.75	388	108	127	10
Nutrients (mg/L)					
Total Phosphorous	0.0403	0.222	0.126	0.0737	12
Orthophosphate	0.01	0.0568	0.0190	2.38	13
Total Kjeldahl Nitrogen	0.62	11	2.9	2.3	11
Nitrate-Nitrite	0.159	2.44	0.848	0.709	12
Metals (ug/L)					
Total Recoverable Copper	9.77	57.8	25.5	13.7	13
Dissolved Copper	5.65	46.1	16.5	9.40	13
Total Recoverable Lead	1.5	22.2	8.51	6.12	13
Dissolved Lead	0.144	1.23	0.573	0.622	13
Total Recoverable Cadmium	0.16	3.19	0.775	0.771	13
Dissolved Cadmium	0.128	2.89	0.644	444	13
Total Recoverable Zinc	275	1830	679.1	426.6	13
Dissolved Zinc	220	1660	591.5	417.7	13
PAH Compounds (ug/L)					
Acenaphthene	0.0097	0.011	0.010	0.042	14
Acenaphthylene	0.0098	0.16	0.052	0.042	15
Anthracene	0.0097	0.028	0.012	0.008	14
Benzo(a)anthracene	0.0097	0.04	0.016	0.024	14
Benzo(b)fluoranthene	0.0071	0.1	0.034	0.024	15
Benzo(k)fluoranthene	0.0097	0.046	0.019	0.024	14
Benzo(ghi)perylene	0.0093	0.092	0.036	0.025	15
Benzo(a)pyrene	0.0083	0.054	0.020	0.024	15
Chrysene	0.0098	0.1	0.033	0.023	15
Dibenzo(a,h)anthracene	0.0097	0.016	0.011	0.036	14
Fluoranthene	0.013	0.15	0.051	0.036	15
Fluorene	0.0098	0.02	0.011	0.012	15
Indeno(1,2,3-cd)pyrene	0.0083	0.055	0.021	0.014	15
Naphthalene	0.0088	0.058	0.021	0.023	14
Phenanthrene	0.01	0.094	0.036	0.054	15
Pyrene	0.012	0.27	0.067	0.070	15
Herbicides (ug/L)					
Dichlobenil	0.023	0.12	0.058	0.020	14
Diuron	0.049	0.056	0.051	0.090	14

Lakeview, Olympic Region (cont.)					
Parameter	**Minimum**	**Maximum**	**Mean**	**Standard Dev.**	***n***
Herbicides (ug/L)					
2,4-D	0.061	0.43	0.15	0.086	14
Clopyralid	0.061	0.077	0.066	0.0048	14
Picloram	0.061	0.077	0.066	6.2	14
Triclopyr	0.38	31	6.1	31	14
Glyphosate	25	160	44.3	39.0	12
TPH (mg/L)					
TPH-Diesel (NWTPH-Dx)	0.5	7.35	2.93	2.50	4
Diesel	0.05	0.14	0.080	2.5	4
Lube Oil	0.36	7.3	2.9	2.5	4
TPH-Gas (NWTPH-Gx)	0.07	0.07	0.07	N/A	4
Surfactants (mg/L)					
Methylene blue active substances	0.058	1.84	0.611125	0.685999636	6

Vancouver, Southwest Region					
Parameter	**Minimum**	**Maximum**	**Mean**	**Standard Dev.**	***n***
Conventionals (mg/L)					
TSS	1	78	16	21	12
Chloride	13.5	1510	282.508	440.363	11
Hardness as CaCO3	21.3	2080	370.2	580.6	12
Nutrients (mg/L)					
Total Phosphorous	0.0251	0.812	0.178	0.221	12
Orthophosphate	0.01	0.03	0.02	0.009	7
Total Kjeldahl Nitrogen	0.63	35	6.0	9.8	12
Nitrate-Nitrite	0.258	0.752	0.439	0.134	12
Metals (ug/L)					
Total Recoverable Copper	2.27	12.9	4.85	3.57	8
Dissolved Copper	1.1	4.22	2.45	0.961	8
Total Recoverable Lead	0.78	17.6	6.79	5.39	7
Dissolved Lead	0.26	1.62	0.981	0.463	8
Total Recoverable Cadmium	0.14	1.49	0.511	0.452	8
Dissolved Cadmium	0.035	0.574	0.245	0.160	8
Total Recoverable Zinc	171	587	306	144	8
Dissolved Zinc	169	415	258	76.7	8
PAH Compounds (ug/L)					
Acenaphthene	0.0097	0.011	0.010	0.00044	11
Acenaphthylene	0.0097	0.086	0.021	0.022	11
Anthracene	0.0097	0.011	0.010	0.00044	11
Benzo(a)anthracene	0.0097	0.011	0.010	0.00044	11
Benzo(b)fluoranthene	0.008	0.014	0.011	0.0018	11
Benzo(k)fluoranthene	0.0097	0.011	0.010	0.00044	11
Benzo(ghi)perylene	0.0084	0.017	0.011	0.0027	11
Benzo(a)pyrene	0.0097	0.013	0.010	0.00092	11
Chrysene	0.0071	0.025	0.013	0.0057	11
Dibenzo(a,h)anthracene	0.0097	0.011	0.010	0.00044	11
Fluoranthene	0.0097	0.026	0.012	0.0046	11
Fluorene	0.0097	0.011	0.010	0.0004	11
Indeno(1,2,3-cd)pyrene	0.0083	0.011	0.0098	0.00062	11
Naphthalene	0.0045	0.011	0.0094	0.0017	11
Phenanthrene	0.0097	0.011	0.010	0.00044	11
Pyrene	0.0074	0.031	0.013	0.0063	11
Herbicides (ug/L)					
Dichlobenil	0.027	0.072	0.041	0.014	12
Diuron	0.033	0.82	0.18	0.23	12

Vancouver, Southwest Region (cont.)					
Parameter	**Minimum**	**Maximum**	**Mean**	**Standard Dev.**	***n***
2,4-D	0.028	1.5	0.29	0.41	12
Clopyralid	0.061	0.065	0.063	0.0014	12
Picloram	0.061	0.065	0.063	0.0014	12
Triclopyr	0.036	49	8.6	14	12
Glyphosate	14	34	25	4.5	12
TPH (mg/L)					
TPH-Diesel (NWTPH-Dx)	0.18	0.5	0.32	0.14	5
Diesel	0.05	0.14	0.076	0.040	5
Lube Oil	0.13	0.36	0.25	0.11	5
TPH-Gas (NWTPH-Gx)	0.07	0.11	0.081	0.018	5
Surfactants (mg/L)					
Methylene blue active substances	0.049	0.449	0.153	0.161	6

Euclid, North Central Region					
Parameter	**Minimum**	**Maximum**	**Mean**	**Standard Dev.**	***n***
Conventional (mg/L)					
TSS	13	308	91.6	96.3	8
Chloride	7.48	54.9	31.2	33.5	2
Hardness as CaCO3	8.54	14.2	11.4	4.00	2
Nutrients (mg/L)					
Total Phosphorous	0.124	2.44	0.727	0.836	7
Orthophosphate	0.0495	0.205	0.109	0.0716	6
Total Kjeldahl Nitrogen	0.38	2.8	1.4	0.85	6
Nitrate-Nitrite	0.231	0.736	0.423	0.212	7
Metals (ug/L)					
Total Recoverable Copper	6.06	25.4	13.8	7.27	6
Dissolved Copper	5.67	19.1	11.2	5.84	6
Total Recoverable Lead	0.11	5.77	2.40	2.32	6
Dissolved Lead	0.16	1.4	0.55	0.46	6
Total Recoverable Cadmium	0.1	0.16	0.13	0.029	6
Dissolved Cadmium	0.036	0.136	0.0858	0.0408	6
Total Recoverable Zinc	55.3	216	125	60.6	6
Dissolved Zinc	56.7	177	109	51.8	6
PAH Compounds (ug/L)					
Acenaphthene	0.0097	0.011	0.010	0.00045	6
Acenaphthylene	0.01	0.051	0.021	0.016	7
Anthracene	0.01	0.036	0.018	0.0100	6
Benzo(a)anthracene	0.01	0.05	0.02	0.015	6
Benzo(b)fluoranthene	0.014	0.18	0.065	0.063	6
Benzo(k)fluoranthene	0.01	0.057	0.025	0.017	6
Benzo(ghi)perylene	0.016	0.066	0.038	0.019	6
Benzo(a)pyrene	0.01	0.066	0.028	0.021	6
Chrysene	0.01	0.1	0.1	0.035	6
Dibenzo(a,h)anthracene	0.0097	0.015	0.012	0.0021	6
Fluoranthene	0.01	0.17	0.057	0.055	7
Fluorene	0.01	0.068	0.025	0.024	6
Indeno(1,2,3-cd)pyrene	0.01	0.043	0.025	0.012	6
Naphthalene	0.01	0.036	0.018	0.0099	6
Phenanthrene	0.0095	0.22	0.076	0.071	7
Pyrene	0.01	0.2	0.08	0.064	7
Herbicides (ug/L)					
Dichlobenil	0.032	0.21	0.075	0.063	8
Diuron	0.049	16	3.3	5.6	8

Euclid, North Central Region (cont.)					
Parameter	**Minimum**	**Maximum**	**Mean**	**Standard Dev.**	***n***
Herbicides (ug/L)					
2,4-D	0.11	15	3.8	5.0	8
Clopyralid	0.061	0.063	0.062	0.00071	8
Picloram	0.061	0.33	0.12	0.095	8
Triclopyr	0.054	0.34	0.14	0.11	8
Glyphosate	12	25	22	4.6	8
TPH					
TPH-Diesel (NWTPH-Dx)	0.88	24	13	17	2
Diesel	0.05	0.49	0.27	0.31	2
Lube Oil	0.83	24	12	16	2
TPH-Gas (NWTPH-Gx)	0.07	0.07	0.07	N/A	2

Geiger, Eastern Region					
Parameter	**Minimum**	**Maximum**	**Mean**	**Standard Dev.**	***n***
Conventional (mg/L)					
TSS	63	660	376	183	10
Chloride	0.1	1030	337.3	354.2	8
Hardness as CaCO3	30.3	379	154	114	8
Nutrients (mg/L)					
Total Phosphorous	0.445	1.29	0.813	0.277	9
Orthophosphate	0.0472	0.237	0.146	0.0693	7
Total Kjeldahl Nitrogen	0.73	4.4	2.2	1.2	9
Nitrate-Nitrite	0.223	2.38	1.03	0.698	9
Metals (ug/L)					
Total Recoverable Copper	16.7	79.3	45.8	23.5	8
Dissolved Copper	8.77	24.6	16.9	5.78	7
Total Recoverable Lead	0.14	58	25	19	8
Dissolved Lead	0.063	1.35	0.446	0.438	7
Total Recoverable Cadmium	0.12	0.6	0.39	0.19	8
Dissolved Cadmium	0.058	0.2	0.12	0.049	7
Total Recoverable Zinc	31.3	460	236	141	8
Dissolved Zinc	11.6	50	29.28	11.68	7
PAH Compounds (ug/L)					
Acenaphthene	0.0096	0.011	0.010	0.00053	10
Acenaphthylene	0.0099	0.049	0.020	0.016	10
Anthracene	0.0099	0.011	0.010	0.00051	9
Benzo(a)anthracene	0.0099	0.039	0.017	0.0095	10
Benzo(b)fluoranthene	0.017	0.21	0.082	0.066	10
Benzo(k)fluoranthene	0.0099	0.036	0.017	0.010	10
Benzo(ghi)perylene	0.014	0.2	0.063	0.055	10
Benzo(a)pyrene	0.0099	0.063	0.026	0.019	10
Chrysene	0.034	0.33	0.14	0.10	10
Dibenzo(a,h)anthracene	0.0096	0.018	0.012	0.0025	10
Fluoranthene	0.034	0.17	0.078	0.050	10
Fluorene	0.0096	0.021	0.012	0.0034	10
Indeno(1,2,3-cd)pyrene	0.009	0.11	0.032	0.032	10
Naphthalene	0.0096	0.021	0.014	0.0046	10
Phenanthrene	0.01	0.18	0.070	0.055	10
Pyrene	0.043	0.74	0.21	0.22	10
Herbicides (ug/L)					
Dichlobenil	0.013	0.75	0.18	0.22	10
Diuron	0.049	44	9.4	15	10

Geiger, Eastern Region (cont.)					
Parameter	**Minimum**	**Maximum**	**Mean**	**Standard Dev.**	***n***
Herbicides (ug/L)					
2,4-D	0.063	2.3	0.89	0.78	9
Clopyralid	0.061	0.76	0.19	0.23	9
Picloram	0.062	9.2	2.6	3.4	9
Triclopyr	0.061	82	15	27	9
Glyphosate	24	25	24.8	0.35	8
TPH (mg/L)					
TPH-Diesel (NWTPH-Dx)	2.45	3.75	3.10	0.919	2
Diesel	0.05	0.15	0.10	0.071	2
Lube Oil	2.4	3.6	3.0	0.85	2
TPH-Gas (NWTPH-Gx)	0.07	0.07	0.07	N/A	2
Surfactants (mg/L)					
Methylene blue active substances	0.085	2.13	1.11	1.45	2

Clarkston, South Central Region					
Parameter	**Minimum**	**Maximum**	**Mean**	**Standard Dev.**	***n***
Conventional (mg/L)					
TSS	9	252	90.5	84.8	9
Chloride	2.24	71.9	20.5	20.2	10
Hardness as CaCO3	9.29	121	43.2	36.9	8
Nutrients (mg/L)					
Total Phosphorous	0.107	0.762	0.346	0.222	8
Orthophosphate	0.0363	0.112	0.0706	0.0317	4
Total Kjeldahl Nitrogen	0.99	4	2.2	0.97	8
Nitrate-Nitrite	0.281	1.38	0.6631	0.3782	8
Metals (ug/L)					
Total Recoverable Copper	5.73	35.4	16.5	10.1	7
Dissolved Copper	3.23	13.2	7.09	3.40	6
Total Recoverable Lead	2.25	27.8	11.7	8.70	7
Dissolved Lead	0.211	2.08	0.790	0.727	7
Total Recoverable Cadmium	0.1	0.36	0.19	0.10	7
Dissolved Cadmium	0.02	0.1	0.07	0.04	6
Total Recoverable Zinc	30.1	283	121	84.3	7
Dissolved Zinc	17	81	45	24	6
PAH Compounds (ug/L)					
Acenaphthene	0.0097	0.011	0.010	0.000427061	7
Acenaphthylene	0.0097	0.039	0.016	0.011	7
Anthracene	0.0097	0.011	0.010	0.00043	7
Benzo(a)anthracene	0.0097	0.011	0.010	0.00043	7
Benzo(b)fluoranthene	0.01	0.074	0.035	0.028	7
Benzo(k)fluoranthene	0.0044	0.023	0.012	0.0057	7
Benzo(ghi)perylene	0.0097	0.047	0.023	0.016	7
Benzo(a)pyrene	0.0097	0.016	0.012	0.0023	7
Chrysene	0.01	0.23	0.094	0.083	7
Dibenzo(a,h)anthracene	0.0097	0.011	0.010	0.00043	7
Fluoranthene	0.01	0.081	0.034	0.027	7
Fluorene	0.0097	0.011	0.010	0.00043	7
Indeno(1,2,3-cd)pyrene	0.0097	0.013	0.011	0.0013	7
Naphthalene	0.0098	0.013	0.011	0.0012	7
Phenanthrene	0.01	0.11	0.041	0.036	7
Pyrene	0.01	0.086	0.041	0.032	7
Herbicides (ug/L)					
Dichlobenil	0.014	0.066	0.036	0.016	7
Diuron	0.049	0.057	0.052	0.0027	8

Clarkston, South Central Region (cont.)					
Parameter	**Minimum**	**Maximum**	**Mean**	**Standard Dev.**	***n***
Herbicides (ug/L)					
2,4-D	0.064	120	25.2	41.9	8
Clopyralid	0.061	0.069	0.064	0.0024	8
Picloram	0.061	0.069	0.064	0.0024	8
Triclopyr	0.061	0.069	0.064	0.0024	8
Glyphosate	6.5	150	50.1	48.5	7
TPH (mg/L)					
TPH-Diesel (NWTPH-Dx)	0.87	1.25	1.06	0.269	2
Diesel	0.05	0.15	0.10	0.071	2
Lube Oil	0.82	1.1	0.96	0.20	2
TPH-Gas (NWTPH-Gx)	0.05	0.07	0.06	0.01	2
Surfactants (mg/L)					
Methylene blue active substances	0.166	1.11	0.667	0.433	4

Ferry Terminal

Bainbridge Island Ferry Terminal					
Parameter	**Minimum**	**Maximum**	**Mean**	**Standard Dev.**	***n***
Conventional (mg/L)					
TSS	3	614	121	158	15
Chloride	1.29	7980	1082	2113	14
Hardness as CaCO3	0.38	349	70.5	89.1	14
Bacteria (cfu/100mL)					
Fecal coliform	1	280	122	150	2
Metals (ug/L)					
Total Recoverable Copper	16.6	171	43.6	45.4	11
Dissolved Copper	0.13	18.7	9.23	5.47	9
Total Recoverable Lead	2.67	71.3	20.5	21.7	10
Dissolved Lead	0.02	2.77	0.933	0.950	8
Total Recoverable Cadmium	0.1	3.19	0.816	1.06	9
Dissolved Cadmium	0.02	3.58	0.895	1.30	7
Total Recoverable Zinc	54.4	1160	370.8	360.7	11
Dissolved Zinc	8.2	982	256	322	9
PAH Compounds (ug/L)					
Acenaphthene	0.0097	0.013	0.010	0.00086	15
Acenaphthylene	0.0097	0.047	0.018	0.013	15
Anthracene	0.0098	0.043	0.016	0.0098	15
Benzo(a)anthracene	0.0099	0.26	0.082	0.079	15
Benzo(b)fluoranthene	0.0099	1.6	0.39	0.42	15
Benzo(k)fluoranthene	0.0099	0.43	0.12	0.12	15
Benzo(ghi)perylene	0.0099	0.49	0.15	0.13	15
Benzo(a)pyrene	0.0099	0.41	0.11	0.11	15
Chrysene	0.0099	0.85	0.24	0.22	15
Dibenzo(a,h)anthracene	0.0098	0.067	0.026	0.020	15
Fluoranthene	0.0099	0.78	0.23	0.19	15
Fluorene	0.0098	0.032	0.014	0.0062	15
Indeno(1,2,3-cd)pyrene	0.0099	0.57	0.16	0.16	15
Naphthalene	0.0082	0.026	0.015	0.0055	15
Phenanthrene	0.0099	0.3	0.10	0.07	15
Pyrene	0.0099	0.84	0.24	0.20	15
TPH (mg/L)					
TPH-Diesel (NWTPH-Dx)	0.05	2.85	0.879	1.070	6
Diesel	0.05	0.15	0.088	0.052	6
Lube Oil	0.14	2.7	0.826	1.0	6
TPH-Gas (NWTPH-Gx)	0.05	0.14	0.083	0.031	6
Surfactants (mg/L)					
Methylene blue active substances	0.025	0.26	0.11	0.067	12