Seattle Public Utilities

Protecting Seattle's Waterways

CSO Program: 2014 Annual Report

March 27, 2015

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List of Abbreviations

Term	Definition
AG	Washington State Office of the Attorney General
CMMS	Computerized Maintenance Management System
CMOM	Capacity, Management, Operations, and Maintenance
CSO	Combined Sewer Overflow
DOJ	U.S. Department of Justice
DNRP	King County Department of Natural Resources and Parks
DWO	Dry Weather Overflow
Ecology	Washington State Department of Ecology
EPA	U.S. Environmental Protection Agency
FSE	Food Service Establishment
GC/CM	General Contractor/Construction Manager
GSI	Green Stormwater Infrastructure (see also NDS, LID)
LID	Low Impact Development (see also NDS, GSI)
LTCP	Long-Term Control Plan
MG	million gallons
MGD	million gallons per day
MODA	Multi Objective Decision Analysis
NDS	Natural Drainage Systems (see also GSI, LID)
NPDES	National Pollutant Discharge Elimination System
PACP	Pipeline Assessment and Certification Program
PMP	Project Management Plan
RCM	Reliability Centered Maintenance
SCADA	Supervisory Control and Data Acquisition
SOP	Standard Operating Procedure
SPU	Seattle Public Utilities
SSO	Sewer Overflow

SECTION 1

Introduction

This annual report was prepared to meet state and federal regulatory requirements and to share information with the public on Seattle Public Utilities' (SPU's) Combined Sewer Program, including work conducted as part of SPU's CSO Reduction Program and SPU's Capacity, Management, Operations and Maintenance (CMOM) Program. The report is organized as follows:

- Section 1: Introduction
- Section 2: Planning Activities
- Section 3: Operation and Maintenance Activities
- Section 4: Capital Activities
- Section 5: Monitoring Programs and Monitoring Results

Additional information about the program may be found at www.seattle.gov/cso.

1.1 The City of Seattle Wastewater Collection System

The City of Seattle's (City's) wastewater collection system is one of the largest in Washington State and includes separate, partially separated, and combined systems, as shown in Figure 1-1. In the areas of the City where there are separate systems, stormwater runoff flows to a storm drainage system, while sewage is conveyed through sewers to regional wastewater treatment facilities owned and operated by King County. In the partially separated areas of the City, storm drain separation projects were built during the 1960s and 1970s to divert street runoff to the storm drainage system while allowing rooftop and other private property drainage to flow into the sewers. In the combined areas of the City, sewage and stormwater runoff are conveyed in combined sewers to the King County wastewater treatment facilities.

During storm events, the quantity of stormwater runoff flowing into the collection system sometimes exceeds the capacity of the partially separated and combined sewer systems. When this happens, the collection system overflows at outfall structures designed for this purpose. There are currently 86 outfalls in the City of Seattle where combined sewer overflows (CSOs) can occur, as shown in Figure 1-1.

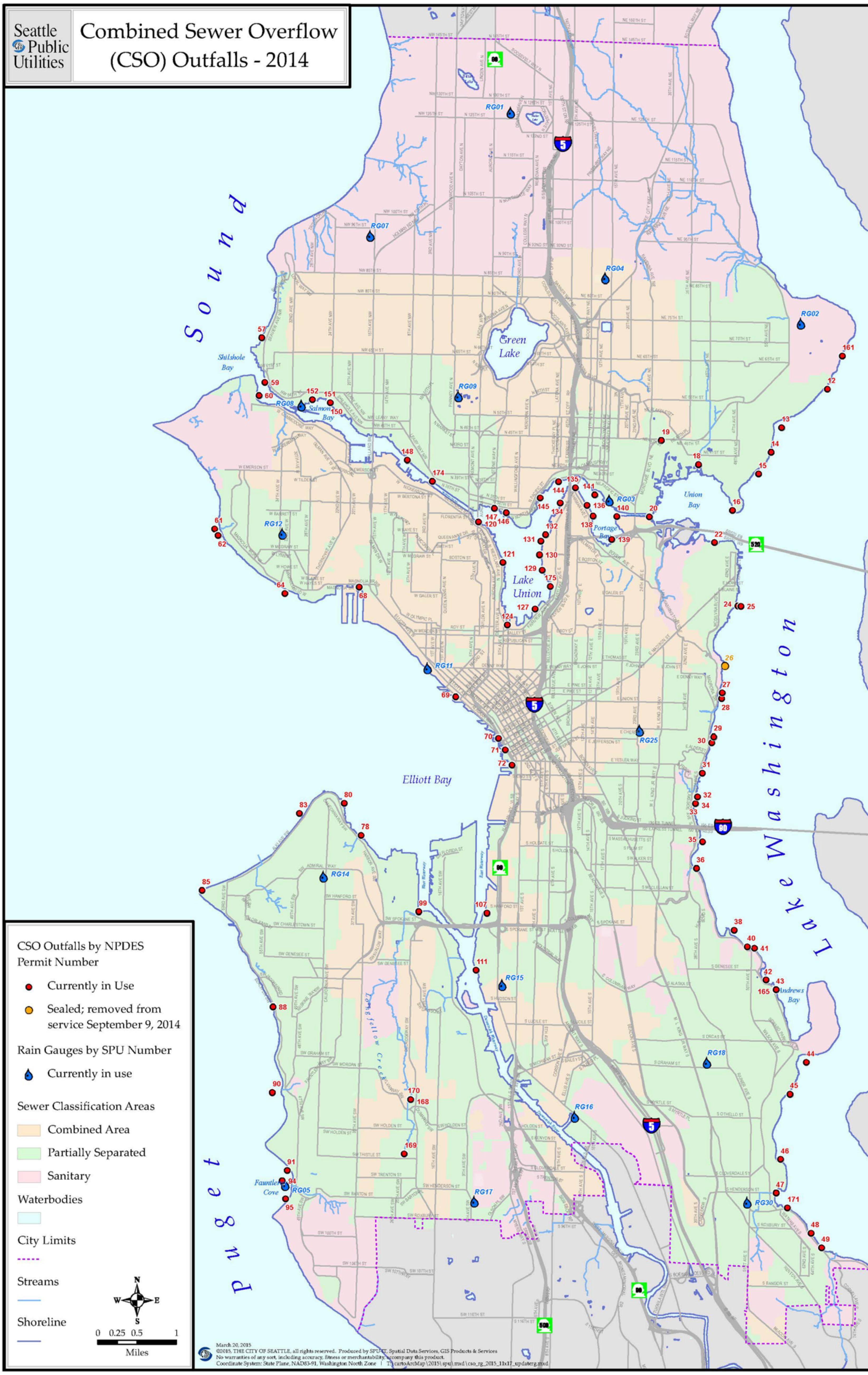


Figure 1-1. 2014 Combined Sewer Outfalls

1.2 The Collection System Permit

The wastewater collection system is regulated by the Washington State Department of Ecology (Ecology), via National Pollutant Discharge Elimination System (NPDES) Permit WA0031682. This permit went into effect on December 1, 2010, was modified on September 13, 2012, and will expire on November 30, 2015. The permit:

- Authorizes CSOs at the 87 outfalls shown in Figure 1-1, including Outfall 26 which formerly served the Leschi area and was sealed and removed from service in September 2014.
- Requires that SPU limit the number of CSOs from each “controlled” outfall to no more than one event per outfall per year on average.
- Includes a compliance schedule for CSO control projects and other activities that must be completed by the permit expiration date.
- Prohibits overflows from the CSO outfalls during periods of non-precipitation. Such overflows (e.g., caused by mechanical failure, blockage, power outage, and/or human error alone) are called dry weather overflows (DWOs). Note that, based on guidance from Ecology, if the volume of a wet weather overflow is increased because of a mechanical failure, blockage, power outage, and/or human error, the event is called an exacerbated CSO.
- Requires SPU to report spills and sewer overflows (SSOs).
- Requires SPU to submit an application for permit renewal prior to May 31, 2015.

SPU works to prevent SSOs, DWOs and exacerbated CSOs by providing appropriate system maintenance, backup generators for key facilities, and employee training.

An application for permit renewal is being prepared and will be submitted to Ecology prior to May 31, 2015.

1.3 Collection System Enforcement Orders

SPU also must meet the requirements of two enforcement actions:

- An Administrative Order with Ecology (Agreed Order; October 26, 2010), which requires SPU to limit the number of CSOs from each permitted outfall to no more than one event per outfall per year on average by December 31, 2025.
- A Consent Decree with the United States Department of Justice (DOJ), EPA, the State of Washington Attorney General (AG), and Ecology (Civil Action No. 2:13-cv-678; July 3, 2013). The Consent Decree achieves the following:
    - Resolves EPA’s and Ecology’s complaints that the City has violated the Clean Water Act and its wastewater NPDES permit.

- Sets a schedule for the City to come into compliance with state and federal requirements, including milestones for development of certain plans, construction of necessary capital improvements, and implementation of a performance based adaptive management approach to system operation and maintenance (O&M).
- Requires the City to report annually on Consent Decree required activities.
- Establishes penalties for non-compliance.

DOJ, EPA, AG, and Ecology negotiated a similar Consent Decree with King County.

1.4 Collection System Reporting Requirements

SPU's NPDES permit requires submittal of the following kinds of reports:

Monthly discharge monitoring reports documenting the volume, duration, precipitation, and storm duration for each CSO event, due by the 28th of the following month.

Reports of any sewer overflows (SSOs) or dry weather overflows (DWOs), with the initial report due within 24 hours following SPU's discovery of an SSO or DWO and a follow-up written report due within five days.

Engineering reports, plans, specifications, and construction quality assurance plans for each specific CSO reduction construction project, due by individual deadlines specified in the permit.

Each of the 2014 monthly precipitation and discharge monitoring reports was complete and submitted on time. All of the required engineering reports, plans, specifications, and construction quality assurance plans were submitted by the required deadlines, and most were submitted in advance of deadlines. Most of the SSOs and DWOs were reported within 24 hours following SPU's discovery of these incidents, and the majority of the follow-up written reports were submitted on time. Timely 24-hour reporting is sometimes difficult during intense storm events, which is when the majority of the SSOs occur, and some follow-up letters were late because of difficulty determining the underlying cause.

In addition, both the NPDES permit and the Consent Decree require submittal of an annual report. Annual reporting requirements are listed in Table 1-1, together with an indication of where the required information is provided in this report. This report meets all NPDES permit and Consent Decree annual reporting requirements.

Table 1-1. 2014 Annual Reporting Requirements		
Source	**Requirement**	**Report Location**
NPDES permit		
S6.A	Detail the past year's frequency and volume of combined sewage discharged from each CSO outfall	Table 5-4
S6.A	For each CSO outfall, indicate whether the number and volume of overflows has increased over the baseline condition and, if so, propose a project and schedule to reduce the number and volume of overflows to baseline or below	Table 5-5, Section 5.3
S6.A	Explain the previous year's CSO reduction accomplishments	Section 4
S6.A	List the CSO reduction projects planned for the next year	Table 4-1
S6.A	Document compliance with the Nine Minimum Controls	Section 3.1
S6.A.1	Include a summary of the number and volume of untreated discharge events per outfall	Table 5-6
S6.A.2	Determine and list which outfalls are controlled (no more than one overflow per year on average), using up to 20 years of past and present data, modeling, and/or other reasonable methods	Table 5-8
S6.A	Summarize all event-based reporting for all CSO discharges for the year	Tables 5-4, 5-6, 5-7
Consent Decree		
V.C.26	Report the metrics regarding sewer overflow (SSO) performance included in Appendix D, Paragraph E (1-7): SSO performance; Number of miles of sewer that were cleaned, inspected, and repaired/replaced/rehabilitated; Number of pump station inspections and the capacity of each pump station; Number of maintenance holes and force mains inspected and repaired/replaced/rehabilitated; Number and type of CSO regulators inspected; Summaries of inspections and cleanings of each CSO control structure; and Summaries of Fats Oil and Grease (FOG) inspections and enforcement actions taken the preceding year.	a. Tables 3-3, 3-4, A-1 b. Table 3-1 c. Tables 3-1, A-2, A-3 d. Table 3-1 e. Table 3-1 f. Tables A-4, A-5 g. Section 3.3
V.D.28	Submit summaries of FOG inspections and enforcement actions taken during the previous year.	Section 3.3
VII.43.a.i	Describe the status of any work plan or report development	Section 2

Table 1-1. 2014 Annual Reporting Requirements		
VII.43.a.ii	Describe the status of any design and construction activities	Section 4
VII.43.a.iii	Describe the status of all Consent Decree compliance measures and specific reporting requirements for each program plan, including: The CSO control measures for the Early Action CSO Control Program (Henderson Basins 44, 45, 46, and 47/171); The Long-Term Control Plan; The Post-Construction Monitoring Program Plan; The CMOM Performance Program Plan; The FOG Control Program Plan; The Revised Floatable Solids Observation Program Plan; and The Joint Operations and System Optimization Plan between the City of Seattle and King County	a. Sections 4.5, 4.6, and 4.7 b. Section 2.1 c. Section 5.4 d. Sections 2.4, 3.2 e. Sections 2.5, 3.3 f. Sections 2.6, 3.5 g. Section 2.2
VII.43.a.iv	Provide the project costs incurred during the reporting period	Table 4-1
VII.43.a.v	Describe any problems anticipated or encountered, along with the proposed or implemented solutions	NA
VII.43.a.vi	Describe the status of any wastewater collection system permit applications	Section 1.2
VII.43.a.vii	Describe any wastewater collection system reports submitted to state or local agencies	Section 1.4
VII.43.a.viii	Describe any anticipated or ongoing collection system O&M activities	Section 3
VII.43.a.ix	Describe any remedial activities that will be performed in the upcoming year to comply with the Consent Decree	NA
VII.43.b	Describe any non-compliance with the requirements of the Consent Decree and include an explanation of the likely cause, the duration of the violation, and any remedial steps taken (or to be taken) to prevent or minimize the violation	NA
Appendix D, Paragraph E	Include the listed CMOM performance metrics.	Tables 3-1, 3-3, 3-4, A-1, A-2, A-3, A-4, and A-5 and Section 3.3
Appendix E	In support of the Floatable Solids Observation Program, document and report the observations of overflow events that occurred during the preceding year.	Section 3.5

SECTION 2

Planning Activities

In 2014 SPU continued planning efforts to help ensure SPU meets Clean Water Act, NPDES permit, and consent decree requirements in a way that is cost-effective and provides the most value to our customers. Sections 2.1 and 2.2 describe progress made in 2014 as well as forecasted 2015 work on each of the following plans:

- The Plan to Protect Seattle's Waterways
- The Joint City of Seattle/King County Operations and System Optimization Plan.
- Outfall Rehabilitation Plan

In addition, SPU reviews previously approved plans annually, to identify any modifications needed to ensure their effectiveness. Sections 2.3, 2.4, and 2.5 describe this year's review of the following previously approved plans:

- The Capacity, Management, Operations & Maintenance (CMOM) Performance Program Plan
- The FOG Control Program Plan
- The Floatables and Solids Observation Program Plan

2.1 The Plan to Protect Seattle's Waterways

In 2014, SPU continued to develop the Plan to Protect Seattle's Waterways (the Plan). The Draft Plan and Draft Plan EIS were issued for public review on May 29, 2014, and comprised the following four volumes:

- Volume 1 – Draft Executive Summary – This short document included a high level summary of the need for the Plan, the alternatives considered, and the remaining steps and schedule.
- Volume 2 - Draft CSO Long-Term Control Plan (LTCP) – This volume described the development of, and the options and projects comprising, the Draft LTCP Alternative. The LTCP Alternative would control all remaining uncontrolled combined sewer basins and would limit CSO discharges to no more than one overflow per outfall per year.
- Volume 3 – Draft Integrated Plan – This volume described the development of, and the projects comprising, the Draft Integrated Plan Alternative. The Integrated Plan Alternative would direct investments in stormwater and CSO control projects so that benefits to water quality would be greater and achieved earlier than would occur if SPU focused exclusively on the CSO control projects identified in the LTCP. The proposed stormwater projects would be constructed in addition to all of the CSO reduction projects.
- Volume 4 – Draft Plan EIS – Volume 4 described the programmatic environmental impacts of the LTCP Alternative, the Integrated Plan Alternative, and the No Action Alternative.

A public meeting for the Draft Plan and a public hearing for the Draft Plan EIS were held on June 24, 2014.

During the second half of 2014 and early 2015, SPU updated the Draft LTCP and Integrated Plan Alternatives to incorporate additional analysis and to identify the recommended LTCP Option and the recommended Plan Alternative. The Final Plan EIS, including all comments received on the Draft Plan EIS as well as responses to the comments, was issued on December 4, 2014.

SPU submitted a draft Final Plan to EPA and Ecology for review on February 2, 2015, so that EPA and Ecology could provide feedback on the recommended LTCP Option and the recommended Plan alternative. This submittal also satisfied an NPDES permit requirement to update the City's CSO Reduction Plan by May 30, 2015.

SPU is continuing to brief stakeholder groups, the Mayor's Office, City Councilmembers and Council's Central Staff. SPU expects to obtain Mayor and City Council approval of the Final Plan in May 2015 and is on schedule to submit the Final Plan to Ecology and EPA by May 30, 2015. The Final Plan will include:

- Volume 1 – Final Executive Summary
- Volume 2 - Final CSO LTCP
- Volume 3 – Final Integrated Plan
- Volume 4 – Final Plan EIS

LTCP - and Integrated Plan-specific work completed in 2014 and forecast for 2015 is described in the following sub-sections.

2.1.1 CSO Long-Term Control Plan

Specific LTCP tasks completed during 2014 included:

- Completed development of the Draft LTCP, including:
  - Four LTCP (CSO control) options for consideration:
    - Neighborhood Storage Option
    - Shared (City of Seattle/King County) Storage Option
    - Shared West Ship Canal Storage Option
    - Shared Ship Canal Tunnel Option
  - Descriptions of all CSO Control measures for each option, including location maps, capital cost estimates, operating and present value estimates.
  - Options rating and ranking analysis.
  - CSO basin ranking using EPA methodology.

- Long-term model simulation results (Control Volume calculations) for uncontrolled CSO basins.
- Green Stormwater Infrastructure conceptual analysis for CSO control.
- Implementation schedules for all CSO control measures for each option.
- Financial capability assessment and rates analysis.
- Operational plan and future resource projections for new facilities.

- Identified recommended LTCP option and started preparing draft Final Plan.
- Updated recommended option, control measure descriptions, maps, capital cost estimate, operating costs and present value estimates.
- Updated rates analysis for the recommended option.
- Updated Sensitive Area Study: CSO Basin Prioritization.
- Analyzed downstream effects on King County's system and prepared a CSO Control Measure Performance Modeling Report for the recommended LTCP option.
- Commenced development of an interagency agreement with King County for a Shared West Ship Canal Storage Project.
- Began briefing the Mayor's Office and City Councilmember on the recommended option.
- Provided three status updates to EPA and Ecology.

During 2015, SPU will perform the following work on the LTCP:

- Prepared and submitted draft Final LTCP for review by EPA and Ecology. This submittal satisfied the NPDES permit requirement to update the City's CSO Reduction Plan by May 30, 2015.
- Obtained EPA and Ecology input on the draft Final LTCP.
- Provide additional briefings to stakeholder groups, the Mayor's Office, City Councilmembers, and Council's Central Staff.
- Complete interagency agreement with King County for the Shared West Ship Canal Storage Project.
- Support King County's request for a consent decree schedule modification to enable King County's participation in the Shared West Ship Canal Storage Project.
- Prepare a Final LTCP for submittal to Ecology and EPA in May of 2015.

2.1.2 Integrated Plan

SPU is using the following approach to develop the Integrated Plan Alternative:

- Develop a list of prioritized stormwater project and program opportunities. Opportunities may include structural stormwater controls and stormwater programs such as street sweeping.
- Identify CSO reduction projects that could be deferred and constructed after 2025.
- Estimate and document the pollutant load reductions for each of the stormwater opportunities and CSO projects using the approach described in the Consent Decree.
- Compare pollutant load reductions and benefits of stormwater opportunities and CSO projects to select the CSO projects to defer and the stormwater projects to propose.
- Prepare and document a cost benefit analysis.
- Develop an implementation schedule for the proposed stormwater projects and the CSO reduction projects that would be deferred.
- Develop a post construction monitoring program for the stormwater projects. (Note that post construction monitoring of CSO reduction projects is addressed in the LTCP.)
- Describe and analyze the Integrated Plan as an alternative in the Plan EIS.
- Provide appropriate opportunities for meaningful stakeholder input throughout the development of the Integrated Plan.

During 2014, SPU made great progress towards completing the Integrated Plan:

- Completed the Draft Integrated Plan and submitted it to Ecology and EPA for review on May 30, 2014.
- Provided project briefings and opportunities for stakeholder input on the Draft Integrated Plan.
- Revised the Integrated Plan to address Ecology and EPA comments on the Draft Integrated Plan.
- Presented status and progress to Ecology and EPA during quarterly briefings.

During 2015, SPU will engage in the following work toward completion of the Integrated Plan:

- Continue to provide the public and stakeholders with opportunities for learning about and providing input on the Integrated Plan.
- Submit the draft Final Integrated Plan to Ecology and EPA for review.
- Revise the draft Final Integrated Plan to address Ecology and EPA comments and prepare a Final Integrated Plan for submittal to Ecology and EPA in May of 2015.

2.2 Joint City of Seattle/King County Operations and System Optimization Plan

The City of Seattle's and King County's consent decrees each contain language directing both agencies to work together to develop a single Joint Operations & System Optimization Plan (Joint Plan), to be submitted no later than March 1, 2016. In 2014, the Joint Operations and System Optimization Plan (Joint Plan) team built on the work completed in 2013 by focusing on four CSO Joint Plan basins in the City of Seattle that have the greatest potential for operational optimization. Over the course of the year, staff from both King County's Department of Natural Resources and Parks (DNRP) and SPU participated in a detailed options analysis process which will result in operational optimization actions for possible inclusion in the final Joint Plan. Highlights of the year included the following:

- Identified four basins in the City with the greatest potential for operational optimization – Montlake, University, West Duwamish and SODO. These basins contained facilities where operational optimization is possible, had benefit to both agencies, and had potential for better capacity management. The remaining basins will be examined in future updates to the Joint Plan.
- Began an options analysis process in each basin to identify, analyze, and select optimization options for potential inclusion in the Joint Plan.
    - Completed brainstorming workshops for each basin with staff from both agencies; over 200 operational optimization ideas were brainstormed across the four basins. Many of the optimization ideas were applicable to multiple basins in the City.
        - Reviewed performance data for two historical storm events in each basin to gain a detailed understanding of how the two CSO systems work independently and together.
    - Completed a consolidation and refinement process that shaped over 200 optimization ideas into 16 optimization alternatives for detailed analysis.
    - Began detailed analysis of 16 alternatives (eight basin-specific, eight multi-basin), which includes consideration of:
        - Technical feasibility
        - Cost
        - Risk
        - Regulatory implications
        - Schedule for implementation
        - Measures of success
- Developed and approved Early Action No. 3 for implementation; Operational Data Sharing Pilot. This Early Action established a framework for real-time data sharing and resulted in development of a secure connection between DNRP's and SPU's Supervisory Control and

Data Acquisition (SCADA) systems. This is the first time that the two agency's SCADA systems have been sharing data with the other, and the first time that staff has had access to real-time data from both systems. Data shared in the pilot is from the University/Windermere basin where both DNRP and SPU have pump stations and CSO control facilities, and the potential for operational optimization and reduction of CSOs and sewer overflows is significant.

2.3 Outfall Rehabilitation Plan

The current NPDES permit requires SPU to submit an outfall rehabilitation plan by October 31, 2015, that describes outfalls to be repaired or replaced during the next NPDES permit cycle. In 2014, SPU reviewed previous consultant assessments, existing record drawings and CCTV investigations, and conducted additional diving inspections and a criticality analysis in order to identify the highest priority outfalls for rehabilitation. SPU expects to complete and submit the outfall rehabilitation plan well in advance of the regulatory deadline.

2.4 CMOM Performance Program Plan

Capacity, Management, Operations, and Maintenance (CMOM) Programs are intended to help municipalities identify and implement activities needed to:

- Better manage, operate, and maintain collection systems,
- Reduce the number and volume of sewer overflow (SSO) events, and
- Prevent dry weather overflow (DWO) events.

The goal of CMOM planning is to identify current performance gaps, select performance goals, and design activities to meet the goals. Data is gathered and analyzed to determine how well each activity is meeting the performance goals, and whether overall system efficiency has improved. Activities are adjusted as needed to better meet the performance goals.

SPU began developing and implementing a CMOM Program in 2004. That year, SPU performed its first gap analysis and proceeded to address prioritized gaps. Work included:

- Implementing data collection improvements;
- Documenting maintenance processes and procedures;
- Hiring a full time Fats Oils and Grease (FOG) Control Program Inspector;
- Revising and re-implementing a Chemical Root Control Program;
- Implementing a geographic based system for scheduling preventive pipe cleaning maintenance; and
- Adopting the Pipeline Assessment and Certification Program (PACP) coding system for pipe condition assessment.

In 2009, SPU performed its second gap analysis, to quantify progress and adjust priorities. This provided an opportunity to integrate SPU's Asset Management business model and asset management-based decision-making into the CMOM Program. It also provided an opportunity to use improved data management tools, including the improved Computerized Maintenance Management System (CMMS) software and the expanded Geographic Information System (GIS) data and software. As a result, dozens of initiatives were identified that would allow SPU to become more effective, efficient, and productive in the operation and maintenance of its wastewater collection system.

SPU worked to prioritize initiatives; identify the level of effort required to implement each initiative; and identify initiative dependences and the appropriate sequencing of the initiatives. The result was a 6-year roadmap for improving operation and maintenance of the wastewater collection system. SPU also set a sewer overflow performance (SSO Performance) threshold and identified appropriate performance-based follow-up activities if the threshold is exceeded. Together, the 6-year roadmap and the SSO performance threshold and performance-based follow-up activities comprise the CMOM Performance Program Plan.

The Plan was submitted to EPA and Ecology on December 31, 2012. After the Consent Decree was filed in U.S. District Court, the Plan was conditionally approved by EPA on September 5, 2013, approved by Ecology on September 9, 2013, resubmitted with the revisions requested by EPA on October 8, 2013, and approved by EPA on January 10, 2014.

In December 2014, SPU reviewed the Plan and determined that no additional revisions are needed at this time. SPU also reviewed the way SSOs are tracked and determined that some modifications were needed to more clearly identify causes. For example, the “Damaged by Known Party” and “Damaged by Unknown Party” categories have been disaggregated into SSOs caused by “City Construction”, “Other Agency Construction”, “Private Construction”, and “Vandalism”. The “Capacity” category has been disaggregated into SSOs caused by “Extreme Weather Event” and “Capacity”. SPU will continue to report all SSOs and summarize all SSOs in its annual report, but SSOs caused by Other Agency Construction, Private Construction, Vandalism, and Extreme Weather Events will not be included in the SSO Performance calculation. These tracking and performance monitoring changes will help SPU ensure that the CMOM roadmap focuses on activities that provide the greatest opportunity for SSO prevention.

2.5 FOG Control Program Plan

SPU began its Fats Oils and Grease (FOG) Control Program in 2005, with the overall goal of reducing the number of FOG-related SSOs. SPU’s initial efforts focused on characterizing the FOG problem by identifying FOG hot spots (locations where FOG was contributing to SSOs, or where pipe segments were scheduled for cleaning every 6 months or less due to FOG accumulation), assessing below-ground FOG impacts at the hot spots (including the relative influence of FOG sources, physical sewer system factors, and the effectiveness of cleaning efforts), and assessing how well Food Service Establishments (FSEs) in the vicinity of the hot spots managed their FOG waste. At the same time, SPU began inventorying FSEs to determine the extent of the FOG problem.

In 2012, SPU completed development and began implementation of a FOG Control Program Plan. SPU used the results of the FOG characterization efforts and the FSE inventory to develop short- and long-term program goals, location-specific strategies, an approach for focusing resources, a workload forecast and staffing plans, and an approach for monitoring and reporting program performance. These items comprise SPU's FOG Control Program Plan, which was submitted to EPA and Ecology on December 31, 2012. After the Consent Decree was filed in U.S. District Court, the FOG Control Plan was approved by EPA on September 5, 2013 and by Ecology on September 9, 2013.

SPU is implementing the approved plan. Each year, SPU also reviews FOG Program efforts and results in order to continue focusing on the worst FOG problems. In 2014, SPU began evaluating the tradeoffs between several alternatives to FOG control, including but not limited to:

- Using preventive maintenance (sewer cleaning) by SPU crews,
- Expanding on-site FOG control at local FSEs, and
- Using a mix of preventive maintenance and on-site regulatory control at the FSE level (the status quo).

If program changes are recommended, a full options analysis will be undertaken. Any resultant changes to the FOG Control Program Plan will be submitted to EPA and Ecology for approval.

Actual 2014 and planned 2015 Plan activities are described in Section 3.3 of this report.

2.6 Floatables and Solids Observation Program Plan

SPU began observing CSO events to document the presence or absence of floatables and solids in 2008. Difficulties with completing visual observations led SPU and EPA to agree to utilize camera technology to accomplish observations beginning in 2011. On December 31, 2012, SPU submitted an updated Floatables and Solids Observation Plan to EPA and Ecology in compliance with the negotiated Consent Decree. The updated plan proposed observing overflows at two additional outfalls each year in 2013 and 2014 and, if no significant floatables are observed by the end of 2014, concluding the observation program. The updated Plan was conditionally approved by EPA on September 5, 2013, approved by Ecology on September 9, 2013, resubmitted with the revisions requested by EPA on October 8, 2013, and approved by EPA on January 10, 2014.

SPU reviewed the Floatables and Solids Observation Plan at the end of 2014. No significant floatables have been observed during 7 years of observation. Thus, SPU is concluding the observation program. The 2014 observations are described in Section 3.4 of this report.

SECTION 3

Operation & Maintenance Activities

This section describes the operation and maintenance (O&M) activities SPU undertakes to reduce the number and volume of sanitary system overflows (SSOs), dry weather overflows (DWOs), and combined system overflows (CSOs).

3.1 Nine Minimum Control Activities

The Federal CSO Control Policy requires municipalities with combined sewer systems to implement nine measures that help reduce the number and volume of sewage overflows without extensive engineering studies or significant construction costs. The following paragraphs describe the work that was performed in 2014 on each of these nine control measures.

3.1.1 Control 1: Provide System Operations & Maintenance (O&M)

Reduce the magnitude, frequency, and duration of CSOs through proper operation and maintenance (O&M) of the combined sewer system.

Each year SPU performs extensive system O&M activities to reduce the frequency and volume of preventable overflows. Routine maintenance activities include sewer inspections, cleaning, and non-emergency point repairs; catch basin inspection, cleaning, and repairs; control structure and storage structure cleaning; valve and flap gate inspection, cleaning, lubricating, and servicing; and pump station electrical, mechanical, and facilities inspection and servicing. SPU uses the National Association of Sewer Service Companies (NASSCO) PACP defect coding system to identify and prioritize pipes to be scheduled for maintenance or rehabilitation.

Once a sewer has been identified as having a maintenance-related problem, the sewer is placed on a routine cleaning schedule to prevent future backups. The initial cleaning frequency is based on the cause of the initial backup, and the cleaning frequency is increased or decreased over time as appropriate. Corrective activities include:

- Jetting, for light to medium debris;
- Hydrocutting, for roots and/or grease;
- Rodding, for pipes with an active blockage; and
- Chemical root treatment, when roots are present and no grease.

SPU's routine maintenance frequencies range from as short as once a month to as long as once every six years. The challenge for sewer utilities is to clean sewers as frequently as necessary to maintain system capacity but no more than necessary, as cleaning sewers shortens the sewer's functional life span. In 2011, SPU launched the use of a cleaning optimization tool (COTools) to analyze sewer pipe cleaning data and recommend appropriate cleaning frequencies. SPU staff review these software-generated recommendations and implement those that provide the right balance between sewer capacity and sewer lifespan.

Pump station electrical and mechanical components are replaced as necessary during pump station maintenance. In 2008, SPU began implementing Reliability Centered Maintenance (RCM) at its wastewater pump stations. The objective of RCM is to ensure the right maintenance is performed at the right intervals, which in turn optimizes life cycle costs while increasing system reliability. In addition, RCM ensures the right data is collected and evaluated, adding discipline to decision-making around operations, spare parts inventory, maintenance strategies, and data collection. SPU continues to use and adjust its RCM-based strategies.

SPU's 2014 O&M accomplishments are summarized in Table 3-1 and are roughly comparable to 2013 O&M accomplishments, with some quantities increasing and others decreasing.

Table 3-1. 2014 O&M Accomplishments

Activity	Quantity
Miles of mainline pipe cleaned	343
Miles of mainline pipe inspected via CCTV	161
Miles of mainline pipe repaired/replaced/rehabilitated	0.2
Number of pump station inspections [1]	1,736
Number of maintenance holes inspected	515
Number of force mains inspected	50
Number of force mains repaired/replaced/rehabilitated	0
Number of CSO structure inspections [2]	272
Number of CSO structure cleanings [2]	96
Number of CSO HydroBrake inspections [2]	315
Number of CSO HydroBrake cleanings [2]	41
Linear feet of pipe receiving chemical treatment to inhibit root growth	35,677
Number of catch basins inspected	13,197
Number of catch basins cleaned	2,736
Number of catch basins repaired	16
Number of catch basins replaced	1
Number of catch basin traps replaced	162

1. *See Tables A-2 and A-3 for pump station capacity and inspection details.*
2. *See Tables A-4 and A-5 for CSO structure inspection and cleaning details.*

3.1.2 Control 2: Maximize Storage of Flows

Maximize the use of the collection system for wastewater storage, in order to reduce the magnitude, frequency, and duration of CSOs.

SPU maximizes storage in its collection system through a multi-faceted approach that includes:

- Regular collection system maintenance, so that existing capacity is available during storm events;
- Retrofits of storage facilities whose existing capacity is not fully utilized;
- Increasing the height of overflow weirs, when doing so increases collection system storage capacity without creating backups; and
- Eliminating excessive inflow and infiltration.

In 2014, SPU continued to perform regular O&M activities as described in Control 1. Those activities helped to minimize sewer blockages and optimize system capacity.

In addition, SPU continued to design and construct system retrofits to better utilize existing sewer system capacity. Work on system retrofits is described in Section 4.1 of this report.

3.1.3 Control 3: Control Nondomestic Sources

Implement selected CSO controls to minimize CSO impacts resulting from nondomestic discharges.

Two important programs are implemented to help control nondomestic discharges into the Seattle sewer system: the FOG Control Program, and the Industrial Pretreatment Program.

SPU administers the City's FOG Control Program, enforcing Seattle Municipal Code requirements to pretreat FOG-laden wastewater before it is discharged to the sewer system. FOG has a deleterious effect on the sewer system as it combines with calcium and grease in wastewater to form hardened calcium deposits which adhere to the inside of sewers, decreasing their capacity. FOG Control Plan development activities are summarized in Section 2.5 of this report. FOG Control inspection and enforcement activities conducted in 2013 are summarized in Section 3.3.

The industrial Pretreatment Program is administered by King County DNRP. DNRP issues industrial waste pretreatment permits that include appropriate discharge limits. DNRP also provides regular site inspections and periodic permit reviews. SPU and DNRP work together if permittees are found to have a negative impact on the sewer system.

Figure 3-1. FOG Control Program Educational Materials

3.1.4 Control 4: Deliver Flows to the Treatment Plant

Operate the collection system to maximize flows to the treatment plant, within the treatment plant's capacity.

SPU maximizes flow to the treatment plant by implementing the measures described in Controls 1 and 2 and also through a program of routine system performance monitoring and analysis.

In 2010, SPU integrated its former water and wastewater control centers into a single Control Center (CC). The Control Center is staffed 24 hours a day and receives real-time SCADA (Supervisory Control & Data Acquisition) information.

Initially, the Control Center received SCADA information only from SPU's 68 wastewater pump stations. SPU continues to regularly analyze performance of the 68 pump stations to ensure that they are operating at their design capacity during storm events. Control Center staff respond to any alarms at the wastewater pump stations or the CSO facilities that would indicate a drop in performance or other problem. In addition, SPU monitors pump station, overflow structure, and outfall flow data as it is collected and uses the data to detect maintenance issues that may be affecting system performance.

In 2011, monitoring and controls for SPU's first sewer system facility with active controls and SCADA connectivity also were brought into the Control Center. In 2012, a second major control project was completed and brought into the Control Center for full operation. The project, located in the Windermere Area (Basin 13), includes two storage tanks and a motor-operated gate valve. The valve is programmed to fill or evacuate storage based on water levels in the downstream sewer (the Lake Line). The next three projects that will be monitored from the Control Center following completion are the CSO storage projects being constructed to serve the Windermere, Genesee, and South Henderson Areas (see Section 4).

In 2013, SPU made continued progress constructing/implementing the infrastructure, hardware and software that comprise the Drainage and Wastewater I-SCADA Program, which is a capital program whose goal is to allow SPU to transition from consultant-provided flow monitoring services to an SPU operated monitoring network.

In 2014, SPU brought into production a new Information Management System (IMS). IMS is an upgraded Historian process to ensure all data collected by SCADA is stored and available for post analysis. This new product improves SPU's ability to utilize system monitoring data to inform preventive maintenance needs and to identify system performance issues proactively.

SPU has started the on-boarding process for three early action CSO projects located within the Windermere, Genesee, and South Henderson Areas. The on-boarding process brings the new facilities into the SPU SCADA system and into the Control Center for remote monitoring and operation. The process was initiated in November 2014 with the expectation that on-boarding of the new projects will be completed and the system stabilized in the second quarter of 2015. Additionally, temporary flow monitoring was installed in 2014 to understand the new facility performance and to inform operational changes during the start-up of these facilities.

3.1.5 Control 5: Prevent Dry Weather Overflows

Prevent dry weather overflows; they are not authorized. Report any dry weather overflows within 24 hours and take prompt corrective action.

SPU experienced one dry weather overflow (DWO) in 2014. This DWO occurred on May 14th at Outfall 45, near Martha Washington Park. Field crews were performing preventive maintenance at Pump Station 10 and had bypassed flow around the pump station. Unfortunately, an inexperienced crew followed incorrect bypass procedures, leading to the DWO. Approximately 4,757 gallons overflowed into Lake Washington. Ecology and EPA were notified via the online ERTS reporting system and details were provided in a follow-up letter.

SPU also experienced sixteen exacerbated CSOs in 2014 (wet weather overflows at CSO outfalls that, while already discharging as a result of precipitation, were worsened by mechanical failures, blockages, equipment outages, or power outages), in large part due to higher than normal rainfall (see annual rainfall comparison in Table 5-2) and construction activities.

- Two of these overflows (a 1,916 gallon overflow on February 16th and a 2,111 gallon overflow on March 5th) were at Outfall 22 in Madison Park and were exacerbated by underperforming air lift style pumps at Pump Station 50. Design is underway on a project to replace the air lift style pumps with more reliable submersible pumps.
- Four of these overflows (a 152,118 overflow on February 16, a 185,927 gallon overflow on March 5th, a 54,117 gallon overflow on March 8th, and a 36,321 gallon overflow on March 16th) were exacerbated by consecutive rainstorms that prevented crews from draining and removing debris from the HydroBrake that regulates flows from Basin 42.
- An additional three of these overflows occurred on March 5th, during the week when the most rainfall fell in recorded Seattle history, including:
  - A 4,910,082 gallon overflow from Outfall 44 near Seward Park, exacerbated by debris in the HydroBrake that regulates flow from that basin;
  - A 2,603,818 gallon overflow from Outfall 99 in the Delridge area, exacerbated by debris in the HydroBrake that regulates flows from that basin; and
  - A 1,092,208 gallon overflow from Outfall 168 in the Delridge area, exacerbated by a vandal scaling a security fence and opening the tank drain valve.
- .Five of these overflows occurred from Outfall 43 during construction of the Genesee CSO Storage Project, during and following installation of the new gate at CSO 9. Before the gate could be placed in service to regulate flows and optimize use of the storage tank at CSO 9, the following exacerbated overflows occurred:
  - A 10,362 gallon overflow on October 11th;
  - A 16,052 gallon overflow on October 13th;
  - An 837 gallon overflow on October 15th;
  - A 35,992 gallon overflow on October 20th; and
  - A 184,278 gallon overflow on October 22nd.

  In addition, a 45,118 gallon exacerbated overflow occurred at Outfall 42 on November 28th because construction-related discharges from Basin 43 filled the Lake Line to capacity, leaving insufficient capacity for flows from Basin 42.
- On December 20th, an 18,292 gallon overflow at Outfall 46 was exacerbated by an unusual amount of rags in the Pump Station 9 wet well. SPU will be following up with additional outreach to a nearby assisted living facility.

To help prevent DWOs and exacerbated CSOs, each combined sewer system overflow location is configured with an alarm that is triggered if there are likely overflow conditions. The alarms alert analysts and/or field crews to assess the situation and take corrective action if possible.

In addition, whenever SPU experiences a DWO or exacerbated CSO, SPU investigates to identify the cause and takes action to address the overflow and reduce or eliminate the probability of recurrence. Investigation includes manual inspection of the site where the overflow occurred, CCTV inspection of adjacent pipe, and review of SCADA data. Whenever possible, the outfall structure and adjacent pipes are cleaned immediately following the event, and SPU reviews and analyzes the cleaning results.

SPU holds monthly “after action” review meetings to learn from our experiences and apply any lessons learned toward preventing additional SSOs, DWOs, and exacerbated CSOs. SPU also looks at the rolling history of DWOs and exacerbated CSOs to determine if there are any patterns and if a systematic solution is required. For example, in past years pump station electrical outages contributed to DWOs, so SPU implemented projects to ensure that each pump station has either an on-site backup generator or an emergency plug that allows a portable generator to be easily placed in service. See Section 4.10 of this report for information on recently completed pump station backup power improvements.

A summary of the DWOs and exacerbated CSOs from 2007-2014 is included in Table 3-2.

Table 3-2. Dry Weather Overflows (DWOs) and Combined Sewer Overflows (CSOs) Exacerbated by System Maintenance Issues 2007 – 2014

Year	DWOs		CSOs Exacerbated by System Maintenance Issues[1]	
	No. of Overflows	Volume (gallons)	No. of Overflows	Volume (gallons)
2007	7	499,264	--	--
2008	1	148,282	8	470,444
2009	1	3,509	3	156,153
2010	0	0	13	12,320,400
2011	0	0	10	2,317,068
2012	0	0	11	5,846,647
2013	3[2]	123,670	5	12,894
2014	1	4,767	16	9,349,549

[1] *CSOs exacerbated by system maintenance issues were not reported prior to 2008. The 'exacerbated CSOs' listed in this table are listed as CSO discharges in Table 5-4 and are included in the discharges summarized in Tables 5-5, 5-6, 5-7, and 5-8. Most of these exacerbated CSOs were caused by heavy precipitation and/or construction activities. See Section 3.1.5 for details.*

[2] *None of these DWOs were caused by SPU or any other City entity.*

3.1.6 Control 6: Control Solids and Floatable Materials

Implement measures to control solid and floatable materials in CSOs.

SPU implements several measures to control floatables:

Catch basins are designed to prevent floatables from entering the system. Specifically, SPU's catch basins are designed to overflow only when the water level in the catch basin is well above the overflow pipe opening. Because floatables remain on the water surface, they are trapped in the catch basins. Catch basins are inspected and cleaned regularly to remove debris and potential floatables. Catch basin inspection, cleaning, and rehabilitation metrics are included in Table 3-1.

In addition, the City of Seattle runs several solid waste and city cleanup programs to prevent and reduce the amount of street litter, including:

- Street sweeping, including increased efforts for Fall leaf pickup,
- Spring clean,
- Storm drain stenciling,
- Event recycling,
- Public litter and recycling cans,
- Waste free holidays,
- Product bans, and
- Illegal dumping investigation and response.

3.1.7 Control 7: Prevent Pollution

Implement a pollution prevention program focused on reducing the impact of CSOs on receiving waters.

SPU conducts multiple pollution prevention programs to keep contaminants from entering the sewer system and subsequently being discharged in sewage overflows. Pollution prevention programs performed by SPU in 2014 include:

- Public education programs,
- Solid waste collection and recycling,
- Product ban/substitution,
- Control of product use such as cleaning and yard care recommendations,
- Illegal dumping prevention,
- Bulk refuse disposal,
- Hazardous waste collection,

- Commercial/industrial pollution prevention,
- Spill response,
- Business inspections, and
- Water quality complaint response.

The City of Seattle Department of Transportation (SDOT) performs street sweeping, including street sweeping downtown streets every night and cleaning alleys three nights per week. In 2014, SDOT street sweeping crews swept 11,101 curb miles in the combined sewer system area, removing approximately 2,294 short wet tons of dirt and debris from City streets.

SPU also supports public education programs on pollution prevention, such as:

- Spring Clean,
- Clean and Green,
- Adopt-a-Street,
- Adopt-a-Drain,
- Storm Drain Stenciling,
- Surface Water Pollution Report Line,
- Pet Waste Disposal,
- Natural Yard Care,
- Car tips (to decrease automobile leaks), and
- Reduce, Reuse, and Recycle tips.

SPU also has reduced the potential for pollution by reducing the volume of sewage entering the sewer system. For years, SPU has been a leader in potable water conservation through the Saving Water Partnership, actually reducing the regional water system annual demand while the population has increased. As a result of these efforts, the total Seattle regional water system demand has dropped from a base (winter) flow of approximately 150 MGD in the late 1980s to a current base flow of 100 MGD, thus reducing the capacity demands on the regional sewer system by approximately 50 MGD.

SPU and King County DNRP are both utilizing green stormwater infrastructure (GSI) to reduce the volume of stormwater entering the combined sewer system. SPU encourages installation of rain gardens and cisterns on private properties and is installing roadside rain gardens in street rights-of-way. Please see Section 4.2 for more information on these GSI programs.

Finally, if sewage contamination of surface waters occurs due to side sewer breaks or illicit connections or discharges, SPU uses regulatory tools such as Notices of Violation and associated penalties to help remedy the problem in a timely manner.

3.1.8 Control 8: Notify the Public

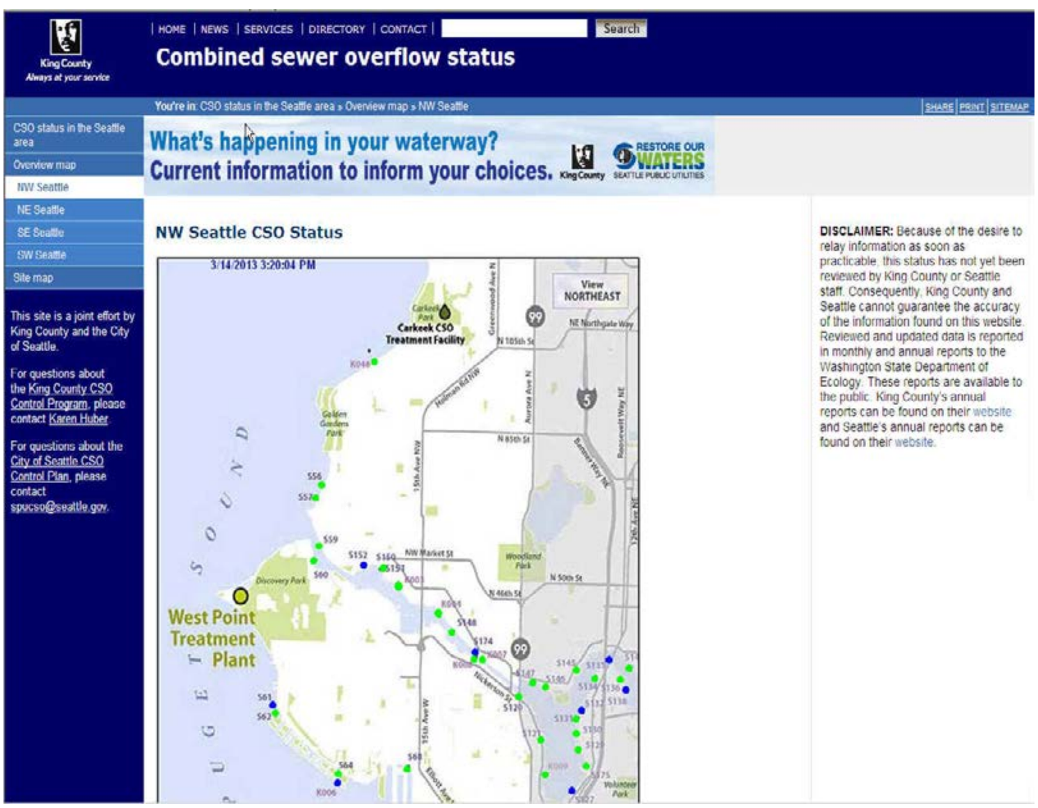
Implement a public notification process to inform the citizens of when and where CSOs occur.

SPU, together with Seattle King County Public Health, maintains a sewage overflow notification and posting program for Seattle's CSO outfalls. Signs at each outfall identify the outfall and warn of possible sewage overflows. The signs include the phone number for the CSO Hotline, staffed and managed by Seattle King County Public Health. Seattle King County Public Health also provides a website with detailed information about CSOs, potential public health hazards, and precautions the public may take to protect themselves. If sewage overflows occur due to side sewer breaks or illicit connections or discharges, SPU posts additional warning signs at impacted waterways until the problem is resolved.

Figure 3-2. Example of Outfall Signage

In addition, King County DNRP has hosted an overflow website since December 2007, providing notification of recent and current DNRP CSO overflows. In 2009, SPU and DNRP worked together to incorporate City of Seattle real-time overflow information on the DNRP website. Now the community is able to access consolidated information to assist in making choices about use of local waters. In 2014, the public notification web pages were viewed 9,220 times, with a peak one-day use of 233 views on February 12, 2014.

Figure 3-3. King County DNRP/SPU Real-Time Overflow Notification Website



3.1.9 Control 9: Monitor CSOs

Monitor CSO outfalls to characterize CSOs and the effectiveness of CSO controls.

SPU monitors each of its CSO outfalls to detect sewage overflows. SPU also tracks the performance of its flow monitors to ensure consistent, high quality measurements. The flow, precipitation, and flow monitor performance monitoring programs and results are described and summarized in Section 5 of this report.

3.2 CMOM Performance Program Activities

The CMOM Performance Program Plan committed SPU to completing performance, productivity, and efficiency initiatives in each of the following program areas:

- Planning and scheduling,
- Sewer cleaning,
- FOG Control Program,
- Repair, rehabilitation, and replacement,
- Condition assessment, and
- SSO response.

Work in each of these program areas is described in the following sections, together with work on a few CMOM initiatives not included in the CMOM Performance Program Plan.

3.2.1 Planning and Scheduling Initiatives

The purpose of the planning and scheduling initiatives is to improve the quality and efficiency of maintenance tasks by standardizing the approach, business rules, and system requirements needed to perform each type of task (for example, sewer cleaning, catch basin pumping, CCTV inspections); centralizing the planning of tasks; and using software to support work order life cycles management. Work completed in 2014 and planned for 2015 includes:

- Risk Based Scheduling - SPU implemented risk based scheduling of sewer pipe cleaning in 2012 and refined the scheduling in 2013. SPU began training Field Managers, Crew Chiefs, and Planning & Scheduling staff in 2013 and continued with training in 2014, with a focus on improving communications and performance metric evaluation. Beginning in Fall 2014, SPU began developing a similar approach for scheduling sewer CCTV work known as Dynamic CCTV Scheduling. This type of scheduling will allow SPU to conduct CCTV on pipes that have not had prior condition assessment while conducting regularly-scheduled preventive CCTV activities. Implementation of Dynamic CCTV Scheduling will begin in 2015.

3.2.2 Sewer Cleaning Initiatives

The purpose of the sewer cleaning initiatives is to improve the quality and efficiency of sewer cleaning by standardizing the procedures, providing ongoing crew training, measuring and tracking the quality of the sewer cleaning efforts, providing feedback to the crews, and using technology to help identify where changes in cleaning frequency should be considered. Work completed in 2014 and planned for 2015 includes:

- Sewer Cleaning Optimization Tool Enhancement - SPU modified its Cleaning Optimization Tool (COTools) in the fourth quarter of 2013 to integrate with Maximo 7. In 2014, after working with this tool for several years, SPU identified several software upgrades needed to improve the user interface, improve the work flow and data review, and better integrate with SPU's Maximo 7 system. The upgrade of COTools will begin in 2015 and is likely to be completed during 2016/2017.
- Sewer Cleaning Crew Training - In 2013, SPU provided two, three-week training sessions and one, two-week training session on mainline cleaning. Two, three-week training sessions and one, one week training session were conducted in 2014. The 2014 training sessions emphasized use of new jet nozzle technology and effective capture of debris while jetting.

3.2.3 FOG Control Program Initiatives

The purpose of the FOG Control Program is to reduce the number of FOG-related SSOs, by developing and implementing a FOG Control Plan, standardizing procedures, training FOG inspectors, providing outreach and education to FOG-generating dischargers, and gathering data to help prioritize inspections, FOG-related sewer cleaning, and FOG-related enforcement. Work completed in 2014 and planned for 2015 includes:

- FOG Management Plan – The FOG Control Program Plan was submitted to EPA and Ecology on December 31, 2012. After the Consent Decree was filed in U.S. District Court, the FOG Control Plan was approved by EPA on September 5, 2013 and by Ecology on September 9, 2013. SPU is implementing the plan and will review it each year and update it as appropriate in order to continue focusing efforts on the worst FOG problems. The 2014 annual review did not result in any revisions.
- Food Service Establishment (FSE) Inventory Management Plan – In 2014, SPU focused on outreach and enforcement, and supplemented the existing food service establishment (FSE) inventory in the vicinity of inspection activity. Inspectors completed 454 regulatory FSE inspections and 1,108 inventory FSE inspections. These inspections include FOG education, data collection and, if it is the first visit to an FSE, an evaluation of FOG discharge risk. SPU is working on an overall FSE inventory management plan which it plans to complete in fourth quarter 2015.

- Standard Operating Procedures and Outreach Materials – SPU updated all FOG Control Program SOPs in 2013, including FOG Characterization, Inventory Inspection, Regulatory Inspection, Enforcement, Education and Outreach, Coordination, Linko Database, Hotspot Database, and FSE ID (identifying FOG hot spots in the wastewater collection system). Training on the various SOPS was provided at several of the 2014 bimonthly FOG inspector meetings. SPU also reviewed all outreach materials in 2014 and will update outdated contact information when materials are re-printed.
- FOG Inspector Training – 2014 FOG inspector training focused on review of FOG Program SOPs and information about plumbing fixtures. No new inspectors were hired in 2014.

3.2.4 Repair, Rehabilitation, and Replacement Initiatives

The purpose of the repair, rehabilitation, and replacement initiatives is to support timely, efficient, standardized identification and resourcing of sewer repair, rehabilitation, and replacement work. Work completed in 2013 and planned for 2014 includes:

- Repair, Rehabilitation and Replacement (3R) Process and Tool – SPU began developing the 3R Process and Tool in 2011. The tool was implemented in mid-2013 and fully utilized after Maximo 7 Reimplementation in September 2013. For all gravity pipes inspected using CCTV, the 3R Tool prioritizes 3R work by risk and tracks final 3R decisions and the status of decision execution. In 2014, SPU modified the 3R Tool to better align with existing business processes and developed a preliminary guideline for determining the appropriate 3R action (e.g. open cut repair, trenchless repair, full pipe replacement, full pipe trenchless, etc.). In late 2014, after working with this tool for several years, SPU identified several software upgrades needed to improve the user interface, improve the work flow between SPU branches and better integrate with SPU's Maximo 7 system. Upgrade of the 3R Tool will begin in 2015 and is likely to be completed during 2016/2017.
- Capital Improvement Plan and Workload Forecasting – In late 2013, SPU initiated a review of its Sewer Mainline Rehabilitation Program, including roles and responsibilities, decision making processes, procedures for prioritization of assets to be rehabilitated (3R Tool), use of pipe rehabilitation technologies, processes and procedures for crew rehabilitation work as well as contracting out rehabilitation work, and identification and use of metrics to measure program performance. An initial Capital Improvement Plan and Workload Forecast was completed in June 2014 and will be updated as the 2015-2020 Repair, Rehabilitation and Replacement Program is developed.

3.2.5 Condition Assessment Initiatives

The purpose of the condition assessment initiatives is to improve the quality and efficiency of force main assessments and sewer inspections by standardizing the procedures, providing crew training, measuring and tracking the quality of the work, and providing feedback to the crews. Work completed in 2014 and planned for 2015 includes:

- Force Main Assessment Strategy – SPU developed a Force Main Assessment Strategy in the first quarter of 2014 and began implementing the strategy in the second quarter of 2014. The strategy recommended the development of a business case evaluation to determine which force mains will benefit most from internal inspection technologies. This business case evaluation will be completed second quarter 2015.
- Acoustic Sewer Inspection Pilot Program – In 2014, SPU began piloting a new acoustic technology to assist in condition assessment. Two crews have each been provided with the two devices needed to pilot the technology. One device is a transmitter and the other is a receiver, and they are placed in adjacent maintenance holes from the surface. Sound waves of varying wavelengths are passed along the sewer between the two devices. Based on the amount of potential blockage within the pipe, the receiver provides a score of 0-10, where 10 reflects a completely clear pipe and 0 reflects a pipe that's completely blocked. The analysis takes only a few minutes per length of pipe between two maintenance holes, thus providing an efficient and cost-effective way to determine if a pipe needs immediate cleaning and allowing SPU to analyze significantly more footage of pipe per day. Based on the results of the pilot program, SPU will determine if the technology should be used on a more widespread basis.

3.2.6 SSO Response Initiatives

The purpose of the SSO response initiatives is to minimize the duration and effects of SSOs by standardizing response procedures, providing training, and ensuring the crews use the most appropriate and best available tools to contain and cleanup SSOs. Work completed in 2014 and planned for 2015 includes:

- Standard Operating Procedures – The Sanitary Sewer Overflow (SSO) Response SOP was finalized in the fourth quarter of 2013. All utility maintenance, analysis and reporting staff received training on the SOPs in 2014, starting with the Drainage & Wastewater First Response Crews.
- Tools and Equipment Usage Plans – SSO Response Tools and Equipment Usage Plans were finalized in the third quarter of 2014 and provided to all utility maintenance, analysis and reporting staff during the fourth quarter of 2014.
- Field Training Program – SPU implemented an SSO Response Field Training in the third quarter of 2014, beginning with 3 table-top exercises held in September.

3.2.7 Other CMOM Initiatives

As CMOM needs are identified, SPU has implemented additional initiatives beyond the ones that are included in the CMOM Performance Program plan. The purpose of these initiatives is to reduce the number of SSOs and/or improve SPU productivity, efficiency, or sustainability. Work completed in 2014 and planned for 2015 includes:

- SPU reviewed and updated the CSO Control Structure Inspection and Cleaning SOP in 2013 and began developing the CSO Control Structure Inspection and Cleaning Training Plan. Site specific job plans were completed in 2014. SPU will continually train staff as facilities come on line.
- SPU began developing the CSO Control Structure Inspection and Cleaning QA/QC Plan in 2013 and results were incorporated into site specific job plans.
- SPU began to evaluate the effectiveness of the Chemical Root Control Program in 2014, and will complete the evaluation in 2015.

3.2.8 SSO Performance

There were 66 sewer overflows in 2014, and they are summarized by cause in Table 3-3. Factors causing the greatest number of sewer overflows were extreme weather events (storms with recurrence intervals of at least 25 years), which caused 19 sewer overflows; roots in the sewer, which led to 10 overflows; vandalism and gravity sewer structural deficiencies, each of which caused 6 overflows; City construction activities, which caused 5 overflows; and private construction activities, which caused 4 overflows. Factors causing very low numbers of sewer overflows were FOG, debris, pump station mechanical issues, system operator error, issues originating in private side sewers, and other agency construction activities. Factors that caused no sewer overflows in 2014 included pump station capacity, power outages, force main structural deficiencies, maintenance worker error, and new facility startup issues.

Table 3-3. 2014 Sewer Overflows by Category

Category	Primary Cause of Sewer Overflows	Number of 2014 Sewer Overflows
1	Roots	10
2	FOG	2
3	Debris	2
4	Structural – gravity	6
5	Structural – force main	0
6	Capacity	7
7	Pump Station – mechanical	1
8	Pump Station - capacity	0
9	Power Outages	0
10	Operator Error	1
11	Maintenance Error	0
12	City Construction	5
13	New Facility Startup	0
14	Private Side Sewer Issue	2
15	Private Construction	4
16	Other Agency Construction	1
17	Vandalism	6
18	Extreme Weather Event	19
	Total for Categories 1 – 18	66
	Total for Categories 1 – 14	36

SSO performance for the years 2012 through 2014 is summarized in Table 3-4. SSO performance measures the effectiveness of SPU's CMOM Performance Program Plan and helps ensure SPU is focusing its efforts on activities that help prevent sewer overflows. For these reasons, the SSO performance calculation excludes sewer overflows that are beyond SPU's ability to control, including sewer overflows caused by extreme weather events (for example, rainfall with a recurrence interval of 25 years or more), other agency construction, private construction, and vandalism. This table shows that SPU is continuing to operate in the high-performing band of utilities (less than or equal to 4 SSOs per 100 miles per year).

Table 3-4. 2012-2014 SSO Performance

Year	Number of SSOs[1]	SSOs/100 Miles of Sewer[2]	2-Year Average SSOs/ 100 Miles of Sewer
2012	55	3.9	NA
2013	40	2.8	3.3
2014	36	2.5	2.7

1. Numbers in this column include only the sewer overflows included in the SSO performance calculation and exclude sewer overflows caused by extreme weather events, other agency construction, private construction, and vandalism.
2. SPU has 1,421 miles of sewers.

In order to remain in the high performing utility band and continue reducing the annual number of SSOs, SPU analyzes each SSO and identifies appropriate follow-up actions, including system modifications and/or increased maintenance where appropriate. SPU also reviews SSO data on an ongoing basis, looking for any patterns or trends. At least a third of the SSOs in each of the last three years were caused by roots, FOG, and/or debris. CMOM initiatives such as the COTools, FOG Inspection & Enforcement Program, and Chemical Root Control Program were identified and implemented to reduce these types of SSOs.

SPU has maintained a Chemical Root Control Program for the past 9 years and has continued to refine and expand this program as experience and knowledge of chemical (herbicide) effectiveness grows. During the first 8 years, the Chemical Root Control Program focused on one herbicide and on specific areas of the City with larger and denser concentrations of “legacy” trees. In 2014, SPU conducted an analysis to determine if any program changes were warranted. The analysis identified approximately 700 pipes with multiple intrusion sites, making them good candidates for chemical root control. Of these 700 pipes, approximately 370 are not part of the current chemical root control program and are scheduled for cleaning every 24 months or less frequently. These pipes are potential candidates for either more frequent cleaning or inclusion in the chemical root control program. In addition, 45 pipes in the chemical root control program show no evidence of root intrusion based on CCTV inspection; these pipes will be removed from the chemical root control program. In 2015, SPU plans to continue the current root control program while analyzing the resources required to implement an expanded program; the analysis will include reviewing both SPU and contractor resources.

3.3 FOG Control Program Activities

In 2014, FOG Control Program staff worked with both residential and commercial customers to reduce the amount of FOG discharged into the wastewater collection system. Inspectors concentrated on regulatory Food Service Establishment (FSE) inspections, completing inventory inspections in nearby areas.

The regulatory inspections were conducted in thirty-nine (39) identified FOG impacted areas. These include areas that experienced FOG related Sanitary Sewer Overflows (SSOs) and areas where sewer mainlines require frequent maintenance due to FOG. Two new hot spots were analyzed for maintenance, structural issues, and FOG sources. FOG sources in these areas were inspected for compliance with the Seattle Municipal Code FOG requirements.

Inspectors completed 454 Regulatory FSE Inspections. These inspections resulted in numerous Correction Notices (enforcement actions), including:

- 60 requiring grease interceptor maintenance,
- 74 requiring installation of grease interceptors and plumbing modifications,
- 23 requiring implementation of kitchen best management practices, and
- 1 requiring only a plumbing modification.

Of the 74 FSEs issued correction notices requiring installation of grease interceptors, 59 installed grease interceptors in 2014. Another 11 FSEs are in the process of installing grease interceptors, and 4 FSEs went out of business.

Inspectors also completed 1,108 inventory inspections in non-hot spot related areas. These inspections include FOG education, data collection and, if it is the first visit to an FSE, an evaluation of FOG discharge risk. The information gathered is used to establish the priority and future inspection frequency.

Inspectors also conducted door to door residential outreach in residential areas located within FOG hot spots. In 2014, the team was able to conduct outreach to single family dwellings and multi-family properties in four of the five areas that experienced FOG-related sewer overflows.

2015 FOG Control Program efforts will continue to focus on conducting regulatory inspections with progressive enforcement, completing all FSE inventory inspections, and outreach in areas having non-commercial land uses.

3.4 Annual Review of Operations and Maintenance Manuals

In 2014, SPU reviewed all Drainage and Wastewater (DWW) Operation and Maintenance (O&M) SOPs and Job Plans and revised the Sewer Overflow Response SOPs.

In addition, SPU began preparing O&M manuals for the new operable CSO storage facilities at Windermere and Genesee. These manuals will be submitted to Ecology and EPA in 2015.

3.5 Floatable and Solids Observation Program Activities

From 2008 through 2014, SPU conducted a Floatables and Solids Observation Program, looking for the presence of floatables and solids in its CSO discharges. The first few years of the program relied on human observations, which proved challenging during storm events. Since 2011, SPU has conducted overflow observations using cameras temporarily located in CSO overflow structures. SPU's goal is to observe three overflow events at a given CSO overflow structure before moving the camera to the next CSO structure selected for observation.

In 2011 and 2012, SPU observed three overflow events at Outfalls 150 and 152 in the Ballard area and two overflow events at Outfall 44, which extends from the southwest corner of Seward Park. No floatables were observed at Outfall 152. At Outfall 150, occasional small floatables were observed during each of three CSO events, each time in minor quantities. At Outfall 44, 18 small bits of material were observed during one of the two CSO events. On January 8, 2013, SPU captured a third overflow event at Outfall 44. No solids or floatables were observed in 36 minutes of video.

After capturing a third overflow event at CSO 44, SPU temporarily installed a sewer camera in the overflow structure at Outfall 43, located in the Genesee area. The purchase of another sewer camera allowed SPU to also install a camera in the overflow structure at Outfall 29, located in the Leschi area. During 2013, SPU collected video of two overflow events each for Outfalls 43 and 29. During almost 73 minutes of video for the four observed events, no solids or floatables were observed. At the start of 2014, cameras remained in the overflow structures for Outfalls 29 and 43 to capture third overflow events. No floatables were observed in the 2014 overflows at these locations with the exception of 1 small floatable observed in the overflow event on March 5th at Outfall 43.

Once a third overflow was recorded at Outfall 29, the sewer camera was moved to the overflow structure for Outfall 49. This camera captured three overflow events in February and March. Minor amounts of occasional small floatables were observed in those overflow events.

The second sewer camera was placed in the overflow structure for Outfall 99 after the third overflow was recorded at Outfall 43. One overflow event was captured by video on November 28, 2014. Occasional small floatables were observed overflowing the lower weir to the storage chamber. No floatables were observed overtopping the high weir flowing to the outfall in approximately 44 minutes of video.

As no significant floatables have been observed in CSO overflow events during SPU's seven years of observation activities, SPU concluded its floatables observation program at the end of 2014. Figure 3-4 displays the overflow locations observed since the start of the observations in 2008. The 2014 sewer camera observations are summarized in Table 3-5.

Table 3-5. 2014 Sewer Camera Observations and Results				
Outfall No.	**Receiving Water Body**	**Observation Date**	**Video Length (minutes)**	**Solids/ Floatables Observed?**
29	Lake Washington	1/11/2014	15:41	No
49	Lake Washington	2/16/2014	32:00	Yes
43	Lake Washington	3/5/2014	31:51	Yes (1 piece)
49	Lake Washington	3/5/2014	33:57	Yes
49	Lake Washington	3/8/2014	39:57	Yes
99	Duwamish	11/28/14	43:58	Yes (to storage only)

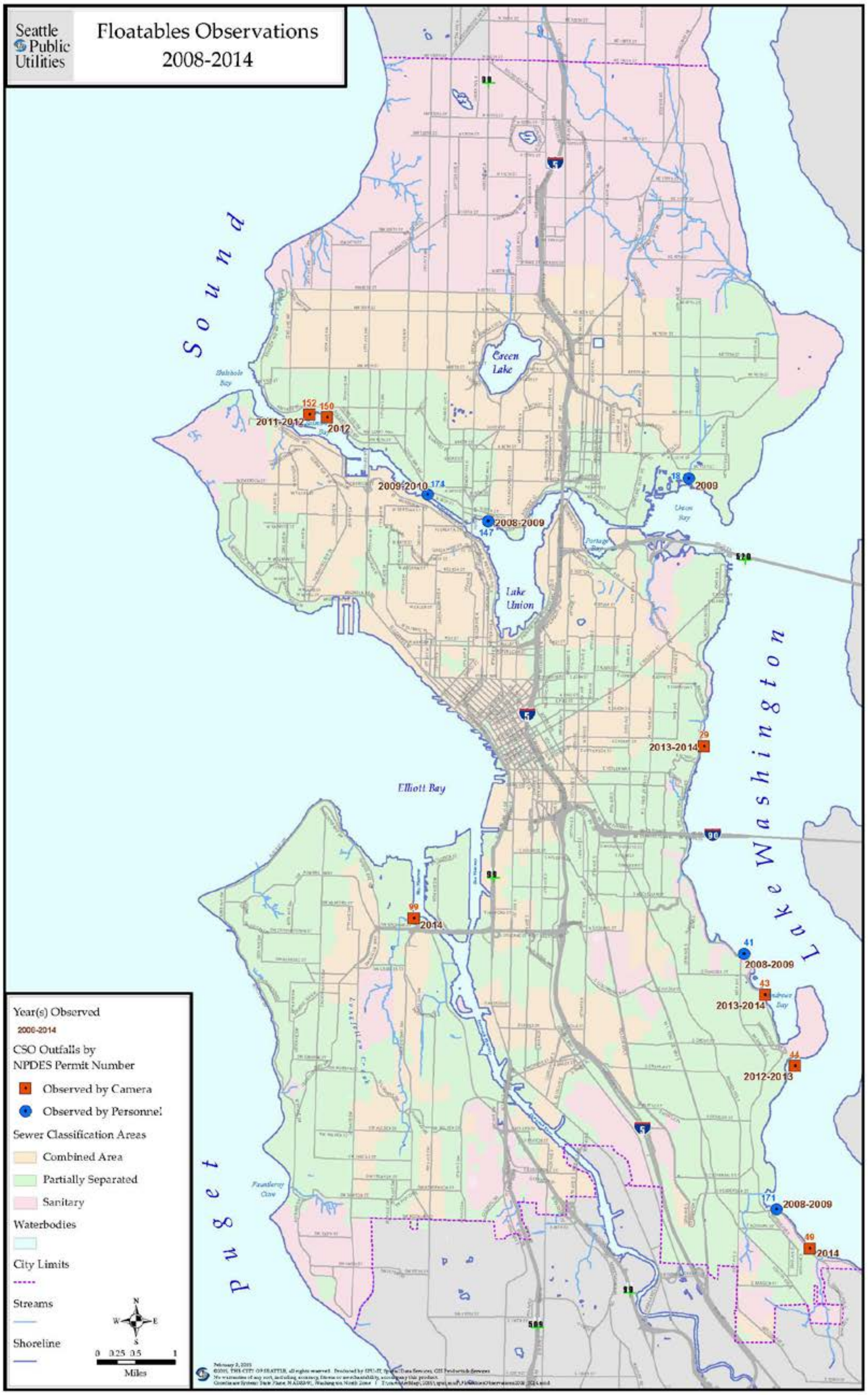


Figure 3-4. Observation Locations – Floatables and Solids Observation Program

SECTION 4

Capital Activities

This section describes capital projects and related activities SPU is undertaking to reduce the number and volume of sewage overflows, including progress made in 2014 and work that we plan to complete in 2015.SPU is continuing to apply a program management model to oversee and direct the delivery of capital projects. During 2014, SPU used the Project Control System (PCS) to proactively monitor and control scope, schedule, and budget on each of its major sewer overflow reduction projects. In addition, SPU applied considerable attention to managing cost and schedule and applying lessons learned across capital projects. 2014 project spending is summarized in Table 4-1.

Table 4-1. 2014 CSO Project Spending

Project Name	Amount Spent
Long-Term Control Plan	$1,769,796
Integrated Plan	$314,074
Delridge Retrofit	$700,135
Leschi Retrofits	$812,244
Other Retrofits	$702,073
Ballard Roadside Raingardens	$723,370
Delridge Roadside Raingardens	$1,029,757
RainWise	$971,132
Windermere CSO Reduction Project	$9,855,314
Genesee CSO Reduction Project	$12,530,894
North Henderson CSO Reduction Project	$3,191,464
52nd Ave S Conveyance Project	$1,999,719
Pump Station 9 Rehabilitation Project	$190,373
South Henderson CSO Reduction Project	$894,199
Central Waterfront CSO Reduction Project	$298,786
Ballard-Fremont-Wallingford Storage Project	$2,571,562
Outfall Rehabilitation Program	$1,185,000
Total	$39,739,891

4.1 Retrofits and Flow Diversion Program

SPU made significant progress on a variety of combined sewer system retrofit projects in 2014, as summarized in the following paragraphs.

4.1.1 Windermere Retrofit (Basin 13)

The NPDES permit required that SPU construct a retrofit in the Windermere area by December 31, 2012, to reduce the number and volume of sewage overflows at Outfall 13. The retrofit within Basin 13 consisted of removing the HydroBrake and replacing the device with an automated slide gate. The automated slide gate modulates based on the sewer system level downstream to balance the discharge from Basin 13 and use of the storage system. This improvement increases utilization of the existing system storage and maximizes flow to the system downstream. SPU completed construction of the improvements in Summer of 2012 and optimized gate operation during 2013. Post-project performance monitoring conducted during 2013 and 2014 has shown that the new gate and optimizations were successful.

4.1.2 North Union Bay Retrofit (Basin 18)

The North Union Bay Area is located in the University District near the Burke-Gilman Trail. Retrofit work in this area has occurred in two different sub-basins: 18A and 18B.

Sub-Basin 18A

Flow monitoring data indicated that the HydroBrake associated with the overflow structure from Sub-basin 18A was not operating in accordance with its design performance curve. The HydroBrake was prematurely restricting higher flows resulting in more frequent CSOs. In addition, only about half of the available storage in the 141,000 gallon in-line detention pipe could be utilized due to weir and side sewer elevations.

During 2012, design and construction were completed for a retrofit that included the following:

- Raised the overflow weir to maximize storage,
- Constructed a new sewer that conveys flows from the local side sewers away from the CSO Facility (allowing the storage to be safely and fully utilized), and
- Augmented the HydroBrake discharge by adding a slotted opening above the HydroBrake. The combination of the slotted opening and HydroBrake discharge are intended to match the design performance curve and bring this basin into compliance with SPU’s long term goal of an average of no more than one overflow per year.

In 2013 and 2014, SPU monitored the post-project performance of the Sub-basin 18A retrofit. Figure 4-1 shows the 2013-2014 monitoring results. The performance of the retrofit during different storm events aligns well with the design curve.

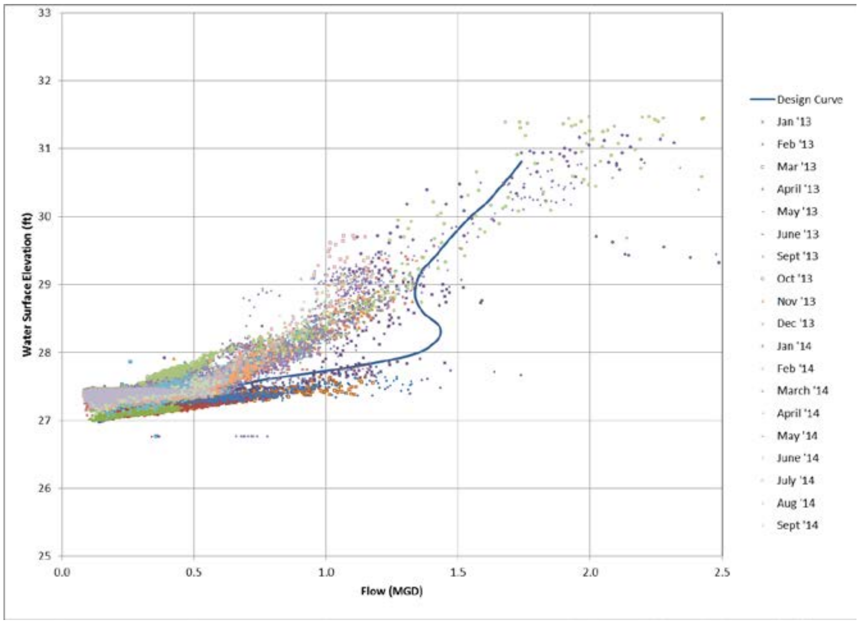


Figure 4-1. Sub-Basin 18A 2013-2014 Monitoring Results

Sub-Basin 18B

Similar to Sub-basin 18A, the existing HydroBrake in Sub-basin 18B is not performing in alignment with its design performance curve. The retrofit consists of replacing the HydroBrake with an automated slide gate. Design of a retrofit at the overflow structure for Sub-basin 18B took place in 2014 and construction of the retrofit is anticipated to be completed by October 2015.

4.1.3 West Seattle Retrofit (Basin 95)

This retrofit project extended an existing storm drain along Fauntleroy Way SW to collect additional road surface runoff. Diverting road surface runoff frees up capacity in the combined sewer system during storm events and will reduce the frequency of CSOs from this small basin to an average of no more than one overflow per year. The project was completed in the first half of 2013. Post-project performance monitoring in 2013 and 2014 indicates that the basin is controlled.

4.1.4 Delridge Retrofit (Basins 168, 169)

During 2012, SPU completed a detailed analysis of retrofits in the Delridge Area (Basins 168 and 169). The selected retrofits will optimize the performance of CSO Facilities 2 and 3 by replacing existing HydroBrakes with improved upstream diversion structures, actively controlled valves, and an upstream and downstream flow monitoring system. The new system is anticipated to reduce the frequency of surcharging in the downstream sewer system and reduce CSOs at Outfalls 168 and 169. In addition, the improvements will reduce the need for preventive maintenance and the frequency of unscheduled maintenance. The design of these retrofits was completed in 2014. Construction of the retrofits started in February of 2015 and will be substantially complete by the NPDES permit deadline of November 1, 2015.

4.1.5 Henderson Retrofits (Basins 47, 49)

The NPDES permit required that SPU complete construction of Henderson retrofits for Basins 47 and 49 by November 30, 2015. SPU completed design and construction of retrofits at Overflow Structure 47C and Outfall 49 in in 2013.

The retrofit for Basin 47 consisted of raising the overflow weir in Overflow Structure 47C to maximize storage as well as improve access to the overflow structure. Figure 4-2 below shows the new raised weir.

Figure 4-2. Retrofit Improvements At Overflow Structure 47C

The retrofit for Basin 49 consisted of:

- Lowering the weir in Overflow Structure 49 and re-adapting it with a Cipoletti style weir, and
- Removing an existing HydroBrake and replacing the device with an orifice plate to maximize flow to the downstream system and use storage more efficiently.

Figure 4-3 below shows the newly installed orifice plate over the entrance of the 12" outlet pipe.

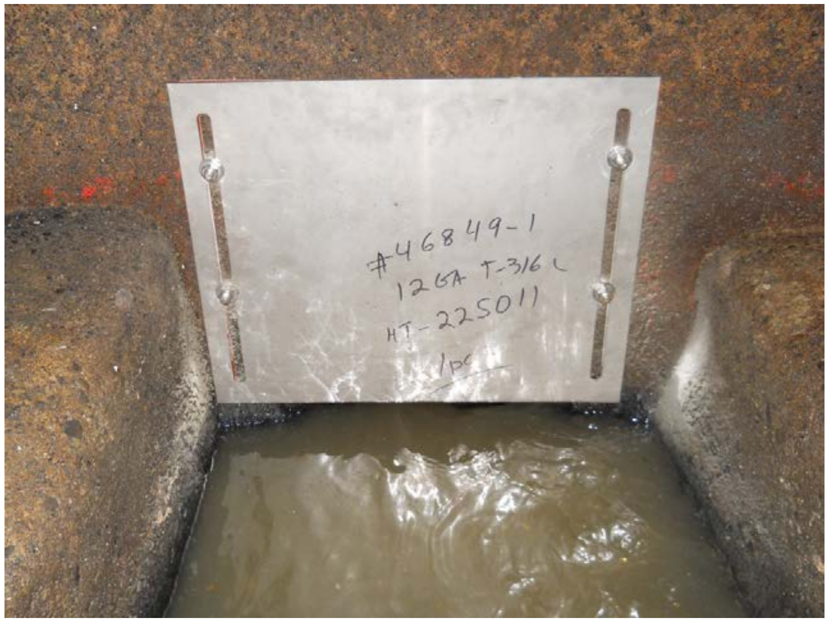


Figure 4-3. Orifice Plate installed over 12-inch pipe in Basin 49

Post-project performance monitoring of each retrofit started in 2014 and will continue through 2015. Figure 4-4 shows the 2014 monitoring results for the newly installed orifice plate. As can be observed, the performance of the orifice is in general alignment with the design curve. In 2015 the plate may be adjusted to further optimize the performance of the orifice.

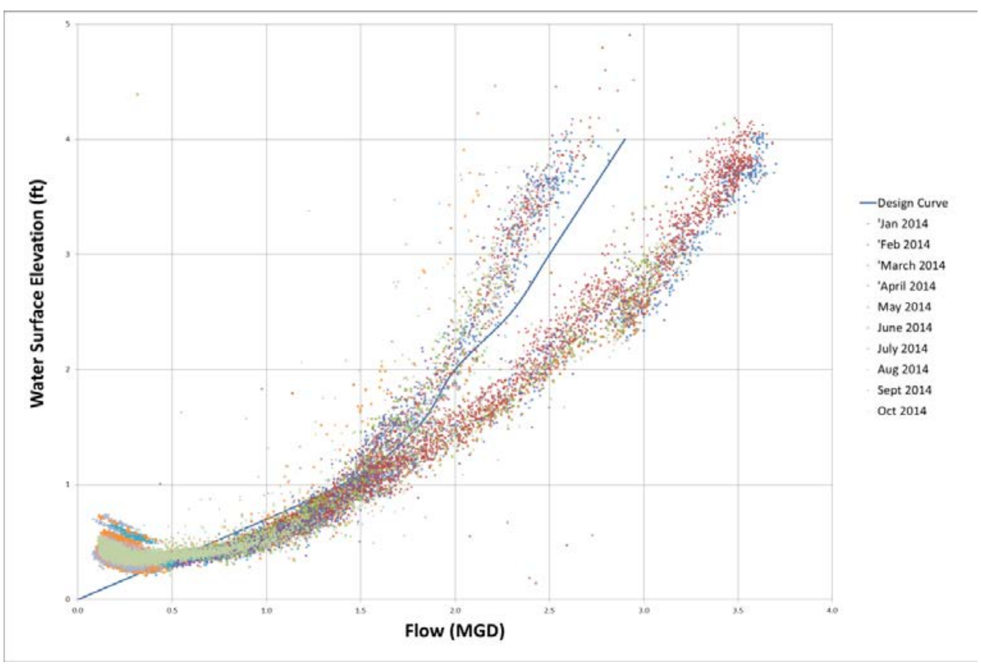


Figure 4-4. Basin 49 Orifice Plate 2014 Monitoring Results

4.1.6 Leschi Retrofits (Basins 26 – 36)

The Leschi Area is in east Seattle bordering Lake Washington, and is comprised of Basins 26 through 36. Over a dozen individual retrofit opportunities have been identified in this area as part of the LTCP planning efforts. The retrofit opportunities are being managed as a single project because each basin is connected hydraulically with upstream and downstream basins, and the impact of each individual retrofit will need to be considered in the context of other connected basins. The project is divided into two phases: Phase 1, which went into construction during 2014 and will be completed by the end of first quarter 2015, and Phase 2, which is currently in design and will be constructed by first quarter of 2016.

Phase 1

During 2014 the following improvements were made as part Phase 1:

- Raised the overflow weirs at CSO Outfalls 34, 30, and 29 by 1 foot,
- Sealed Overflow Structure 32B and removed CSO Outfall 26 from service, and
- Removed the HydroBrakes at Overflow Structure 32B and Outfall 33.

Figures 4-5 and 4-6 show some of the constructed improvements that are a part of the Phase 1 Leschi Retrofits. The only remaining improvement of Phase 1 is replacement of two existing pumps at Pump Station 2. This will be completed by the end of the first quarter of 2015.

Figure 4-5. Outfall 29 Raised Weir Installation

Figure 4-6. Outfall 30 Raised Weir Installation

Phase 2

Phase 2 improvements are on schedule to be constructed starting in the third quarter of 2015 and include the following:

- Replace approximately 1,500 linear feet of combined sewer,
- Reline approximately 3,000 linear feet of combined sewer,
- Install a low flow diversion structure in Basin 35,
- Seal the overflow structure to CSO Outfall 33 and remove CSO Outfall 33 from service, and
- Remove the HydroBrakes in Basins 33 and 29.

4.1.7 Duwamish (Basin 111)

The Duwamish Basin (111) retrofit project consists of raising the overflow weirs located in MH 056-270 (Overflow Structure 111B) and MH 056-365 (Overflow Structure 111C). These improvements were constructed in 2014 and post-project performance monitoring will be conducted until late 2016.

4.1.8 Madison Park (Basin 22) Pump Station 50 Airlift Replacement Project

Basin 22 is located in the Madison Park area. Combined sewage from the basin flows by gravity to Pump Station 50, located at the north end of 39th Avenue East. Pump Station 50 is an airlift-type pump station that in recent years has underperformed and had recurring reliability and maintenance issues. In 2014 the decision was made to replace the airlift-type pumps with submersible pumps. The project will include new pumps, piping, valves, and new electrical and

SCADA equipment. The project will also include upgrades to the overflow structure and new valve vaults. Design was initiated in mid 2014 and will proceed through 2015. Construction is anticipated to be completed in 2016.

4.1.9 Future Retrofit Projects (Magnolia Basin 60 and Montlake Basins 139 and 140)

In 2013 and 2014 SPU analyzed retrofit and flow diversion alternatives in each of the Magnolia (Basin 60) and Montlake (Basins 139 and 140) areas. Further analysis will be completed in 2015, and preferred alternatives will be selected by the end of 2015.

4.2 Green Stormwater Infrastructure

The term green stormwater infrastructure (GSI) describes a variety of measures that use soil to absorb stormwater or slow the rate of stormwater entering the sewer system. Green solutions control the sources of pollution by slowing, detaining, or retaining stormwater so that it does not carry runoff into nearby waterways. This reduces the volume and timing of flows into the system. GSI facilities also are referred to as natural drainage systems (NDS) and they are a type of low impact development (LID). Examples of GSI include:

- RainWise – City of Seattle program that provides homeowners with rebates for installing rain gardens and cisterns on their own property.
- Roadside rain gardens – Deep-rooted native plants and grasses planted in a shallow depression in the public right-of-way, such as the planting strip adjacent to homes.

SPU’s goal is to use green solutions to the maximum extent feasible to reduce CSOs.

4.2.1 RainWise Program

Since 2010, RainWise has offered rebates to residents living in the combined sewer areas of the Ballard neighborhood of Seattle. Eligible homeowners were alerted through regular mailings, public meetings, media events, and an annual tour. By logging onto the RainWise website at www.rainwise.seattle.gov, property owners are able to learn about green stormwater technologies and are presented with solutions appropriate to their property. Through this site, they are also able to contact a trained contractor marketplace.

Since 2009, over 500 contractors, landscape designers and similar professionals have been trained in the program. Each year, the program offers two training opportunities for interested contractors to enter the program. There are 54 active contractors listed on SPU’s website that are available to bid and install systems for RainWise customers. In 2014, contractor fairs were offered to connect interested participants with participating contractors. Additionally, SPU and its community partners offered several opportunities to talk with satisfied participants and meet contractors.

Upon completion, installations are inspected by a RainWise inspector and homeowners apply for rebates. RainWise rebates for rain gardens are currently three dollars and fifty cents per square foot of roof area controlled. Rebates for cisterns equal 64% or more of the rain garden rate, depending on the size of the cistern and contributing area. The average 2014 installation now controls the runoff from over 1,300 square feet of roof area. Typical RainWise installations are shown in Figure 4-7.

Figure 4-7. Raingarden (left) and Cistern (right)

In 2014, the RainWise program completed 82 projects in the Ballard, North Union Bay, Delridge, Fremont, Henderson, Montlake, and Windermere basins. Since program inception, 408 installations have been completed. These installations control approximately 11.7 acres of impervious roof area and an estimated 6.9 million gallons (MG) per year of stormwater, and provide an estimated 121,000 gallons of CSO control volume.

In an effort to reach historically underserved communities, an equity inclusion pilot was undertaken in the Delridge, Genesee and Henderson basin to explore best practices for involving these communities in RainWise. As a result of the effort, 38 installations were started, and valuable information for further outreach efforts was gained.

The RainWise program continues to operate under a memorandum of agreement with King County to make RainWise rebates available to customers located in CSO basins that are within the City of Seattle and under the County’s jurisdiction in Ballard/West Phinney, Highland Park, Barton, and South Park. They completed 146 installations in 2014, controlling approximate 5.45 acres of impervious roof area and 2.2 MG per year of stormwater.

4.2.2 Ballard Roadside Raingardens

In August of 2012, SPU began developing and analyzing alternatives for the Ballard Natural Drainage System 2015 (Ballard NDS 2015) project. This project is the next NDS project in Ballard, building on the experience from the first Ballard NDS project constructed in 2010, and providing roadside raingardens on up to 17 blocks.

Work completed in 2014 includes the following:

- SPU shared the 30 percent design with the community and received feedback on preferences for plant palettes.
- Cost estimates showed that the original concrete vertical wall design was too expensive, so the project team developed a new concept using modular soil cells (see Figure 4-8), which reduced costs and reduced the number of raingarden cells required along each block.
- The 60 percent design was completed at the end of 2014.

Design will be completed in Spring 2015, followed by the start of construction in the Summer/Fall of 2015.

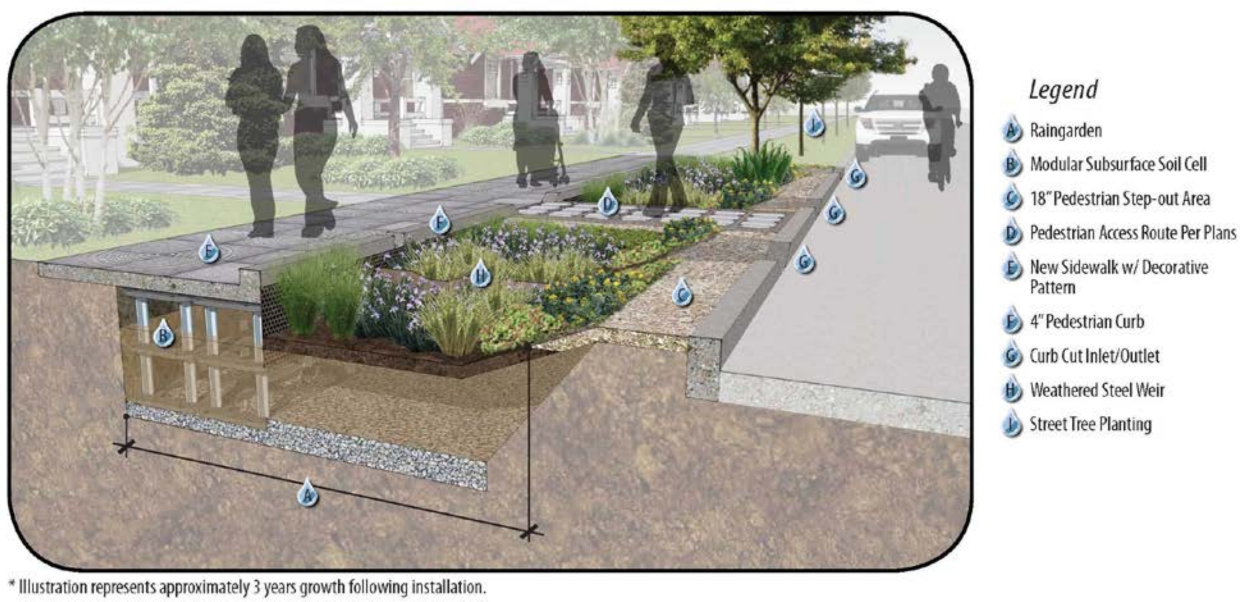


Figure 4-8. Ballard NDS 2015 Proposed Modular Soil Cells

4.2.3 Delridge Roadside Raingardens

SPU began developing and analyzing alternatives for the Delridge NDS 2015 project in August 2012. This project will use roadside raingardens in the public right-of-way to help reduce combined sewer overflows into Longfellow Creek. Public engagement efforts and extensive geotechnical analyses in 2012 and 2013, along with coordination with Seattle Department of Transportation (SDOT) to co-locate neighborhood greenways, allowed the proposed alignment of the raingardens to be identified in early 2014. The majority of the work in 2014 focused on design, taking a conceptual layout for the proposed raingardens in February 2014 to 60 percent design in November 2014.

The refined design for Delridge NDS includes raingardens connected with underdrains that convey cleaned waters to medium-depth infiltration wells (30-40' deep). These drilled drains are similar to underground injection control (UIC) wells, and provide infiltration to the advance outwash layer below glacial till. The current design coordinates siting of individual raingarden cells within existing landscape strips to minimize conflicts with utilities, driveways and trees, while maximizing the possible control of surface water within these catchment areas. Design will be completed in the second quarter of 2015, and construction is slated to begin in 2015 and extend into 2016.

Figure 4-9. Delridge NDS 2015 Conceptual Drawing

4.3 Windermere CSO Reduction Project

The Windermere CSO Reduction Project will reduce the number and volume of sewage overflows from Outfall 13. The project is being constructed near Magnuson Park on the south side of NE 65th Street. It includes a 2.05 million gallon (MG) storage tank, facility vault, and motor-operated gates to control the flow of wastewater into the tank. Flow will be diverted to the storage tank through a 2,250-foot-long gravity sewer located in NE 65th Street and Sand Point Way NE. After a storm has passed, the wastewater will be pumped back to the sewer system through a parallel discharge force main.

In March 2011, SPU hired a General Contractor/Construction Manager (GC/CM) to conduct value engineering and constructability reviews and to assist with preconstruction in order to facilitate an early start to construction. Construction began in October 2012.

In 2013, SPU constructed the floor slab, walls and columns for the new storage tank and installed 1,400 feet of conveyance pipe in Sand Point Way. In 2014, SPU constructed the roof and then backfilled the storage tank; installed the remaining 700 feet of conveyance pipe in NE 65th St; installed the mechanical, electrical, and instrumentation equipment in the tank and the facility vault; and completed system and operational testing. Final commissioning of the Windermere system (including Windermere CSO 22 and 22A) is scheduled to be complete in Spring 2015.

Figure 4-10. Windermere CSO Reduction Project Construction, February 2015

4.4 Genesee CSO Reduction Project

The Genesee CSO Reduction Project will reduce the number and volume of sewage overflows from Outfalls 40, 41, and 43. The project is being constructed in two parking lots along Lake Washington Boulevard S at 49th Avenue S and at 53rd Avenue S. It includes a 380,000 gallon storage tank and a 120,000 gallon storage tank. Each will have a facility vault, diversion sewer, and a force main with motor-operated gates to control the flow of wastewater similar to Windermere.

Construction began in April 2013 using the General Contractor / Construction Manager delivery method. In 2013, SPU installed shoring, carried out excavation, and began constructing the underground storage tanks, facility vaults, and site utilities. In 2014, SPU completed the buried concrete storage tank and facility vault structures, most of the mechanical and electrical components, and part of the piping modifications to connect the local sewer system to the new tanks. In 2015, SPU will complete construction of the local sewer system modifications, surface restoration, and testing and commissioning of the new facilities. Construction of the project is scheduled to be completed in the second quarter of 2015, well ahead of the regulatory requirement.

Figure 4-11. Genesee (CSO 11A) CSO Reduction Project Construction, July 2014

Figure 4-12. Genesee (CSO 9A) CSO Reduction Project Construction, September 2014

4.5 North Henderson CSO Reduction Project (Basins 44, 45)

The North Henderson CSO Reduction Project will reduce the number and volume of combined sewage overflows from Outfalls 44 and 45. As part of this project, SPU plans to construct a storage facility in Seward Park and make more modest improvements adjacent to Martha Washington Park.

In 2013, SPU completed the 60 percent design and completed the selection process for a General Contractor/Construction Manager (GCCM). In 2014, SPU completed final design of the project, completed the draft Construction Quality Assurance Plan, obtained all necessary permits and approvals, and signed a construction contract using the GC/CM delivery method.

In 2015, SPU will complete the final Construction Quality Assurance Plan and begin construction of the project. Construction completion is anticipated in the second quarter of 2017, well ahead of the regulatory requirement for construction completion. 2015 construction activities include:

- Installation of the shoring system for the tank in Seward park and begin excavation,
- Replacement of the existing outfall pipe in Basin 44,
- Construction of piping improvements in Basin 45 (will be completed early 2015).
- Continued updates to the community.

4.6 52nd Ave S Conveyance Project (Basins 47, 171)

The 52nd Ave S Conveyance Project will reduce the number and volume of combined sewage overflows from Outfalls 47 and 171 in the South Henderson area.

In 2014, SPU awarded the construction contract, installed the new piping and structures, restored disturbed surfaces, and put the new pipeline into service. Final construction completion will occur in 2015 as the contractor completes work with the associated Mapes Creek Restoration project. In addition, SPU will create record of construction drawings and begin post construction monitoring

Figure 4-13. 52nd Ave S Conveyance Project Construction, April 2014

4.7 Pump Station 9 Rehabilitation Project (Basin 46)

The Pump Station 9 Rehabilitation Project will reduce the number and volume of combined sewage overflows from Outfall 46 in the South Henderson area. SPU is replacing the existing pumps with two higher capacity pumps. SPU submitted the final design drawings and the construction quality assurance plan to Ecology for review in 2014. All required construction permits have been obtained and the contract has been awarded. SPU expects to complete construction in the third quarter of 2015.

Figure 4-14. Pump Station 9 Rehabilitation Project

4.8 South Henderson CSO Reduction Project (Basin 49)

SPU first analyzed Basin 49 combined sewer flows and capacity beginning in 2008, as part of an analysis of the entire South Henderson Area (Basins 46, 47, 48, 49, and 171). Flow monitoring and modeling completed between 2008 and 2010 indicated that the basin's control volume was small (0.16 MG) and that retrofit projects would control the basin. In 2012 and 2013, retrofits were completed in the basin (see Section 4.1.5 Henderson Retrofits) and were instrumental in improving the accuracy of the estimated control volume. Subsequent monitoring and modeling completed in 2013 revealed the need for a significantly larger control volume (approximately 0.80 MG). Consequently, an additional CSO reduction project was developed to control Basin 49.

SPU initiated planning on the Henderson 49 CSO reduction project in 2013 and completed options analysis in 2014. The preferred option is to construct storage. In 2015 SPU will further evaluate the geometry and configuration of the storage tank. Design of the new storage tank is anticipated to begin in 2018. SPU has committed to achieving controlled status for Basin 49 by December 31, 2025.

4.9 Shared West Ship Canal Storage Project

The Plan to Protect Seattle's Waterways identified a shared storage option at the west end of the Ship Canal as the recommended option for controlling CSOs from the Wallingford, Fremont and Ballard areas as well as the King County's overflows 3rd Avenue West and 11th Avenue Northwest outfalls. Evaluation of this option is proceeding in parallel with the approval of the Plan in order to meet Consent Decree deadlines.

In 2014, SPU contracted for additional program management support services, assessed project delivery risks, completed a peer review assessment, updated cost and schedule estimates, completed initial geotechnical investigations, completed initial site surveys, initiated acquisition of the properties needed to construct the storage facility, began developing coordination and cost-sharing agreements with King County, inspected the pier at the end of 24^{th} Ave NW as a potential site for loading tunneling spoils onto barges, began the procurement process for communications support, and initiated interdepartmental coordination with SDOT, Parks and Seattle City Light.

In 2015, SPU will complete the development of coordination and cost-sharing agreements with King County, develop a Project Management Plan, undertake additional geotechnical investigations, draft a Facility Plan and Supplemental EIS, procure consultant design services, begin community outreach, and complete the purchase of property in Ballard.

4.10 Central Waterfront CSO Reduction Project

In 2012, SPU determined that a manifolded conveyance system linking Outfalls 70 (University), 71 (Madison), and 72 (Washington) would allow for decommissioning of Outfalls 70 and 72, with their respective basins discharging any CSOs via Outfall 71. Upsizing the manifolded pipe by one size over that required for conveyance only would provide enough incremental storage to bring all three outfalls under control without needing to route any additional peak flows to King County.

SPU is continuing to work with SDOT to coordinate construction of this CSO control project with SDOT's Waterfront Seattle program. Design will be completed in 2014 and 2015, and construction will be completed between 2016 and 2018.

Outfall 69 (Vine) will be addressed as a separate project, to be constructed in coordination with SDOT's Elliott Bay Seawall Project – North Section, currently scheduled in 2020.

4.11 Pump Station Backup Generator Program

SPU's pump stations fall into two categories:

Those that have generators installed on site to provide power in the event of a power outage, and

Those that have emergency plugs for hooking up portable generators.

At the time the Pump Station Power Backup Program was initiated in 2008, seventeen stations had permanently installed on-site generators and the remainder either had emergency plugs or required hard wiring to portable generators. At the pump stations with generators, if there is a power outage there is no loss of function and operations and maintenance crews do not need to respond. At the pump stations with emergency plugs, if there is a power outage crews need to respond, but the pre-wired emergency plugs generally decrease the amount of time it takes to provide alternative power.

In 2010, SPU installed emergency plugs at all wastewater pump stations without permanent generators. From 2011 through 2013, SPU installed permanent generators at nine additional pump stations having peak daily flows over 1 MGD, short wet well storage times (less than 1 hour during peak flow), and a history of crews needing to respond to power outages. Permanent generators were installed at five locations in 2011 (Pump Stations 7, 25, 43, 49, and 59), an additional three locations in 2012 (Pump Stations 62, 63, and 77), and one final location in 2013 (Pump Station 39). SPU completed the landscaping work at Pump Station 39 in April 2014.

Figure 4-15. Pump Station 39 Backup Generator

4.12 Outfall Rehabilitation Program

The current NPDES permit requires that SPU complete repairs on Outfalls 150 by December 31, 2014 and complete repairs on Outfalls 31 by November 1, 2015.

Outfall 150 had deteriorated under an existing pedestrian pier. The Outfall 150 rehabilitation project replaced the existing maintenance hole just upstream of the shoreline and installed a replacement outfall comprised of approximately 50 feet of 30-inch diameter epoxy-coated ductile iron pipe and approximately 110 feet of 30-inch diameter high-density polyethylene (HDPE) outfall pipe. The work was completed in December 2014. As mitigation, SPU is required to install flap gates on two nearby storm drainage outfalls: Outfalls 181 and 183. The mitigation work is expected to be completed by Fall 2015.

Outfall 31 had issues with tree root intrusion and damage caused during the installation of the breakwater for Leschi Marina. The Outfall 31 rehabilitation project replaced the existing outfall with an 8-inch diameter high density polyethylene (HDPE) pipe. The land-based portion of the new HDPE pipeline was installed in the same horizontal and vertical alignments as the existing outfall pipe using trenchless pipe-bursting technology. The construction was completed in February 2015.

Figure 4-16. Outfall 150 Rehabilitation Project

Figure 4-17. Outfall 31 Rehabilitation Project

SECTION 5

Monitoring Programs and Monitoring Results

This section provides a brief overview of SPU's precipitation and flow monitoring programs and presents 2014 results, including CSO overflow details, 5-year average overflow frequencies, and a summary of the outfalls meeting the CSO control standard.

5.1 Precipitation Monitoring Program

SPU collects precipitation data from a network of 17 rain gauges located throughout the City of Seattle, as shown in Figure 1. Two rain gauges were relocated in 2014. Construction activity required relocation of Rain Gauge (RG) 15, which was moved from S Idaho Street and E Marginal Way to Ohio Avenue S and S Alaska Street. RG 04 was previously moved from the east to the south side of Maple Leaf Reservoir to accommodate construction, and was moved back to its original location in 2014 for easier access. No additional changes to the network of 17 permanent rain gauges were made in 2014.

5.2 Flow Monitoring Program

During 2014, SPU's flow monitoring consultant operated and maintained 94 monitoring points. An additional 22 monitoring points were operated and maintained by SPU staff, for a total of 116 continuous monitoring sites. These numbers include monitoring at Outfall 26 which was discontinued after this outfall was removed from service (see Section 1.2).

Dedicated monitoring program staff review flow monitoring results on a regular basis and evaluate data quality and flow monitor performance. If emerging problems are identified during these reviews (such as data showing slow storage tank drainage or missing data), the issues are rapidly addressed by requesting field service from the monitoring consultant or from the SPU Drainage and Wastewater crews. The consultant and SPU staff also perform site-specific troubleshooting.

Each month, the consultant's lead data analyst and senior engineer and SPU monitoring staff meet to review and analyze any apparent overflows that occurred the previous month, taking into consideration rainfall, knowledge of site hydraulics, and the best available monitoring data. During these meetings a final determination is made regarding whether or not an overflow occurred, and any necessary follow-up actions are documented.

5.3 Summary of 2014 Monitoring Results

Two tables summarizing 2014 precipitation monitoring results are included in the following pages of this report:

- Table 5-1 provides precipitation by gauge and month; and
- Table 5-2 summarizes the last 5 years of precipitation monitoring results by year and month.

One can see from these two tables that:

- 2014 precipitation amounts varied from one part of the City to another;
- 2014 precipitation amounts varied by month, with the peak month occurring in March (8.62 inches), when Seattle experienced the wettest week in recorded history. The driest month occurred in June, when an average of 0.88 inches was recorded; and
- Average annual precipitation was 46.76 inches for 2014, which is almost 20 inches more than the previous year and almost 7 inches above the average of the previous four years.

Several tables summarizing 2014 flow monitoring and flow monitor performance are included in the following pages of this report:

- Table 5-3 show the 2014 flow monitor performance by outfall and month;
- Table 5-4 provides the details of all 2014 CSOs by outfall and date;
- Table 5-5 includes the most recent 5-year overflow frequency for each outfall and compares 2014 and baseline CSO conditions;
- Table 5-6 compares 2010-2014 CSOs by outfall;
- Table 5-7 compares 2010-2014 CSOs by receiving water body;
- Table 5-8 shows which outfalls met the performance standard for controlled outfalls in 2014.

Observations and conclusions from these tables include:

- 2014 cumulative average system-wide “up-time” and cumulative average individual “up-times” of all flow monitoring stations were over 99%.
- 2014 had the highest number of CSOs in the last five years (406 CSOs). This is not surprising given the higher than normal precipitation experienced in 2014. The good news is that 2014 had a lower CSO volume (116 MG) than the previous two wet years (190 MG in 2010 and 154 MG in 2012).
- Over one-third of the 2014 CSO volume is from Outfall 152 in Ballard, which serves the largest drainage area of any of the outfalls.
- Five outfalls contributed almost 75 percent of the 2014 CSO volume: Outfall 152 in Ballard (41.1 MG), Outfall 13 in the Windermere area (12.4 MG), Outfall 147 in the Fremont/ Wallingford Area (12.3 MG), Outfall 44 in Seward Park (11.2 MG), and Outfall 174 in the Fremont/ Wallingford Area (8.8 MG).

The water body receiving the greatest CSO volume in 2014 was Salmon Bay, followed by Lake Washington, followed by Lake Union, and the Ship Canal.

A total of 39 outfalls did not meet the performance standard for controlled outfalls. SPU expects that these outfalls will be controlled once the CSO control projects currently in planning (i.e., in the Long-Term Control Plan), design and construction are complete.

Three of the outfalls that did not meet the performance standard were previously characterized as controlled: Outfalls 22, 42, and 165. Outfall 22 is experiencing exacerbated CSOs caused by the deteriorating performance of Pump Station 50. The air-lift style pumps will be replaced with submersible pumps as part of a pump station rehabilitation project that is in design and projected to be complete in 2016. Basins 42 and 165 are in the Genesee area and discharge into the Lake Line, as do the other Genesee basins (Basins 40, 41, and 43); hence, their performance is interdependent. In 2014, there were several CSOs at Outfalls 42 and 165 that were believed to be a consequence of flows and activities in Basins 40, 41, and 43. In addition, Outfall 42 had several exacerbated CSOs due to a partially clogged HydroBrake that could not be relieved because of continued heavy rainfall (March 2014). SPU will continue to monitor the performance of the Genesee basins to either confirm that Basins 42 and 165 are controlled or determine what additional control is needed.

One outfall that was reported to be controlled in SPU's baseline report is still uncontrolled: Outfall 139 in Portage Bay. SPU plans to construct a sewer system improvement in this basin by 2020 and, if necessary, offline storage pipes by 2030.

5.4 Post-Construction Monitoring Program & Sediment Sampling and Analysis Plan

In 2013, SPU began conducting in-situ sediment monitoring off shore of controlled Outfall 62. The in-situ monitoring was completed in early 2014.

In order to conduct in-line sediment monitoring, a sediment trap was installed in Outfall 62 in March 2014. The trap was retrieved in March 2015. Very little sediment was collected in the sediment trap. A report will be submitted to Ecology in 2015.

Initial site investigations on uncontrolled Outfalls 107, 147, and 152 were conducted in 2013 and revealed that there was insufficient sediment to sample and analyze. The QAPP was revised to describe a shift to using in-line sediment traps, as well as a shift to using King County Environmental Laboratory for sediment analysis. The QAPP modifications were approved in early 2014, and the sediment traps were deployed in March 2014 and recovered in March 2015. Samples are currently being analyzed at the King County Environmental Laboratory and a report will be submitted to Ecology in 2015.

A QAPP for Outfall 13 is being developed for sampling and analysis of in-situ sediments in Lake Washington. In-situ sediment will be conducted following approval of the QAPP by Ecology and execution of an agreement between SPU and King County DNRP similar to the agreement for Outfalls 62, 107, 147, and 152.

Table 5-1. 2014 Precipitation by Gauge and by Month (inches)												
Rain Gauge	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**
RG01	4.24	5.59	9.06	3.23	2.26	1.22	1.28	1.62	2.73	6.83	5.01	6.09
RG02	4.07	5.45	8.76	3.07	2.28	1.34	1.54	1.67	3.76	8.79	5.74	5.37
RG03	4.05	5.42	8.54	3.07	2.20	0.90	0.98	1.29	2.69	6.17	4.55	5.29
RG04	4.07	5.12	8.69	3.37	2.45	1.16	1.33	1.64	2.64	6.91	4.54	5.50
RG05	3.40	5.55	7.93	2.65	2.40	0.54	0.57	1.21	1.96	6.58	4.46	5.42
RG07	4.39	5.62	8.80	3.22	2.25	1.11	1.02	1.46	2.67	6.65	4.75	6.26
RG08	3.89	4.88	8.30	2.60	2.24	0.98	0.81	1.13	2.35	6.03	4.28	5.39
RG09	4.54	5.55	9.73	3.37	2.60	1.12	0.99	1.29	2.69	6.60	4.81	6.08
RG11	3.99	5.33	8.04	2.70	2.38	0.75	0.75	1.23	3.35	6.42	4.62	5.41
RG12	4.60	5.85	8.87	2.78	2.71	0.95	0.96	1.25	2.52	7.08	4.79	5.93
RG14	4.50	6.03	8.81	2.84	2.76	0.56	0.69	1.15	2.83	6.87	5.25	5.86
RG15	3.40	5.55	7.93	2.84	2.76	0.56	0.69	1.15	2.83	6.58	4.41	5.43
RG16	3.68	6.28	8.17	3.43	2.88	0.56	0.72	1.17	2.27	5.83	3.72	4.60
RG17	3.72	5.84	8.26	2.84	2.94	0.65	0.76	1.35	2.39	5.85	3.43	4.38
RG18	4.06	6.21	8.84	3.53	2.90	0.69	0.99	1.53	2.68	7.25	4.41	5.29
RG25	4.34	5.87	8.51	3.11	2.62	1.08	0.67	1.35	3.41	6.71	5.13	5.92
RG30	3.93	6.27	9.24	4.47	3.14	0.79	1.09	1.48	2.61	7.21	4.44	5.24
Monthly Average	**4.05**	**5.67**	**8.62**	**3.12**	**2.57**	**0.88**	**0.93**	**1.35**	**2.73**	**6.73**	**4.61**	**5.50**

Table 5-2. 2010-2014 Average Precipitation by Month (inches)					
Month/Year	**2010**	**2011**	**2012**	**2013**	**2014**
January	6.90	5.04	5.40	3.95	4.05
February	3.64	3.42	2.97	1.67	5.67
March	3.32	6.73	6.61	2.67	8.62
April	3.34	3.59	2.27	4.58	3.12
May	3.34	3.10	2.32	1.63	2.57
June	2.25	1.34	3.03	1.64	0.88
July	0.24	0.78	1.53	0.04	0.93
August	0.73	0.06	0.00	1.06	1.35
September	3.88	1.12	0.16	5.30	2.73
October	4.35	2.94	6.12	1.25	6.73
November	4.79	5.91	9.36	2.92	4.61
December	8.83	1.80	7.89	1.22	5.50
Annual Total	**45.61**	**35.83**	**47.66**	**27.93**	**46.76**

Table 5-3. 2014 Flow Monitor Performance by Outfall and Month																										
Outfall Number	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sept		Oct		Nov		Dec		2014 Cumulative	
	Downtime (hrs)	Uptime (%)	Downtime (hrs)	Uptime (%)	Downtime (hrs)	Uptime (%)	Downtime (hrs)	Uptime (%)	Downtime (hrs)	Uptime (%)	Downtime (hrs)	Uptime (%)	Downtime (hrs)	Uptime (%)	Downtime (hrs)	Uptime (%)	Downtime (hrs)	Uptime (%)	Downtime (hrs)	Uptime (%)	Downtime (hrs)	Uptime (%)	Downtime (hrs)	Uptime (%)	Downtime (hrs)	Uptime (%)
12	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
13	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
14	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
15	36.6	95.1	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	36.6	99.6
16	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	3.4	99.5	0.0	100.0	0.0	100.0	5.3	99.3	0.0	100.0	0.0	100.0	0.0	100.0	8.7	99.9
18	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
19	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
20	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
22	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
24	0.0	100.0	0.0	100.0	0.0	100.0	50.8	92.9	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	50.8	99.4
25	56.8	92.4	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	56.8	99.4
26	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
27	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
28	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
29	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
30	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
31	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
32	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
33	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	1.1	99.9	0.0	100.0	0.0	100.0	0.0	100.0	1.1	100.0
34	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	72.7	90.2	72.7	99.2
35	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0

Outfall Number	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sept		Oct		Nov		Dec		2014 Cumulative	
	Downtime (hrs)	Uptime (%)	Downtime (hrs)	Uptime (%)	Downtime (hrs)	Uptime (%)	Downtime (hrs)	Uptime (%)	Downtime (hrs)	Uptime (%)	Downtime (hrs)	Uptime (%)	Downtime (hrs)	Uptime (%)	Downtime (hrs)	Uptime (%)	Downtime (hrs)	Uptime (%)	Downtime (hrs)	Uptime (%)	Downtime (hrs)	Uptime (%)	Downtime (hrs)	Uptime (%)	Downtime (hrs)	Uptime (%)
36	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	68.3	90.5	0.0	100.0	68.3	99.2
38	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	11.1	98.5	15.9	97.9	27.0	99.7
40	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
41	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
42	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
43	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
44	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
45	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	23.9	96.8	23.9	99.7
46	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
47	0.0	100.0	0.0	100.0	49.3	93.4	56.3	92.2	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	105.6	98.8
48	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.5	99.9	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.5	100.0
49	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
57	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
59	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
60	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
61	5.2	99.3	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	5.2	99.9
62	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
64	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
68	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
69	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
70	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
71	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	42.5	94.3	42.5	99.5
72	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0

Outfall Number	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sept		Oct		Nov		Dec		2014 Cumulative	
	Downtime (hrs)	Uptime (%)	Downtime (hrs)	Uptime (%)	Downtime (hrs)	Uptime (%)	Downtime (hrs)	Uptime (%)	Downtime (hrs)	Uptime (%)	Downtime (hrs)	Uptime (%)	Downtime (hrs)	Uptime (%)	Downtime (hrs)	Uptime (%)	Downtime (hrs)	Uptime (%)	Downtime (hrs)	Uptime (%)	Downtime (hrs)	Uptime (%)	Downtime (hrs)	Uptime (%)	Downtime (hrs)	Uptime (%)
78	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
80	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
83	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	1.0	99.9	0.0	100.0	0.0	100.0	1.0	100.0
85	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
88	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
90	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	1.6	99.8	0.0	100.0	0.0	100.0	1.6	100.0
91	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
94	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
95	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
99	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	3.5	99.5	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	3.5	100.0
107	0.0	100.0	0.0	100.0	0.0	100.0	29.6	95.9	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	29.6	99.7
111	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
120	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
121	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
124	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
127	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
129	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
130	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
131	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
132	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
134	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	1.5	99.8	1.5	100.0
135	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
136	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0

Outfall Number	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sept		Oct		Nov		Dec		2014 Cumulative	
	Downtime (hrs)	Uptime (%)	Downtime (hrs)	Uptime (%)	Downtime (hrs)	Uptime (%)	Downtime (hrs)	Uptime (%)	Downtime (hrs)	Uptime (%)	Downtime (hrs)	Uptime (%)	Downtime (hrs)	Uptime (%)	Downtime (hrs)	Uptime (%)	Downtime (hrs)	Uptime (%)	Downtime (hrs)	Uptime (%)	Downtime (hrs)	Uptime (%)	Downtime (hrs)	Uptime (%)	Downtime (hrs)	Uptime (%)
138	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
139	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
140	0.0	100.0	28.1	95.8	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	28.1	99.7
141	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
144	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
145	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
146	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
147	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
148	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
150 /151	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
152	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
161	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
165	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
168	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
169	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
170	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
171	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
174	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
175	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
TOTAL:	98.57	99.85	28.08	99.95	49.30	99.92	136.7	99.78	4.0	99.99	3.4	99.99	0.0	100.0	0.0	100.0	6.4	100.0	2.6	100.0	79.4	99.9	156.5	99.76	565.0	99.9

Table 5-4. 2014 CSO Details by Outfall and Date

Permit No	Outfall No	Facility Name	Receiving Water	CSO Events				
				Starting Date	Duration (hours)	Volume (gallons)	Precipitation (inches)	Storm Duration (hours)
WA0031682	**012**	City of Seattle	Lake Washington	01/11/14	0.17	389	0.68	11.35
				03/05/14	0.70	2,223	2.85	88.58
				Total	0.87	2,612	3.53	99.93
				Average	0.44	1,306	1.77	49.97
WA0031682	**013**	City of Seattle	Lake Washington	01/11/14	4.50	70,361	1.43	22.90
				02/16/14	12.00	1,936,990	2.06	44.87
				03/02/14	3.00	21,628	1.03	32.63
				03/05/14	30.42	2,432,454	3.61	114.22
				03/08/14	9.25	768,993	1.10	14.35
				03/16/14	3.50	133,225	1.38	29.20
				04/17/14	1.50	92,858	0.69	71.12
				08/13/14	5.17	53,187	1.02	8.40
				09/23/14	12.42	114,132	1.75	21.30
				10/22/14	9.08	164,608	2.14	65.58
				10/31/14	23.83	2,735,528	2.45	35.30
				11/06/14	1.67	18,983	0.80	20.78
				11/23/14	2.50	189,764	0.62	7.23
				11/28/14	10.08	2,014,212	1.88	42.93
				12/23/14	10.50	1,629,451	1.12	18.17
				Total	139.4	12,376,374	23.1	549.0
				Average	9.3	825,092	1.5	36.6
WA0031682	**014**	City of Seattle	Lake Washington	*No combined sewer overflow during 2014*				

Permit No	Outfall No	Facility Name	Receiving Water	CSO Events				
				Starting Date	Duration (hours)	Volume (gallons)	Precipitation (inches)	Storm Duration (hours)
WA0031682	**015**	City of Seattle	Lake Washington	02/16/14	3.08	60,883	1.99	37.12
				03/05/14	3.33	5,162	2.85	88.38
				Total	6.41	66,045	4.84	125.50
				Average	3.21	33,023	2.42	62.75
WA0031682	**016**	City of Seattle	Lake Washington	*No combined sewer overflow during 2014*				
WA0031682	**018**	City of Seattle	Union Bay	02/16/14	4.07	1,297,426	2	38.68
				03/05/14	27.65	1,457,719	3.61	114.22
				03/08/14	2.58	246,145	1.1	12.35
				11/28/14	3.48	323,783	1.87	40.92
				12/23/14	0.97	25,030	1.09	15.88
				Total	38.75	3,350,103	9.67	222.05
				Average	7.75	670,021	1.93	44.41
WA0031682	**019**	City of Seattle	Union Bay	*No combined sewer overflow during 2014*				
WA0031682	**020**	City of Seattle	Union Bay	02/16/14	4.20	148,342	2.01	38.73
				03/05/14	4.83	211,219	2.77	90.62
				10/31/14	0.37	661	1.34	25.75
				11/28/14	4.27	111,427	1.35	31.93
				12/23/14	4.93	90,759	1.21	17.08
				Total	18.60	562,408	8.68	204.11
				Average	3.72	112,482	1.74	40.82

Permit No	Outfall No	Facility Name	Receiving Water	CSO Events				
				Starting Date	Duration (hours)	Volume (gallons)	Precipitation (inches)	Storm Duration (hours)
WA0031682	**022**	City of Seattle	Union Bay	02/16/14	1.13	1,916	1.84	35.73
				03/05/14	1.25	2,111	2.47	87
				10/31/14	1.64	12,738	1.51	34.69
				Total	4.02	16,765	5.82	157.42
				Average	1.34	5,588	1.94	52.47
WA0031682	**024**	City of Seattle	Lake Washington	*No combined sewer overflow during 2014*				
WA0031682	**025**	City of Seattle	Lake Washington	*No combined sewer overflow during 2014*				
WA0031682	**026**	City of Seattle	Lake Washington	*No combined sewer overflow during 2014*				
WA0031682	**027**	City of Seattle	Lake Washington	*No combined sewer overflow during 2014*				
WA0031682	**028**	City of Seattle	Lake Washington	01/11/14	0.17	398	1	18.35
				03/05/14	0.07	21	2.3	85.63
				03/10/14	0.17	1,748	1.87	50.4
				09/02/14	0.23	1,004	0.61	0.65
				09/24/14	0.03	64	1.38	18.53
				10/11/14	0.07	496	0.15	31.67
				11/06/14	0.03	50	0.67	18.95
				Total	0.77	3,781	7.98	224.18
				Average	0.11	540	1.14	32.03

Permit No	Outfall No	Facility Name	Receiving Water	CSO Events				
				Starting Date	Duration (hours)	Volume (gallons)	Precipitation (inches)	Storm Duration (hours)
WA0031682	**029**	City of Seattle	Lake Washington	01/11/14	0.68	441	1.02	18.98
				02/16/14	5.83	53,715	1.92	39.75
				03/05/14	7.43	65,778	2.92	92.67
				03/08/14	3.77	1,540	1.21	11.7
				03/16/14	2.37	8,582	1.41	27.53
				09/02/14	0.2	2,524	0.61	0.62
				11/28/14	3.4	1,847	1.37	29.08
				Total	23.68	134,427	10.46	220.33
				Average	3.38	19,204	1.49	31.48
WA0031682	**030**	City of Seattle	Lake Washington	02/16/14	3.1	42,088	1.72	35.82
				03/05/14	5.43	107,254	2.9	90.9
				Total	8.53	149,342	4.62	126.72
				Average	4.27	74,671	2.31	63.36
WA0031682	**031**	City of Seattle	Lake Washington	02/16/14	5.08	10,086	1.91	39.45
				03/05/14	6.92	9,972	2.92	92.27
				10/31/14	1.92	2,078	1.54	25.85
				11/28/14	7.25	118,715	1.66	32.53
				12/23/14	7.52	12,046	1.38	16.43
				Total	28.69	152,897	9.41	206.53
				Average	5.74	30,579	1.88	41.31
WA0031682	**032**	City of Seattle	Lake Washington	02/16/14	4	42,263	1.91	38.78

Permit No	Outfall No	Facility Name	Receiving Water	CSO Events				
				Starting Date	Duration (hours)	Volume (gallons)	Precipitation (inches)	Storm Duration (hours)
				03/05/14	6.08	69,148	2.92	91.6
				Total	10.08	111,411	4.83	130.38
				Average	5.04	55,706	2.42	65.19
WA0031682	**033**	City of Seattle	Lake Washington	*No combined sewer overflow during 2014*				
WA0031682	**034**	City of Seattle	Lake Washington	02/16/14	2.5	45,536	1.91	38.12
				03/05/14	2.47	34,328	2.88	89.33
				Total	4.97	79,864	4.79	127.45
				Average	2.49	39,932	2.40	63.73
WA0031682	**035**	City of Seattle	Lake Washington	01/11/14	0.08	610	1.01	18.38
				11/06/14	0.08	241	0.7	19.55
				Total	0.16	851	1.71	37.93
				Average	0.08	426	0.86	18.97
WA0031682	**036**	City of Seattle	Lake Washington	02/16/14	3.95	12,868	1.91	38.32
				03/05/14	4.45	14,063	2.89	89.8
				Total	8.40	26,931	4.80	128.12
				Average	4.20	13,466	2.40	64.06
WA0031682	**038**	City of Seattle	Lake Washington	02/16/14	1.5	19,963	1.96	37.92
				03/05/14	1.03	35,768	2.64	75.07

Permit No	Outfall No	Facility Name	Receiving Water	CSO Events				
				Starting Date	Duration (hours)	Volume (gallons)	Precipitation (inches)	Storm Duration (hours)
				Total	2.53	55,731	4.60	112.99
				Average	1.27	27,866	2.30	56.50
WA0031682	**040**	City of Seattle	Lake Washington	02/11/14	0.67	10,937	1.59	61.5
				02/16/14	11.9	590,504	2.19	46.08
				02/18/14	2.1	65,560	2.94	76.92
				03/05/14	27.6	922,996	3.48	98.83
				03/08/14	7.77	338,249	1.22	14.23
				03/10/14	2.43	50,553	1.88	42.57
				03/16/14	4.6	197,586	1.53	29.57
				05/03/14	0.3	5,901	1.2	10.7
				10/22/14	1.03	3,637	1.81	65.03
				10/30/14	25.5	151,002	1.89	26.18
				11/28/14	13.37	165,810	1.24	30.4
				Total	97.27	2,502,735	20.97	502.01
				Average	8.84	227,521	1.91	45.64
WA0031682	**041**	City of Seattle	Lake Washington	01/02/14	2.77	12,741	0.69	30.9
				01/11/14	13.17	21,763	1.99	113.78
				01/29/14	3.07	29,344	0.84	7.45
				02/10/14	0.13	5	0.63	21.23
				02/11/14	5.87	71,883	1.61	64.73
				02/16/14	48.4	567,226	2.94	81.62
				03/02/14	16.57	6,046	1.07	30.17
				03/05/14	36	736,702	3.52	105.82

Permit No	Outfall No	Facility Name	Receiving Water	CSO Events				
				Starting Date	Duration (hours)	Volume (gallons)	Precipitation (inches)	Storm Duration (hours)
				03/08/14	45.63	443,118	1.9	48.63
				03/16/14	17.23	188,495	1.59	31.1
				04/08/14	0.3	108	0.42	2.88
				04/17/14	1.4	8,514	1.12	42.55
				05/03/14	7.5	64,585	1.24	12.77
				07/23/14	0.37	140	0.75	13.12
				08/12/14	4	10,542	1.09	29.63
				09/23/14	10.27	1,641	1.58	31.48
				10/22/14	1.03	3,637	1.81	65.03
				10/30/14	25.5	33,310	1.89	26.18
				11/23/14	0.83	642	1.15	52.33
				11/28/14	13.37	321,051	1.44	38.5
				12/10/14	2.13	5,216	1.23	50.02
				12/23/14	13.63	218,935	1.26	13.80
				Total	269.17	2,745,644	31.76	913.72
				Average	12.24	124,802	1.44	41.53
WA0031682	**042**	City of Seattle	Lake Washington	02/16/14	10.13	152,118	2.18	45.12
				03/05/14	22.6	185,927	3.35	94.43
				03/08/14	5.1	54,117	1.22	13.93
				03/16/14	3.27	36,321	1.53	29.2
				10/31/14	1.5	15,532	1.88	26.17
				11/28/14	4.2	45,118	1.25	31.03
				Total	46.80	489,133	11.41	239.88
				Average	7.80	81,522	1.90	39.98

Permit No	Outfall No	Facility Name	Receiving Water	CSO Events				
				Starting Date	Duration (hours)	Volume (gallons)	Precipitation (inches)	Storm Duration (hours)
WA0031682	**043**	City of Seattle	Lake Washington	02/11/14	0.42	3,877	1.58	61.03
				02/16/14	7.25	281,435	2.06	40.92
				02/18/14	0.68	6,498	2.94	76.02
				03/05/14	22.95	406,742	3.35	93.97
				03/08/14	6.08	88,759	1.22	12.75
				03/16/14	4.17	101,148	1.53	28.92
				10/11/14	0.27	10,362	0.18	14.08
				10/13/14	2.07	16,052	0.56	6.07
				10/15/14	0.25	837	0.93	35.75
				10/20/14	0.5	35,992	0.52	20.05
				10/22/14	35.58	184,278	2.41	86.88
				10/30/14	21.33	126,999	1.89	26.18
				11/28/14	4.78	111,024	1.24	30.5
				12/23/14	10.75	167,556	1.24	13.05
				Total	117.08	1,541,559	21.65	546.17
				Average	8.36	110,111	1.55	39.01
WA0031682	**044**	City of Seattle	Lake Washington	01/02/14	3.57	82,007	0.69	31.13
				01/11/14	13.87	195,300	1.99	114.32
				01/29/14	14.75	83,705	1.19	18.87
				02/11/14	5.17	256,452	1.61	64.45
				02/16/14	48.7	2,083,436	2.94	82.18
				03/02/14	18.5	59,936	1.12	32.67
				03/05/14	36.4	2,559,607	3.52	105.82

Permit No	Outfall No	Facility Name	Receiving Water	CSO Events				
				Starting Date	Duration (hours)	Volume (gallons)	Precipitation (inches)	Storm Duration (hours)
				03/08/14	51.4	1,489,403	1.97	53.53
				03/16/14	21.67	789,957	1.59	31.1
				03/29/14	1.7	11,179	1.6	110.33
				04/17/14	1.92	82,278	1.12	42.55
				04/24/14	2.83	8,072	1.19	60.88
				05/03/14	8.92	360,036	1.24	13.28
				07/23/14	0.92	8,365	0.74	13.08
				08/13/14	3.93	134,418	1.09	29.77
				09/23/14	11.75	13,679	1.59	32.27
				10/20/14	0.08	3	0.52	20.05
				10/22/14	14.03	278,605	2.14	71.23
				10/30/14	25.87	870,100	1.89	26.18
				11/23/14	1.08	30,065	1.15	52.33
				11/28/14	13.43	1,022,247	1.44	38.9
				12/10/14	2.17	21,844	1.23	50.82
				12/18/14	1.67	42	0.81	45.6
				12/20/14	0.08	31	1.44	82.27
				12/23/14	15.4	816,546	1.26	13.80
				Total	319.81	11,257,313	37.07	1237.41
				Average	12.79	450,293	1.48	49.50
WA0031682	**045**	City of Seattle	Lake Washington	01/02/14	2.23	279	0.68	30.47
				01/11/14	0.93	2,665	1.98	111.22
				02/11/14	0.8	546	1.57	60.83
				02/16/14	8	172,468	2.07	41.25

Permit No	Outfall No	Facility Name	Receiving Water	CSO Events				
				Starting Date	Duration (hours)	Volume (gallons)	Precipitation (inches)	Storm Duration (hours)
				02/18/14	2.58	11,445	2.94	76.25
				03/05/14	22.17	152,403	3.29	92.77
				03/08/14	8.5	5,920	1.22	12.25
				03/10/14	0.42	15	1.74	39.33
				03/16/14	3.5	27,345	1.53	28.17
				04/17/14	0.77	18,067	1.19	42.55
				04/24/14	0.83	7,179	1.19	58.72
				05/03/14	2.27	4,566	1.2	10.47
				05/14/14	1.07	4,767	0	0
				07/23/14	0.35	5,222	0.71	12.35
				09/23/14	0.12	77	0.82	21.38
				10/30/14	21.2	17,408	1.88	25.7
				11/23/14	0.8	4,886	1.14	51.97
				11/28/14	7.83	55,670	1.37	33.13
				12/10/14	0.55	215	1.18	48.42
				12/18/14	0.12	20	0.74	43.47
				12/23/14	10.68	29,319	1.23	12.07
				Total	95.72	520,482	29.67	852.77
				Average	4.56	24,785	1.41	40.61
WA0031682	**046**	City of Seattle	Lake Washington	01/02/14	1.08	4,529	0.68	30.4
				02/16/14	3.17	19,703	1.96	38
				03/05/14	21.95	9,458	2.64	74.77
				12/20/14	1.68	18,292	1.43	81.70
				Total	27.88	51,982	6.71	224.87

Permit No	Outfall No	Facility Name	Receiving Water	CSO Events				
				Starting Date	Duration (hours)	Volume (gallons)	Precipitation (inches)	Storm Duration (hours)
				Average	6.97	12,996	1.68	56.22
WA0031682	**047**	City of Seattle	Lake Washington	01/02/14	0.7	15,005	0.62	70.63
				01/11/14	0.27	3,452	1.4	100.6
				02/11/14	1.07	12,874	1.57	60.98
				02/16/14	10.83	1,072,881	2.23	44.53
				02/18/14	2.38	56,570	3.06	76.17
				03/05/14	21.95	897,852	3.41	107.07
				03/08/14	5.38	73,644	1.24	12.68
				03/16/14	3	65,203	1.61	27.63
				04/17/14	0.6	33,077	1.35	42.15
				04/24/14	0.8	71,736	1.75	58.77
				05/03/14	1.1	15,017	1.24	29.88
				07/23/14	0.82	22,804	0.8	12.07
				10/31/14	2.4	41,231	1.86	26.18
				11/23/14	0.22	3,147	1.28	79.93
				11/28/14	4.2	91,427	1.22	31.4
				Total	55.72	2,475,920	24.64	780.67
				Average	3.71	165,061	1.64	52.04
WA0031682	**048**	City of Seattle	Lake Washington	*No combined sewer overflow during 2014*				
WA0031682	**049**	City of Seattle	Lake Washington	02/16/14	10.23	777,575	2.24	45.73
				02/18/14	1.27	37,997	3.07	76.87
				03/05/14	22.07	1,000,397	3.44	108.5

Permit No	Outfall No	Facility Name	Receiving Water	CSO Events				
				Starting Date	Duration (hours)	Volume (gallons)	Precipitation (inches)	Storm Duration (hours)
				03/08/14	4.67	290,821	1.25	14.28
				03/16/14	2.47	117,254	1.61	28.9
				11/28/14	3.57	228,628	1.23	31.57
				Total	44.28	2,452,672	12.84	305.85
				Average	7.38	408,779	2.14	50.98
WA0031682	**057**	City of Seattle	Puget Sound	*No combined sewer overflow during 2014*				
WA0031682	**059**	City of Seattle	Salmon Bay	*No combined sewer overflow during 2014*				
WA0031682	**060**	City of Seattle	Salmon Bay	02/16/14	1	30,073	1.53	34.15
				03/05/14	3.3	56,299	2.7	88.62
				Total	4.30	86,372	4.23	122.77
				Average	2.15	43,186	2.12	61.39
WA0031682	**061**	City of Seattle	Elliott Bay	*No combined sewer overflow during 2014*				
WA0031682	**062**	City of Seattle	Elliott Bay	03/05/14	0.47	1,276	2.58	85.92
				08/13/14	0.17	308	0.84	17.27
				Total	0.64	1,584	3.42	103.19
				Average	0.32	792	1.71	51.60
WA0031682	**064**	City of Seattle	Elliott Bay	*No combined sewer overflow during 2014*				
WA0031682	**068**	City of Seattle	Elliott Bay	02/16/14	1.77	33,246	2.17	36.53

Permit No	Outfall No	Facility Name	Receiving Water	CSO Events				
				Starting Date	Duration (hours)	Volume (gallons)	Precipitation (inches)	Storm Duration (hours)
				03/05/14	2.07	155,017	3.08	89.02
				Total	3.84	188,263	5.25	125.55
				Average	1.92	94,132	2.63	62.78
WA0031682	**069**	City of Seattle	Elliott Bay	01/11/14	0.23	15,895	0.9	17.4
				03/05/14	0.43	53,587	2.26	85.9
				09/02/14	0.43	136,756	0.73	0.87
				Total	1.09	206,238	3.89	104.17
				Average	0.36	68,746	1.30	34.72
WA0031682	**070**	City of Seattle	Elliott Bay	*No combined sewer overflow during 2014*				
WA0031682	**071**	City of Seattle	Elliott Bay	01/11/14	0.48	62,576	0.9	17.43
				03/05/14	0.53	19,099	2.26	85.9
				Total	1.01	81,675	3.16	103.33
				Average	0.51	40,838	1.58	51.67
WA0031682	**072**	City of Seattle	Elliott Bay	*No combined sewer overflow during 2014*				
WA0031682	**078**	City of Seattle	Elliott Bay	*No combined sewer overflow during 2014*				
WA0031682	**080**	City of Seattle	Elliott Bay	*No combined sewer overflow during 2014*				
WA0031682	**083**	City of Seattle	Puget Sound	*No combined sewer overflow during 2014*				

Permit No	Outfall No	Facility Name	Receiving Water	CSO Events				
				Starting Date	Duration (hours)	Volume (gallons)	Precipitation (inches)	Storm Duration (hours)
WA0031682	**085**	City of Seattle	Puget Sound	*No combined sewer overflow during 2014*				
WA0031682	**088**	City of Seattle	Puget Sound	*No combined sewer overflow during 2014*				
WA0031682	**090**	City of Seattle	Puget Sound	*No combined sewer overflow during 2014*				
WA0031682	**091**	City of Seattle	Puget Sound	*No combined sewer overflow during 2014*				
WA0031682	**094**	City of Seattle	Puget Sound	*No combined sewer overflow during 2014*				
WA0031682	**095**	City of Seattle	Puget Sound	*No combined sewer overflow during 2014*				
WA0031682	**099**	City of Seattle	Duwamish River	02/12/14	0.57	7,821	1.63	62.08
				02/16/14	12.5	868,461	1.87	46.03
				02/18/14	3.33	175,601	2.56	77
				03/05/14	11.57	1,160,917	2.65	92.28
				03/08/14	41.67	1,442,901	1.77	46.33
				11/28/14	3.03	172,029	1.29	43.18
				Total	72.67	3,827,730	11.77	366.90
				Average	12.11	637,955	1.96	61.15
WA0031682	**107**	City of Seattle	Duwamish River	03/02/14	0.93	277	0.64	24.68
				03/05/14	18.2	201,586	3.01	98.92
				03/08/14	9.13	62,758	1.23	13.1
				05/03/14	0.27	1,636	0.93	10.95

Permit No	Outfall No	Facility Name	Receiving Water	CSO Events				
				Starting Date	Duration (hours)	Volume (gallons)	Precipitation (inches)	Storm Duration (hours)
				08/13/14	0.3	1,379	0.85	5.52
				11/28/14	1.27	21,168	0.86	39.05
				Total	30.10	288,804	7.52	192.22
				Average	5.02	48,134	1.25	32.04
WA0031682	**111**	City of Seattle	Duwamish River	02/16/14	2.67	104,896	1.69	37.5
				03/05/14	3.32	25,876	2.65	89.22
				11/28/14	10.6	15,882	1.38	47.82
				Total	16.59	146,654	5.72	174.54
				Average	5.53	48,885	1.91	58.18
WA0031682	**120**	City of Seattle	Lake Union	*No combined sewer overflow during 2014*				
WA0031682	**121**	City of Seattle	Lake Union	*No combined sewer overflow during 2014*				
WA0031682	**124**	City of Seattle	Lake Union	*No combined sewer overflow during 2014*				
WA0031682	**127**	City of Seattle	Lake Union	*No combined sewer overflow during 2014*				
WA0031682	**129**	City of Seattle	Lake Union	*No combined sewer overflow during 2014*				
WA0031682	**130**	City of Seattle	Lake Union	*No combined sewer overflow during 2014*				
WA0031682	**131**	City of Seattle	Lake Union	*No combined sewer overflow during 2014*				

Permit No	Outfall No	Facility Name	Receiving Water	CSO Events				
				Starting Date	Duration (hours)	Volume (gallons)	Precipitation (inches)	Storm Duration (hours)
WA0031682	**132**	City of Seattle	Lake Union	*No combined sewer overflow during 2014*				
WA0031682	**134**	City of Seattle	Lake Union	*No combined sewer overflow during 2014*				
WA0031682	**135**	City of Seattle	Lake Union	*No combined sewer overflow during 2014*				
WA0031682	**136**	City of Seattle	Lake Union	*No combined sewer overflow during 2014*				
WA0031682	**138**	City of Seattle	Portage Bay	02/16/14	2.68	92,323	1.98	37.3
				03/05/14	2.9	123,572	2.76	89.02
				11/28/14	2.42	48,749	1.32	31.03
				Total	8.00	264,644	6.06	157.35
				Average	2.67	88,215	2.02	52.45
WA0031682	**139**	City of Seattle	Portage Bay	03/05/14	3.1	35,763	2.76	88.68
				10/31/14	0.23	11,752	1.51	34.68
				Total	3.33	47,515	4.27	123.36
				Average	1.67	23,758	2.14	61.68
WA0031682	**140**	City of Seattle	Portage Bay	01/08/14	0.08	128	0.87	40.2
				01/11/14	0.2	1,461	0.97	16.85
				02/15/14	0.13	704	0.5	7.5
				02/16/14	3.33	126,940	2	37.57
				03/05/14	4.33	184,418	2.76	89.32
				05/04/14	0.08	1,203	1.34	26.88

Permit No	Outfall No	Facility Name	Receiving Water	CSO Events				
				Starting Date	Duration (hours)	Volume (gallons)	Precipitation (inches)	Storm Duration (hours)
				07/23/14	0.37	4,930	0.41	26.32
				09/02/14	0.08	477	0.21	0.28
				09/23/14	0.07	96	0.62	10.85
				10/11/14	0.05	162	0.15	13.08
				10/31/14	0.17	3,702	1.51	34.68
				11/06/14	0.2	4,454	0.64	18.88
				11/28/14	0.63	12,952	1.31	30.67
				Total	9.72	341,627	13.29	353.08
				Average	0.75	26,279	1.02	27.16
WA0031682	**141**	City of Seattle	Portage Bay	*No combined sewer overflow during 2014*				
WA0031682	**144**	City of Seattle	Lake Union	*No combined sewer overflow during 2014*				
WA0031682	**145**	City of Seattle	Lake Union	*No combined sewer overflow during 2014*				
WA0031682	**146**	City of Seattle	Lake Union	*No combined sewer overflow during 2014*				
WA0031682	**147**	City of Seattle	Lake Union	01/02/14	2.02	101,351	0.43	60.8
				01/08/14	3	53,144	1.04	40.85
				01/10/14	18.25	528,101	2.69	112.93
				01/28/14	16.22	457,481	1.21	38.2
				02/10/14	3.17	85,217	0.74	22.12
				02/11/14	4.58	142,720	1.52	62.12
				02/14/14	2.92	7,347	0.32	3.68

Permit No	Outfall No	Facility Name	Receiving Water	CSO Events				
				Starting Date	Duration (hours)	Volume (gallons)	Precipitation (inches)	Storm Duration (hours)
				02/15/14	41.95	1,202,738	2.1	42.72
				02/18/14	6.08	345,606	2.72	74.37
				02/24/14	0.42	632	0.56	49.38
				03/02/14	20.33	624,093	1.49	44.02
				03/04/14	30.55	2,501,890	3.84	108.57
				03/08/14	50	1,591,341	2.03	50.05
				03/15/14	30.98	504,504	1.54	32.45
				03/25/14	0.35	4,314	0.15	8.47
				03/28/14	29.43	186,469	1.63	108.15
				04/08/14	0.68	15,864	0.21	1.43
				04/17/14	15.75	86,262	1.08	69.77
				04/19/14	0.25	306	0.12	0.97
				04/22/14	0.08	139	0.63	25.22
				04/24/14	0.27	9,367	1.19	63.32
				04/26/14	0.25	3,024	0.2	20.87
				05/03/14	24.65	476,369	1.44	42.5
				05/08/14	0.17	958	0.23	2.05
				06/27/14	0.3	10,624	0.12	11.68
				07/23/14	6.73	85,268	0.51	27.52
				08/12/14	4.25	370,673	0.91	20.4
				08/30/14	0.33	39,391	0.19	14.15
				09/02/14	3.17	76,066	0.34	3.28
				09/23/14	13.63	62,335	1.49	21.78
				09/26/14	0.4	9,952	1.89	66.72
				09/29/14	0.63	19,406	0.23	17.42

Permit No	Outfall No	Facility Name	Receiving Water	CSO Events				
				Starting Date	Duration (hours)	Volume (gallons)	Precipitation (inches)	Storm Duration (hours)
				10/11/14	0.27	6,747	0.13	0.28
				10/13/14	27.27	68,824	0.87	53.4
				10/18/14	1.42	2,542	0.37	20.27
				10/22/14	34.53	233,824	2.15	86.43
				10/25/14	4	3,594	2.69	137.82
				10/28/14	6.08	27,022	0.56	10.95
				10/30/14	24.58	442,078	1.42	27.25
				11/05/14	20.57	163,592	1.31	95.7
				11/09/14	0.08	87	0.12	12.9
				11/21/14	3.15	33,333	0.77	40.8
				11/23/14	2.33	69,506	0.48	6.45
				11/28/14	11.5	485,053	1.52	46.83
				12/06/14	0.47	7,392	0.37	39.40
				12/08/14	67.42	85,281	2.24	84.40
				12/18/14	42.58	5,367	1.49	93.80
				12/23/14	10.58	1,063,790	1.25	17.78
				12/27/14	0.38	15,634	0.24	12.77
				Total	589.00	12,316,618	52.77	2055.19
				Average	12.02	251,360	1.08	41.94
WA0031682	**148**	City of Seattle	Lake Washington - Ship Canal	*No combined sewer overflow during 2014*				
WA0031682	**150/151**	City of Seattle	Salmon Way	04/17/14	0.37	25,203	0.59	67.48
				01/02/14	1.33	3,258	0.32	26.55
				01/08/14	0.43	102,432	0.86	40.85

Permit No	Outfall No	Facility Name	Receiving Water	CSO Events				
				Starting Date	Duration (hours)	Volume (gallons)	Precipitation (inches)	Storm Duration (hours)
				01/10/14	16.17	162,240	2.15	111.08
				01/29/14	13.8	147,126	1.18	36.65
				02/10/14	1.8	3,907	0.59	21.2
				02/11/14	0.93	426	1.11	59.03
				02/16/14	5.9	591,646	1.75	36.35
				02/18/14	1.47	43,856	2.2	71.85
				03/02/14	5.97	148,180	0.91	29.78
				03/04/14	18.8	562,429	2.93	101.28
				03/08/14	1.63	75,093	0.66	5.63
				03/10/14	0.73	65,911	1.77	50.57
				03/16/14	0.7	12,074	1	25.98
				03/29/14	11.98	179,334	1.54	108.28
				05/03/14	18.87	48,751	1.33	34.38
				07/23/14	5.33	28,247	0.49	8.32
				08/12/14	2.6	47,636	0.74	5.2
				09/02/14	2.9	340,772	0.29	3.00
				09/23/14	10.63	10,323	1.24	19.50
				09/26/14	0.37	2,271	1.65	66.97
				10/13/14	1.58	2,406	0.53	5.25
				10/18/14	0.73	16,453	0.41	19.67
				10/22/14	33.73	47,331	1.75	85.82
				10/28/14	7.2	2,074	0.6	12.15
				10/30/14	18.7	123,673	1.39	25.4
				11/06/14	0.77	177,306	1.09	91.3
				11/21/14	4.03	3,950	0.7	40.88

Permit No	Outfall No	Facility Name	Receiving Water	CSO Events				
				Starting Date	Duration (hours)	Volume (gallons)	Precipitation (inches)	Storm Duration (hours)
				11/23/14	1.33	211,571	0.46	5.6
				11/28/14	8.27	215,233	1.27	22.75
				12/09/14	23.18	84,634	1.4	50.10
				12/11/14	0.42	10,538	2.15	84.83
				12/18/14	36.92	1,333	1.09	74.58
				12/23/14	8.57	46,106	0.98	9.00
				Total	268.14	3,543,723	39.12	1457.26
				Average	7.89	104,227	1.15	42.86
WA0031682	**152**	City of Seattle	Salmon Bay	01/02/14	2.13	165,140	0.35	27.28
				01/07/14	39.97	566,210	0.86	41.22
				01/10/14	18.75	1,667,513	2.19	112.02
				01/28/14	17.5	1,606,443	1.2	37.63
				02/10/14	4.1	384,185	0.66	22.8
				02/11/14	8.92	687,483	1.37	63.2
				02/14/14	9.03	220,333	0.37	9.42
				02/15/14	75.42	5,451,451	2.36	74.43
				02/23/14	21.42	92,842	0.55	52.38
				03/02/14	21.08	1,868,383	1.27	44.22
				03/04/14	51.98	6,063,292	3.54	114.27
				03/08/14	50.75	3,317,069	1.77	52
				03/14/14	0.53	65,841	0.09	7.02
				03/15/14	31.42	1,081,273	1.23	32.33
				03/19/14	0.4	24,714	0.07	7.03
				03/28/14	36.5	1,117,425	1.55	108.63

Permit No	Outfall No	Facility Name	Receiving Water	CSO Events				
				Starting Date	Duration (hours)	Volume (gallons)	Precipitation (inches)	Storm Duration (hours)
				04/03/14	0.17	125	0.12	5.27
				04/08/14	1.02	51,251	0.17	1.58
				04/17/14	15.42	164,325	0.69	69.6
				04/19/14	2.5	14,115	0.17	3.15
				04/22/14	54.13	144,685	1.03	61.92
				04/26/14	1.27	7,968	0.15	20.95
				05/03/14	24.77	1,215,052	1.33	34.68
				05/08/14	3.67	102,326	0.38	4.65
				06/14/14	0.5	55,461	0.1	0.97
				06/15/14	0.58	3,419	0.35	26.88
				06/27/14	0.32	11,181	0.14	11.87
				07/23/14	8.82	304,249	0.62	11.78
				08/12/14	4	504,483	0.88	6.45
				08/30/14	2.283	25,288	0.18	17.72
				09/02/14	3.22	659,835	0.29	3.23
				09/23/14	13.67	750,890	1.38	22.05
				09/26/14	0.83	110,387	1.66	67.22
				09/29/14	0.67	1,108	0.18	13.85
				10/13/14	33.42	431,289	0.9	36.58
				10/17/14	10.37	223,461	0.41	19.97
				10/20/14	0.33	5,283	0.17	2.92
				10/22/14	35.53	902,792	1.75	85.95
				10/24/14	1.5	3,139	1.93	117
				10/28/14	20.42	397,052	0.72	25.15
				10/30/14	32.6	1,624,967	1.54	35.22

Permit No	Outfall No	Facility Name	Receiving Water	CSO Events				
				Starting Date	Duration (hours)	Volume (gallons)	Precipitation (inches)	Storm Duration (hours)
				11/03/14	24.2	5,617	0.41	50.7
				11/05/14	16.58	728,562	1.1	91.92
				11/09/14	2.5	15,657	0.2	15.72
				11/21/14	10.45	288,600	0.73	42.05
				11/23/14	1.92	1,015,348	0.46	5.97
				11/25/14	3.67	3,740	0.64	52.63
				11/28/14	23.25	2,202,724	1.42	36.98
				12/05/14	17.42	64,326	0.42	42.38
				12/08/14	78.5	2,504,865	2.22	92.92
				12/18/14	48.92	796,948	1.41	84.58
				12/23/14	10.83	1,371,436	1.03	11.17
				12/27/14	0.5	12,850	0.19	12.38
				Total	900.65	41,104,401	46.90	2051.89
				Average	16.99	775,555	0.88	38.71
WA0031682	**161**	City of Seattle	Lake Washington	*No combined sewer overflow during 2014*				
WA0031682	**165**	City of Seattle	Lake Washington	02/16/14	0.67	2,050	1.82	36.82
				03/05/14	0.67	6,920	2.64	74.6
				Total	1.34	8,970	4.46	111.42
				Average	0.67	4,485	2.23	55.71
WA0031682	**168**	City of Seattle	Longfellow Creek	03/05/14	13.73	1,092,208	3.44	116.4
				Total	13.73	1,092,208	3.44	116.40
				Average	13.73	1,092,208	3.44	116.40

Permit No	Outfall No	Facility Name	Receiving Water	CSO Events				
				Starting Date	Duration (hours)	Volume (gallons)	Precipitation (inches)	Storm Duration (hours)
WA0031682	**169**	City of Seattle	Longfellow Creek	03/05/14	23.15	604,990	3.42	113.45
				Total	23.15	604,990	3.42	113.45
				Average	23.15	604,990	3.42	113.45
WA0031682	**170**	City of Seattle	Longfellow Creek	*No combined sewer overflow during 2014*				
WA0031682	**171**	City of Seattle	Lake Washington	01/02/14	0.65	18,825	0.63	70.67
				01/11/14	0.37	8,755	1.4	100.7
				02/11/14	1.17	17,411	1.58	61.08
				02/16/14	11.17	434,833	2.24	44.95
				02/18/14	2.58	85,308	3.06	76.37
				03/05/14	21.97	472,465	3.41	107.2
				03/08/14	5.65	112,018	1.25	12.95
				03/16/14	3.08	91,247	1.61	27.8
				04/17/14	0.93	55,097	1.35	42.15
				04/24/14	1.33	87,618	1.75	58.8
				05/03/14	1.23	25,267	1.24	29.92
				07/23/14	0.68	16,700	0.79	11.92
				10/31/14	2.33	42,210	1.86	26
				11/23/14	0.23	2,868	1.29	79.97
				11/28/14	4.25	73,404	1.23	31.45
				Total	57.62	1,544,026	24.69	781.93
				Average	3.84	102,935	1.65	52.13

Permit No	Outfall No	Facility Name	Receiving Water	CSO Events				
				Starting Date	Duration (hours)	Volume (gallons)	Precipitation (inches)	Storm Duration (hours)
WA0031682	**174**	City of Seattle	Lake Washington Canal	01/11/14	4.6	290,435	2.69	112.62
				01/29/14	2.62	232,933	0.82	27.1
				02/11/14	1.67	109,000	1.52	62.03
				02/16/14	7.08	979,077	2.03	38.68
				02/18/14	4.75	291,575	2.72	75.93
				03/02/14	4.52	534,672	1.18	32.87
				03/05/14	19.52	1,704,409	3.61	104.87
				03/08/14	10.15	1,261,015	1.24	13.53
				03/10/14	0.23	4,942	2.03	50.03
				03/16/14	4.4	450,306	1.5	29.95
				03/29/14	0.17	72	1.26	98.22
				05/03/14	3.43	310,842	1.04	27.03
				08/13/14	2.55	246,402	0.91	20.28
				10/14/14	0.08	7	0.62	28.82
				10/22/14	1.83	153,935	1.41	61.07
				10/31/14	3.25	257,817	1.42	27.25
				11/06/14	0.33	12,003	1.24	90.72
				11/28/14	8.05	930,774	1.52	46.63
				12/10/14	1.3	96,777	1.48	50.28
				12/23/14	8.82	896,666	1.24	17.43
				Total	89.35	8,763,659	31.48	1015.34
				Average	4.47	438,183	1.57	45.24
WA0031682	**175**	City of Seattle	Lake Union	*No combined sewer overflow during 2014*				

Table 5-5. Comparison of 2014 and Baseline Flows by Outfall								
Outfall Number	2010 - 2014 Average CSO Frequency (#/year)	2014 CSO Discharge Events			Receiving Waters of Overflow	2010 Baseline CSO		2014 CSO Compared to 2010 Baseline CSO
		Frequency (#/year)	Duration (hours)	Volume (gallons)		Frequency (#/year)	Volume (MG/year)	
012	1	2	0.87	2,612	Lake Washington	0	0	Above
013	6.6	15	139.42	12,376,374	Lake Washington	12	6.7	Above
014	0	0	0.00	0	Lake Washington	0	0	Equals
015	2.8	2	6.41	66,045	Lake Washington	1.2	0.3	Frequency Above, Volume Below
016	0	0	0.00	0	Lake Washington	0	0	Equals
018	4.8	5	38.75	3,350,103	Union Bay	6.6	0.5	Frequency below, Volume above
019	0.2	0	0.00	0	Union Bay	0.2	0	Frequency below, Volume Equals
020	3	5	18.60	562,408	Union Bay	2.6	0.1	Above
022	2.4	3	4.02	16,765	Union Bay	0.7	0.1	Frequency Above, Volume Below
024	0.6	0	0.00	0	Lake Washington	0.2	0	Frequency below, Volume Equals
025	0.6	0	0.00	0	Lake Washington	2.8	1.6	Below
026	0	0	0.00	0	Lake Washington	0.3	0	Frequency below, Volume Equals
027	0	0	0.00	0	Lake Washington	0	0	Equals
028	3.2	7	0.77	3,781	Lake Washington	15	0.4	Below
029	6	7	23.68	134,427	Lake Washington	4.7	0.3	Frequency Above, Volume Below
030	1.6	2	8.53	149,342	Lake Washington	5.4	0.7	Below
031	5.8	5	28.69	152,897	Lake Washington	9.3	0.5	Below
032	2.6	2	10.08	111,411	Lake Washington	8.4	0.3	Below
033	0.2	0	0.00	0	Lake Washington	0.2	0	Frequency below, Volume Equals
034	0.8	2	4.97	79,864	Lake Washington	1.4	0.5	Frequency Above, Volume Below
035	1	2	0.16	851	Lake Washington	2	0.3	Frequency Equals, Volume Below
036	2	2	8.40	26,931	Lake Washington	2.7	0.1	Below
038	0.8	2	2.53	55,731	Lake Washington	0.7	0.4	Frequency Above, Volume Below
040	6.4	11	97.27	2,502,735	Lake Washington	6	0.8	Above
041	10.6	22	269.17	2,745,644	Lake Washington	7.5	0.9	Above
042	2.6	6	46.80	489,133	Lake Washington	0.6	0.02	Above
043	10	14	117.08	1,541,559	Lake Washington	7	0.7	Above

Outfall Number	2010 - 2014 Average CSO Frequency (#/year)	2014 CSO Discharge Events			Receiving Waters of Overflow	2010 Baseline CSO		2014 CSO Compared to 2010 Baseline CSO
		Frequency (#/year)	Duration (hours)	Volume (gallons)		Frequency (#/year)	Volume (MG/year)	
044	18.2	25	319.81	11,257,313	Lake Washington	13	9.3	Above
045	12.6	21	95.72	520,482	Lake Washington	5.9	1.1	Frequency Above, Volume Below
046	4.6	4	27.88	51,982	Lake Washington	6.5	0.9	Below
047	10.4	15	55.72	2,475,920	Lake Washington	5.6	1.8	Above
048	0	0	0.00	0	Lake Washington	0	0	Equals
049	3.8	6	44.28	2,452,672	Lake Washington	1.6	0.8	Above
057	0	0	0.00	0	Puget Sound	0	0	Equals
059	0.8	0	0.00	0	Salmon Bay	0.2	0.4	Below
060	3	2	4.30	86,372	Salmon Bay	1.7	0.8	Frequency Above, Volume Below
061	0.2	0	0.00	0	Elliott Bay	0	0	Equals
062	1.6	2	0.64	1,584	Elliott Bay	0.7	0	Above
064	0	0	0.00	0	Elliott Bay	0.1	0	Frequency below, Volume Equals
068	1	2	3.84	188,263	Elliott Bay	1.4	1.3	Frequency Above, Volume Below
069	2.2	3	1.09	206,238	Elliott Bay	4.4	1.4	Below
070	0.2	0	0.00	0	Elliott Bay	0.9	0.2	Below
071	4.2	2	1.01	81,675	Elliott Bay	4.3	1.3	Below
072	0.2	0	0.00	0	Elliott Bay	1.2	0.3	Below
078	0	0	0.00	0	Elliott Bay	0.3	0.2	Below
080	0	0	0.00	0	Elliott Bay	0	0	Equals
083	0	0	0.00	0	Puget Sound	0	0	Equals
085	0	0	0.00	0	Puget Sound	0	0	Equals
088	0.2	0	0.00	0	Puget Sound	0.3	0.2	Below
090	0	0	0.00	0	Puget Sound	0.2	0	Frequency below, Volume Equals
091	0	0	0.00	0	Puget Sound	0	0	Equals
094	0	0	0.00	0	Puget Sound	0.1	0	Frequency below, Volume Equals
095	1.2	0	0.00	0	Puget Sound	3	0.4	Below
099	3.4	6	72.67	3,827,730	W Waterway - Duwamish River	0.5	2.8	Above
107	6	6	30.10	288,804	E Waterway - Duwamish River	3.8	1.9	Frequency Above, Volume Below
111	2.4	3	16.59	146,654	Duwamish River	3	7.9	Frequency Equals, Volume Below
120	0	0	0.00	0	Lake Union	0	0	Equals
121	0	0	0.00	0	Lake Union	0.1	0	Frequency below, Volume Equals

Outfall Number	2010 - 2014 Average CSO Frequency (#/year)	2014 CSO Discharge Events			Receiving Waters of Overflow	2010 Baseline CSO		2014 CSO Compared to 2010 Baseline CSO
		Frequency (#/year)	Duration (hours)	Volume (gallons)		Frequency (#/year)	Volume (MG/year)	
124	0	0	0.00	0	Lake Union	0	0	Equals
127	0	0	0.00	0	Lake Union	0.7	0.1	Below
129	0.4	0	0.00	0	Lake Union	0.1	0	Frequency below, Volume Equals
130	0	0	0.00	0	Lake Union	0	0	Equals
131	0	0	0.00	0	Lake Union	0.1	0	Frequency below, Volume Equals
132	0.6	0	0.00	0	Lake Union	0.7	0	Frequency below, Volume Equals
134	0	0	0.00	0	Lake Union	0	0	Equals
135	0	0	0.00	0	Lake Union	0.3	0	Frequency below, Volume Equals
136	0	0	0.00	0	Lake Union	0	0	Equals
138	2.2	3	8.00	264,644	Portage Bay	2.3	2	Frequency Above, Volume Below
139	1.6	2	3.33	47,515	Portage Bay	0.7	1.4	Frequency Above, Volume Below
140	6.4	13	9.72	341,627	Portage Bay	4.1	0.3	Above
141	0	0	0.00	0	Portage Bay	0.1	0	Frequency below, Volume Equals
144	0	0	0.00	0	Lake Union	0.1	0.2	Below
145	0	0	0.00	0	Lake Union	0	0	Equals
146	0	0	0.00	0	Lake Union	0	0	Equals
147	45.2	49	589.00	12,316,618	Lake Union	33	19	Frequency Above, Volume Below
148	0.6	0	0.00	0	Lake Washington Ship Canal	0	0	Equals
150/151	26.6	34	268.14	3,543,723	Salmon Bay	15	2	Above
152	53	53	900.65	41,104,401	Salmon Bay	15	9.7	Above
161	0	0	0.00	0	Lake Washington	0	0	Equals
165	1.2	2	1.34	8,970	Lake Washington	1.1	0.02	Frequency Above, Volume Below
168	1	1	13.73	1,092,208	Longfellow Creek	3.9	1.6	Below
169	1.2	1	23.15	604,990	Longfellow Creek	2.2	49	Below
170	0.4	0	0.00	0	Longfellow Creek	0.4	0.1	Below
171	9.8	15	57.62	1,544,026	Lake Washington	4.1	0.75	Above
174	13.4	20	89.35	8,763,659	Lake Washington Ship Canal	11	5.9	Above
175	0.4	0	0.00	0	Lake Union	0.7	0	Frequency below, Volume Equals
Total	316	406	3,464	115,586,683		252	140	

Outfall Number	Frequency					Overflow Duration (Hours)					Overflow Volume (Gallons per Year)					Receiving Waters
	2010	2011	2012	2013	2014	2010	2011	2012	2013	2014	2010	2011	2012	2013	2014	
012	1	0	1	1	2	12.40	0.00	10.87	0.30	0.87	223,010	0	58,966	590	2,612	Lake Washington
013	5	4	7	2	15	70.70	49.66	60.87	8.42	139.42	6,526,814	1,397,291	4,471,990	889,232	12,376,374	Lake Washington
014	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	Lake Washington
015	4	4	2	2	2	41.45	4.03	14.78	2.53	6.41	1,409,738	22,529	188,231	28,466	66,045	Lake Washington
016	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	Lake Washington
018	5	4	8	2	5	75.72	20.39	70.93	6.43	38.75	17,174,989	1,772,295	9,541,486	1,635,247	3,350,103	Union Bay
019	0	0	0	1	0	0.00	0.00	0.00	1.03	0.00	0	0	0	902	0	Union Bay
020	3	3	2	2	5	24.13	17.03	14.36	6.13	18.60	1,943,677	189,159	762,481	209,475	562,408	Union Bay
022	1	1	4	3	3	19.00	2.23	46.23	8.42	4.02	1,193,468	6,285	23,146	11,402	16,765	Union Bay
024	1	0	1	1	0	13.77	0.00	11.00	1.73	0.00	2,181,178	0	1,179,613	184,519	0	Lake Washington
025	1	0	1	1	0	13.50	0.00	10.77	1.53	0.00	2,402,363	0	1,214,977	97,238	0	Lake Washington
026	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	Lake Washington
027	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	Lake Washington
028	2	2	2	3	7	0.38	0.11	0.35	6.33	0.77	324	1,204	3,931	4,761	3,781	Lake Washington
029	2	3	11	7	7	10.78	38.41	43.45	21.73	23.68	42,839	24,029	299,426	107,553	134,427	Lake Washington
030	0	1	3	2	2	0.00	0.03	18.53	10.60	8.53	0	13	360,739	103,602	149,342	Lake Washington
031	11	11	2	0	5	116.21	99.19	9.76	0.00	28.69	957,983	356,655	8,170	0	152,897	Lake Washington
032	3	4	3	1	2	25.53	44.43	19.46	6.42	10.08	1,111,491	368,002	237,856	88,300	111,411	Lake Washington
033	0	0	1	0	0	0.00	0.00	0.10	0.00	0.00	0	0	360	0	0	Lake Washington
034	1	0	1	0	2	16.57	0.00	11.13	0.00	4.97	833,946	0	229,082	0	79,864	Lake Washington
035	0	1	1	1	2	0.00	0.25	1.07	0.08	0.16	0	1,815	5,893	802	851	Lake Washington
036	2	1	2	3	2	19.43	14.43	12.65	4.72	8.40	256,969	16,852	40,092	8,389	26,931	Lake Washington
038	1	0	1	0	2	18.97	0.00	10.38	0.00	2.53	2,144,838	0	433,405	0	55,731	Lake Washington
040	5	4	10	2	11	37.93	48.06	83.74	14.70	97.27	3,207,479	814,849	3,602,239	728,493	2,502,735	Lake Washington
041	5	5	13	8	22	78.73	84.48	189.40	54.07	269.17	1,623,574	557,594	1,747,947	400,178	2,745,644	Lake Washington
042	1	2	3	1	6	19.13	6.86	26.43	7.13	46.80	1,377,285	82,769	453,768	125,525	489,133	Lake Washington
043	9	7	14	6	14	99.23	76.79	135.33	17.02	117.08	2,825,223	1,136,935	2,693,671	517,740	1,541,559	Lake Washington

Table 5-6. 2010-2014 Summary Comparison of Overflows by Outfall

Outfall Number	Frequency					Overflow Duration (Hours)					Overflow Volume (Gallons per Year)					Receiving Waters
	2010	2011	2012	2013	2014	2010	2011	2012	2013	2014	2010	2011	2012	2013	2014	
044	16	17	22	11	25	318.67	270.03	399.66	91.27	319.81	9,887,390	7,331,324	12,327,310	2,873,135	11,257,313	Lake Washington
045	10	11	14	7	21	124.83	85.31	199.56	53.33	95.72	1,322,252	159,235	889,798	243,619	520,482	Lake Washington
046	12	4	2	1	4	167.11	28.50	16.00	0.33	27.88	4,197,631	88,604	27,595	281	51,982	Lake Washington
047	8	7	12	10	15	42.87	67.29	89.47	70.75	55.72	10,900,742	1,044,960	10,000,932	2,377,107	2,475,920	Lake Washington
048	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	Lake Washington
049	4	2	5	2	6	29.98	19.15	35.25	9.27	44.28	4,552,799	634,667	1,984,105	1,056,726	2,452,672	Lake Washington
057	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	Puget Sound
059	0	1	2	1	0	0.00	0.17	5.51	0.44	0.00	0	915	95,408	11,666	0	Salmon Bay
060	4	2	6	1	2	11.90	25.03	10.76	1.17	4.30	466,164	174,145	727,910	47,234	86,372	Salmon Bay
061	1	0	0	0	0	1.23	0.00	0.00	0.00	0.00	50,026	0	0	0	0	Elliott Bay
062	0	3	1	2	2	0.00	0.24	6.80	0.41	0.64	0	239	237	7,285	1,584	Elliott Bay
064	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	Elliott Bay
068	1	0	1	1	2	12.77	0.00	7.00	2.10	3.84	1,840,469	0	2,801,197	331,236	188,263	Elliott Bay
069	1	2	2	3	3	26.87	0.46	10.70	2.18	1.09	214,775	57,940	277,093	439,013	206,238	Elliott Bay
070	0	0	0	1	0	0.00	0.00	0.00	0.60	0.00	0	0	0	65,550	0	Elliott Bay
071	7	3	5	4	2	54.68	39.08	14.47	11.08	1.01	1,352,572	129,452	600,682	369,332	81,675	Elliott Bay
072	0	0	0	1	0	0.00	0.00	0.00	0.47	0.00	0	0	0	14,783	0	Elliott Bay
078	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	Elliott Bay
080	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	Elliott Bay
083	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	Puget Sound
085	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	Puget Sound
088	1	0	0	0	0	10.38	0.00	0.00	0.00	0.00	342,740	0	0	0	0	Puget Sound
090	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	Puget Sound
091	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	Puget Sound
094	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	Puget Sound
095	3	1	1	1	0	10.42	0.03	0.22	1.58	0.00	179,782	744	4,276	803	0	Puget Sound
099	2	3	5	1	6	22.77	29.97	30.00	5.07	72.67	1,620,161	715,775	2,494,862	405,700	3,827,730	W Waterway - Duwamish River
107	12	5	4	3	6	71.30	64.33	14.02	9.33	30.10	4,167,734	767,499	352,041	232,587	288,804	E Waterway - Duwamish River

Outfall Number	Frequency					Overflow Duration (Hours)					Overflow Volume (Gallons per Year)					Receiving Waters
	2010	2011	2012	2013	2014	2010	2011	2012	2013	2014	2010	2011	2012	2013	2014	
111	3	2	1	3	3	20.27	17.85	26.23	6.37	16.59	7,724,604	723	314,968	11,507	146,654	Duwamish River
120	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	Lake Union
121	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	Lake Union
124	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	Lake Union
127	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	Lake Union
129	0	0	0	2	0	0.00	0.00	0.00	49.97	0.00	0	0	0	64,910	0	Lake Union
130	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	Lake Union
131	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	Lake Union
132	0	1	0	2	0	0.00	0.08	0.00	0.23	0.00	0	2,559	0	3,986	0	Lake Union
134	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	Lake Union
135	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	Lake Union
136	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	Lake Union
138	1	3	2	2	3	15.30	15.05	12.25	3.50	8.00	1,098,144	124,027	649,289	119,989	264,644	Portage Bay
139	2	1	2	1	2	13.33	0.03	10.60	1.43	3.33	399,306	2,638	320,403	47,561	47,515	Portage Bay
140	8	2	4	5	13	48.48	0.15	17.96	8.05	9.72	755,672	3,107	437,331	147,407	341,627	Portage Bay
141	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	Portage Bay
144	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	Lake Union
145	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	Lake Union
146	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	Lake Union
147	63	40	47	27	49	801.28	391.91	672.19	238.15	589.00	23,213,300	9,748,238	14,636,073	4,800,690	12,316,618	Lake Union
148	1	2	0	0	0	0.78	0.69	0.00	0.00	0.00	19,092	6,883	0	0	0	Lake Washington Ship Canal
150/151	29	25	31	14	34	244.24	208.64	378.01	114.80	268.14	2,848,612	2,497,818	4,871,447	1,737,206	3,543,723	Salmon Bay
152	63	48	57	44	53	999.37	640.68	1098.59	440.30	900.65	40,356,610	40,634,362	52,382,276	13,192,217	41,104,401	Salmon Bay
161	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	Lake Washington
165	1	0	2	1	2	11.30	0.00	10.43	0.25	1.34	118,552	0	54,470	4,387	8,970	Lake Washington
168	2	0	2	0	1	110.83	0.00	47.24	0.00	13.73	4,824,814	0	5,364,038	0	1,092,208	Longfellow Creek
169	2	2	1	0	1	36.30	6.50	16.03	0.00	23.15	6,874,940	614,501	2,587,257	0	604,990	Longfellow Creek
170	1	0	1	0	0	5.17	0.00	0.90	0.00	0.00	40,069	0	12,286	0	0	Longfellow Creek

Outfall Number	Frequency					Overflow Duration (Hours)					Overflow Volume (Gallons per Year)					Receiving Waters
	2010	2011	2012	2013	2014	2010	2011	2012	2013	2014	2010	2011	2012	2013	2014	
171	5	6	13	10	15	72.09	68.67	97.47	79.75	57.62	3,344,191	828,364	2,199,443	970,469	1,544,026	Lake Washington
174	13	10	17	7	20	122.91	93.30	267.09	24.95	89.35	9,846,389	5,877,361	10,262,141	2,775,594	8,763,659	Lake Washington Ship Canal
175	0	0	0	2	0	0.00	0.00	0.00	1.40	0.00	0	0	0	3,062	0	Lake Union
Total	**339**	**260**	**355**	**219**	**406**	**4,121**	**2,580**	**4,296**	**1,408**	**3,464**	189,996,720	78,194,356	154,232,337	37,497,456	115,586,683	

Table 5-7. 2010-2014 Summary Comparison of CSOs by Receiving Water

Receiving Waters of Overflow	Overflow Frequency (# per Year)					Overflow Event Duration (Hours)					Overflow Volume (Gallons per Year)				
	2010	2011	2012	2013	2014	2010	2011	2012	2013	2014	2010	2011	2012	2013	2014
Duwamish River	3	2	1	3	3	20	18	26	11	17	7,724,604	723	314,968	11,507	146,654
East Waterway	12	5	4	3	6	71	64	14	9	30	4,167,734	767,499	352,041	232,587	288,804
Elliott Bay	10	8	9	12	4	96	40	39	12	5	3,457,842	187,631	3,679,209	1,227,201	269,938
Lake Union	63	41	47	33	49	801	392	672	290	589	23,213,300	9,750,797	14,636,073	4,872,642	12,316,618
Lake Washington	110	96	149	84	191	1,362	1,006	1,518	462	1,367	61,448,611	14,867,691	44,714,009	11,216,814	38,750,702
Lake Washington - Ship Canal	14	12	17	7	20	124	94	267	25	89	9,865,481	5,884,244	10,262,141	2,775,594	8,763,659
Longfellow Creek	5	2	4	0	2	152	7	64	0	37	11,739,823	614,501	7,963,581	0	1,697,198
Portage Bay	11	6	8	8	18	77	15	41	13	21	2,253,122	129,772	1,407,023	314,957	653,786
Puget Sound	4	1	1	1	0	21	0.03	0.22	2	0	522,522	744	4,276	803	0
Salmon Bay	96	76	96	60	94	1,256	875	1,493	561	1,175	43,671,386	43,307,240	58,077,041	14,988,321	44,942,318
Union Bay	9	8	14	8	13	119	40	132	22	61	20,312,134	1,967,739	10,327,113	1,857,024	3,929,276
West Waterway	2	3	5	0	6	23	30	30	0	73	1,620,161	715,775	2,494,862	0	3,827,730
TOTAL:	339	260	355	219	406	4,122	2,581	4,296	1,407	3,464	189,996,720	78,194,356	154,232,337	37,497,450	115,586,683

Table 5-8. Outfalls Meeting Performance Standard for Controlled CSOs Based on Flow Monitoring Results and Modeling

Outfall Number	Number of Overflows Per Year [1]																				Average Annual Overflow Frequency	Meets Performance Standard? [2]	Long-Term Simulation Source	Notes
	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014				
12							0	0	0	0	0	0	0	0	0	1	0	1	1	2	0.4	Yes	N/A	3, 4
13	14	16	19	15	15	8	10	5	14	8	9	25	4	2	4	5	4	7	2	15	10.1	No	Windermere H&H Report, July 2010	5
14													1	0	1	0	0	0	0	0	0.3	Yes	N/A	4, 6
15	0	3	1	2	0	0	0	0	2	0	1	4	1	0	8	4	4	2	2	2	1.8	No	Windermere H&H Report, July 2010	5
16							0	0	0	0	0	1	0	0	1	0	0	0	0	0	0.1	Yes	N/A	3, 4
18	2	7	5	5	2	0	3	2	3	4	4	11	2	3	8	5	4	8	2	5	4.3	No	LTCP Long Term Simulation Results February 2013	5
19							0	0	1	0	0	1	0	0	0	0	0	0	1	0	0.2	Yes	N/A	3,4
20	0	3	2	1	1	0	0	0	2	1	0	3	1	0	3	3	3	2	2	5	1.6	No	LTCP Long Term Simulation Results February 2013	5
22	0	2	1	0	0	0	0	0	2	3	0	1	1	0	1	1	1	4	3	3	1.2	No	LTCP Long Term Simulation Results February 2013	5, 12
24	0	4	1	1	0	0	0	0	2	2	0	4	1	0	1	1	0	1	1	0	1.0	Yes	LTCP Long Term Simulation Results February 2013	5
25	0	3	0	0	0	0	0	0	2	1	0	3	1	1	2	1	0	1	1	0	0.8	Yes	LTCP Long Term Simulation Results February 2013	5, 7
26	0	1	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	N/A	Yes	LTCP Long Term Simulation Results February 2013	5, 13
27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	Yes	LTCP Long Term Simulation Results February 2014	5
28	0	3	1	0	0	0	1	1	1	1	0	2	1	26	8	2	2	2	3	7	3.1	No	LTCP Long Term Simulation Results February 2013	5
29	1	4	1	1	1	0	3	1	2	2	0	5	1	5	4	2	3	11	7	7	3.1	No	LTCP Long Term Simulation Results February 2013	5
30	0	2	0	1	0	0	1	1	1	1	0	1	1	2	1	0	1	3	2	2	1.0	Yes	LTCP Long Term Simulation Results February 2013	8
31	18	22	11	21	14	2	17	13	18	13	19	32	10	4	12	11	11	2	0	5	12.8	No	LTCP Long Term Simulation Results February 2013	5
32	8	10	5	7	4	1	13	4	4	4	4	15	5	1	7	3	4	3	1	2	5.3	No	LTCP Long Term Simulation Results February 2013	5
33	0	1	0	0	0	0	0	1	0	0	0	1	0	0	1	0	0	1	0	0	0.3	Yes	LTCP Long Term Simulation Results February 2013	5

Outfall Number	Number of Overflows Per Year [1]																				Average Annual Overflow Frequency	Meets Performance Standard? [2]	Long-Term Simulation Source	Notes
	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014				
34	0	4	1	1	1	0	1	1	2	1	0	3	1	0	1	1	0	1	0	2	1.1	No	LTCP Long Term Simulation Results February 2013	5, 9, 14
35	0	3	0	0	0	0	1	1	2	2	0	1	1	0	3	0	1	1	1	2	1.0	Yes	LTCP Long Term Simulation Results February 2013	5, 10, 14
36	1	6	0	3	2	0	3	1	2	2	1	6	1	0	5	2	1	2	3	2	2.2	No	LTCP Long Term Simulation Results February 2013	5
38	0	2	0	1	0	0	1	0	2	1	0	2	1	0	1	1	0	1	0	2	0.8	Yes	InfoWorks V9.5 H&H Model – Extracted Data Set From Long Term Simulation Run.	5
40	8	10	6	5	2	3	9	4	6	4	4	12	7	1	6	5	4	10	2	11	6.0	No	InfoWorks V9.5 H&H Model – Extracted Data Set From Long Term Simulation Run.	5
41	9	11	8	9	3	3	11	5	7	5	9	15	7	9	14	5	5	13	8	22	8.9	No	InfoWorks V9.5 H&H Model – Extracted Data Set From Long Term Simulation Run.	5
42	0	3	0	1	0	0	1	2	1	1	0	0	0	0	1	1	2	3	1	6	1.2	No	InfoWorks V9.5 H&H Model – Extracted Data Set From Long Term Simulation Run.	5, 15
43	9	10	7	8	3	3	11	5	7	4	5	13	7	3	11	9	7	14	6	14	7.8	No	InfoWorks V9.5 H&H Model – Extracted Data Set From Long Term Simulation Run.	5
44	16	18	22	20	12	8	14	10	18	16	13	29	9	12	16	16	17	22	11	25	16.2	No	InfoWorks V9.5 H&H Model – Extracted Data Set From Long Term Simulation Run.	5
45	13	24	15	20	10	6	16	11	18	22	17	21	19	5	11	10	11	14	7	21	14.6	No	InfoWorks V9.5 H&H Model – Extracted Data Set From Long Term Simulation Run.	5
46	9	11	12	9	4	3	13	4	8	7	8	13	5	9	9	12	4	2	1	4	7.4	No	InfoWorks V9.5 H&H Model – Extracted Data Set From Long Term Simulation Run.	5
47	12	19	11	10	8	9	10	17	28	32	27	39	34	3	12	8	7	12	10	15	16.2	No	InfoWorks V9.5 H&H Model – Extracted Data Set From Long Term Simulation Run.	5
48														0	0	0	0	0	0	0	0.0	Yes	N/A	4, 5

Outfall Number	Number of Overflows Per Year [1]																				Average Annual Overflow Frequency	Meets Performance Standard? [2]	Long-Term Simulation Source	Notes
	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014				
49	1	3	1	1	0	0	1	1	2	0	4	11	2	1	6	4	2	5	2	6	2.7	No	InfoWorks V9.5 H&H Model – Extracted Data Set From Long Term Simulation Run.	5
57							0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	Yes	N/A	3, 4
59							0	0	1	0	0	0	1	0	0	0	1	2	1	0	0.4	Yes	N/A	3, 4
60	4	8	3	1	4	1	2	0	2	1	4	4	3	0	3	4	2	6	1	2	2.8	No	LTCP Long Term Simulation Results February 2013	5
61	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0.1	Yes	N/A	3, 4
62	1	2	1	0	0	0	1	0	1	0	1	1	1	0	0	0	3	1	2	2	0.9	Yes	N/A	3, 4
64	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	Yes	N/A	3, 4
68	1	3	0	0	0	0	1	0	2	0	1	1	1	0	1	1	0	1	1	2	0.8	Yes	LTCP Long Term Simulation Results February 2013	5, 11
69	2	3	2	3	0	1	1	1	2	1	1	2	1	1	3	1	2	2	3	3	1.8	No	LTCP Long Term Simulation Results February 2013	5
70	0	2	1	1	0	0	1	0	0	1	0	1	1	0	1	0	0	0	1	0	0.5	Yes	AWVSRP Modeling Support Alternative Modeling Report May 2012, Appendix D	5
71	0	4	2	1	0	0	1	0	3	1	1	2	1	2	9	7	3	5	4	2	2.4	No	AWVSRP Modeling Support Alternative Modeling Report May 2012, Appendix D	5
72	0	2	1	0	0	0	0	0	2	0	0	1	1	0	0	0	0	0	1	0	0.4	Yes	AWVSRP Modeling Support Alternative Modeling Report May 2012, Appendix D	5
78							0	0	2	0	0	0	1	0	0	0	0	0	0	0	0.2	Yes	N/A	3, 4
80							0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	Yes	N/A	3, 4
83							0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	Yes	N/A	3, 4
85							0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	Yes	N/A	3, 4
88							0	0	0	1	0	0	2	0	0	1	0	0	0	0	0.3	Yes	N/A	3, 4
90							0	0	0	0	1	1	0	0	0	0	0	0	0	0	0.1	Yes	N/A	3, 4
91							0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	Yes	N/A	3, 4
94							0	0	1	0	0	0	0	0	0	0	0	0	0	0	0.1	Yes	N/A	3, 4
95							3	1	2	0	4	6	1	3	7	3	1	1	1	0	2.4	No	N/A	3, 4
99	2	3	1	2	2	0	3	0	1	1	2	1	1	0	1	2	3	5	1	6	1.9	No	LTCP Long Term Simulation Results February 2013	5
107	2	7	4	5	6	1	6	5	3	7	5	7	1	2	11	12	5	4	3	6	5.1	No	LTCP Long Term Simulation Results January 2014	5

Outfall Number	Number of Overflows Per Year [1]																				Average Annual Overflow Frequency	Meets Performance Standard? [2]	Long-Term Simulation Source	Notes
	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014				
111	0	3	3	2	0	0	2	1	3	1	3	2	1	0	6	3	2	1	3	3	2.0	No	LTCP Long Term Simulation Results February 2013	5
120							0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	Yes	N/A	3, 4
121							0	0	0	1	0	0	0	0	0	0	0	0	0	0	0.1	Yes	N/A	3, 4
124							0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	Yes	N/A	3, 4
127							0	0	0	1	0	3	0	1	1	0	0	0	0	0	0.4	Yes	N/A	3, 4
129							0	1	0	0	0	0	0	0	0	0	0	0	2	0	0.2	Yes	N/A	3, 4
130														0	0	0	0	0	0	0	0.0	Yes	N/A	4, 5
131							0	0	0	0	0	0	1	0	0	0	0	0	0	0	0.1	Yes	N/A	3, 4
132														0	0	0	1	0	2	0	0.4	Yes	N/A	4, 5
134							0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	Yes	N/A	3, 4
135														0	1	0	0	0	0	0	0.1	Yes	N/A	4, 5
136							0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	Yes	N/A	3, 4
138	1	5	2	1	0	0	1	0	2	3	0	3	1	1	2	1	3	2	2	3	1.7	No	LTCP Long Term Simulation Results February 2013	5
139	0	2	4	2	0	0	1	0	1	3	1	2	1	0	1	2	1	2	1	2	1.3	No	LTCP Long Term Simulation Results February 2013	5
140	1	7	7	3	0	2	2	3	6	5	6	5	1	1	7	8	2	4	5	13	4.4	No	LTCP Long Term Simulation Results February 2013	5
141							0	0	0	0	0	1	0	0	0	0	0	0	0	0	0.1	Yes	N/A	3, 4
144							0	0	0	0	0	0	1	0	0	0	0	0	0	0	0.1	Yes	N/A	3, 4
145							0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	Yes	N/A	3, 4
146							0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	Yes	N/A	3, 4
147	43	50	41	32	32	27	26	29	31	29	37	45	35	50	45	63	40	47	27	49	38.9	No	LTCP Long Term Simulation Results February 2013	5
148							0	0	0	0	0	0	0	0	0	1	2	0	0	0	0.2	Yes	N/A	3, 4
150/151	18	24	29	15	19	11	16	10	14	6	15	23	11	2	22	29	25	31	14	34	18.4	No	LTCP Long Term Simulation Results February 2013	5
152	44	52	52	49	49	57	47	39	53	44	46	42	43	11	29	63	48	57	44	53	46.1	No	LTCP Long Term Simulation Results February 2013	5
161							0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	Yes	N/A	3, 4
165														1	1	1	0	2	1	2	1.1	No	N/A	4, 5, 16
168	3	5	1	2	6	0	5	1	2	1	2	8	3	0	6	2	0	2	0	1	2.5	No	LTCP Long Term Simulation Results February 2013	5
169	3	5	1	2	6	0	5	1	2	1	2	8	3	1	1	2	2	1	0	1	2.4	No	LTCP Long Term Simulation Results February 2013	5

Outfall Number	Number of Overflows Per Year [1]																				Average Annual Overflow Frequency	Meets Performance Standard? [2]	Long-Term Simulation Source	Notes
	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014				
170														0	2	1	0	1	0	0	0.6	Yes	N/A	4, 5
171	6	10	9	8	2	4	4	10	6	3	8	12	6	4	10	5	6	13	10	15	7.6	No	InfoWorks V9.5 H&H Model – Extracted Data Set From Long Term Simulation Run.	5
174	5	12	10	9	6	1	8	3	5	6	10	21	6	6	14	13	10	17	7	20	9.5	No	LTCP Long Term Simulation Results February 2013	5
175														0	1	0	0	0	2	0	0.4	Yes	N/A	4, 5

Notes:

1. Per Section S6.A.2 of the NPDES Permit, the determination of whether an outfall is meeting the performance standard for controlled outfalls has been made based on up to 20 years of data and modeling. Numbers in the colorless cells were obtained from flow monitoring. Numbers in blue-shaded cells were obtained using actual precipitation data and basin-specific models and are used in the long-term average annual overflow calculation for years when flow monitoring data either is not available or the accuracy of the flow monitoring data cannot be confirmed.
2. Responses in this column are "Yes" if the calculated Average Annual Overflow Frequency is no more than 1 per year and "No" if the calculated Average Annual Overflow Frequency is >1 per year. Some outfalls have higher than expected calculated Average Annual Overflow Frequencies because of impacts from uncontrolled adjacent basins and/or exacerbated CSOs. Examples of these situations are explained in Notes 9 through 15. SPU will continue to monitor these outfalls to confirm that they are controlled and, if not, to plan additional control actions.
3. The flow monitoring configuration prior to 2001 cannot be confirmed and the pre-2001 data accuracy is questionable, so the calculated Average Annual Overflow Frequency is based on flow monitoring conducted between 2001 and 2014.
4. The Average Annual Overflow Frequency was calculated based on the number of years of reliable data.
5. The flow monitoring configuration prior to 2008 cannot be confirmed and the pre-2008 data accuracy is questionable, so the calculated Average Annual Overflow Frequency is based on flow monitoring conducted between 2008 and 2014.
6. The flow monitoring configuration prior to 2007 cannot be confirmed and the pre-2007 data accuracy is questionable, so the calculated Average Annual Overflow Frequency is based on flow monitoring conducted between 2007 and 2014.
7. SPU raised the weir at Outfall 25 in early 2008, so the calculated Average Annual Overflow Frequency uses flow modeling through 2008 and flow monitoring for subsequent years.
8. Monitoring configuration prior to 2009 cannot be confirmed and the data accuracy is questionable, so the calculated Average Annual Overflow Frequency is based on flow monitoring conducted between 2009 and 2014.
9. CSOs in 2006 likely due to clogged HydroBrake; inspection frequency has since been increased.
10. CSOs in 2009 likely due to clogged HydroBrake; inspection frequency has since been increased.
11. Actual overflow frequency affected by clogged HydroBrake (2005, 2007) and leaky flap gate leading to offline storage.
12. Several exacerbated CSOs occurred at Outfall 22 in recent years because of the deteriorating performance of WWPS50. The pump station will be rehabilitated and existing air-lift style pumps will be replaced with submersible pumps in 2016 (see Section 4.1.8).
13. SPU sealed Outfall 26 and removed it from service in early 2014.
14. Two phases of retrofits are being implemented in the Leschi Area (Basins 26-36). As part of Phase I, the weir height at Outfall 34 was raised a foot in August 2014, and consequently, this outfall is believed to be controlled. The Phase II retrofits will be completed in 2016 and should bring additional Leschi basins into control.
15. Several exacerbated CSOs occurred from Outfall 42 in 2014 due to the historic wet weather (March 2014) and construction of the Genesee CSO reduction project (Basins 40/41 and 43). SPU will monitor the performance of Basin 42 to ensure it is controlled.
16. Basin 165 is in the Genesee area is pumped into the Lake Line upstream of the other Genesee basins. Based on modeling, control of the other Genesee basins (Basins 40/41, 42, and 43) should bring Basin 165 in control.

Appendix A: Additional CMOM Information

Table A-1. 2014 Sanitary Sewer Overflow (SSO) Details									
2014 SSO Number[1]	ERTS Number	Date	Address	SSO Volume (gallons)	Volume in Receiving Water (gallons)	Receiving Water	Primary Cause	Secondary Cause, if Any	Additional Contributing Cause, If Any
1	646205	1/10/14	36th Ave E & Lake Washington Blvd E	100			Structural failure-gravity main		
2	646432	1/22/14	1821 Boren Ave	5			Private Construction		
3	646575	1/30/14	9029 49th Ave NE	1,000			Structural failure-gravity main	Debris	
4	646904	2/16/14	2534 39th Ave E	300			Pump Station-Mechanical		
5	646997	2/16/14	1244 S Concord St	14,000			Capacity-gravity main		
6	649732	2/17/14	1113 & 1115 S Pearl St	100			Capacity-gravity main		
7	647290	3/5/14	SW Andover St & 26th Ave SW	39,000	39,000	Longfellow Creek	Debris	Extreme Weather Event	
8	647291	3/5/14	1244 S Concord St	13,000			Extreme Weather Event		
9	647364	3/5/14	2307 SW Myrtle St	41,250	41,250	Longfellow Creek	Vandalism	Extreme Weather Event	
10	647356	3/8/14	1100 NE 47th St	960			Private side sewer issue	Extreme Weather Event	
11	647416	3/8/14	2653 SW Yancy St	38,000	38,000	Longfellow Creek	Extreme Weather Event		
12	647625	3/14/14	820 S Trenton St	746			Roots	FOG	
13	647651	3/23/14	1608 11th Ave S	360			Vandalism		

2014 SSO Number[1]	ERTS Number	Date	Address	SSO Volume (gallons)	Volume in Receiving Water (gallons)	Receiving Water	Primary Cause	Secondary Cause, if Any	Additional Contributing Cause, If Any
14	647776	3/27/14	3027 Humes Pl W	5			Roots		
15	648017	4/8/14	Elliott Ave W & W Lee St	21,000			Vandalism		
16	648048	4/10/14	Elliott Ave W & W Lee St	150			Vandalism		
17	648554	5/5/14	342 NW 76th St	2			Structural failure-gravity main		
18	648923, 650730	5/22/14	Court Pl & Eastlake Ave E	unknown			Structural failure-gravity main		
19	650079	7/11/14	3801 46th Ave NE	1			Private side sewer issue	Debris	FOG
20	650323	7/23/14	9020 22nd Ave SW	235	160	Longfellow Creek	Vandalism		
21	650315	7/23/14	3617 Lakewood Ave S	25			Debris	Structural failure-gravity main	
22	650395	7/25/14	333 Boren Ave N	300			Private Construction		
23	650795	8/12/14	6th Ave N and Broad St	1,000			Other Agency Construction		
24	650995	8/20/14	30th Ave E and E Mercer St	unknown			Structural failure-gravity main		
25	651106	8/24/14	3209 32nd Ave W	20			City Construction		
26	651280	9/2/14	8034 17th Ave NW	280			Extreme Weather Event		
26	651280	9/2/14	7502 17th Ave NW	290			Extreme Weather Event		

2014 SSO Number[1]	ERTS Number	Date	Address	SSO Volume (gallons)	Volume in Receiving Water (gallons)	Receiving Water	Primary Cause	Secondary Cause, if Any	Additional Contributing Cause, If Any
26	651280	9/2/14	7507 17th Ave NW	440			Extreme Weather Event		
26	651280	9/2/14	7515 17th Ave NW	4,500			Extreme Weather Event		
26	651280	9/2/14	7523 17th Ave NW	200			Extreme Weather Event		
26	651280	9/2/14	7525 17th Ave NW	230			Extreme Weather Event		
26	651280	9/2/14	7534 17th Ave NW	440			Extreme Weather Event		
26	651280	9/2/14	7538 17th Ave NW	430			Extreme Weather Event		
26	651280	9/2/14	8010 17th Ave NW	130			Extreme Weather Event		
26	651280	9/2/14	8027 17th Ave NW	280			Extreme Weather Event		
26	651280	9/2/14	8042 17th Ave NW	75			Extreme Weather Event		
26	651280	9/2/14	8048 17th Ave NW	130			Extreme Weather Event		
26	651280	9/2/14	8052 17th Ave NW	500			Extreme Weather Event		
27	651286	9/2/14	8044 20th Ave NE	500			Extreme Weather Event		
27	651286	9/2/14	8050 20th Ave NE	1,400			Extreme Weather Event		
27	651286	9/2/14	8056 20th Ave NE	2,200			Extreme Weather Event		
28	651288	9/2/14	7515 12th Ave NE	1,500			Extreme Weather Event		
29	None	9/2/14	7841 12th Ave NE	1,800			Extreme Weather Event		
30	None	9/2/14	7722 18th Ave NE	unknown			Extreme Weather Event		

2014 SSO Number[1]	ERTS Number	Date	Address	SSO Volume (gallons)	Volume in Receiving Water (gallons)	Receiving Water	Primary Cause	Secondary Cause, if Any	Additional Contributing Cause, If Any
30	None	9/2/14	7558 18th Ave NE	unknown			Extreme Weather Event		
30	None	9/2/14	7705 19th Ave NE	520			Extreme Weather Event		
31	None	9/2/14	7301 21st Ave NE	130			Extreme Weather Event		
32	None	9/2/14	801 NE 85th	unknown			Extreme Weather Event		
33	None	9/2/14	6534 12th Ave NW	2,600			Extreme Weather Event		
33	None	9/2/14	6538 12th Ave NW	2,600			Extreme Weather Event		
33	None	9/2/14	6542 12th Ave NW	1,100			Extreme Weather Event		
33	None	9/2/14	6550 12th Ave NW	1,400			Extreme Weather Event		
33	None	9/2/14	6737 12th Ave NW	unknown			Extreme Weather Event		
33	None	9/2/14	7009 12th Ave NW	unknown			Extreme Weather Event		
34	None	9/2/14	8316 Dibble Ave NW	88			Extreme Weather Event		
34	None	9/2/14	8322 Dibble Ave NW	22			Extreme Weather Event		
34	None	9/2/14	814 NW 80th St	unknown			Extreme Weather Event		
34	None	9/2/14	815 NW 80th St	470			Extreme Weather Event		
35	None	9/2/14	527 N 74th St	unknown			Extreme Weather Event		
35	None	9/2/14	529 N 74th St	unknown			Extreme Weather Event		
35	None	9/2/14	541 N 73rd St	470			Extreme Weather Event		

2014 SSO Number[1]	ERTS Number	Date	Address	SSO Volume (gallons)	Volume in Receiving Water (gallons)	Receiving Water	Primary Cause	Secondary Cause, if Any	Additional Contributing Cause, If Any
36	None	9/2/14	544 N 71st St	940			Extreme Weather Event		
37	None	9/2/14	943 N 83rd St	unknown			Extreme Weather Event		
38	None	9/2/14	7907 Aurora Ave N	unknown			Extreme Weather Event		
39	None	9/2/14	3131 Western Ave	6,000			Extreme Weather Event		
40	None	9/2/14	2800 Elliot Ave	unknown			Extreme Weather Event		
41	None	9/2/14	324 NW 82nd St	unknown			Extreme Weather Event		
42	None	9/2/14	7247 27th Ave NE	unknown			Extreme Weather Event		
43	None	9/2/14	Elliott Ave W and 4th Ave W	unknown			FOG	Extreme Weather Event	Debris
44	652423	9/2/14	7532 23rd Ave NE	300			Roots	Debris	Capacity-gravity main
45	651307	9/3/14	6777 37th Ave S	10			FOG		
46	651360	9/5/14	1100 9th Ave	30			Roots	Structural failure-gravity main	
47	653924	9/5/14	1315 1st Ave N	unknown			Operator error		
48	651382	9/8/14	1109 9th Ave	5			Vandalism		
49	651738	9/23/14	1149 12th Ave S	100			Roots	Structural failure-gravity main	Debris

2014 SSO Number[1]	ERTS Number	Date	Address	SSO Volume (gallons)	Volume in Receiving Water (gallons)	Receiving Water	Primary Cause	Secondary Cause, if Any	Additional Contributing Cause, If Any
50	651773	9/24/14	3315 25th Ave S	500			Roots		
51	651881	9/26/14	1414 32nd Ave S	600			Structural failure-gravity main	Debris	FOG
52	652184	10/11/14	1242 17th Ave E	300			Roots	Debris	
53	652253	10/11/14	8038 20th Ave NE	unknown			Capacity-gravity main		
53	652253	10/11/14	8039 20th Ave NE	unknown			Capacity-gravity main		
53	652253	10/11/14	8044 20th Ave NE	unknown			Capacity-gravity main		
53	652253	10/11/14	8056 20th Ave NE	unknown			Capacity-gravity main		
54	652264	10/11/14	1033 NE 90th St	unknown			Capacity-gravity main		
54	652264	10/11/14	1034 NE 90th St	unknown			Capacity-gravity main		
54	652264	10/11/14	1036 NE 90th St	unknown			Capacity-gravity main		
54	652264	10/11/14	1039 NE 90th St	unknown			Capacity-gravity main		
54	652264	10/11/14	1040 NE 90th St	unknown			Capacity-gravity main		
54	652264	10/11/14	1041 NE 90th St	unknown			Capacity-gravity main		
54	652264	10/11/14	1043 NE 90th St	unknown			Capacity-gravity main		
55	652422	10/11/14	1523 Parkside Dr E	unknown			Capacity-gravity main	Roots	
55	652422	10/11/14	1530 Parkside Dr E	unknown			Capacity-gravity main	Roots	

2014 SSO Number[1]	ERTS Number	Date	Address	SSO Volume (gallons)	Volume in Receiving Water (gallons)	Receiving Water	Primary Cause	Secondary Cause, if Any	Additional Contributing Cause, If Any
55	652422	10/11/14	1555 Parkside Dr E	unknown			Capacity-gravity main	Roots	
56	652424	10/11/14	7532 23rd Ave NE	300			Roots	Debris	
57	None	10/11/14	7247 27th Ave NE	unknown			Capacity-gravity main		
58	652181	10/14/14	129 Broadway Ave	1,200			City Construction		
59	652270	10/15/14	1947 7th Ave W	1			Private Construction		
60	652361	10/16/14	330 Fairview Ave N	50			Private Construction		
61	652681	10/31/14	4007 49th Ave S	1,150			City Construction		
62	652886	11/8/14	670 Washington Ave	unknown			Roots		
63	653140	11/24/14	807 E Roy	1,800			Roots		
63	653140	11/23/14	611 Harvard Ave E	unknown			Roots		
64	653263	11/28/14	53rd Ave S and Lake Washington Blvd S	39,000	39,000	Lake Washington	City Construction		
65	653452	12/9/14	4020 49th Ave S	25			City Construction		
66	653603	12/11/14	11518 3rd Ave NW	unknown			Capacity-gravity main		

Rows with the same SSO Number represent multiple customers affected by the same sewer system constraint during an extreme weather-caused sewer overflow event.

Table A-2. Pump Station Location and Capacity

Number	Name	Address	Type [1]	Basin Area (acres)	Average Inflow (gpm)	Number of Pumps and Rating	Static Head (feet)	Storage Time (hours)
1	Lawton Wood	5645 45th Ave West	WW/DW	31.8	36	2 at 350 gpm each	60.5	9.4
2	Charles Street	901 Lakeside Dr	WW/DW	108.1	262	2 at 450 gpm each	20	4+
4	South Director Street	5135 South Director St	Air Lift	3.1	4	2 at 150 gpm each	28.5	10.7
5	46th Avenue South	3800 Lake Washington Blvd	WW/DW	198.2	1147	2 at 1000 gpm each	13.9	4+
6	South Alaska Street	4645 Lake Washington Blvd	WW/DW	10.2	439	2 at 300 gpm each	14	4+
7	East Lee Street	4214 East Lee St	WW/DW	227	209	2 at 2800 gpm each	50	5.75
9	South Grattan Street	8400 55th Ave South	WW/DW	422.2	1293	2 at 900 gpm each	13.9	2
10	South Holly Street	5711 South Holly St	WW/DW	188.4	1064	2 at 1000 gpm each	13.5	2
11	North Sand Point	63rd Ave NE and NE 78th St	Submersible		10	2 at 800 gpm each	23	1
13	Montlake	2160 East Shelby St	WW/DW	64.9		2 at 600 gpm each	29.7	4+
15	West Park Drive East	West Park Dr East and East Shelby St	Submersible		10	2 at 800 gpm each	12	1
17	Empire Way	42nd Ave South and South Norfolk St	WW/DW	395	1341	2 at 2000 gpm each	27.7	5
18	South 116th Place	6700 South 116th Pl	Submersible		18	2 at 800 gpm each	45	12+
19	Leroy Place South	9400 Leroy Pl South	Submersible		22	2 at 800 gpm each	45	12+
20	East Shelby Street	1205 East Shelby St	WW/DW	48.6	541	2 at 600 gpm each	45	4+
21	21st Avenue West	2557 21st Ave West	Submersible		19	2 at 800 gpm each	45	12+
22	West Cramer Street	5400 38th Ave West	WW/DW	26.9	444	2 at 750 gpm each	62	6.64
25	Calhoun Street	1812 East Calhoun St	WW/DW	52.2	371	2 at 850 gpm each	36	3.63
28	North Beach	9001 View Ave NW	Submersible	4.8	7	2 at 800 gpm each	40.7	4
30	Esplanade	3206 NW Esplanade St	Submersible	5.7	9	2 at 800 gpm each	63	11.88
31	11th Avenue NW	12007 11th Ave NW	Submersible	2	10	2 at 800 gpm each	20	12+
35	25th Avenue NE	2734 NE 45th St	WW/DW	71	436	3 at 850 gpm each	39.8	1
36	Maryland	1122 Harbor Ave SW	Air Lift	12.2	18	2 at 150 gpm each	10	10.25
37	Fairmont	1751 Harbor Ave SW	WW/DW	281.5	1491	2 at 3500 gpm each	12.8	2
38	Arkansas	1411 Alki Ave SW	Air Lift	46.5	188	2 at 150 gpm each	10	13.15

Number	Name	Address	Type [1]	Basin Area (acres)	Average Inflow (gpm)	Number of Pumps and Rating	Static Head (feet)	Storage Time (hours)
39	Dawson	5080 Beach Dr SW	WW/DW	55	622	2 at 1100 gpm each	36.7	4.6
42	Lincoln Park	8617 Fauntleroy Way SW	WW/DW	6.5	64	2 at 200 gpm each	55.5	12.4
43	Seaview No. 1	5635 Seaview Ave NW	WW/DW	177.4	1693	2 at 1500 gpm each	40.4	4.85
44	Boeing No. 1	6820 Perimeter Rd S	WW/DW	168.5	334	2 at 600 gpm each	19	1.68
45	Boeing No. 2	7609 Perimeter Rd S	WW/DW	133.5	293	2 at 300 gpm each	16.5	2.91
46	Seaview No. 2	6541 Seaview Ave NW	Air Lift	52.6	68	2 at 150 gpm each	14.6	2.45
47	Seaview No. 3	7242 Seaview Ave NW	Air Lift	11	14	2 at 150 gpm each	9.5	5.87
48	Brooklyn	3701 Brooklyn Ave NE	WW/DW	31.4	156	2 at 1000 gpm each	53.3	4.01
49	Latona	3750 Latona Ave NE	WW/DW	22.4	257	2 at 250 gpm each	33.3	4+
50	39th Avenue East	2534 39th Ave East	Air Lift	10.6	14	2 at 150 gpm each	20.5	10
51	NE 60th Street	6670 NE 60th St	WW/DW	44.5	59	2 at 325 gpm each	126.3	1.71
53	SW Hinds Street	4951 SW Hinds St	WW/DW	10.6	41	2 at 150 gpm each	66	2
54	NW 41st Street	647 NW 41st St	WW/DW	24.5	169	2 at 350 gpm each	27	1.52
55	Webster Street	3021 West Laurelhurst NE	Air Lift	2.4	5	2 at 150 gpm each	31	2.15
56	Bedford Court	10334 Bedford Ct NW	Air Lift	1.6	3	2 at 150 gpm each	30.3	0.75
57	Sunnyside	3600 Sunnyside Ave North	WW/DW	16.3	57	2 at 300 gpm each	31.5	2.66
58	Woodlawn	1350 North Northlake Way	WW/DW	33.4	290	2 at 600 gpm each	30	3.5
59	Halliday	2590 Westlake Ave North	WW/DW	21.2	53	2 at 325 gpm each	17.7	9.7
60	Newton	2010 Westlake Ave North	WW/DW	57.6	77	2 at 250 gpm each	67.4	4.38
61	Aloha	912 Westlake Ave North	WW/DW	26.3	59	2 at 450 gpm each	19.1	4.9
62	Yale	1103 Fairview Ave North	WW/DW	12.2	211	2 at 350 gpm each	18.4	4.63
63	East Blaine	140 East Blaine St	WW/DW	33.1	251	2 at 600 gpm each	31	2.43
64	East Lynn Street No. 2	2390 Fairview Ave East	WW/DW	9.4	253	2 at 300 gpm each	16.2	7.05
65	East Allison Street	2955 Fairview Ave East	WW/DW	19.2	111	2 at 300 gpm each	47.2	3.96
66	Portage Bay No. 1	3190 Portage Bay Pl East	WW/DW	6.5	200	2 at 200 gpm each	12.2	18.6
67	Portage Bay No. 2	1209 East Shelby St	WW/DW	14.7	176	2 at 250 gpm each	17	9.08

Number	Name	Address	Type [1]	Basin Area (acres)	Average Inflow (gpm)	Number of Pumps and Rating	Static Head (feet)	Storage Time (hours)
69	Sand Point	6451 65th Ave NE	WW/DW	15.5	124	2 at 300 gpm each	79	2.03
70	Barton No. 2	4890 SW Barton St	WW/DW	73	136	2 at 300 gpm each	29	5.34
71	SW 98th Street	5190 SW 98th St	WW/DW	36.3	155	2 at 450 gpm each	16	6.79
72	SW Lander Street	2600 13th Ave SW	WW/DW	203.5	428	3 at 2000 gpm each	22.8	4+
73	SW Spokane St	1190 SW Spokane St	WW/DW	336.5	45	3 at 2500 gpm each	16.3	4+
74	26th Avenue SW	2799 26th Ave SW	Submersible	144		2 at 800 gpm each	30	3.21
75	Point Place SW	3200 Point Pl SW	Air Lift	4.9	9	2 at 150 gpm each	12.2	10
76	Lowman Park	7025 Beach Dr SW	WW/DW	20.4	27	2 at 100 gpm each	34	17.8
77	32nd Avenue West	1499 32nd Ave West	WW/DW	206.5	601	2 at 1400 gpm each	48	5.17
78	Airport Way South	8415 Airport Way South	Air Lift	18.4	41	2 at 150 gpm each	14.5	5.5
80	South Perry Street	9724 Rainier Ave South	Air Lift	4.6	5	2 at 150 gpm each	22	10
81	72nd Avenue South	10199 Rainier Avenue South	WW/DW	11	60	2 at 200 gpm each	53.3	24.3
82	Arroyo Beach Place	11013 Arroyo Beach Pl SW	Air Lift	6	8	2 at 150 gpm each	19.8	10
83	West Ewing Street	390 West Ewing St	Air Lift	6.1	39	2 at 150 gpm each	19	4.24
84	28th Avenue NW	5390 28th Ave NW	WW/DW	691.4	128	2 at 500 gpm each	24.4	3.43
114	35th Avenue NE	10701 36th Ave NE	Submersible	3.2	47	2 at 800 gpm each	5.6	2
118	Midvale Avenue North	1200 North 107th St	WW/DW	22.4	103	2 at 300 gpm each	11.5	3.5

1. *WW/DW = Wet Well/Dry Well*

Table A-3. 2014 Pump Station Work Order Summary			
WWPS Number	Inspection	Maintenance	Total Work Orders
WWPS001	7	13	20
WWPS002	17	9	26
WWPS004	12	19	31
WWPS005	16	8	24
WWPS006	16	14	30
WWPS007	20	18	38
WWPS009	12	9	21
WWPS010	14	32	46
WWPS011	6	19	25
WWPS013	4	41	45
WWPS017	8	10	18
WWPS018	2	21	23
WWPS019	4	19	23
WWPS020	11	11	22
WWPS021	4	22	26
WWPS022	11	7	18
WWPS025	15	18	33
WWPS028	3	7	10
WWPS030	6	32	38
WWPS031	4	8	12
WWPS035	11	138	149
WWPS036	15	18	33
WWPS037	6	21	27
WWPS038	17	14	31
WWPS039	3	13	16
WWPS042	6	2	8
WWPS043	7	19	26
WWPS044	7	20	27
WWPS045	11	13	24
WWPS046	16	14	30
WWPS047	8	14	22
WWPS048	18	6	24
WWPS049	9	24	33
WWPS050	18	26	44
WWPS051	8	12	20
WWPS053	5	9	14
WWPS054	9	10	19
WWPS055	15	12	27
WWPS056	16	18	34

WWPS Number	Inspection	Maintenance	Total Work Orders
WWPS057	6	14	20
WWPS058	3	9	12
WWPS059	9	11	20
WWPS060	6	7	13
WWPS061	7	7	14
WWPS062	7	14	21
WWPS063	12	12	24
WWPS064	2	6	8
WWPS065	6	29	35
WWPS066	8	7	15
WWPS067	5	6	11
WWPS069	15	29	44
WWPS070	23	10	33
WWPS071	9	15	24
WWPS072	7	12	19
WWPS073	13	13	26
WWPS074	3	24	27
WWPS075	3	10	13
WWPS076	17	11	28
WWPS077	6	10	16
WWPS078	6	14	20
WWPS080	8	18	26
WWPS081	3	3	6
WWPS082	12	14	26
WWPS083	3	16	19
WWPS084	4	6	10
WWPS114	8	32	40
WWPS118	12	17	29
Grand Total	**620**	**1116**	**1736**

Table A-4. 2014 CSO Structure Inspection Summary

CSO Structure	Inspection Finish Date	Description of Work	Maintenance Hole observations	Recommend cleaning?	Weir wall shows signs of damage?	Debris blocking HydroBrake intake?	Debris blocking gate operation?	Signs of infiltration?	Sign missing or damaged?
NPDES175	1/1/2014	Inspect weir wall, overflow structure, and outfall signage			YES				NO PROBLEM
NPDES111	3/27/2014	Inspect flap gates, flow control structures, weir walls, bladder valves, overflow structures, flow control chamber, HydroBrake, sluice gates, detention tank, signage, tie flex valve, diversion structure			NO		NO	NONE	
NPDES168	3/28/2014	Inspect flow control chamber, outfall signage, sluice gate, HydroBrake, weir wall overflows, flap gate, offline detention tank, drain valve, bypass drain valve	NORMAL FLOW	NO	YES	NO	NO	NONE	REPLACE
NPDES169	3/28/2014	Inspect flow control structures, HydroBrake, weir walls, overflow structures, sluice gates, flap gate, drain valve, offline detention tank, signage	NORMAL FLOW	NO	YES	NO	NO	NONE	
NPDES170	3/17/2014	Inspect offline detention pipes, signage, flow control chambers, weir walls, HydroBrake, flap gate	NORMAL FLOW	NO	YES	NO	NO	NONE	REPLACE SIGN POLE
NPDES171	2/28/2014	Inspect flow control structure, HydroBrake, weir wall, inline detention pipe, gate	NORMAL FLOW	NO	NO	NO		NONE	
NPDES29	3/11/2014	Inspect flow control chambers, weir walls, HydroBrake, inline detention pipe, signage	NORMAL FLOW	NO	NO	YES		SOME	NO PROBLEM
NPDES30	3/11/2014	Inspect weir walls, flow control chambers, automatic sluice gate, inline detention pipe signage	NORMAL FLOW	NO	NO		NO	NONE	NO PROBLEM
NPDES32	3/11/2014	Inspect inline detention pipe, flow control chambers, HydroBrake, signage	NORMAL FLOW	NO	NO	YES		NONE	
NPDES34	3/26/2014	Install flow control chambers, HydroBrake, weir walls, inline detention pipe, signage	NORMAL FLOW	NO	MOSTLY NO	NO		NONE	NO PROBLEM
NPDES35	4/2/2014	Inspect weir walls, flow control chambers, HydroBrake, flap gate, sluice gate, actuator gate, offline detention pipe, signage	NORMAL FLOW	NO	YES	NO	MOSTLY NO	NONE	NO PROBLEM
NPDES36	3/27/2014	Inspect flow control chambers, weir walls, inline detention pipe, HydroBrake, signage	NORMAL FLOW	NO	YES	NO		NONE	NO PROBLEM
NPDES38	3/26/2014	Inspect flow control chambers, weir walls, HydroBrake, sluice gate, signage	NORMAL FLOW	NO	NO/YES	NO	NO	NONE	
NPDES40	3/27/2014	Inspect flow control structure, flow control chamber, HydroBrake, sluice gate, weir walls, inline detention pipe, signage	NORMAL FLOW	NO	YES	NO	NO	NONE	NO PROBLEM
NPDES42	3/27/2014	Inspect flow control chambers, HydroBrake, weir walls, ECV valves, inline detention pipe, sluice gate, signage	NORMAL FLOW	NO	NO/YES	NO	NO	NONE	NO PROBLEM

CSO Structure	Inspection Finish Date	Description of Work	Maintenance Hole observations	Recommend cleaning?	Weir wall shows signs of damage?	Debris blocking HydroBrake intake?	Debris blocking gate operation?	Signs of infiltration?	Sign missing or damaged?
NPDES43	3/27/2014	Inspect flow control chambers, weir walls, inline detention pipe, HydroBrake, sluice gate, signage	NORMAL FLOW	NO	NO	NO	NO	NONE	NO PROBLEM
NPDES44	2/28/2014	Inspect flow control structures, weir walls, HydroBrake, flap gates, offline detention pipe, signage	NORMAL FLOW	NO	MOSTLY NO	NO		NONE	NO PROBLEM
NPDES120	3/6/2014	Inspect flow control structure, weir wall, signage			NO			NONE	NO PROBLEM
NPDES121	3/6/2014	Inspect flow control structure, flow control chamber, weir walls, HydroBrake, signage	NORMAL FLOW	NO	NO			NONE	NO PROBLEM
NPDES45	2/28/2014	Inspect weir walls, flow control chambers, HydroBrake, signage	NORMAL FLOW	NO	YES	NO		NONE	NO PROBLEM
NPDES124	3/6/2014	Inspect flow control structure, weir wall, signage			NO			NONE	NO PROBLEM
NPDES127	3/6/2014	Inspect flow control structure, weir wall, signage			NO			NONE	NO PROBLEM
NPDES129	3/6/2014	Inspect flow control structure and signage						NONE	
NPDES130	3/6/2014	Inspect flow control chamber, weir wall, and signage			NO			NONE	NO PROBLEM
NPDES47	2/28/2014	Inspect flow control chambers, weir walls, steel plate with notch			YES		NO	NONE	
NPDES131	3/5/2014	Inspect flow control structure, weir wall, and signage			NO			NONE	NO PROBLEM
NPDES132	3/5/2014	Inspect flow control structure, weir wall, and signage			NO			NONE	NO PROBLEM
NPDES49	2/28/2014	Inspect flow control chamber, weir wall	NORMAL FLOW	NO	YES			NONE	
NPDES134	3/5/2014	Inspect flow control structure, weir wall, and signage			NO			NONE	NO PROBLEM
NPDES135	3/6/2014	Inspect flow control structure, weir wall, and signage			NO			NONE	NO PROBLEM
NPDES136	3/6/2014	Inspect flow control structure, weir wall, and signage			NO			ACTIVE	REPLACE SIGN POLE
NPDES70	3/28/2014	Inspect flow control chambers, tide valve, weir wall, flap gate, weir wall diversion			NO		NO	NONE	
NPDES138	3/6/2014	Inspect weir walls, flow control chambers, HydroBrake, flap gate, sluice gate, offline detention pipe, signage	MOSTLY NORMAL FLOW	MOSTLY NO	NO	YES		NONE	NO PROBLEM
NPDES99	3/13/2014	Inspect sluice gate, flow control chambers, weir wall, flap gate, duck bill valves, detention pipe, HydroBrake, signage	NORMAL FLOW	MOSTLY YES	YES	NO	MOSTLY NO	NONE	REPLACE SIGN POLE
NPDES139	3/6/2014	Inspect signage							NO PROBLEM
NPDES13	3/4/2014	Inspect remote operation slide gate, flow control chambers, weir walls, duck bill	NORMAL	NO	NO		NO	NONE	REPLACE

CSO Structure	Inspection Finish Date	Description of Work	Maintenance Hole observations	Recommend cleaning?	Weir wall shows signs of damage?	Debris blocking HydroBrake intake?	Debris blocking gate operation?	Signs of infiltration?	Sign missing or damaged?
		valve, offline detention pipe, signage	FLOW						SIGN POLE
NPDES140	3/4/2014	Inspect weir walls, flow control chambers, HydroBrake, offline detention pipe, overflow maintenance hole, signage	NORMAL FLOW	NO	NO	YES		NONE	REPLACE SIGN POLE
NPDES141	3/4/2014	Inspect weir wall, overflow MH, signage			NO			NONE	NO PROBLEM
NPDES144	3/5/2014	Inspect signage							NO PROBLEM
NPDES145	3/5/2014	Inspect weir wall, overflow MH, signage			NO			NONE	NO PROBLEM
NPDES146	3/5/2014	Inspect weir wall, overflow MH, signage			NO			NONE	REPLACE SIGN POLE
NPDES147	3/5/2014	Inspect flow control chamber, weir, signage			NO			NONE	NO PROBLEM
NPDES148	3/4/2014	Inspect weir wall, overflow MH, signage			NO			NONE	NO PROBLEM
NPDES14	3/5/2014	Inspect weir walls, flow control chambers, sluice gate, HydroBrake, inline detention pipe, signage	NORMAL FLOW	NO	NO	NO	NO	NONE	NO PROBLEM
NPDES150	3/4/2014	Inspect overflow structure, weir wall, signage			NO			NONE	NO PROBLEM
NPDES152	3/4/2014	Inspect flow control chamber, weir, signage			NO			NONE	NO PROBLEM
NPDES15	3/6/2014	Inspect flow control chambers, flow control structure, HydroBrake, sluice gate, weir walls, inline detention pipe, signage	NORMAL FLOW	NO	NO	NO	NO	NONE	NO PROBLEM
NPDES161	3/5/2014	Inspect weir wall and overflow MH			NO			NONE	
NPDES174	3/5/2014	Inspect weir wall, overflow MH, and signage			NO			NONE	NO PROBLEM
NPDES175	3/6/2014	Inspect weir wall and signage			NO				NO PROBLEM
NPDES18	3/5/2014	Inspect flow control chambers, weir walls, HydroBrake, inline detention pipe, sluice gate, offline detention pipe, signage	SURCHARGE	YES/NO	NO	NO	NO	NONE	NO PROBLEM
NPDES20	3/4/2014	Inspect flow control chambers, weir walls, offline detention pipe, signage			NO			NONE	NO PROBLEM
NPDES22	3/5/2014	Inspect overflow MH, signage						NONE	NO PROBLEM
NPDES24	3/6/2014	Inspect weir wall, signage			NO				NO PROBLEM
NPDES25	3/5/2014	Inspect flow control structure, weir wall, inline detention pipe, signage			NO			NONE	NO PROBLEM
NPDES57	3/4/2014	Inspect flow control chamber, weir wall, signage			NO			NONE	NO PROBLEM
NPDES59	3/4/2014	Inspect flow control structure, weir wall						NONE	
NPDES60	3/7/2014	Inspect flow control structure, weir wall						NONE	
NPDES61	3/7/2014	Inspect flow control chambers, HydroBrake, weir walls, sluice gate, inline detention pipe, signage	NORMAL FLOW	NO	NO	NO	NO	NONE	NO PROBLEM
NPDES62	3/7/2014	Inspect flow control chamber, HydroBrake, overflow weirs, signage			NO	NO		NONE	NO PROBLEM

CSO Structure	Inspection Finish Date	Description of Work	Maintenance Hole observations	Recommend cleaning?	Weir wall shows signs of damage?	Debris blocking HydroBrake intake?	Debris blocking gate operation?	Signs of infiltration?	Sign missing or damaged?
NPDES64	3/7/2014	Inspect weir wall, overflow MH, signage			NO			NONE	NO PROBLEM
NPDES68	3/7/2014	Inspect flow control chambers, weir walls, HydroBrake, flap gate, inline detention pipe, offline detention pipe, signage	NORMAL FLOW	NO	NO	NO	NO	NONE	NO PROBLEM
NPDES13	6/12/2014	Inspect flow control chambers, weir walls, flap gate, offline detention pipe, sluice gate	NORMAL FLOW	NO	NO		NO	NONE	
NPDES15	6/11/2014	Inspect flow control chamber, HydroBrake, weir wall, sluice gate, inline detention pipe	NORMAL FLOW	NO	NO	NO	NO	NONE	
NPDES18	6/12/2014	Inspect offline detention pipe, flow control chambers, weir walls, HydroBrake, sluice gate	NORMAL FLOW	NO	NO	NO	NO	NONE	
NPDES68	6/11/2014	Inspect offline detention pipe, flow control chambers, HydroBrake, weir walls, flap gate	NORMALFLOW	NO	NO	NO	NO	NONE	
NPDES61	6/9/2014	Inspect flow control chambers, weir wall, HydroBrake, signage	NORMAL FLOW	NO	NO	NO		NONE	NO PROBLEM
NPDES146	6/2/2014	Inspect weir wall, overflow MH, signage			NO			NONE	REPLACE SIGN POLE
NPDES64	6/9/2014	Inspect weir wall, overflow MH, signage			NO			NONE	NO PROBLEM
NPDES136	6/5/2014	Inspect weir wall, overflow MH, signage			NO			NONE	NO PROBLEM
NPDES13	6/12/2014	Inspect weir walls, offline detention pipe, flow control chambers, remote operation slide gate, duck bill valve, signage	NORMAL FLOW	NO	NO		NO	NONE	NO PROBLEM
NPDES14	6/11/2014	Inspect flow control chambers, weir walls, sluice gate, HydroBrake, inline detention pipe	NORMAL FLOW	NO	NO	NO	NO	NONE	NO PROBLEM
NPDES15	6/11/2014	Inspect sluice gate, flow control chambers, HydroBrake, weir walls, inline detention pipe, signage	NORMAL FLOW	NO	NO	NO	NO	NONE	NO PROBLEM
NPDES18	6/12/2014	Inspect weir walls, inline detention pipe, flow control chambers, signage	NORMAL FLOW	NO	NO	NO	NO	NONE	NO PROBLEM
NPDES20	6/5/2014	Inspect flow control chambers, weir walls, offline detention pipe, signage			NO			NONE	NO PROBLEM
NPDES22	6/3/2014	Inspect overflow MH, signage						NONE	NO PROBLEM
NPDES24	6/3/2014	Inspect weir wall, signage			NO				REPLACE SIGN
NPDES25	6/3/2014	Inspect flow control structure, weir wall, inline detention pipe, signage			NO			NONE	REPLACE SIGN
NPDES120	6/3/2014	Inspect flow control structure, weir wall, signage			NO			NONE	NO PROBLEM

CSO Structure	Inspection Finish Date	Description of Work	Maintenance Hole observations	Recommend cleaning?	Weir wall shows signs of damage?	Debris blocking HydroBrake intake?	Debris blocking gate operation?	Signs of infiltration?	Sign missing or damaged?
NPDES121	6/10/2014	Inspect flow control structure, weir wall, signage			NO			NONE	NO PROBLEM
NPDES124	6/4/2014	Inspect flow control structure, weir wall, signage			NO			NONE	NO PROBLEM
NPDES127	6/4/2014	Inspect flow control structure, weir wall, signage			NO			NONE	NO PROBLEM
NPDES129	6/3/2014	Inspect flow control structure, signage						NONE	NO PROBLEM
NPDES130	6/4/2014	Inspect flow control structure, weir wall, signage			NO			NONE	NO PROBLEM
NPDES131	6/4/2014	Inspect flow control structure, weir wall, signage			NO			NONE	NO PROBLEM
NPDES132	6/5/2014	Inspect flow control structure, weir wall, signage			NO			NONE	NO PROBLEM
NPDES134	6/4/2014	Inspect flow control structure, weir wall, signage			NO			NONE	NO PROBLEM
NPDES135	6/4/2014	Inspect flow control structure, weir wall, signage			NO			NONE	NO PROBLEM
NPDES57	6/2/2014	Inspect flow control structure, weir wall, signage			NO			NONE	NO PROBLEM
NPDES59	6/2/2014	Inspect signage							NO PROBLEM
NPDES60	6/3/2014	Inspect weir wall, flow control structure, signage			NO			NONE	NO PROBLEM
NPDES61	6/9/2014	Inspect flow control chamber, HydroBrake, weir wall, sluice gate, inline detention pipe	NORMAL FLOW	NO	NO	NO	NO	NONE	
NPDES62	6/9/2014	Inspect overflow weirs, flow control chamber, HydroBrake, signage			NO	NO		NONE	NO PROBLEM
NPDES68	6/11/2014	Inspect flow control chamber, HydroBrake, weir wall, inline detention pipe, signage	NORMALFLOW	NO	NO	NO		NONE	NO PROBLEM
NPDES138	6/5/2014	Inspect HydroBrake, weir walls, flap gate, sluice gate, offline detention pipe, flow control chambers, signage	NORMAL FLOW	MOSTLY NO	NO	NO	NO	NONE	NO PROBLEM
NPDES139	6/5/2014	Inspect signage							NO PROBLEM
NPDES140	6/5/2014	Inspect HydroBrake, flow control chambers, weir walls, offline detention pipe, signage	NORMAL FLOW	NO	NO	YES		NONE	REPLACE SIGN POLE
NPDES141	6/5/2014	Inspect overflow MH, weir wall, signage			NO			NONE	NO PROBLEM
NPDES144	6/2/2014	Inspect signage							NO PROBLEM
NPDES145	6/2/2014	Inspect overflow MH, weir wall, signage			NO			NONE	NO PROBLEM
NPDES147	6/2/2014	Inspect flow control chamber, weir, signage			NO			NONE	NO PROBLEM
NPDES148	6/2/2014	Inspect overflow MH, weir wall, signage			NO			NONE	NO PROBLEM
NPDES150	6/2/2014	Inspect overflow structure, weir wall, signage			NO			NONE	NO PROBLEM
NPDES152	6/2/2014	Inspect flow control chamber, weir, signage			NO			NONE	NO PROBLEM
NPDES161	6/12/2014	Inspect overflow MH, weir wall			NO			NONE	
NPDES174	6/2/2014	Inspect overflow MH, weir wall, signage			NO			NONE	NO PROBLEM

CSO Structure	Inspection Finish Date	Description of Work	Maintenance Hole observations	Recommend cleaning?	Weir wall shows signs of damage?	Debris blocking HydroBrake intake?	Debris blocking gate operation?	Signs of infiltration?	Sign missing or damaged?
NPDES175	6/4/2014	Inspect weir wall, signage			NO				NO PROBLEM
NPDES70	6/24/2014	Inspect flow control chambers, tide valves, weir wall, flap gate, weir wall diversion			NO		NO	NONE	
NPDES29	6/5/2014	Inspect weir walls, flow control chambers, HydroBrake, inline detention pipe, signage	NORMAL FLOW	NO	NO	NO	NO	NONE	NO PROBLEM
NPDES30	6/13/2014	Inspect flow control chambers, weir walls, automatic sluice gate, inline detention pipe, signage	NORMAL FLOW	NO	NO		NO	NONE	NO PROBLEM
NPDES32	6/11/2014	Inspect flow control chambers, weir wall, inline detention pipe, HydroBrake, signage	NORMAL FLOW	NO	NO	NO		NONE	NO PROBLEM
NPDES34	6/5/2014	Inspect weir walls, inline detention pipe, flow control chambers, HydroBrake, signage	NORMAL FLOW	NO	NO	NO		NONE	NO PROBLEM
NPDES35	6/10/2014	Inspect flow control chambers, HydroBrake, weir walls, flap gate, sluice gate, actuator gate, offline detention pipe, signage	NORMAL FLOW	NO	NO	NO	NO	NONE	NO PROBLEM
NPDES36	6/4/2014	Inspect inline detention pipe, flow control chamber, weir wall, HydroBrake, signage	NORMAL FLOW	NO	NO	NO		NONE	NO PROBLEM
NPDES38	6/4/2014	Inspect HydroBrake, weir walls, sluice gate, flow control chambers, signage	NORMAL FLOW	NO	NO	NO	NO	NONE	NO PROBLEM
NPDES40	6/4/2014	Inspect flow control structure, HydroBrake, sluice gate, flow control chamber, weir wall, inline detention pipe, signage	NORMAL FLOW	NO	NO	NO	NO	NONE	NO PROBLEM
NPDES99	6/23/2014	Inspect duck bill valves, flow control chambers, HydroBrake, sluice gate, weir walls, flap gate, detention pipe, signage	NORMAL FLOW	YES/NO	NO	NO	NO	NONE	REPLACE SIGN POLE
NPDES111	6/17/2014	Inspect bladder valves, overflow structures, weir walls, sluice gates, flap gates, flow control structure, tide flex valve, diversion structure, flow control chamber, HydroBrake, detention tank, signage			NO	NO	NO	NONE	REPLACE SIGN POLE
NPDES42	6/4/2014	Inspect flow control chambers, HydroBrake, weir walls, sluice gates, inline detention pipe, signage	NORMALFLOW	NO	NO	YES	NO	NONE	NO PROBLEM
NPDES43	6/4/2014	Inspect inline detention pipe, flow control chambers, weir wall, HydroBrake, sluice gate, signage	NORMAL FLOW	NO	NO	YES	NO	NONE	NO PROBLEM
NPDES44	6/9/2014	Inspect flow control structures, HydroBrake, weir walls, offline detention pipe, signage	NORMAL FLOW	NO	NO	NO		NONE	NO PROBLEM
NPDES45	6/9/2014	Inspect flow control chambers, HydroBrake, weir walls, signage	NORMAL FLOW	NO	NO	NO	NO	NONE	NO PROBLEM

CSO Structure	Inspection Finish Date	Description of Work	Maintenance Hole observations	Recommend cleaning?	Weir wall shows signs of damage?	Debris blocking HydroBrake intake?	Debris blocking gate operation?	Signs of infiltration?	Sign missing or damaged?
NPDES47	6/24/2014	Inspect flow control chambers, steel plate with notch, weir walls			NO		NO	NONE	
NPDES49	6/9/2014	Inspect flow control chamber, weir wall, signage	NORMALFLOW	NO	NO			NONE	REPLACE SIGN POLE
NPDES168	6/23/2014	Inspect flow control chambers, sluice gate (bypass valve), HydroBrake, weir wall overflow, inflow sluice gate, flap gate, offline detention tank, drain valve, bypass drain valve, signage	NORMAL FLOW	NO	NO	YES	NO	NONE	REPLACE SIGN POLE
NPDES169	6/5/2014	Inspect offline detention tank, flow control structures, weir wall, flow control chamber, HydroBrake, weir wall overflow, inflow sluice gate valve, flap gate, drain valve, sluice gate, signage	NORMALFLOW	NO	NO	NO	NO	NONE	NO PROBLEM
NPDES170	6/10/2014	Inspect flow control chambers, weir walls, HydroBrake, flap gate, offline detention pipe, signage	NORMAL FLOW	NO	NO	NO	NO	NONE	REPLACE SIGN POLE
NPDES171	6/24/2014	Inspect weir wall, flow control structure, HydroBrake, inline detention pipe, signage	NORMAL FLOW	NO	NO	NO		NONE	NO PROBLEM
NPDES13	9/16/2014	Inspect flow control chambers, remote operation slide gate, weir walls, duck bill valve, offline detention pipe, signage	NORMAL FLOW	NO	NO		NO	NONE	NO PROBLEM
NPDES14	9/16/2014	Inspect flow control chambers, weir walls, sluice gate, HydroBrake, inline detention pipe, signage	NORMAL FLOW	NO	NO	NO	NO	NONE	NO PROBLEM
NPDES15	9/16/2014	Inspect sluice gate, flow control chambers, HydroBrake, weir walls, inline detention pipe, signage	NORMAL FLOW	YES	NO	NO	NO	NONE	NO PROBLEM
NPDES18	9/16/2014	Inspect flow control chambers, weir walls, inline detention pipe, HydroBrake, sluice gate							
NPDES20	9/15/2014	Inspect flow control chambers, weir walls, offline detention pipe, signage			NO			NONE	NO PROBLEM
NPDES22	9/15/2014	Inspect overflow MH, signage						NONE	NO PROBLEM
NPDES24	9/15/2014	Inspect weir wall, signage			NO				NO PROBLEM
NPDES25	9/15/2014	Inspect flow control structure, weir wall, inline detention pipe, signage			NO			NONE	NO PROBLEM
NPDES29	9/12/2014	Inspect flow control chambers, weir walls, HydroBrake, inline detention pipe, signage	NORMALFLOW	NO	NO	NO		NONE	NO PROBLEM
NPDES30	9/3/2014	Inspect flow control chambers, weir walls, automatic sluice gate, inline detention pipe, signage	NORMAL FLOW	NO	NO		NO	NONE	NO PROBLEM
NPDES32	9/3/2014	Inspect flow control chambers, weir wall, inline detention pipe, signage	NORMAL FLOW	NO	NO			NONE	NO PROBLEM
NPDES34	9/3/2014	Inspect weir walls, flow control chambers, inline detention pipe, offline	NORMAL	NO	NO			NONE	NO PROBLEM

CSO Structure	Inspection Finish Date	Description of Work	Maintenance Hole observations	Recommend cleaning?	Weir wall shows signs of damage?	Debris blocking HydroBrake intake?	Debris blocking gate operation?	Signs of infiltration?	Sign missing or damaged?
		detention pipe, HydroBrake, signage	FLOW						
NPDES35	9/3/2014	Inspect weir walls, flow control chambers, HydroBrake, flap gate, sluice gate, actuator gate, offline detention pipe, signage	NORMAL FLOW	NO	NO	NO	NO	NONE	NO PROBLEM
NPDES36	9/3/2014	Inspect flow control chambers, weir wall, inline detention pipe, HydroBrake, signage	NORMAL FLOW	NO	NO	NO		NONE	NO PROBLEM
NPDES38	9/18/2014	Inspect flow control chambers, weir walls, HydroBrake, sluice gate, signage	NORMAL FLOW	NO	NO	NO	NO	NONE	NO PROBLEM
NPDES40	9/3/2014	Inspect flow control structure, HydroBrake, sluice gate, flow control chamber, weir wall, inline detention pipe, signage	NORMAL FLOW	NO	NO	NO	NO	NONE	NO PROBLEM
NPDES42	9/3/2014	Inspect flow control chambers, HydroBrake, weir walls, ECV valves, inline detention pipe, offline detention pipe, sluice gates, signage	NORMALFLOW	NO	NO	NO	NO	NONE	NO PROBLEM
NPDES43	9/3/2014	Inspect inline detention pipe, flow control chambers, weir wall, HydroBrake, sluice gate, signage	NORMAL FLOW	NO	NO	NO	NO	NONE	NO PROBLEM
NPDES44	9/3/2014	Inspect flow control structures, weir walls, HydroBrake, offline detention pipe, signage	NORMAL FLOW	NO	NO	NO		NONE	NO PROBLEM
NPDES45	9/2/2014	Inspect weir walls, flow control chambers, HydroBrake, elevated pipe, signage	NORMAL FLOW	NO	NO	NO		NONE	NO PROBLEM
NPDES47	9/2/2014	Inspect flow control chambers, weir walls, steel plate with notch			NO		NO	NONE	
NPDES49	9/2/2014	Inspect flow control chamber, weir wall, orifice plate, signage	NORMALFLOW	NO	NO			NONE	REPLACE SIGN POLE
NPDES57	9/10/2014	Inspect flow control chamber, weir wall, signage			NO			NONE	NO PROBLEM
NPDES59	9/10/2014	Inspect signage							NO PROBLEM
NPDES60	9/10/2014	Inspect flow control structure, signage			NO				NO PROBLEM
NPDES61	9/11/2014	Inspect flow control chamber, HydroBrake, weir wall, sluice gate, inline detention pipe	NORMAL FLOW	NO	NO	YES	NO	NONE	
NPDES62	9/11/2014	Inspect flow control chamber, HydroBrake, overflow weirs, signage			NO	NO		NONE	NO PROBLEM
NPDES64	9/11/2014	Inspect overflow MH, weir wall, signage			NO			NONE	NOPROBLEM
NPDES68	9/10/2014	Inspect flow control chamber, HydroBrake, weir wall, inline detention pipe, signage	NORMAL FLOW	NO	NO	NO		NONE	NO PROBLEM
NPDES70	9/23/2014	Inspect tide valve, weir wall, flow control chambers, flap gate, weir wall diversion			NO		NO	NONE	
NPDES99	9/18/2014	Inspect duck bill valves, flow control chambers, HydroBrake, sluice gate, weir	NORMAL	NO	NO	NO	NO	NONE	NO PROBLEM

CSO Structure	Inspection Finish Date	Description of Work	Maintenance Hole observations	Recommend cleaning?	Weir wall shows signs of damage?	Debris blocking HydroBrake intake?	Debris blocking gate operation?	Signs of infiltration?	Sign missing or damaged?
		wall, flap gate, detention pipe, signage	FLOW						
NPDES111	9/23/2014	Inspect weir walls, bladder valves, flap gates, flow control structures, sluice gates, flow control chamber, HydroBrake, detention tank, overflow structures, tide flex valve, diversion structure, signage			NO	NO	MOSTLY NO	NONE	NO PROBLEM
NPDES120	9/3/2014	Inspect flow control structure, weir wall, signage			NO			NONE	NO PROBLEM
NPDES121	9/3/2014	Inspect flow control structure, weir wall, signage			NO			NONE	NO PROBLEM
NPDES124	9/3/2014	Inspect flow control structure, weir wall, signage			NO			NONE	NO PROBLEM
NPDES127	9/3/2014	Inspect flow control structure, weir wall, signage			NO			NONE	NO PROBLEM
NPDES129	9/3/2014	Inspect flow control structure, signage						NONE	
NPDES130	9/3/2014	Inspect flow control chamber, weir wall, signage			NO			NONE	REPLACE SIGN
NPDES131	9/3/2014	Inspect flow control structure, weir wall, signage			NO			NONE	NO PROBLEM
NPDES132	9/11/2014	Inspect flow control structure, weir wall, signage			NO			NONE	NO PROBLEM
NPDES134	9/11/2014	Inspect flow control structure, weir wall, signage			NO			NONE	NO PROBLEM
NPDES135	9/11/2014	Inspect flow control chamber, weir wall, signage			NO			NONE	NO PROBLEM
NPDES136	9/15/2014	Inspect signage			NO			NONE	NO PROBLEM
NPDES138	9/15/2014	Inspect flow control chambers, weir walls, HydroBrake, flap gate, sluice gate, offline detention pipe, signage	NORMAL FLOW	MOSTLY NO	NO	NO	NO	NONE	NO PROBLEM
NPDES139	9/15/2014	Inspect signage							NO PROBLEM
NPDES140	9/16/2014	Inspect offline detention pipe, flow control chambers, HydroBrake, weir walls, signage	NORMAL FLOW	YES	NO	YES		NONE	NO PROBLEM
NPDES141	9/15/2014	Inspect overflow MH, weir wall, signage			NO			NONE	NO PROBLEM
NPDES144	9/11/2014	Inspect signage							NO PROBLEM
NPDES145	9/11/2014	Inspect overflow MH, weir wall, signage			NO			NONE	NO PROBLEM
NPDES146	9/3/2014	Inspect overflow MH, weir wall, signage			NO			NONE	NO PROBLEM
NPDES147	9/3/2014	Inspect signage			NO			NONE	NO PROBLEM
NPDES148	9/3/2014	Inspect overflow MH, weir wall, signage			NO			NONE	NO PROBLEM
NPDES150	9/10/2014	Inspect overflow structure, weir wall, signage			NO			NONE	NO PROBLEM
NPDES152	9/10/2014	Inspect flow control chamber, weir, signage			NO			NONE	NO PROBLEM
NPDES161	9/15/2014	Inspect overflow MH, weir wall			NO			NONE	
NPDES168	9/23/2014	Inspect weir wall overflow, inflow sluice gate, flap gate, offline detention tank,	NORMAL	NO	NO	NO	NO	NONE	NO PROBLEM

CSO Structure	Inspection Finish Date	Description of Work	Maintenance Hole observations	Recommend cleaning?	Weir wall shows signs of damage?	Debris blocking HydroBrake intake?	Debris blocking gate operation?	Signs of infiltration?	Sign missing or damaged?
		drain valve, bypass drain valve, flow control chambers, sluice gate (bypass valve), HydroBrake, signage	FLOW						
NPDES169	9/23/2014	Inspect flow control structures, weir wall, flow control chamber, HydroBrake, weir wall overflows to detention drain and to detention tank, inflow sluice gate valve, flap gate, drain valve, sluice gate, offline detention tank, signage	NORMAL FLOW	NO	NO	NO	NO	NONE	NO PROBLEM
NPDES170	9/18/2014	Inspect offline detention pipe, HydroBrake, weir walls, flap gate, flow control chambers, signage	NORMAL FLOW	NO	NO	NO	NO	NONE	NO PROBLEM
NPDES171	9/2/2014	Inspect flow control structure, HydroBrake, weir wall, inline detention pipe, gate	NORMAL FLOW	NO	NO	NO		NONE	
NPDES174	9/3/2014	Inspect overflow MH, weir wall, signage			NO			NONE	NO PROBLEM
NPDES175	9/3/2014	Inspect weir wall, signage			NO				NO PROBLEM
NPDES13	9/23/2014	Inspect offline detention pipe, flow control chambers, HydroBrake, weir walls, sluice gate, flap gates, offline detention pipe	NORMALFLOW	NO	NO	NO	NO	NONE	
NPDES15	9/17/2014	Inspect sluice gate, flow control chamber, HydroBrake, weir wall, inline detention pipe	NORMAL FLOW	NO	NO	NO	NO	NONE	
NPDES18	9/23/2014	Inspect flow control chambers, weir walls, offline detention pipe, HydroBrake, sluice gate	NORMALFLOW	YES	NO	NO	NO	NONE	
NPDES68	9/10/2014	Inspect flap gate, flow control chambers, HydroBrake, weir walls, offline detention pipe	NORMAL FLOW	NO	NO	NO	NO	NONE	
NPDES61	9/11/2014	Inspect flow control chambers, weir wall, HydroBrake, signage	NORMAL FLOW	NO	NO	NO		NONE	NO PROBLEM
NPDES13	12/3/2014	Inspect duck bill valve, remote operation slide gate, weir walls, flow control chamber, offline detention pipe, signage	NORMAL FLOW	NO	NO		NO	NONE	NO PROBLEM
NPDES14	12/3/2014	Inspect flow control chambers, weir walls, sluice gate, HydroBrake, inline detention pipe, signage	NORMAL FLOW	NO	NO	YES	NO	NONE	NO PROBLEM
NPDES15	12/12/2014	Inspect flow control chamber, HydroBrake, weir walls, sluice gate, inline detention pipe, signage	NORMAL FLOW	NO	NO	NO	NO	ACTIVE/NONE	NO PROBLEM
NPDES18	12/3/2014	Inspect flow control chambers, sluice gate, weir walls, inline detention pipe, HydroBrake, signage	NORMAL FLOW	NO	NO	YES	NO	ACTIVE/NONE	NO PROBLEM
NPDES20	12/11/2014	Inspect weir walls, flow control chambers, offline detention pipe, signage			NO			NONE	NO PROBLEM
NPDES22	12/18/2014	Inspect overflow MH, signage						NONE	NO PROBLEM
NPDES24	12/18/2014	Inspect weir wall, signage			NO				NO PROBLEM

CSO Structure	Inspection Finish Date	Description of Work	Maintenance Hole observations	Recommend cleaning?	Weir wall shows signs of damage?	Debris blocking HydroBrake intake?	Debris blocking gate operation?	Signs of infiltration?	Sign missing or damaged?
NPDES25	12/15/2014	Inspect weir wall, inline detention pipe, flow control structure, signage			NO			NONE	NO PROBLEM
NPDES29	12/23/2014	Inspect flow control chambers, weir walls, HydroBrake, inline detention pipe, signage	NORMAL FLOW	NO	NO	NO		NONE	NO PROBLEM
NPDES30	12/23/2014	Inspect weir walls, flow control chambers, automatic sluice gate, inline detention pipe, signage	NORMAL FLOW	NO	NO		NO	NONE	NO PROBLEM
NPDES32	12/8/2014	Inspect weir wall, inline detention pipe, flow control chambers, signage	NORMALFLOW	NO	NO			NONE	NO PROBLEM
NPDES34	12/8/2014	Inspect weir walls, flow control chambers, inline detention pipe, HydroBrake, offline detention pipe	NORMAL FLOW	NO	NO	NO		NONE	NO PROBLEM
NPDES35	12/8/2014	Inspect weir wall, flow control chambers, HydroBrake, flap gate, sluice gate, actuator gate, offline detention pipe, signage	NORMALFLOW	NO	NO	NO	NO	NONE	NO PROBLEM
NPDES36	12/8/2014	Inspect flow control chamber, weir wall, inline detention pipe, HydroBrake, signage	NORMALFLOW	NO	NO	NO		NONE	NO PROBLEM
NPDES38	12/8/2014	Inspect sluice gate, flow control chambers, weir walls, HydroBrake, signage	NORMAL FLOW	NO	NO	NO	NO	NONE	NO PROBLEM
NPDES40	12/8/2014	Inspect HydroBrake, sluice gate, flow control chamber, weir wall, inline detention pipe, signage	NORMAL FLOW	NO	NO	NO	NO	NONE	NO PROBLEM
NPDES42	12/4/2014	Inspect flow control chambers, HydroBrake, weir walls, ECV (2), signage, inline detention pipe, offline detention pond, sluice gates	NORMAL FLOW	NO	NO		NO/YES	NONE	
NPDES43	12/3/2014	Inspect flow control chambers, weir wall, inline detention pipe, HydroBrake, NSP ML @ U/S MH 060W-049 (RUN 060W-049 060W-048	NORMALFLOW	NO	NO			NONE	NO PROBLEM
NPDES44	12/3/2014	Inspect weir walls, flow control structures, HydroBrake, offline detention pipe, signage	NORMAL FLOW	NO	NO	NO		NONE	NO PROBLEM
NPDES45	12/3/2014	Inspect flow control chambers, weir wall, HydroBrake, elevated pipe, signage	NORMAL FLOW	NO	NO	NO		NONE	NO PROBLEM
NPDES47	12/23/2014	Inspect flow control chambers, weir walls, steel plate with notch			NO		NO	NONE	
NPDES49	12/9/2014	Inspect flow control chamber, weir wall, orifice plate, signage	NORMAL FLOW	NO	NO			NONE	REPLACE SIGN POLE
NPDES57	12/2/2014	Inspect weir wall, flow control chamber, signage			NO			ACTIVE	NO PROBLEM
NPDES59	12/2/2014	Inspect signage							NO PROBLEM
NPDES60	12/8/2014	Inspect flow control structure, signage			NO			NONE	NO PROBLEM
NPDES61	12/8/2014	Inspect flow control chamber, HydroBrake, weir wall, sluice gate, inline detention pipe	NORMALFLOW	NO	NO	YES	NO	NONE	

CSO Structure	Inspection Finish Date	Description of Work	Maintenance Hole observations	Recommend cleaning?	Weir wall shows signs of damage?	Debris blocking HydroBrake intake?	Debris blocking gate operation?	Signs of infiltration?	Sign missing or damaged?
NPDES62	12/2/2014	Inspect flow control chamber, HydroBrake, overflow weirs, signage			NO	NO		NONE	NO PROBLEM
NPDES64	12/8/2014	Inspect overflow MH, weir wall, signage			NO			NONE	NO PROBLEM
NPDES68	12/8/2014	Inspect flow control chamber, HydroBrake, weir wall, inline detention pipe, signage	NORMAL FLOW	NO	NO	YES		NONE	NO PROBLEM
NPDES70	12/23/2014	Inspect flow control chambers, tide valve, weir wall, flap gate, weir wall diversion			NO		NO	NONE	
NPDES99	12/23/2014	Inspect duck bill valves, flow control chambers, HydroBrake, sluice gate, detention pipe, weir wall, flap gate, signage	NORMAL FLOW	NO	NO	NO	NO	NONE	NO PROBLEM
NPDES111	12/23/2014	Inspect flap gates, flow control structures, weir wall, sluice gates, flow control chamber, HydroBrake, detention tank, overflow structures, weir walls, tide flex valve, diversion structure, bladder valves, signage			NO	NO	NO	NONE	NO PROBLEM
NPDES120	12/23/2014	Inspect flow control structure, weir wall, signage			NO			NONE	NO PROBLEM
NPDES121	12/18/2014	Inspect flow control structure, weir wall, signage			NO			NONE	NO PROBLEM
NPDES124	12/18/2014	Inspect flow control structure, weir wall, signage			NO			NONE	NO PROBLEM
NPDES127	12/15/2014	Inspect flow control structure, weir wall, signage			NO			NONE	NO PROBLEM
NPDES129	12/15/2014	Inspect flow control structure, weir wall			NO			NONE	
NPDES130	12/15/2014	Inspect flow control structure, weir wall, signage			NO			NONE	NO PROBLEM
NPDES131	12/15/2014	Inspect flow control structure, weir wall, signage			NO			NONE	NO PROBLEM
NPDES132	12/15/2014	Inspect flow control structure, weir wall, signage			NO			NONE	NO PROBLEM
NPDES134	12/12/2014	Inspect flow control structure, weir wall, signage			NO			NONE	NO PROBLEM
NPDES135	12/15/2014	Inspect flow control chamber, weir wall, signage			NO			NONE	NO PROBLEM
NPDES136	12/9/2014	Inspect overflow MH, weir wall, signage			NO			NONE	NO PROBLEM
NPDES138	12/9/2014	Inspect weir walls, flow control chambers, HydroBrake, flap gate, sluice gate, offline detention pipe, signage	NORMAL FLOW	MOSTLY NO	NO	YES	YES/NO	NONE	NO PROBLEM
NPDES139	12/10/2014	Inspect signage							NO PROBLEM
NPDES140	12/11/2014	Inspect flow control chambers, HydroBrake, weir walls, offline detention pipe, signage	NORMALFLOW	YES/NO	NO	YES		NONE	NO PROBLEM
NPDES141	12/9/2014	Inspect overflow MH, weir wall, signage			NO			NONE	NO PROBLEM
NPDES144	12/23/2014	Inspect signage							NO PROBLEM
NPDES145	12/23/2014	Inspect overflow MH, weir wall, signage			NO			NONE	NO PROBLEM
NPDES146	12/23/2014	Inspect overflow MH, weir wall, signage			NO			NONE	NO PROBLEM

CSO Structure	Inspection Finish Date	Description of Work	Maintenance Hole observations	Recommend cleaning?	Weir wall shows signs of damage?	Debris blocking HydroBrake intake?	Debris blocking gate operation?	Signs of infiltration?	Sign missing or damaged?
NPDES147	12/23/2014	Inspect flow control chamber, weir wall, signage			NO			NONE	NO PROBLEM
NPDES148	12/8/2014	Inspect overflow MH, weir wall, signage			NO			NONE	NO PROBLEM
NPDES150	12/9/2014	Inspect overflow MH, weir wall, signage			NO			NONE	NO PROBLEM
NPDES152	12/2/2014	Inspect flow control chamber, weir, signage			NO			NONE	NO PROBLEM
NPDES161	12/3/2014	Inspect overflow MH, weir wall			NO			NONE	
NPDES168	12/15/2014	Inspect flow control chambers, offline detention tank, drain valve, bypass drain valve, sluice gate (bypass valve), HydroBrake, weir wall overflow, inflow sluice gate, flap gate, signage	NORMAL FLOW	NO	NO	NO	NO	NONE	NO PROBLEM
NPDES169	12/23/2014	Inspect weir wall overflows, flow control structures, flow control chamber, HydroBrake, inflow sluice gate valve, flap gate, drain valve, sluice gate, offline detention tank, weir wall, signage	NORMAL FLOW	NO	YES	NO	NO	NONE	NO PROBLEM
NPDES170	12/23/2014	Inspect flow control chambers, weir walls, HydroBrake, flap gate, offline detention pipe, signage	NORMAL FLOW	NO	NO	NO	NO	NONE	NO PROBLEM
NPDES171	12/9/2014	Inspect flow control structure, HydroBrake, weir wall, inline detention pipe, gate	NORMAL FLOW	NO	NO	NO		NONE	NO PROBLEM
NPDES174	12/8/2014	Inspect overflow MH, weir wall			NO			NONE	
NPDES175	12/15/2014	Inspect weir wall, signage			NO				NO PROBLEM
NPDES13	12/3/2014	Inspect weir walls, flap gates, flow control chambers, offline detention pipe	NORMAL FLOW	NO	NO		NO	NONE	
NPDES15	12/12/2014	Inspect inline detention pipe, HydroBrake, weir wall, sluice gate, flow control chamber	NORMALFLOW	NO	NO	YES	NO	NONE	
NPDES18	12/3/2014	Inspect weir walls, flow control chambers, offline detention pipe, HydroBrake, sluice gate			NO			NONE	
NPDES68	12/8/2014	Inspect flow control chambers, weir walls, HydroBrake, flap gate, offline detention pipe,	NORMAL FLOW	NO	NO	NO	NO	NONE	
NPDES61	12/8/2014	Inspect flow control chambers, weir wall, HydroBrake, signage	NORMAL FLOW	NO	NO	NO		NONE	NO PROBLEM

Table A-5. 2014 CSO Structure Cleaning Summary						
Cleaning Date	Location	Asset Description	Action Taken	Problem	Cause	Remedy
1/1/2014	NPDES 29	FLOW CONTROL STRUCTURE - NPDES 29 - CSO 18 - 042-302	FLOW CONTROL CLEANING/MAINT	HYDROBRAKE	BLOCKAGE BY DEBRIS	RELIEVED
1/1/2014	NPDES 29	FLOW CONTROL STRUCTURE - NPDES 29 - CSO 18 - 042-302	FLOW CONTROL CLEANING/MAINT	HYDROBRAKE	BLOCKAGE BY DEBRIS	RELIEVED
1/1/2014	NPDES 42	FLOW CONTROL STRUCTURE - NPDES 42 - CSO 10 - 060W-052	FLOW CONTROL CLEANING/MAINT	HYDROBRAKE	BLOCKAGE BY DEBRIS	RELIEVED
1/2/2014	NPDES 170	FLOW CONTROL STRUCTURE - NPDES 170 - CSO 1 - 069-146	FLOW CONTROL CLEANING/MAINT	HYDROBRAKE	BLOCKAGE BY UNKNOWN	RELIEVED
1/6/2014	NPDES 168	HYDROBRAKE - FLOW CONTROL CHAMBER - NPDES 168 - CSO 2 - 069-428	WW FLOW CONTROL HYDROBRAKE CLEAN/MAINT	N/A - PM	N/A - PM	N/A - PM
1/14/2014	NPDES 169	FLOW STRUCTURE - 076-367	FLOW CONTROL CLEANING/MAINT	HYDROBRAKE	BLOCKAGE BY DEBRIS	RELIEVED
1/21/2014	NPDES 169	FLOW STRUCTURE - 076-367	WW FLOW CONTROL HYDROBRAKE CLEAN/MAINT	HYDROBRAKE	BLOCKAGE BY UNKNOWN	RELIEVED
2/4/2014	NPDES 44	FLOW CONTROL STRUCTURE - NPDES 44 - CSO 8 - 067-272	WW FLOW CONTROL HYDROBRAKE CLEAN/MAINT	HYDROBRAKE	BLOCKAGE BY DEBRIS	RELIEVED
2/4/2014	NPDES 45	FLOW CONTROL STRUCTURE - NPDES 45 - CSO 29 - 074-159	WW FLOW CONTROL HYDROBRAKE CLEAN/MAINT	HYDROBRAKE	BLOCKAGE BY DEBRIS	RELIEVED
2/11/2014	NPDES 29	FLOW CONTROL STRUCTURE - NPDES 29 - CSO 18 - 042-302	FLOW CONTROL CLEANING/MAINT	HYDROBRAKE	BLOCKAGE BY DEBRIS	RELIEVED
2/11/2014	NPDES 42	FLOW CONTROL STRUCTURE - NPDES 42 - CSO 10 - 060W-052	WW FLOW CONTROL HYDROBRAKE CLEAN/MAINT	HYDROBRAKE	BLOCKAGE BY DEBRIS	RELIEVED
2/11/2014	NPDES 43	FLOW CONTROL STRUCTURE - NPDES 43 - CSO 9 - 060W-047	WW FLOW CONTROL HYDROBRAKE CLEAN/MAINT	HYDROBRAKE	BLOCKAGE BY DEBRIS	RELIEVED
2/20/2014	NPDES 169	HYDROBRAKE - CONTROL CHAMBER - 076-367	WW FLOW CONTROL HYDROBRAKE CLEAN/MAINT	HYDROBRAKE	BLOCKAGE BY DEBRIS	RELIEVED
2/20/2014	NPDES 169	HYDROBRAKE - CONTROL CHAMBER - 076-367	WW FLOW CONTROL HYDROBRAKE CLEAN/MAINT	HIGH WETWELL ALARM	PUMP (OR PIPE) CLOG	REMOVE CONSTRICTION
3/6/2014	NPDES 99	FLOW CONTROL STRUCTURE - NPDES 99 - CSO 34 - 055-477	WW FLOW CONTROL HYDROBRAKE CLEAN/MAINT	PARSHALL FLUME	DEBRIS/OBJECT	REMOVED
3/12/2014	NPDES 168	HYDROBRAKE - FLOW CONTROL CHAMBER - NPDES 168 - CSO 2 - 069-428	WW FLOW CONTROL HYDROBRAKE CLEAN/MAINT	N/A - PM	N/A - PM	N/A - PM
3/12/2014	NPDES 169	FLOW CONTROL STRUCTURE - 076-218	WW FLOW CONTROL HYDROBRAKE CLEAN/MAINT	N/A - PM	N/A - PM	N/A - PM
3/13/2014	NPDES 99	FLOW CONTROL STRUCTURE - NPDES 99 - CSO 34 - 055-478	FLOW CONTROL CLEANING/MAINT	HYDROBRAKE	BLOCKAGE BY DEBRIS	RELIEVED
3/17/2014	NPDES 170	FLOW CONTROL STRUCTURE - NPDES 170 - CSO 1 - 069-144	WW FLOW CONTROL HYDROBRAKE CLEAN/MAINT	CHANNEL IN MH	DEBRIS/OBJECT	REMOVED
3/31/2014	NPDES 36	HYDROBRAKE - FLOW CONTROL STRUCTURE - NPDES 36 - CSO 13 - 046E-142	FLOW CONTROL CLEANING/MAINT	CONTROL CHAMBER	DEBRIS/OBJECT	CLEANED

Cleaning Date	Location	Asset Description	Action Taken	Problem	Cause	Remedy
3/31/2014	NPDES 40	FLOW CONTROL STRUCTURE - NPDES 40 - CSO 11 - 059-490	FLOW CONTROL CLEANING/MAINT	N/A - PM	N/A - PM	N/A - PM
3/31/2014	NPDES 43	FLOW CONTROL STRUCTURE - NPDES 43 - CSO 9 - 060W-047	FLOW CONTROL CLEANING/MAINT	CONTROL CHAMBER	DEBRIS/OBJECT	CLEANED
3/31/2014	NPDES 42	FLOW CONTROL STRUCTURE - NPDES 42 - CSO 10 - 060W-052	FLOW CONTROL CLEANING/MAINT	CONTROL CHAMBER	DEBRIS/OBJECT	CLEANED
4/1/2014	NPDES 111	FLOW CONTROL STRUCTURE - NPDES 111 - 057-350	FLOW CONTROL CLEANING/MAINT	CONTROL CHAMBER	DEBRIS/OBJECT	CLEANED
4/1/2014	NPDES 38	HYDROBRAKE - FLOW CONTROL STRUCTURE - NPDES 38 - CSO 12 - 059-498	FLOW CONTROL CLEANING/MAINT	CONTROL CHAMBER	DEBRIS/OBJECT	CLEANED
4/2/2014	NPDES 35	COMBINED MAIN LINE - 046-188 046-139	FLOW CONTROL CLEANING/MAINT	CONTROL CHAMBER	DEBRIS/OBJECT	CLEANED
4/9/2014	NPDES 168	HYDROBRAKE - FLOW CONTROL CHAMBER - NPDES 168 - CSO 2 - 069-428	WW FLOW CONTROL HYDROBRAKE CLEAN/MAINT	N/A - PM	N/A - PM	N/A - PM
4/15/2014	NPDES 29	FLOW CONTROL STRUCTURE - NPDES 29 - CSO 18 - 042-302	FLOW CONTROL CLEANING/MAINT	N/A - PM	N/A - PM	N/A - PM
4/15/2014	NPDES 44	FLOW CONTROL STRUCTURE - NPDES 44 - CSO 8 - 067-272	FLOW CONTROL CLEANING/MAINT	CONTROL CHAMBER	DEBRIS/OBJECT	CLEANED
4/15/2014	NPDES 45	FLOW CONTROL STRUCTURE - NPDES 45 - CSO 29 - 074-159	FLOW CONTROL CLEANING/MAINT	CONTROL CHAMBER	DEBRIS/OBJECT	CLEANED
4/15/2014	NPDES 49	FLOW CONTROL STRUCTURE - NPDES 49 - CSO 4 - 306-428	FLOW CONTROL CLEANING/MAINT	CONTROL CHAMBER	DEBRIS/OBJECT	CLEANED
4/17/2014	NPDES 99	FLOW CONTROL STRUCTURE - NPDES 99 - CSO 34 - D055-165	STRUCTURE VACTOR MH OR OTHER	N/A - PM	N/A - PM	N/A - PM
4/17/2014	NPDES 99	ECV - ELASTOMERIC CHECK VALVE - 055-170 - NPDES99 - CSO 34	GATE FLOW CONTROL CLEAN/MAINT	CONTROL CHAMBER	DEBRIS/OBJECT	CLEANED
5/8/2014	NPDES 40	FLOW CONTROL STRUCTURE - NPDES 40 - CSO 11 - 059-490	WW FLOW CONTROL HYDROBRAKE CLEAN/MAINT	CONTROL CHAMBER	DEBRIS/OBJECT	CLEANED
5/8/2014	NPDES 45	HYDROBRAKE - FLOW CONTROL STRUCTURE - NPDES 45 - CSO 29 - 074-159	WW FLOW CONTROL HYDROBRAKE CLEAN/MAINT	CONTROL CHAMBER	DEBRIS/OBJECT	CLEANED
5/8/2014	NPDES 32	HYDROBRAKE - NPDES 32 - CSO 16 - 046-156, RETIRED	WW FLOW CONTROL HYDROBRAKE CLEAN/MAINT	CONTROL CHAMBER	DEBRIS/OBJECT	CLEANED
5/12/2014	NPDES 29	HYDROBRAKE - FLOW CONTROL STRUCTURE - NPDES 29 - CSO 18 - 042-302	WW FLOW CONTROL HYDROBRAKE CLEAN/MAINT	CONTROL CHAMBER	DEBRIS/OBJECT	CLEANED
5/12/2014	NPDES 99	COMBINED MAIN LINE - 055-478 055-170	WW FLOW CONTROL HYDROBRAKE CLEAN/MAINT	SURCHARGE/RISE INDICATION	RESTRICTION	CLEAN PIPE
5/15/2014	NPDES 138	HYDROBRAKE - FLOW CONTROL STRUCTURE - NPDES 138 - CSO 36 - 023-434	WW FLOW CONTROL HYDROBRAKE CLEAN/MAINT	HYDROBRAKE	BLOCKAGE BY DEBRIS	RELIEVED
5/15/2014	NPDES 140	HYDROBRAKE - FLOW CONTROL STRUCTURE - NPDES 140 - CSO	WW FLOW CONTROL HYDROBRAKE CLEAN/MAINT	HYDROBRAKE	BLOCKAGE BY DEBRIS	RELIEVED

Cleaning Date	Location	Asset Description	Action Taken	Problem	Cause	Remedy
		31 - 031-001				
5/15/2014	NPDES 168	HYDROBRAKE - FLOW CONTROL CHAMBER - NPDES 168 - CSO 2 - 069-428	WW FLOW CONTROL HYDROBRAKE CLEAN/MAINT	N/A - PM	N/A - PM	N/A - PM
6/2/2014	NPDES 14	FLOW CONTROL STRUCTURE - NPDES 14 - CSO 21 - 025-299	WW FLOW CONTROL HYDROBRAKE CLEAN/MAINT	HYDROBRAKE	BLOCKAGE BY DEBRIS	RELIEVED
6/10/2014	NPDES 45	FLOW CONTROL STRUCTURE - NPDES 45 - CSO 29 - 074-159	STRUCTURE VACTOR MH OR OTHER	N/A - PM	N/A - PM	N/A - PM
6/20/2014	NPDES 32A	FLOW CONTROL STRUCTURE - NPDES 32A - CSO 16 - 046-078	FLOW CONTROL CLEANING/MAINT	CONTROL CHAMBER	DEBRIS/OBJECT	CLEANED
7/1/2014	NPDES 32	FLOW CONTROL STRUCTURE - NPDES 32 - CSO 16 - 046-156	FLOW CONTROL CLEANING/MAINT	CONTROL CHAMBER	DEBRIS/OBJECT	CLEANED
7/1/2014	NPDES 32	COMBINED MAINTENANCE HOLE - 046-160	FLOW CONTROL CLEANING/MAINT	O&M DEFECT	RESTRICTION	CLEAN PIPE
7/10/2014	NPDES 29	FLOW CONTROL STRUCTURE - NPDES 29 - CSO 18 - 042-325	STRUCTURE VACTOR MH OR OTHER	PARSHALL FLUME	DEBRIS/OBJECT	REMOVED
7/10/2014	NPDES 44A	FLOW CONTROL STRUCTURE - NPDES 44A - CSO 8 - 067-274	STRUCTURE VACTOR MH OR OTHER	CHANNEL IN MH	DEBRIS/OBJECT	REMOVED
7/10/2014	NPDES 33	FLOW CONTROL STRUCTURE - NPDES 33 - 046-171	FLOW CONTROL CLEANING/MAINT	N/A - PM	N/A - PM	N/A - PM
7/14/2014	NPDES 45	HYDROBRAKE - FLOW CONTROL STRUCTURE - NPDES 45 - CSO 29 - 074-159	WW FLOW CONTROL HYDROBRAKE CLEAN/MAINT	HYDROBRAKE	BLOCKAGE BY DEBRIS	RELIEVED
7/14/2014	NPDES 38	HYDROBRAKE - FLOW CONTROL STRUCTURE - NPDES 38 - CSO 12 - 059-498	FLOW CONTROL CLEANING/MAINT	CONTROL CHAMBER	DEBRIS/OBJECT	CLEANED
7/14/2014	NPDES 34	FLOW CONTROL STRUCTURE - NPDES 34 - CSO 15 - 046-176	FLOW CONTROL CLEANING/MAINT	N/A - PREV MAIN	N/A - PREV MAIN	N/A - PREV MAIN
7/14/2014	NPDES 170	HYDROBRAKE - FLOW CONTROL STRUCTURE - NPDES 170 - CSO 1 - 069-146	WW FLOW CONTROL HYDROBRAKE CLEAN/MAINT	CONTROL CHAMBER	DEBRIS/OBJECT	CLEANED
7/15/2014	NPDES 43	HYDROBRAKE - FLOW CONTROL STRUCTURE - NPDES 43 - CSO 9 - 060W-047	WW FLOW CONTROL HYDROBRAKE CLEAN/MAINT	HYDROBRAKE	BLOCKAGE BY DEBRIS	RELIEVED
7/16/2014	NPDES 42	HYDROBRAKE - FLOW CONTROL STRUCTURE - NPDES 42 - CSO 10 - 060W-052	WW FLOW CONTROL HYDROBRAKE CLEAN/MAINT	CONTROL CHAMBER	DEBRIS/OBJECT	CLEANED
7/17/2014	NPDES 42	FLOW CONTROL STRUCTURE - NPDES 42 - CSO 10 - 060W-052	FLOW CONTROL CLEANING/MAINT	CONTROL CHAMBER	DEBRIS/OBJECT	CLEANED
7/22/2014	NPDES 111H	FLOW CONTROL STRUCTURE - NPDES 111H - 057-347	WW DETENTION TANK CLEAN/MAINT	O&M DEFECT	RESTRICTION	CLEAN PIPE
7/24/2014	NPDES 111	DETENTION TANK - NPDES 111 - 057-348	WW DETENTION TANK CLEAN/MAINT	O&M DEFECT	RESTRICTION	CLEAN PIPE
7/24/2014	NPDES 29	FLOW CONTROL STRUCTURE - NPDES 29 - CSO 18 - 042-303	FLOW CONTROL CLEANING/MAINT	CONTROL CHAMBER	DEBRIS/OBJECT	CLEANED

Cleaning Date	Location	Asset Description	Action Taken	Problem	Cause	Remedy
7/27/2014	NPDES 29	FLOW CONTROL STRUCTURE - NPDES 29 - CSO 18 - 042-303	FLOW CONTROL CLEANING/MAINT	CONTROL CHAMBER	DEBRIS/OBJECT	CLEANED
7/28/2014	NPDES 41B	FLOW CONTROL STRUCTURE - NPDES 41B - 059-406	FLOW CONTROL CLEANING/MAINT	N/A - PM	N/A - PM	N/A - PM
7/29/2014	NPDES 138	HYDROBRAKE - FLOW CONTROL STRUCTURE - NPDES 138 - CSO 36 - 023-434	WW FLOW CONTROL HYDROBRAKE CLEAN/MAINT	HYDROBRAKE	BLOCKAGE BY DEBRIS	RELIEVED
7/29/2014	NPDES 99	FLOW CONTROL STRUCTURE - NPDES 99 - CSO 34 - 055-477	SEDIMENTATION CHAMBER CLEAN/MAINT	CONTROL CHAMBER	DEBRIS/OBJECT	CLEANED
7/30/2014	NPDES 152B	OVERFLOW STRUCTURE - NPDES 152B - 011-189	FLOW CONTROL CLEANING/MAINT	CHANNEL IN MH	DEBRIS/OBJECT	REMOVED
8/5/2014	NPDES 168	HYDROBRAKE - FLOW CONTROL CHAMBER - NPDES 168 - CSO 2 - 069-428	WW FLOW CONTROL HYDROBRAKE CLEAN/MAINT	N/A - PM	N/A - PM	N/A - PM
8/6/2014	NPDES 140	HYDROBRAKE - FLOW CONTROL STRUCTURE - NPDES 140 - CSO 31 - 031-001	WW FLOW CONTROL HYDROBRAKE CLEAN/MAINT	HYDROBRAKE	BLOCKAGE BY DEBRIS	RELIEVED
8/7/2014	NPDES 30	FLOW CONTROL STRUCTURE - NPDES 30 - CSO 17 - 042-322	FLOW CONTROL CLEANING/MAINT	NOTICEABLE ODOR FROM ENCLOSURE	ODOR FROM KING COUNTY PIPES	NONE NEEDED
8/8/2014	NPDES 13	HYDROBRAKE - FLOW CONTROL STRUCTURE - NPDES 13 - CSO 23 - 017-225	WW FLOW CONTROL HYDROBRAKE CLEAN/MAINT	N/A - PM	N/A - PM	N/A - PM
8/8/2014	NPDES 14	HYDROBRAKE - FLOW CONTROL STRUCTURE - NPDES 14 - CSO 21 - 025-299	WW FLOW CONTROL HYDROBRAKE CLEAN/MAINT	HYDROBRAKE	BLOCKAGE BY DEBRIS	RELIEVED
8/20/2014	NPDES 49	HYDROBRAKE - FLOW CONTROL STRUCTURE - NPDES 49 - CSO 4 - 306-428	FLOW CONTROL CLEANING/MAINT	CONTROL CHAMBER	DEBRIS/OBJECT	CLEANED
8/20/2014	NPDES 44	WEIR - FLOW CONTROL STRUCTURE - NPDES 44 - CSO 8 - 067-272	FLOW CONTROL CLEANING/MAINT	WEIR WALL	SURCHARGE/RISE INDICATION	WEIR CLEANED
8/20/2014	NPDES 42	FLOW CONTROL STRUCTURE - NPDES 42 - CSO 10 - 060W-052	FLOW CONTROL CLEANING/MAINT	CONTROL CHAMBER	DEBRIS/OBJECT	CLEANED
8/20/2014	NPDES 42	HYDROBRAKE - FLOW CONTROL STRUCTURE - NPDES 42 - CSO 10 - 060W-052	FLOW CONTROL CLEANING/MAINT	HYDROBRAKE	BLOCKAGE BY DEBRIS	RELIEVED
9/8/2014	NPDES 140	HYDROBRAKE - FLOW CONTROL STRUCTURE - NPDES 140 - CSO 31 - 031-001	WW FLOW CONTROL HYDROBRAKE CLEAN/MAINT	DETENTION OUTFALL	BLOCKAGE BY DEBRIS	REMOVE BLOCKAGE
9/9/2014	NPDES 38	HYDROBRAKE - FLOW CONTROL STRUCTURE - NPDES 38 - CSO 12 - 059-498	WW FLOW CONTROL HYDROBRAKE CLEAN/MAINT	HYDROBRAKE	BLOCKAGE BY DEBRIS	RELIEVED
9/10/2014	NPDES 45	FLOW CONTROL STRUCTURE - NPDES 45 - CSO 29 - 074-159	FLOW CONTROL CLEANING/MAINT	N/A - PM	N/A - PM	N/A - PM

Cleaning Date	Location	Asset Description	Action Taken	Problem	Cause	Remedy
10/20/2014	NPDES 61	HYDROBRAKES (3) - FLOW CONTROL STRUCTURE - NPDES 61 - CSO 27, 28 - 026-422	WW FLOW CONTROL HYDROBRAKE CLEAN/MAINT	SURCHARGE/RISE INDICATION	DEBRIS/OBJECT	CLEANED
10/29/2014	NPDES 168	HYDROBRAKE - FLOW CONTROL CHAMBER - NPDES 168 - CSO 2 - 069-428	WW FLOW CONTROL HYDROBRAKE CLEAN/MAINT	CONTROL CHAMBER	DEBRIS/OBJECT	CLEANED
10/29/2014	NPDES 169	FLOW STRUCTURE - 076-367	WW FLOW CONTROL HYDROBRAKE CLEAN/MAINT	CONTROL CHAMBER	DEBRIS/OBJECT	CLEANED
11/4/2014	NPDES 111	OVERFLOW STRUCTURE - 111C, 056-365 - NPDES111 - CSO 35	FLOW CONTROL CLEANING/MAINT	N/A - PM	N/A - PM	N/A - PM
11/4/2014	NPDES 70	DIVERSION STRUCTURE - NPDES 70 - CSO 30 - 039-519	FLOW CONTROL CLEANING/MAINT	OVERFLOW	DEBRIS/OBJECT	CLEANED
11/13/2014	NPDES 68A	HYDROBRAKE - FLOW CONTROL STRUCTURE - NPDES 68A - CSO 33 - 028-431	WW FLOW CONTROL HYDROBRAKE CLEAN/MAINT	SURCHARGE/RISE INDICATION	DEBRIS/OBJECT	CLEANED
11/19/2014	NPDES 45	HYDROBRAKE - FLOW CONTROL STRUCTURE - NPDES 45 - CSO 29 - 074-159	FLOW CONTROL CLEANING/MAINT	HYDROBRAKE	BLOCKAGE BY DEBRIS	RELIEVED
11/20/2014	NPDES 42	HYDROBRAKE - FLOW CONTROL STRUCTURE - NPDES 42 - CSO 10 - 060W-052	FLOW CONTROL CLEANING/MAINT	HYDROBRAKE	BLOCKAGE BY DEBRIS	RELIEVED
11/20/2014	NPDES 29	HYDROBRAKE - FLOW CONTROL STRUCTURE - NPDES 29 - CSO 18 - 042-302	FLOW CONTROL CLEANING/MAINT	HYDROBRAKE	BLOCKAGE BY DEBRIS	RELIEVED
12/4/2014	NPDES 43	FLOW CONTROL STRUCTURE - NPDES 43 - CSO 9 - 060W-049	FLOW CONTROL CLEANING/MAINT	CONTROL CHAMBER	DEBRIS/OBJECT	CLEANED
12/15/2014	NPDES 168	HYDROBRAKE - FLOW CONTROL CHAMBER - NPDES 168 - CSO 2 - 069-428	WW FLOW CONTROL HYDROBRAKE CLEAN/MAINT	CONTROL CHAMBER	DEBRIS/OBJECT	CLEANED
12/15/2014	NPDES 170	FLOW CONTROL STRUCTURE - NPDES 170 - CSO 1 - 069-144	FLOW CONTROL CLEANING/MAINT	CONTROL CHAMBER	DEBRIS/OBJECT	CLEANED
12/23/2014	NPDES 14	HYDROBRAKE - FLOW CONTROL STRUCTURE - NPDES 14 - CSO 21 - 025-299	WW FLOW CONTROL HYDROBRAKE CLEAN/MAINT	HYDROBRAKE	BLOCKAGE BY DEBRIS	WRITE WO TO CLEAN