

# **Regional Wastewater Services Plan 2015 Annual Report**

Prepared in accordance with  
Ordinance 15384, Section 6, as amended, and King County Code 28.86.165

**September 2016**



**King County**

Department of Natural Resources and Parks  
Wastewater Treatment Division

## Table of Contents

Introduction .....	1
Executive Summary .....	1
RWSP Major Components .....	2
Conveyance System Improvement Program .....	2
Infiltration and Inflow Control Program.....	8
Protecting Our Waters Program.....	10
Odor Prevention and Control Program .....	18
Water Quality Monitoring.....	19
RWSP Plan Elements .....	20
Biosolids Recycling Program .....	20
Energy Efficiency and Recovery Program .....	21
Reclaimed Water Program .....	22
RWSP Policy Review.....	23
Permit Compliance .....	23
RWSP Cost Estimates .....	24
Conclusion .....	24

## List of Figures

Figure 1. Sunset and Heathfield Pump Stations and Force Main Upgrade Project Area .....	3
Figure 2. North Creek Interceptor Project Area .....	4
Figure 3. North Lake Sammamish Flow Diversion Project Area.....	5
Figure 4. North Mercer Island and Enatai Sewer Upgrade Project Recommended Alternative .....	6
Figure 5. Lake Hills and Northwest Lake Sammamish Sewer Upgrade Project Area .....	7
Figure 6. Phase B Kent-Auburn Conveyance System Improvements Project Area .....	8
Figure 7. Sources of Infiltration and Inflow .....	9
Figure 8. North Beach Pump Station with New Landscaping .....	10
Figure 9. Finishing Touches Underway at South Magnolia CSO Control Storage Facility.....	11
Figure 10. Murray CSO Control Project Under Construction.....	12
Figure 11. Barton CSO Control Project Area and New Roadside Rain Garden .....	12
Figure 12. Rainier Valley Wet Weather Storage Project New Storage Tank .....	13

Figure 13. Rainier Valley Wet Weather Storage Project New and Reused Pipe .....	14
Figure 14. Initial Design of Georgetown Wet Weather Treatment Station .....	15
Figure 15. West Duwamish CSO Control Project Area .....	16
Figure 16. Conceptual Ship Canal Water Quality Project System Illustration.....	17
Figure 17. Loop Biosolids Distribution and Use in Washington State.....	21
Figure 18. West Point Treatment Plant Cogeneration System .....	22
Figure 19. Reclaimed Water Irrigation at Starfire Sports Complex.....	23

## List of Tables

Table 1. Odor Complaints in 2015.....	18
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## **Introduction**

King County Ordinance 15384, Section 6, as amended, and King County Code 28.86.165 require the King County Executive to transmit a report to the Council in September each year to cover the previous year's implementation of the Regional Wastewater Services Plan (RWSP). The RWSP outlines programs and projects through 2030 to increase system capacity and function; gives guidance on recovering and recycling beneficial resources from the wastewater treatment process; and provides direction on protecting and monitoring water quality and meeting permit conditions.

Specifically, the Ordinance, as amended, and the King County Code require the report to:

- Summarize activities for the major components of the RWSP, including associated capital projects that were underway
- Include a status of the odor prevention program and a summary of odor complaints
- Summarize the results for the water quality monitoring program
- Include information on the plan's elements, such as reclaimed water, biosolids, and energy
- Provide an update of anticipated RWSP program costs through the year 2030

This report addresses each requirement under a corresponding heading. This is the 16th RWSP annual report that the Wastewater Treatment Division (WTD) in the Department of Natural Resources and Parks has prepared.<sup>1</sup>

## **Executive Summary**

The RWSP 2015 Annual Report summarizes the progress made during 2015 in implementing the plan's major programs and projects.

Highlights of RWSP implementation in 2015 are as follows:

- The South Treatment Plant, the West Point Treatment Plant, and the Vashon Treatment Plant each received Platinum Peak Performance awards from the National Association of Clean Water Agencies (NACWA). Platinum level awards indicate five or more consecutive years of compliance with effluent limits established by National Pollutant Discharge Elimination System (NPDES) permits under the federal Clean Water Act and the state's Water Pollution Control Law. To date, South Treatment Plant has attained 18 years of 100 percent permit compliance; the West Point Treatment Plant has attained 14 years of compliance, and the Vashon Treatment Plant 5 years of compliance. In addition,

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<sup>1</sup>Previous RWSP annual reports are available at <http://www.kingcounty.gov/environment/wtd/Construction/planning/rwsp/Library/AnnualReport.aspx>.

the Brightwater and Carnation treatment plants each received a NACWA gold award for 100 percent compliance in 2015.

- Progress was made on capital projects associated with the Conveyance System Improvement Plan and the Long-term Combined Sewer Overflow Plan.
- West Point, South, and Brightwater treatment plants produced 114,957 wet tons of Loop® biosolids, all of which were recycled and used as a fertilizer and soil amendment for forestry and agricultural applications or to make compost.
- The South, West Point, and Brightwater treatment plants continued to use digester gas to produce heat, electricity, and natural gas.
- Over 760 million gallons of reclaimed water produced at the South, West Point, Brightwater, and Carnation treatment plants were used for landscape irrigation, wetland enhancement, and industrial processes.

### **RWSP Major Components**

This section summarizes activities in 2015 for the following RWSP major components:

- Conveyance System Improvement Program
- Infiltration and Inflow Control Program
- Protecting Our Waters Program

### **Conveyance System Improvement Program**

In accordance with RWSP policies, the Conveyance System Improvement (CSI) Program works to provide capacity in areas of the separated conveyance system in order to meet the RWSP 20-year peak flow design standard.<sup>2</sup> This standard was adopted by the King County Council to serve as an objective measure for designing and building conveyance facilities intended to meet NPDES permit requirements that there be no overflows from the separated system. A 20-year peak flow consists of both storm flow (infiltration and inflow) and base flow (wastewater from homes and businesses) and has a 5 percent chance of occurring in any year. The King County Executive and King County Council recognize that this is a stringent standard and that it will require time to upgrade the entire conveyance system to meet the standard.

In 2015, work continued on the CSI Program Update. RWSP policies call for regular program updates to verify, modify, or identify new conveyance system needs. WTD is working with the Engineering and Planning Subcommittee of the Metropolitan Water Pollution Abatement Advisory Committee (MWPAAC) and individual sewer agencies on the update. The update is expected to be complete in early 2017.

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<sup>2</sup> The separated system is the part of the King County regional system where stormwater and wastewater are collected in separate pipes.

More information on the CSI Program update is available at <http://www.kingcounty.gov/environment/wastewater/CSI/ProgramUpdate.aspx>.

Six CSI projects intended to provide projected capacity needs to meet the 20-year peak flow standard were underway in 2015:

- **Sunset and Heathfield Pump Stations and Force Main Upgrade Project.** The Sunset and Heathfield Pump Stations and related sewer pipes send sewage from Sammamish, Issaquah, and Bellevue to be treated at the South Treatment Plant in Renton. The Sunset and Heathfield Pump Stations and Force Main project (Figure 1) will upgrade both pump stations and the force main pipe connected to them. The project will also upgrade the Eastgate Trunk structure near I-90, which connects the force main to a larger pipe. The project was in design in 2015, and is expected to be complete in 2020.

More information on the Sunset and Heathfield Pump Stations and Force Main Upgrade Project is available at <http://www.kingcounty.gov/environment/wtd/Construction/East/SunsetHeathfield.aspx>.

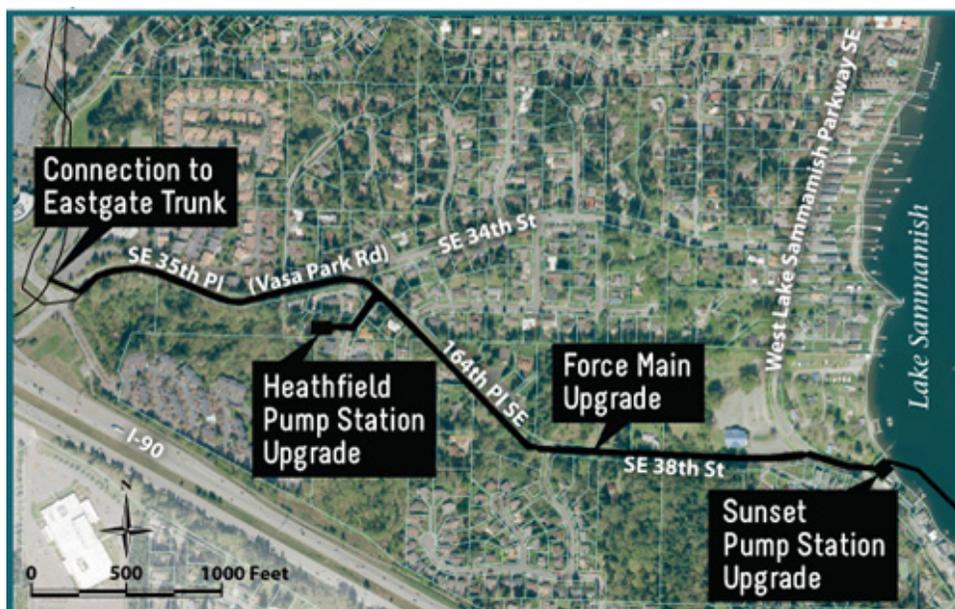


Figure 1. Sunset and Heathfield Pump Stations and Force Main Upgrade Project Area

- **North Creek Interceptor Project.** The North Creek Interceptor project (Figure 2) will replace a pipeline that serves parts of Bothell and unincorporated Snohomish County. The project provides additional capacity and needed upgrades to ensure safe and reliable operations for the future. The project includes constructing approximately 10,000 feet of new sewer line and connecting it to previously constructed pipe. Construction began in 2015, and is expected to be complete in 2017.

More information on the North Creek Interceptor Project is available at <http://www.kingcounty.gov/environment/wtd/Construction/North/NCI.aspx>.

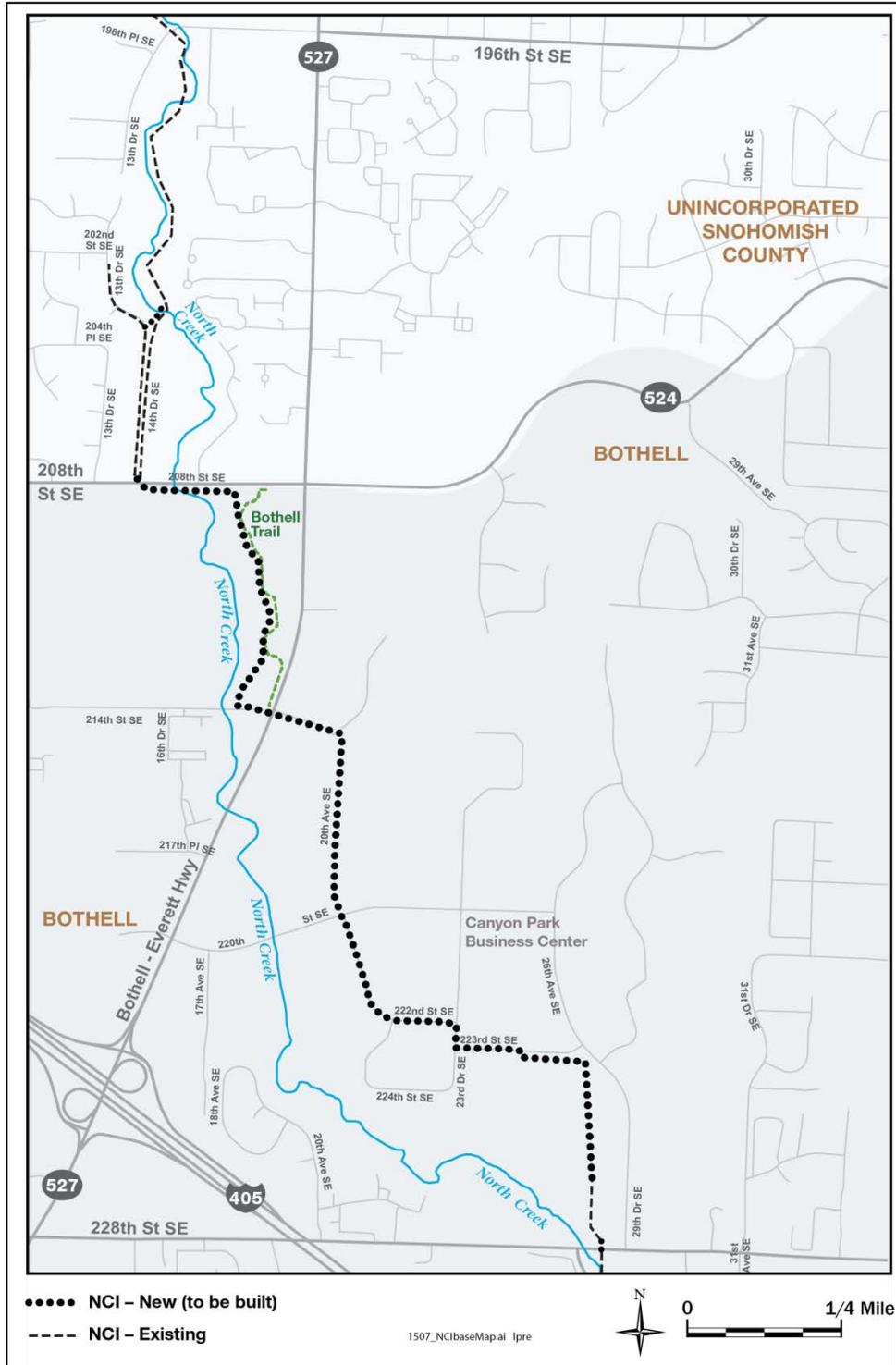


Figure 2. North Creek Interceptor Project Area

- North Lake Sammamish Flow Diversion Project.** Currently, flows from the North Lake Sammamish basin are routed to the South Treatment Plant through the East Side Interceptor (ESI). The North Lake Sammamish Flow Diversion project (Figure 3) will divert up to 43 million gallons per day of wastewater from the North Lake Sammamish basin and send them to the Brightwater Treatment Plant to maintain the ability of the ESI to convey peak flows during 20-year flow events. Work in 2015 focused on conducting geotechnical and environmental conditions assessments and alternatives analyses.

More information on the North Lake Sammamish Flow Diversion Project is available at

<http://www.kingcounty.gov/environment/wtd/Construction/East/NLkSamFlowDiversion.aspx>.

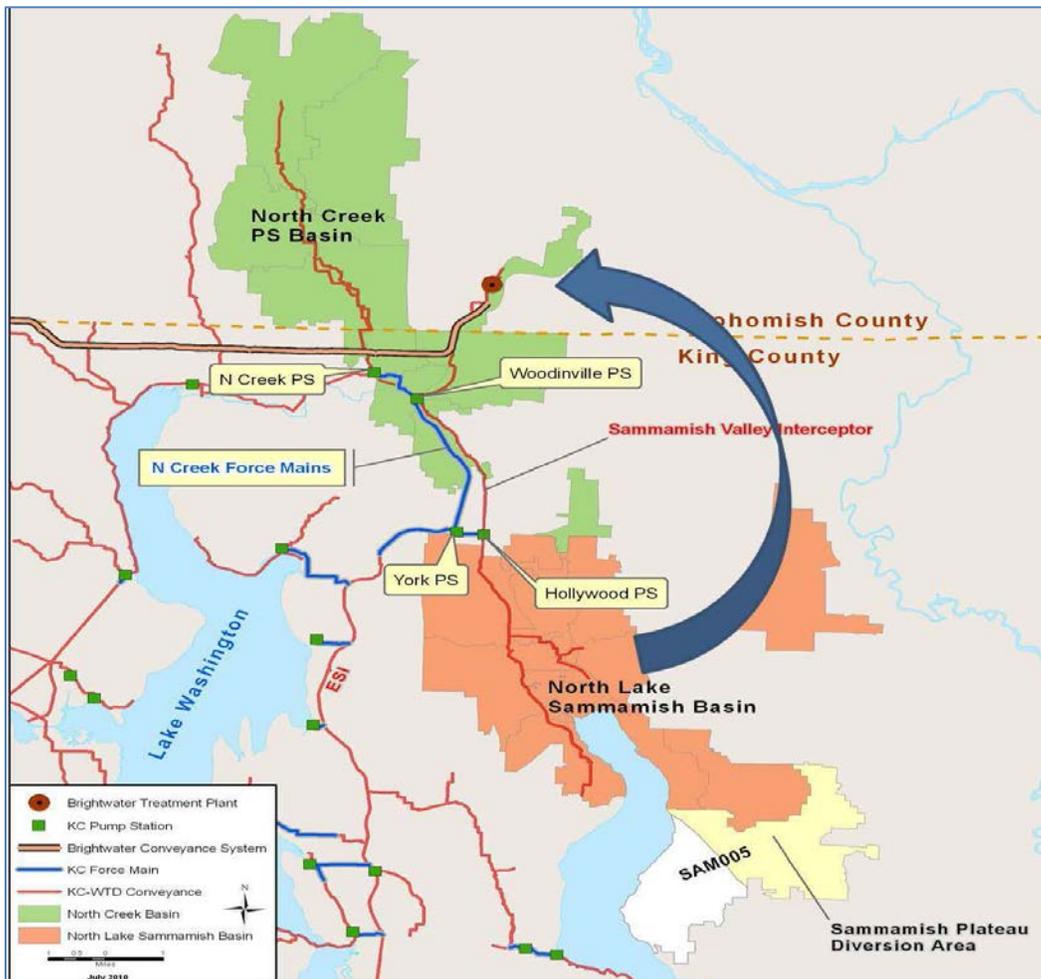


Figure 3. North Lake Sammamish Flow Diversion Project Area

- North Mercer Island and Enatai Sewer Upgrade Project.** The North Mercer Island and Enatai interceptors serve areas in North Mercer Island, southwest Bellevue, and Beaux Arts Village. The North Mercer Island Interceptor and Enatai Interceptor Upgrade project will construct a new pipeline from the North Mercer

Island Pump Station along the northeast side of Mercer Island, a new siphon across Lake Washington East Channel, and a new pipe in south Bellevue to the Sweyolocken Pump Station. Work in 2015 focused on alternatives analysis and developing a recommended alternative (Figure 4).

More information on the North Mercer Island and Enatai Sewer Upgrade Project is available at <http://www.kingcounty.gov/environment/wtd/Construction/East/NMIEenatai.aspx>.

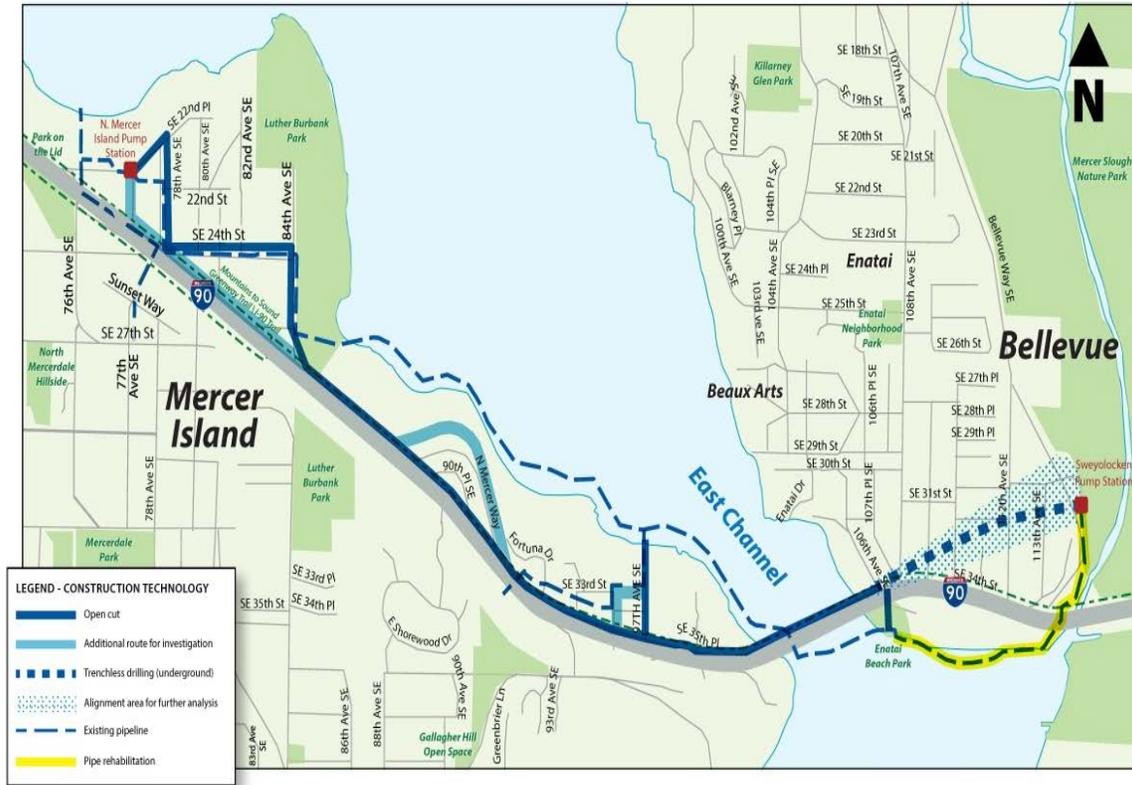


Figure 4. North Mercer Island and Enatai Sewer Upgrade Project Recommended Alternative

- Lake Hills and Northwest Lake Sammamish Sewer Upgrade Project.** The Lake Hills and Northwest Lake Sammamish Sewer Upgrade Project (Figure 5) will replace the existing Lake Hills Trunk and upgrade the Northwest Lake Sammamish Interceptor. The existing gravity pipelines are about 4.5 miles long and are located in Redmond. A notice to proceed for engineering design consultant services was issued in March 2015, and project efforts in 2015 focused on developing alternatives. The project team selected a recommended project alternative in December 2015. Field work and project design will begin in 2016, and construction is expected to begin in 2018.

More information on the Lake Hills and Northwest Lake Sammamish Sewer Upgrade Project is available at <http://www.kingcounty.gov/environment/wtd/Construction/East/LkHillsNWLkSam.aspx>.



Figure 5. Lake Hills and Northwest Lake Sammamish Sewer Upgrade Project Area

- Kent-Auburn Conveyance System Improvements Project (Phase B).** Phase B of the Kent-Auburn Conveyance System Improvements Project includes installation of new sewer lines in Pacific, Algona, and Auburn and modifications to the Pacific Pump Station discharge piping in Pacific (Figure 6). Activities in 2015 focused on design and permitting. Final design is expected to be complete in 2016, and construction is expected to begin in late 2016 and last for about two years.

More information on the Phase B Kent-Auburn Conveyance System Improvements Project is available at <http://www.kingcounty.gov/environment/wtd/Construction/South/KentAuburn.aspx>.

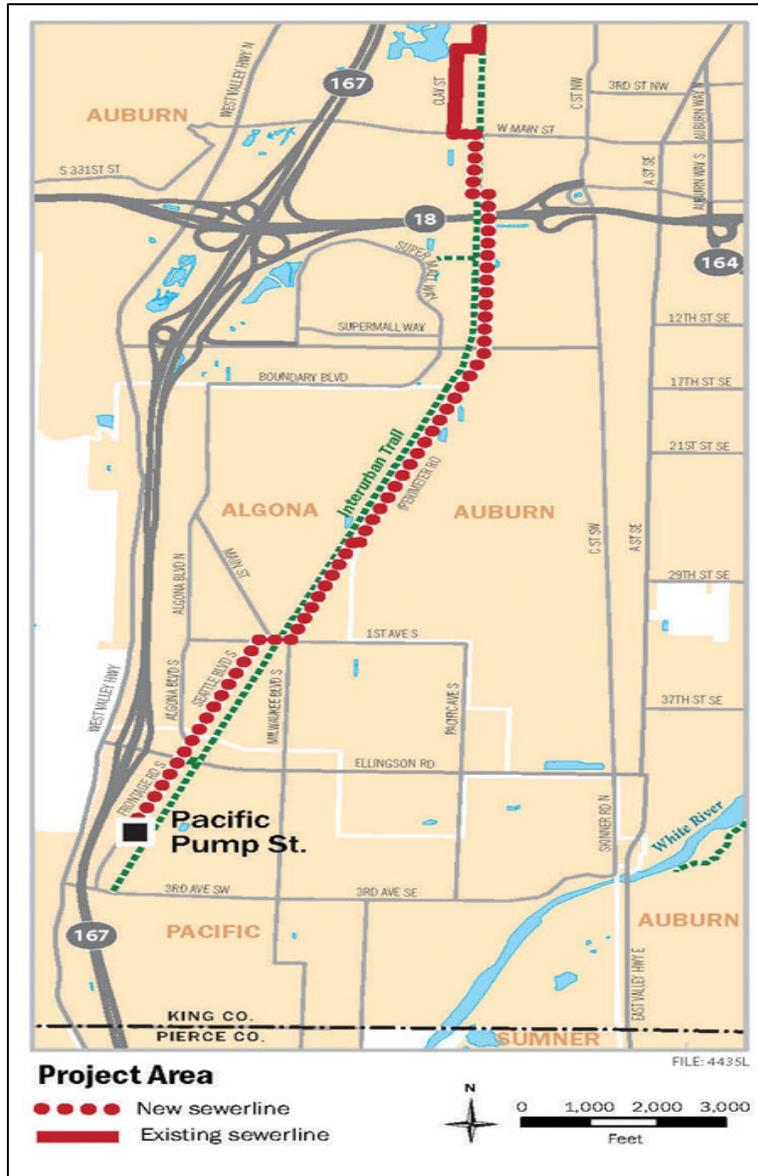


Figure 6. Phase B Kent-Auburn Conveyance System Improvements Project Area

### Infiltration and Inflow Control Program

The County's Infiltration and Inflow (I/I) Control Program was created in 1999 as part of the RWSP to reduce the amount of I/I that enters the regional wastewater system, as I/I affects the capacity needs of sewer pipes and treatment plants. I/I (Figure 7) is excess water that flows into sewer pipes from groundwater and stormwater. Groundwater (infiltration) seeps into sewer pipes through holes, cracks, joint failures, and faulty connections. Stormwater (inflow) rapidly flows into sewers via roof drain downspouts, foundation drains, storm drain cross-connections, and through holes in manhole covers.

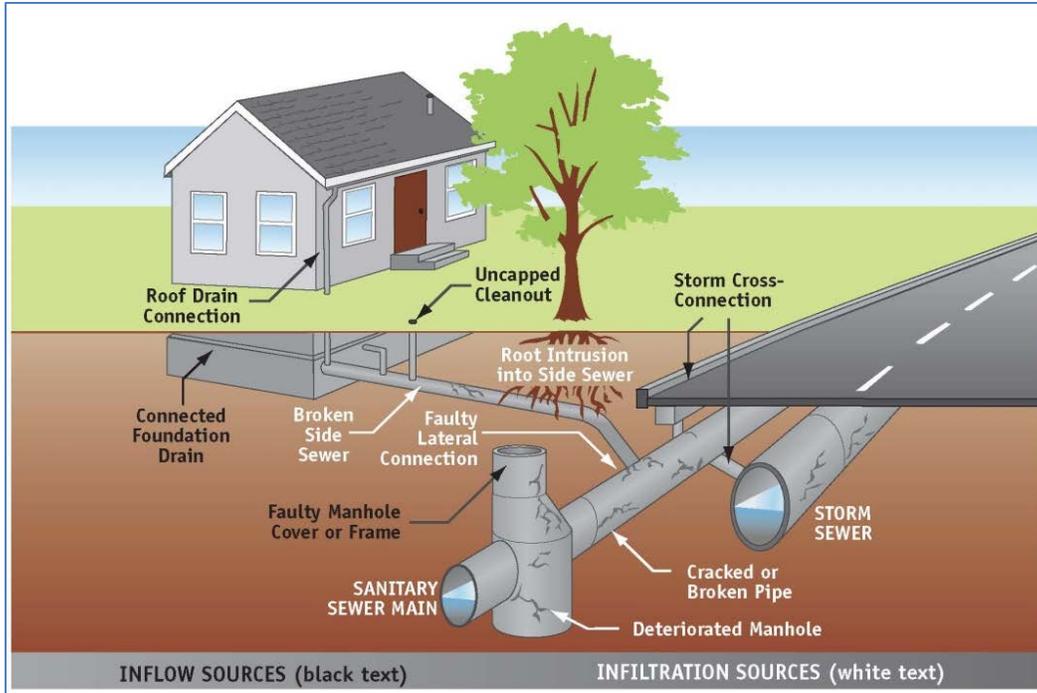


Figure 7. Sources of Infiltration and Inflow

Activities in 2015 focused on working with a MWPAAC I/I Reduction Task Force to brainstorm I/I programs that may benefit the regional wastewater system. The MWPAAC Task Force reviewed program activities to date and recommended several items for further consideration for future I/I control program actions. As a result, next steps include:

- Assess sewer and side sewer standards in place throughout the service area and consideration of an approach or program to achieve common standards if needed
- Evaluate current sewer line inspection programs in place throughout the service area, and as necessary, identify areas for improvement, including the potential for a regional inspection training program
- Research and evaluate private side sewer programs for potential development and implementation to help ensure private side sewers are being maintained, repaired, and replaced as needed, which would ultimately minimize the amount of I/I from side sewers entering into the local and regional sewer pipes

A request for proposals for consultant support in this effort is expected to be issued in 2016, and work will continue through 2017.

More information on the I/I Control Program is available at <http://www.kingcounty.gov/environment/wastewater/II.aspx>.

## Protecting Our Waters Program

Work continued in 2015 to implement the County's Combined Sewer Overflow Control (CSO) Program, called Protecting Our Waters. RWSP policies and the 2013 consent decree, which the County entered into with the U.S. Department of Justice, the U.S. Environmental Protection Agency (EPA), and the Washington State Department of Ecology (Ecology), call for control of all CSO locations by 2030. Control means that each location meets the Washington State standard of no more than one untreated discharge per year on a 20-year moving average. Seventeen of the County's 39 CSOs are currently controlled. Projects are under way or planned to control the other CSOs. As of December 31, 2015, all projects are on schedule to meet the critical milestones outlined in the consent decree.

More information on the Protecting Our Waters Program is available at <http://www.kingcounty.gov/environment/wastewater/CSO.aspx>.

Eight Protecting Our Waters capital projects and a water quality assessment and monitoring study were underway in 2015 and are described below.

- **North Beach CSO Control Project.** The North Beach CSO Control Project includes construction of a new underground storage tank in the right-of-way in NW Blue Ridge Drive and Triton Drive NW. The facility will store peak flows during heavy rains when the North Beach Pump Station (Figure 8) reaches maximum capacity. After storms have passed and capacity is available, an underground pump will send stored flows to the pump station for conveyance to the Carkeek Wet Weather Treatment Facility either for treatment or for transfer to the West Point Treatment Plant. Construction was completed in 2015, and the facility began operating in December.

More information on the North Beach CSO Control Project is available at <http://www.kingcounty.gov/environment/wtd/Construction/Seattle/NBeachCSOStorage.aspx>.



Figure 8. North Beach Pump Station with New Landscaping

- **South Magnolia CSO Control Project.** The South Magnolia CSO Control Project (Figure 9) includes construction of an underground storage tank on 23rd Avenue West in the Smith Cove area south of the Magnolia Bridge. When heavy rains fill the sewer pipes, a new underground diversion structure at 32nd Avenue West will send excess sewer flows to a pipeline extending over one-half mile under Magnolia Bluff to the storage tank. Following storms, when room is available in the sewer pipes, stored flows will be sent to the Interbay Pump Station for transfer to the West Point Treatment Plant. Construction was completed in 2015, and site restoration and landscaping was underway.

More information on the South Magnolia CSO Control Project is available at <http://www.kingcounty.gov/environment/wtd/Construction/Seattle/SMagnoliaCSOStorage.aspx>.



Figure 9. Finishing Touches Underway at South Magnolia CSO Control Storage Facility

- **Murray CSO Control Project.** The Murray CSO Control Project is building a 1 million gallon (MG) underground storage tank beneath property across the street from Lowman Beach Park in West Seattle (Figure 10). The facility will store peak flows during heavy rains when the Murray Pump Station reaches maximum capacity. After storms are passed, and capacity is available, stored flows will be sent to the Murray Pump Station for conveyance to the West Point Treatment Plant. Construction continued in 2015 and is expected to be complete in October 2016.

More information on the Murray CSO Control Project is available at <http://www.kingcounty.gov/environment/wtd/Construction/Seattle/MurrayCSOStorage.aspx>.



Figure 10. Murray CSO Control Project Under Construction

- Barton CSO Control Project.** The Barton CSO Control Project constructed 91 roadside rain gardens, which are a type of green stormwater infrastructure (GSI), on 15 blocks in the Sunrise Heights and Westwood neighborhoods in West Seattle (Figure 11). Located in the planter strip between the curb and sidewalk, the rain gardens divert stormwater runoff away from the combined sewer system. When it rains, stormwater filters through rain garden soil to a drain pipe, which takes the water to a deep well for slow infiltration underground. Keeping stormwater out of the sewer system will reduce CSOs into Puget Sound near the Fauntleroy ferry dock. Construction was substantially complete in 2015.

More information on the Barton CSO Control Project is available at <http://www.kingcounty.gov/environment/wtd/Construction/Seattle/BartonCSO-GSI.aspx>.



Figure 11. Barton CSO Control Project Area and New Roadside Rain Garden

- Rainier Valley Wet Weather Storage Project.** The Rainier Valley Wet Weather Storage Project will install a new sewer pipe near the intersection of Rainier Avenue South and South Bayview Street in Seattle to convey flow from a pipe that fills during storms to another pipe that has more capacity (Figure 12 and Figure 13). Excess flows will be routed to a new storage tank at the intersection of South Hanford Street and South 27th Avenue for eventual transfer to the West Point Treatment Plant when capacity is available. The completed project will reduce CSOs in the Duwamish River.

Activities in 2015 focused on completing final design, permitting, and community outreach. Construction is expected to begin in 2016.

More information on the Rainier Valley Wet Weather Storage Project is available at <http://www.kingcounty.gov/environment/wtd/Construction/Seattle/HanfordCSO.aspx>.



Figure 12. Rainier Valley Wet Weather Storage Project New Storage Tank

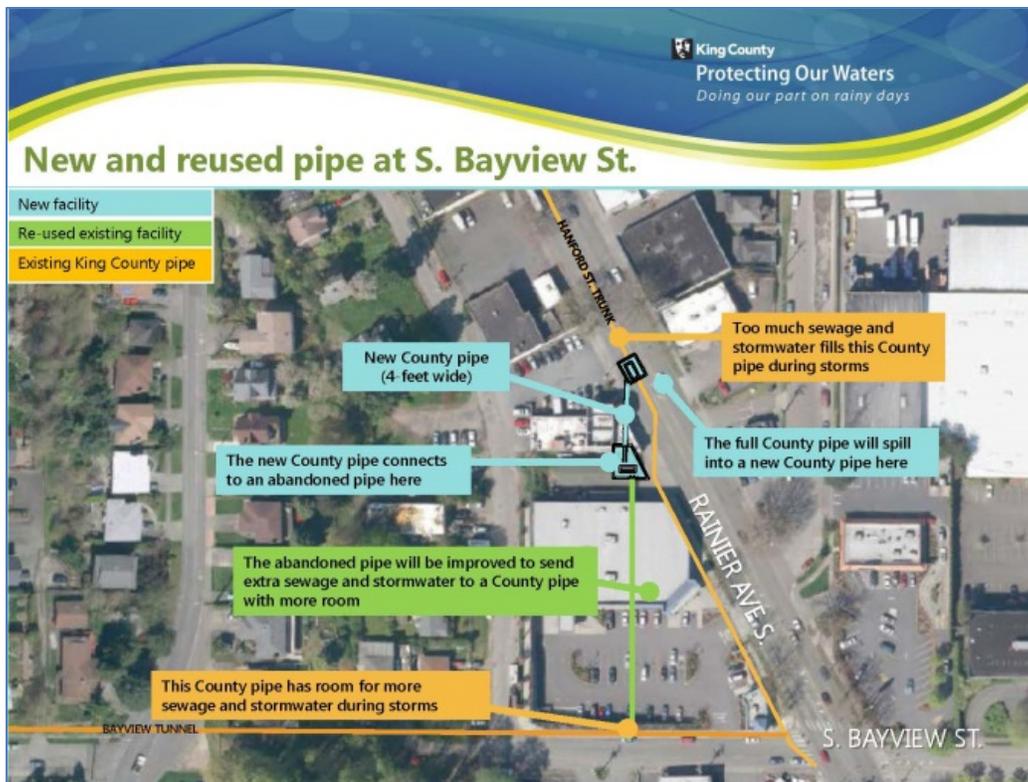


Figure 13. Rainier Valley Wet Weather Storage Project New and Reused Pipe

- Georgetown Wet Weather Treatment Station Project.** The Georgetown Wet Weather Treatment Station Project includes construction of a CSO treatment facility between the Brandon Street and South Michigan Street regulator stations, pipelines, and a new outfall structure to release the treated water into the Duwamish River. The station will have the capacity to treat up to 70 MG of combined rain and wastewater that would otherwise have discharged directly to the Duwamish River without treatment during storm events.

Work in 2015 focused on initiating design work (Figure 14) and working with the community, including the project's Design Advisory Group. Final design is expected to be complete in 2016, and construction is expected to begin in 2017.

More information on the Georgetown Wet Weather Treatment Station Project is available at <http://www.kingcounty.gov/environment/wtd/Construction/Seattle/BrandonMichiganCSO.aspx>

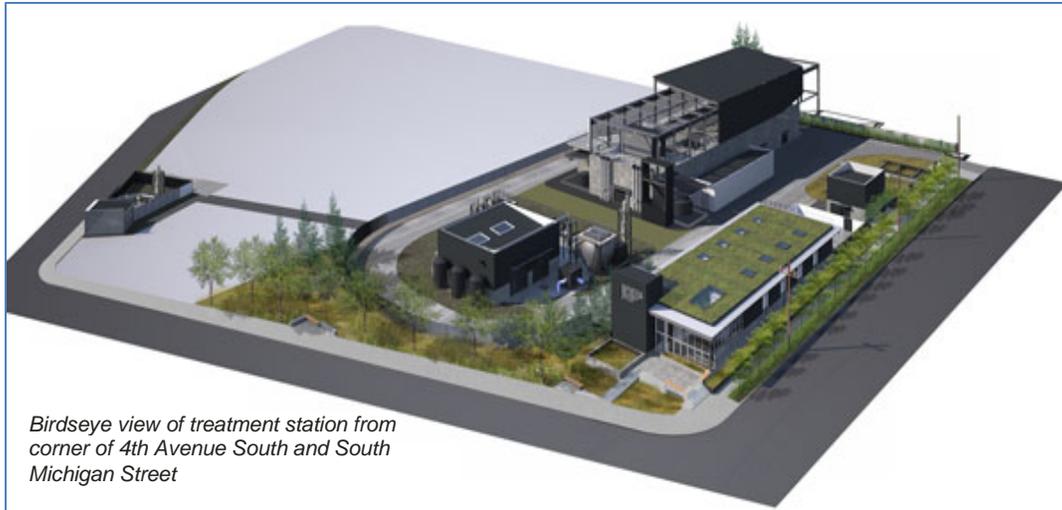


Figure 14. Initial Design of Georgetown Wet Weather Treatment Station

- **West Duwamish CSO Control Project.** The purpose of the West Duwamish CSO Control Project (Figure 15) is to control the CSOs at the Terminal 115 and West Michigan CSO locations on the Duwamish River. The County is considering several options, including a 100 percent green solution that could include roadside rain gardens and/or permeable pavement that lets water soak through it, a traditional “gray” infrastructure solution such as an underground storage tank or pipe, or a mix of green and gray. The South Park and Highland Park neighborhoods in Seattle have been identified as possible GSI areas because of their relatively flat streets, wide planter strips or roads, and favorable soil conditions.

Activities in 2015 focused on selecting a design consultant, and design work is expected to begin in 2016.

More information on the West Duwamish CSO Control Project is available at <http://www.kingcounty.gov/environment/wtd/Construction/Seattle/WMichT115CSO.aspx>.

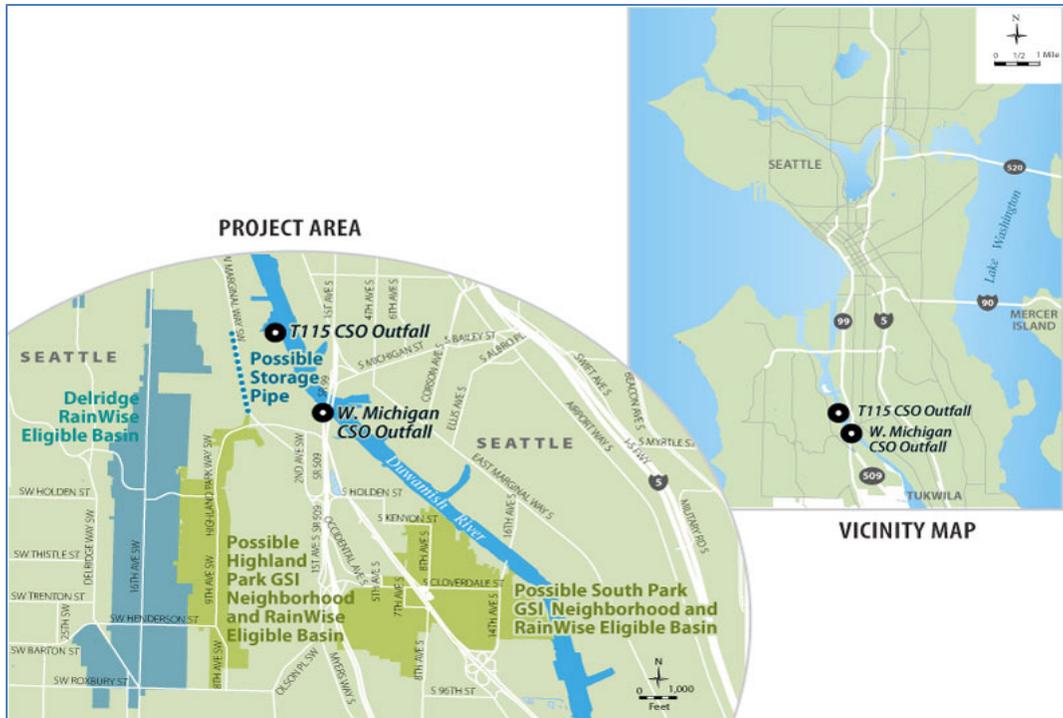


Figure 15. West Duwamish CSO Control Project Area

- Ship Canal Water Quality Project.** The Ship Canal Water Quality Project (Figure 16) is a joint City of Seattle and King County project. The City of Seattle is serving as the lead agency for design and construction of the project. The project will provide offline storage of combined wastewater in an approximately 2.7-mile long storage tunnel constructed between the Ballard and Wallingford neighborhoods, on the north side of the Ship Canal. The project will control five of Seattle's CSOs and two of King County's CSOs. Construction of a single project, rather than several independent projects, will reduce environmental impacts and minimize neighborhood disruptions. The Ship Canal Project will replace the need to build the County's 3rd Avenue NW Storage CSO Control Project and 11<sup>th</sup> Avenue NW Conveyance CSO Control Project.

In 2015, the County worked with the City of Seattle to develop a joint project agreement (JPA) for the purpose of jointly cooperating in and sharing funding of, the planning, design, construction, maintenance, operation, repair, replacement, alteration, and improvement of the facility. In addition, the County worked with the City on design work and development of a scope of work and selection of a consultant for final design.

More information on the Ship Canal Water Quality Project is available on the City of Seattle's website at <http://www.seattle.gov/util/EnvironmentConservation/Projects/ShipCanalWaterQuality/index.htm>.

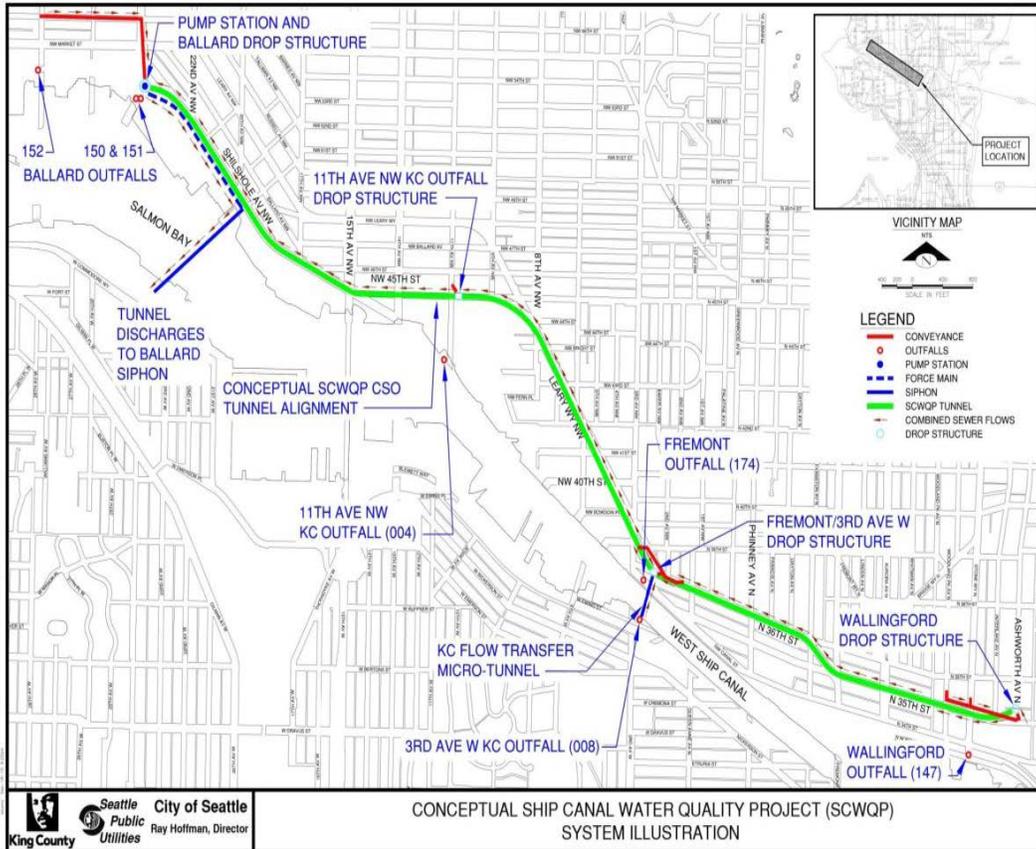


Figure 16. Conceptual Ship Canal Water Quality Project System Illustration

- Water Quality Assessment and Monitoring Study.** Work continued in 2015 on the Water Quality Assessment and Monitoring Study (assessment) as specified in Ordinance 17413. The assessment is examining local water quality issues near King County CSOs in Elliott Bay, Lake Union/Ship Canal, and the Duwamish River. It will also examine how upcoming Protecting Our Waters CSO control projects can be sequenced and integrated to optimize the investments being made in these projects. The County will use results from the assessment to inform the next long-term CSO control plan update, which is due to regulators in 2019.

In 2015, the Scientific and Technical Review Team, whose members are independent technical experts in water quality and environmental science and engineering, completed the bulk of the scientific and technical analyses. Briefings related to the assessment and findings to date were held with various interested parties, including the MWPAAC and the Regional Water Quality Committee.

More information on the Water Quality Assessment and Monitoring Study is available at <http://www.kingcounty.gov/services/environment/wastewater/cso/projects/water-quality-study.aspx>.

## Odor Prevention and Control Program

RWSP policies provide direction on implementing an Odor Prevention and Control Program that goes beyond traditional odor control for the County’s wastewater treatment plants and associated conveyance facilities. RWSP policies also call for including a summary of odor complaints in annual reports.

WTD received and investigated 84 odor complaints in 2015 (Table 1). When investigating an odor complaint, the source of the odor is not always identifiable. For example, some complaints were from areas where there are no WTD facilities and other complaints were associated with odor from low tides.

Of the 84 complaints received, 59 were determined to be attributable to WTD facilities. No odor complaints were attributed to the Brightwater, West Point, and Carnation treatment plants. Complaints attributable to WTD facilities were resolved through replacing carbon in odor control facilities, sealing manhole covers, replacing equipment such as fan belts, and adding caustic soda when force mains are being flushed.

About 30 of the complaints attributable to the conveyance facilities in the West Point Treatment Plant service area were from three residences in the Alki Beach area that were experiencing odors in their homes. Investigations to identify the sources of these odors began in 2014. In November 2015, backflow preventers were installed near their side sewers to prevent odors from the sewer trunks entering their homes. Additional work in 2016 and 2017 is planned to help control odors in this area, including installing a pipe to connect the sewer trunk to an odor control duct, and installing a new fan at the Alki Pump Station. WTD staff will continue to monitor and evaluate the effectiveness these improvements.

Table 1. Odor Complaints in 2015

Location	Complaints Received	Complaints Attributed to WTD Facilities
West Point Treatment Plant	4	0
Conveyance facilities in the West Point service area	53	40
South Treatment Plant	1	1
Conveyance facilities in the South Treatment Plant service area	18	12
Brightwater Treatment Plant	0	0
Conveyance facilities in the Brightwater Treatment Plant service area	5	5
Vashon Treatment Plant	3	1
Carnation Treatment Plant	0	0
<b>Total</b>	<b>84</b>	<b>59</b>

More information on the Odor Prevention and Control Program is available at <http://www.kingcounty.gov/environment/wtd/Response/OdorControl/GoodNeighbor.aspx>.

## **Water Quality Monitoring**

To protect public health and King County's significant investment in water quality improvements, the County regularly monitors treatment plant effluent, marine water, fresh water, and sediments. The parameters used to assess a water body's health under Washington State Water Quality Standards are fecal coliform bacteria, dissolved oxygen, temperature, pH, nutrients, turbidity, and a variety of chemical compounds. Monitoring results for the previous year are presented as environmental indicators on the County's Department of Natural Resources and Parks KingStat website at <http://your.kingcounty.gov/dnrp/measures/>.

Overall water and sediment quality conditions observed in 2015 were largely consistent with those observed in 2014 and in previous years, with a few exceptions for specific parameters.

Key findings in 2015 included the following:

- Treatment plant effluent consistently met permit requirements.
- Waters in most urban streams are frequently warmer, have more fecal coliform bacteria, and less dissolved oxygen than Washington State standards allow.
- The health of streams, as measured by the diversity and abundance of the invertebrate community that lives on the stream bottom, is generally better in streams that have less urban development.
- Six beaches monitored in Lake Washington had incidents of high bacteria and did not meet standards for swimming beaches. Thirteen beaches were resampled because of exceedances of the standards. Juanita Beach was closed for seven weeks due to a large influx of geese (and their feces) following a big storm event that washed mounds of aquatic plants onto the beach. Newcastle Beach was closed for one week.
- The unusually warm Pacific Ocean waters, dubbed "the blob" by meteorologists, entered inland Puget Sound marine waters in late 2014, and continued to cause anomalously high water temperatures in the Puget Sound Central Basin throughout the water column in 2015. Temperatures were at least 1 degree Celsius above normal for most of the year. The blob waters, along with anomalous weather conditions, contributed to abnormal water column stratification.
- For marine waters, large rainfall events during the 2015 wet season caused fresher than normal surface waters between January and April. Conversely, surface salinities were higher than normal in June and July during the warm and dry summer.
- Based on the Marine Water Quality Index, most offshore monitoring stations (79 percent), including those at the County's treatment plant marine outfalls, were at a low level of concern in 2015. As in previous years, the stations in Quartermaster Harbor were at a high level of concern.

- No exceedances of fecal coliform bacteria standards occurred at the County's treatment plant marine outfalls.
- Preliminary data results from marine intertidal sediment sampling in 2015 indicate no exceedances of the Sediment Management Standards.

Data and reports are available on the Water and Land Resources Division's Science and Technical Support Section website at <http://www.kingcounty.gov/depts/dnrp/wlr/sections-programs/science-section/doing-science.aspx>.

### **RWSP Plan Elements**

This section summarizes activities in 2015 for the following RWSP plan elements:

- Biosolids Recycling Program
- Energy Efficiency and Recovery Program
- Reclaimed Water Program
- RWSP Policy Review
- Permit Compliance

#### **Biosolids Recycling Program**

Biosolids are the nutrient-rich organic material produced by treating wastewater solids. After being processed and treated, biosolids are used beneficially as a fertilizer and soil amendment. RWSP biosolids policies encourage the County to continue to produce and market Class B biosolids and to evaluate alternative technologies to produce the highest quality marketable biosolids, including Class A biosolids.<sup>3,4</sup>

In 2015, a total of 114,957 wet tons of Loop® biosolids were produced at the West Point, South, and Brightwater treatment plants, all of which were recycled and used beneficially as a soil amendment for forestry and agricultural applications or were used to make compost (Figure 17).

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<sup>3</sup>Class B biosolids refer to biosolids that have been treated to significantly reduce pathogens to levels that are safe for beneficial use in land application.

<sup>4</sup>Class A biosolids refer to biosolids that have been treated to reduce pathogens to below detectable levels. Biosolids that meet this designation can be used without site access or crop harvest restrictions and are exempt from site-specific permits. Federal regulations require Class A level of quality for biosolids that are sold or given away in a bag or other container or that are applied to lawns or home gardens.

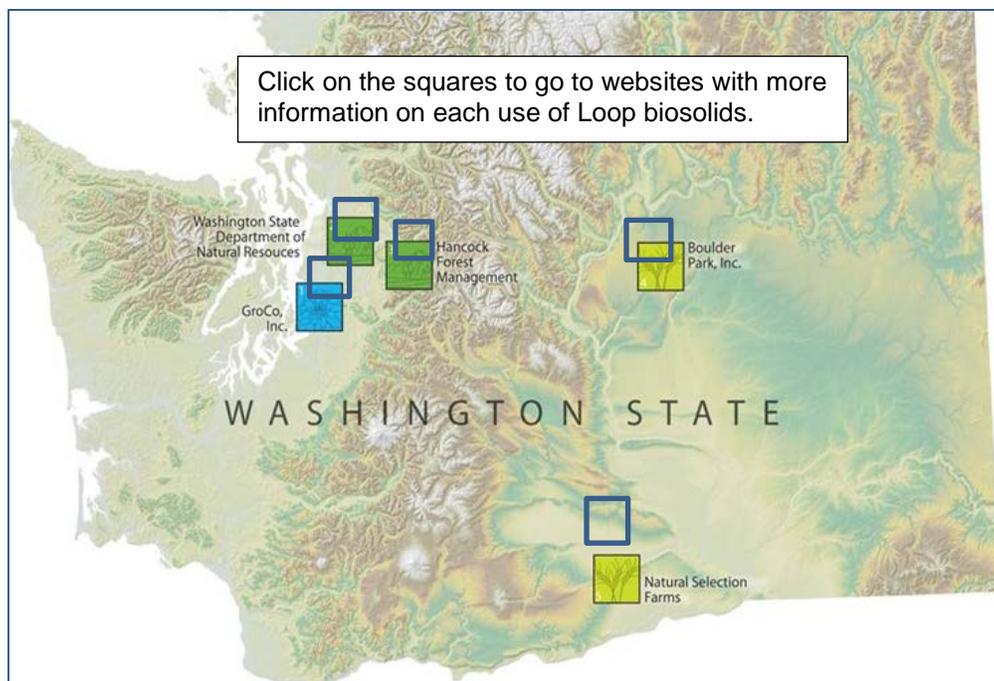


Figure 17. Loop Biosolids Distribution and Use in Washington State

Carbon sequestered from the use of Loop in agriculture, forestry, and composting totaled 37,263 MtCo<sub>2e</sub> (metric tons of carbon dioxide equivalents—the standard measure of carbon storage) after subtracting diesel emissions for transport and land application.

More information on the Biosolids Recycling Program is available at <http://www.kingcounty.gov/environment/wastewater/Biosolids.aspx>

### Energy Efficiency and Recovery Program

RWSP policies call for the County to use digester gas, an energy-rich methane gas naturally produced as a byproduct of solids treatment, for energy and other purposes when it is cost-effective to do so. In addition, the County’s Strategic Climate Action Plan includes goals to implement energy efficiencies and increase renewable energy production.

The South, West Point, and Brightwater treatment plants use digester gas to produce heat, electricity, and natural gas. At South Treatment Plant, digester gas that is not used for in-plant purposes is “scrubbed” to the quality required for pipeline natural gas and then sold to Puget Sound Energy.

In 2015, the Waste-to-Energy cogeneration system (Figure 18) at the West Point Treatment Plant continued regular operations. The cogeneration system creates electricity from digester gas and captures the heat generated from the process. The system supplies a significant portion of the plant’s heat demand. It produced about 18,000 megawatt hours of “green” electricity in 2015. Seattle City Light purchases the electricity produced at the West Point Treatment Plant, including the associated

renewable energy credits. In addition, South Treatment Plant sold approximately 1.8 million therms of scrubbed natural gas back to Puget Sound Energy in 2015.<sup>5</sup>



Figure 18. West Point Treatment Plant Cogeneration System

More information on the Energy Efficiency and Recovery Program is available at <http://www.kingcounty.gov/services/environment/wastewater/resource-recovery/Energy.aspx>.

### Reclaimed Water Program

The RWSP encourages the County to explore ways to increase the use of reclaimed water from its wastewater treatment plants. In 2015, over 760 MG of reclaimed water was produced and used at the treatment plants for on-site process water and irrigation. In addition, 85 MG was distributed to off-site uses. Information on reclaimed water production and use by treatment plant in 2015 is summarized below.

- The South Treatment Plant produced and used about 81 MG of reclaimed water, and 3.2 MG was distributed and used offsite by reclaimed water customers, including the City of Tukwila (Figure 19). The reclaimed water was used for irrigation of the Starfire Sports Complex, a wetland plants nursery, City Soil Community Farm project, and for city public works uses such as street sweeping and sewer flushing.
- The West Point Treatment Plant produced and used about 160 MG of reclaimed water for process water and landscape irrigation at the plant.
- The Brightwater Treatment Plant produced and used about 520 MG of reclaimed water for process water at the plant. In addition, 50 MG was distributed to the Brightwater Education and Community Center, the Influent and North Creek pump stations, Willows Run Golf Course, 60 Acres Park, and to the City of Kirkland from a temporary fill station. The water was used for irrigation, toilets/urinals, public art, and for city public works uses.

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<sup>5</sup> A therm is a unit of heat energy equal to 100,000 British thermal units. It is approximately the energy equivalent of burning 100 cubic feet of natural gas.

- All of the effluent produced at the Carnation Treatment Plant is reclaimed water quality, and 32 MG of reclaimed water was used to beneficially enhance a wetland in the County's Chinook Bend Natural Area.



Figure 19. Reclaimed Water Irrigation at Starfire Sports Complex

More information on the Reclaimed Water Program is available at <http://www.kingcounty.gov/services/environment/wastewater/resource-recovery/recycled-water.aspx>.

### **RWSP Policy Review**

In 2014, a task force of MWPAAC's Engineering and Planning Subcommittee was formed to review RWSP policies and make recommendations for policy amendments for consideration by the County Executive and the County Council. The task force completed its review in 2015, and made recommendations for four new sets of policies to guide sustainability and innovation, asset management, energy, and the industrial waste program. Recommendations were also made to make existing policies more current, readable, and to avoid duplication of policies. MWPAAC reviewed and discussed the task force's recommendations and came to tentative agreement on the proposed policy amendments. A policy subcommittee of the Council's Regional Water Quality Committee also reviewed and discussed MWPAAC's proposed amendments. In 2016, the County Executive will review and consider MWPAAC's proposed policy amendments and is expected to transmit legislation amending RWSP policies to the Council in 2017.

### **Permit Compliance**

On average, the County's treatment plants processed about 178 MG of wastewater each day in 2015. All of the plants operated without a single violation of their NPDES

permit effluent limits.

The South Treatment Plant, the West Point Treatment Plant, and the Vashon Treatment Plant each received Platinum Peak Performance awards from the National Association of Clean Water Agencies (NACWA) for 2015. Platinum level awards are given for five or more consecutive years of compliance with effluent limits established by NPDES permits under the federal Clean Water Act and the state's Water Pollution Control Law. To date, South Treatment Plant has attained 18 years of 100 percent permit compliance, West Point Treatment Plant has attained 14 years of compliance, and Vashon Treatment Plant has attained 5 years of compliance.

The Brightwater and Carnation treatment plants each received gold awards from NACWA for 100 percent compliance with effluent limits in 2015.

More information on WTD's NPDES permits is available at <http://www.kingcounty.gov/environment/wtd/About/System/NPDES.aspx>.

### **RWSP Cost Estimates**

The RWSP reporting policies call for an update of anticipated RWSP program costs through the year 2030. An update of RWSP cost estimates has been provided in each annual report since 2004. In accordance with a proviso in Budget Ordinance 17941 and Motion 14384, WTD began work in 2015 to review and make recommendations regarding the processes the division uses to establish and update planning-level cost estimates for capital projects. This work is expected to continue through the end of 2016. The results of this work will be applied to update planning-level cost estimates of RWSP projects planned for the future. Because this work was still in process during the preparation of this report, an update of RWSP cost estimates has not been prepared for 2015.

### **Conclusion**

WTD continued to implement the RWSP in 2015. Highlights are as follows:

- Progress was made on six RWSP CSI projects.
- Three CSO control projects were substantially complete in 2015, and the County's CSO Control program continues to meet its consent decree critical milestones.
- WTD continued to beneficially recycle the products of wastewater treatment—biosolids, digester gas, and reclaimed water.
- All of the County's treatment plants operated without a single violation of their NPDES permit effluent limits in 2015.