

Water Quality Management and Compliance

RWSP reporting policies call for including in RWSP annual reports a summary of the Wastewater Treatment Division's water quality management programs and its compliance with the Endangered Species Act and with other agency regulations and agreements.

The Wastewater Treatment Division (WTD) manages several programs to protect and preserve water quality. An important task is to ensure that King County's wastewater treatment plants produce effluent that meets permit requirements and water quality standards. The quality of treated effluent from the three secondary treatment plants remained high in 2007, despite an unusually intense storm that sent record flows through the South Treatment Plant. Both the South plant and West Point plant earned the National Association of Clean Water Agencies (NACWA) Gold Peak Performance Award.¹ Both plants also received the Platinum Peak Performance Award for multiple years of consecutive gold performance. The Vashon plant experienced no permit violations this year—the first full year of operation of the upgraded plant.

WTD is working to reduce marine discharges of treated effluent through expansion of its reclaimed water system (Chapter 9). In addition, it recycles 100 percent of biosolids produced at the plants and recovers methane (digester gas) to generate energy for running plant operations and for sale to local utilities.

WTD has committed to controlling all its combined sewer overflow (CSO) locations by 2030 so that they meet the Washington State standard of no more than one untreated discharge per year. About one-third of the county's CSOs are controlled thus far. The total volume of untreated CSOs was down to approximately 691 million gallons (MG) during the year compared to a baseline of 2,339 MG, representing a 70.5 percent reduction in CSO volume over time.

The best way to protect our waterways is to control pollutants at their sources. Two programs work to prevent pollutants from reaching King County treatment plants—the Industrial Waste Program and the Local Hazardous Waste Management Program. Among other achievements, these programs have helped to reduce the level of mercury in biosolids by 50 percent from levels in 2000.

This chapter reports on WTD water quality management and compliance activities in 2007. Detailed information on the 2007 results of the county's water quality monitoring program is included as Appendix C.

¹ The gold award is given to plants that have achieved 100 percent compliance with their National Pollutant Discharge Elimination System (NPDES) permits for an entire calendar year.

11.1 Wastewater Treatment Plant Capacity, Flows, and NPDES Compliance

On average, WTD's three secondary treatment plants process over 178 million gallons of wastewater each day. All three plants operated in 2007 without a single violation of their National Pollutant Discharge Elimination (NPDES) permit limits.

One rain event on December 3 and 4 was notable for its intensity. South plant processed the greatest flow ever recorded (235 million gallons per day [mgd]). The plants and conveyance system performed well during the storm, although multiple overflows occurred when facilities were overwhelmed.

11.1.1 South Treatment Plant

The South Treatment Plant provides secondary treatment for wastewater flows from customers in the lower Green River basin, suburban cities east of Lake Washington, and Seattle's Rainier Valley, in addition to flows from parts of Snohomish and Pierce Counties. The South plant also treats septic tank solids from the region and sludge from treatment facilities in neighboring areas such as Snoqualmie Valley cities and Vashon Island.

South plant is designed to manage an average dry-weather flow of 96 mgd, average wet-weather flow of 115 mgd, and instantaneous maximum flow of 325 mgd.² Its outfalls at Duwamish Head in West Seattle discharge secondary effluent into Puget Sound 10,000 feet from shore at a depth of 600 feet into the denser deeper water layer. In 2007, the plant processed an average monthly volume of 79.58 mgd.

Despite the fluctuation of influent volume and composition, South plant's secondary treatment process consistently produces high quality secondary effluent. In 2007, the plant accepted over 15 million gallons of septic tank solids. From November 2006 through April 2007, the plant managed an average wet-weather flow of 101.1 mgd. Treatment efficiency remained high and consistent, even though primary and secondary treated effluent were blended for discrete periods during the high intensity and duration storms in January, November, and December to maintain the optimum plant operation and to meet permit limits. No NPDES permit effluent limit exceptions occurred during the year; the plant earned the National Association of Clean Water Agencies (NACWA) Gold Peak Performance Award for 2007 and its Platinum Peak Performance Award for 10 consecutive years of gold performance.

² For the South and Vashon plants, the average wet-weather flow (AWWF) is the average flow during the wet season, between November and April, on days when no rainfall has occurred on the previous day. For the West Point plant, the "non-storm" AWWF is calculated without counting the flow on days when it rains or the days immediately following a rain event.

11.1.2 West Point Treatment Plant

The West Point Treatment Plant provides secondary treatment for wastewater from customers located in the greater Seattle area and in southwest Snohomish County. West Point is the largest plant in the King County system. This plant is designed to manage an average dry-weather flow of 110 mgd, average non-storm wet-weather flow of 133 mgd, and instantaneous maximum flow of 440 mgd. After treatment, the secondary effluent is discharged through an outfall near the plant into Puget Sound. The outfall discharges 3,650 feet from shore at a depth of 240 feet. The increasingly dilute effluent plume flows northward most of the year, out of Puget Sound.

West Point is designed to provide secondary treatment for up to 300 mgd of wastewater. Capacity between the 300-mgd capacity for secondary treatment (defined as 2.25 times the average wet-weather flow of 133 mgd) and the 440-mgd peak capacity is used to manage captured CSO flows. After receiving CSO treatment (equivalent to primary treatment), these flows are mixed with secondary effluent for disinfection, dechlorination, and discharge at the deep marine outfall. The blended effluent must meet secondary effluent quality limits, with a small reduction in total suspended solids removal requirements (from 85 to 80 percent).

From November 2006 through April 2007, the average wet-weather flow through the West Point Treatment Plant was 130.76 mgd. Several disinfection failures occurred during the year, each caused by a different operational issue that has since been resolved. None of these short interruptions in disinfection affected compliance with state Water Quality Standards. The December storm caused several overflows in the system and a power bump at the plant that temporarily disrupted operations. No NPDES permit effluent limit exceptions occurred during the year; the plant earned the NACWA Gold Peak Performance Award for 2007 and its Platinum Peak Performance Award for six consecutive years of gold performance.

11.1.3 Vashon Treatment Plant

The Vashon Treatment Plant was originally designed to manage a monthly average flow of 0.264 mgd and a peak flow of approximately 1.0 mgd. Late in 2006, the upgraded plant with increased capacity began full operation (see Chapter 2). The upgraded plant is designed to manage an annual average flow of 0.18 mgd, maximum monthly average flow of 0.52 mgd, and instantaneous maximum flow of 1.74 mgd. An outfall discharges 2,900 feet offshore to Puget Sound at a depth of minus 200 feet mean lower low water (MLLW).

The annual average flow through the Vashon plant in 2007 was 0.12 mgd, and the 2006–2007 average wet-weather flow was 0.22 mgd. The plant had no permit effluent limit exceptions during 2007. In the four years before the upgrade, the plant had been experiencing an average of four exceptions per year.

WTD also owns and operates the Beulah Park/Cove Treatment Facility on Vashon Island. This facility collects wastewater from approximately 60 residences via a vacuum system and pump station; treats the wastewater with a series of septic tanks, recirculating sand filters, and ultraviolet disinfection; and then pumps the effluent to a drip field for percolation to subsurface

soils. King County reports quarterly on the operation of this facility. This facility exceeded its pH limits during 2007. Operating procedures are being modified to address the pH problem.

11.2 Sanitary Sewer Overflows and Permit Deviations

Extensive resources have been committed to maintaining the integrity of the system and preventing sanitary sewer overflows (SSOs).³ WTD's Maintenance and Asset Management groups regularly inspect, maintain, and repair facilities to prevent mechanical failures. In addition, WTD regularly updates its Conveyance System Improvement Program to ensure that conveyance facilities keep pace with projected needs for increased capacity.

In 2004 and 2005, the numbers of SSOs and NPDES permit deviations were below the 15-year annual average of 15 occurrences. In 2006 and 2007, the numbers of these events were about double the annual average, primarily because of extreme storms that hit the region both years. Table 11-1 lists SSOs and Table 11-2 lists permit deviations that occurred in 2007. The extreme storm on December 3 and 4, 2007, caused significant overflows at various points in the King County regional system and in local systems. During this storm, 17 SSOs or permit deviations occurred at 16 locations. During the rest of the year, 15 events occurred at 7 locations. The affected volumes ranged in size from about 100 gallons to 101 million gallons.

One type of permit deviation—interruption of disinfection—occurred at the West Point plant on three separate occasions during the year. The reasons for these failures were investigated and remedied. Because of mechanical problems at the plant on five other occasions, a small volume of primary treated effluent was diverted around secondary treatment and then subsequently blended with the secondary flow prior to discharge (also considered a permit deviation). The discharged blended effluent stayed within permit limits. Electrical systems were upgraded to address these problems.

While there may be some short-term risk to public health and the environment from SSOs and permit deviations, the volumes of releases do not produce long-term effects. For all SSOs, WTD implements overflow response procedures, including posting the area, cleaning up the area as appropriate, and monitoring water quality in the vicinity of the overflow to determine when pollutant concentrations have returned to levels consistent with state Water Quality Standards.

³ SSOs are discharges of wastewater from separated sewer systems and from combined systems when no rain is occurring. They can flow from manholes, broken pipes, or pump stations to city streets, water bodies, and basements. SSOs occur on rare occasions such as extreme storms and power outages.

Table 11-1. Sanitary Sewer Overflows in 2007

Date	Location	Estimated Volume (gallons)	Duration	Discharge Type	Receiving Water	Reason for Overflow or Permit Deviation
Jan. 19	Vashon Treatment Plant	1,500	9 minutes	Waste activated sludge	Onto the ground and a small amount to Gorsuch Creek	Programmable logic controller problems caused accidental spill from tank
Mar. 10	South Mercer Pump Station	5,000	10 minutes	Untreated wastewater	South Lake Washington	After power failure, emergency generator engaged but then stopped working after 20 minutes
April 5-6	Lake Hills Blvd. Siphon	100-200	~2 days	Untreated wastewater	Onto the ground in backyards; did not reach a waterway	One siphon line was damaged; flow was transferred to second line
July 2	Murray Pump Station	1,000	10 minutes	Untreated wastewater	Puget Sound	Power failure
Sept. 8	8-inch line in Bellevue	<1,000	~16 hours	Untreated wastewater	Onto the ground; contained and remediated in a parking lot.	Construction contractor accidentally damaged the line
Dec. 2-3	Cedar River Siphon	500	Unknown	Untreated wastewater	Onto the ground at a manhole near the siphon; did not reach a waterway	Siphon line failure
Dec. 3	Kirkland Pump Station	300,000	Up to 9 hours	Untreated wastewater	Onto the ground near the Starfire Sports complex	High-intensity storm
Dec. 3	North Portal	~900,000-3,600,000	60-90 minutes	Untreated wastewater	Thornton Creek	High-intensity storm
Dec. 3	Carkeek Pump Station	Unknown	Up to 1.5 hours	Untreated wastewater	Over ground and into Pipers Creek	High-intensity storm caused overflow at a manhole and from the chlorine contact channel and sedimentation tanks
Dec. 3	Juanita Bay Pump Station	1,000	30 minutes	Untreated wastewater	Lake Washington	High-intensity storm
Dec. 3	Hidden Lake Pump Station	1,200,000	>18 hours	Untreated wastewater	Puget Sound	High-intensity storm
Dec. 3	Yarrow Bay Pump Station	<1,000	2 hours, 10 minutes	Untreated wastewater	Lake Washington	High-intensity storm
Dec. 3	Medina Pump Station	250,000-500,000	2 hours	Untreated wastewater	Lake Washington	High-intensity storm.
Dec. 3	Kenmore Pump Station	200,000	1 hour, 40 minutes	Untreated wastewater	Sammamish Slough	High-intensity storm
Dec. 3	Elliott West CSO Treatment Facility	Unknown	3 hours	Combined wastewater and stormwater	Myrtle Edwards park grounds	High-intensity storm plus high tide caused surcharging
Dec. 3	Duwamish Pump Station	6,300,000	2 hours	Combined wastewater and stormwater	Duwamish Waterway	High-intensity storm
Dec. 3	Richmond Beach Pump Station	Unknown	6.5 hours	Untreated wastewater	Puget Sound	High-intensity storm.
Dec. 3	North Mercer Pump Station	10,000-50,000	Up to 5 hours	Untreated wastewater	Lake Washington	High-intensity storm caused overflow at unsecured manhole
Dec 3	North Creek Pump Station	250,000-500,000	~ 1 hour	Untreated wastewater	Over ground and into a drainage swale	Faulty drain valve on the west force main drained when put into service during high-intensity storm

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Date	Location	Estimated Volume (gallons)	Duration	Discharge Type	Receiving Water	Reason for Overflow or Permit Deviation
Dec. 3	South Mercer Force Main	100,000	Up to 5 hours	Untreated wastewater	Into a drainage swale and then into Lake Washington	Overflow from manhole during high-intensity storm
Dec. 3	Wilburton Pump Station	20,000	17 minutes	Untreated wastewater	Kelsey Creek	Overflow from influent manhole during high-intensity storm

Table 11-2. Permit Deviations in 2007

Date	Location	Estimated Volume (gallons)	Duration	Discharge Type	Receiving Water	Reason for Overflow or Permit Deviation
Jan. 6	West Point Treatment Plant	1,230,000	13 minutes	Partially treated wastewater mixed with fully treated effluent	Puget Sound	Power bumps
Jan. 15	West Point Treatment Plant	3,100,000	Unknown	Partially treated wastewater mixed with fully treated effluent	Puget Sound	Power issues
May 21	Elliott West CSO Treatment Facility	560,000	36 minutes	Combined wastewater and stormwater	Elliott Bay	Disinfection failure
July 1	West Point Treatment Plant	Unknown	13 minutes	Treated wastewater without disinfection	Puget Sound	Disinfection failure
Aug. 12	West Point Treatment Plant	Unknown	Unknown	Treated wastewater without disinfection	Puget Sound	Disinfection failure
Oct. 10	West Point Treatment Plant	1,600,000	39 minutes	Partially treated wastewater mixed with fully treated effluent	Puget Sound	Equipment failure opened CSO gate after plant testing activity
Nov. 11	West Point Treatment Plant	<500,000	6 minutes	Partially treated wastewater mixed with fully treated	Puget Sound	CSO gate opened; cause not determined
Nov. 15	West Point Treatment Plant	4,400,000	20 minutes	Treated wastewater without disinfection	Puget Sound	Disinfection failure
Nov. 16	Elliott West CSO Treatment Facility	1,020,000	1.5 hours	Combined wastewater and stormwater	Puget Sound	Disinfection failure
Dec. 3-4	Elliott West CSO Treatment Facility	101,300,000	22 hours	Combined wastewater and stormwater	Elliott Bay	Disinfection failures during high-intensity storm.
Dec. 31	West Point Treatment Plant	50,000	8 minutes	Partially treated wastewater mixed with fully treated effluent	Puget Sound	Power issues

11.3 Combined Sewer Overflows

King County’s CSO facilities are regulated through West Point’s NPDES permit. With each permit renewal application (about every five years), WTD submits a CSO plan update to the Washington State Department of Ecology (Ecology). WTD also submits a report to Ecology each year on annual CSO volumes and frequencies and on progress made to control its CSOs.⁴

King County began to develop plans for controlling CSOs as early as 1979, after treatment plants and conveyance lines were in place. Almost 20 years of data demonstrate progress toward the control goal (Figure 11-1). As of May 2007, about 13 of King County’s 38 CSOs are controlled. Five other CSOs—all part of the Mercer/Elliott West and Henderson/Norfolk CSO control systems that came online in 2005—are expected to achieve control after startup adjustments and modifications are made to these systems.⁵ Control status will be confirmed in the hydraulic model recalibration that is under way. The remaining 20 uncontrolled CSOs will meet state standards as projects listed in the RWSP are completed between 2013 and 2030 (see Chapter 5).

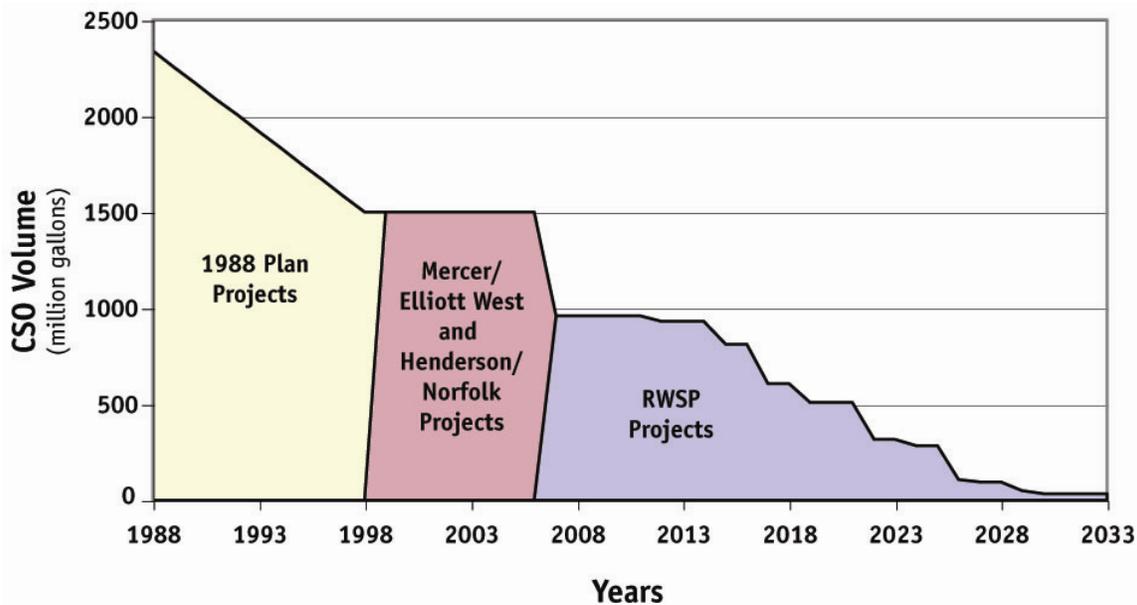


Figure 11-1. Actual and Planned CSO Reduction, 1988–2030

⁴ “Control” is defined as meeting the Washington State standard of an average of no more than one untreated discharge per year per outfall. An update and calibration of the hydraulic model, expected to be ready in 2007, will help to verify the control status of King County CSOs.

⁵ The CSOs are the Denny Way Regulator Station, Dexter Avenue Regulator Station, Henderson Pump Station, Martin Luther King, Jr., Way weir, and Norfolk Street Regulator Station CSOs. See Chapter 5 for a description of the Mercer/Elliott West and Henderson/Norfolk systems.

11.3.1 Frequencies and Volumes of Untreated CSOs

King County reports CSO data beginning in June of one year and ending in May of the next year. The period between 1981 and 1983 is used as the baseline for measuring progress toward controlling CSOs. Baseline volumes were determined using computer modeling. As shown in Figure 11-2, there is a pattern of decreasing volumes of untreated CSOs over time despite fluctuations in rainfall from year to year.⁶

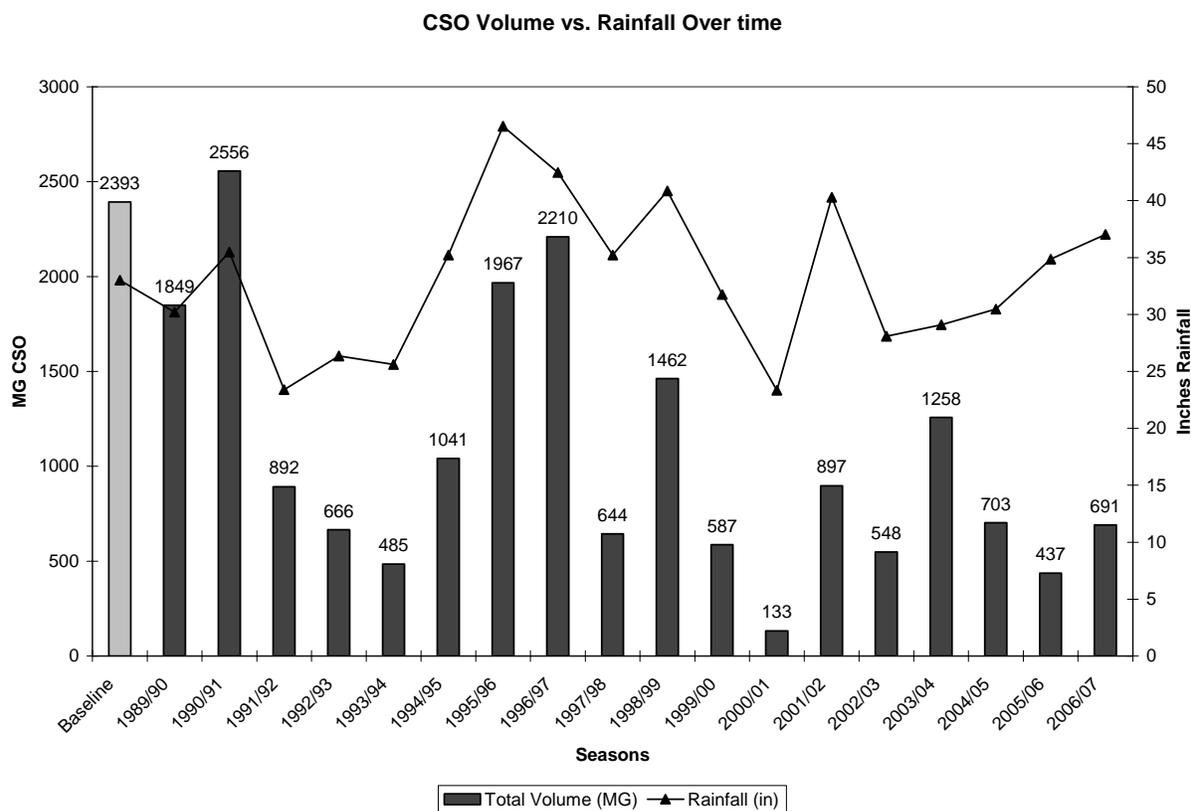


Figure 11-2. Annual CSO Volumes—2000 through 2007

A total of 268 untreated CSO events were recorded in 2006–2007 (162 events in the South Service Area; 87 events in the North Service Area; and 19 events in the Alki Service Area). The total of 268 untreated CSO events represents a 43.3 percent reduction in frequency over the 1981–1983 baseline of 471 events.

The total volume of untreated CSOs for 2006–2007 was 690.92 million gallons (MG) (572.76 MG in the South Service Area; 85.77 MG in the North Service Area; and 32.38 MG in the Alki Service Area). The 690.92 MG total represents a 70.5 percent reduction over the 1981–1983 baseline of 2,339 MG.

⁶ More information about specific CSOs can be found in the *Combined Sewer Overflow Program 2006–2007 Annual Report* at http://dnr.metrokc.gov/wtd/cso/library/AnnualReport/2006-07_CSAnnual.pdf.

While a reasonable relationship between annual rainfall and CSO volumes can be seen in Figure 11-2, large and/or intense storms can contribute most of the year’s CSO volume, especially if the storms cause power outages and flooding at WTD facilities. This was the case in 2006–2007, where approximately one-third of the annual rainfall and one-half of the CSOs occurred during two storms that took place November 2–15 (8.67 inches) and December 9–15 (4.12 inches).

11.3.2 Frequencies and Volumes of Treated CSOs

In 2006–2007, treated flows were discharged a total of 71 times from King County’s five CSO treatment facilities. Total discharge volume was 1,139.88 MG. Table 11-3 shows frequency and volume for each facility.

**Table 11-3. Frequency and Volume of Treated CSOs
June 2006–May 2007**

CSO Facility	Events ^a	Volume (million gallons)
Alki plant	6	68.23
Carkeek plant	8	21.70
Elliott West	13	489.20
Henderson/Norfolk	3	9.00
West Point CSO process	41	551.75
TOTAL	71	1,139.88

^a Events are defined by a 48-hour dry inter-event interval; West Point defines events in terms of days.

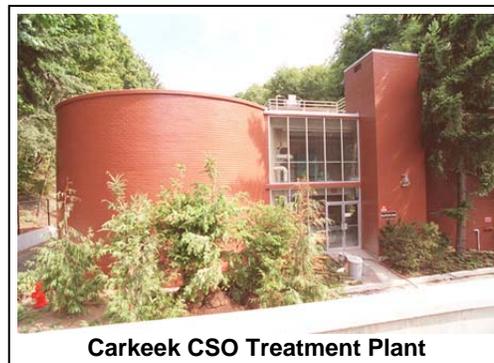
For the 2006–2007 CSO year, there were 41 occurrences totaling 551.75 MG of treated CSO discharges from West Point.

The total volume of treated CSO discharged from the Alki CSO Treatment Plant was 68.23 MG during six events. In the past, the plant operated an average of only two times per year. These events occurred under the largest storms and so were the most dilute and difficult to treat. During 2006–2007, more flow was treated at Alki as a result of an operating approach for the West Seattle Pump Station that relieved pressure on the Elliot Bay Interceptor (EBI) and Duwamish Pump Station. This larger volume slightly improved the annual total suspended solids (TSS) removal at the Alki plant when compared to previous years, but was not sufficient to meet the 50 percent TSS removal requirement for these storms.

Implementation in the 2007–2008 season of a different pumping control strategy at the 63rd Avenue Pump Station may improve TSS removal at the Alki plant. The station tended to cycle on-off during high flows in 2006–2007. The new control strategy will moderate changes in flow

rates and provide a better opportunity for the clarifiers at the plant to remove TSS. The new control strategy and repairs made in 2006–2007 to correct short-circuiting in the plant’s dechlorination contact channel may also help prevent future exceedances of the chlorine limit that had been occurring whenever the channel short-circuited.

During this reporting period, the Carkeek CSO Treatment Plant operated 20 times, with eight discharge events totaling 21.7 MG in volume. NPDES effluent limits were met. The new dechlorination system and upgraded chlorination system functioned well during the second year of operation. Refinements to optimize disinfection effectiveness and to improve pumping are in progress.



There were 13 discharge events from the Elliott West CSO outfall. The total discharge volume for the reporting period was 489.2 MG. Discharge effluent limits were not met, and Ecology issued a Notice of Violation (NOV 5059) on September 6, 2007. King County has been responding to the questions in the NOV. Hydraulic, solids management, and disinfection problems were identified and are being analyzed. Because the Elliott West facility operates intermittently, several rounds of monitoring, planning and design, implementation, and testing over several seasons may be required to ensure the efficacy of solutions. King County is keeping Ecology informed of progress in addressing the problems and achieving CSO control.



In 2006–2007, there were three discharge events from the Henderson/Norfolk CSO Treatment Facilities (9.0 MG of treated CSO was discharged). All permit conditions were met, except for the 39 microgram-per-liter maximum daily chlorine limit. Modifications to improve chlorine measurement and bisulfite dosing were implemented to correct this deficiency.

See Chapter 5 for more information on the county’s CSO control program.

11.4 Pollution Source Control

King County operates two source control programs: the Industrial Waste Program and the Local Hazardous Waste Management Program. Both programs work to control pollutants at their source, thereby keeping them out of the wastewater system and, in turn, out of surface waters and the environment. The two programs complement each other. The Industrial Waste Program focuses on larger businesses in a regulatory manner, issuing permits and discharge authorizations under a federally mandated pretreatment program. The Local Hazardous Waste Management Program focuses on smaller businesses and on households in a non-regulatory manner, providing technical assistance, resources, and education under a state-mandated program.

11.4.1 Industrial Waste Program

The King County Industrial Waste Program (KCIW) regulates industrial wastewater discharged into the King County wastewater system. The program serves to protect surface water and biosolids quality, the environment, public health, and the wastewater system and its workers. It does this by ensuring that industries treat wastewater for harmful substances such as metals, oils, acids, flammables, organic compounds, gases, and solids before discharging the wastewater to sewers.

Permits, Authorizations, and Enforcement

KCIW may regulate any industry, from largest to smallest, if the industry discharges to the wastewater system. To do this, the program issues three main kinds of discharge approvals: letters of authorization, discharge authorizations, and permits. Letters of authorization are issued for limited duration construction dewatering discharges. Discharge authorizations are issued to smaller industries. Permits are issued to industries that discharge more than 25,000 gallons per day and/or that are included in federally regulated categories. The Environmental Protection Agency (EPA) requires at least 20 categories of industries to get permits, whatever their size or quantity of wastewater. Permits have more comprehensive operating and self-monitoring requirements than do discharge authorizations.

Discharge of fats, oil, and grease from a petroleum or mineral origin (nonpolar FOG) is limited to 100 milligrams per liter. Industries must use oil/water separators to pretreat oily wastewater to prevent harm to the biological phase of wastewater treatment and must submit plans for the separators to the local sewer utility or to KCIW for review and approval before installing the separators. FOG from an animal or a vegetable origin (polar FOG) can block sewer lines. Although polar FOG has no numerical limit, dischargers are required to minimize free-floating polar FOG and may be required to complete a FOG control plan for King County's review and approval.

KCIW investigators inspect facilities before issuing discharge approvals and also inspect facilities with existing approvals to ensure that they are complying with regulations. Most companies are required to self-monitor their discharges. In addition, industrial waste specialists take verification samples at facilities that have been issued permits. If they find violations, the specialists conduct follow-up inspections and sampling.

The program issues a Notice of Violation when a company discharges more contaminants or volume than allowed, violates conditions of its discharge approval, or fails to submit required reports. For enforcement, KCIW uses tools such as compliance schedules, fines, charges for monitoring and inspections, and cost recovery for damages.

In 2007, 128 permits and 310 industrial waste discharge approvals were in effect and 405 inspections were conducted. Table 11-4 shows the number of compliance samples collected versus the number of violations detected. During 2007, KCIW issued Notices of Violation to 29 companies for 58 violations (with several companies having multiple violations in more than one category):

- Sixteen companies had 29 discharge violations, including those based on self-monitoring data.
- Ten companies had 25 permit/code violations.
- Four companies had 4 reporting violations.

Two companies had six violations each: Cibo Naturals, a Seattle food processing facility, and TTM Technologies, a Redmond circuit board manufacturer.

During 2007, KCIW issued six fines totaling \$49,210. The largest fine, \$36,620, was issued to Sound Transit, the regional transit provider for Central Puget Sound. The fine is currently the subject of an appeal to the King County Hearings Examiner. The 2005 RWSP annual report mentioned a \$23,894 fine issued to Argent Laboratories. Argent Laboratories placed an appeal before the King County Hearing Examiner but subsequently withdrew the appeal before it could be heard. In 2006, the company started making monthly payments and, in 2007, paid the final balance of \$11,947.

None of the violations identified by KCIW or by self-monitoring in 2007 caused NPDES permit exceptions at King County treatment facilities.

Table 11-4. Number and Type of Compliance Samples of Industrial Wastewater Collected in 2007

	Compliance Monitoring	Post-Violation	Discharge Violation^d
Cyanide amendable to chlorination	26		
Total cyanide	131	1	
Metals	417	8	19
Organics			
BNA	37		3
VOA	138		1
Fats, oils, and grease			
Total	0		
Polar ^a	24		
Nonpolar	325		
pH (field) ^b	552	5	5
Surcharge	545		
Miscellaneous ^c	70		1

^a The polar fats, oils, and grease (FOG) analyses are for the visual free-floating FOG test, not laboratory analyses.

^b The number of pH samples is somewhat misleading because it shows only discrete pH samples collected and analyzed in the field. The number does not include readings from continuous pH measurements.

^c Miscellaneous includes tests for dissolved sulfide, hydrogen sulfide (H₂S) field, polychlorinated biphenyls (PCBs), settleable solids, total phosphorus, and turbidity.

^d Discharge violations do not include those based on self-monitoring data.

Categorical Pretreatment Regulation Activity

It is KCIW's standard practice to submit comments to EPA concerning proposed pretreatment regulations. EPA did not propose any new or revised pretreatment standards in 2007; however, at the end of October, it issued the *Notice of Availability of Preliminary 2008 Effluent Guidelines Program Plan* (EGP). EPA issues such notices biennially. The focus for 2008 will be on four industrial sectors: steam electric power generating, coal mining, oil and gas extraction, and health services. In December, KCIW submitted comments on the health services industry (HSI) portion of the EGP. (There are no dischargers in the other three sectors in the county's wastewater service area.)

EPA's primary interests in the HSI are in dental mercury and unused pharmaceuticals. In regard to dental mercury, KCIW's comments emphasized the effectiveness of its non-permit approach in reducing mercury loading in the county's biosolids. It made the case that in its experience, a program of mandatory controls with follow-up inspections works well and that the additional resources required to implement categorical standards are not justified.

In regard to unused pharmaceuticals, KCIW pointed out that Ecology had recently developed an Interim Enforcement Policy for Pharmaceutical Waste Management in Healthcare and that KCIW had advised local hospitals to employ it. KCIW also noted that its authorizations "listed Best Management Practices for the substances most commonly found in hospitals that were in some cases discharged to the sewer." Its conclusion was that its current methods to control the disposal of unused pharmaceuticals to the sewer can be as effective as, or even more effective than, the use of categorical standards.

Dental Waste Program

KCIW's nationally prominent dental waste program allows dentists to demonstrate that they are in compliance with the local limits for mercury by installing a pretreatment unit commonly known as an amalgam separator. While it is difficult to precisely quantify the impact of this program, it may be partly responsible for the more than a 50 percent reduction in the amount of mercury in King County biosolids from 2000, the year before King County began implementing this program, to 2004, the year in which a 97 percent compliance rate was achieved by local dentist offices (Figure 11-3).⁷ The annual median concentration of mercury in biosolids has started to stabilize at around 1.1 milligrams per kilogram (dry weight basis).⁸

⁷ See also the discussion on the EnviroStars program in the section on the Local Hazardous Waste Management Program.

⁸ Washington State's monthly average limit for mercury in biosolids is 17 milligrams per kilogram (WAC 173-308-160).

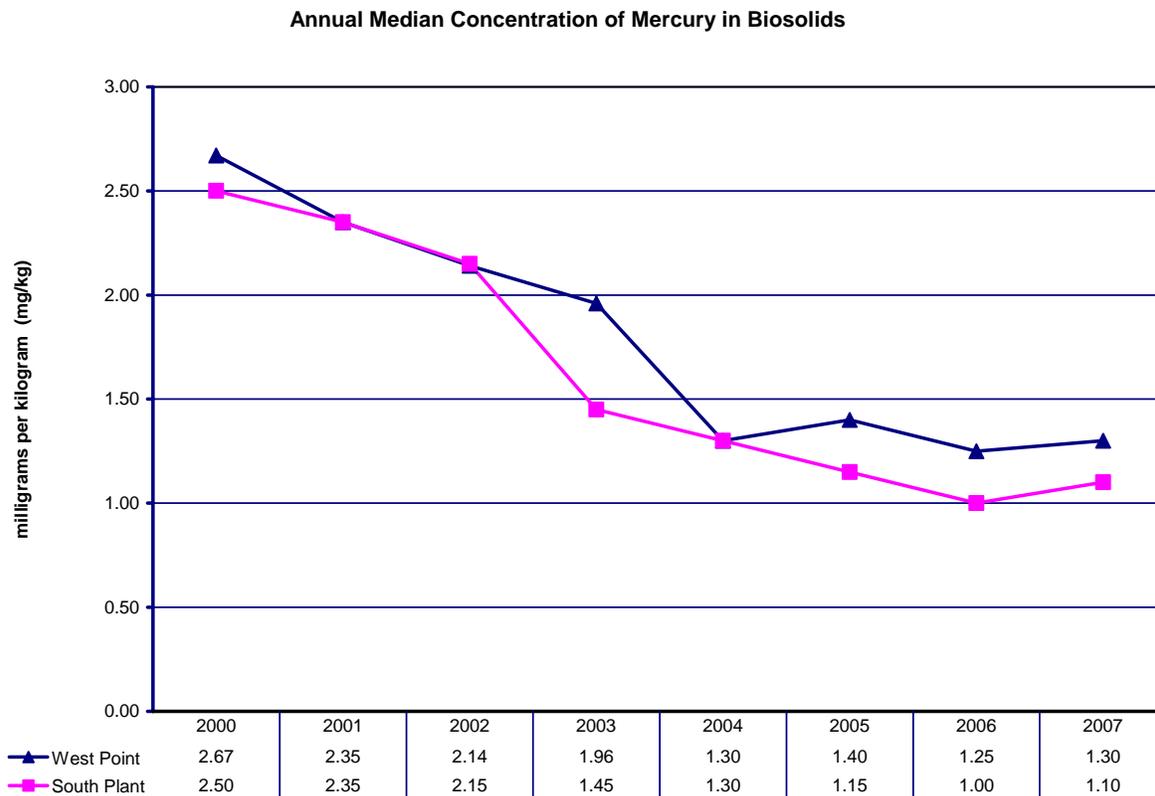


Figure 11-3. Decline of Mercury Concentrations in Biosolids, 2000 through 2007

Accomplishments in 2007 include the following:

- Updated the Dental Waste Program Internet page.
- In partnership with WTD’s Biosolids Program, sent a letter to all dentists in its service area, thanking them for their role in reducing mercury levels in biosolids and reminding them that KCIW will continue to conduct random compliance inspections. Enclosed with the letter was a copy of the fact sheet *Discharging Dental Wastewater into the King County Sewer System*.
- Inspected 89 dental offices in 2007, finding two offices that had not yet installed a separator.
- Continued to participate in a national study of mercury concentrations in treatment plant influent, effluent, and biosolids under the auspices of the National Association of Clean Water Agencies (NACWA).

Duwamish Waterway Source Control Projects

Although the sanitary wastewater component in CSOs is small and the industrial wastewater component even smaller still, KCIW actively seeks to control sewer-related pollution wherever it occurs in our system. To that end, the program is supporting efforts to clean up contaminated

sediments in the Lower Duwamish Waterway (LDW) and East Duwamish Waterway (EW) by participating in programs to control sources of pollution at their sources and thus reduce the potential for recontamination following cleanup.

Lower Duwamish Waterway

In 2007, KCIW performed the following source control activities in the Lower Duwamish drainage basin:

- **Sampling of industrial sewer dischargers for phthalates.** Between March and November 2006, KCIW collected 34 samples from industrial sewer dischargers in the Lower Duwamish basin to analyze them for concentrations of two chemicals of concern for the Lower Duwamish Waterway: bis-2-ethylhexyl phthalate (BEHP) and butylbenzyl phthalate (BBzP). KCIW is interested in determining if there are controllable industrial sources of these chemicals. Analysis of data and report writing occurred in 2007; a final report will be completed in early 2008.
- **Atmospheric deposition sampling.** From October 2005 to April 2007, KCIW staff collected 16 rounds of atmospheric deposition samples in the Lower Duwamish basin. This sampling was conducted to evaluate the atmospheric deposition pathway to the LDW for phthalates, carcinogenic polycyclic aromatic hydrocarbons (PAHs), and polychlorinated biphenyls (PCBs) The final monitoring report will be available in early 2008.
- **Participation in the Lower Duwamish Waterway Source Control Work Group.** KCIW participates in monthly meetings of the Lower Duwamish Waterway Source Control Work Group (SCWG). The group includes three of the four members of the Lower Duwamish Waterway Group (King County, Port of Seattle, and City of Seattle) and the two agencies with regulatory responsibility for different aspects of LDW sediment remediation (Ecology and EPA). The SCWG was formed to discuss source control issues and activities that can affect sediment remediation in the LDW and has met regularly for several years. In one of the 2007 meetings, a WTD staff member made a presentation on King County CSOs.

East Duwamish Waterway

Initiated in 2007, the East Waterway source control project, being conducted in conjunction with sediment remediation, is a new project for KCIW. The remediation is being implemented under an agreed order between the Port of Seattle and EPA. The City of Seattle and King County are participating with the Port of Seattle because of stormwater and CSO inputs to the EW. During 2007, KCIW participated in several source control meetings, review of source control documents, and planning of source control activities. KCIW source control activities in the EW are expected to continue through 2008 and likely into 2009.

11.4.2 Local Hazardous Waste Management Program

The Local Hazardous Waste Management Program (LHWMP) in King County is a regional program that complements WTD's efforts to protect water quality. LHWMP brings together resources from four local government agencies and 37 suburban cities to protect and enhance public health and environmental quality by helping citizens, businesses, and government reduce the threat posed by the production, use, storage, and disposal of hazardous materials. The program is a regional partnership comprising King County Water and Land Resources Division and Solid Waste Division, Seattle Public Utilities, Public Health–Seattle & King County, and the Suburban Cities Association. In 2007, WTD paid more than \$2.1 million into the Local Hazardous Waste Fund to support LHWMP. This contribution comes from King County Board of Health fees levied per million gallons of wastewater treated at wastewater treatment plants in King County's service area.



The program provides collection and recycling services for household hazardous materials and wastes and offers public outreach aimed at proper handling and reduction in use of hazardous products. It also provides technical assistance, incentives, and recognition to businesses that generate small quantities of hazardous waste.

Waste Disposal and Recycling

LHWMP furnishes King County residents with household hazardous waste collection services at the Household Hazardous Wastemobile, which travels throughout the county, and at three fixed facilities located in Factoria (Bellevue), North Seattle, and South Seattle. In 2007, the program collected 2,998 tons of household hazardous waste from more than 69,950 customers at these collection facilities:

- 17,753 customers brought 774 tons into the North and South Seattle sites
- 21,345 customers brought 832 tons into the Factoria drop-off site
- 21,852 customers brought 1,392 tons to the Wastemobile

The program's suburban city partners sponsored 47 events that resulted in the collection of an additional 189 tons of waste. Also in 2007, more than 221,050 gallons of used motor oil were collected at public and private collection sites throughout the county. Were it not for LHWMP's collection services, much of this waste could have ended up in regional landfills, sewers, storm drains, and the environment.

Several LHWMP projects work to reduce the use of mercury and ensure its proper disposal. In 2007, LHWMP spurred the collection and appropriate disposal or recycling of at least 105 pounds of mercury through the following activities:

- The EnviroStars program recognizes businesses that have taken steps to reduce pollution and to properly manage their hazardous wastes. In 2007, four King County dentists

became new EnviroStars in recognition of their efforts to prevent discharge of mercury to sewers. A total of 79 dentists in the county are EnviroStars.

- Approximately 2.1 million mercury-containing lamps were recycled as the result of LHWMP outreach efforts and incentives to businesses and others.
- LHWMP is working to expand the Take-It-Back-Network, which provides private sector options for recycling fluorescent tubes and electronics—and their hazardous components—in a safe and cost-effective manner. In 2007, the Take-It-Back Network collected 41,090 fluorescent bulbs and tubes.
- Program staff worked with local contractors and distributors to increase their usage of the thermostat recycling program sponsored by the Thermostat Recycling Corporation. Through this program, 1,703 thermostats containing 21 pounds of mercury were collected.

In addition, LHWMP is participating in a statewide medicine take-back pilot project that began in 2006. In 2007, all 25 Group Health Cooperative clinical pharmacies in the state (including 11 in King County) started collecting old, unused waste medicines from the public. The project will expand to Bartell Drug retail stores in 2008. About 4,000 pounds of old medicines were collected in 2007, and 10,000 pounds were collected since the project was launched. In addition, LHWMP provided key support in drafting safe medicine return legislation for consideration in the 2008 Washington State legislature. LHWMP staff have become recognized national experts on this issue and have helped to initiate a national dialogue via the Product Stewardship Institute, which will formally launch in spring 2008. More information on this project is available at <http://www.medicinereturn.com/>.

Strategic Planning and Refocus

In 2007, LHWMP started implementing its 2006 strategic plan. While continuing many of the program's existing activities, the plan places increasing emphasis on eliminating the inclusion of the most problematic chemicals in commercial or consumer products; reducing the use of hazardous materials in sensitive environmental areas such as groundwater and wellhead protection zones, flood hazard zones, and commercial generators on septic systems; and allocating more resources to reducing the exposure of the most vulnerable and historically underserved populations to toxic materials.⁹

The program is encouraging companies that manufacture hazardous products to reduce the toxicity of their products and to view their responsibilities for those products expansively, through their full lifecycle. Progress is being made with respect to establishing take-back systems for consumer electronics, which is now in state law; pharmaceuticals, with major initiatives under way; lighting products, with a national system recently announced; and paint, with a

⁹ The most problematic chemicals include priority pesticides, bisphenol-A, solvents, mercury, pharmaceuticals, lead, and polybrominated diphenyl ethers (PBDEs).

national agreement that will take effect in Washington State in 2009. Local take-back efforts have been developed for thermostats, fluorescent lamps, and other problem wastes.¹⁰

Community Outreach/Technical Assistance, Recognition, and Incentives for Businesses

During 2007, LHWMP staff began to work in the new areas of emphasis while continuing to provide key program services to residents and businesses. In addition to collecting household hazardous wastes, program staff partnered with community-based organizations, business organizations, trade organizations, housing authorities, and others to provide residents and businesses with information about ways to reduce the use of toxic and hazardous materials.

For example, the Priority Pesticide project conducted these and other activities during the year:

- Trained 2,723 landscape professionals, nursery workers, and horticultural students on integrated pest management (IPM) techniques. Special IPM trainings for Spanish-speaking and Vietnamese landscapers were held.
- Trained approximately 254 nursery staff and horticulture students in Less Toxic Weed Control and Natural Lawn Care.
- Provided Natural Landscaping training to 2,185 professionals in environmentally friendly site design and landscape installation and maintenance practices.
- Answered at least 2,800 IPM-related questions on the Natural Lawn & Garden Hotline.

The program expanded its outreach efforts to historically underserved and vulnerable populations. The Environmental Justice Network In Action Team partnered with seven community-based organizations in the region and reached people of 30 ethnicities involving 12 languages in projects across 39 King County zip codes. A total of 1,200 green home kits were distributed to promote proper disposal of household hazardous waste and the use of safer alternative products. The healthy home tips, shopper card, and disposal flyer were translated into seven languages.

Other 2007 assistance and outreach programs include the following:

- Teaching students and educators about hazardous products and ways to reduce them and working with schools to remove mercury and other hazardous materials.
- Providing technical consultations, fact sheets, brochures, and the Business Waste Line to help small businesses understand how to properly use, store, manage, and dispose of hazardous products and wastes. The Business Waste Line assisted more than 1,747 callers, and field staff made at least 348 technical assistance visits to 326 businesses.
- Offering industry-specific information about ways to reduce the use of toxic and hazardous material.

¹⁰ Take back programs generally mean either that the manufacturers directly take back the product or that they pay for taking back and disposing of waste products, generally through a third party.

- Giving limited financial assistance to qualified businesses to facilitate waste disposal/reduction. In 2007, the Voucher Incentive Program reimbursed 164 businesses a total of approximately \$82,245.
- Recognizing businesses, through the EnviroStars program, for their efforts to reduce pollution. In 2007, 26 businesses became new EnviroStars and 25 businesses increased their EnviroStar rating. As of the end of 2007, there were 375 EnviroStar businesses.
- Operating the Industrial Materials Exchange (IMEX), which matches businesses that no longer need a hazardous material with businesses that have a need for that material. IMEX has an online listing of available and wanted materials.
- Coordinating the Interagency Compliance Team (ICT), which is composed of multiple enforcement agencies focusing on priority problem sites throughout the county. ICT opened seven cases in 2007 and brought five sites into compliance.
- Sustaining the Interagency Resource for Achieving Cooperation (IRAC), which serves as an umbrella meeting place for local, regional, and federal regulatory agencies. IRAC sponsored five training sessions for 165 attendees. Its Lead-based Paint Work Group produced a variety of useful tools and continued active involvement in EPA's proposed new Renovation, Repair and Painting rule.

11.5 Endangered Species Act Compliance

WTD continues to consult with the National Marine Fisheries Service and the U.S. Fish and Wildlife Service ("Services"), as required under Section 7 of the Endangered Species Act (ESA), on projects that require a federal permit or receive federal funding. WTD has determined that the traditional ESA Section 7 consultation process is the most efficient way to ensure that its projects comply with ESA and has abandoned the alternative strategy of negotiating programmatic agreements with the Services (habitat conservation plan, programmatic biological assessments). WTD's past efforts to develop programmatic agreements and its funding of a position at National Marine Fisheries Service (NMFS) to review projects have helped make the Section 7 consultations more predictable and efficient.

In 2007, ESA compliance activities included extending the agreement under which WTD funds an NMFS position for reviewing WTD projects and continuing to work on a technical memorandum on the impact of reclaimed water use on ESA-listed species. The memorandum will serve as a resource for any future King County reclaimed water projects that require environmental review and Section 7 consultations.

11.6 Endocrine-Disrupting Chemicals and Other Microconstituents

Endocrine-disrupting chemicals (EDCs) are natural or synthetic chemicals that interfere with or mimic the hormones responsible for growth and development of an organism. Information is

continually emerging about these natural and synthetic chemicals that people and industries use every day and dispose of down their drains and toilets. Because the potential impact of EDCs on aquatic life and wildlife is an issue of national and international scope, it is beyond the capability of a local agency or utility to solve alone. Studies will continue for many years before definitive answers are known and regulations adopted.

Other chemicals are gaining attention because of their persistence in the waste stream and the environment. These microconstituents include pharmaceuticals and non-EDC components in personal care products (sun screens, analgesics, fragrances, plasticizers).

King County scientists are tracking this issue carefully to keep up-to-date on new findings. The county's environmental laboratory is investigating new analytical methods for the complex testing of some of these chemicals. Sampling for 15 suspected EDCs in the county's marine and fresh waters found low levels of five types of EDCs: natural estrogen (estradiol), synthetic estrogen (ethynylestradiol), plasticizers (phthalates), surfactants from soaps (nonylphenol), and epoxy compounds (bisphenol A). The April 2007 report titled *Survey of Endocrine Disruptors in King County Surface Waters* describes these findings in detail. More information about this work can be found at <http://dnr.metrokc.gov/wlr/waterres/streamsdata/reports/Endocrine-disrupting-compounds.htm>.

Conventional secondary wastewater treatment and newer technologies such as membrane bioreactors are designed to remove solids and biodegradable organic material from wastewater. These technologies remove many EDCs and other chemicals. For some chemicals, the removal rate is from 50 to 90 percent; for others, the removal rate is much less. Controlling chemicals at their source is the easiest and least expensive way to protect the environment and people from the harmful effects of all pollutants, including EDCs, pharmaceuticals, and personal care products. WTD will continue its efforts to protect water quality and will adapt its programs, if needed, as more information on these microconstituents emerges. View WTD's latest information at <http://dnr.metrokc.gov/WTD/community/edc/>.