



How Carkeek CSO Treatment Plant Works

King County operates combined sewer overflow (CSO) control facilities in Seattle, where stormwater and wastewater may be conveyed in the same pipes. CSO's serve as a relief valve when stormwater fills the pipes and exceeds system capacity, and prevent damage to facilities and overflows into homes and businesses, on roadways, and in parks. CSO control facilities help to limit the number of untreated discharges to nearby water bodies, meeting current regulations and protecting water quality.



CSO control approaches include storing flows until storms have passed, treating excess flows on site, conveying more flows downstream, and limiting incoming stormwater (demand management). King County's Carkeek CSO Treatment Plant uses storage and treatment approaches to manage combined wastewater and stormwater flows depending on weather conditions.

During normal weather and flow conditions, which occur on average all but 4-8 days per year, wastewater that flows to Carkeek is conveyed to West Point Treatment Plant for secondary treatment.

During large storms, when the combination of gravity flow and North Beach flow to Carkeek exceeds pumping capacity, flow is routed through the Carkeek treatment process and either stored or discharged (depending on the size and duration of the wet weather event). In 2005-07, the Carkeek TP had eight treated discharges.¹

Storage:

- Flow is routed into two 115,000 gallon above-ground storage tanks
- When the capacity of the tanks is exceeded, additional flows are stored in the Carkeek facility
- After the storm passes and flows return to normal, stored wastewater/storm water is conveyed to West Point Treatment Plant

Treatment and Discharge:

Once storage capacity at Carkeek is reached, treatment of additional flows begins. The treatment process involves primary treatment, which removes 50% of solids, and disinfection using chlorine. A dechlorination facility, installed in 2005-6, is used to

¹ WTD CSO Annual Report, 2006 – 2007



King County

Department of Natural Resources and Parks
Wastewater Treatment Division

CARKEEK CSO TREATMENT PLANT

remove chlorine before discharge through the Carkeek outfall to location about 200 feet below the surface of Puget Sound.

In extreme storm events, when pumping, storage, and treatment capacity can be exceeded, the Carkeek CSO Treatment Plant may discharge and untreated combination of stormwater and wastewater to Puget Sound. Current regulations allow no more than one untreated discharge per year on a long-term average.

How has Carkeek CSO Treatment Plant performed?

Performance standards and limits for the Carkeek CSO Treatment Plant are established in the West Point Treatment Plant National Pollutant Discharge Elimination Permit (NPDES). Performance data for the Carkeek facility is provided in annual reports filed with the Washington Department of Ecology. From the *2009 Annual Report, King County CSO Control Program*, provides performance data and detailed information about operations and rainfall events associated with discharges. A summary of 16 years of performance data can be found in this report, and lists an average of 5.2 treated discharges, and less than 1 untreated discharge, per year. In 2009, King County reported 9 treated discharges and no untreated discharges from Carkeek.

King County continues to make improvements to the Carkeek CSO Treatment Plant. In 2009, the Carkeek Outfall received needed repairs. In 2010, the County completed pump upgrade work.

For more information

King County's CSO Control Program

<http://www.kingcounty.gov/environment/wastewater/CSO.aspx>

West Point Treatment Plant and CSO system NPDES Permit

<http://www.kingcounty.gov/environment/wtd/About/System/NPDES.aspx>

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ALTERNATIVE FORMATS AVAILABLE
206-684-1280 / 711 (TTY Relay)