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# Clean Creeks

## A pilot program helps the City of Santa Barbara improve summertime water quality by diverting polluted runoff from storm drains to sanitary sewers

By Megan Monson

Santa Barbara, Calif., is a popular place in the summer: Residents and visitors flock to the city's wide beaches and natural creeks. During the warm months, people also irrigate their lawns, wash their cars in the street, and hose off sidewalks and parking lots. That's a problem.

Undiluted by stormwater, urban runoff during dry periods is often highly polluted, containing residue from landscape irrigation and water washing oily pollutants from streets and parking lots. Bacterial pollutants come from soil; pet, wild animal and bird feces; and garbage and green waste. Eventually, it all flows into the creeks that feed into the Pacific Ocean.

In Santa Barbara, one of the main areas where this flow concentrates is Haley Street, a residential area near downtown and next to Brinkerhoff Avenue, a street of antique shops and bed and breakfast inns. The Haley Street storm drain conveys runoff from the downtown area and discharges to nearby Mission Creek, which, in turn, flows into the ocean at heavily used East Beach.



*Mission Creek viewed from Haley Street Bridge*



*Haley Street lift station is constructed at grade in traffic lane.*

An innovative project launched by the city in July aims to divert that dirty urban runoff during low-flow conditions. "The idea is that in the dry season, the polluted water that was getting into the storm drains would be diverted and sent to the wastewater treatment plant," says Phillip Myers, city project engineer.

The Haley Street Low Flow Diversion Project uses a lift station with submersible pumps to reroute polluted runoff from the Haley Street storm drain to the sanitary sewer system. The goal is to improve water quality and reduce beach closures.

"It's a pilot project to explore what it takes to design, install and maintain this type of diversion system," explains Jill Zachary, manager of the city's Creeks Restoration and Water Quality Improvement Program. "We're targeting storm drains where we know we have ongoing problems, and using this project as an opportunity to assess if it is a viable option for the rest of the city."

### Polluted runoff

The Haley Street project was identified after a comprehensive Mission Creek Watershed study looked at the city's storm drain system and its outfalls into Mission Creek. Testing revealed high levels of indicator bacteria; the source was unknown.

Mission Creek is one of the city's three major creeks, all of which originate in the foothills north of the city, and flow south to the ocean. The watersheds of the creeks are largely urbanized with residential, commercial and limited industrial development, as well as an extensive road network and parks and open space.

Mission Creek flows directly into East Beach, a large park area in the harbor near downtown. Testing there found high concentrations of fecal matter in and around the beach. "We elected, as a first step, to develop a diversion system for dry-weather flow," Zachary explains. "Ultimately we want to find the source and remove it, but our immediate goal is to deal with the diversion in the short term."

The city's contractor on the Haley Street project is Tierra Contracting of Goleta, Calif. "We do a lot of storm drain projects, but this one was unique because usually you are trying to separate storm drainage and sewer lines, not trying to connect them," says Blair Douglas, project manager with the firm.

### Achieving diversion

Haley Street runs next to Mission Creek, and the storm drain is just 20 to 30 feet from its outflow into the creek. At this location, the storm drain line is lower than the sewer line. To divert the flow to the sanitary sewer, the water had to be pumped up five to six feet. To accomplish this, engineers from URS Corp. of Oakland specified a pre-engineered lift station from Romtec Utilities of Roseburg, Ore.

The complete lift station, which was delivered to the Haley Street site on two trucks, consists of a pre-cast concrete wet well (6 feet in diameter, 13 feet 8-inches deep) two Flygt N series pumps, a pre-assembled valve vault, and UL-listed control panel and pump disconnect panel.

Haley Street was closed for most of a day while the lift station was installed in the parking lane of the street. To accommodate the special requirements of the site, the Flygt access hatches that cover the wet well and the valve vault were constructed of heavy-duty galvanized steel. The lift station was fully rated for automobile traffic.



The operation of the diversion system is simple: in dry weather, the inlet valve is turned on to trap the flow and pump it up to the sanitary sewer line; in wet weather, the valve is turned off.

The lift station is equipped with MultiTrobe liquid level sensing probes and programmable controls to manage pump starts and stops. "The probe system detects 10 levels and we have it running so it kicks the pump on when it hits 50 percent," explains Thomas Totton, El Estero Wastewater Treatment Plant supervisor.

### Easy care

Ease of maintenance is a key issue in Santa Barbara's pilot projects, and Totton gives high marks to the self-cleaning feature of the Flygt pumping system in the lift station. In the two-pump configuration, one pump is equipped with a mix/flush valve.

When the pump fitted with the valve turns on, part of the flow is diverted into a swirling effect in the base of the wet well. Any solid waste, dirt or sand is re-suspended in the fluid and easily pumped out, keeping the bottom of the wet well clean. "It just seems like a smart thing to do," Totton says.

The lift station will operate from April 1 to Oct. 1, the dry-weather season. During a typical day, the control system records 20 to 40 pump starts, with a total run time for both pumps of 30 minutes to an hour. Volume is expected to run between 9,000 and 18,000 gallons daily.

The lift station is the only part of the diversion system that needs to be maintained. City personnel will monitor it closely to see how well it performs and what maintenance it requires. "We'll close it up to isolate the flow, and open it back up after the rainy season is over," Totton says. "The lift station is a nice unit and it will be interesting to see if we can keep it maintained."



*ITT Flygt submersible pump with mix/flush valve is installed.*

### **A comprehensive program**

The Haley Street Low Flow Diversion project is just one of the city's new water quality improvement initiatives. The Hope Avenue Low Flow Diversion uses a gravity station to divert summer flow from the Hope Avenue storm drain to the sanitary sewer system for treatment.

The Westside Summer Urban Runoff Facility is another of the city's innovative pilot programs. It uses an ultraviolet treatment device to eliminate microbes from summer runoff before it enters Old Mission Creek. In an effort to clean runoff water before it enters the city's drainage systems, 100 special storm drain filters have been installed in key locations, including one just upstream of the Haley Street lift station. These filters capture debris, garbage and sediment that otherwise would go into the creek. The Continuous Deflection System was established four years ago to deal with trash and sediment that enters the storm drain. It operates mostly under wet-weather conditions.

"This way we can tackle water quality issues both during wet weather rainy and dry months," Zachary says.



Romtec Utilities, Inc.  
18240 North Bank Road  
Roseburg, OR 97470  
P: 541-496-9678  
F: 541-496-0804

[info@romtecutilities.com](mailto:info@romtecutilities.com)

<http://www.romtecutilities.com/>