

POWER PROJECT IN 60 SECONDS: CONTROLLING THE FLOW



By Chris Limke

PROJECT

Combined Sewer Overflow Source Control

SCHEDULE

Start: July 2013

Completion estimate: August 2019

CLIENT

Metropolitan Sewer District of Greater Cincinnati
(MSDGC)

TOTAL PROJECT COST

\$35 million

POWER'S ROLE

- » Stormwater and sewershed modeling
- » Design of stormwater management and sewer infrastructure
- » Phase I and II environmental site assessments
- » Biological assessments
- » Environmental and land use permitting
- » Construction administration services

IN LAYMAN'S TERMS

For older cities like Cincinnati, Ohio, the sewer infrastructure was originally designed to convey both stormwater and sanitary sewage (wastewater from your drains and toilets) in the same pipe to a treatment plant. Known as combined sewers, they are often filled beyond their capacity during heavy rains. To relieve pressure on the sewer line and prevent widespread flooding and sewage backups into buildings, combined sewers were designed to overflow directly into local creeks and rivers through outfall structures known as combined sewer overflows (CSOs). At the



ADDITIONAL SERVICES

POWER completed hydrologic and hydraulic modeling of each alternative to estimate CSO reduction achieved and performed cost estimation and triple bottom line analyses to identify the most cost-effective solution.

We also prepared construction documents for multiple, phased bid packages, completed federal, state and local permitting, assisted with right-of-way acquisition, and provided bid phase and construction administration services.



UAV at work.

POWER drone-captured imagery of Phase B CSO storage tank site construction.

Trenchless situation.

(Inset photo) Workers install jack and bore sewer pipe crossing below major road.

PHOTOS: CHRIS LIMKE

time they were built, CSOs were an acceptable way of handling excess flows, but their environmental impacts are now regulated under the federal Clean Water Act.

POWER provided watershed planning and infrastructure design services for a portion of the Metropolitan Sewer District of Greater Cincinnati's wastewater collection system to reduce or eliminate CSO discharges to local creeks and rivers as required by federal Consent Decree. Each outfall location in the collection system where these discharges occur is assigned a number. This project involved two CSO locations: CSO 217 and CSO 483. The proposed alternatives included separating stormwater in separate stormwater pipes from the wastewater collection system or providing temporary stormwater or wastewater storage in the system. Both were designed to reduce peak flows during storm events from overwhelming the collection system and resulting in CSO discharges.

Ultimately, the preferred source control alternative for the 1,000-acre CSO 217/483 watershed included a combination of both: four stormwater detention basins, sewer separation along major roads, and a wastewater storage tank to reduce CSO volume at CSO 217; stream restoration; and sewer separation along major roads to reduce CSO volume at CSO 483. This alternative is anticipated to achieve 96 million gallons in CSO volume reduction in a typical year.

ACCOMPLISHMENTS AND CHALLENGES

REGULATORY REQUIREMENTS. Designs are required to meet regulatory limits on the amount of CSOs allowed during a typical rainfall year. In many areas, it was not practical to simply construct independent sewers to separate stormwater from the wastewater collection system. POWER spent time studying numerous scenarios to get the stormwater and wastewater storage infrastructure down to the smallest size possible while still meeting the performance requirements of the Consent Decree.

MINIMAL COMMUNITY IMPACT. Retrofitting large, complex infrastructure elements in often dense, ultra-urban settings can mean major disruption to the community during construction. Temporary road restrictions and closures cause traffic delays for the traveling public, and construction noise and dust can become a nuisance. The project required several property acquisitions in established communities. POWER's efforts included significant involvement with the affected communities for both education and to promote acceptance of the proposed project.

TIGHT SCHEDULE. Completing designs on an accelerated schedule, POWER assisted MSDGC in constructing needed wastewater infrastructure in compliance with federal Consent Decree requirements. POWER-Cincinnati continues to provide planning and design services for MSDGC.

PROJECT TEAM: CINCINNATI

Christopher Limke—Engineer of Record
Stuart Toraason—Project Engineer
Tom Gill—Project Engineer

AJ Wehr—Project Engineer
Patrick Goddard—Project Engineer

Chris Limke is a senior project lead and department manager for the Midwest Environmental Services Civil/Environmental Engineering department in Cincinnati.