

solving the CSO conundrum

By Neil Raymond & Peter C. Atherton

Maine town gets creative to eliminate CSOs with no taxpayer dollars

Historically, combined sewer overflows (CSOs) have been handled by discharging the sewage at designated outfall points into nearby bodies of water. The National Pollutant Discharge Elimination System (NPDES) portion of the Clean Water Act, however, has mandated communities with CSOs take action and handle their overflow in a more environmentally conscious manner. Cash-strapped cities and towns across the country are struggling to fund CSO mitigation projects.

ARTICLE SUMMARY

Challenge: Bucksport, Maine, had two CSO outfalls that were an eyesore along a scenic route; the state ordered them to be removed and replaced with a more environmentally conscious approach.

Solution: Bucksport officials opted for an alternative approach of satellite treatment where wet-weather flows are treated further upstream. This was a \$3.1-million project.

Conclusion: The Storm King has taken the pressure off of the plant effectively and treated all wet-weather events that would have been discharged without treatment in the past. The process works automatically, with little maintenance.

CSO Dilemma

One town in Maine faced this problem in 2007. Bucksport is a working-class fishing and paper mill community on the coast of Maine. Its two CSO outfalls were “eyesores,” according to Town Manager Roger Raymond, located within eyesight of Route 1, within an important part of the town’s downtown district.

The two outfalls were ordered by the state of Maine to be removed. In 2000, Raymond formed a sewer committee to investigate the town’s CSO abatement alternatives. It could add a significant amount of capacity to the wastewater treatment plant located downstream of the overflows, or it could split storm water and wastewater flows by constructing a separate collection system. Either option would be a costly and disruptive proposition.

Satellite Solution

Bucksport’s third option was satellite treatment within the collection system—an alternative provided by Hydro Intl. Satellite treatment involves treating wet-weather flows further upstream, before such flows reach the treatment plant. Solids break down as they travel through the collection system. Capturing both floatable and settleable solids early in the system provides the greatest opportunity for removing high levels of solids and associated pollutants without requiring more complex treatment processes.

Satellite treatment proved to be the most cost-effective alternative for the town, but local leaders still had to fund the \$3.1-million project. Instead of having taxpayers shoulder the bill, the leaders came up with a novel idea. With the outfall located next to several neglected buildings, they used this mandate as a community betterment initiative. With the help of several rural development, community development, public infrastructure and enterprise grants, Bucksport had the funding it needed to make the project a success. In May 2007, the project was underway.

From Eyesore to Focal Point

Bucksport contracted engineering firm Wright Pierce to design the new downtown treatment center. Given that the town’s main pump station could transport only 1 million gal per day to the treatment plant, the objective was to route the excess wet-weather flows via a new diversion structure and pump station to an advanced hydrodynamic vortex separator—the Storm King—for treatment.

When the project finished in the fall of 2008, the Storm King was taking the pressure off of the plant effectively and treating all wet-weather events

that would have been discharged without treatment in the past. Since the separator was commissioned in 2008, all rain events that the system has handled have been treated in accordance with regulatory requirements. The process works automatically, with little maintenance.

“The system is designed to fit naturally within the existing sewer hydraulic grade line,” said Peter Atherton, principal in charge at Wright Pierce. “In the past, surcharging flows would back up and flow to the river. This design diverts high flows to a dedicated new pump station, which conveys flow to the new treatment unit. From the treatment unit, treated water flows by gravity through the former CSO outfall. Treatment underflow also returns safely and efficiently via gravity to the existing sewer system.”

When the project broke ground in the fall of 2007, it was greeted by locals with skepticism. A wastewater treatment station is not generally regarded as a community beautification initiative.

“During construction, there was a lot of curiosity within the community and passersby,” said Atherton. “Our staff not only spent time overseeing the construction, but also assisted with public relations.”

Initial skepticism of town residents has changed to resounding approval. The site now contains a cupola, fishing pier, fountain, water wheel and pond. In front of the site stretches a mile-long waterfront walkway and picnic tables where the public can enjoy the view of Penobscot Bay, the Penobscot Narrows Bridge and the 19th-century Fort Knox. When visitors drive up Route 1 to Acadia, they have the option of turning right, continuing their trip or turning left into downtown Bucksport. Due to some creative funding and alternative technology, Bucksport is a town that is turning heads in the left direction. [www](#)

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Once a community eyesore, the new CSO treatment site in Bucksport now offers amenities including a fishing pier and fountain.