

Integrated Planning in Action

2016 Integrated Wastewater Plan

Boone, Iowa

Kate Shelly High Bridge, crossing over the Des Moines River.

Boone, Iowa, is home to nearly 13,000 people. The city operates sanitary and storm sewer systems. Most of the sanitary sewer system was installed more than 100 years ago and has not been replaced. Boone's wastewater treatment facility¹ and storm sewer system discharge to Honey Creek, a tributary to the Des Moines River, the largest river in Iowa. The river supports tourism and recreation, including boating on the 100-mile Des Moines River Water Trail, which follows the river as it winds through Boone County.

Challenges

During heavy storms, stormwater and groundwater enter Boone's sanitary sewer system through cracks and improper connections (i.e., infiltration and inflow). This causes sanitary sewer overflows (SSOs) at one pump station and sewage backups into basements. These SSOs lead to the discharge of sewage, which contains high concentrations of pollutants, such as bacteria, to the Des Moines River. In addition, the city's 2014 wastewater treatment facility permit required the city to install disinfection equipment to meet more stringent bacteria effluent limits by 2018. As a small community, Boone has faced challenges in balancing environmental compliance with financial capabilities.

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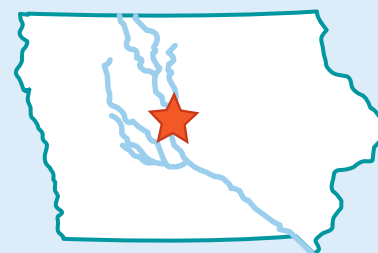
Boone decided to use an integrated planning approach to prioritize projects to achieve the greatest environmental and human health benefits using existing rate revenue to avoid short-term rate spikes. The city conducted an open process: it engaged the community through civic organizations and open house meetings and educated the city council about the importance of preventing less polluted stormwater and groundwater from entering the sanitary sewer system. Boone also kept the public informed throughout the planning process using a wide variety of media, including radio shows, newsletters, a website, social media, and the local newspaper.

The city's plan indicated that reducing infiltration and inflow first would result in the highest human health and water quality impacts by reducing basement backups and SSO discharges. The integrated plan included a project



EPA Region 7

13,000 population



¹ "Wastewater treatment facilities" (WWTFs) is a generic term for facilities that treat or manage wastewater, including publicly owned treatment works.

schedule that delayed the installation of disinfection equipment by five years while the city focused on addressing infiltration and inflow. The integrated plan projects cost \$15.4 million over 16 years (2016–2033), including about \$10 million in capital costs and \$5.4 million for operation and maintenance.

Results

In 2016, the city submitted the *Integrated Wastewater Plan* to the Iowa Department of Natural Resources. The Department approved the plan that same year. In 2018, Boone's City Council passed an ordinance that gave Boone's Sewer Department authority to inspect and disconnect sump pumps and roof drains from residences connected to the sanitary sewer system or require that they pay a monthly fee on their utility bill. One year later, in 2019, the Department of Natural Resources issued a wastewater treatment facility permit that allowed the city to delay installing disinfection

equipment to meet new bacteria limits by five years in order to more quickly reduce SSOs and reduce infiltration and inflow.

Since plan approval, Boone has installed flow meters in 1 of the 4 pilot project areas and disconnected 60 sump pumps from the sanitary sewer to reduce inflow. The city reports that this has reduced the amount of wastewater flowing to the wastewater treatment facility by 30 percent, which is more than half of the 50 percent flow reduction goal. Sequencing the infiltration and inflow work first led to less water flowing to the wastewater treatment facility, thus reducing the size of the disinfection system needed and saving the city about \$500,000 to \$750,000. In 2019, the city also has received no basement backup complaints from residences in the pilot area, down from the 15–20 complaints it had received before disconnecting the residents' sump pumps.