OVERVIEW

The nation's 14,748 wastewater treatment plants protect public health and the environment. Years of treatment plant upgrades and more stringent federal and state regulations have significantly reduced untreated releases and improved water quality nationwide. It is expected that more than 56 million new users will be connected to centralized treatment systems over the next two decades, and an estimated $271 billion is needed to meet current and future demands. Through new methods and technologies that turn waste into energy, the nation's 1,269 biogas plants help communities better manage waste through reuse.

CAPACITY & CONDITION

Wastewater removal and treatment is critical to protect public health. Wastewater treatment processes improve water quality by reducing toxins that cause harm to humans and pollute rivers, lakes, and oceans. Wastewater enters the treatment system from households, business, and industry through public sewer lines and, in many places across the country, stormwater drains.

Wastewater treatment is typically overseen by a community utility or public works department that ensures water quality standards are met before the treated water is discharged back into the environment. In most localities, all publicly-supplied water is treated to meet federal drinking water standards, regardless of whether it will be used for drinking. Nearly 240 million Americans – 76% of the population – rely on the nation's 14,748 treatment plants for wastewater sanitation. By 2032 it is expected that 56 million more people will connect to centralized treatment plants, rather than private septic systems – a 23% increase in demand. In the U.S., there are over 800,000 miles of public sewers and 500,000 miles of private lateral sewers connecting private property to public sewer lines. Each of these conveyance systems is susceptible to structural failure, blockages, and overflows. The U.S.

Environmental Protection Agency (EPA) estimates that at least 23,000 to 75,000 sanitary sewer overflow events occur in the United States each year.

As new users are connected to centralized treatment, older conveyance and treatment systems must manage increasing flow or new treatment facilities must be constructed. It is estimated 532 new systems will need to be constructed by 2032 to meet future treatment needs.

STORMWATER

Stormwater – runoff from rain or snow melt – also requires collection and treatment infrastructure. 39 states have one or more stormwater utility and seven states have 100 or more stormwater utilities. The number of communities with stormwater utilities or fees has grown from approximately 1,400 in 2013 to 1,600 in 2016.

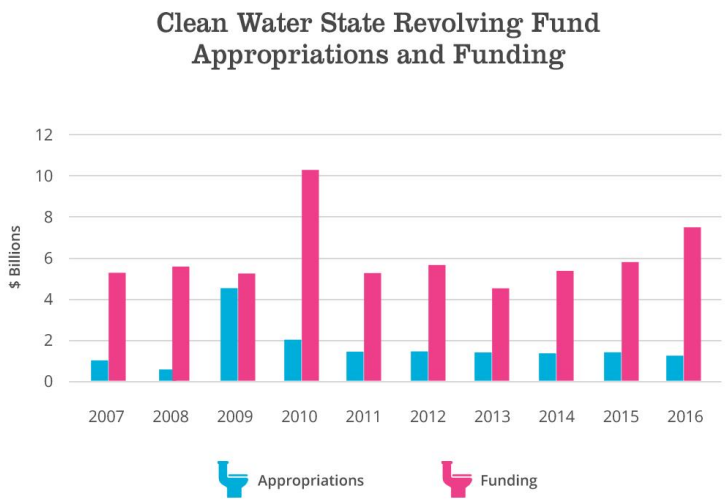
In approximately 772 communities in the U.S., wastewater and stormwater drain into the same treatment system. These combined sewer systems can experience capacity issues following heavy rain events, resulting in overflows containing stormwater as well as untreated human and industrial waste, toxic substances, debris, and other pollutants. Called combined sewer overflows (CSOs), these occurrences can significantly impair water quality and impact public health and wildlife. After non-point source pollution (e.g., agricultural runoff and stormwater), combined sewer overflows are a leading source of water pollution in the U.S. The problem is exacerbated when communities have large amounts of impervious surfaces – concrete sidewalks, roads, parking lots, traditional roofs – that increase the amount of runoff entering the stormwater system.

Data on stormwater infrastructure and CSOs are limited. In 2016, the EPA released a report to Congress on CSOs in the Great Lakes region. For the 184 CSO communities that discharge CSOs in the Great Lakes Basin, there were 1,482 CSO events in 2014, discharging an estimated 22 billion gallons of untreated wastewater into the Great Lakes Basin. Even these numbers were on the low side, as several communities did not report or have data available. In 2015, EPA finalized the National Pollutant Discharge Elimination System (NPDES) electronic reporting rule, requiring the filing of discharge monitoring reports; this will make more CSO data available to the public.

FUNDING & FUTURE NEED

The EPA estimates $271 billion is needed for wastewater infrastructure over the next 25 years. While the federal government provides some funding through the Clean Water State Revolving Fund (CWSRF), according to the U.S. Conference of Mayors 95% of spending on water infrastructure is made at the local level.

The federal government has provided on average $1.4 billion per year over the past five years to the 50 states and the District of Columbia through the Clean Water State Revolving Fund (CWSRF) programs. They, in turn, have provided on average a total of $5.8 billion per year in financial assistance to eligible recipients, primarily as discounted loans. In 2015 the annual assistance agreement for the CWSRF was $5.6 billion and in 2016 that number increased by $2 billion to $7.6 billion. Of the major infrastructure



categories the federal government funds, water services receive less than 5%. It is estimated local governments spend $20 billion a year on capital sewer expenditures and $30 billion annually on O&M.
As cities continue to experience population growth, particularly in the south and west, new housing developments are constructed, and rural households switch from septic systems to public sewers, pressure on existing centralized systems and treatment plant infrastructure will require billions of dollars in new investment to meet federal regulatory requirements. 75% would go toward treatment plant improvements, conveyance system repairs, new conveyance systems, and recycled water distribution; 18% to CSO correction; and about 7% to stormwater management.

Cities and towns across the country report that complying with federal wastewater and stormwater regulations represents some of their costliest capital infrastructure projects. Local governments rely on a mix of funding, including sewer rates, dedicated fees such as stormwater or watershed restoration fees, local taxes, and the federal government. Approximately half of total annual expenditures in the wastewater sector go to operation and maintenance (O&M) and this share will likely rise further against capital investments. Since no federal funding may be used to pay for O&M, the full burden falls on rate payers.

Funding both capital projects and O&M is difficult because the public often does not see or appreciate the modern convenience of wastewater treatment, making it difficult to convey the need for sewer rate increases. Further, the rates charged on monthly bills are generally set by local governments and can be subject to political influence. As a result, wastewater rates often do not cover the full cost of service, particularly as needs rise due to aging systems, a growing number of users, and additional water quality measures. The majority of treatment facility expenses are supported by rate payers, however rising utility bills can present affordability issues. In a 2014 survey of the nation's 50 largest cities, average monthly sewer bills ranged from $12.72 in Memphis to $149.35 in Atlanta.

Through the Water Infrastructure Finance and Innovation Act (WIFIA) of 2014, Congress authorized a new mechanism to primarily fund large water infrastructure projects over $20 million. In December 2016, the WIFIA program received $20 million in appropriations and began releasing funding opportunities to prospective borrowers in January 2017. EPA estimates that this appropriation will result in approximately $1 billion in loans supporting approximately $2 billion in water and wastewater infrastructure investments.

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RESILIENCE & INNOVATION

Treatment plants are typically located at the bottom of watersheds or coastal and riverine areas. Given these locations, many utilities have recently undertaken studies to assess vulnerability to more extreme flooding events and sea level rise. For instance, during Superstorm Sandy in 2012, several wastewater treatment plants in New York and New Jersey were inundated with storm surge, causing hundreds of millions of gallons of untreated sewage to spill into neighboring waterways. In the years since, many of these plants and others across the U.S. have developed resilience plans and increased infrastructure fortification against floods and storm surge.

Treatment plants are also rethinking biosolid disposal through nutrient recovery programs. Biosolids are the organic materials left over following the treatment process. Traditionally biosolids were considered waste and transferred to landfills. However, when properly treated and processed biosolids become nutrient rich organic material that can be applied as fertilizer or, through the use of anaerobic digesters and centrifuges, can be pelletized and incinerated at high pressure and temperature for use as energy. According to the American Biogas Council, there are currently 1,269 water resource recovery facilities using anaerobic digesters, with about 860 using biogas as a new energy source to reduce demand and costs from traditional, grid-supplied energy sources. More than 2,440 plants have been identified as ripe for future biogas development projects, which, when combined with other biogas sources such as agriculture, could produce enough energy to power 3.5 million American homes.

Through the advent of new treatment methods such as reverse osmosis, ozone, and ultraviolent light, treated water can be processed quicker than traditional chlorine contact methods. With less processing and holding time, plants can treat more wastewater and often discharge a cleaner, purer product back into the environment.

With heavy rain events in some regions of the country, and water shortages in others, wastewater and stormwater are increasingly reused. New methods and technologies of reusing water have allowed communities to better manage precious water supplies by treating wastewater products to levels required for commercial, irrigation, and industrial uses.

RECOMMENDATIONS TO RAISE THE GRADE

- Reinvigorate the State Revolving Loan Fund (SRF) under the Clean Water Act by reauthorizing the minimum federal funding of $20 billion over five years.
- Fully fund the Water Infrastructure Finance and Innovation Act (WIFIA) at its authorized level.
- Preserve tax exempt municipal bond financing. Low-cost access to capital helps keep lending for wastewater upgrades strong and accessible for communities large and small.
- Eliminate the state cap on private activity bonds for water infrastructure projects to bring an estimated $6 billion to $7 billion annually in new private financing.
- Establish a federal Water Infrastructure Trust Fund to finance the national shortfall in funding of infrastructure systems under the Clean Water Act.
- Preserve the status of tax-exempt bonds. These bonds have funded more than $1.9 trillion in infrastructure construction in the last decade alone.
- Raise awareness of the true cost of wastewater treatment.

- Achieve Clean Water Act compliance in a way that minimizes the impact on lower-income residents and on economic competitiveness through bill payment assistance; revisiting EPA affordability guidelines; renewed or enhanced federal and state aid; and redirecting other aid sources to sewer-mandate compliance.
- Support green infrastructure, which provides co-benefits such as water and air quality improvement, aesthetic value to communities, and cost competitiveness.

DEFINITIONS

Clean Water Act State Revolving Fund (CWSRF) — Program added to the Clean Water Act by Congress in 1987 to make funds available to drinking water systems to finance infrastructure improvements.

Clean Watersheds Needs Survey (CWNS) — A survey of wastewater infrastructure investment needs over 20 years undertaken by the Environmental Protection Agency's Office of Wastewater Management in conjunction with the states every four years. The CWNS is required by the Clean Water Act.

Sanitary Sewer Overflows (SSOs) — occasional unintentional discharges of raw sewage from municipal sanitary sewers due to blockages, line breaks, sewer defects that allow storm water and groundwater to overload the system, lapses in sewer system operation and maintenance, power failures, inadequate sewer design, and vandalism. EPA estimates that there are at least 23,000 to 75,000 SSOs per year.

Green Infrastructure — A man-made or natural system to prevent stormwater runoff that allows most precipitation to be absorbed or infiltrated into the ground where it replenishes aquifers, nourishes plants, and supplies water to nearby streams during low flows.

Large Community Water Systems — systems serving more than 50,000 people

Medium Community Water Systems — systems serving 3,301 to 50,000 people

Small Community Water Systems — systems serving 3,300 or fewer people

Water Infrastructure Finance Innovations Authority (WIFIA) — If enacted by Congress, a program that would access funds from the U.S. Treasury at Treasury rates and use those funds to support loans and other credit mechanisms for projects to repair or replace aging drinking water and wastewater infrastructure. The loans would be repaid to the Authority and then to the U.S. Treasury with interest.

Combined Sewer Systems — Sewers that are designed to collect rainwater runoff, domestic sewage, and industrial wastewater in the same pipe.

Combined Sewer Overflows (CSOs) — Contain not only stormwater but also untreated human and industrial waste, toxic materials, and debris when heavy rainfall produces a volume of water that exceeds the capacity of a combined sewer.

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GAME CHANGERS

While all categories of American infrastructure require modernization and improvement, civil engineers, local communities, all levels of government, and the private sector have already started to develop innovative approaches to address our nation's significant infrastructure needs.