

Understanding How the Water Sector is Organized in New Jersey

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Overview

This document describes the general structure of the water sector in New Jersey, providing background and context for the types of water systems included in Jersey WaterCheck.

Specifically, this document explains:

1. How different water systems are classified in New Jersey
 2. Which of those systems are included or excluded in Jersey WaterCheck and why
 3. How systems in Jersey WaterCheck are classified, if different from the standard nomenclature
 4. The characteristics of well-managed utilities
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Drinking Water, Wastewater, and Stormwater

Let's start with the basics— the types of water you encounter most days, if not every day:

- 1) The drinking water that comes into your house is called potable water, which means you can drink it safely if the system meets drinking water standards.
 - Water supply systems draw from either surface water or groundwater. In New Jersey, about 60% of drinking water service comes from surface waters like rivers and reservoirs. The remainder is from shallow or deep aquifers.
- 2) The water that leaves your house from sinks, toilets and showers, or that leaves businesses, is wastewater.
 - Wastewater systems (sometimes called “sewer systems”) collect this used water and send it to a plant to be treated to meet regulatory standards. After that, it is returned to the environment. It is either discharged to a stream, river, bay or ocean or it is discharged over the ground to be absorbed.
- 3) The water from rainfall and snowfall (i.e., stormwater) will end up in one of four places:
 - Surface water bodies (e.g., streams and rivers, ponds and lakes, bays and oceans), either directly or through stormwater systems
 - Groundwater, including aquifers (i.e., groundwater units of sufficient quantity and quality to support major water uses)
 - Wastewater treatment plants (in the case of combined sewer systems)
 - Public spaces (e.g., streets, parks), open lands, or in buildings (e.g., basements)

Water Utility Systems in New Jersey

In New Jersey, about 10 percent of the population has private wells and septic systems, mostly located in the less densely populated areas. The remaining 90 percent of the population is served by hundreds of drinking water, wastewater, and stormwater systems which are owned by either governmental entities or the private sector. Regardless of ownership, their functions are very similar and they are all required to meet the same environmental standards.

Table 1. Overview of Water Utility System Types in New Jersey

	Drinking Water	Wastewater	Stormwater
Number of “public community systems” (both publicly and privately owned)	574	191 systems with treatment plants, plus additional collection-only systems	All municipalities with significant developed areas, roads, etc.
Served by investor-owned & private systems	Approximately 40% of the population served by PCWS systems ¹	Minimal	Most private office parks, business campuses and gated communities
Function(s)	Water treatment and/or distribution	Sewage collection and/or treatment	Stormwater collection and discharge
Primary revenue source	Usage fees (along with connection fees)	Usage fees (along with connection fees)	No usage fees. Paid for from local govt. budget
Not served by “public community” system	Roughly 10% of NJ population served by wells	Roughly 13% of population on private septic systems	- Private development - Rural areas

**191 active NJPDES permits categorized as “Sanitary Wastewater”*

**574 is the latest number according to the 2019 Annual Violations report from NJDEP*

Water utility systems (drinking water, wastewater, stormwater) are considered “public” systems if they serve the public (rather than specific industrial or agricultural uses), regardless of ownership. Ownership of these systems within one area can be quite diverse, creating complicated relationships between a municipality and perhaps multiple drinking water and wastewater utility systems under a variety of owners, as well as a municipal stormwater system. On the other extreme, a municipality may have direct ownership and control of the drinking water, wastewater, and stormwater systems in the entire municipality. The major types of ownership include publicly-owned, investor-owned, and privately-held.

Publicly-Owned Systems

Publicly-owned systems are owned by government entities, such as municipalities, municipal or county utility authorities, and state or interstate agencies. Where a municipality is the direct owner of the utility, it may be run as a municipal department with its own revenue base (common for drinking water and wastewater systems) or within a department (often Public Works or its equivalent) without a revenue base (common for stormwater systems).

Table 2. Publicly-Owned System Types by Owner, Examples, and Revenue Sources

System Owner	Examples	Revenue Sources
Municipal water/sewer	Waldwick Borough sewer system	Mostly part of property tax (Some collect user fees) *80+ municipal sewer systems receive revenue from property taxes
Municipal stormwater	Public Works Department, Stormwater management/system	No revenue base
Authority	Municipal utilities authority (MUA), sewerage authority, regional sewerage authority, county utilities authority	User fees, separate from property tax
Joint meeting created by one or more local governments (<i>Wastewater only</i>)	Joint Meeting of Essex and Union Counties, Madison-Chatham Joint Meeting	User fees, separate from property tax
State agency	New Jersey Water Supply Authority, North Jersey District Water Supply Authority, Passaic Valley Water Commission, Passaic Valley Sewerage Commission	User fees, separate from property tax

Investor-Owned Systems

Investor-owned systems are private corporations with shares that are listed on the stock market. The corporation’s stock is owned by people who buy shares to make money and which is controlled by a holding company. This category can include corporations specifically formed as water utilities, but may also include other corporations that own water utilities for their own private facilities that nonetheless qualify as “public” due to the number of individuals served (such as apartment complexes). Fewer sewer systems are investor-owned, but 40% of the water system population is served by investor-owned systems, the largest of which are NJ American Water, SUEZ NJ, Middlesex Water Company and Aqua NJ

Privately-Held Systems

Privately-held systems are private corporations that are owned by individuals without listing on the stock market. In most cases, these corporations provide services to specific developments or

properties, for which the utility systems were specifically created, such as mobile home communities. In many cases, the private owner is not related to the customers, but in a number of situations, the owner is a homeowners association, which in turn is owned in common by the homeowners within the development.

Combination Systems

Across the state, service is often delivered through a combination of publicly-owned and investor-owned systems. Examples:

- A municipality runs a sewage collection system, which it runs as a utility. The sewage collected is piped to a county utilities authority. A corporation owns the water system in the town and bills the residents for its service.
- Municipalities establish, through a service agreement, a regional authority to which they all send their sewage for treatment. Some of these may run their own water system and others may receive service from a corporation.
- A municipality has residents whose homes have septic systems and others on a sewer line.

Jersey WaterCheck

Jersey WaterCheck does not include privately-held systems due to data gathering challenges, but these may be added in future updates. For the purpose of the dashboard, systems classified as “Private” refer to investor-owned systems and systems classified as “Public” refer to publicly-owned systems. The following graph depicts the breakdown of “Public” and “Private” systems within the “Water” and “Wastewater” categories for Jersey WaterCheck. In total, there are 388 drinking water systems and 155 wastewater systems included.

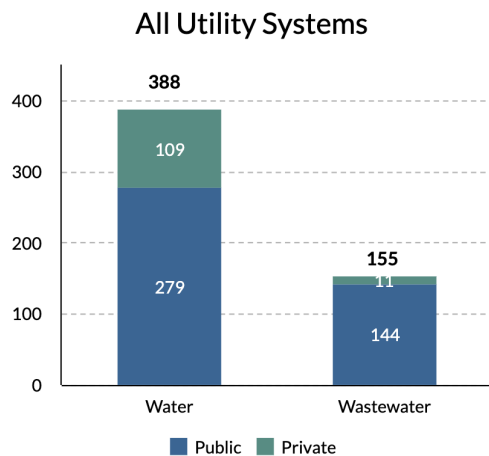


Figure 1. Water and wastewater utility systems by type (public and private).

Public Water Systems

A “public water system” is defined by federal regulations as a system that 1) provides water for human consumption through pipes or other constructed conveyances and 2) has at least 15 service connections or regularly serves at least 25 individuals for at least 60 days of the year. Public water systems are further classified as “community water systems”, such as water systems that serve residential populations, and “non-community water systems” that are typically businesses supplied by their own wells.

Public community water supply (PCWS) systems are defined by the federal and New Jersey Safe Drinking Water Act as “a public water system which serves at least 15 service connections used by *year-round* residents or regularly serves at least 25 *year-round* residents.” These systems can range from small mobile home parks and apartment complexes to regional utilities that serve hundreds of thousands of customers. Of the nearly 90 percent of New Jersey’s total population served by PCWS systems, roughly 40 to 45 percent are customers of investor-owned or privately-held corporations. The publicly-owned systems are generally municipal systems or municipal or county utility authorities (MUAs); the Passaic Valley Water Commission is a notable exception, having been formed by state legislation before MUAs were authorized.

Public non-community water supply (PNCWS) Systems (e.g., hospitals, schools, retail malls) regularly serve “an average of at least 25 individuals daily at least 60 days out of the year,” but are not PCWS systems. These systems are further divided into “non-transient,” such as schools or factories with their own wells, or “transient,” such as rest stops or parks with their own wells.

In both cases, the terminology focuses on the population served, not the system ownership. Confusingly, a public community water system may be privately owned.

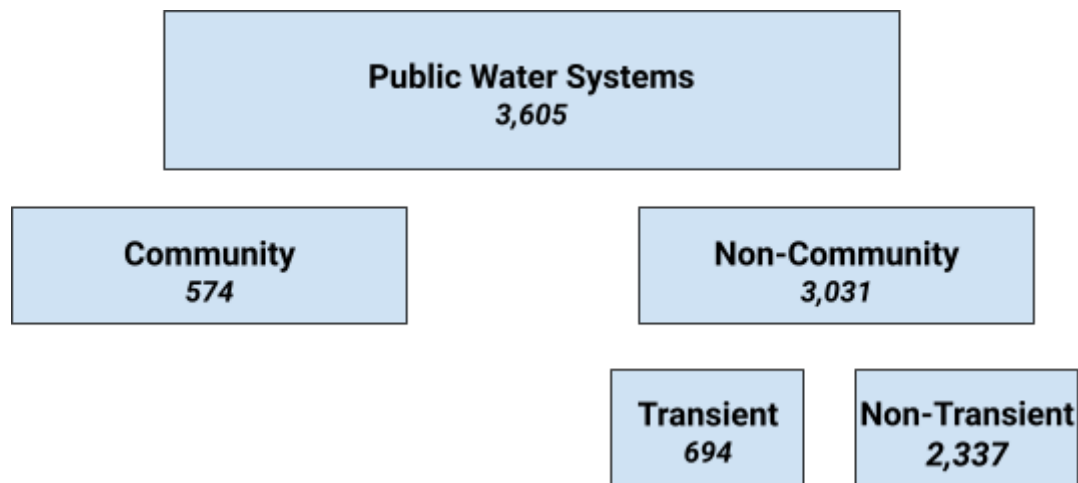


Figure 2. Categorization and inventory of public water systems in New Jersey as of December 31, 2019. Source: [2019 Annual Compliance Report on Public Water Systems, NJDEP](#)

Water System Size

Public community water systems are classified as small, medium, or large based on the residential populations that they serve. The size classification of a system determines the frequency and amount of sampling for certain water quality regulations that is required. Approximately 96% of New Jersey residents served by public water systems are supplied by medium or large community water systems. There are many very small drinking water systems and relatively few very large systems.

Table 1: New Jersey Community Water Systems Grouped by Population in 2019.

Population Categories	Population Ranges	Number of Systems	Total Estimated Population Served
Large Systems	> 50,000	28	5,145,586
	10,001 – 50,000	132	2,973,568
Medium Systems	3,301 – 10,000	81	505,744
	1,001 - 3,300	76	149,772
Small Systems	501 – 1,000	49	34,787
	101-500	123	29,920
	<101	85	6,077
Total:		574	8,845,454

Table from [2019 Annual Compliance Report on Public Water Systems, NJDEP](#)

Jersey WaterCheck

Only public community water systems (PCWS) are included in Jersey WaterCheck, as the goals of Jersey Water Works focus on residents and communities. These are labeled as “Water” systems.

In Jersey WaterCheck, “Water” systems are sub-characterized as:

- Government owned* and operated
 - *For Jersey WaterCheck, this is synonymous with publicly owned
 - EX: Hamilton Township MUA
- Government owned and corporate* operated
 - *Specifically, operated by a private entity under a contractual agreement
 - EX: Bayonne Water Department - SUEZ
- Corporate* owned and operated
 - *For Jersey WaterCheck, this is synonymous with investor owned
 - EX: SUEZ Water New Jersey - Lambertville

Public Wastewater Systems

The New Jersey Department of Environmental Protection (NJDEP) manages a program called [New Jersey Pollution Discharge Elimination System](#) (NJPDES). This program protects the state's ground and surface water quality by ensuring the proper treatment and discharge of wastewater and stormwater from various types of facilities and activities. To accomplish this, permits are issued limiting the mass and/or concentration of pollutants that may be discharged into groundwater, streams, rivers, and the ocean.

The NJDEP Water Pollution Control Act does not define wastewater utilities in the same manner as PCWS systems for drinking water, by population served and duration of service. Rather, wastewater systems are defined in the NJPDES rules as:

- Industrial treatment works
- Individual subsurface sewage disposal systems (A.K.A. “septic systems”)
- Domestic treatment works (DTW)

These rules further define DTW as “all publicly-owned treatment works as well as any other treatment works processing primarily domestic sewage and pollutants together with any groundwater, surface water, stormwater, or process wastewater that may be present.” This assumes that most DTW are publicly-owned, but private utilities are included as “any other treatment works.”

DTW can be small, such as for a small subdivision in a rural area that uses a common treatment facility instead of septic systems, but also can be large enough to serve hundreds of thousands of customers. Many small wastewater utilities in New Jersey are privately-owned, whereas only a few middle-sized ones are. The publicly-owned systems are generally municipal systems, multi-municipal “joint meetings,” or municipal or county utility authorities (MUAs); the Passaic Valley Sewerage Commission is a notable exception, having been formed by state legislation before MUAs were authorized.

In some cases, the collection of wastewater and its treatment are handled by the same entity. A municipality manages the pipes that draw the wastewater away after use and also the plant where the wastewater is treated. In other cases, the municipality manages the pipes for collection, but sends the wastewater to an entity that runs a regional wastewater treatment plant. Likewise, a corporation can own a collection system, but send the wastewater to a treatment plant that is publicly owned. There is also a variety of development-specific systems, some of which are privately-held (e.g., owned by the property owners association) and others of which are investor-owned (e.g., Environmental Disposal Corporation).

Wastewater System Size

Wastewater system size is typically classified according to flow capacity, as opposed to population served for drinking water systems. Most wastewater treatment facilities with surface water discharges (which serve the vast majority of the public with sewer service) are small. Roughly 83 percent of them have a capacity of less than 10 million gallons per day (MGD). The largest wastewater treatment facilities, such as the Passaic Valley Sewerage Commission, receive wastewater from multiple municipal systems through regional trunk lines.

Jersey WaterCheck

Jersey WaterCheck includes wastewater systems with active NJPDES permits classified as Domestic Treatment Works (DTW). Most have a discharge category of “Sanitary Wastewater,” which discharge to surface water, and a few are classified as “Discharge to Groundwater.” Currently, Jersey WaterCheck does not include wastewater systems that are collection systems only, and thus, do not have a NJPDES permit. This decision was made based on data gathering challenges, but future updates may include adding collection systems to the dashboard. For information on households costs in regional systems, weighted averages of the municipal costs were calculated.

In Jersey WaterCheck, “Wastewater” systems are sub-characterized as:

- Government owned* and operated
 - *For Jersey WaterCheck, this is synonymous with publicly owned
 - EX: Middlesex County Utilities Authority (MCUA)
- Corporate owned* and operated
 - *For Jersey WaterCheck, this is synonymous with investor owned
 - EX: SUEZ Water - West Milford

Note: No wastewater systems in Jersey WaterCheck are categorized as “Government owned and corporate operated,” but this may change in the future with additional systems.

Public Stormwater Systems

Municipal Separate Storm Sewer Systems

The focus of the NJPDES rules for stormwater systems is on “municipal separate storm sewer systems” (i.e., MS4s), which are not all owned by municipalities but can also be owned by “an interstate agency, a state, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over the disposal of sewage,

industrial wastes, stormwater, or other wastes...” This language comes from federal law, as New Jersey lacks parishes and other jurisdictions mentioned. All components of a stormwater system are included, specifically “roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man made channels, or storm drains” that are “designed and used for collecting or conveying stormwater.” Systems that are *excluded* include: 1) combined sewer systems, which are considered part of Domestic Treatment Works, and 2) separate storm sewers at industrial facilities or construction sites that collect or convey stormwater discharges associated with those sites. Individual developments such as office parks that collect and discharge stormwater from their properties without connection to an MS4 are also excluded.

Combined Sewer Systems

Combined sewer systems (CSS) were state-of-the-art solutions for the disease-ridden, flood-prone urban areas of the late 1800s and early 1900s when they were built, because they were able to remove sewage and stormwater quickly from urban areas. In a combined sewer system, stormwater runoff and wastewater from homes and businesses are combined into one pipe. During dry weather this combination is transported and treated at a wastewater treatment plant, but when it rains, the stormwater can overwhelm the capacity of the combined sewer system and lead to a mix of sewage and stormwater spilling from the system’s outfalls and into waterways. When this occurs, it is called a combined sewer overflow (CSO). CSOs pollute rivers and bays during rain events and combined sewers can also cause sewer backups into basements and streets, threatening human health. They also have a significant environmental impact, causing the closure of beaches and shellfish beds as well as impairing fish and other aquatic life and their habitats.

There are 21 New Jersey municipalities with combined sewer systems and 210 individual combined sewer outfalls. These cities are: Bayonne, Camden, East Newark, Elizabeth, Fort Lee, Gloucester City, Guttenberg, Hackensack, Harrison, Hoboken, Jersey City, Kearny, Newark, North Bergen, Paterson, Perth Amboy, Ridgefield Park, Trenton, Union, Weehawken, and West New York.

In New Jersey, the issues of these combined sewer systems are currently being addressed through CSO permits that are issued by the NJDEP. As stated on the NJDEP’s [CSO webpage](#), “the goal of CSO permit is to meet the requirements of the Clean Water Act and the National CSO Policy by reducing or eliminating the remaining CSO outfalls in New Jersey.” Please visit the webpage to learn more about the 5-year CSO permit process. Note: The latest permit cycle was from 2015-2020. There will be another permit cycle potentially beginning in 2021.

Of the 21 municipalities with combined sewer systems, 17 of them are CSO permit holders. The remaining four (Hoboken, Union, Weehawken, and West New York) are not permit holders because the North Hudson Sewerage Authority, the regional utility that treats the municipalities’

wastewater and owns the outfalls, is one. There are 25 CSO permit holders, which comprise eight regional wastewater treatment plants (which also have NJPDES permits), and 17 municipalities, which own the collection systems and most of the outfalls.

As part of the permit process, the 25 permit holders were required to submit Long Term Control Plans (LTCPs) to NJDEP by the end of the 5-year permit cycle. The City of Trenton submitted its LTCP individually in 2018 before the other permit holders. Thus, the LTCPs for the remaining 24 permit holders were submitted in the fall of 2020, grouped by region. These are the eight regional wastewater treatment plants as well as the 16 municipal permit holders (excluding Trenton) that are associated with the corresponding regions:

- Bergen County Utilities Authority
 - Fort Lee
 - Hackensack
 - Ridgefield Park
- Joint Meeting of Essex and Union Counties
 - Elizabeth
- Passaic Valley Sewerage Commission
 - Bayonne
 - East Newark
 - Kearny
 - Harrison
 - Jersey City
 - Newark
 - North Bergen
 - Paterson
- Camden County Municipal Utilities Authority
 - Camden
 - Gloucester
- Middlesex County Utilities Authority
 - Perth Amboy
- North Bergen Municipal Utilities Authorities
 - Guttenberg
- North Hudson Sewerage Authority - River Road Treatment Plant
- North Hudson Sewerage Authority - Adams Street Treatment Plant

Stormwater Utilities

In March 2019, Governor Murphy signed into law the [Clean Stormwater and Flood Reduction Act](#), which gives local government entities the ability to create stormwater utilities and establish fees. With this enactment, New Jersey joined more than 40 states where stormwater utilities were



already authorized. New Jersey's law allows, but does not require, local governments to establish stormwater utilities to collect fees based on the amount of stormwater the property generates that needs to be managed. Funds generated from these fees are dedicated to stormwater management and cannot be diverted for other purposes. As of 2020, no stormwater utilities have been formed in New Jersey, though some municipalities were exploring the concept.

Jersey WaterCheck

Jersey WaterCheck does not currently include municipal separate storm sewer systems (MS4s), but may include them in future updates. In terms of combined sewer systems (CSSs), Jersey WaterCheck includes 24 CSO permit holders (excluding Trenton): the eight wastewater treatment plants that have both a NJPDES and CSO permits, as well as the 16 municipalities that have a CSO permit, but not a NJPDES permit (i.e., have CSO outfalls, but are not utilities). Although there are no stormwater utilities in New Jersey yet, as of the end of 2020, this is expected to change. Any stormwater utilities that are established in the future will be included in Jersey WaterCheck.

Characteristics of a Well-Managed Utility

Water and wastewater systems are complex and managing them requires expertise and money. Like just about any human endeavor, these systems can be managed either well or poorly.

Water Systems

A well-managed drinking water system:

- Is managed by an appropriately licensed drinking water system operator.
- Meets Maximum Contaminant Levels (MCLs) and other water quality criteria established by the Environmental Protection Agency (EPA) and the NJ Department of Environmental Protection (NJDEP).
- Provides reliable fire hydrant service.
- Maintains reliable service with few or no boil water notices, service interruptions, or water main breaks.
- Provides rates that are affordable.
- Has a low rate of leakage at or better than industry standards.
- Is adequately funded so as to address current needs and maintain the system for two or more decades into the future (i.e., has good asset management).

Wastewater Systems

A well-managed wastewater system:

- Is managed by an appropriately licensed wastewater system operator.
- Meets all wastewater post-treatment discharge permit requirements as established by the Environmental Protection Agency (EPA) and the NJ Department of Environmental Protection (NJDEP).
- Has a low rate of stormwater/groundwater intrusion (inflow and infiltration) into the collection system.
- Has few or no service interruptions or back-ups.
- Is a good neighbor by minimizing odors from treatment facilities and pump stations.
- Provides service at affordable rates.
- Is adequately funded to address current needs and those of two or more decades into the future (i.e., has good asset management).

All Systems

A well-managed utility:

- Has qualified staff that is responsive to elected leaders and the public.
- Values staff training and continuing education; participates in sector-wide learning opportunities.
- Values good community relations: is accessible and engaged with the ratepayers by way of tours, participation in community events, conducting tours.
- Practices innovative and cost-saving energy management such as using solar; combined heat and power; energy aggregation; energy efficiency, including demand response programs; and electric or liquid natural gas vehicles.
- Works with neighbors in a variety of ways that are beneficial; engages in shared services.
- Manages debt well: uses it to maintain the system but avoids over-reliance.
- Resists efforts by controlling entities to use its funds for other purposes. (For example, discourages the municipality with which it is associated from diverting its funds for non-utility uses such as filling a pension gap, or using ratepayer funds to subsidize acquisitions or other practices that do not benefit the ratepayer.)
- Is transparent and complies with all disclosure and web posting regulations and statutes.
- Demonstrates integrity and ethical behavior.



Sources

- [2019 Annual Compliance Report on Public Water Systems, NJDEP](#)
- Our Water Transformed: An Action Agenda for New Jersey's Water Infrastructure
 - [Appendix: Adequate Finances - Background](#)