



Town of Orangetown Drinking Water Source Protection Program (DWSP2) Plan

Veolia Water New York – Rockland

PWS ID: NY4303673

Prepared for:

Town of Orangetown

26 W Orangeburg Rd,

Orangeburg, NY 10962

Prepared by:



Hudson Valley Regional Council

105 Ann St #2,

Newburgh, NY 12550

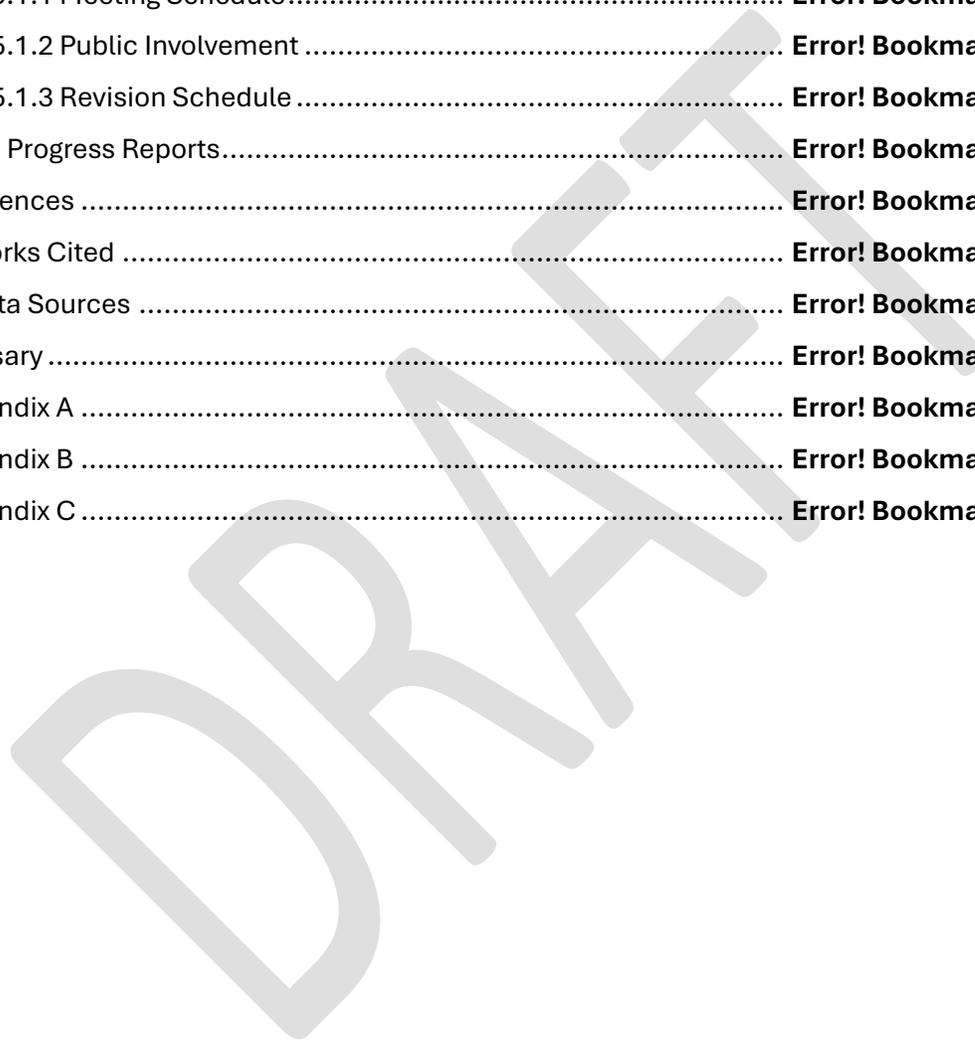
Completed on:

[Date]

Table of Contents

Executive Summary.....	Error! Bookmark not defined.
Table of Contents.....	2
Abbreviations.....	Error! Bookmark not defined.
Introduction.....	2
Drinking Water Source	5
History	5
Previous Studies.....	7
1. Foundation and Formation.....	8
1.1 Prepare Drinking Water Source Protection Maps.....	8
1.1.1 Overview of the Water System	9
1.1.2 Water Quality	13
1.1.3 References.....	18
1.2 Form a Stakeholder Group.....	Error! Bookmark not defined.
1.2.1 List of Stakeholder Group Members.....	Error! Bookmark not defined.
1.2.2 Meeting Schedule.....	Error! Bookmark not defined.
1.3 Formulate a Vision and Establish Goals	Error! Bookmark not defined.
2. Drinking Water Source Assessment.....	Error! Bookmark not defined.
2.1 Complete Drinking Water Source Protection Maps	Error! Bookmark not defined.
2.1.1 Ownership and Control Area	Error! Bookmark not defined.
2.1.2 Critical Areas.....	Error! Bookmark not defined.
2.1.3 Source Water Areas	Error! Bookmark not defined.
2.2 Create a Potential Contaminant Source Inventory	Error! Bookmark not defined.
2.2.1 Potential Contaminant Source Categories	Error! Bookmark not defined.
2.2.2 Potential Contaminant Source Inventory	Error! Bookmark not defined.
2.2.3 Data Sources.....	Error! Bookmark not defined.
3. Protection and Management.....	Error! Bookmark not defined.
3.1 Identify Protection and Management Methods	Error! Bookmark not defined.
3.1.1 List of Protection and Management Issues.....	Error! Bookmark not defined.
3.2 Develop an Implementation Timeline.....	Error! Bookmark not defined.
3.3 Project Profiles	Error! Bookmark not defined.
4. Plan Management	Error! Bookmark not defined.

4.1 Plan Management **Error! Bookmark not defined.**
 4.1.1 Plan Management Team Members **Error! Bookmark not defined.**
 4.1.2 Revision Timeline **Error! Bookmark not defined.**
4.2 Compile Plan **Error! Bookmark not defined.**
5. Implementation and Maintenance **Error! Bookmark not defined.**
 5.1 Implement the Program **Error! Bookmark not defined.**
 5.1.1 Meeting Schedule **Error! Bookmark not defined.**
 5.1.2 Public Involvement **Error! Bookmark not defined.**
 5.1.3 Revision Schedule **Error! Bookmark not defined.**
 5.2 Progress Reports **Error! Bookmark not defined.**
References **Error! Bookmark not defined.**
 Works Cited **Error! Bookmark not defined.**
 Data Sources **Error! Bookmark not defined.**
Glossary **Error! Bookmark not defined.**
Appendix A **Error! Bookmark not defined.**
Appendix B **Error! Bookmark not defined.**
Appendix C **Error! Bookmark not defined.**



Introduction

The Drinking Water Source Protection Program (DWSP2) is a locally led, state-supported program that empowers municipalities to take action to improve and protect their public water sources and surrounding environment. The program builds off previous work, helps align priorities, and fills gaps within these municipalities' current and future source water protection efforts. It is designed to engage community stakeholders to define priority issues and potential solutions. At its core, the DWSP2 plan is an implementation plan that identifies specific issues and threats to the drinking water supply, priority actions, resources, and a timeline required for implementation. The Town of Orangetown and their partners, with the assistance of the Hudson Valley Regional Council (HVRC), worked to develop and initiate implementation of their unique Drinking Water Source Protection Program.

To help guide the development of DWSP2 plans, representatives of key state agencies, including New York State Department of Health (NYSDOH), New York State Department of Environmental Conservation (NYSDEC), New York State Department of Agriculture and Markets (NYSAGM), and New York State Department of State (NYSDOS), created a draft "Framework for Creating a Drinking Water Source Protection Program" ("the draft Framework"). The draft Framework is currently on Version 1, which was published on December 18, 2019. Four phases and eight key components from Version 1 of the draft Framework were used in development of this plan. They are as follows:

Phases and Key Components

1. Stakeholder Group

- 1.1 Form a Stakeholder Group
- 1.2 Establish Goals and Formulate a Vision

2. Drinking Water Source Assessment

- 2.1 Develop an Overview of the Water System
- 2.2 Prepare a Drinking Water Source Protection Map
- 2.3 Create a Potential Contaminant Source Inventory

3. Protection and Implementation Strategies

- 3.1 Identify Protection and Management Methods
- 3.2 Develop an Implementation Timeline

4. Progression and Maintenance

- 4.1 Designate a Plan Management Team

This DWSP2 Plan was prepared by the HVRC for the Town of Orangetown, in collaboration with a local stakeholder group, which includes representatives from Veolia, Rockland County Department of Health and Department of Planning, Town of Clarkstown, Orangetown Environmental Committee, Lamont-Doherty Earth Observatory, Sustainable Piermont, Sparkill Creek Watershed Alliance, Riverkeeper, and Cornell Cooperative Extension Rockland County, using the draft Framework steps listed above. The stakeholders were able to provide knowledge of current conditions of the water supply and emerging concerns. In developing their Plan, the stakeholder group and HVRC interpreted data, created maps, identified potential sources of contamination, developed an actionable list of source water protection methods, and researched funding and partnership opportunities.

The Plan was completed in [Month, Year]. It evaluates the eight Veolia groundwater wells located within or near Orangetown's boundaries. The PWS name for the source is Veolia Water New York – Rockland and has the ID NY4303673. This Plan will be updated, maintained, and implemented by the involved communities and organizations. It is comprehensive and tailored to the Town's unique needs and goals. Ultimately, this plan offers a detailed road map for the long-term protection of the Town of Orangetown's drinking water sources.

Drinking Water Source

Veolia Water New York ("Veolia") in Rockland County sources water from 60 supply wells, the Lake DeForest Reservoir, and three Letchworth Reservoirs, and currently provides source water for an estimated population of 325,000 residents across the Towns of Clarkstown, Haverstraw, Orangetown, Ramapo, and Stony Point and the Villages of Airmont, Chestnut Ridge, Grand View-on-Hudson, Haverstraw, Hillburn, Kaser, Montebello, New Hempstead, New Square, Piermont, Pomona, Sloatsburg, Spring Valley, Upper Nyack, Wesley Hills, and West Haverstraw in Rockland County and some residents of the Towns of Tuxedo and Warwick in Orange County.

There are eight of the 60 supply wells located within or near Orangetown's boundaries. These groundwater wells draw from the Newark basin aquifer, which is a fractured sedimentary bedrock aquifer. This DWSP2 plan will focus on those eight groundwater wells since Orangetown can effectively implement protection methods within its jurisdiction. The following wells are discussed in detail in the plan:

- Sparkill 8
- Sparkill 11
- Nanuet 13
- Nanuet 14
- Blauvelt 15
- Tappan 16
- Tappan 20
- Pearl River 22

This program will direct and inform sustainable future decisions on drinking water source protection so that the approximately 48,000 residents of Orangetown continue to receive reliable, high quality drinking water that meets public health and environmental standards and guidelines.

History

Prior to World War II, Rockland County was mostly rural and agricultural. Domestic water supplies were individually sourced from springs, dug wells, or shallow bedrock wells, and some villages, such as Hillburn, Nyack, Spring Valley, and Suffern, were supplied by privately owned production wells (Heisig 2010). Orangetown's water supply initially began in the mid- to late 1800s as two separate water supply companies. The Hackensack Water Company and the Spring Valley Water Works and Supply Company.

The Hackensack Water Company was founded in 1869 to supply water to the Village of Hackensack, New Jersey and later expanded to serve all of Bergen County in New Jersey. The Spring Valley Water Works and Supply Company was incorporated in 1893 for the purpose of supplying water in the Village of Spring Valley, New York.

In 1900, the Spring Valley Water Works and Supply Company was acquired by the Hackensack Water Company. Spring Valley Water Works and Supply Company continued operating under the same name in Rockland County but was now a subsidiary of the Hackensack Water Company.

By 1951, the Spring Valley Water Works and Supply Company's system was sourced from 14 wells. The principal well field was located in the Village of Spring Valley and consisted of six wells. Two additional wells were located in the hamlet of Nanuet in the Town of Clarkstown, one in the hamlet of Blaauvelt, another well in the hamlet of Tappan, three more wells in the hamlet of Sparkill, all in the Town of Orangetown, and one well in New Hempstead in the Town of Ramapo (WSA No. 2189).

Suburban development in Rockland County began after World War II, and the population of the county began to grow rapidly (Heisig 2010). Spring Valley Water Works and Supply Company submitted Water Supply Application No. 2189 to the Water Power and Control Commission on September 26, 1951, for the acquisition of land and the construction of a dam for an impounding reservoir in Rockland County (WSA No. 2189). After the decision on the application was made in 1952, construction began on Lake DeForest Reservoir and it was completed in 1956. Diversions for water began in 1965 (Heisig 2010). In 1967, Lake Tappan Reservoir was completed, flooding parts of Orangetown, to supply water to Bergen County in New Jersey.

As the population grew from the 1950s to the 1970s, new housing developments began to be supplied by new public supplies. These supplies included new deep bedrock aquifer production wells and alluvial aquifer well fields in the Mahwah River and Ramapo River valleys. A mid-1960s drought spurred the exploration for additional water supply from the bedrock aquifer, leading to the greatest increase in new production wells in Rockland County in the late 1960s to mid-1970s (Heisig 2010). The Ramapo well field was developed in the 1970s, with the last well coming online in 1981. Potake Pond reservoir was constructed in 1993 to supplement flow of water in the Ramapo River when flow is too low for the well field to operate.

The Hackensack Water Company reorganized as United Water Resources, Inc. in New Jersey on February 25, 1983. Despite the change, Spring Valley Water Works and Supply Company continued to operate under the same name in New York until 1995 when it adopted its name change to United Water New York, Inc. ("UWNY") (Public Service Commission). In 2000, Suez North America, Inc. acquired United Water Resources, Inc., but, once again, UWNY continued to operate under the same name until 2015 when it changed its name to SUEZ Water New York.

In 2006, a long-term lease was established between UWNY and the Palisades Interstate Park Commission for the use of the Letchworth Reservoirs. These reservoirs originally supplied water to the former state psychiatric institution at Letchworth Village.

Lastly, between 2021 and 2022, Veolia Environment S.A. acquired SUEZ S.A. and SUEZ Water New York. Veolia Water New York, Inc. (Veolia) became the water supplier of Rockland County (Public Service Commission).

Previous Studies

Water Resources of Rockland County, New York, 2005-07, with Emphasis on the Newark Basin Bedrock Aquifer, Scientific Investigations Report 2010-5245, Paul M. Heisig, 2010

Hydrogeology and Simulation of Groundwater Flow in Fractured Rock in the Newark Basin, Rockland County, New York, Scientific Investigations Report 2010-5250, Richard M. Yager and Nicholas M. Ratcliffe, 2010

Rockland Tomorrow: Rockland County Comprehensive Plan, March 1, 2011

Haverstraw Water Supply Project Water Supply Permit Application, AKRF, Inc., December 2011

Report on the Feasibility of Incremental Water Supply Projects and Conservation Opportunities in Rockland County, CDM Smith & AKRF, Inc., June 2015

Evaluation of the Suez Water-New York, Rockland County Water Supply, Daniel J. Van Abs, June 2016

Preliminary Assessment of the Ramapo and Hackensack Watershed in Rockland and Orange Counties, Daniel J. Van Abs, 2017

Comprehensive Water Conservation Plan, County of Rockland, March 3, 2020

Sparkill Creek Watershed Characterization Report, Hudson River Watershed Alliance, September 2024

1. Foundation and Formation

1.1 Initial Drinking Water Source Information & Maps

1.1.1 Hydrogeology of Rockland County

Rockland County is located in southern New York State and contains three major drainage watersheds, the Hackensack River, Hudson River, and Ramapo River. The Cedar Pond Brook and the Minisceongo Creek drain towards the Hudson River in the northern portion of the County and the Sparkill Creek drains towards the Hudson River in the southeastern corner of the County. The Hackensack River originates in the central portion of the county and drains the eastern lowlands area. The Pasacack Brook drains the central and south-central areas before entering the Hackensack River. The Muddy Brook is a tributary in the southern section. The Ramapo River drains the western portion of the County along with its tributary, the Mahwah River, which originates in Rockland County.

The 2018 water quality report states that, on average, about 45 inches of rain fall each year in the Hackensack River Watershed. However, according to the 2022 water quality report, the Hackensack River Watershed only received approximately 35 inches of rain.

Rockland County is geologically separated into two parts, the highlands and the lowlands, by the Ramapo and Theills faults. The highlands consist of crystalline bedrock primarily composed of gneisses and granitic rocks that are resistant to erosion, and the lowlands consist of sedimentary bedrock that generally coarsens and thickens westward. The lowlands are the northernmost extent of the Newark basin. Volcanism during basin formation resulted in the intrusion of igneous rock in the sedimentary bedrock. These units are more resistant to erosion and form the Palisades sill along the Hudson River on the eastern boundary of the county.

Unconsolidated sediment, predominately deposited by glaciers, overlays the bedrock with thin, recent alluvium deposits in river valleys. Glacial till, an unsorted mixture of sediments deposited by glacial ice, is widespread throughout the County. Stratified glacial sediments, deposited by glacial melt water or in glacial lake environments, are limited to major river valleys such as the Ramapo, Mahwah, and Hackensack Rivers and Minisceongo and lower Sparkill Creeks. Coarse-grained (sand and gravel) stratified deposits largely make up the Ramapo and Mahwah River valleys and the lower reach of the Sparkill Creek. Fine-grained (clay, silt, and fine sand) stratified lacustrine, or lake, deposits overlie coarse grained deposits in the north-south branch of the Hackensack River and the South Branch of the Minisceongo Creek valley.

This underlying geology affects the amount of water available. Coarse-grained glacial deposits form the best aquifer material. In Rockland County, these deposits are more widespread in the Ramapo River Valley. They are also present in the Mahwah River and the Sparkill Creek valleys, but in a more limited area. These aquifers derive their water by inducing flow from the rivers. Glacial till is not generally considered an aquifer on its own, but it can act as a conduit for groundwater recharge and water flow from the streams to the bedrock, particularly in stream valleys. Bedrock wells in areas of thin till are more responsive to precipitation than bedrock wells in areas of thick till.

The Newark basin aquifer is fractured sedimentary bedrock in the lowland area that provides water throughout the County. This rock consists of a combination of conglomerate, sandstone, siltstone, and mudstone. The bedrock dips approximately 10 degrees to the northwest. Groundwater flows along bedding strike, which is perpendicular to the dip, and within bedding-plane partings or fractures. The eastern area of the aquifer is characterized by lower yields. A challenge of the aquifer is to prevent the loss of existing resources from groundwater contamination. Widespread suburban development over this fractured bedrock aquifer with many areas of thin soil make it highly susceptible to contamination (Heisig 2010).

The Palisades sill has limited water bearing properties and typically only provides water for domestic use. Where the Palisades sill overlies the Newark basin aquifer, it likely prevents direct recharge to the underlying bedrock. The steep slopes of the sill drains any water down the hillslopes. Groundwater that reaches the base of the hillslopes likely drains into glacial deposits and discharges into the Hackensack River, Sparkill Creek, Minisceongo Creek, or their tributaries.

The alluvial aquifers in the Ramapo and Mahwah River valleys and the coarse-grained part of the Newark basin sedimentary bedrock in the western half of the lowlands support the most productive supply wells in the County.

1.1.2 Overview of the Water System

Orangetown's public water supply system is owned and operated by Veolia. Veolia provides water to the residents and businesses of Rockland County, excluding the Villages of Suffern and Nyack, and parts of Orange County. They also supply water for fire suppression via fire hydrants and fire system connections. Drinking water for the system is derived from 60 groundwater wells and from Lake DeForest and the Letchworth reservoirs, which are located in the Towns of Clarkstown and Haverstraw, respectively. Approximately 70% of the water supply is sources from the wells, which are located throughout Rockland County. The remaining 30% of the water supply comes from the reservoirs (2024 Water Quality Report).

Lake DeForest is a 985-acre, 5.6-billion-gallon reservoir that receives water from the headwaters of the Hackensack River. Water withdrawn from Lake DeForest is treated at the Lake DeForest Water Treatment Plant before being pumped into the water distribution system. Withdrawals from the reservoir are limited to an annual average daily withdrawal of 10 million gallons a day (mgd) by Water Supply Application (WSA) permit 2189 (Heisig 2010; Haverstraw Report 2012). According to the permit, withdrawals may exceed 10 mgd up to 20 mgd during peak conditions so long as the annual average daily yield remains at 10 mgd. The permit also stipulates that a daily average flow in the stream immediately above the Village of Nyack's water intake must be maintained at 9.75 mgd (Haverstraw Report 2012).

The Letchworth reservoirs are three reservoirs sourced by Horse Chock Brook a tributary of Minisceongo Creek. They have a total capacity of 173 million gallons. The Letchworth Water Treatment Plant treats the water from the reservoirs before it enters the distribution system. The reservoirs are typically used to provide water during the peak demand season (May through

September) (Rockland Tomorrow 2011, Heisig 2010). The Water Supply Application permit 9947 allows for a withdrawal of 1 mgd on an annual average basis, 3 mgd during peak conditions, and a maximum of 45 million gallons a month.

The Ramapo Valley Well Field consists of 10 sand and gravel wells that draw groundwater from the Ramapo Aquifer, which is hydraulically connected to the Ramapo River. Water from each well is pumped to one central pump station where the water is treated to remove volatile organic compounds and chlorinated solvents. Withdrawals are subject to Water Supply Application permit 6507 which requires maintenance of a minimum flow into the Ramapo River (8 mgd) down river from the well field to New Jersey (WSA no. 6507). When flows are below that threshold, pumping must be stopped (Heisig 2010). When the flow of water in the Ramapo River is too low for the well field to operate, water from Potake Pond is carried by pipe to Nakoma Brook, a tributary of the Ramapo River, to supplement flow. Releases are only when necessary to supplement the flow of the Ramapo River so that the well field can be used (2012 Mar 29 Haverstraw Report).

In addition to the Ramapo Well Field, 50 other wells are also in operation throughout Rockland County. These wells consist of deep bedrock wells, primarily located in the southern half of Rockland County, and shallow sand and gravel wells, primarily located near the Mahwah River, Minisceongo Creek, and Sparkill Creek. Well water is treated and collected at water storage tanks throughout Rockland County prior to distribution (2012 Haverstraw Report). Wells susceptible to contamination from surrounding development and a small number of wells (in addition to the 50 active wells) are not in use because their yield is low and their water has become contaminated (2012 Mar 29 Haverstraw Report).

Water enters the distribution system from both water treatment plants and the well pump stations and is distributed through a series of 15 pressure districts, which are areas of similar ground elevation where one common hydraulic gradient (water pressure) is maintained. Water generally is contained to its origin pressure district, however, it can be transmitted between pressure districts if brought under the correct pressure for the destination district. Orangetown is served by pressure district 10, which also services pressure districts 12 (Piermont) and 13 (Grandview-on-Hudson). Pressure district 10 receives water from:

- Spring Valley 1-4, 6, and 17,
- **Sparkill 8 and 11,**
- **Nanuet 13 and 14,**
- **Blauvelt 15,**
- **Tappan 16 and 20,**
- Bardonia 19,
- Gemonds 21,
- **Pearl River 22,**
- New City 23,
- Piermont 25,
- Norse 69,
- Elmwood 66,
- Lake Shore 73,
- West Gate 79,
- Groke 83, and
- Lake DeForest

All wells are located within the boundaries of pressure district 10, which serves Clarkstown and Orangetown, with the exception of the Spring Valley wells, which are located in the Village of Spring

Valley in the Town of Ramapo and pressure district 95. The above bolded wells are the focus of this Plan. Piermont well 25 is located in the Village of Piermont within the Town of Orangetown and is currently out of service and will remain out of service per communication with Veolia.

Water treatment processes differs whether the water is from the wells, Lake DeForest Water Treatment Plant, or Letchworth Water Treatment Plant. Water treatment is as follows:

Supply Source	Treatment
Lake DeForest Water Treatment Plant	Physical Treatment: Traveling screens, aeration (Dissolved Air Flotation (DAF)) and dual media filtration Chemical Treatment: Ozone treatment, carbon dioxide, power activated carbon, cationic polymer, aluminum sulfate, sodium hypochlorite, polyphosphates, and sodium hydroxide
Letchworth Water Treatment Plant	Chemical addition, mixing, flocculation, sedimentation, filtration, disinfection, and corrosion control
Groundwater Wells	Sodium hypochlorite for disinfection and polyphosphates for corrosion control. Some wells receive additional treatment through granular activated carbon (GAC) filtration, aeration and/or ultraviolet disinfection. Wells that are GWUDI have additional steps including ultraviolet disinfection and filtration
*Information for this table was sourced from the 2023 and 2024 Annual Drinking Water Reports for Veolia Water New York – Rockland County.	

Ozone treatment eliminates unpleasant tastes and odors caused by algae and organic contaminants. Powder activated carbon removes organic contaminants. Sodium hypochlorite is added to protect against microbiological contamination. Sodium hydroxide and polyphosphates are added to reduced corrosion of metal piping. Aeration treats groundwater contamination from gasoline, dry cleaning solvents, and other volatile organic compounds (VOCs). In 2024, there were 11 permanent GAC filtration treatment facilities and one temporary GAC filtration facility in place across various well sites to reduce certain PFAS compounds from the water. The according to Veolia’s 2nd Quarter of 2025 PFAS Progress Report following well sites have this permanent treatment facility:

- New Hempstead 18 and 24,
- Pomona 38,
- Eckerson 71,
- Eckerson 82,
- Monsey 30,
- Willow Tree 56,
- **Tappan 16 and 20,**
- Monsey 31A,
- Viola 28 and 106,
- Spring Valley Well Field
1A, 3, 4, 6, & 17,
- Birchwood 70

According to the annual water quality supplementary reports, Nanuet wells 13 and 14 have an air stripper and Blauvelt well 15 has a GAC and UV treatment system. A temporary GAC treatment system was listed as installed at Blauvelt 15 in Q4 2021 pending the installation of permanent treatment, according to the PFAS progress report for Q4 2022.

1.1.2.1 Water Demand and Losses

Water losses due to leaks, main breaks, under-registering meters, firefighting, hydrant flushing, and theft of service are common in water systems. The annual water quality reports from 2018-2024 were reviewed for information related to water production and water loss. The table below summarizes that information.

Service Year	Facts and Figures
2018	9.93 billion gallons of water was produced 27.8% of that water was non-revenue producing
2019	9.76 billion gallons of water produced 21.5% of that water was non-revenue producing
2020	9.97 billion gallons of water was produced 20.5% of that water was non-revenue producing
2021	9.7 billion gallons of water produced 20.5% of that water was non-revenue producing
2022	10.1 billion gallons of water produced 20.86% of that water was non-revenue producing
2023	9.9 billion gallons of water produced 21.2% of that water was non-revenue producing
2024	10.2 billion gallons of water produced 20.7% of the water was non-revenue producing

Rockland County’s 2020 Comprehensive Water Conservation and Implementation Plan estimated the annual average water production rate for Rockland County to be 49 mgd. Since SUEZ, now Veolia, produces an estimated 70% of the County’s daily supply, this number is SUEZ’s annual average supply rate of 34.5 mgd plus an additional 30%. Using a forecasted population estimate through 2050 and assumed system losses at 18% of the total demand, a baseline annual average water production forecast was produced. Based on that baseline demand, the County is estimated to have enough water until 2044. However, the report notes that not all of the available county supply may be readily accessible, so the County may hit the supply cap sooner.

1.1.2.2 Lead Service Line Inventory

In 2024, water systems in New York State were required to inventory their lead service lines. A summary of the inventory for Rockland County is provided in the table below and was last updated in August 2024. An interactive web map of the inventory is available at:

<https://vnagis.maps.arcgis.com/apps/webappviewer/index.html?id=240660d8f0164b0f8130255347013e9f>.

Type of Service Line	Number of Service Lines
Service Lines in the Distribution System	76,437
Identified Service Lines	54,277
Lead Service Lines	487

Galvanized Service Lines Requiring Replacement (GSLRR)	38
Non-Lead Service Line	53,752
Unknown Service Lines	22,160
Source: NYS DOH (https://www.health.ny.gov/environmental/water/drinking/service_line/NY4303673.htm)	

1.1.3 Water Quality

1.1.3.1 Finished Water

On January 7, 2021, the NYS DOH granted Veolia a deferral. This was issued because perfluorooctane sulfonic acid (PFOS) and perfluorooctanoic acid (PFOA) were found above the maximum contaminant level (MCL) of 10 parts per trillion (ppt) in the water system. When a system is issued a deferral, the water system agrees to a schedule for corrective action and compliance with the new MCLs. As part of the deferral process, Veolia submitted a detailed action plan that will ensure that the water system will meet the new State standard and has produced progress reports on achieving compliance. In exchange, the NYS DOH agrees to defer enforcement actions if the water system is meeting the established deadlines and other conditions of the deferral. On August 23, 2022, the NYS DOH renewed Veolia's deferral for an additional year.

Below is a table listing information from the Annual Water Quality Reports from 2018 to 2024.

Service Year	Contaminant in Violation	MCL	Level Detected Range	Level Detected Average	Likely Source of Contamination
2018	No reported violations ¹				
2019	No reported violations ¹				
2020	No reported violations ²				
2021	No reported violations ²				
2022	Iron	300 µg/L ³	ND – 1,110 µg/L	33 µg/L	Naturally occurring element; leaching from metal pipes
	Manganese	300 µg/L ³	ND – 1,520 µg/L	22 µg/L	Naturally occurring element; leaching from metal pipes
	Total Dissolved Solids (TDS)	500 mg/L ^{3,4}	17 – 721 mg/L	293 mg/L	Minerals and salts dissolved in the water
	No reported PFOS/PFOA violations ²				
2023	2-Butanone (Methyl Ethyl Ketone) ⁵	50 µg/L	ND – 613 µg/L	7 µg/L	Large quantities of this compound are used in the coatings industry. MEK will be discharged from this and other industrial uses.

	Acetone ⁵	50 µg/L	ND – 1,070 µg/L	0.014 µg/L	Occurs naturally and is used in production of paints, varnishes, plastics, adhesives, organic chemicals, and alcohol. Also used to clean and dry parts of precision equipment.
	Tetrahydrofuran ⁵	50 µg/L	ND – 2,450 µg/L	0.028 µg/L	Used as a monomer, a solvent for natural and synthetic resins, and a chemical intermediate.
	Perfluorooctanoic Acid (PFOA) ⁶	10 ng/L	ND – 18 ng/L	ND – 18 ng/L (Quarterly Locational Average Range)	Used in products to make them stain, grease, heat, and water resistant; Released into the environment from widespread use in commercial and industrial applications; Surfactant or emulsifier; has been used in fire-fighting foam, circuit board etching acids, alkaline cleaners, floor polish, and as a pesticide active ingredient for insect bait traps
2024	Perfluorooctanesulfonic Acid (PFOS)	10 ng/L 4 ng/L ⁷	ND – 29 ng/L	ND – 16.8 ng/L (Quarterly Locational Average Range)	Released into the environment from widespread use in commercial and industrial applications.
	Perfluorooctanoic Acid (PFOA) ⁸	10 ng/L 4 ng/L ⁷	ND – 14 ng/L	ND – 13 ng/L (Quarterly Locational Average Range)	Released into the environment from widespread use in commercial and industrial applications.

	Total Dissolved Solids (TDS)	500 mg/L ^{3,4}	29 – 808 mg/L	268 mg/L	Minerals and salts dissolved in the water.
--	------------------------------	-------------------------	---------------	----------	--

¹The U.S. Environmental Protection Agency (EPA) has established a lifetime health advisory level (HAL) of 70 parts per trillion (ppt) for PFOA and PFOS combined.

² When a public water system (PWS) is issued a deferral, the water systems agrees to a schedule for corrective action and compliance with the new PFOS, PFOA, or 1,4-dioxane MCLs. In exchange, the NYS DOH agrees to defer enforcement actions, such as assessing fines, if the PWS is meeting established deadlines. Deferral recipients are required to update the NYS DOH and the RC DOH each calendar quarter on the status of the established deadlines. The NYS DOH can resume enforcement if the agreed upon deadlines are not met.

³ Value is indicative of secondary MCL, which is specific to NY state. There is no applicable maximum contaminant level goal (MCLG).

⁴ The SMCL for TDS is a guideline, not an enforceable standard.

⁵ These contaminants were detected at a small production well’s sample tap and there is evidence that these contaminants never entered the distribution system.

⁶ This system was operating under deferral until August 25, 2023. While PFOA and PFOS levels exceeded the maximum contaminant levels (MCL) during this deferral, no violation was issued. However, some individual samples exceeded the PFOA MCL after the deferral period ended. Since the average of the initial and confirmatory samples were below the MCL, no violations were issued for these locations.

⁷EPA MCLs or MCLGs for PFOA, PFOS, PFNA, PFHxS, and Gen-X contaminants were announced on April 10, 2024. As of May 1, 2025, public water systems must meet these standards by 2029. In 2024, the New York State MCLs for PFOS and PFOA remained at 10.0 ppt. Please note, no other PFAS contaminants other than PFOA and PFOS have state issued MCLs.

⁸All compliance sampling conducted for PFOA and PFOS is addressed in the “Contaminant, Synthetic Organic” section of this table. No additional locations exceeded in the New York State MCL for PFOA under the UCMR5 sampling that were not already in violation.

The secondary maximum contaminant levels (SMCLs) for iron, manganese, and total dissolved solids were exceeded from specific sites and sampling events in 2022. Since the mentioned contaminants are standards to assist public water systems in managing their drinking water, Veolia will continue with standard monitoring and treatment.

The PFOA levels at two wells exceeded the maximum contaminant levels (MCLs) of New York State during the 4th quarter of 2023 and at multiple wells during the 1st, 3rd, and 4th quarters of 2024. PFOS levels at one well exceeded the New York State MCL during the 3rd quarter of 2024. Veolia Water New York is working with the Rockland County Department of Health on a compliance schedule that includes steps to reduce levels of PFOA. Each of the well sites are in the process of being evaluated for treatment design. Quarterly PFAS treatment project progress reports and all PFOA and PFOS exceedance public notification can be viewed at:

<https://nywq.veolianoorthamerica.com/>.

The MCLs for acetone, 2-butanone, and tetrahydrofuran were exceeded between November 21, 2023, and January 4, 2024, at one of Veolia’s small drinking water production wells. Veolia stated it is highly unlikely that water with these contaminants reached customers since evidence suggested that these contaminants originated from the sample tap and never entered the public drinking water. Customers within the hydraulically isolated zone of this well were notified of the exceedance. The sample tap was replaced on January 19, 2024, and these contaminants have been undetectable in subsequent samples.

1.1.3.2 Raw Water

The NYS DOH completed a source water assessment for the system in 2004. The assessment included a susceptibility rating for each of the wells based on the risk posed by each potential source of contamination and how easily contaminants can move through the subsurface. The susceptibility rating can be found for the wells assessed in this plan. It is noted that this susceptibility rating is an estimate of the potential for contamination of the source water but does not mean that the water is contaminated.

Well Name	Well Number	Microbials	Nitrates	VOCs	Others
Nanuet	13	MH	H	H	H
Tappan	16	MH	H	H	H
Tappan	20	MH	MH	MH	MH
Pearl River	22	MH	MH	NR	NR

Key: MH = Medium High, H = High, NR = Not Rated

The source water assessment rated the drilled wells as having high susceptibility to microbials, nitrates, and industrial solvents, and a high susceptibility to other industrial contaminants. These ratings are primarily due to the close proximity of permitted discharge facilities (industrial/commercial facilities that discharge wastewater into the environment and are regulated by the state and/or federal government) to the wells and the associated industrial activity in the assessment area. In addition, some of the wells draw from fractured bedrock and the overlying soils do not provide adequate protection from potential contamination.

This assessment also found Lake DeForest to have an elevated susceptibility to contamination due to the amount of residential land within the assessment area. Potential contamination threats include pesticides, sediments, DBP precursors, phosphorus, and microbials.

As part of Veolia's PFOA and PFOS deferral, a progress report detailing compliance and sampling testing of wells has been completed. Below is a table with the results of that testing for wells included as part of this Plan from the PFAS Progress Report 2nd Quarter of 2025. Red font denotes concentrations greater than the New York State Drinking Water Standard 10 ppt and require treatment.

Well Site	Sample Date	PFOS (ppt)	PFOA (ppt)
Tappan 20¹ Note: Well out of service Q1-23, Q2-23	10/1/2020	47	11
	10/22/2020	47	10
	1/12/2021	32	8.9
	4/14/2021	40	10
	7/8/2021	3.3	11
	10/5/2021	32	11
	1/5/2022	23	9.8
	4/11/2022	17	9.8
	8/2/2022	24	9.8
	10/18/2022	24	11
	8/23/2023	14	18
Tappan 16	10/1/2020	8.6	16

	10/14/2020	11	16
	1/12/2021	7.3	17
	4/14/2021	10	18
	7/8/2021	6.6	15
	10/5/2021	6.8	14
	1/5/2022	4	14
	4/11/2022	4.4	15
	8/2/2022	6.1	16
	10/18/2022	5.2	17
	1/17/2023	7.5	15
	5/22/2023	Lab Error (Resampled 6/13/2023)	
	6/13/2023	9.2	17
	8/1/2023	10	16
VW 16/20 POE³	10/24/2023	ND	ND
	1/30/2024	ND	ND
	4/24/2024	ND	ND
	5/21/2024	ND	ND
	7/16/2024	ND	ND
	11/5/2024	ND	ND
	1/27/2025	ND	ND
	4/7/2025	ND	ND
Blauvelt 15 Note: Well out of service Q1-22, Q1-23, Q1-25	1/13/2021	2	12
	4/14/2021	7.3	17
	4/28/2021	8.3	17
	7/8/2021	8.3	18
	12/2/2021 ²	ND	ND
	4/11/2022	4.4	15
	8/2/2-22	ND	ND
	10/25/2022	ND	ND
	5/8/2023	ND	ND
	8/1/2023	10	17
	10/24/2023 ³	ND	ND
	3/12/2024 ³	ND	ND
	3/26/2024 ³	ND	2.7
	4/24/2024 ³	ND	4.5
	5/21/2024 ³	ND	6.0
	8/27/2024 ³	ND	ND
11/5/2024 ³	ND	ND	
4/10/2025 ³	ND	ND	

¹Tappan 20 (SW 20/VW 20) has been shut down for many years and will not be used until treatment is installed.

²Blauvelt 15 (SW 15/VW 15) PFOA & PFOS results were non-detect after implementation of treatment upgrades in Q4-21.

³Several systems were placed into service in Q3 and Q4 2023. Data reflects point of entry (POE), which is after treatment only. Individual wells that are part of a larger wellfield are not individually depicted due to ease of understanding for compliance. Raw water date is represented in the Supplemental Report.

1.1.4 References

Documentary History of American Water-works: <http://www.waterworkshistory.us/NY/>

Veolia PFAS Progress Reports 2022-2025: <https://nywq.veolianoorthamerica.com/>

Veolia Water Annual Water Quality Reports: <https://mywater.veolia.us/weir-river-water-system/water-in-my-area/water-quality-reports>

Veolia Water Withdrawal Annual Reports: <https://extapps.dec.ny.gov/data/IF/WWR/WWR0001591/>

NYS Public Service Commission:

<https://documents.dps.ny.gov/public/Common/AdvanceSearch.aspx>

Water Supply Application No. 2189

Water Supply Application No. 4925

Nuclear Regulatory Commission: <https://adams-search.nrc.gov/>

Haverstraw Report 2012: <https://www.nrc.gov/docs/ML1209/ML12090A522.pdf>

Heisig 2010

Rockland Tomorrow 2011

United Water Long Term Water Supply Project: <https://nyacknewsandviews.com/wp-content/uploads/2008/09/unitedwaterplan.pdf>

Rockland County Water Conservation Plan:

<https://www.rocklandcountyny.gov/home/showpublisheddocument/1600/638216457160400000>