Town of Orangetown

Drinking Water Source Protection Program (DWSP2) Plan

Veolia Water New York – Rockland

PWS ID: NY4303673

Prepared for:

Town of Orangetown

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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 "Framework"). The Framework is currently on Version 1, which was published on December 18, 2019. The following phases and key components from the Framework were used in development of this plan:

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

The Orangetown DWSP2 Plan (the "Plan") was prepared by the HVRC for the Town of Orangetown, in collaboration with a local stakeholder group, which includes representatives from:

- Veolia Water New York ("Veolia")
- Rockland County Task Force on Water Resources Management
- Rockland County Department of Health
- Rockland County Department of Planning
- Town of Clarkstown
- Village of Piermont
- Orangetown Environmental Committee

- Lamont-Doherty Earth Observatory,
- Sustainable Piermont
- Sparkill Creek Watershed Alliance
- Riverkeeper
- Cornell Cooperative Extension Rockland County

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 eight groundwater wells that are part of the Veolia New York – Rockland public water supply system and located within or near Orangetown's boundaries. 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 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 334,500 residents across Rockland and Orange Counties. Including residents of the Towns of Tuxedo and Warwick in Orange County, and residents of the following municipalities in Rockland County:

- Town of Clarkstown
- Town of Haverstraw
- Town of Orangetown
- Town of Ramapo
- Town of Stony Point
- Village of Airmont
- Village of Chestnut Ridge
- Village of Grand View-on-Hudson
- Village of Haverstraw
- Village of Hillburn
- Village of Kaser
- Village of Montebello
- Village of New Hempstead
- Village of New Square
- Village of Piermont
- Village of Pomona
- Village of Sloatsburg
- Village of Spring Valley
- Village of Upper Nyack
- Village of Wesley Hills
- Village of West Haverstraw

This Plan will direct and inform sustainable future decisions on drinking water protection so that the approximately 48,000 residents of Orangetown shall continue to receive reliable, high quality drinking water that meets public health and environmental standards and guidelines. Of Veolia's 60 supply wells, there are eight located within or near Orangetown's boundaries. These groundwater wells draw from the Newark basin aquifer, which is a fractured sedimentary bedrock aquifer. The Plan will focus on those eight groundwater wells because Orangetown can effectively implement

the Plan's management and protection methods within its jurisdiction. The following wells are discussed in detail:

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

Drinking Water Source History

In the late 1800s and early 1900s, Rockland County consisted of mostly rural and agricultural lands. Domestic water supplies were individually sourced from springs, dug wells, or shallow bedrock wells. 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 under the Transportation Corporations Law 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 wholly owned subsidiary of the Hackensack Water Company. This merger gave the Hackensack Water Company control over much of the Hackensack River watershed.

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 Town of Clarkstown (Hamlet of Nanuet), five additional wells in the Town of Orangetown (one in the Hamlet of Blauvelt, another well in the Hamlet of Tappan, three more wells in the Hamlet of Sparkill), and one additional well in the Village of New Hempstead (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, with diversions for water did not begin until 1965 (Heisig 2010). The original Lake DeForest Treatment plant was constructed in the 1960s (Rockland County Business Journal, 2021). 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 unconsolidated sediment (sand and gravel) aquifer well fields in the Mahwah River (1961) and Rampo River (1979) 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 would otherwise be 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 in the Town of Haverstraw.

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

Below is a list of previous studies in Orangetown and Rockland County:

- Water Shortages, Development, and Drought in Rockland County, New York, Journal of the American Water Resources Association, Bradfield Lyon, Nicholas Christie-Blick, and Yekaterina Gluzberg, December 2005
- 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, Richad 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
- Water Losses and Customer Water Use in the United Water System, Amy Vickers & Associates, Inc., Amy Vickers, July 2015

- Independent Review, Review of July 2015 Report Entitled "Water Losses and Customer Water Use in the United Water New York System," Prepared by Amy Vickers & Associates, Inc., Ove Arup & Partners P.C., August 4, 2015
- Preliminary Assessment of the Ramapo and Hackensack Watersheds in Rockland and Orange Counties, Daniel J. Van Abs, Jennifer Ryan, and Mukta Ramola, 2017
- Comprehensive Water Conservation Plan, Rockland County, Rockland County Task Force on Water Resources Management and Jacobs Civil Consultants, Inc., March 3, 2020
- Resilient NY Studies
    - Flood Mitigation & Resilience Report Mahwah River, November 2021
    - Flood Mitigation & Resilience Report Sparkill Creek, January 2022
    - Flood Mitigation & Resilience Report Hackensack River, February 2022
    - Flood Mitigation & Resilience Report Minisceongo Creek, April 2022
    - Flood Mitigation & Resilience Report Saddle River Watershed, June 2022
    - Flood Mitigation & Resilience Report Ramapo River, May 2023
- Orangetown Comprehensive Plan, Town of Orangetown, AKRF, MUD, September 2023
- Sparkill Creek Watershed Characterization Report, Hudson River Watershed Alliance, September 2024
- Multi-Jurisdictional Hazard Mitigation Plan, Rockland County, New York, Tetra Tech, October 2024

1. Foundation and Formation

Orangetown is the southernmost town in Rockland County, bordered to the east by the Hudson River, to the south by New Jersey, to the west by the Town of Ramapo, and to the north by the Town of Clarkstown. The Villages of Nyack and Piermont and the Hamlets of Blauvelt, Orangeburg, Palisades, Pearl River, South Nyack, Sparkill, Tappan, and Upper Grandview are located within Orangetown. The Town has approximately 48,000 residents and encompasses a total area of 31.4 square miles (Rockland County Hazard Mitigation Plan, 2024).

The Hackensack River and the Sparkill Creek are the two major watersheds that pass through the Town. The Hudson River watershed encompasses a small portion of the Town's eastern boundary. Water supply in Orangetown is mainly sourced from the Newark basin aquifer. Lake Tappan, located along Orangetown's southern border, provides drinking water to New Jersey and is privately owned by Veolia.

Through this lens, existing conditions were reviewed, and stakeholders were selected to participate in the DWSP2 process. This was a key initial step in defining the goals and vision for Orangetown's Plan. The goals form the basis for the assessment and identified management methods.

1.1 Drinking Water Source Information & Geological Setting

This Plan focuses on Orangetown and the groundwater supply wells within or near Orangetown's boarders. However, since Veolia's system sources and distributes water from a broader area throughout Rockland County, this first Chapter will discuss water resources on a countywide scale for context before narrowing down to Orangetown for more robust analysis.

1.1.1 Geology & Hydrogeology of Rockland County

1.1.1.1 Geologic Overview

Rockland County is geologically separated into two parts, the highlands and the lowlands, by the Ramapo and Theills faults. The Ramapo and Theills faults are normal faults, which caused the lowlands side of the fault to dip downwards. 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 the generally coarsens and thickens westward. The lowlands are the northernmost extent of the Newark basin. Volcanism during the formation of the basin resulted in the intrusion of igneous rock in the sedimentary bedrock. Igneous rock is more resistant to erosion and form the Palisades sill along the Hudson River to the east. Figure 1 shows the location of the highlands and lowlands in Rockland County, the Ramapo and Theills faults, and the general bedrock type and location (Heisig, 2010).

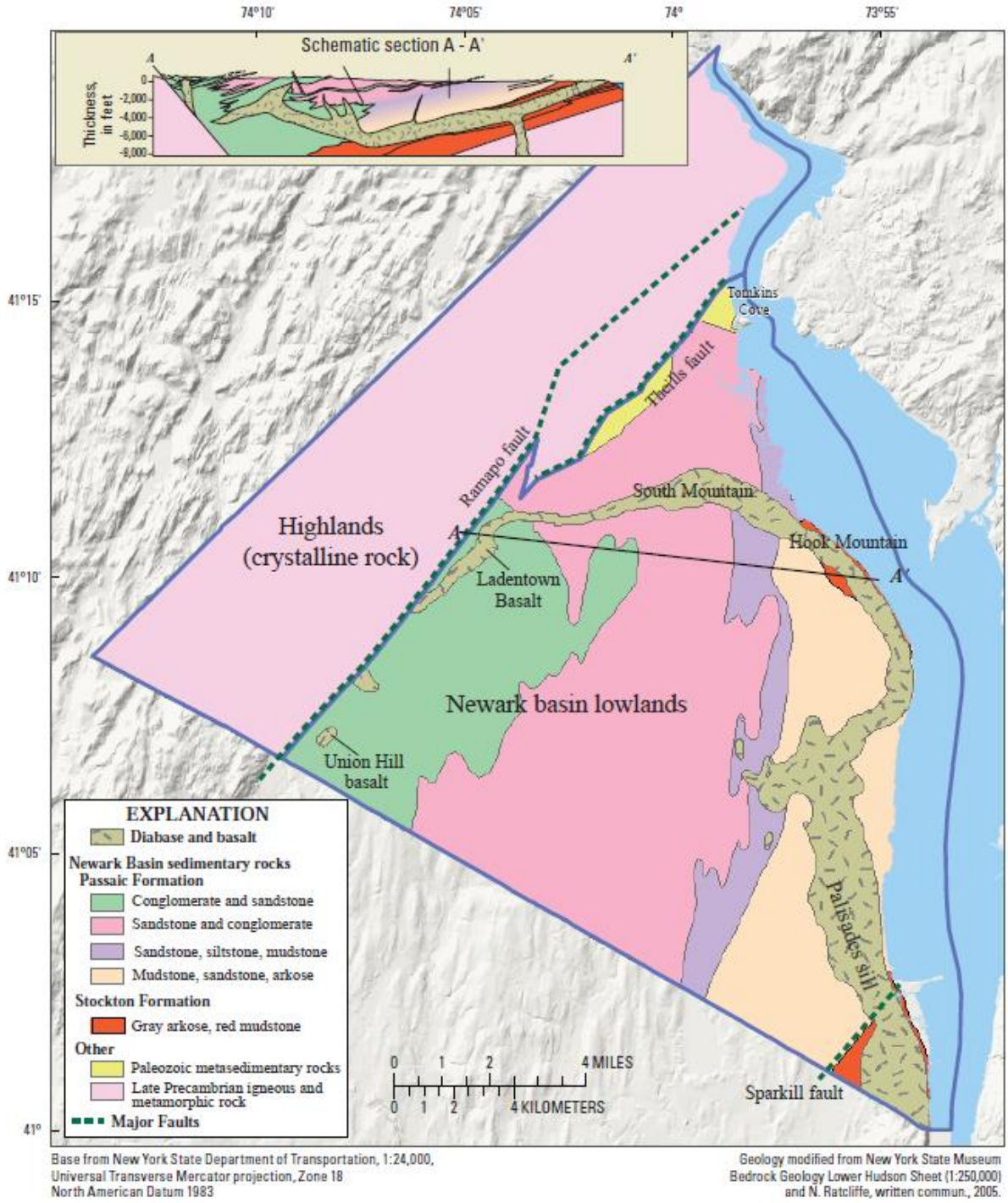

Figure 1: Generalized bedrock geologic map with schematic section, Rockland County, New York

Source: Heisig 2010, Fig. 6

1.1.1.2 Unconsolidated Sediment Aquifers

In the lowlands, unconsolidated sediment, predominately deposited by glaciers, overlays the bedrock with thin, recent alluvium (loose sediment) 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 located in major river valleys such as the Ramapo, Mahwah, and Hackensack Rivers and Minisceongo and lower Sparkill Creeks. Coarse-grained (sand and gravel) stratified deposits make up a large portion of the Ramapo and Mahwah River valleys and the lower end of the Sparkill Creek. Fine-grained (clay, silt, and find sand) stratified lacustrine (lake deposited) deposits overlie coarse grained (sand and gravel) deposits in the north-south branch of the Hackensack River and the South Branch of the Minisceongo Creek valley (Heisig, 2010).

This overlying geology affects the amount of water available. Coarse-grained glacial deposits form the best aquifer material for storing and transmitting water. In Rockland County, these deposits are widespread in the Ramapo River Valley but are more limited in extent in the Mahwah River and the Sparkill Creek valleys. These aquifers obtain 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 (Heisig, 2010).

1.1.1.3 Bedrock Aquifers

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 due to the nature of the normal faults. Groundwater flows along bedding strike (northeast or southeast), which is perpendicular to the dip, and within bedding-plane partings or fractures. The eastern area of the aquifer, which includes Orangetown, is characterized by lower yields. A challenge of the aquifer is preventing the loss of existing resources from groundwater contamination. There are widespread suburban development and many areas of thin soil over the aquifer, which make it highly susceptible to contamination (Heisig, 2010).

The Palisades sill has limited water baring 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 (Heisig, 2010).

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 (Heisig, 2010).

1.1.1.4 Orangetown

The Town of Orangetown has steep slopes to the east, which are part of the Palisades sill, that taper out to more gentle plains and hills towards the west. The highest point in the Town is at 675 feet

located in the Palisades sill, and the lowest point is at sea level along the Hudson River. Steep slopes are vulnerable to erosion, landslides, and subsidence, which can endanger communities, water quality, and infrastructure. Because of this, Orangetown has designated some of the areas of the steep slopes as Critical Environmental Areas (CEAs). Other areas in Orangetown have been designated as a CEA for their open space and esthetic value, including:

- Portions of the former Village of South Nyack
    - South Nyack Mountainous Area CEA (for steep slopes, natural, aesthetic, historic, archeological, and recreational significance)
    - Hudson River CEA (aesthetic, historic, ecological, geological and hydrological sensitivity)
- The Hamlet of Upper Grandview and environs (for exceptional or unique character)
- Palisades slope area (for protection of open space and aesthetic)
- Sparkill Creek area (for protection of open space and aesthetic beauty)
- The pier areas of Piermont (for protection of open space and aesthetic beauty)

1.1.1.5 Watersheds

Rockland County contains three major drainage watersheds, the Hackensack River, Hudson River, and Ramapo River. The minor watersheds of Cedar Pond Brook and 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 center of the county and drains the eastern lowlands area. The minor watershed of the Pasacack Brook drains the central and south-central areas before entering the Hackensack River, and the Muddy Brook is a southern tributary. The Ramapo River drains the western portion of the County along with its tributary, the Mahwah River, which originates in Rockland County. Figure 2, from Heisig (2010), depicts the location of these watersheds (Heisig, 2010).

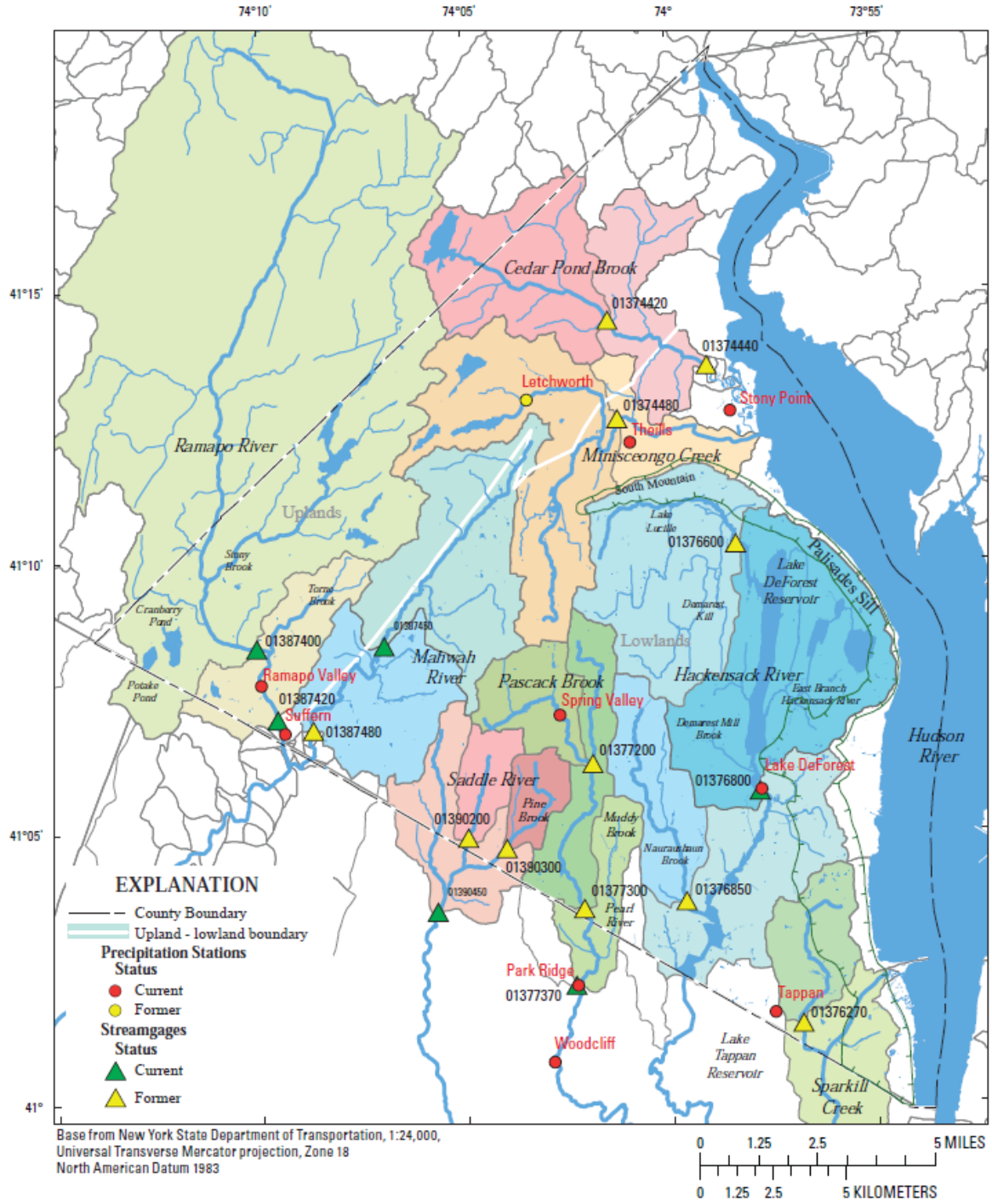

Figure 2: River and stream drainages in Rockland County, New York, with current and former precipitation stations and stream gages (denoted with U.S. Geological Survey site identification number).

Source: Heisig 2010, Fig. 5

Major waterbodies in the Town of Orangetown include Lake Tappan, Hackensack River, Sparkill Creek, Nauraushaun Brook, Muddy Creek, and the Pasacak Brook. Orangetown also has a considerable number of wetlands, many of which are recognized by the NYSDEC and the National Wetlands Inventory. Piermont Marsh is the largest riparian marsh in Orangetown. Wetland locations are depicted in Figure 4, sourced from Orangetown's 2023 Comprehensive Plan (Orangetown Comprehensive Plan, 2023).

1.1.1.6 Precipitation

In 2015, SUEZ (now Veolia) began reporting monthly precipitation totals at Lake DeForest. Based on that data, an average of 48 inches of precipitation fell per year over the ten-year-period from 2014 to 2024. The monthly mean precipitation over that same period ranged from 2.83 inches to 5.56 inches, with February seeing the lowest average monthly precipitation and July seeing the highest. This is similar to the 2005 to 2007 lowlands mean annual precipitation of approximately 47 inches reported by Heisig (2010). Lower precipitation totals were reported between 2015 and 2017 when an average of 38 inches of precipitation fell at Lake DeForest per year. Yearly totals are reported in the table below.

Year	Total Precipitation (inches)
2014	46.89
2015	38.42
2016	36.08
2017	39.45
2018	66.47
2019	54.48
2020	44.92
2021	48.86
2022	47.46
2023	57.37
2024	48.45
Source: UWNY, SUEZ, Veolia Annual Demand Reports	

One of the most significant environmental concerns in Orangetown is flooding. It is estimated that 26.1 percent of the Towns's land area is under high flood risks (Orangetown Comprehensive Plan, 2023; Rockland County Hazard Mitigation Plan, 2018). According to the 2024 Rockland County Hazard Mitigation Plan, approximately 6.4% of Orangetown's land, excluding waterbodies, is located in the 1-percent annual chance flood event zone, and 8.4% is located in the 0.2-percent annual chance flood event zone. This correlates with 0.5% and 2.3% of Orangetown's population, respectively. Figure 3, from the 2024 Rockland County Hazard Mitigation Plan, shows the locations of those two annual chance flood event zones.

Flooding in Orangetown is aggravated by overwhelmed stormwater infrastructure, increasing areas of impervious surfaces, and development that predates stormwater regulations, such as on steep slopes.

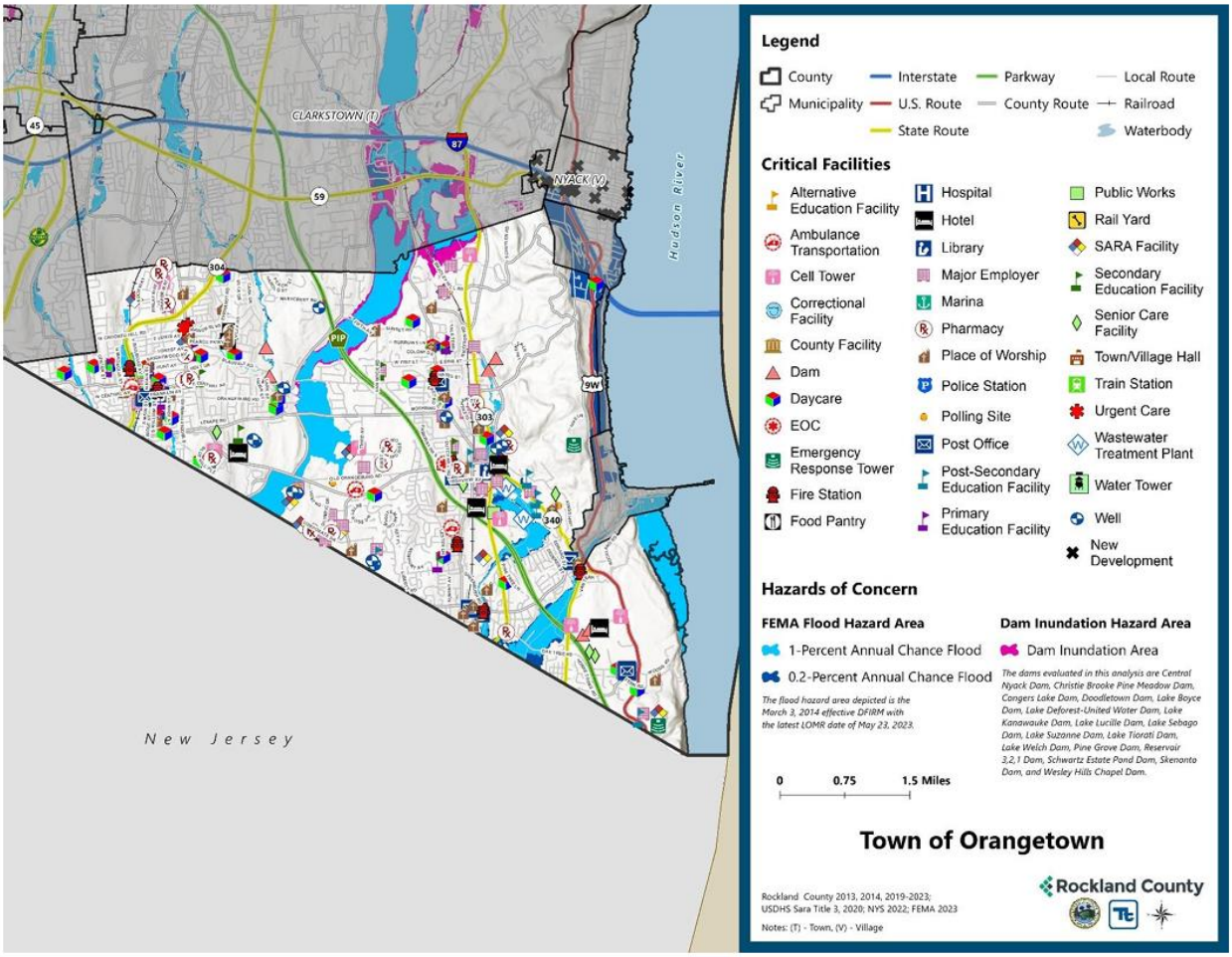

Figure 3: Town of Orangetown Flood and Dam Inundation Hazard Area Extent and Location

Source: Rockland County 2024 Hazard Mitigation Plan, Fig. 9.14-1

1.1.2 Land Use in Rockland County

Land use in Rockland County was historically primarily agricultural, with localized industry and development in villages. After World War II, there were major improvements to roads and bridge networks. The New York State Thruway and Tappan Zee Bridge (now Governor Mario M. Cuomo Bridge) opened in 1955, connecting Rockland County to Westchester County and New York City. This brought upon suburban expansion in the County, shifting land use from primarily agricultural to primarily residential and commercial. The highlands portion of Rockland County remains largely preserved as forested land after Harriman State Park was acquired in 1900 (Rockland Tomorrow, 2017; Van Abs, 2017). Parkland is the single largest land use in the County, comprising of 176 square miles, or just over one third of the county's total land area. This includes Harriman State Park and a 33-mile strip of green spaces along the Hudson River (Rockland Tomorrow, 2011).

The Ramapo and Hackensack watersheds are two of the major water sources for the Veolia system. The Ramapo watershed is largely preserved by state park. The New York State Thruway bisects the

watershed through a narrow valley called the Ramapo Pass. Commercial and residential land uses are concentrated around the Villages of Suffern and Hillburn. The Hackensack watershed, which consists of the Towns of Clarkstown and Orangetown, is largely made up of single-family housing. Major roadways in the watershed are the New York State Thruway and the Palisades Parkway. Denser areas of residential and commercial land uses are supported in the Villages and there are pockets of industrial land use throughout. There is very little undeveloped land left in the watershed (Van Abs, 2017).

According to the 2023 Orangetown Comprehensive plan, in Orangetown, there are nine main categories of land use:

- Single-family residential
- Multi-family residential
- Commercial
- Institutional
- Industrial
- Infrastructure (public works)
- Recreation & entertainment
- Vacant land
- Public parks & open space

The table below shares a breakdown of the acres and percentage of Orangetown that each land use type encompasses for the years 2010 and 2020. The data was compiled for Orangetown's 2023 Comprehensive Plan from the New York State Tax Parcels Data Set.

Land Use Type	2010		2020	
	Acres	Percentage	Acres	Percentage
Commercial	764	5.9	897	6.9
Institutional	1,152	8.9	1,216	9.3
Industrial	505	3.9	622	4.8
Infrastructure	161	1.2	161	1.2
Recreation & entertainment	854	6.6	884	6.8
Residential	5,081	39.4	5,073	39.0
Vacant land	2,052	15.9	1,912	14.7
Public parks & open space	2,320	18.0	2,248	17.3
Total	12,889	100	13,013	100

Source: Orangetown's 2023 Comprehensive Plan

The installation of sanitary sewer systems and increases in impervious surface and storm sewers has reduced recharge to the groundwater aquifer exporting wastewater from the County. Roughly 42 percent of the population was served by sewers in the early 1960s (Ayer and Pauszek, 1963), but by 2010, nearly the entire population have been connected to the sewer system. Wastewater is routed to wastewater treatment plants and then discharged to the Hudson or Ramapo Rivers, which transports it out of the County. Water can also be lost through stormwater sewer systems that route stormwater runoff from paved surfaces and sloped lawns to local streams and ultimately out of the County (Heisig, 2010).

Impervious surfaces in Orangetown include roadways, parking lots, and buildings, and tend to be concentrated in Villages and Hamlets. Many of these surfaces are in proximity to waterbodies, which may lead to contaminated runoff flowing into the waterbodies.

Flooding in developed areas also contributes to pollutants entering and degrading the Town's waterbodies. Much of the floodwater is untreated and carries with it surface pollutants and debris, such as traces of gasoline, lawn care chemicals, microplastics, and street litter. Figure 4 shows the location of wetlands, flood zones, and impervious surfaces in Orangetown (2023 Orangetown Comprehensive Plan).

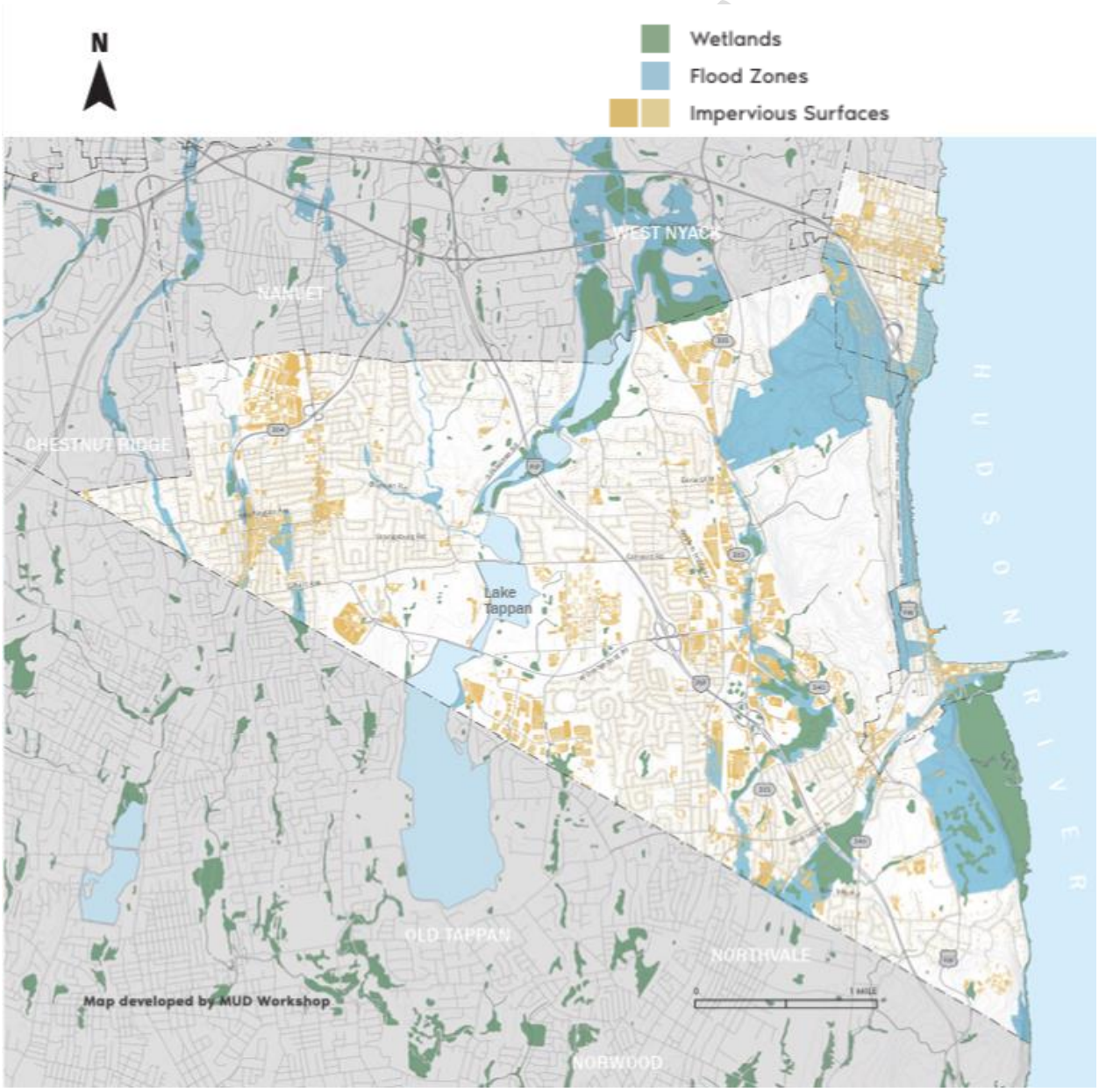

Figure 4: Impervious Surfaces, Wetlands, and Flood Zones

Source: 2023 Orangetown Comprehensive Plan, Fig. 7-6

The Town of Orangetown has a number of land development and environmental regulations in place to protect historic and natural resources, quality of life, and environmentally sensitive areas. Three of these regulations are related to protecting water resources in the Town. Two of these regulations are related to stormwater management and sediment and erosion control (Orangetown Comprehensive Plan, 2023).

Chapter 30C of the Town Code regulates the discharge of any materials other than stormwater into the municipal storm sewer system (MS4), apart from certain materials outlined in the Town Code. Methods for controlling the introduction of pollutants into the MS4 are also listed in this chapter to comply with the Town's State Pollutant Discharge Elimination System (SPDES) permit (Orangetown Comprehensive Plan, 2023).

Chapter 30D of the Town Code includes an ordinance which states that no land development application can be approved by the Town without an established stormwater pollution prevention plan. The Town adopted this ordinance after it determined that increases in impervious surfaces, stormwater runoff, clearing and grading, and improper design and construction of stormwater management practices were negatively impacting the Town (Orangetown Comprehensive Plan, 2023).

Chapter 41 of the Town Code prevents anyone from diverting any watercourse within the Town without first obtaining a permit from the Town Board. It also establishes water quality standards to protect streams from pollution and requires a permit from the Department of Public Works (DPW) for the discharge of any liquid into a stream, drain, or watercourse, other than from a one- or two-family dwelling (Orangetown Comprehensive Plan, 2023).

1.1.3 Overview of the Water System

Orangetown's public water supply system is owned and operated by Veolia (public water supply (PWS) ID NY4303673). Veolia provides water though approximately 78,900 residential and business service connections serving about 334,500 people throughout Rockland County and municipalities in Orange County. They also supply water for fire suppression via fire hydrants and fire system connections in the same footprint. This excludes the Villages of Suffern and Nyack. Approximately 70% of the drinking water supply is derived from 60 groundwater wells, with the remaining 30% from Lake DeForest and Letchworrth reservoirs, located in Towns of Clarkstown and Haverstraw, respectively (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 the 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 system. The reservoirs are typically used to provide water during the peak demand season of 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. Withdrawals are subject to Water Supply Application permit 6507 which requires a minimum flow to be maintained in the Ramapo River (8 MGD) down river from the well field to the New Jersey boarder (WSA no. 6507). When flows are below that threshold, pumping must be stopped (Heisig 2010). Water from Potake Pond, piped to Nakoma Brook, a tributary of the Ramapo River, can be used to supplement the flow of the Ramapo River so that the well field may remain operable during these periods. Water Supply Application permit 8620 permits the release of water from Potake Pond at a rate of 10 MGD or less so long as the water level in the pond does not fall below the upper 7 feet (2012 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 and sand and gravel wells which are primarily located near the Mahwah River, Minisceongo Careek, and Sparkill Creek. Well water is treated and collected at water storage tanks throughout Rockland County prior to distribution. Well water is susceptible to contamination from surrounding development. There are a few wells, in addition to the 50 active wells, that are not currently in use because their yield is low and/or their water is contaminated (2012 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, or 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
- New City 23
- Piermont 25
- Norse 69
- Elmwood 66
- Lake Shore 73
- West Gate 79

- Gemonds 21
- **Pearl River 22**
- Groke 83
- Lake DeForest

The bolded wells are the focus of this Plan. 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. 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.

1.1.3.1 Water Treatment

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 and polyphosphates 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

Source: 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 reduce corrosion of metal piping. Aeration, or air strippers, treats groundwater contamination from gasoline, dry cleaning solvents, and other volatile organic compounds (VOCs). Granular activated carbon (GAC) filtration reduces certain per- and polyfluoroalkyl substances (PFAS) from the water. In 2024, there were 11 permanent GAC filtration treatment facilities and one temporary GAC filtration facility in place across various well sites. The according to Veolia's 2nd Quarter of 2025 PFAS Progress Report following well sites have this permanent treatment facility, the bolded wells are focused on in this Plan:

- 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.

1.1.3.2 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. This is reported as non-revenue producing water. 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
Source: SUEZ, Veolia 2018-2024 Annual Water Quality Reports	

According to Van Abs, Ryan, and Ramola (2017), average demand in the SUEZ NY, now Veolia, system was 29.4 MGD from 2000 to 2009 but fell to roughly 28 MGD from July 2015 to June 2017. Using data from SUEZ and Veolia's annual demand reports, average demand was approximately 27 MGD from 2018 to 2024. Van Abs, Ryan and Ramola (2017) reported that single-family residential, commercial, and industrial demand accounts for 75 percent, 21 percent, and 4 percent of metered water demands, respectively. Towns like Orangetown, Clarkstown, and Stony Point see greater summer demand increases than Ramapo and Haverstraw.

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.

1.1.3.3 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)*

1.1.4 Water Quality

The wells in Orangetown source their water from the Newark basin aquifer. Suburban development and areas of thin overlying sediment have made the aquifer susceptible to contamination (Heisig, 2010). This section will discuss the finished water, or water quality after treatment, from Veolia's annual water quality reports. It will also discuss available information on raw water, or water quality prior to treatment, from the wells in Orangetown.

1.1.4.1 Finished Water

On January 7, 2021, the NYSDOH granted Veolia a deferral 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 NYSDOH 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 NYSDOH 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.

[1]The 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-dioxance 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.
[7]EPA 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.
[8]All 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.veolianorthamerica.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.

1.1.4.2 Raw Water

The NYSDOH 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 walls 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 20[1] 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 POE[3]	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	1/13/2021	2	12
	4/14/2021	7.3	17

Note: Well out of service Q1-22, Q1-23, Q1-25	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

[1]Tappan 20 (SW 20/VW 20) has been shut down for many years and will not be used until treatment is installed.
[2]Blauvelt 15 (SW 15/VW 15) PFOA & PFOS results were non-detect after implementation of treatment upgrades in Q4-21.
[3]Several 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.

1.1.5 References

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

Haverstraw Water Supply Project Water Supply Permit Application, 2012: https://www.nrc.gov/docs/ML1209/ML12090A522.pdf

Heisig, 2010: https://pubs.usgs.gov/sir/2010/5245/

Lyon, Christie-Blick, and Gluzberg, 2005: https://doi.org/10.7916/D81N8B4V

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

NYS Public Service Commission: https://documents.dps.ny.gov/public/Common/AdvanceSearch.aspx

- Water Supply Application No. 2189
- Water Supply Application No. 4925

Orangetown Comprehensive Plan, 2023: https://www.orangetown.com/wp-content/uploads/2023/10/2023-10-12_Orangetown-Comp-Plan.pdf

Resilient NY Flood Mitigation & Resilience Reports: https://dec.ny.gov/environmental-protection/water/water-quantity/resilient-ny

Rockland Tomorrow – Comprehensive Plan, 2011: https://www.rocklandcountyny.gov/home/showpublisheddocument/1554/638216350420970000

Rockland County Water Conservation Plan, 2020: https://www.rocklandcountyny.gov/home/showpublisheddocument/1600/638216457160400000

Rockland County Hazard Mitigation Plan, 2024: https://rocklandhmp.com/final-plan/

Sparkill Creek Watershed Characterization Report, 2024: https://hudsonwatershed.org/wp-content/uploads/Sparkill-Creek-Watershed-Characterization-Report.pdf

United Water Long Term Water Supply Project, 2007: https://nyacknewsandviews.com/wp-content/uploads/2008/09/unitedwaterplan.pdf

Van Abs, Ryan, and Ramola, 2017: https://www.rocklandcountyny.gov/home/showpublisheddocument/1642/638216468082100000

Veolia PFAS Progress Reports 2022-2025: https://nywq.veolianorthamerica.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/

Vickers, 2015: https://www.scenichudson.org/wp-content/uploads/legacy/7.22.15_Report-Water_Losses_and_Customer_Water_Use_in_the_United_Water_NY_System.pdf

Yager & Ratcliffe, 2010: https://pubs.usgs.gov/sir/2010/5250/

1.2 Form a Stakeholder Group

The Framework requires the formation of a knowledgeable stakeholder group to guide the development and implementation of the Plan. The stakeholder group provides local knowledge and perspective on the water source and the threats it faces. Members of the stakeholder group were invited to join the DWSP2 process based on the initial information uncovered about the water source. A list of stakeholders and their affiliations can be found in section 1.2.1. Regular meetings were held with the group to work through the key components of the Framework. The stakeholder group established the goals and vision statement, provided knowledge and input on the source water maps, potential contaminant sources, and the protection and management methods. A list of meeting dates and the topics covered can be found in section 1.2.2.

1.2.1 List of Stakeholder Group Members

Member Name	Relevant Role and Affiliation
Teresa Kenny	Supervisor, Town of Orangetown
Allison Kardon	Confidential Secretary to the Supervisor, Town of Orangetown
Jim Dean	Superintendent of Highways, Town of Orangetown Highway Department
Tomas Hughes	Member, Sustainable Piermont Climate Action Committee
Nicole Laible	Task Force Coordinator, Rockland Task Force on Water Resources Management, Rockland County Department of Health, Environmental Health
Audrey Lupachino	Planning Assistant, Land Use Boards, Orangetown
Stephen Munno	Senior Administrative Assistant, Town of Orangetown Highway Department
Rick Oliver	Acting Director of Office of Building, Zoning, Planning, Administration and Enforcement (OBZPAE), Orangetown
Ariana Polanco	Task Force Water Conservation Coordinator, Rockland Task Force on Water Resources Management, Rockland County Department of Health, Environmental Health
Eamon Reilly	Commissioner, Town of Orangetown Department of Environmental Management and Engineering (DEME)
Shannon Roback	Science Director, Riverkeeper
Sophia Salis	Manager of Communications and Community Relations, Veolia
Richard Schiafo	Deputy Commissioner, Rockland County Department of Planning
Colin Schmitt	Director of Finance, Chief of Staff, Town of Clarkstown
Donald Steinmetz	Member, Orangetown Environmental Committee
Margie Turrin	Director of Educational Field Programs, Lamont-Doherty Earth Observatory of Columbia University
Larry Vail	Sparkill Creek Watershed Alliance

Thank you to Bill Madden from Veolia, Nate Mitchell from the Village of Piermont, and Jane Slavin from the Town of Orangetown who participated in the Orangetown DWSP2 Committee at the start of the project.

1.2.2 Meeting Schedule

Date	Topics Covered
6/27/2024	Overview of DWSP2, Discussion of Goals and Vision for the plan.
9/18/2024	Continued discussion on Goals and Vision for the plan, Began discussion on mapping and potential contaminant sources.
12/2/2024	Continued discussion on mapping and potential contaminant sources. Draft source water protection maps were shared and stakeholder group provided feedback on the maps and added additional context for potential sites of interest.

2/3/2025	Discussion of potential contaminant sources in the source watershed and implementation actions that could be used to address those sources. Continued discussion on draft source water protection maps.
3/14/2025	Reviewed and finalized goals and vision statement. Continued discussion on potential contaminant source list and source water protection maps.
4/14/2025	Began discussion of draft project profiles. Reviewed the agreed upon actions and began to flush out the details regarding potential partners, costs, and implementation steps.
6/4/2025	Continued review of draft source water protection maps. Discussed formatting of maps and labeling of key features.
7/15/2025	Continued review of draft project profiles. Expanded upon the details of project profiles 1-3, including updated descriptions, costs, and implementation steps.
8/19/2025	Finished reviewing draft project profiles 4 and 5, including updated descriptions and added resources. Discussed the review timeline for the whole DWSP2 plan. Began discussion on the introduction and first chapter of the plan.
10/7/2025	

1.3 Formulate a Vision and Establish Goals

The stakeholder group met to establish goals and formulate a vision for Orangetown's DWSP2 plan. The following goals were established and used as a framework for developing the plan:

1. *Enhance community education on known contaminants and their potential impact on the water supply*
2. *Establish shared outreach and messaging campaigns with other Rockland municipalities served by the water systems in Orangetown.*
3. *Evaluate current land use and plan for future land use within the source water protection areas*

During the discussion of Orangetown's goals, a vision statement arose. The statement reads:

"The Town of Orangetown, in collaboration with Veolia Water and neighboring municipalities, is committed to establishing a comprehensive drinking water protection program that includes groundwater sources. This program will direct and inform sustainable future decisions on drinking water source protection so that the residents of Orangetown continue to receive reliable, high quality drinking water that meets public health and environmental standards and guidelines."