

A large teal graphic element on the left side of the page, consisting of a triangle pointing upwards at the top, a horizontal line, and a vertical rectangle below it, with a diagonal cutout on the right side.

# **Ridgewood Water - PFAS Planning and Treatment Study**

May 26, 2020



Mott MacDonald  
111 Wood Avenue South  
Iselin  
NJ 08830-4112  
United States of America

T +1 (800) 832 3272  
mottmac.com

Ridgewood Water  
131 North Maple Avenue  
Ridgewood, NJ 08541

# **Ridgewood Water - PFAS Planning and Treatment Study**

May 26, 2020





# Issue and revision record

Revision	Date	Originator	Checker	Approver	Description
00	02/05/20	ASK	SBP	ECS	FINAL DRAFT
	04/10/20	ASK	SBP	ECS	FINAL
	04/28/20	ASK	SBP	ECS	FINAL (Rev 1)
	05/26/20	ASK	SBP	ECS	FINAL (Rev 2) - REDACTED

**Document reference:** 403527 | 01 |

**Information class:** Standard

This document is issued for the party which commissioned it and for specific purposes connected with the above-captioned project only. It should not be relied upon by any other party or used for any other purpose.

We accept no responsibility for the consequences of this document being relied upon by any other party, or being used for any other purpose, or containing any error or omission which is due to an error or omission in data supplied to us by other parties.

This document contains confidential information and proprietary intellectual property. It should not be shown to other parties without consent from us and from the party which commissioned it.

# Contents

Executive summary	1
1 Introduction	3
2 Water Quality Data Analysis	4
2.1 Review of Water Quality Data for Groundwater Wells	4
2.2 Review of Water Quality from Interconnections	15
2.2.1 SUEZ	15
2.2.2 Passaic Valley Water Commission	16
2.2.3 Borough of Hawthorne	17
2.3 Discussion of Ridgewood Water Hydrogeology	17
2.4 Summary of Water Quality	18
3 Interim Seasonal Operations Strategy	19
3.1 Hydraulic Model	19
3.1.1 Model Update and Calibration	20
3.2 NJDEP Water Allocation Limits	20
3.3 Wholesale Supply Contracts	20
3.4 Off-Season (6 MGD) Operations Strategy	21
3.5 Shoulder Season (9 MGD) Operations Strategy	22
3.6 Peak Season (12 MGD) Operations Strategy	22
3.7 Summary	26
4 Alternative Solutions for PFAS Treatment	27
4.1 Granular Activated Carbon Treatment Technology	27
4.2 Ion Exchange Treatment Technology	28
4.3 Backwash and Disposal System Options	29
4.3.1 Direct Disposal to Sewers	30
4.3.2 Sites Requiring On-Site Detention	31
4.3.3 Alternative Backwashing Method	33
4.3.4 Summary of Backwash Disposal Options	33
4.4 Comparison of Technologies	34
4.4.1 Cost to Construct PFAS Treatment Facilities	34
4.4.2 Operating Costs	36
4.4.3 Site Space Requirements	38
4.4.4 Summary of Advantages and Disadvantages for Each Technology	38
4.5 Temporary Treatment Alternative	39

<b>5</b>	<b>PFAS Treatment Site Investigation</b>	<b>40</b>
5.1	Desktop Analysis and Site Plan Development	40
5.2	Feasibility Ranking	40
5.2.1	Sites of Concern, Risks, and Potential Mitigation	42
5.2.2	Infeasible Sites	44
5.3	Costs to Combine Facilities	45
<b>6</b>	<b>PFAS Treatment Solutions and Costs</b>	<b>46</b>
6.1	Distributed Treatment Alternative	46
6.2	Centralized Treatment Alternative	46
6.2.1	Centralized Concept	46
<b>7</b>	<b>Prioritized Capital Improvement Program</b>	<b>53</b>
7.1	Current Efforts and Investments	53
7.2	NJDEP Guidance on Compliance	53
7.3	Prioritization and Implementation Strategy	54
7.4	Proactive Steps for Future Treatment	55
<b>8</b>	<b>Grant and Funding Opportunities</b>	<b>57</b>
8.1	New Jersey Infrastructure Bank	57
8.2	New Jersey Site Remediation Program	57

## Appendices

A.	PFAS Glossary	
B.	Pressure Comparison	
C.	NJDEP Allocation Limits	
D.	Gravity Sewer and Force Main Costs	
E.	Detailed Construction Cost Estimates	
F.	Plan and Section of Vessel Layout	
G.	Orthographic Site Mapping with Preliminary Treatment Layout (REDACTED)	
H.	Site Investigation Forms	

## Tables

Table 3.1: Off-Season (6 MGD) Operations Strategy	23
Table 3.2: Shoulder Season (9 MGD) Operations Strategy	24
Table 3.3: Peak Season (12 MGD) Operations Strategy	25
Table 4.1: Granular Activated Carbon Vessel Characteristics (10 Minute EBCT)	28
Table 4.2: Ion Exchange Vessel Characteristics (2.5 Minute EBCT)	29
Table 4.3: GAC Backwash Requirements	30
Table 4.4: Costs for Temporary Tanks and Pump	32
Table 4.5: PFAS Treatment Initial Capital Cost @ Well Facilities	36
Table 4.6: PFAS Treatment Initial Capital Cost @ Treatment Facilities	36
Table 4.7: Media Costs – GAC vs. IX	37
Table 4.8: Electrical Cost for Headloss Through Media	37
Table 4.9: Required Building Footprint for GAC and IX Treatment	38
Table 4.10: Advantages and Disadvantages of GAC and IX Technologies for PFAS Removal	39
Table 5.1: Feasibility of Construction	41
Table 5.2: Raw Water Main Costs	45
Table 6.1: 40 Year Present Value for GAC	47
Table 6.2: 40 Year Present Value for IX	48
Table 6.3: 13 POE Centralized Treatment	49
Table 6.4: 40 Year Present Value for 13 POE	50
Table 7.1: Prioritization Strategy	56

## Figures

Figure 2.1: 2018 PFOA data	5
Figure 2.2: 2018 PFOS data	6
Figure 2.3: 2018 PFNA data	7
Figure 2.4: 2018 Combined PFAS	8
Figure 2.5: 2019 PFOA data	9
Figure 2.6: 2019 PFOS data	10
Figure 2.7: 2019 PFNA data	11
Figure 2.8: 2019 Combined PFAS	12
Figure 2.9: 2018 SUEZ - PFOA	15
Figure 2.10: 2018 SUEZ - PFOS	16
Figure 2.11: 2018 PVWC PFAS	17
Figure 4.12: Standard GAC Configuration	27
Figure 4.2: Frac Tank	32
Figure 4.3: NO-DES Truck	33
Figure 4.4: Diesel Sewer Pump	34

## Plates

Plate 2.1: PFOA Concentration (REDACTED)	13
Plate 2.2: PFOS Concentration (REDACTED)	14
Plate 6.1: 13 POE (REDACTED)	51

# Executive summary

Per- and polyfluoroalkyl substances (PFAS) in drinking water have been identified by the U.S. Environmental Protection Agency (EPA) as contaminants of concern amidst uncertainty of potential health effects. In 2018, New Jersey became the first state to establish a regulatory limit for a PFAS chemical, perfluorononanoic acid (PFNA) at 13 parts per trillion (ppt). The NJDEP has also proposed drinking water standards for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS) at 14 ppt and 13 ppt, respectively. The EPA's current health advisory is 70 parts per trillion for PFOA and PFOS combined.

From 2018 and 2019, Ridgewood Water detected PFOA in the majority of well supplies above the proposed regulatory limit and has detected PFOS at a smaller sampling of wells above the proposed regulatory limit. PFNA has not been detected above the current maximum contaminant level (MCL).

With 52 wells and 31 points of entry into the water system that supplies Ridgewood, Wyckoff, Glen Rock, and Midland Park, Ridgewood Water retained Mott MacDonald to prepare this master plan to proactively evaluate how treatment could be provided cost-effectively and on an accelerated schedule in the event the NJDEP adopts the new regulations for PFOA and PFOS.

The master plan evaluated two primary methods for treating and removing PFAS:

- Granular Activated Carbon (GAC) – PFAS are removed by the GAC through a process known as adsorption; and
- Anion Exchange (IX) – negatively charged ions of PFAS are attracted and adhere to the positively charged anion resins

The master plan determined that, from a life cycle cost basis, GAC treatment is less costly than IX treatment and this form of treatment has been put forth as the base recommendation for future treatment. In addition to cost, the master plan provides detailed comparisons as to the advantages and disadvantages of both treatment technologies, and GAC is identified as a more proven technology for PFAS removal with additional benefits from an operations and maintenance standpoint. It is noted that the vessels used for treatment are basically the same for either GAC or IX treatment, and that by installing larger GAC vessels initially, they could be used for IX treatment in the future if market costs for IX media become lower. However, the converse does not hold true that the smaller treatment vessels sized for IX could be used with GAC in the future.

As part of the master plan, an interim strategy was developed to reduce the amount of PFAS (i.e., PFOA, PFOS, and PFNA) chemicals introduced into the system while new treatment is being designed and constructed. Although the average levels of PFAS is relatively consistent in the well supplies, there is some ability to reduce system loadings by prioritizing the use of various wells throughout the water demands seasons of the year. Influences of purchased water from SUEZ, Hawthorne, and the Passaic Valley Water Commission (PVWC) are also discussed.

The master plan evaluated two primary concepts for system-wide future treatment:

- Distributed Treatment – would maintain the existing 31 points of entry into the system; and

- Centralized Treatment – by constructing raw water transmission mains from various satellite wells and pumping this water to central locations, the points of entry into the system is reduced from 31 locations to 13 locations

The centralized treatment alternative with GAC provided the lowest life cycle cost over a period of 40 years. A summary of the costs is provided in **Table E.1**.

**Summary of Alternative Treatment Costs**  
**Table E.1**

Alternative	Capital Costs	40 Year Operating Costs	Present Value
Distributed GAC	\$104.3 million	\$44.2 million	\$148.5 million
Distributed IX	\$85.9 million	\$64.7 million	\$150.6 million
Centralized GAC	\$89.3 million	\$34.7 million	\$124.0 million

The master plan has proposed a timeframe of four years to design and construct treatment for the centralized treatment alternative.

The master plan also reviewed potential grant and funding opportunities through the New Jersey Infrastructure Bank and the State's Spill Compensation Fund as described in Section 8 of this study.

# 1 Introduction

Per- and polyfluoroalkyl substances (PFAS) in drinking water have been identified by the U.S. Environmental Protection Agency (EPA) as contaminants of concern amidst uncertainty of potential health effects. PFAS have been associated with serious health effects such as cancer, hormone disruption, liver and kidney damage, developmental and reproductive harm, changes in cholesterol levels, and immune system toxicity—some of which can occur at extremely low levels of exposure<sup>1</sup>.

The potentially toxic PFAS have become known as “forever chemicals” because they persist in the human body and the environment. PFAS includes many chemicals used for various applications including firefighting foams, and numerous commercial products (e.g., nonstick cookware, waterproof and stain resistant fabrics, etc.).

Two PFAS that have been most detected in water systems include perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS). In 2016, the EPA issued a Lifetime Health Advisory level for PFOA and PFOS in drinking water at 70 parts per trillion (ppt) separately or combined.

The New Jersey Department of Environmental Protection (NJDEP) recently promulgated a maximum contaminant level (MCL) for perfluorononanoic acid (PFNA) at 13 parts per trillion (ppt) based upon contamination found at high levels in the Gloucester County area of New Jersey.

The NJDEP currently has a rule proposal that perfluorooctanoic acid (PFOA) will be regulated at 14 ppt and perfluorooctanesulfonic acid (PFOS) will be regulated at 13 ppt in the near future.

The Ridgewood Water system consists of 52 groundwater wells and PFAS have been found widespread throughout these sources of supply.

The purpose of this master plan is to evaluate the current impact on water quality from PFAS, develop an interim strategy for system operation for limiting PFAS exposure to customers, and identify long-term treatment solutions, costs and a prioritized schedule for system-wide implementation to address anticipated NJDEP regulation.

---

<sup>1</sup> NRDC “NJ Proposed Limits on PFOA & PFOS Must Go Further”, June 5, 2019



## 2 Water Quality Data Analysis

From past sampling data, several PFAS levels with the Ridgewood Water system are higher than the proposed MCLs for the contaminants. Ridgewood Water is working proactively to reduce the presence of PFAS in its system with the goal of reducing all PFAS concentrations below the current Method Detection Limit (MDL) of 2 ppt (referred to hereafter as “non-detectable levels”) at points of entry to the system.

Mott MacDonald has reviewed data provided by Ridgewood Water to understand the existing levels of PFAS found in the Ridgewood Water system. In addition, the team has also trended data from SUEZ, the Borough of Hawthorne, and the Passaic Valley Water Commission (PVWC) to try to determine the impact of the existing and proposed interconnection supplies to the PFAS levels in Ridgewood Water’s system.

### 2.1 Review of Water Quality Data for Groundwater Wells

Ridgewood Water sampled well locations that were in operation between 2014 and 2019 for PFAS contaminants. This data was provided to Mott MacDonald to review minimum, average, and maximum concentrations in the provided PFAS data for PFOA, PFOS, and PFNA values, and to determine whether any trends could be established from the data.

During 2014-2015, Ridgewood Water took samples at its well locations as required by the Unregulated Contaminate Monitoring Rule (UCMR 3). For 12 out of 26 locations, sample results were between 20 ppt and 42 ppt. Due to the lab equipment precision available at the time, samples from 14 out of 26 locations returned non-detectable concentrations which were at or below the previous MDL of 20 ppt. The highest value was recorded at the Carr TF.

During 2018, Ridgewood Water staff gathered samples at individual well facilities and the samples were analyzed for 12 PFAS compounds (PFOA, PFOS, PFNA, PFHxA, PFDA, PFuNA, PFDoA, PFTriA, PFTreA, PFBS, PFHxS, PFHpA, NMEFOSAA, NetFOSAA). The chemicals are listed with their abbreviations in **Appendix A**. With advancements in testing methods, the 2018 non-detectable levels for these compounds dropped to 2 ppt.

This report focuses on the regulated and anticipated regulated contaminants of PFOA, PFOS, and PFNA. For 2018, **Figure 2.1** presents PFOA data, **Figure 2.2** presents PFOS data, **Figure 2.3** the PFNA data, and **Figure 2.4** the combined PFAS.

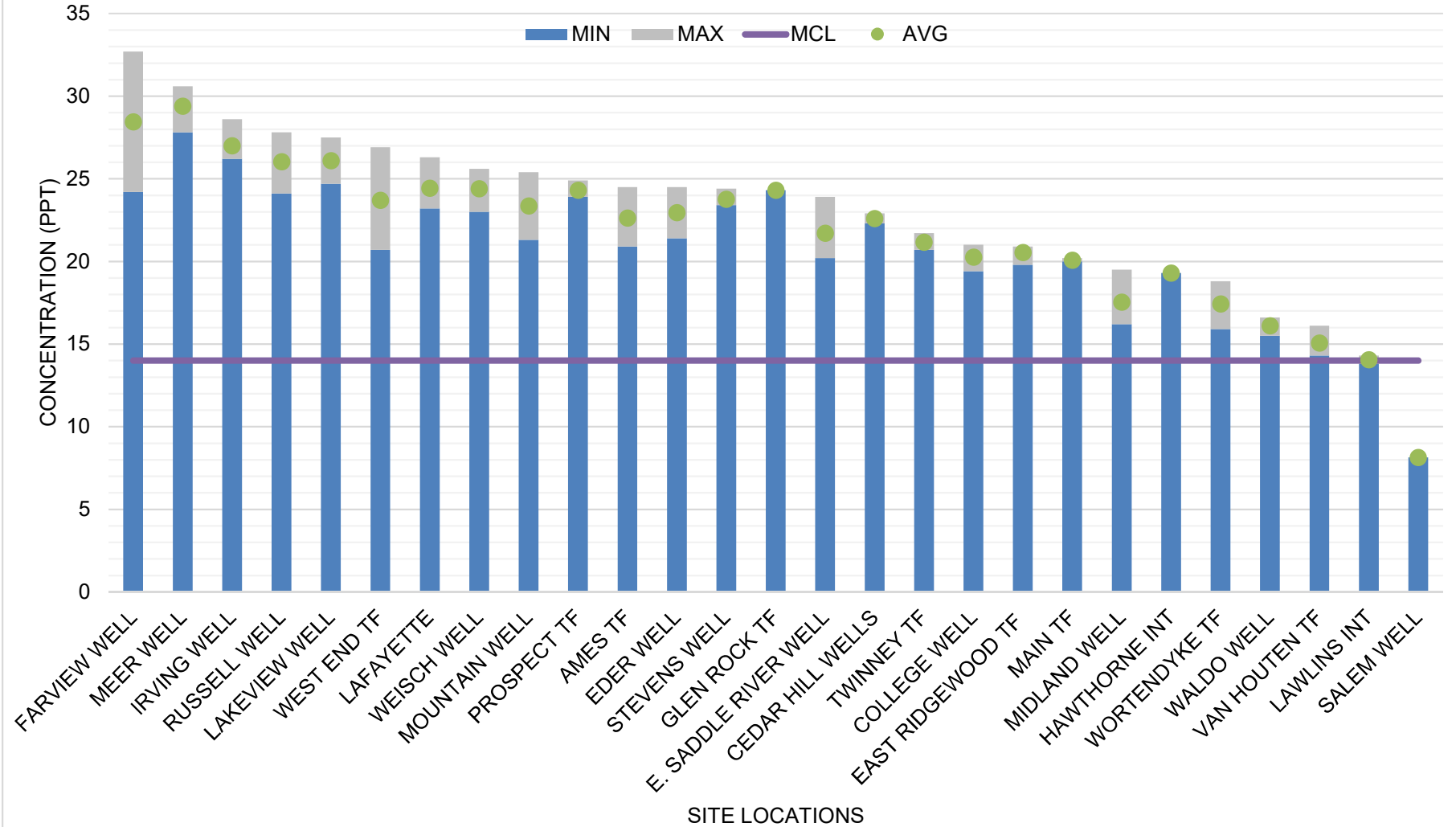
Recently obtained data for 2019 is charted for PFOA, PFOS, PFNA, and combined PFAS, is shown in **Figures 2.5 through 2.8**.

In addition, on **Plates 2.1 and 2.2**, we have spatially plotted the maximum PFOA and PFOS concentrations from well testing for 2014-2018.

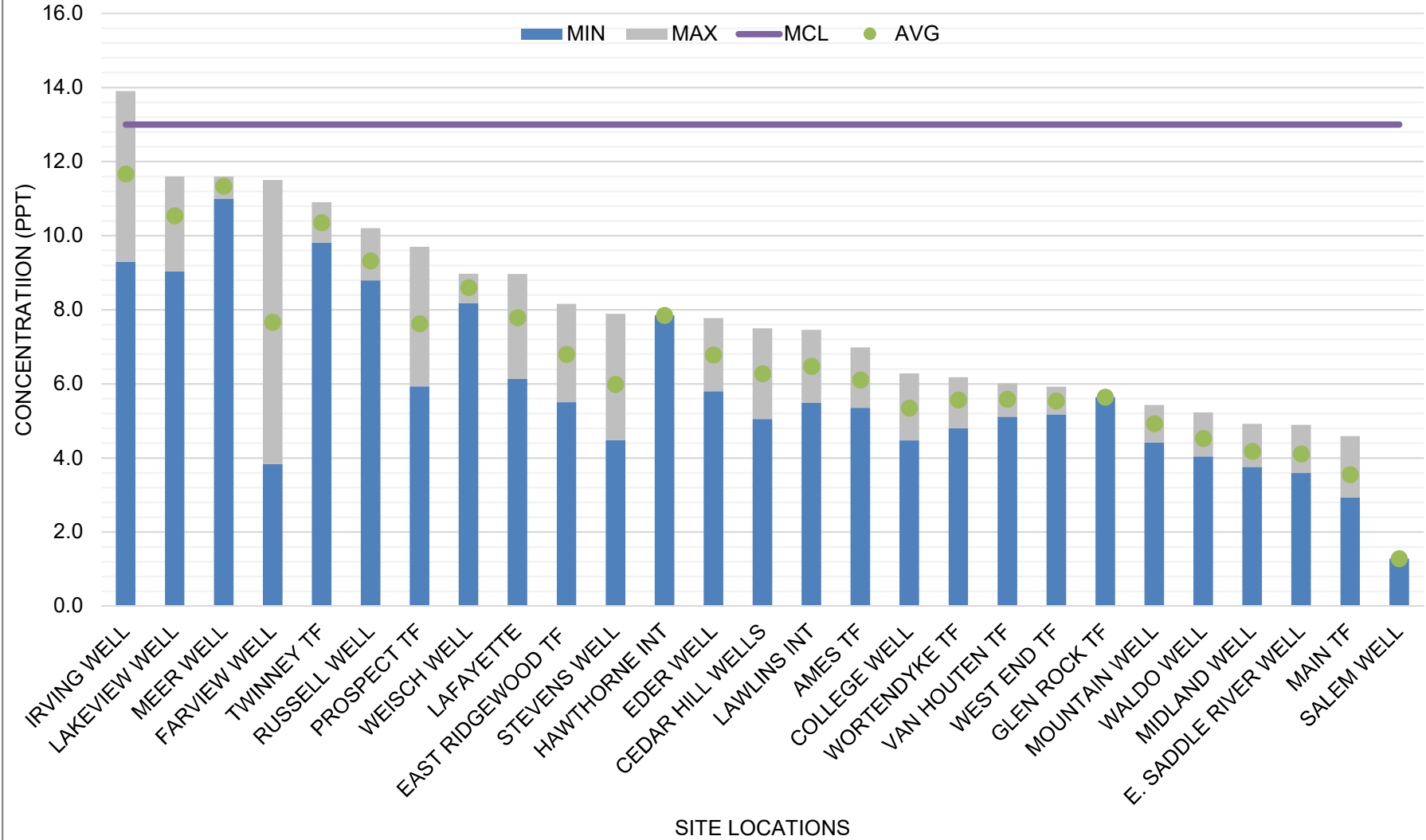
The following observations are made from a review of the 2018 and 2019 water quality data:

- The concentrations of PFAS are widespread throughout the Ridgewood Water system. In particular, PFOA is a contaminant of concern that is regularly sampled above the proposed MCL;
- The concentrations of PFAS are basically stable from 2018 to 2019, showing no general increase or decrease;
- PFNA is regularly detected well below the current MCL; and

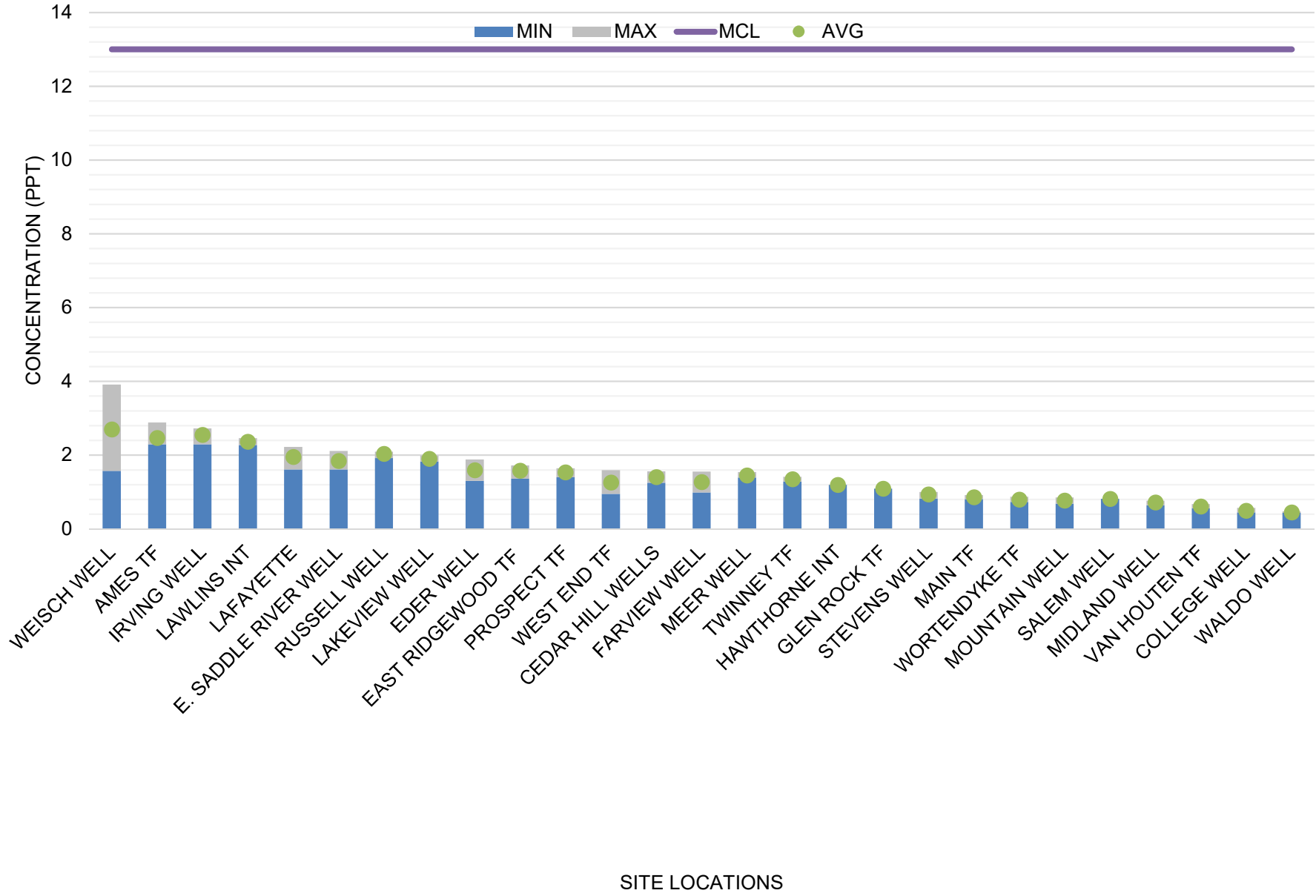
### Figure 2.1 - Ridgewood Water - PFOA Concentration - 2018



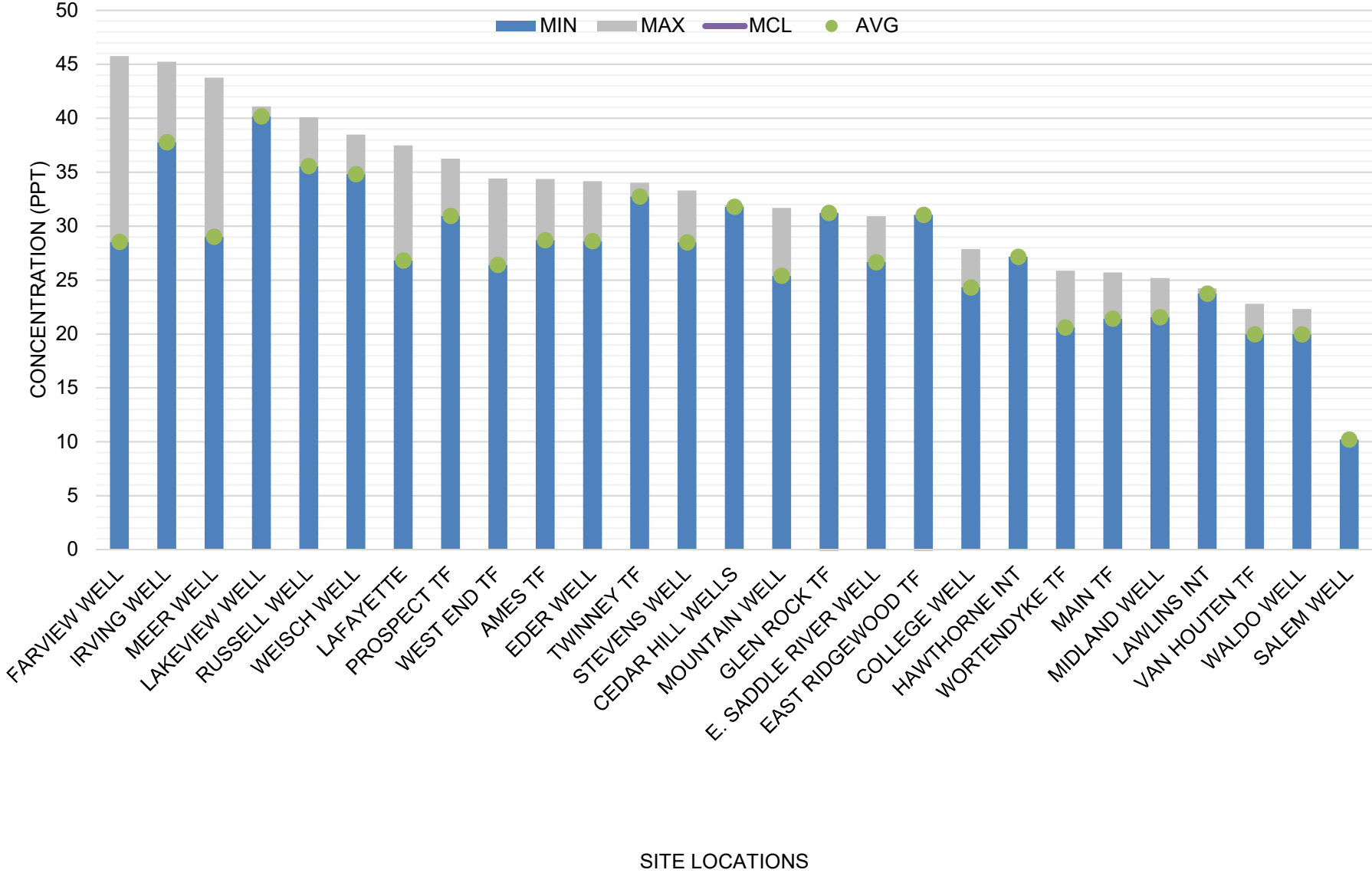
### Figure 2.2 - Ridgewood Water - PFOS Concentration - 2018



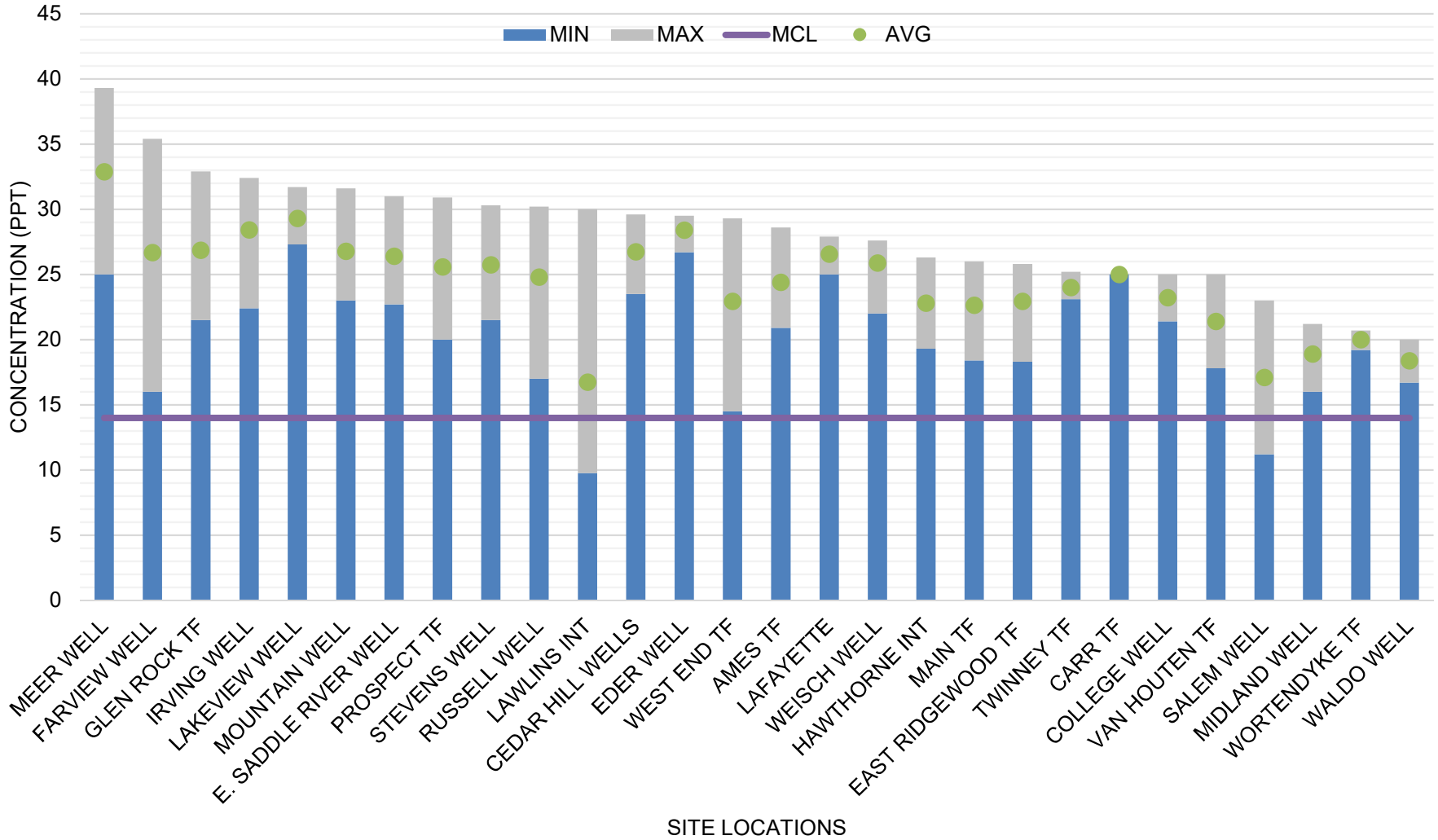
### Figure 2.3 - Ridgewood Water - PFNA Concentration - 2018



### Figure 2.4 - Ridgewood Water - PFOA+PFOS+PFNA Combined Concentration - 2018

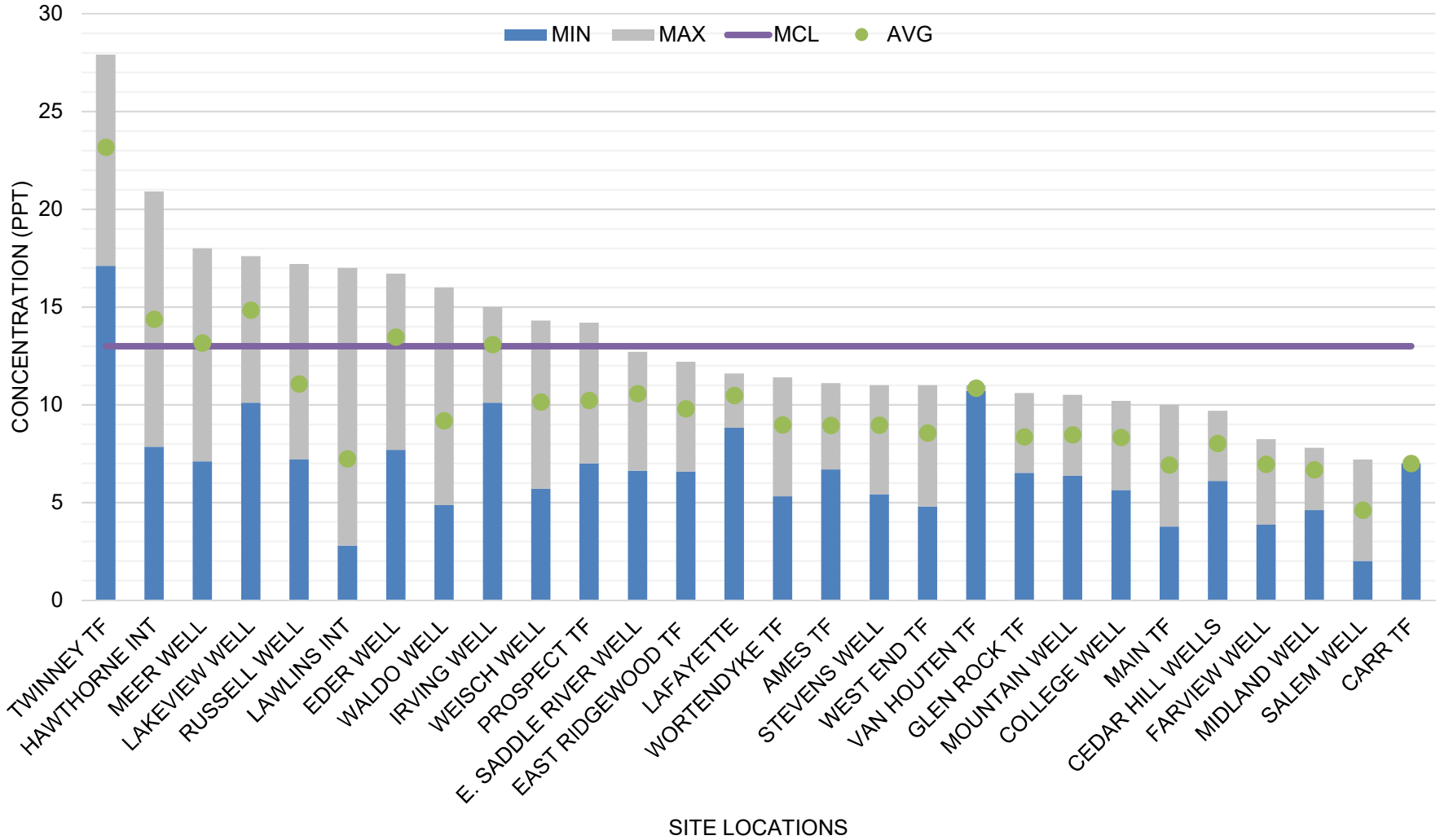


### Figure 2.5 - Ridgewood Water - PFOA Concentration - 2019



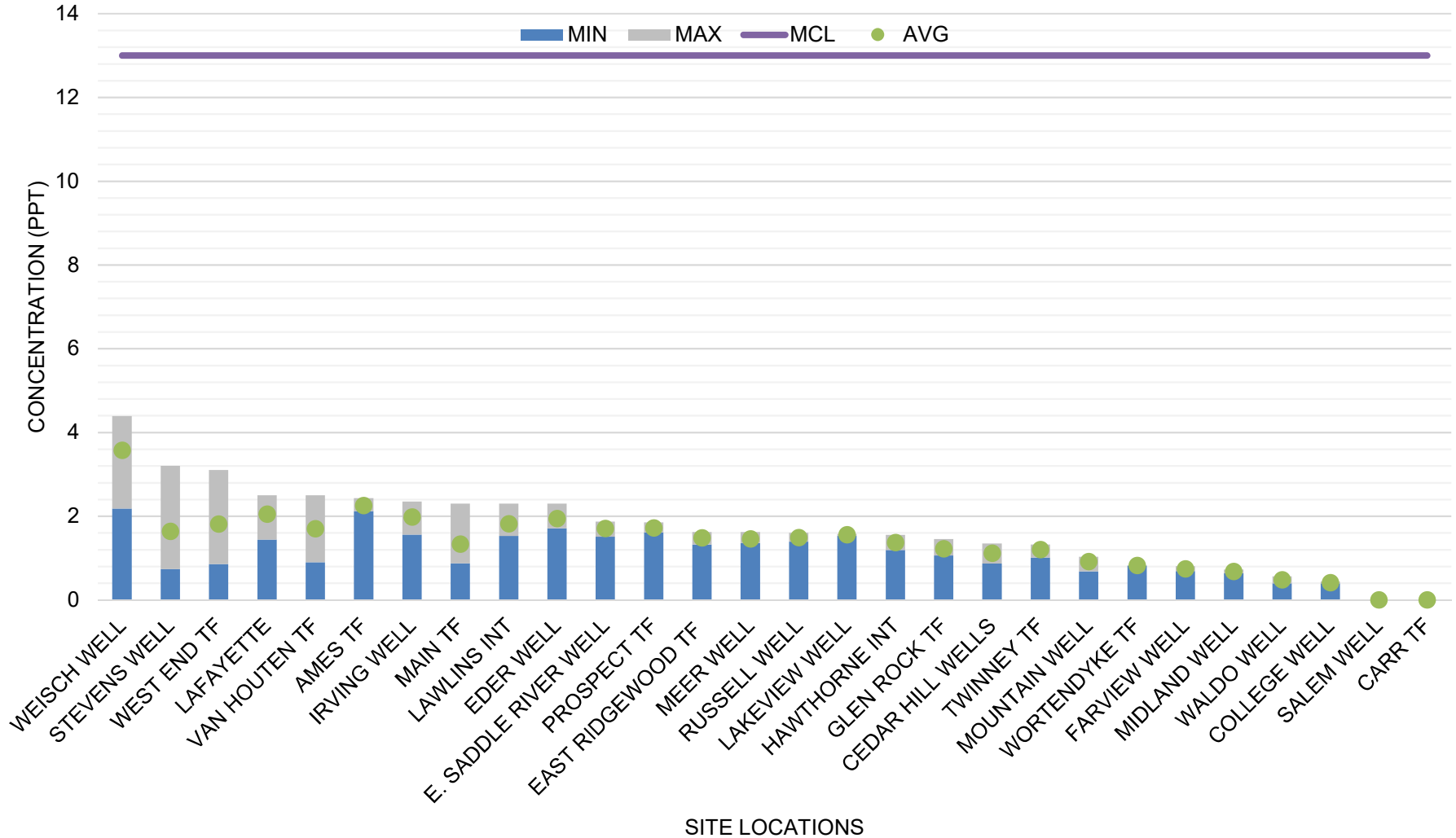
NOTE: PFAS treatment has been implemented at Carr TF resulting in non-detect PFAS concentrations at this facility. The PFAS concentrations shown at Carr TF are for raw water samples.

### Figure 2.6 - Ridgewood Water - PFOS Concentration - 2019



NOTE: PFAS treatment has been implemented at Carr TF resulting in non-detect PFAS concentrations at this facility. The PFAS concentrations shown at Carr TF are for raw water samples.

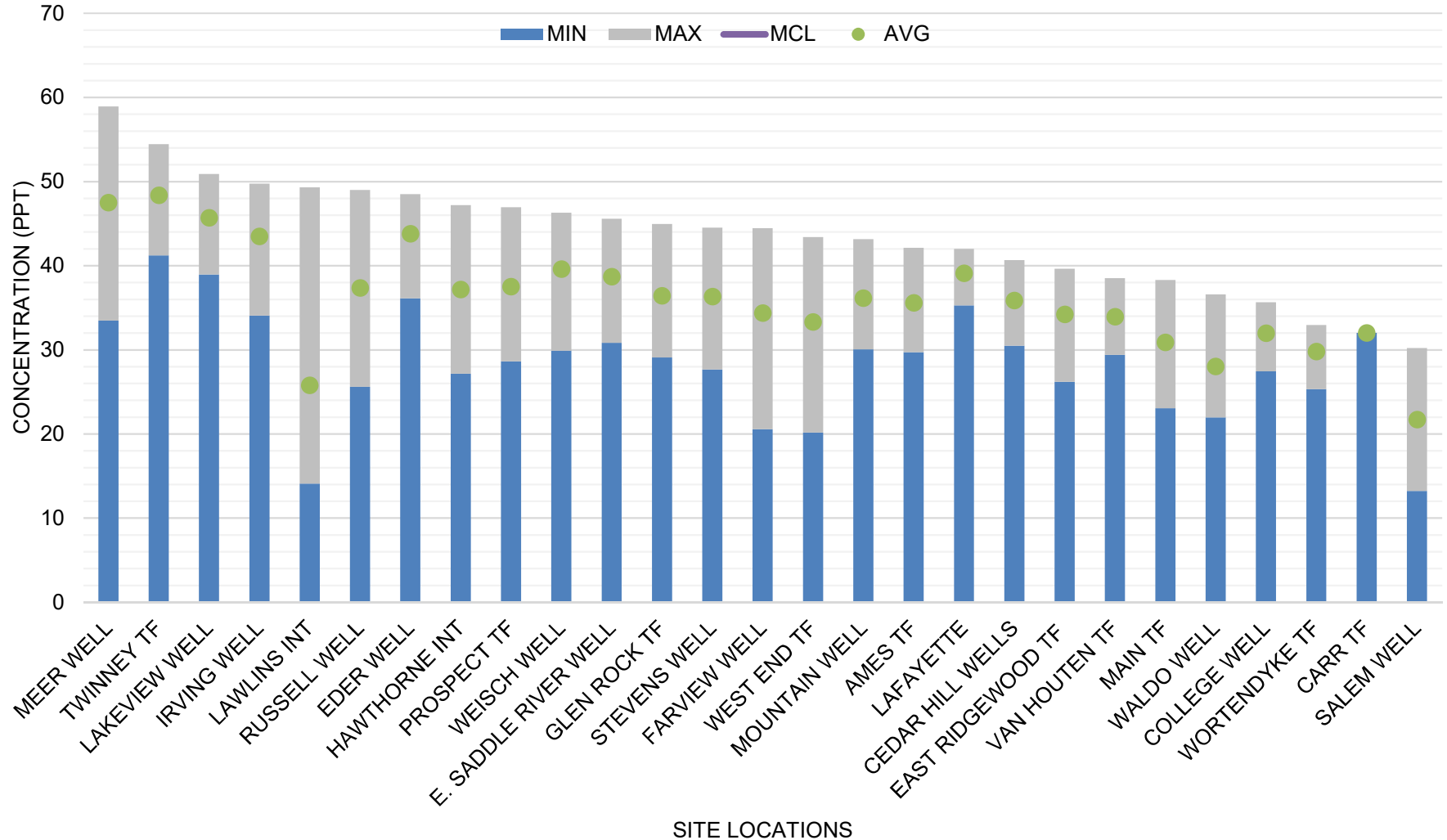
### Figure 2.7 - Ridgewood Water - PFNA Concentration - 2019



NOTE: PFAS treatment has been implemented at Carr TF resulting in non-detect PFAS concentrations at this facility. The PFAS concentrations shown at Carr TF are for raw water samples.



### Figure 2.8 - Ridgewood Water - PFOA+PFOS+PFNA Combined Concentration - 2019



NOTE: PFAS treatment has been implemented at Carr TF resulting in non-detect PFAS concentrations at this facility. The PFAS concentrations shown at Carr TF are for raw water samples.

- PFOS appears to be more concentrated in the Village of Ridgewood than other municipalities in the water system.

## 2.2 Review of Water Quality from Interconnections

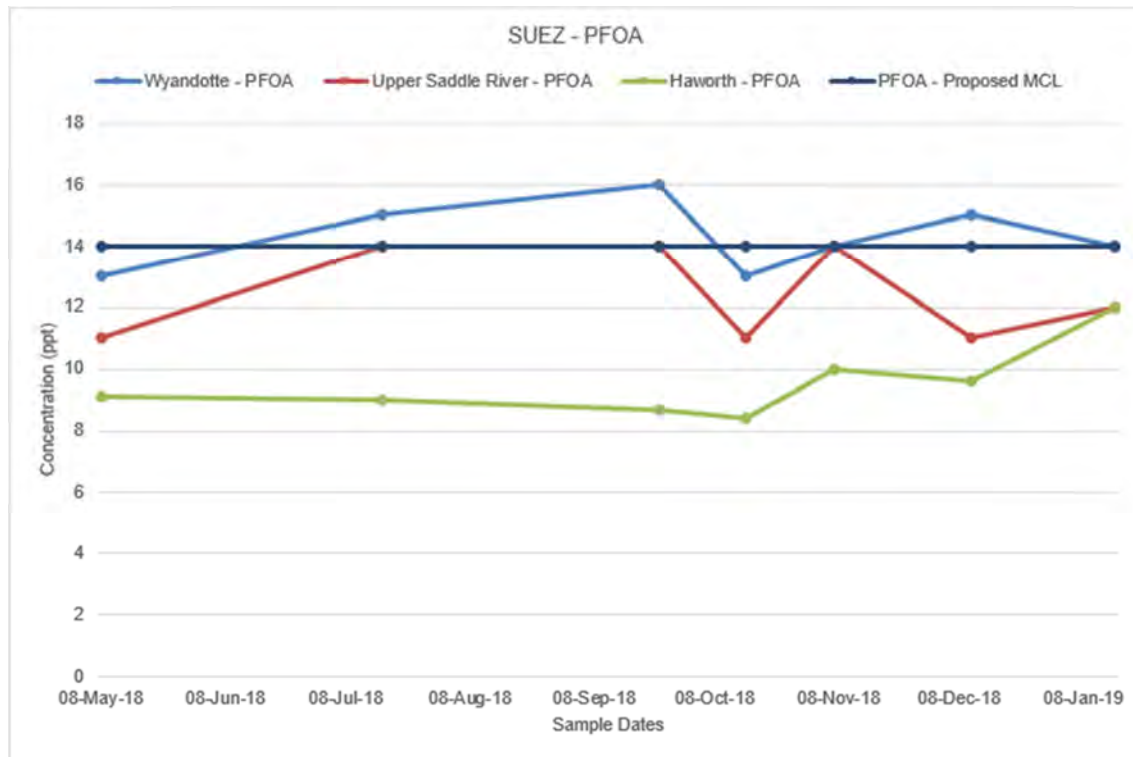
### 2.2.1 SUEZ

Ridgewood Water obtains water through two interconnections with SUEZ:

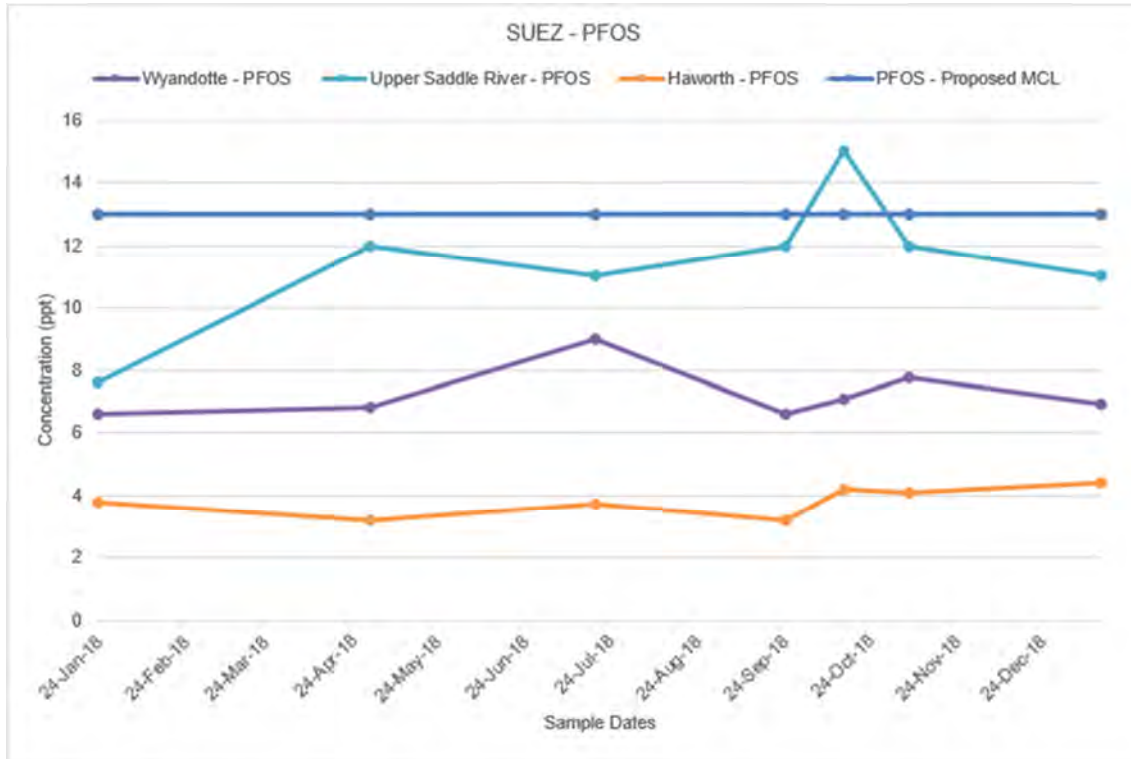
- Lawlins – the primary source of supply provides 0.5 to 3 mgd of contracted supply;
- Hampshire Road – used sometimes during peak demands, the capacity of this interconnection is approximately one mgd.

Figures 2.9 and Figure 2.10 provide 2018 concentrations of PFOA and PFOS, respectively, found in several SUEZ source of supplies. The Haworth Water Treatment Plant is the main source of supply for the SUEZ system and this water is delivered to the Ridgewood Water interconnections. The Wyandotte Well is located near the Lawlins interconnection and this water can be supplied to Ridgewood Water when the well is in operation. The Upper Saddle River Well water can blend with Haworth WTP supply and can be delivered to Ridgewood Water interconnections. This information is provided to indicate that SUEZ has PFAS in various supplies. For Ridgewood Water, the PFAS concentrations recorded at the interconnection points of entry of are the most significant.

Figure 2.9: 2018 SUEZ - PFOA



**Figure 2.10: 2018 SUEZ - PFOS**



Data from SUEZ indicated similar trends to those seen within the Ridgewood Water system. PFOA and PFOS were observed at levels above the proposed MCLs of 14 ppt and 13 ppt, respectively.

PFOA was observed in higher levels than PFOS. Samples for the other PFAS were observed at levels within 5 ppt of the non-detectable levels except for PFHxA and PFHxS. The highest levels of these two compounds were sampled at the Upper Saddle River Wells at 16 ppt for PFHxA and 10 ppt for PFHxS.

Overall, the sample data from the Upper Saddle River wells resulted in higher PFAS levels than the other sources sampled within the SUEZ system.

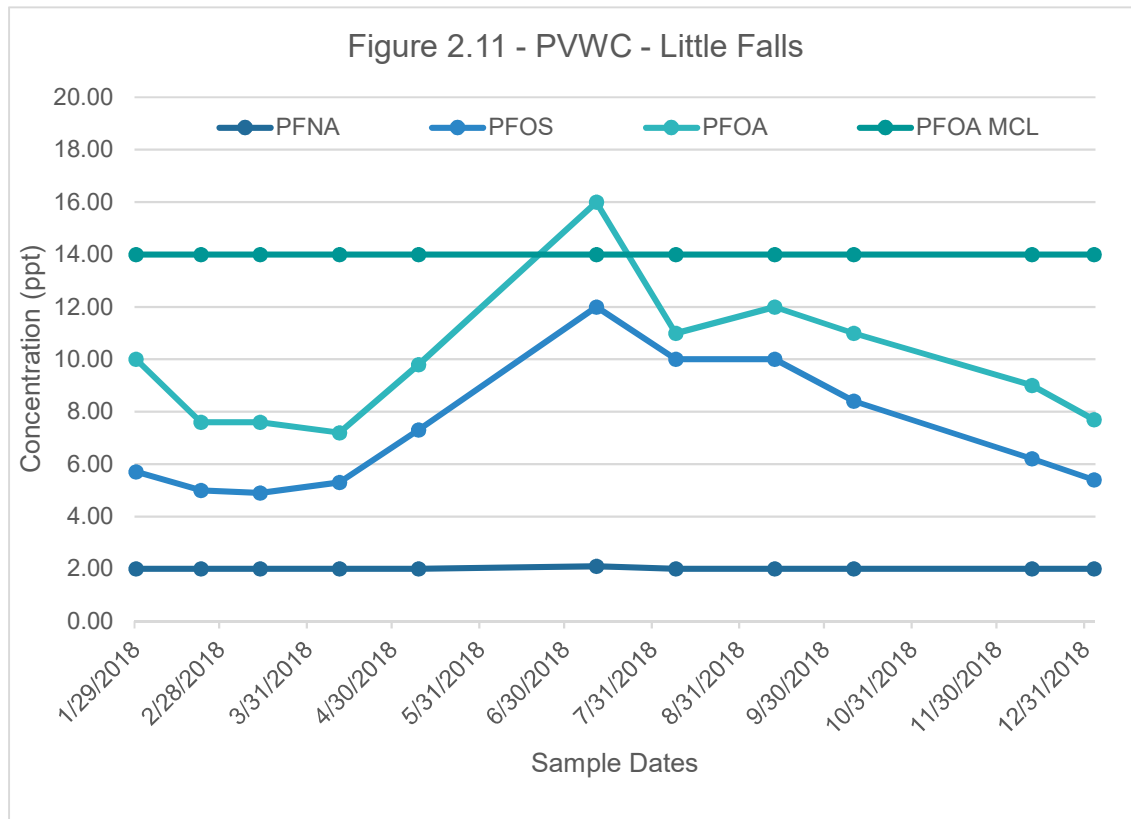
From the 2019 Ridgewood Water sample data, samples values were available for the Lawlins interconnection that show both PFOA and PFOS above the proposed MCL.

### 2.2.2 Passaic Valley Water Commission

Ridgewood Water is in the process of establishing a 3 MGD interconnection to purchase water from PVWC at the southern end of Ridgewood Water’s system in Glen Rock. To accurately anticipate the potential change in PFAS with the addition of a proposed PVWC interconnection, PFAS data was collected from NJ WaterWatch for the Little Falls Water Treatment Plant point of entry.

Based on the available data from the PVWC supply at Little Falls, values from all 11 rounds of sampling were graphed below in **Figure 2.11**.

**Figure 2.11: 2018 PVWC PFAS**



While other PFAS compounds were within 5 ppt of non-detect levels, PFHxA was observed with a maximum level of 12 ppt in July, 2018.

During 2018, the contaminant levels appear to peak during the summer.

PVWC might not need to treat for PFAS in the future if levels are maintained below the proposed MCLs. Ridgewood Water would need to consider blending this future supply, or if non-detect levels are the goal, to treat this supply in the future.

**2.2.3 Borough of Hawthorne**

Ridgewood Water’s contract with the Hawthorne (via the Marr Interconnection) provides an average of 30 million gallons per month (mgm) during June, July, and August subject to availability. PFAS data from 2018 and 2019 at the interconnection indicates the following:

- PFOA from 19.3 to 26.3 ppt, averaging 22.8 ppt
- PFOS from 7.85 to 20.9 ppt, averaging 14.4 ppt
- PFNA from 1.15 to 1.55 ppt, averaging 1.35 ppt

**2.3 Discussion of Ridgewood Water Hydrogeology**

Ridgewood Water has been working with Mr. David Terry of WSP Global Inc., a hydrogeologist, to better understand the sources of PFAS contamination within the aquifer. During a phone call with Mr. Terry, Mott MacDonald learned there is not yet enough data to definitively determine the

movement or source of the PFAS in the aquifer. While the time period of the study is too short to determine further trends, the distribution of contaminant is observed to be widespread in the Ridgewood Water system, instead of being concentrated in plumes.

Mr. Terry also provided the following general “observations”, while noting that none of the information was definitive or without exception. He noted that PFAS overall has appeared to be more prevalent in developed (urban) areas and was less often found in rural places of the country. Mr. Terry also described the aquifer that Ridgewood Water draws from has a relatively “young” water age (15-20 years). Based on his preliminary research, it has appeared that in deeper and confined aquifers, which contain “older” water, PFAS also tended to be less prevalent.

## 2.4 Summary of Water Quality

Based on the results of the analysis, the most prevalent PFAS chemical within the Ridgewood Water system is PFOA which occurs at almost every groundwater source above the proposed MCL. There is no blending alternative that appears to exist where PFOA could be blended below the proposed MCL, and definitely not below non-detect, therefore, a treatment strategy will be needed.

At the Paramus, Irving, and Grove wells, treatment will also be required for PFOS to continue current operations.

With PFNA levels below the proposed MCL, this contaminant should be monitored, and is a lower priority than PFOA and PFOS removal. However, using the treatment technologies discussed in Section 4 of this report, PFNA (and the other 12 identified PFAS) will potentially be removed using either Granular Activated Carbon (GAC) or Anion Ion Exchange (AIX) treatment technologies.

## 3 Interim Seasonal Operations Strategy

In the interim, and until the final treatment facilities are constructed, Ridgewood Water desires to limit the amount of PFAS that are introduced to the water distribution system from the groundwater wells and interconnections.

From a simplistic approach, Ridgewood Water would simply operate the sources of supply with the existing lowest concentrations of PFAS. However, this might not be achievable hydraulically when it is also necessary to maintain adequate pressure and flow capacity to customers at all times, and to maintain adequate tank storage and tank turnover. In addition, there are some water allocation permit limitations as to how much water can be drawn from the wells in various municipalities, and in various combinations, over the course of a month(s) and/or year.

This section of the report evaluates ways to potentially minimize PFAS loading into the system while maintaining hydraulic adequacy and complying with allocation permit requirements.

To evaluate the interim strategy for water supply, the water delivery was divided into three distinct seasons. These seasons represent the approximate average of water that is supplied during these periods. The actual quantities of water in these seasons can vary, and during the summer, it is common that the system might experience demands as high as 17 mgd. The seasons evaluated are as follows:

- Off Season – 6 mgd average delivery from November through May
- Shoulder Season – 9 mgd average delivery that occurs in June and October
- Peak Season – 12 mgd average delivery that occurs in July through September

There are several sources of supply which were not evaluated as part of the short-term seasonal operational strategy. The facilities are as follows:

- Ravine Well – a 235 gpm well out of service due to previous volatile organic chemical (VOC) Treatment will need to be added at this location before it can be restarted. Potential treatment for both VOC and PFAS could be implemented at this location to restart operations at this facility.
- Leigh Well – out of service due to arsenic contamination.
- Linwood Well – VOC contamination
- Brook Well – out of service due to manganese buildup. This well has been abandoned.
- Wyckoff Well – out of service due to new industrial site. This well has been abandoned.
- Goffle Well – is currently out of service
- Andover Well – is currently out of service
- King Well – out of service during this analysis.

### 3.1 Hydraulic Model

In order to determine if the lowest PFAS producing sources of supply can be used to solely supply the system during the various seasons of the year, it is necessary to evaluate the hydraulic impact. To assist this effort, the existing Bentley Systems WaterGEMS modeled was used for the supporting analysis.

### 3.1.1 Model Update and Calibration

The initial step in this phase of master planning was to ensure that Ridgewood Water's hydraulic model was calibrated, and included any recent updates, so that the model was reliable for validating proposed operational strategies.

The hydraulic model for Ridgewood Water was last calibrated in 2017. To improve upon the prior calibration, recent water main improvements were added to the model.

The next step was to compare pressures in the model versus pressure in the system for a specific test date (March 5<sup>th</sup>, 2019). The comparison of observed pressures is provided in **Appendix B**.

Although the majority of pressures correlated between the model and field results, discrepancies were noted between the model and SCADA data:

- Eder Well – appears to be an inaccurate pressure transmitter at the well since the pressure is controlled by the nearby Cedar Hill Reservoir in the Intermediate Zone;
- Farview Well – The model had the Glen Avenue Upper Tank completely full at this timestep. Once the tank level is dropped into the normal operating range, the pressure correlates properly; and
- Mountain Well - appears to be an inaccurate pressure transmitter at the well since the Mountain Well is adjacent to the suction of the Sicomac Pump Station and based upon elevation and normal suction pressures at Sicomac, the pressure should be approximately 26 psi.

Additional model investigation was performed by comparing the valve database from Ridgewood Water to the valve open/closed status in the model. Several discrepancies were noted with the division valve locations between the High and Booster Zones. In the valve database, these valves were shown as open but, in the model. These are likely errors in the valve database that should be checked by Ridgewood Water. For analysis purposes, these valves were kept closed to provide normal pressures and hydraulic gradeline in both zones in the system.

### 3.2 NJDEP Water Allocation Limits

When considering any change to the existing well supply operations to the system, existing permitted limits for the system must be understood and evaluated. These NJDEP enforced limits include:

- The combined flow rates for Twinney, East Saddle River, Waltherly, Salem, Paramus, East Ridgewood and Stevens wells shall not exceed 75.2 million gallons per month (mgm); and
- Each municipality has its own monthly allocation limits

A summary of this information is provided in **Appendix C**.

### 3.3 Wholesale Supply Contracts

The interim strategy for supplying water through interconnections must consider contractual obligations and limits. Of note:

- Ridgewood Water’s contract with Suez (Lawlins and Hampshire Road) requires that Ridgewood Water pay for a minimum of 0.55 mgd, allowing for a maximum purchase of 3 mgd, but only requiring Suez to provide 0.55 MGD, based on available capacity; and
- Ridgewood Water’s contract with Hawthorne (Marr Interconnection) provides Ridgewood with an average of 30 mgm during June, July and August.

### 3.4 Off-Season (6 MGD) Operations Strategy

**Table 3.1** includes a summary of active wells, the existing zone these wells supply (needed in order to understand system hydraulics and water transfers), and the combined current (2019) average concentrations of PFOA, PFNA, and PFOS being produced from the wells and estimated at the interconnection locations.

An explanation of how values are calculated in **Table 3.1** (and the following seasonal strategy tables) is as follows per the columns:

- “Combined PFAS Concentration (ppt)” – this is the average concentration from 2019 sampling events of the combination of PFOA, PFOS and PFNA in parts per trillion (the same as nanograms per liter (ng/l));
- “Source Capacity (gpm)” – is the current capacity of wells and interconnections based upon input from Ridgewood operations;
- “Existing Flow (gpm)” – represents a sampling of how the sources are currently used during the off-season. The existing flows are less than the source capacities, when the source is used for only a portion of the day (i.e., it represents the average flow rate over the course of the day);
- “PFAS Loading at Existing Flow (µg PFAS/day)” – presents the micrograms of PFAS introduced into the system per day for the particular source of supply scenario.
- The proposed alternatives use sources based upon specifics detailed below and calculate micrograms per day in the same manner.

**Table 3.1** compares existing off-season operation of wells (compiled from recent data), with two alternative approaches described as follows:

- Alternative A – under this alternative, water is supplied using wells with the lowest PFAS concentrations. Under this scenario, a 31% reduction of PFAS loading into the system is achieved.
- Alternative B – under this alternative, the SUEZ Lawlins interconnection, that is not typically used in winter months is maximized at 3 mgd since it has a lower PFAS concentration than the majority of Ridgewood Water wells. *However, due to ongoing water quality investigations, there might be other reasons not to rely on this supply during off-peak demand seasons.* Under this scenario, a 65% reduction of PFAS loading into the system is achieved.
- Alternative C – under this alternative, PVWC is used to supply 3 MGD of supply, with SUEZ Lawlins supplying 2 MGD, and 1 MGD from the Carr TF. Under this scenario, a 77% reduction of PFAS loading into the system is achieved.

All three alternatives are hydraulically feasible due to the ability to transfer water between all gradient zones, and because the low demands of the off-season result in very low headloss and “stress” in the system.



### 3.5 Shoulder Season (9 MGD) Operations Strategy

**Table 3.2** compares the estimated current method of supplying the system during the shoulder seasons of June and October, with an alternative that prioritize supply based upon the lowest PFAS concentrations:

- Alternative A – Under this scenario, the SUEZ Lawlins interconnection supply is maximized at 3 MGD, and RW wells are brought on-line in order of lowest PFAS concentration. Under this scenario, a 27% reduction of PFAS loading into the system is achieved.

The alternative is hydraulically feasible due to the ability to transfer water between all gradient zones, and the distribution of supply into the gradient zones from the operating sources.

### 3.6 Peak Season (12 MGD) Operations Strategy

**Table 3.3** compares the estimated current method of supplying the system during the peak season of July through September, with an alternative that prioritizes supply based upon the lowest PFAS concentrations:

- Alternative A – Under this scenario, the SUEZ Lawlins interconnection supply is maximized at 3 MGD, and Ridgewood Water wells are brought on-line in order of lowest PFAS concentration. Under this scenario, a 7% reduction of PFAS loading into the system is achieved.

The alternative is hydraulically feasible due to the ability to transfer water between all gradient zones, and the distribution of supply into the gradient zones from the operating sources.

TABLE 3.1 - Off Season (6 mgd) Operational Strategy

Rank	Facility Name	Zone	Combined PFAS Concentration <sup>1</sup> (ppt)	Source Capacity (gpm)	Existing Flow (gpm)	PFAS Loading at Existing Flow (µg PFAS/day)	Proposed Alternative A Flow <sup>2</sup> (gpm)	PFAS Loading at Alternative A Flow (µg PFAS/day)	Proposed Alternative B Flow <sup>3</sup> (gpm)	PFAS Loading at Alternative B Flow (µg PFAS/day)	Proposed Alternative C Flow <sup>3</sup> (gpm)	PFAS Loading at Alternative C Flow (µg PFAS/day)
1	CARR TF	Low	-	700	-	-	700	-	700	-	700	-
2	SALEM WELL	Low	22	275	-	-	275	32,979	-	-	-	-
3	LAWLINS INTERCONNECT (SUEZ) <sup>4</sup>	High	26	2,082	-	-	-	-	2,082	295,074	1,348	191,047
4	MIDLAND WELL	Intermediate	26	160	-	-	160	22,676	-	-	-	-
5	WALDO WELL	Intermediate	28	325	-	-	325	49,604	-	-	-	-
6	WORTENDYKE TF	Intermediate	30	730	250	40,883	730	119,377	-	-	-	-
7	MAIN TF	Low	31	190	240	40,555	190	32,106	-	-	-	-
8	COLLEGE WELL	Intermediate	32	150	120	20,932	150	26,165	-	-	-	-
9	WEST END TF	Low	33	250	180	32,379	250	44,971	-	-	-	-
10	VAN HOUTEN TF	High	34	530	230	42,627	530	98,227	-	-	-	-
11	EAST RIDGEWOOD TF	Low	34	870	400	74,134	820	151,974	-	-	-	-
12	FARVIEW WELL	Intermediate	34	280	-	-	-	-	-	-	-	-
13	AMES TF	High	36	760	720	141,290	-	-	-	-	-	-
14	CEDAR HILL WELLFIELD	Intermediate	36	630	-	-	-	-	-	-	-	-
15	MOUNTAIN WELL	Intermediate	36	190	-	-	-	-	-	-	-	-
16	STEVENS WELL	Low	36	245	140	27,473	-	-	-	-	-	-
17	GLEN ROCK TF	Low	36	155	-	-	-	-	-	-	-	-
18	RUSSELL WELL	High	37	140	-	-	-	-	-	-	-	-
19	PROSPECT TF	Low	38	1,010	340	70,427	-	-	-	-	-	-
20	E. SADDLE RIVER WELL	Low	39	250	300	63,777	-	-	-	-	-	-
21	LAFAYETTE WELL	Intermediate	39	380	-	-	-	-	-	-	-	-
22	WEISCH WELL	Intermediate	40	400	550	119,922	-	-	-	-	-	-
23	IRVING WELL	Low	43	770	420	98,445	-	-	-	-	-	-
24	EDER WELL	Intermediate	44	360	-	-	-	-	-	-	-	-
25	LAKEVIEW WELL	High	46	230	-	-	-	-	-	-	-	-
26	MEER WELL	Intermediate	47	185	240	61,487	-	-	-	-	-	-
27	TWINNEY TF	Low	48	645	-	-	-	-	-	-	-	-
28	HAMPSHIRE RD INTERCONNECT (SUEZ)	Low	-	694	-	-	-	-	-	-	-	-
29	MARR INTERCONNECT (HAWTHORNE)	Intermediate	-	694	-	-	-	-	-	-	-	-
30	PVWC INTERCONNECT (PROPOSED)	Low	-	-	-	-	-	1,348	-	2,082	-	-

<b>TOTALS:</b>				<b>14,280</b>	<b>4,130</b>	<b>834,330</b>	<b>4,130</b>	<b>578,079</b>	<b>4,130</b>	<b>295,074</b>	<b>4,130</b>	<b>191,047</b>
----------------	--	--	--	---------------	--------------	----------------	--------------	----------------	--------------	----------------	--------------	----------------

<b>Proposed Alt. A % Reduction:</b>	<b>31%</b>
<b>Proposed Alt. B % Reduction:</b>	<b>65%</b>
<b>Proposed Alt. C % Reduction:</b>	<b>77%</b>

Water Supply and Demand by Zone				
Zones	Zone Demand (gpm)	Alt A Zone Supply (gpm)	Alt B Zone Supply (gpm)	Alt C Zone Supply (gpm)
Low	2105	2235	2048	2782
Intermediate	1226	1365	0	0
High	493	530	2082	1348
Booster	340	0	0	0

<sup>1</sup> Combined average concentrations for PFOA, PFOS, and PFNA based on 2019 sampling data

<sup>2</sup> Alternative A provides an operational strategy utilizing well sources

<sup>3</sup> Alternatives B and C provide an operational strategy utilizing the Carr treatment facility (which has operational PFAS treatment) and the SUEZ and PVWC interconnections

<sup>4</sup> Ridgewood may not prefer to use Lawlins during off-peak seasons due to other water quality considerations currently being investigated

TABLE 3.2 - Shoulder Season (9 mgd) Operational Strategy

Rank	Facility Name	Zone	Combined PFAS Concentration* (ppt)	Source Capacity (gpm)	Existing Flow (gpm)	PFAS Loading at Existing Flow (µg PFAS/day)	Proposed Flow (gpm)	PFAS Loading at Proposed Flow (µg PFAS/day)
1	CARR TF	Low	-	700	-	-	700	-
2	SALEM WELL	Low	22	275	-	-	275	32,979
3	LAWLINS INTERCONNECT (SUEZ)	High	26	2,082	400	56,690	2,082	295,074
4	MIDLAND WELL	Intermediate	26	160	149	21,117	160	22,676
5	WALDO WELL	Intermediate	28	325	315	48,078	325	49,604
6	WORTENDYKE TF	Intermediate	30	730	730	119,377	730	119,377
7	MAIN TF	Low	31	190	190	32,106	190	32,106
8	COLLEGE WELL	Intermediate	32	150	150	26,165	150	26,165
9	WEST END TF	Low	33	250	250	44,971	250	44,971
10	VAN HOUTEN TF	High	34	530	200	37,067	530	98,227
11	EAST RIDGEWOOD TF	Low	34	870	-	-	862	159,758
12	FARVIEW WELL	Intermediate	34	280	200	37,067	-	-
13	AMES TF	High	36	760	588	115,387	-	-
14	CEDAR HILL WELLFIELD	Intermediate	36	630	-	-	-	-
15	MOUNTAIN WELL	Intermediate	36	190	190	37,285	-	-
16	STEVENS WELL	Low	36	245	236	46,312	-	-
17	GLEN ROCK TF	Low	36	155	155	30,417	-	-
18	RUSSELL WELL	High	37	140	125	25,211	-	-
19	PROSPECT TF	Low	38	1,010	760	157,425	-	-
20	E. SADDLE RIVER WELL	Low	39	250	250	53,147	-	-
21	LAFAYETTE WELL	Intermediate	39	380	351	74,619	-	-
22	WEISCH WELL	Intermediate	40	400	200	43,608	-	-
23	IRVING WELL	Low	43	770	300	70,318	-	-
24	EDER WELL	Intermediate	44	360	100	23,984	-	-
25	LAKEVIEW WELL	High	46	230	230	57,672	-	-
26	MEER WELL	Intermediate	47	185	185	47,396	-	-
27	TWINNEY TF	Low	48	645	-	-	-	-
28	HAMPSHIRE RD INTERCONNECT (SUEZ)	Low	-	694	-	-	-	-
29	MARR INTERCONNECT (HAWTHORNE)	Intermediate	-	694	-	-	-	-
30	PVWC INTERCONNECT (PROPOSED)	Low	-	-	-	-	-	-

**TOTALS:****14,280****6,254****1,205,418****6,254****880,936****Proposed % Reduction: 27%**

Water Supply and Demand by Zone		
Zones	Zone Demand (gpm)	Zone Supply (gpm)
Low	3157	2277
Intermediate	1839	1365
High	740	2612
Booster	510	0

\* Combined average concentrations for PFOA, PFOS, and PFNA based on 2019 sampling data

TABLE 3.3 - Peak Season (12 mgd) Operational Strategy

Rank	Facility Name	Zone	Combined PFAS Concentration* (ppt)	Source Capacity (gpm)	Existing Flow (gpm)	PFAS Loading at Existing Flow (µg PFAS/day)	Proposed Flow (gpm)	PFAS Loading at Proposed Flow (µg PFAS/day)
1	CARR TF	Low	-	700	-	-	700	-
2	SALEM WELL	Low	22	275	-	-	275	32,979
3	LAWLINS INTERCONNECT (SUEZ)	High	26	2,082	700	99,208	2,082	295,074
4	MIDLAND WELL	Intermediate	26	160	110	15,590	160	22,676
5	WALDO WELL	Intermediate	28	325	210	32,052	325	49,604
6	WORTENDYKE TF	Intermediate	30	730	250	40,883	730	119,377
7	MAIN TF	Low	31	190	190	32,106	190	32,106
8	COLLEGE WELL	Intermediate	32	150	150	26,165	150	26,165
9	WEST END TF	Low	33	250	250	44,971	250	44,971
10	VAN HOUTEN TF	High	34	530	375	69,500	530	98,227
11	EAST RIDGEWOOD TF	Low	34	870	150	27,800	870	161,241
12	FARVIEW WELL	Intermediate	34	280	280	51,894	280	51,894
13	AMES TF	High	36	760	400	78,494	760	149,139
14	CEDAR HILL WELLFIELD	Intermediate	36	630	300	58,871	630	123,629
15	MOUNTAIN WELL	Intermediate	36	190	190	37,285	190	37,285
16	STEVENS WELL	Low	36	245	245	48,078	157	30,809
17	GLEN ROCK TF	Low	36	155	155	30,417	-	-
18	RUSSELL WELL	High	37	140	125	25,211	-	-
19	PROSPECT TF	Low	38	1,010	680	140,854	-	-
20	E. SADDLE RIVER WELL	Low	39	250	250	53,147	-	-
21	LAFAYETTE WELL	Intermediate	39	380	350	74,406	-	-
22	WEISCH WELL	Intermediate	40	400	400	87,216	-	-
23	IRVING WELL	Low	43	770	500	117,197	-	-
24	EDER WELL	Intermediate	44	360	340	81,547	-	-
25	LAKEVIEW WELL	High	46	230	230	57,672	-	-
26	MEER WELL	Intermediate	47	185	185	47,396	-	-
27	TWINNEY TF	Low	48	645	-	-	-	-
28	HAMPSHIRE RD INTERCONNECT (SUEZ)	Low	-	694	694	-	-	-
29	MARR INTERCONNECT (HAWTHORNE)	Intermediate	-	694	570	-	-	-
30	PVWC INTERCONNECT (PROPOSED)	Low	-	-	-	-	-	-

<b>TOTALS:</b>				<b>14,280</b>	<b>8,279</b>	<b>1,377,958</b>	<b>8,279</b>	<b>1,275,174</b>
----------------	--	--	--	---------------	--------------	------------------	--------------	------------------

**Proposed % Reduction: 7%**

Water Supply and Demand by Zone		
Zones	Zone Demand (gpm)	Zone Supply (gpm)
Low	4000	2442
Intermediate	2653	2465
High	991	3372
Booster	684	0

\* Combined average concentrations for PFOA, PFOS, and PFNA based on 2019 sampling data

### 3.7 Summary

Using a prioritized approach to operating sources of supply with the lowest PFAS concentrations, the system can reduce loadings significant in the off-season and shoulder seasons months, with less of a reduction during the peak season when nearly all water sources are required to meet demands.

Tables 3.1 through 3.3 can be provided to the operations staff and guides for system operation. It is noted that these scenarios are hydraulically feasible based upon the current model calibration and are subject to real-world testing.

## 4 Alternative Solutions for PFAS Treatment

Treatment options were analyzed to meet the Ridgewood Water goal of achieving non detect (< 2 ppt) levels of PFOA, PFOS, and PFNA in the Ridgewood Water system. Two treatment technologies were considered for the removal of PFAS: Granular Activated Carbon (GAC), and Ion Exchange (IX) Resins.

A discussion of each technology is provided below, along with additional considerations for the implementation of treatment. Special consideration was also given to facilities that already use packed tower aeration (PTA) for VOC removal, to determine how best to integrate the proposed PFAS treatment options into the existing treatment process.

### 4.1 Granular Activated Carbon Treatment Technology

GAC has historically been the most widely available technology for treatment of PFAS in water supplies, with multiple full-scale drinking water treatment installations in service. GAC treatment consists of at least two vessels, operating in series (lead-lag). Refer to **Figure 4.12**.

As pressurized water moves through the carbon vessels, PFAS compounds are removed from the water via adsorption. Once the carbon within a vessel reaches its adsorptive capacity (also referred to as the carbon becoming “spent” or “exhausted”), it can be removed from the vessel and regenerated at the manufacturer’s facility. Fresh or regenerated carbon is then placed back into the vessel.

There are several types of GAC media that can be used. Per recommendations from Calgon Carbon, the costs were calculated for using Filtrasorb 400 GAC. According to Calgon, this bituminous coal-based has better performance than the lignite and coconut-based alternatives. Based on limited water quality data from Ridgewood Water’s sites<sup>2</sup>, the media is estimated to have a life of 50,000 “bed volumes” (BVs) before breakthrough of contaminants.

Empty bed contact time (EBCT) measures time as the volume of the media divided by the flow rate. For planning purposes, treatment trains have been sized to provide a total empty bed contact time of 20 minutes (10 minutes per vessel) for removing PFAs, which complies with current NJDEP standards (NJAC 7:10-11.15(h)2). After the media in the bed is exhausted, the lag vessel is put into lead operation, and the media replaced in the exhausted vessel which becomes the lag vessel. This allows for continuous operation of the facility while media is being replaced.

**Figure 4.12: Standard GAC Configuration**



<sup>2</sup> “Removing PFCs at Carr Treatment Facility”, Arcadis, May, 2017

Calgon GAC contact vessels come in various sizes and volumes that accommodate various ranges of flows and EBCTs indicated in **Table 4.1**.

**Table 4.1: Granular Activated Carbon Vessel Characteristics (10 Minute EBCT)**

Vessel Model #	Vessel Diameter (ft)	Minimum Flow (gpm) <sup>1</sup>	Maximum Flow (gpm) <sup>2</sup>	Media Bed Volume per Vessel (CF)	Media Bed Volume per Vessel (Gal)
Model 6	6	60	150	200	1500
Model 8	8	100	250	330	2500
Model 10	10	160	500	670	5010
Model 12-40	12	230	1000	1330	9950

<sup>1</sup> Minimum Flow is based on a minimum recommended liquid loading rate of 2 gpm/SF, which is the minimum liquid loading rate recommended by Calgon Carbon to prevent channeling within the media

<sup>2</sup> Maximum Flow is based on maintaining a minimum 10 minutes of EBCT based on media bed volume per vessel

Although GAC technology is proven, there are several considerations that should be addressed during the design and operation of these facilities, including:

- Based upon raw water alkalinity, use of GAC media can result in a pH of up to 9 during commissioning and until the media is conditioned. Since this could have an adverse effect on distribution water quality (e.g. lead and copper rule compliance), this study has used costs for the purchase of acid washed GAC to mitigate this issue. In addition, jar testing with lead and copper samples might be prudent when placing new media online;
- Occasionally, GAC media has shown traces of arsenic during initial startup, and therefore filter-to-waste facilities need to be included in the design of the facilities. Discussions with GAC suppliers indicate that they cannot guarantee at this time that GAC deliveries will be free of arsenic (even if it is pre-acid washed). Ridgewood Water could reduce the probability of receiving GAC with arsenic by using regenerated GAC. If the sewerage treatment facility will not treat for arsenic an on-site treatment system might be needed;
- If radionuclides are present in the raw water, they would be adsorbed by the GAC, and the spent media could be classified as radioactive waste;
- GAC vessels perform better in controlled environments (i.e., within temperature-controlled building) since there has been evidence of poor performance of GAS vessels that can develop biofouling when heated from direct sunlight; and
- New GAC media requires much higher backwash rates than IX media when the media is first placed into service, resulting in a larger backwash waste quantity requiring disposal. This is discussed in subsequent sections.

## 4.2 Ion Exchange Treatment Technology

While GAC has the longest track record as a proven treatment technology for PFAS contamination, recent advances in single use anion exchange (IX) resins have made them a viable alternative for PFAS removal in the drinking water treatment market.

Pilot studies have demonstrated the effectiveness of resins for PFAS removal, and while still limited in number, there are a few full-scale drinking water facilities in the United States using ion exchange resins for PFAS treatment.

Similar to GAC, there are several types of IX resins that can be used. Calgon offers type 2301 and 2304 resins. The 2301 resin is a macroporous resin and is considered better for treatment

of PFAS (especially with long chain compounds like PFOA and PFOS). The 2304 media is a gel-based resin and has greater treatment capacity than 2301 but is not as effective at PFAS removal. The 2301 macro porous resin can also be chlorinated if needed to remove bacteriological growth, while the 2304 gel-based resin cannot.

At this time, and without specific pilot testing, it is unknown how many bed volumes can be treated using IX resin prior to breakthrough and change out of the media. Based on discussions with the supplier Calgon, IX resin is estimated to have a life of 150,000 bed volumes (BVs) before breakthrough of contaminants.

IX utilizes a similar vessel, piping and valve tree to the GAC systems. Similar to GAC systems, most resin system vendors recommend that the vessels are configured in series to maximize the use of the resin capacity. IX is more effective at removing PFAS compared to GAC, resulting in a shorter required EBCT. While the NJDEP has not established a required EBCT for IX technology, ion exchange resin units are commonly recommended to have a minimum of 2 – 2.5 minutes of EBCT per vessel for PFAS removal. A 2.5-minute EBCT is being used as a conservative value for planning purposes. At the lower EBCTs ion exchange vessels are typically smaller than GAC vessels for a given flow rate. However, IX systems also require a set of two prefiltration units (one in operation, one standby) to remove any particles in the feed water that are larger than 5 to 10 microns in size that could otherwise build-up on the resin and cause excessive head loss.

**Table 4.2** provides Calgon vessel sizes and volumes for IX required at various flow rates, to achieve 2.5 minutes of EBCT.

**Table 4.2: Ion Exchange Vessel Characteristics (2.5 Minute EBCT)**

Vessel Model #	Vessel Diameter (ft)	Minimum Flow (gpm) <sup>1</sup>	Maximum Flow (gpm) <sup>2</sup>	Media Bed Volume per Vessel (CF)	Media Bed Volume per Vessel (Gal)
Model 6	6	90	500	176	1320
Model 8	8	150	630	212	1590
Model 10	10	240	1200	424	3170
Model 12	12	340	1700	565	4230

<sup>1</sup> Minimum Flow is based on a minimum recommended liquid loading rate of 3 gpm/SF, which is the minimum liquid loading rate recommended by Calgon Carbon to prevent channeling within the media

<sup>2</sup> Maximum Flow is based on maintaining a minimum 2.5 minutes of EBCT based on media bed volume per vessel

### 4.3 Backwash and Disposal System Options

When placing media into the treatment vessels, PFAS treatment will require backwashing of either the GAC or IX media to remove fines from the media, to minimize headloss through the media and to avoid future clogging of the vessel components. Estimating a ground water temperature of approximately 55 degrees F, for GAC, Calgon Carbon recommends a maximum backwashing “superficial velocity” (based on the backwash flow rate and area of the vessel, represented as gpm/sf) of 8.5 gpm/SF, which would result in approximately 30% expansion of the GAC bed. This is the maximum allowable expansion before there would be risk of media loss during backwash.

Calgon also recommends a maximum backwash flow rate for IX vessels, to limit bed expansion to 50%. Because the IX media is extremely light, the backwash rate required to achieve this expansion is much lower than the backwash rate required for GAC. The maximum required



backwash rates and corresponding spent backwash water volumes requiring disposal for each vessel size are shown in **Table 4.3**.

**Table 4.3: GAC Backwash Requirements**

Vessel Size	Vessel Diameter (ft)	Granular Activated Carbon		Ion Exchange	
		Maximum Backwash Flow Rate (gpm) <sup>1</sup>	Total Volume of Spent Backwash Water (Gal) <sup>2</sup>	Maximum Backwash Flow Rate (gpm) <sup>3</sup>	Total Volume of Spent Backwash Water (Gal)
Model 6	6	250	9000	50	1800
Model 8	8	430	15480	85	3060
Model 10	10	670	24120	130	4680
Model 12 (or 12-40)	12	970	34920	190	6840

<sup>1</sup> Maximum recommended backwash flow rates for GAC are based on 8.5 gpm/SF to achieve 30% bed expansion

<sup>2</sup> Total volume of spent backwash water based on 30-minute backwash at required flow and 6 minutes of gradual increase/decrease

<sup>3</sup> Maximum recommended backwash flow rates for IX are based on Calgon IX Data Sheet for 50% bed expansion

The first step of the analysis was to determine if the existing water system could provide the necessary backwash flow rates without compromising pressure in the distribution system. Mott MacDonald performed a hydraulic modeling analysis that indicated that the system should be able to supply up to 1,000 gpm to each site for backwash purposes while maintaining adequate system pressure. These results should be confirmed through field flow tests as part of developing the Basis of Design Reports for each proposed treatment facility.

Using the volumes of spent backwash water generated by the GAC vessels, several options for disposal of the spent backwash water were considered in the following sections.

#### 4.3.1 Direct Disposal to Sewers

For backwash disposal, the most traditional manner for disposing of backwash is to send the flow to the sanitary sewer system. For the majority of the Ridgewood Water well and treatment facility sites there is no on-site sanitary sewer, and therefore, sewer main extensions will be required from the site to existing sewer facilities in the roadways.

The sewer extensions can be performed in several manners, including:

- Gravity sewer – if adequate slope can be maintained between the sites and existing sewers, a gravity sewer line can be installed;
- Permanent force main – where adequate slope is not available, it would be necessary to pump the backwash to existing sewers. In most cases, this could be completed by installing a 4-inch HDPE or DIP sewer force main with a clean out-style quick connection for pumping to the existing sewer; or
- Temporary force main – as an option to constructing a permanent force main, hoses could be temporarily installed above grade to allow backwash to be pumped to a receiving sewer. This method would require additional manpower from Ridgewood Water or each backwash, and could also require traffic control when pumping to a manhole

Another major consideration would be the flow rate to the receiving sewers. In some cases, the existing sewer systems might be able to accommodate full backwash flows, but in other circumstances on-site detention might be required, with the backwash sent to the sewers at a rate that does not exceed sewer capacity.

The availability of sewers was checked during the site investigation process for the disposal of the water used during backwash. The distance to the closest sewer manhole was estimated to determine the length of additional sewer main that would be required to transmit the backwash water from each site to the sewer. An estimate of the required size and length of sewer main required to connect to the closest sewer was developed for each site, to determine the potential costs. Gravity sewers were sized at 8-inch diameter for sites implementing Model 6 and Model 10 units. 10-inch diameter sewer main was estimated for Model 12-40 units, to accommodate higher flow rates.

While the feasibility of gravity flow to the sewer would need to be analyzed on a site by site basis during detailed design, visual inspection during the field surveys indicated that temporary pumps with force mains or temporary hoses would likely be required at several locations to discharge to the existing sewer. The estimated installation costs are \$500/LF for 8-inch PVC gravity sewer main and \$550/LF for 10-inch gravity sewer mains, installed (including manholes), based upon comparable projects. Alternatively, and in areas where a gravity sewer is not feasible due to site conditions, a 4-inch High Density Polyethylene (HDPE) force main could be constructed for approximately \$150/LF, with a quick connection as described above. While the force main has a lower installation cost than gravity sewer, gravity sewer has advantages in areas where the existing sewer can accept the backwash flows directly, as it requires no additional manpower to operate during the backwashing process. The force main option requires Ridgewood Water to purchase, maintain and operate a diesel pump (discussed in the next section), but can be used at any site, regardless of backwash rates or existing sewer conditions. **Appendix D** contains a comparison table with the approximate lengths and the associated costs for installing gravity sewers and force mains at each site.

#### 4.3.2 Sites Requiring On-Site Detention

In the event that the existing sewer capacity is not adequate to receive the full backwash flowrate (GAC applications), some form of onsite detention would be required. Beyond the scope of the master plan, each site would require an investigation into the preferred manner of handling backwash rates, as follows:

1. The ability to send full flow gravity backwash rates directly to sewer would be the preferred option, and would require a capacity evaluation with the sewerage utility;
2. The second option would consider the needed volume of permanent onsite storage that would be required in order to “bleed off” backwash to the sewers (via gravity or pumping) at the maximum rate the sewer could handle (subject to a capacity study);
3. Another option would be to consider an IX resin solution in lieu of GAC since the backwash rates are significantly lower and should be able to be handled by the existing sewer systems in most cases; and
4. Temporary on-site storage using a temporary tank or frac tank as shown in **Figure 4.2**.

**Figure 4.2: Frac Tank**



Source: Rain for Rent Tank Rentals

For the temporary storage alternative, two 21,000-gallon frac tanks (45 ft x 11 ft x 9 ft) would be required for containing the water during the backwashing of the largest GAC vessels. The frac tank would require a Class 6 – Medium Truck for transport (e.g, Ford F-650). The estimated cost of this vehicle is \$70,000.

These temporary tanks could be rented or purchased. A cost comparison for renting or purchasing the tanks (with associated appurtenances – hoses, pumps etc.) is shown in **Table 4.4** below.

**Table 4.4: Costs for Temporary Tanks and Pump**

Temporary Tank and Pump Rental Costs		
Item	Cost	Frequency
Rental of (2) 21,000-gallon tanks	\$300	per day
Tank mobilization fee	\$650	per day
4" Diesel Pump (including Delivery and Pickup)	\$550	per day
4" Hose Rental (500 LF)	\$250	per day
<b>TOTAL COST (Per Facility):</b>	<b>\$1,750</b>	<b>per day</b>

Temporary Tank and Pump Purchase Costs		
Item	Cost	Frequency
Purchase of (2) 21,000-gallon tanks	\$60,000	once
Purchase of 4" Diesel Pump	\$9,000	once
Purchase of 4" Cam-Lock Hose (500 LF)	\$1,500	once
<b>TOTAL COST (All Facilities):</b>	<b>\$70,500</b>	<b>once</b>
Number of Facilities:	25	
<b>TOTAL COST (Per Facility):</b>	<b>\$2,820</b>	<b>once</b>

While purchasing the temporary tanks requires initial capital investment and would require Ridgewood Water to have available space to store and a means to transport the tanks, purchasing of the tanks would provide significant cost savings compared to renting tanks for the purpose of backwash water handling over time. The cost for purchasing two frac tanks has been included in the capital investment plan strategy.

### 4.3.3 Alternative Backwashing Method

There are commercially available vehicles equipped with filtration systems that could be used for backwashing. The NO-DES solution utilizes a filtration truck as shown in **Figure 4.3**.

**Figure 4.3: NO-DES Truck**



Source: ValveTek Utility Services

The main advantage of this solution is that no backwash wastewater is generated for disposal. Instead the truck pumps in a closed backwash loop and the backwash materials are removed using on-board, disposable filters. However, there are several potential drawbacks to this solution, including:

- The estimated daily cost for renting the NO-DES solution (e.g., from ValveTek Utility Services) including manpower and filter changes is approximately \$10,000 per day.
- Ridgewood Water could potentially purchase the truck themselves for \$500,000 but the operation of the equipment would require specialized training. In addition, each time the truck is used it would require disinfection and bacteriological testing prior to use.
- It is noted that the NJDEP has approved the use of the NO-DES solution for closed loop flushing of water systems, but the NO-DES solution is classified as water treatment and therefore requires the disinfection protocols identified above. There is also no guarantee that NJDEP will continue to approve this technology at some later date.
- The costs for filters would be approximately \$3,000 per backwash event (estimated). These recurring costs increase the overall lifecycle costs to where other solutions are more attractive.
- In the event that a fresh shipment of GAC media has traces of arsenic, the filters would not remove the arsenic. In this situation, a filter to waste operation is undertaken until the arsenic is removed, requiring alternative disposal options.

Due to these considerations, the NO-DES solution is eliminated from further analysis. However, in the future, based upon specific conditions, NO-DES might be viable for occasional use.

### 4.3.4 Summary of Backwash Disposal Options

At the master planning level, it cannot be determined what the optimal backwash disposal configuration would be for each individual site. This would require additional field survey to determine the inverts of existing receiving sewers and would require discussions with the sewer departments as to existing sewer capacity. For the purposes of generating costs for the master plan, the following assumptions have been made:

- All sites will have a sewer line constructed whether it be a gravity sewer or force main sewer (refer to **Appendix D** for costs);

- Based upon limited space of the majority of sites, and the likelihood that not all existing sewers can receive the full backwash capacity, the cost for the purchase of two frac tanks, diesel pumps and hose for temporarily storing the backwash flows and discharging at a controlled rate to the sewer is included in the initial capital investments recommended for Ridgewood Water.

**Figure 4.4: Diesel Sewer Pump**



## 4.4 Comparison of Technologies

### 4.4.1 Cost to Construct PFAS Treatment Facilities

There are similarities in the design of a PFAS treatment facility that uses either GAC or IX media. When considering a “generic” PFAS treatment facility, each design would include the following capital costs:

- Vessels containing the GAC or IX media, with more durable (stainless steel) internal components required for the IX vessels that operate at higher loading rates (gpm/sq. ft.);
- Similar appurtenant piping to convey water from the sources, through the vessels, and out to distribution;
- Concrete foundations for the vessels
- Building enclosures for environmental control and to prevent freezing;
- Backwash and disposal system and facilities (site specific);
- Site improvements and landscape screening to reduce visual impact of facilities in the neighborhood;
- Upgrades to well pumps as required to address additional headloss through the treatment equipment;
- Modifications to chemical feed system injection points; and
- Potential upgrades to electric service and electric distribution equipment to accommodate additional loads;

Some of the differences in IX and GAC designs would include:

- In general, IX systems typically require smaller vessels than GAC systems for the same flow rate. As a result, future conversion to IX treatment from GAC treatment is possible due to the smaller vessel sizes required for IX. Future conversion from IX to GAC is not possible without a reduction in flow rate;

- IX systems would require smaller backwash and disposal systems than GAC system, and could potentially be discharged directly to the sewer if permitted, reducing operational efforts during backwash;
- For IX systems, prefiltration is needed to remove any particles in the feed water that are larger than 5 to 10 microns in size that could otherwise build-up on the resin and cause excessive head loss. Cartridge filters would be required to provide the prefiltration. Based upon manufacturer's recommendations, once the filters are clogged, they are disposed of and new filters are installed.
- At sites with existing packed tower aeration (PTA) treatment, the GAC media would need to be installed after the PTA treatment that removes volatile organic chemicals (VOCs), otherwise the GAC media would adsorb VOCs.
- Since the NJDEP requires that chlorination is the last form of treatment prior to system delivery, this creates a significant design consideration for sites with existing PTA treatment. Since these locations add chlorine into the clearwell to achieve final disinfection and contact time, a customized layout is required as follows:
  - Well water is pumped directly to the packed tower aerator;
  - Water that exits the aerator is intercepted prior to discharge to the clearwell and is pumped to the GAC vessels using a new intermediate wet well and pumps;
  - As water leaves the GAC vessel it is returned to the clearwell for normal disinfection and contact time; and
  - Existing high lift pumps supply the water from the clearwell to the distribution system.

These various treatment schemes result in three basic designs:

- GAC Vessels Installed at Well Sites – well water is pumped directly through the pressurized vessels, then chlorinated and delivered to the system. Larger vessels and larger backwash disposal systems are required;
- GAC Vessels at PTA Sites – as explained above, water is intercepted from the PTA and pumped through the GAC media and then back to the clearwell; and
- IX Vessels at Well and PTA Sites – – since IX media will not remove VOCs, the IX media vessels can be installed prior to the packed tower aerators. For this reason, any IX vessel installation will be similar to a GAC vessel well site installation, but smaller contact vessels and smaller backwash disposal systems are required;

Vessels installed at treatment facilities may need more than one well in operation to achieve the minimum flow rates required to avoid channeling through the media.

Total project cost ranges have been estimated for these potential “generic” design schemes for four different flow ranges as summarized in **Table 4.5** & **Table 4.6**. The detailed cost estimates are included in **Appendix E**.

**Table 4.5: PFAS Treatment Initial Capital Cost @ Well Facilities**

GAC			IX	
Maximum Facility Flow Rate (gpm)	Required Treatment Vessels	Initial Construction Cost (\$)	Required Treatment Vessels	Initial Construction Cost (\$)
150	Model 6	\$2,311,200	Model 6	\$2,534,500
250	Model 8	\$2,664,600	Model 6	\$2,534,500
500	Model 10	\$3,163,100	Model 6	\$2,534,500
1000	Model 12-40	\$4,198,100	Model 10	\$3,402,600

**Table 4.6: PFAS Treatment Initial Capital Cost @ Treatment Facilities**

GAC			IX	
Maximum Facility Flow Rate (gpm)	Required Treatment Vessels	Initial Construction Cost (\$)	Required Treatment Vessels	Initial Construction Cost (\$)
150	Model 6	\$2,693,100	Model 6	\$2,534,500
250	Model 8	\$2,990,300	Model 6	\$2,534,500
500	Model 10	\$3,488,800	Model 6	\$2,534,500
1000	Model 12-40	\$4,523,900	Model 10	\$3,402,600

*These cost estimates are prepared in accordance with an AACE Class 4 Estimate (-30% to +50% budget level estimate).*

These costs are further refined in subsequent sections of this report to include estimated operating costs, to estimate the present value life cycle costs of implementing treatment at each site. The costs above do not include sewer installation costs from **Appendix D**, which are to be considered on a site-specific basis.

**4.4.2 Operating Costs**

**4.4.2.1 Media Replacement**

One of the most significant differences in operating costs between GAC and IX treatment solutions is associated with the periodic replacement of the media. Media replacement requirements are typically calculated based upon an estimated number of “bed volumes”, which is the amount of media contained in the vessel. Multiplying the bed volume (in cubic feet) by the estimated number of bed volumes of water that can be treated before breakthrough determines the volume of water that the media can treat before changeout is required.

**Table 4.7** provides an estimate of costs associated with GAC and IX media replacement for treating PFAS in the Ridgewood Water system.

**Table 4.7: Media Costs – GAC vs. IX**

Solution	Media	Cost (\$/CF)	Bed Volumes Before Breakthrough	EBCT (Minutes)	Cost (\$/MG)	Annual Well Production (MG)	Estimated Annual Media Cost (\$)
GAC	Filtrisorb 400 (Regenerated)	\$40	50000	10	\$108	2,555	\$275,940
IX	Calgon 2301 Resin	\$275	150000	2.5	\$245	2,555	\$625,975

At the estimated bed volumes before breakthrough shown above, the estimate above indicates significant operational cost savings using GAC compared to IX. The GAC bed volume estimate of 50,000 is based upon more empirical data than the estimate of 150,000 bed volumes for IX. The IX bed volume estimate is considered conservative, with the potential that IX resins could provide more bed volume throughput. The actual IX media throughput can be calculated for Ridgewood Water using pilot testing for each facility as part of the basis of design for PFAS treatment.

#### 4.4.2.2 Pumping Costs

Another significant operating cost to consider is the electrical cost associated with increased headloss through the new treatment vessels, requiring additional horsepower. Based upon the flow rate and the Empty Bed Contact Time (EBCT), the headloss through a vessel could be anywhere from 15 psi to 40 psi. The higher headloss values would be associated with IX installations running at higher flowrates. Assuming a generic rate of \$0.12 per kW-hr, the additional annual electrical costs are shown in **Table 4.8**.

**Table 4.8: Electrical Cost for Headloss Through Media**

	Flow Rate (gpm)	Vessels	Headloss (psi)	Additional kW-hr/day	Additional Electrical Cost per Year
GAC	150	Model 6	9	18	\$772
	250	Model 8	7	23	\$1,000
	500	Model 10	10	65	\$2,858
	1000	Model 12-40	23	300	\$13,146
IX	150	Model 6	5	10	\$429
	250	Model 6	15	49	\$2,143
	500	Model 6	35	228	\$10,003
	1000	Model 10	14	183	\$8,002



#### 4.4.2.3 Building Enclosure Heating and Ventilation

At a master planning level, building enclosures have been recommended for several reasons, including: 1) freezing of media during winter months; 2) aesthetics; and 3) potential degradation of media (biofouling) exposed to direct sunlight and heating.

#### 4.4.2.4 Cartridge Filter Replacement (IX Systems)

For the IX option, the pre-filtration unit will require periodic cartridge replacement, which costs approximately \$2,500 for replacement of all cartridges. The frequency of cartridge replacement is based on free solids concentration within the influent well water at each facility, but filter manufacturer Towner has noted that they have seen cartridge replacement frequency range between 1-6 months. For the purpose of estimating costs for filter replacements in this study, it is estimated that filters will need to be replaced every 3 months of operation, resulting in an additional \$10,000 annually in costs at facilities using Model 10 IX vessels and \$5,000 annually in costs at facilities using Model 6 IX vessels.

#### 4.4.3 Site Space Requirements

Since the EBCT of IX is approximately one-quarter of the EBCT of GAC, smaller IX can be used to treat equal flow rates, as can be seen in **Table 4.9**. However, in most cases this does not seem to result in significantly much savings in site space, due to the need to include room to install cartridge filters ahead of the IX vessels. Generic vessel configurations and building layouts are provided in **Appendix F**.

**Table 4.9: Required Building Footprint for GAC and IX Treatment**

Maximum Flow Rate (gpm)	Granular Activated Carbon		Ion Exchange	
	Required Treatment Vessels	Estimated Treatment Footprint (ft)	Required Treatment Vessels	Estimated Treatment Footprint (ft)
150	Model 6	18' x 30' x 26'	Model 6	18' x 30' x 26'
250	Model 8	20' x 34' x 26'	Model 6	18' x 30' x 26'
500	Model 10	22' x 38' x 26'	Model 6	18' x 30' x 26'
1000	Model 12-40	24' x 42' x 33'	Model 10	22' x 38' x 26'

#### 4.4.4 Summary of Advantages and Disadvantages for Each Technology

A summary of the advantages and disadvantages of GAC and IX for treatment of PFAS is provided in **Table 4.10**.

**Table 4.10: Advantages and Disadvantages of GAC and IX Technologies for PFAS Removal**

	Advantages	Disadvantages
<b>GAC</b>	Industry Standing / Proven track record	Prewash required to control pH
	Lower Life Cycle Costs for Media Replacement	Filter to waste may be required to remove arsenic
	Vessels can potentially be converted for use of IX resin in the future	Large backwash volumes
	Media can be regenerated after exhaustion	Media is non-selective (must be installed downstream of existing VOC treatment)
<b>IX</b>	Longer media life	Media cannot be reused, and must be incinerated
	Media is selective (can be installed upstream of existing VOC treatment)	Pre-filtration process required for water conditioning
	Smaller backwash volume	May require pilot testing for NJDEP approval
	Higher PFAS removal capacity	Not chlorine tolerant
	Lower EBCT required for PFAS removal	Cannot be replaced with GAC in the future
	Can have a smaller footprint than GAC at higher flow rates	Higher headloss through media

### 4.5 Temporary Treatment Alternative

Temporary treatment could be considered for use at seasonal facilities during the peak demand season, additionally, temporary treatment units can be considered for areas in which permanent treatment may not be feasible due to site constraints.

The rental and purchase of temporary GAC systems was discussed with the manufacturer TIGG, Inc. TIGG offers two Model 10 equivalent vessels or two Model 12-40 equivalent vessels that can be transported to and from sites via a flatbed trailer. After the vessels are delivered to a site, they are loaded with GAC and backwashed similar to the permanent installations. The media can be removed from these vessels and the vessels can be transported off site (or between sites) as needed.

Based on discussions with TIGG, due to the increase in demand for PFAS treatment equipment, rental availability is subject to a 6-month lead time for delivery of equipment and requires a minimum 2-year contract for rentals. As such, the estimated 2-year rental cost of the temporary treatment equipment (vessels, piping, and media, only) would be as follows:

- Model 10: \$400,238
- Model 12-40: \$618,264

The 2-year rental cost for these vessels exceeds the purchase cost for the same equipment and would require initial capital investments similar to a permanent installation, including installation of a concrete pad, piping/chlorine feed modifications, and sewer infrastructure.

Due to the relatively high cost of renting the units vs. a permanent installation, and the contractual constraints noted above, temporary treatment solutions are only recommended for consideration at sites where permanent treatment is not feasible, or where Ridgewood Water wants the flexibility to move treatment between multiple sites.

# 5 PFAS Treatment Site Investigation

## 5.1 Desktop Analysis and Site Plan Development

A desktop review was performed for all Ridgewood Water well and treatment facilities to determine the feasibility of installing PFAS treatment. Factors such as space limitations, environmental and Green Acres constraints, and site access issues were evaluated. Mott MacDonald developed orthographic maps of each site, with digital overlays of relevant publicly available information for desktop review. These maps which include an estimated building footprint for the facilities based upon flowrates are provided in **Appendix G**.

Based on the conceptual layouts, sites which appear to have setback concerns which may require Planning/Zoning Board variances are noted in **Table 5.1**. These setback concerns need to be considered during design to avoid unnecessary delays to the projects, and should be considered during the prioritization strategy, as they can impact the project timeline.

Permanent construction within a wetlands transition area or a Flood Hazard Area (FHA) will require permitting through the NJDEP and can increase the length of time until a project can be implemented. There are four main environmental constraints for planning purposes:

- Installation of permanent treatment in a wetlands transition area is generally permitted by the NJDEP, following a 90-day review period and submission of the appropriate permit fee.
- Installation of permanent treatment in a 500-year flood zone only matters for projects seeking federal funding (to be discussed further in the prioritization strategy section). Raising the treatment above the 500-year flood plain may be necessary, along with a 90-day review period of the proposed installation.
- Installation of permanent treatment in the “flood fringe” (within the 100-year flood zone, but outside of the flood way) will require permitting by the NJDEP. At a minimum, submission of a permit application and appropriate fee will be required, and a 90-day review period should be anticipated.
- Installation of permanent treatment within a flood way may only be permitted on a case-by-case basis and requires an alternatives analysis that indicates there are no viable options to avoid building within the floodway. At a minimum, submission of a permit application, alternatives analysis, and permit fee will be required, and a 90-day review period should be anticipated.

Property that is designated as Green Acres by the State is protected from development and poses a potential barrier to constructing treatment. Projects on Green Acres land requires review by a State Commission that meets every 6 months and includes an alternatives analysis that indicates there are no other viable options. Potential mitigation measures necessary for approval could include deed restricting other properties for Green Acres use or adding project components that provide recreational benefit (fences, recreational spaces) to the surrounding area. Attempts to build in Green Acres property can have significant impact to project schedule and cost.

## 5.2 Feasibility Ranking

Field surveys were conducted to assess the feasibility of constructing treatment at each site. Field surveys reviewed site characteristics, community impact, constructability, environmental impact, operational considerations, and future accessibility and maintenance considerations.

**Table 5.1: Feasibility of Construction**

Site	Site Name	Municipality	Status	FHA Permitting?	Wetlands Permitting?	Zoning Variance?	Green Acres?	Easement Required?	Small Site?	Feasibility
1	Ames TF	Wyckoff	Active	None	No Wetlands with 50 feet or habitat of concern	No	No	No	No	1
2	Carr TF <sup>(1)</sup>	Ridgewood	Active	Flood Fringe	No Wetlands	No	No	No	No	1
3	Cedar Hill Wellfield	Wyckoff	Active	None	No Wetlands	No	No	No	No	1
4	College	Midland Park	Active	None	No Wetlands	No	No	Yes	Yes	1
5	E. Saddle River <sup>(2)</sup>	Ridgewood	Active	Within Floodway	Potential Individual Permit	Yes	No	No	Yes	3
6	East Ridgewood TF	Ridgewood	Active	Flood Fringe	No Wetlands	Yes	No	No	Yes	2
7	Eder	Wyckoff	Active	None	No Wetlands	Yes	No	No	No	2
8	Farview	Ridgewood	Active	None	No Wetlands	Yes	No	No	Yes	2
9	Glen Rock TF	Glen Rock	Active	Flood Fringe	Potential Individual Permit	Yes	No	Yes	Yes	3
10	Irving	Ridgewood	Active	Within Floodway	Potential Individual Permit	Yes	No	No	Yes	3
11	Lafayette	Wyckoff	Active	None	No Wetlands	No	No	No	No	1
12	Lakeview	Wyckoff	Active	None	Potential General Permit	Likely No	No	No	No	1
13	Main TF/South Side	Glen Rock	Active	None	No Wetlands	No	Yes	No	No	2
14	Marr	Ridgewood	Inactive	None	General Permit 7	No	No	No	No	2
15	Meer	Wyckoff	Active	None	No Wetlands	Likely No	No	No	No	1
16	Midland	Wyckoff	Active	None	Permittable - Yellow Heron Habitat Adjacent	Likely No	No	No	No	1
17	Mountain	Wyckoff	Active	None	No Wetlands	No	No	No	No	1
18	Prospect TF	Glen Rock	Active	None	No Wetlands	No	No	No	No	1
19	Ravine	Ridgewood	Inactive	None	No Wetlands	Likely No	No	No	Yes	2
20	Russell	Wyckoff	Active	None	No Wetlands	No	No	No	No	1
21	Salem (2)	Ridgewood	Active	None	No Wetlands	Yes	No	Yes	Yes	2
22	Stevens	Glen Rock	Active	Flood Fringe	No Wetlands	No	Yes	No	No	3
23	Twinney TF	Ridgewood	Active	None	Permittable - Black Heron Habitat Adjacent	No	No	No	Yes	2
24	Van Houten TF	Wyckoff	Active	None	Potential Redevelopment Permit (Wood Turtles Adjacent)	Yes	No	No	Yes	2
25	Waldo	Midland Park	Active	None	No Wetlands	Probably Yes	No	No	No	1
26	Weisch	Wyckoff	Active	None	No Wetlands	No	No	No	No	1
27	West End TF	Ridgewood	Active	None	Potential General Permit	No	No	No	No	2
28	Wortendyke TF	Midland Park	Active	None	No Wetlands	Likely No	No	No	No	1

(1) Considers Carr TF for future central location for other well treatment

(2) E. Saddle River and Salem wells could be treated at Eastside Reservoir but might require a "Special Activity Transition Area Waiver for Redevelopment" due to endangered species (Black Heron)

Note: Leigh, Andover, Goffle, King and Linwood out of service and not evaluated

Mott MacDonald worked with Mr. Jose Martinez, Superintendent of Water Treatment for Ridgewood Water, during the site investigations. Mr. Martinez provided additional insight regarding the typical operation of the facilities.

The site surveys confirmed that the key issues identified during desktop review (available space, flood hazard areas, Green Acres and proximity to neighboring buildings) were the main barriers to treatment installation.

Following the field surveys, each site was assigned a “Feasibility Score” of 1, 2, or 3 based on the potential for installing the required treatment at a given site. Scores were as follows:

1. Feasible
2. Potentially feasible but will require changes to existing site conditions
3. Infeasible - potential for temporary treatment may exist

**Table 5.1** provides a summary of the anticipated feasibility for implementing PFAS at each site, based on desktop review and field surveys. The forms containing observations collected during the visits can be found in **Appendix H**.

Of the 28 well/treatment facility points of entry investigated, treatment is considered feasible with no major barriers at fourteen (14) facilities.

### 5.2.1 Sites of Concern, Risks, and Potential Mitigation

There were ten wells and facilities where installation of treatment appears potentially feasible, with the following considerations:

#### East Ridgewood TF

Desktop review indicates that the East Ridgewood Treatment Facility, which treats approximately 825 gpm, is within the 100-year flood plain. The majority of the site and surrounding area are paved surfaces, making approval to construct permanent treatment feasible, but the additional NJDEP review times required will need to be considered when developing the prioritized capital investment strategy for implementing PFAS treatment. The site is very small and may be a site to consider smaller IX vessels than the use of GAC vessels. Since the backyard abuts an existing parking lot there should not be a significant community impact.

#### Twinney TF

Twinney Treatment Facility treats water from Twinney Well and Walthery Well with a combined NJDEP allocated well capacity of approximately 645 gpm (future capacity of up to 1,025 gpm). Twinney TF currently houses two existing Model 10 GAC contactors on a concrete pad, which are currently not in use. Water quality testing is ongoing for this site to test the effectiveness of GAC and IX resins for PFAS removal. Following the results of the study, this site should be prioritized for establishing PFAS treatment, as the reuse of the existing vessels offers one of the lowest capital investments for PFAS treatment. A field investigation identified wetlands and a Black Heron habitat. Upgrades can be performed and permitted under a “Special Activity Transition Area Waiver for Redevelopment” if the work is contained within previously disturbed (paved or gravel) areas. The site is very small and may be a site to consider smaller IX vessels than the use of GAC vessels.

### Van Houten TF

Van Houten Treatment Facility treats water from the Van Houten well and Franklin well with a combined NJDEP allocated well capacity of 600 gpm. The Van Houten TF is located at a dead end of the road with adequate screening from residential neighbors. Currently, there is no clear location to install treatment vessels, but during site investigation it was noted by Ridgewood Water that the existing fence is not at the boundaries of the land owned by Ridgewood Water. Construction of treatment at this location is feasible but would require tree removal outside of the fence and relocation of the fence to fit the vessels. The property is adjacent to Wood Turtle habitat and upgrades can be performed and permitted under a “Special Activity Transition Area Waiver for Redevelopment” if the work is contained within previously disturbed (paved or gravel) areas. If approximately 4,600 feet of raw water main was constructed to connect the Van Houten TF to the Ames TF, it would be possible to treat the water from both facilities together at that location. The cost for supplying treatment at this site or installing a transmission main to Ames TF will be considered as sites are prioritized during the master planning process.

### Eder Well

Eder well has an NJDEP allocated well capacity for 440 gpm. The Eder well is currently housed in a below ground pit. Upgrades are planned to include access stairs, a shed covering, and additional chemical storage. The site is in a residential neighborhood, but the location of the well is within a grove of trees that provides natural screening for the site that may be sufficient for limiting disturbance to the neighborhood. However, if treatment is prioritized at this location, it may be necessary to remove trees to clear space for the treatment vessels and foundation. With Route 280 bordering the back of the property, GAC vessels could likely be constructed with low visual impact.

### Farview Well

The Farview well is currently allocated for 350 gpm. The Farview well is located directly along Farview Ave with two residential neighbors separated by minimal screening. Any upgrades at this location would require heavy screening to the street and both neighbors. If treatment is prioritized at this location, screening trees could be used to minimize the disturbance to the community. This site could consider the use of smaller IX vessels and would also be a candidate for a raw water transmission main to a central location (e.g., Wortendyke).

### Salem Well

The Salem well, which currently produces approximately 275 gpm, is located on a small site close to a school. Desktop review indicates that there is not adequate space on Ridgewood Water’s existing lot to accommodate treatment. During the site visit, the possibility of obtaining land from the school property was discussed as a potential option and will be considered during the prioritization strategy process. Alternatively, an express raw water transmission main could be constructed to direct this flow to centralized treatment (e.g., Eastside Reservoir). The East Side Reservoir is in proximity to Black Heron habitat. Upgrades can be performed and permitted under a “Special Activity Transition Area Waiver for Redevelopment” if the work is contained within previously disturbed (paved or gravel) areas.

### West End TF

West End well is currently allocated for 275 gpm of flow. At the West End Well, the property and surrounding properties are all owned by the Village of Ridgewood which provides several options for locating treatment outside of the floodplain and also away from existing wetlands. There appears to be some inconsistency in information related to whether or not the properties are designated as Green Acres. State information has identified the properties as Green Acres,

but the local Recreation and Open Space Inventory (ROSI) does not include these properties as Green Acres. Green Acres diversion permitting can take up to a year and must be considered in the prioritization of future treatment.

#### Main Treatment Facility/Southside Reservoir

The Main Treatment Facility, which treats approximately 190 gpm, is located on the Southside Reservoir site. There is a significant amount of space on this site for PFAS treatment to be implemented. The desktop review indicates that this site is designated as Green Acres property. However, since Ridgewood Water has operated facilities on this site for 50 years, there is potentially an agreement in place to allow expansion in designated areas. If Green Acres diversion permitting would be required, it can take up to a year and must be considered in the prioritization of future treatment.

#### Marr and Ravine Wells

These wells are currently inactive. The Marr Well (400 gpm) and the Ravine Well (235 gpm) would likely benefit from centralized treatment. There are space limitations at the Ravine site, but treatment for VOCs and PFAs should be feasible. The Marr site will likely require a General Permit 7 for wetlands.

### 5.2.2 Infeasible Sites

There were four (4) facilities where installation of treatment was not considered feasible:

#### Irving Well

Based on information from Ridgewood Water, the NJDEP has denied prior requests to install a permanent generator at the site, due to the site being within the floodway. It is anticipated that requests to implement permanent PFAS treatment at this facility will also be denied. There are two options for providing PFAS treatment to this site:

- Implement temporary PFAS treatment where flatbed trucks with GAC vessels could be brought on to the easement adjacent to the site (potentially only during the summer months to help meet peak demands for the system)
- Install approximately 5,000 LF of raw water main from the Irving site to the Carr TF facility where there is available space to add treatment vessels.

Nearby, the Linwood Well, currently inactive, is located on Green Acres property. The Linwood Well could be combined with the Irving Well raw water transmission main for treatment at the Carr TF.

#### East Saddle River Well

Treatment options cannot be implemented at the East Saddle River Well due to the lack of space on site to house the vessels and flood zone concerns. The Eastside Reservoir site, located approximately 1,000 feet south of the East Saddle River Well, has adequate space for the construction of treatment. Using a raw water main to route water to the Eastside Reservoir site, the well flow could be treated at this site.

#### Glen Rock TF

Glen Rock TF is currently allocated for 155 gpm of flow. At Glen Rock TF, there is a space restriction on site. The best potential location to construct PFAS treatment is near the sloped driveway with access to the adjacent swimming pool owned by the Borough of Glen Rock. However, the site is also within the 100-year flood zone and wetlands boundaries. NJDEP

permitting would be required for this site, and the equipment might have to be elevated above the flood plain, increasing potential costs. Based on the NJDEP's response with the installation of a generator at Irving Well, it may be difficult to receive permits for this location. If approximately 5,000 feet of raw water main was constructed to connect the Glen Rock TF to the West End TF, it would be possible to treat the water from both facilities together at that location. The cost for supplying treatment at this site or installing a transmission main to West End well will be considered as sites are prioritized during the master planning process.

### Stevens Well

The Stevens well currently produces approximately 225 gpm. Desktop review indicates that this site is within the 100-year flood plain and has been designated Green Acres property. Further investigation should be performed to confirm these constraints, to determine the feasibility of installing treatment at this site. Alternatively, an express raw water transmission main could be constructed to direct this flow to centralized treatment at the Prospect TF site.

## 5.3 Costs to Combine Facilities

As identified above, several sites were recommended to be provided with express mains, to divert flow to another location where the installation of treatment was considered more feasible. Costs for each connection of raw water main shown in **Table 5.2** below was based on \$150 per foot for 8-inch water main and \$200 per foot for 12-inch water main.

**Table 5.2: Raw Water Main Costs**

Connection	Diameter (in)	Estimated Length (ft)	Cost per foot	Total Cost with 30% Contingency
Glen Rock Well to West End Well	8	6,150	\$200	\$1,599,000
Linwood Well to Irving Well to Carr TF	12	5,590	\$250	\$1,816,750
East Saddle River Well to Eastside Reservoir	8	1,450	\$200	\$377,000
Marr Well to Ravine Well (1)	8	2,070	\$200	\$538,200
Van Houten TF to Ames TF	8	4,600	\$200	\$1,196,000
<b>TOTAL</b>		<b>15,260</b>		<b>\$4,330,950</b>

(1) There is a water main already constructed between these two facilities, but it is unknown at the existing time if its condition is adequate for future use



## 6 PFAS Treatment Solutions and Costs

Ridgewood Water requested that comprehensive treatment solutions be evaluated in two manners: 1) distributed treatment; and 2) centralized treatment.

The distributed treatment alternative is based upon maintaining the existing points of entry (POEs) in the system, and only combining treatment at centralized locations where treatment was deemed infeasible in Section 5 of this study. This alternative maintains system operations in a manner most similar to current conditions.

The centralized treatment option is based upon minimizing the number of points of entry into the system utilizing more raw water transmission mains to convey water to central locations. For Ridgewood Water there may be significant advantages to this approach, including:

- Space availability and community impact – there are several central locations where new facilities could be constructed with less community impact and less potential permitting hurdles (e.g., floodplains and wetlands);
- Workforce requirements – by reducing the POEs into the system, this might reduce overall workforce requirements to continuously visit numerous facilities over a large geographic area. This would also require less water quality sampling which is currently required by the NJDEP for each point of entry in operation.
- Seasonal operation – The most optimized method for operating either GAC or IX treatment systems is continuous operation. These systems prefer not to sit idle which could require periodic backwashing to prevent media compaction. With centralized treatment there is greater flexibility to operate systems in a more continuous manner.

### 6.1 Distributed Treatment Alternative

**Tables 6.1 and 6.2** provide a 40-year present value analysis for GAC and IX treatment solutions, respectively. These costs are based upon the information compiled in previous sections of this report.

The distributed treatment alternative considers treatment at the existing 28 active points of entry (POEs) and maintaining a distributed system of supply. This does require that several facilities are combined (due to governing site restrictions) and would result in 24 future POEs.

The 40-year present value was calculated using a 0 percent effective rate, which considers that the bank interest rate will likely be very close or equal to the rate of inflation for the operating expenses. The 40-year present value for the GAC and IX alternatives is estimated at \$148.5 million and \$150.6 million, respectively. GAC shows a slight advantage in terms of overall life cycle costs, and based upon other advantages identified in the report, is the primary recommendation for treatment in the future.

### 6.2 Centralized Treatment Alternative

#### 6.2.1 Centralized Concept

The centralized concept considers replacing 31 POEs (28 active) with 15 POEs (13 active) by routing many existing well facilities to centralized locations as identified in **Table 6.3** and shown on **Plate 6.1**.

**Table 6.1 - Present Value PFAS Treatment Costs - Granular Activated Carbon**

Facility	Municipality	Flow Rate (gpm)	Number of Treatment Systems	Selected GAC Treatment System Size	Feasibility Ranking	Loading Rate (gpm/sq. ft)	Construction Capital Costs	Gravity Sewer Main Construction Costs	Raw Water Main Costs	Total Capital Cost	Present Value of Electrical Cost for Pumping (40 Years) <sup>2</sup>	Present Value of Backwash Water Disposal Costs (40 Years) <sup>2</sup>	Present Value of Media Changeout Costs (40 Years) <sup>1,2</sup>	Present Value of HVAC Costs (40 Years) <sup>2</sup>	Total Present Value (Capital + O&M) (40 Years) <sup>2</sup>
Ames TF	Wyckoff	760	1	Model 12-40	1	7	\$4,523,900	\$55,000		\$4,578,900	\$129,741	\$5,598	\$769,499	\$920,000	\$6,403,800
Cedar Hill Wellfield	Wyckoff	630	1	Model 12-40	1	6	\$4,198,100	\$27,500		\$4,225,600	\$82,582	\$4,641	\$637,874	\$920,000	\$5,870,700
College Well	Midland Park	150	1	Model 6	1	5	\$2,311,200	\$125,000		\$2,436,200	\$17,147	\$1,898	\$151,875	\$278,572	\$2,885,700
E. Saddle River Well	Ridgewood	250	1	Model 8	3	5	\$2,664,600	\$25,000	\$377,000	\$3,066,600	\$21,434	\$3,265	\$253,125	\$350,794	\$3,695,300
East Ridgewood TF	Ridgewood	825	1	Model 12-40	2	7	\$4,523,900	\$137,500		\$4,661,400	\$157,184	\$6,077	\$835,311	\$920,000	\$6,580,000
Eder Well	Wyckoff	360	1	Model 10	2	5	\$3,163,100	\$55,000		\$3,218,100	\$23,869	\$3,663	\$364,499	\$431,270	\$4,041,500
Farview Well	Ridgewood	280	1	Model 10	2	4	\$3,163,100	\$110,000		\$3,273,100	\$10,883	\$2,849	\$283,500	\$431,270	\$4,001,700
Glen Rock TF	Glen Rock	155	1	Model 8	3	3	\$2,990,300		\$1,599,000	\$4,589,300	\$4,873	\$2,024	\$156,937	\$350,794	\$5,104,000
Irving	Ridgewood	1010	1	Model 12-40	3	9	\$4,523,900		\$926,250	\$5,450,150	\$249,391	\$7,440	\$1,022,623	\$920,000	\$7,649,700
Lafayette Well	Wyckoff	375	1	Model 10	1	5	\$3,163,100	\$137,500		\$3,300,600	\$26,793	\$3,816	\$379,687	\$431,270	\$4,142,200
Lakeview Well	Wyckoff	230	1	Model 8	1	5	\$2,664,600	\$50,000		\$2,714,600	\$17,090	\$3,004	\$232,875	\$350,794	\$3,318,400
Linwood TF	Ridgewood	610	1	Model 12-40	3	5	\$4,523,900		\$890,500	\$5,414,400	\$76,241	\$4,493	\$617,624	\$920,000	\$7,032,800
Main TF	Glen Rock	190	1	Model 8	2	4	\$2,990,300	\$175,000		\$3,165,300	\$9,774	\$2,482	\$192,375	\$350,794	\$3,720,800
Marr Well	Ridgewood	400	1	Model 10	2	5	\$3,163,100		\$538,200	\$3,701,300	\$32,008	\$4,070	\$404,999	\$431,270	\$4,573,700
Meer Well	Wyckoff	185	1	Model 8	1	4	\$2,664,600	\$100,000		\$2,764,600	\$8,988	\$2,416	\$187,312	\$350,794	\$3,314,200
Midland Well	Wyckoff	160	1	Model 8	1	3	\$2,664,600	\$125,000		\$2,789,600	\$5,487	\$2,090	\$162,000	\$350,794	\$3,310,000
Mountain Well	Wyckoff	190	1	Model 8	1	4	\$2,664,600	\$125,000		\$2,789,600	\$9,774	\$2,482	\$192,375	\$350,794	\$3,345,100
Prospect TF	Glen Rock	1010	1	Model 12-40	1	9	\$4,523,900	\$220,000		\$4,743,900	\$249,391	\$7,440	\$1,022,623	\$920,000	\$6,943,400
Ravine Well	Ridgewood	235	1	Model 8	2	5	\$2,664,600	\$25,000		\$2,689,600	\$18,133	\$3,069	\$237,937	\$350,794	\$3,299,600
Russell Well	Wyckoff	140	1	Model 6	1	5	\$2,311,200	\$50,000		\$2,361,200	\$14,404	\$1,772	\$141,750	\$278,572	\$2,797,700
Salem Well	Ridgewood	275	1	Model 10	2	4	\$3,163,100	\$275,000		\$3,438,100	\$10,217	\$2,798	\$278,437	\$431,270	\$4,160,900
Stevens Well	Ridgewood	225	1	Model 8	3	4	\$2,664,600	\$125,000		\$2,789,600	\$16,076	\$2,939	\$227,812	\$350,794	\$3,387,300
Twinney TF	Ridgewood	1025	1	Model 12-40	2	9	\$4,523,900	\$220,000		\$4,743,900	\$243,874	\$7,550	\$1,037,811	\$920,000	\$6,953,200
Van Houten TF	Wyckoff	530	1	Model 12-40	2	5	\$6,977,600	\$165,000		\$7,142,600	\$53,317	\$3,904	\$536,624	\$920,000	\$8,656,500
Waldo Well	Midland Park	325	1	Model 10	1	4	\$3,163,100	\$110,000		\$3,273,100	\$17,648	\$3,307	\$329,062	\$431,270	\$4,054,400
Weisch Well	Wyckoff	400	1	Model 10	1	5	\$3,163,100	\$247,500		\$3,410,600	\$32,008	\$4,070	\$404,999	\$431,270	\$4,283,000
West End TF	Ridgewood	250	1	Model 8	2	5	\$2,990,300	\$50,000		\$3,040,300	\$21,434	\$3,265	\$253,125	\$350,794	\$3,669,000
Wortendyke TF	Midland Park	730	1	Model 12-40	1	6	\$4,523,900	\$27,500		\$4,551,400	\$117,943	\$5,377	\$739,124	\$920,000	\$6,333,900
<b>Total:</b>		<b>11905</b>					<b>\$97,230,200</b>	<b>\$2,762,500</b>	<b>\$4,330,950</b>	<b>\$104,323,650</b>	<b>\$1,677,705</b>	<b>\$107,800</b>	<b>\$12,053,792</b>	<b>\$15,363,969</b>	<b>\$133,528,500</b>

<sup>1</sup> Operational costs for GAC assumed that initial capital investment is made to purchase temporary (frac) tanks, diesel pumps and hoses

<sup>2</sup> Present value (0% effective rate) is based on operation at maximum observed facility flow rate for half of the year over a 40 year period

Note: Table does not include Andover, Leigh, and King wells which are currently out of service, and may be abandoned in the future.

Capital Cost to Purchase of Backwash Equipment: Frac Tanks, Medium Truck, and Diesel Pumps	<b>\$140,500</b>
Present Value of Operations and Maintenance Cost for 4 Full Time Staff (\$75,000 per person per year for 40 years)	<b>\$12,000,000</b>
Present Value of Operations and Maintenance Cost to sample each POE in the system quarterly (\$70,000 per year for 40 years)	<b>\$2,800,000</b>
<b>TOTAL PRESENT VALUE COST OF PFAS TREATMENT FOR 40 YEARS</b>	<b>\$148,469,000</b>

**Table 6.2 - Present Value PFAS Treatment Costs - Ion Exchange**

Facility	Municipality	Flow Rate (gpm)	Number of Treatment Systems	Selected IX Treatment System Size	Feasibility Ranking	Loading Rate (gpm/sq. ft)	Construction Capital Costs	Gravity Sewer Main Construction Costs	Raw Water Main Costs	Total Capital Cost	Present Value of Electrical Cost for Pumping (40 Years) <sup>2</sup>	Present Value of Backwash Water Disposal Costs (40 Years) <sup>2</sup>	Present Value of Media Changeout Costs (40 Years) <sup>1,2</sup>	Present Value of Filter Replacement Costs (40 Years) <sup>2</sup>	Present Value of HVAC Costs (40 Years) <sup>2</sup>	Total Present Value (Capital + O&M) (40 Years) <sup>2</sup>
Ames TF	Wyckoff	760	1	Model 10	1	10	\$3,402,600	\$55,000		\$3,457,600	\$149,434	\$393	\$1,959,372	\$400,000	\$431,270	\$6,398,100
Cedar Hill Wellfield	Wyckoff	630	1	Model 10	1	8	\$3,402,600	\$27,500		\$3,430,100	\$97,346	\$326	\$1,624,216	\$400,000	\$431,270	\$5,983,300
College Well	Midland Park	150	1	Model 6	1	5	\$2,534,500	\$125,000		\$2,659,500	\$12,432	\$72	\$386,718	\$200,000	\$278,572	\$3,537,300
E. Saddle River Well	Ridgewood	250	1	Model 6	3	9	\$2,534,500	\$25,000	\$377,000	\$2,936,500	\$42,154	\$120	\$644,530	\$200,000	\$278,572	\$4,101,900
East Ridgewood TF	Ridgewood	825	1	Model 10	2	11	\$3,402,600	\$137,500		\$3,540,100	\$179,583	\$427	\$2,126,949	\$400,000	\$431,270	\$6,678,400
Eder Well	Wyckoff	360	1	Model 6	2	13	\$2,534,500	\$55,000		\$2,589,500	\$94,653	\$173	\$928,123	\$200,000	\$278,572	\$4,091,100
Farview Well	Ridgewood	280	1	Model 6	2	10	\$2,534,500	\$110,000		\$2,644,500	\$54,414	\$134	\$721,874	\$200,000	\$278,572	\$3,899,500
Glen Rock TF	Glen Rock	155	1	Model 6	3	5	\$2,534,500		\$1,599,000	\$4,133,500	\$13,511	\$74	\$399,609	\$200,000	\$278,572	\$5,025,300
Irving	Ridgewood	1010	1	Model 10	3	13	\$3,402,600		\$926,250	\$4,328,850	\$280,373	\$523	\$2,603,902	\$400,000	\$431,270	\$8,045,000
Lafayette Well	Wyckoff	375	1	Model 6	1	13	\$2,534,500	\$137,500		\$2,672,000	\$103,420	\$180	\$966,795	\$200,000	\$278,572	\$4,221,000
Lakeview Well	Wyckoff	230	1	Model 6	1	8	\$2,534,500	\$50,000		\$2,584,500	\$34,838	\$110	\$592,968	\$200,000	\$278,572	\$3,691,000
Linwood TF	Ridgewood	610	1	Model 10	3	8	\$3,402,600		\$890,500	\$4,293,100	\$90,304	\$316	\$1,572,654	\$400,000	\$431,270	\$6,787,700
Main TF	Glen Rock	190	1	Model 6	2	7	\$2,534,500	\$175,000		\$2,709,500	\$22,263	\$91	\$489,843	\$200,000	\$278,572	\$3,700,300
Marr Well	Ridgewood	400	1	Model 6	2	14	\$2,534,500		\$538,200	\$3,072,700	\$118,888	\$192	\$1,031,248	\$200,000	\$278,572	\$4,701,700
Meer Well	Wyckoff	185	1	Model 6	1	7	\$2,534,500	\$100,000		\$2,634,500	\$20,884	\$89	\$476,952	\$200,000	\$278,572	\$3,611,000
Midland Well	Wyckoff	160	1	Model 6	1	6	\$2,534,500	\$125,000		\$2,659,500	\$14,632	\$77	\$412,499	\$200,000	\$278,572	\$3,565,300
Mountain Well	Wyckoff	190	1	Model 6	1	7	\$2,534,500	\$125,000		\$2,659,500	\$22,263	\$91	\$489,843	\$200,000	\$278,572	\$3,650,300
Prospect TF	Glen Rock	1010	1	Model 10	1	13	\$3,402,600	\$220,000		\$3,622,600	\$280,373	\$523	\$2,603,902	\$400,000	\$431,270	\$7,338,700
Ravine Well	Ridgewood	235	1	Model 6	2	8	\$2,534,500	\$25,000		\$2,559,500	\$36,602	\$113	\$605,858	\$200,000	\$278,572	\$3,680,700
Russell Well	Wyckoff	140	1	Model 6	1	5	\$2,534,500	\$50,000		\$2,584,500	\$10,403	\$67	\$360,937	\$200,000	\$278,572	\$3,434,500
Salem Well	Ridgewood	275	1	Model 6	2	10	\$2,534,500	\$275,000		\$2,809,500	\$52,264	\$132	\$708,983	\$200,000	\$278,572	\$4,049,500
Stevens Well	Ridgewood	225	1	Model 6	3	8	\$2,534,500	\$125,000		\$2,659,500	\$33,116	\$108	\$580,077	\$200,000	\$278,572	\$3,751,400
Twinney TF	Ridgewood	1025	1	Model 10	2	13	\$3,402,600	\$220,000		\$3,622,600	\$274,358	\$530	\$2,642,574	\$400,000	\$431,270	\$7,371,400
Van Houten TF	Wyckoff	530	1	Model 10	2	7	\$3,402,600	\$165,000		\$3,567,600	\$64,728	\$274	\$1,366,404	\$400,000	\$431,270	\$5,830,300
Waldo Well	Midland Park	325	1	Model 6	1	12	\$2,534,500	\$110,000		\$2,644,500	\$75,699	\$156	\$837,889	\$200,000	\$278,572	\$4,036,900
Weisch Well	Wyckoff	400	1	Model 6	1	14	\$2,534,500	\$247,500		\$2,782,000	\$118,888	\$192	\$1,031,248	\$200,000	\$278,572	\$4,411,000
West End TF	Ridgewood	250	1	Model 6	2	9	\$2,534,500	\$50,000		\$2,584,500	\$42,154	\$120	\$644,530	\$200,000	\$278,572	\$3,749,900
Wortendyke TF	Midland Park	730	1	Model 10	1	9	\$3,402,600	\$27,500		\$3,430,100	\$136,442	\$378	\$1,882,028	\$400,000	\$431,270	\$6,280,300

<b>Total:</b>		<b>11905</b>					<b>\$78,778,900</b>	<b>\$2,762,500</b>	<b>\$4,330,950</b>	<b>\$85,872,350</b>	<b>\$2,476,418</b>	<b>\$5,978</b>	<b>\$30,692,526</b>	<b>\$7,400,000</b>	<b>\$9,174,290</b>	<b>\$135,622,800</b>
---------------	--	--------------	--	--	--	--	---------------------	--------------------	--------------------	---------------------	--------------------	----------------	---------------------	--------------------	--------------------	----------------------

<sup>2</sup> Present value (0% effective rate) is based on operation at maximum observed facility flow rate for half of the year over a 40 year period

Note: Table does not include Andover, Leigh, and King wells which are currently out of service, and may be abandoned in the future.

Capital Cost to Purchase of Backwash Equipment: Frac Tanks, Medium Truck, and Diesel Pumps	<b>\$140,500</b>
Present Value of Operations and Maintenance Cost for 4 Full Time Staff (\$75,000 per person per year for 40 years)	<b>\$12,000,000</b>
Present Value of Operations and Maintenance Cost to sample each POE in the system quarterly (\$70,000 per year for 40 years)	<b>\$2,800,000</b>
<b>TOTAL PRESENT VALUE COST OF PFAS TREATMENT FOR 40 YEARS</b>	<b>\$150,563,300</b>

TABLE 6.3 - Centralized Treatment at 13 Points of Entry (POE)

Facility #	Municipality	Facility	Flow Rate (gpm)	Combined Flow (gpm)	Raw Water Main Connection Length (feet)	Vessel Size Required (GAC)
1	Wyckoff	<b>Ames TF</b>	760	1,430	-	Model 12-40 and Model 10
	Wyckoff	Russell Well	140		4,240	
	Wyckoff	Van Houten TF	530		4,600	
2	Wyckoff	<b>Mountain Well</b>	190	190	-	Model 8
3	Wyckoff	<b>Cedar Hill Wellfield</b>	630	1,805	-	2 - Model 12-40s
	Wyckoff	Lakeview Well	230		2,570	
	Wyckoff	Eder Well	360		2,740	
	Wyckoff	Meer Well	185		3,670	
	Wyckoff	Weisch Well	400		5,240	
4	Wyckoff	<b>Lafayette Well</b>	375	375	-	Model 10
5	Midland Park	<b>Wortendyke TF</b>	730	1,645	-	2 - Model 12-40s
	Midland Park	College Well	150		3,370	
	Ridgewood	Farview Well	280		2,530	
	Wyckoff	Midland Well	160		7,330	
	Midland Park	Waldo Well	325		7,300	
6	Wyckoff	<b>Marr Well</b>	400	635	-	Model 12-40
	Ridgewood	Ravine Well	235		2,070	
7	Glen Rock	<b>Main TF</b>	190	190	-	Model 8
8	Ridgewood	<b>West End TF</b>	250	405	-	Model 10
	Glen Rock	Glen Rock TF	155		6,150	
9	Ridgewood	<b>Carr TF</b>	700	2,320	-	Model 12-40 and Model 10
	Ridgewood	Irving	1,010		2,850	
	Ridgewood	Linwood Well	610		2,740	
10	Glen Rock	<b>Prospect TF</b>	1,010	1,235	-	Model 12-40 and Model 8
	Ridgewood	Stevens Well	225		4,400	
11	Ridgewood	<b>Twinney TF</b>	1,025	1,025	-	Model 10
12	Ridgewood	<b>East Ridgewood TF</b>	825	825	-	Model 12-40
13	Ridgewood	<b>Eastside Reservoir</b>				
	Ridgewood	E. Saddle River Well	250	525	1,450	Model 12-40
	Ridgewood	Salem Well	275		3,270	
		<b>TOTAL</b>	<b>12,605</b>	<b>12,605</b>	<b>66,520</b>	

**Table 6.4 - Present Value PFAS Treatment Costs for 13 POE - Granular Activated Carbon**

Facility	Municipality	Flow Rate (gpm)	Number of Treatment Systems	Selected GAC Treatment System Size	Feasibility Ranking	Loading Rate (gpm/sq. ft)	Construction Capital Costs	Gravity Sewer Main Construction Costs	Raw Water Main Costs	Total Capital Cost	Present Value of Electrical Cost for Pumping (40 Years) <sup>2</sup>	Present Value of Backwash Water Disposal Costs (40 Years) <sup>2</sup>	Present Value of Media Changeout Costs (40 Years) <sup>1,2</sup>	Present Value of HVAC Costs (40 Years) <sup>2</sup>	Total Present Value (Capital + O&M) (40 Years) <sup>2</sup>
Ames TF	Wyckoff	1430	1	Model 10											
			1	Model 12-40	1	7	\$8,012,700	\$55,000	\$2,298,400	\$10,366,100	\$258,091	\$12,020	\$1,447,631	\$1,351,270	\$13,435,200
Carr TF <sup>3</sup>	Ridgewood	1620	1	Model 10											
			1	Model 12-40	1	8	\$8,012,700	-	\$1,453,400	\$9,466,100	\$301,032	\$8,068	\$1,639,919	\$1,351,270	\$12,766,400
Cedar Hill Wellfield	Wyckoff	1805	2	Model 12-40	1	8	\$8,396,200	\$27,500	\$3,697,200	\$12,120,900	\$386,544	\$13,295	\$1,827,559	\$1,840,000	\$16,188,300
Eastside Reservoir	Ridgewood	525	1	Model 12-40	1	5	\$4,198,100	\$25,000	\$1,227,200	\$5,450,300	\$52,014	\$3,867	\$531,562	\$920,000	\$6,957,800
East Ridgewood TF	Ridgewood	825	1	Model 12-40	2	7	\$4,523,900	\$137,500		\$4,661,400	\$157,184	\$6,077	\$835,311	\$920,000	\$6,580,000
Lafayette Well	Wyckoff	375	1	Model 10	1	5	\$3,163,100	\$137,500		\$3,300,600	\$26,793	\$3,816	\$379,687	\$431,270	\$4,142,200
Main TF	Glen Rock	190	1	Model 8	2	4	\$2,990,300	\$175,000		\$3,165,300	\$9,774	\$2,482	\$192,375	\$350,794	\$3,720,800
Marr Well	Ridgewood	635	1	Model 12-40	2	6	\$4,523,900	\$25,000	\$538,200	\$5,087,100	\$84,205	\$4,677	\$642,936	\$920,000	\$6,739,000
Mountain Well	Wyckoff	190	1	Model 8	1	4	\$2,664,600	\$125,000		\$2,789,600	\$9,774	\$2,482	\$192,375	\$350,794	\$3,345,100
Prospect TF	Glen Rock	1235	1	Model 8											
			1	Model 12-40	1	7	\$7,188,500	\$220,000	\$1,144,000	\$8,552,500	\$265,308	\$10,504	\$1,250,435	\$1,270,794	\$11,349,600
Twinney TF	Ridgewood	1025	1	Model 12-40	2	9	\$4,523,900	\$220,000		\$4,743,900	\$257,782	\$7,550	\$1,037,811	\$920,000	\$6,967,100
West End TF	Ridgewood	405	1	Model 10	2	5	\$3,488,800	\$50,000	\$1,599,000	\$5,137,800	\$33,103	\$4,121	\$410,062	\$431,270	\$6,016,400
Wortendyke TF	Midland Park	1645	2	Model 12-40	1	7	\$9,047,800	\$27,500	\$5,337,800	\$14,413,100	\$312,162	\$12,117	\$1,665,560	\$1,840,000	\$18,243,000

<b>Total:</b>		<b>11905</b>					<b>\$70,734,500</b>	<b>\$1,225,000</b>	<b>\$17,295,200</b>	<b>\$89,254,700</b>	<b>\$2,153,765</b>	<b>\$83,007</b>	<b>\$12,053,223</b>	<b>\$12,897,461</b>	<b>\$116,450,900</b>
---------------	--	--------------	--	--	--	--	---------------------	--------------------	---------------------	---------------------	--------------------	-----------------	---------------------	---------------------	----------------------

<sup>1</sup> Operational costs for GAC assumed that initial capital investment is made to purchase temporary (frac) tanks, diesel pumps and hoses

<sup>2</sup> Present value (0% effective rate) is based on operation at maximum observed facility flow rate for half of the year over a 40 year period

<sup>3</sup> Carr TF currently utilizes 2 Model 10 GAC systems. All costs shown above reflect costs to install and operate 1 additional Model 10 GAC system and 1 Model 12-40 GAC system.

Note: Table does not include Andover, Leigh, and King wells which are currently out of service, and may be abandoned in the future.

Capital Cost to Purchase of Backwash Equipment: Frac Tanks, Medium Truck, and Diesel Pumps	<b>\$140,500</b>
Present Value of Operations and Maintenance Cost for 2 Full Time Staff (\$75,000 per person per year for 40 years)	<b>\$6,000,000</b>
Present Value of Operations and Maintenance Cost to sample each POE in the system quarterly (\$37,500 per year for 40 years)	<b>\$1,400,000</b>
<b>TOTAL PRESENT VALUE COST OF PFAS TREATMENT FOR 40 YEARS</b>	<b>\$123,991,400</b>

The 40-year present value for GAC treatment using the centralized concept is shown in **Table 6.4** and estimated at \$124 million, demonstrating a distinct financial advantage over distributed treatment, and providing additional advantages in terms of operations and maintenance.

Hydraulic modeling supports the centralized treatment alternative and demonstrates the ability to supply water to customers at adequate flows and pressures throughout the year.

# 7 Prioritized Capital Improvement Program

## 7.1 Current Efforts and Investments

Ridgewood Water has proactively started addressing PFAS contamination in the water system through several initiatives, including:

- Carr Wellfield and Treatment Facility – In the Village of Ridgewood, full scale (up to 1,000 gpm) of GAC treatment has been provided using two trains of Calgon Model 10 vessels operating in parallel. This first treatment solution was performed based upon the levels of combined PFOS and PFOA fluctuating around the EPA health level advisory of 70 ppt;
- Twinney and Walthery Wells and Treatment Facility Treatability Study – In the Village of Ridgewood, includes column testing of both lignite and bituminous GAC at various loading rates and empty bed contact times for up to 1,025 gpm of treatment. Project also includes desktop study of IX resins;
- Ravine Treatability Study – In the Village of Ridgewood, study to treat PFAS and VOCs up to 235 gpm;
- Marr Well Treatability Study – In the Town of Wyckoff, study to treat PFAS and VOCs up to 400 gpm; and
- Linwood Well Treatability Study – In the Village of Ridgewood, study to treat PFAS and VOCs up to 600 gpm.
- Prospect Well – IX resin demonstration pilot to treat 285 gpm in Glen Rock Borough

These efforts represent a significant start for getting ahead of the curve for future treatment based upon the likelihood of PFOA and PFOS regulation in the near future.

## 7.2 NJDEP Guidance on Compliance

NJAC 7:10.5.7 “Remediation requirements and procedures” provides a one-year timeframe to bring water into compliance with any applicable regulated maximum contaminant level (MCL). The NJDEP has the ability to extend this deadline following a public hearing and determination that an extension will not pose an imminent threat to public health. Any extension would be to allow for adequate time for the construction of new treatment.

Similar to compliance with volatile organic chemical (VOC) treatment requirements promulgated in 1989, when Ridgewood Water constructed ten treatment facilities between 1990 and 1992, the PFAS treatment will take more than one year to design and construct.

With permitting through the NJDEP and considering site plan approval from the stakeholder municipalities, a realistic timeframe to design, permit, bid and construct a new treatment facility is between 1.5 and 2 years. The centralized facility concept considers new designs for 13 centralized facilities.



### 7.3 Prioritization and Implementation Strategy

The prioritization and implementation strategy should seek to design and construct new treatment facilities quickly when, and if, new regulations are passed into law. At a minimum, Ridgewood Water should attempt to have 7 mgd of treated supply available as quickly as possible. This is the average demand of the water system and can sustain supply to the customer base for indoor water use. The 7 mgd of supply will not be enough for outdoor uses including lawn watering and other landscaping requirements.

When evaluating the critical path for the construction of new treatment facilities, the following observations are made related to schedule:

- Site plan approval from the various municipalities can be time consuming in the event that zoning variances are required for construction. Proactively, Ridgewood Water should look to prioritize locations where variances might not be required, and also engage the municipal planning boards prior to NJDEP regulation; and
- Site locations that do not have extensive environmental permitting (e.g., flood hazard area, wetlands, etc.) should be prioritized first, as obtaining these permits can create schedule delays;

**Table 7.1** provides a potential prioritization strategy based upon the centralized treatment alternative. The work is divided into three separate phases over a period of four years. It is noted that Ridgewood Water was able to construct 10 VOC treatment facilities from 1990 through 1992. The approach laid out in **Table 7.1** includes the construction of 13 PFAS treatment facilities from 2020 through 2023.

The following information is provided in support of the identified project phasing:

- **Phase 1** – under this phase treatment is designed and constructed at many of the central sites that have room to construct new facilities with minor environmental impact and permitting requirements. The projects are dispersed geographically to support system hydraulics and provide investment in all four participating municipalities. The sites are also sites where treatment will be sized to accept the raw water transmission mains being designed and constructed under Phase 2 that will be piped to these central sites to increase flows. Phase 1 is geared at bringing on 7 mgd of supply for the system as quickly as possible while also satisfying hydraulic capacity (pressure and flow) to the system;
- **Phase 2** – this phase includes five projects to construct raw water transmission mains to the existing central wellfields of Wortendyke, Prospect, Cedar Hill, and Ames. Once these raw water mains are connected, this will provide an additional 4.3 mgd of supply. Included under this phase will be upgrading two existing vessels at the Twinney site to accommodate GAC and putting 500 gpm on-line.
- **Phase 3** – The remaining six central facilities are those that will require more extensive environmental permitting that can have an impact on schedule. The Ravine facility (which would include Marr) also is being currently investigated for the need to provide VOC treatment. The Carr upgrade will be performed in the flood plain (similar to a previous upgrade) and will require significant environmental permitting. The Carr upgrade is to construct raw water transmission mains from the Irving and Linwood wells to this central site that has room to construct additional GAC vessels. Phase 3 includes additional vessels at Twinney to increase supply from 500 to 1,025 gpm. The Main TF site is also included in this phase.



The three-phase approach considers the design and construction of 13 central treatment facilities over a period of 4 years at an estimated cost of over \$99.4 million.

#### 7.4 Proactive Steps for Future Treatment

It is not known when the new regulations for PFOA and PFOS will be promulgated (currently anticipated in 2020), but there are several steps that Ridgewood Water might consider at this time to improve the future schedule for design, permitting, and construction, including:

- Engage Planning Boards – this work can be done prior to any new regulation, with the potential to accelerate future site plan approval. Conceptual layouts and rendering can be developed and submitted to the planning boards ahead of formal site plan application. These early site plans can address zoning ordinances for the subject properties and the need for any potential variances.
- Master Specifications – The design of treatment facilities at 13 locations throughout the system will likely include several design consultants. It could be beneficial for Ridgewood Water to develop master specifications at this time in order to achieve consistency in the layout of facilities; the equipment provided; and to address future operation and maintenance considerations.
- Draft Vendor Agreements – As an example, Calgon will enter into a lease agreement with a municipality for regenerated carbon. Calgon's Custom Municipal Reactivation (CMR) program ensures that each customer receives their own GAC back after reactivation, therefore, reducing concerns about any shortage of future GAC supply.

It will be important for Ridgewood Water to stay ahead of the curve on the design and construction of new facilities. The potential exists that the costs for treatment will rise quickly as contractors become increasingly busy with this flash market of construction. Ridgewood Water should consider including several facility designs in one contract bid in order to achieve economy of scales and to attract top state contractors.

Ridgewood Water  
 PFAS Master Plan  
 PFAS Treatment Prioritization Schedule  
 Table 7.1

Phase	Facility	Municipality	Flow (gpm)	Capital Cost	2020	2021	2022	2023	2024	2025		
I	Wortendyke	Midland Park	730	\$9,075,300	Prelim. Design	Design and Permitting	Construction	Construction				
	Prospect	Glen Rock	1,235	\$7,408,500								
	Cedar Hill	Wyckoff	630	\$8,423,700								
	Twinney (1)	Ridgewood	500	\$1,423,170								
	Ames	Wyckoff	760	\$8,067,700								
	Eastside Reservoir	Ridgewood	525	\$5,450,300								
	Lafayette	Wyckoff	375	\$3,300,600								
	<b>TOTALS</b>		<b>4,755 (6.9 mgd)</b>	<b>\$43,149,270</b>								
II	Wortendyke - Raw Water	Midland Park	915	\$5,337,800	Prelim. Design	Design and Permtting	Construction	Construction				
	Cedar Hill - Raw Water	Wyckoff	1,175	\$3,697,200								
	Ames - Raw Water	Wyckoff	670	\$2,298,400								
	Prospect - Raw Water	Glen Rock	225	\$1,144,000								
	Twinney	Ridgewood	525	\$3,320,730								
		<b>TOTALS</b>		<b>2,950 (5.1 mgd)</b>					<b>\$15,798,130</b>			
III	West End	Ridgewood	405	\$5,137,800	Prelim. Design			Design and Permtting	Construction	Construction		
	Carr	Ridgewood	1,620	\$9,466,100								
	Marr	Wyckoff	635	\$5,087,100								
	East Ridgewood	Ridgewood	825	\$4,661,400								
	Main	Glen Rock	190	\$3,165,300								
	Mountain	Wyckoff	190	\$2,789,600								
	<b>TOTALS</b>		<b>3,865 (5.6 mgd)</b>	<b>\$30,307,300</b>								
	<b>SUM TOTAL</b>		<b>12,130 (16.4 mgd)</b>	<b>\$89,254,700</b>	<b>\$446,274</b>	<b>\$4,462,735</b>	<b>\$22,313,675</b>	<b>\$22,313,675</b>	<b>\$22,313,675</b>	<b>\$17,404,667</b>		

(1) Phase I at Twinney estimated at 30% of total overall cost to put existing Model 10s back in service

## 8 Grant and Funding Opportunities

The Village of Ridgewood (Ridgewood Water) is currently involved in a lawsuit with DuPont and seven other Potentially Responsible Parties (PRPs) that have potentially contaminated the groundwater with PFAs. Reimbursement for capital investment and operating costs through the PRPs would be the desired path forward for the Village or Ridgewood. This section discusses other potential financing vehicles and potential grant opportunities.

### 8.1 New Jersey Infrastructure Bank

Discussions with the I-Bank have indicated that the Village of Ridgewood could potentially finance capital improvements through a loan comprised of:

- 50 percent interest free through the NJDEP; and
- 50 percent market rate

The loan is capped at \$25 million per year, and the sooner the initial loan paperwork is submitted, along with a ranked prioritization, the best the chances of obtaining a loan. Ranking points are higher for contaminants which have been regulated, and additional points can be obtained for have a capital investment plan (such as this master plan) in place.

The fees associated with a \$25 million loan are as follows:

One-time DEP fee:

DEP = 2% of \$25M

1% -> Borrowed, rolled into your loan

1%-> Paid with the first long-term loan payment

Administration fee – Annual payment of 30 bps (basis points) on the I-Bank portion of the loan - \$12.5M:

\$37,500/year

\$18,750 due in August

\$18,750 due in March

At issuance, there is a one-time 10bps fee on the I-Bank portion:

$\$12,500,000 \times .001 = \$12,500$

The Village of Ridgewood is Triple A rated and, therefore, will compare the rates through the I-Bank to other rates they might be able to secure through other lenders.

### 8.2 New Jersey Site Remediation Program

Based on conversations with the NJDEP, while Spill Fund Compensation claims are still being accepted and encouraged, they have become increasingly more difficult to obtain, due to the emergence of PFAS-related claims, and current availability of funding. Because of this, the Spill Fund now prioritizes funding for residential users and then public water systems that have been issued a Notice of Violation from the NJDEP for exceeding an MCL (whether it be for a VOC, or PFNA, which currently has an MCL).

From discussions with the NJDEP, there is a significant queue already. Spill fund is also meant to be treated as a “last resort”, and they will require information on what other funding sources have been contacted (NJEIT loan, a responsible party, etc.) Additionally, Spill Fund will pay for capital costs of treatment, only (no O&M).

It is important to note that Spill Fund Claims can be submitted but there is a statute of limitations on when the claim can be submitted. If a claim to the Spill Fund is not submitted within one year of knowledge of an MCL violation, the claim will not be entertained. Submitting the claim form (found here: <https://www.nj.gov/dep/srp/finance/spillfund/spillfund.pdf>) along with sampling results and any notice of violation from the NJDEP within the one year window will maintain the rights of the municipality to file a complete claim in the future. However, the Spill Fund will consider the package incomplete and will not formally review or make a determination without the following documents:

- Non-compliance violation letter from NJDEP
- Alternatives Analysis
- Record and results of trying to obtain funding from other sources

Additionally, it may be possible to obtain funding through NJDEP 3<sup>rd</sup> party contracts, where the funding sources vary. This is not a formal process and involves the municipality (typically a high-level executive like the Mayor) submitting a letter of correspondence either to the NJDEP Commissioner or the Governor, stating the issue, proposed solution, and requesting whether there are funding sources available (through 3<sup>rd</sup> party contracts or other divisions of the NJDEP). It is also advisable to have submitted for funding through the Spill Fund prior to sending any letter of correspondence.

## A. PFAS Glossary

Abbreviation	Full Term
MCL	Maximum contaminant level
EPS	Extended period simulation
PPT	Part per trillion
PFAS	Per- and Polyfluoroalkyl Substances
PFOA	Perfluorooctanoic acid
PFNA	Perfluorononanoic acid
PFHxA	Perfluorohexanoic acid
PFOS	Perfluorooctanesulfonic acid
PFDA	Perfluorodecanoic acid
PFuNA	Perfluoroundecanoic acid
PFDoA	Perfluorododecanoic acid
PFTriA	Perfluorotridecanoic acid
PFTreA	Perfluoromyristic acid
PFBS	Perfluorobutanesulfonic acid
PFHxS	Perfluorohexane sulfonic acid
PFHpA	Perfluoroheptanoic acid
NMEFOSAA	N-Methyl-perfluorooctanesulfonamidoacetic acid
NetFOSAA	N-ethyl perfluorooctanesulfonamidoacetic acid

## **B. Pressure Comparison**

**Ridgewood Water – PFAS Master Plan**  
**Comparison of Field and Hydraulic Modeled Pressures Used for Calibration**  
**Appendix B**

Facility	Field Pressure (psi)	Model Pressure (psi)	Pressure Difference (psi)
Ames Pressure	63	59	4
Cedar Hill Pressure	61	65	4
College Pressure	39	48	8
E. Ridgewood Pressure	91	101	10
Eastside Pressure	94	93	1
Eder Pressure	57	60	3
Farview Pressure	67	70	3
Irving Pressure	96	100	4
Lafayette Pressure	66	67	1
Lakeview Pressure	80	82	2
Main Pressure	102	104	3
Meer Pressure	57	64	7
Midland Pressure	79	86	8
Mountain Pressure	102	99	3
Prospect Pressure	97	103	6
Russell Pressure	72	73	1
Salem Pressure	81	84	3
Stevens Pressure	102	106	4
Twinney pressure	84	88	5

In general, there is a good correlation in pressures. At the locations where there is a significant (more than 5 psi difference), the modeled results are consistent with the pressures that should be observed based upon the hydraulic gradeline of the zones and the proximity to storage. The instruments at the well facilities should be checked for accuracy, in particular, at locations where the field pressure is less than the modeled pressure (i.e., E. Ridgewood, College, Meer, Midland).

## C. NJDEP Allocation Limits





State of New Jersey

CHRIS CHRISTIE  
GOVERNOR

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BOB MARTIN  
COMMISSIONER

KIM GUADAGNO  
LT. GOVERNOR

Mail Code 401-04Q  
Division of Water Supply & Geoscience  
New Jersey Geological and Water Survey Element  
Bureau of Water Allocation & Well Permitting  
401 E. State Street - P.O. Box 420  
Trenton, New Jersey 08625-0420  
Tel #: (609) 984-6831 - Fax #: (609) 633-1231  
<http://www.nj.gov/dep/watersupply/>

May 25, 2017

Ridgewood Water Dept  
131 North Maple Avenue  
Ridgewood, NJ 07451  
Attn: Richard Calbi



Dear Mr. Calbi:

Re: **Water Allocation Permit - Renewal**  
**Program Interest ID/ Permit No. 5014X/5017**  
**Activity No. WAP160004**

Enclosed is a permit issued pursuant to the Water Supply Management Act, N.J.S.A. 58:1A-1 et seq. This permit becomes effective on June 1, 2017 and is to divert water from 7 wells in the following Municipality and County:

MUNICIPALITY	COUNTY
Midland Park Boro	Bergen

5014X is your Program Interest ID and WAP160004 is your Permit Activity Number, and will appear on all forms and correspondence from the Bureau of Water Allocation & Well Permitting. Reference your Program Interest ID and Activity No. in all correspondence.

Be advised that as you are responsible for complying with the terms and conditions of the enclosed permit you should review them thoroughly. Failure to comply with any or all of the terms and conditions could result in penalties and/or revocation of the permit.

Within 20 calendar days following your receipt of this permit you may submit a request for an adjudicatory hearing to contest the conditions of this permit. Regulations regarding the format and requirements for requesting an adjudicatory hearing may be found in N.J.A.C. 7:19-2.13.

To request a hearing, the permittee must complete the enclosed Tracking Form and supply all the information specified in Part III of the Tracking Form. A copy of the completed, signed and dated Tracking Form, together with all of the information required by Part III of the Tracking Form, including attachments where specified, must be submitted to:

1. Janis Hoagland, Director  
New Jersey Department of Environmental Protection  
Office of Legal Affairs  
P.O. Box 402  
Trenton, New Jersey 08625

2. Terry D. Pilawski, Chief  
New Jersey Department of Environmental Protection  
Mail Code 401-04Q  
Division of Water Supply & Geoscience  
Bureau of Water Allocation & Well Permitting  
P.O. Box 420  
Trenton, New Jersey 08625-0420

Very truly yours,



Terry D. Pilawski, Chief  
Bureau of Water Allocation & Well Permitting

Enclosure

Certified Mail No.: 7016-3010-0001-1450-3624

C: Bureau of Water Allocation & Well Permitting  
Northern Bureau of Water Compliance & Enforcement  
Chelsea Du Brul, BWAWP



State of New Jersey  
 Department of Environmental Protection  
 Bureau of Water Allocation & Well Permitting  
 PO Box 426, Trenton, New Jersey 08625-0426



## Water Allocation Permit

The New Jersey Department of Environmental Protection grants this permit\* in accordance with your application, attachments accompanying same application, and applicable laws and regulations. This permit is also subject to further conditions and stipulations enumerated in the supporting documents.

<b>Program Interest ID/ Permit Number:</b> 5014X/5017 <b>Activity Number:</b> WAP160004	<b>Issuance Date:</b> 05/25/2017	<b>Effective Date:</b> 06/01/2017	<b>Expiration Date:</b> 05/31/2027
--	----------------------------------	-----------------------------------	------------------------------------

<b>Name and Address of Applicant</b> RIDGEWOOD WATER DEPT 131 North Maple Avenue Ridgewood, NJ 07451	<b>Location of Activity/Facility</b> Midland Park Boro Bergen County		
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; vertical-align: top;"> <b>Type of Permit</b>            Water Allocation Permit -            Renewal         </td> <td style="width: 50%; vertical-align: top;"> <b>Statute(s)</b>            N.J.S.A. 58:1A-1         </td> </tr> </table>	<b>Type of Permit</b> Water Allocation Permit - Renewal	<b>Statute(s)</b> N.J.S.A. 58:1A-1
<b>Type of Permit</b> Water Allocation Permit - Renewal	<b>Statute(s)</b> N.J.S.A. 58:1A-1		

**This permit grants permission to divert water from the approved sources in the attached permit inventory, in the following municipalities, for the following water uses:**

<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;"><b>MUNICIPALITY</b></td> <td style="width: 50%;"><b>COUNTY</b></td> </tr> <tr> <td>Midland Park Boro</td> <td>Bergen</td> </tr> </table>	<b>MUNICIPALITY</b>	<b>COUNTY</b>	Midland Park Boro	Bergen	<b>Water Uses:</b> Public Community Supply
<b>MUNICIPALITY</b>	<b>COUNTY</b>				
Midland Park Boro	Bergen				

This permit is subject to the attached Conditions.

Approved by the authority of:  
 Bob Martin, Commissioner  
 Department of Environmental Protection

  
 Terry D. Pilawski, Chief  
 Bureau of Water Allocation & Well Permitting

5/25/17  
 Date

\* Permit means Certification, Approval, Registration, Equivalency, etc.



STAFF REPORT  
PERMIT MODIFICATION WITH RENEWAL

In the matter of:

RIDGEWOOD WATER DEPT  
Water Allocation Permit No. 5014X (5017)

Bergen

Midland Park Boro

In compliance with the provisions of N.J.S.A. 58:1A-1 et seq., RIDGEWOOD WATER DEPT filed an application with the Department of Environmental Protection on March 31, 2016 for the Renewal of Water Allocation Permit No. 5014X (5017).

Background

On April 24, 2014, Water Allocation Permit No. 5014X (5017) was issued to RIDGEWOOD WATER DEPT, 131 North Maple Avenue, Ridgewood, New Jersey, 07451 with an expiration date of April 30, 2024.

This permit approved the diversion of water from seven wells in the above noted Municipality and County.

While Ridgewood Water Department operates one interconnected system under PWSID# 0251001, the diversion sources are broken down into four separate water allocation permits in accordance with N.J.A.C. 7:19-1.6(f). The requested permit changes, in bold, are as follows:

Permit	Currently Permitted Monthly (mgm)	Currently Permitted Annual (mgy)	Currently Permitted Maximum Diversion Rate (gpm)	Proposed Monthly (mgm)	Proposed Annual (mgy)	Proposed Maximum Diversion Rate (gpm)
5014 (Ridgewood)	170.5	1,572.0	6,095.0	170.5	1,572.0	6,095.0
5015 (Wyckoff)	180.0	1,247.0	5,245.0	180.0	1,247.0	5,245.0
5016 (Glen Rock)	62.5	540.0	1,400.0	<b>61.9</b>	540.0	<b>1,280.0</b>
5017 (Midland Park)	70.0	524.0	1,370.0	70.0	524.0	1,370.0
5014X Overall Limit	403.0	-	-	<b>449.0</b>	-	-

This modification with renewal request represents an increase in the overall system wide monthly allocation (encompassing 5014, 5015, 5016, and 5017) from 403 mgm to 449 mgy. The analysis of the requested increase is discussed in detail in permit 5016.

The renewal application filed on March 31, 2016 requests the renewal of the privilege to divert the following:

Allocation Limits

From	Designation	Parameter	Limit
5017 WA PERMIT - ALL DIVERSION SOURCES	RIDGEWOOD WATER DEPT	Water Diverted	<= 524 Million Gallons Per Year
5017 WA PERMIT - ALL DIVERSION SOURCES	RIDGEWOOD WATER DEPT	Water Diverted	<= 70 Million Gallons Per Month
5017 WA PERMIT - ALL DIVERSION SOURCES	RIDGEWOOD WATER DEPT	Maximum Diversion Rate	<= 1370 Gallons Per Minute

Approved Sources and Maximum Diversion Rates

Groundwater (5017)

Well Permit No.	Well Name or Designation	Pump Capacity (gpm)	Aquifer
4300013006	WORTENDYKE 7	100	Brunswick
4300013005	WORTENDYKE 6	130	Brunswick
4300013007	WORTENDYKE 4	280	Brunswick
4300013004	WORTENDYKE 2	125	Brunswick
2300001047	WALDO	325	Brunswick
2300004169	GOFFLE	250	Brunswick
2300004573	COLLEGE	160	Brunswick

Groundwater – Permits 5014, 5015, 5016, & 5017 (5014X)

Permit No.	Well Name	Well Permit Number	Pump Capacity gpm	Aquifer	Status
5014	E. Saddle River	2300000333	350	Brunswick	Active
5014	Paramus	2300001445	225	Brunswick	Active
5014	Walthery	2300001643	175	Brunswick	Active
5014	Spring	2300001644	300	Brunswick	Active
5014	Andover	2300001771	125	Brunswick	Inactive
5014	Ravine	2300001836	235	Brunswick	Inactive
5014	Salem	2300003902	400	Brunswick	Active
5014	Irving	2300003903	1,010	Brunswick	Active
5014	Stevens	2300004170	225	Brunswick	Active

5014	Twinney	2300004458	850	Brunswick	Active
5014	King	2300004470	125	Brunswick	Inactive
5014	West End	2300005931	275	Brunswick	Active
5014	Carr #1	4300000004	255	Brunswick	Active
5014	Carr #3	4300000006	300	Brunswick	Active
5014	Carr #4	4300000007	130	Brunswick	Active
5014	Carr #6	4300000009	160	Brunswick	Active
5014	Carr #7	4300000010	160	Brunswick	Active
5014	Grove	4300000013	260	Brunswick	Active
5014	East Ridgewood	4300000014	600	Brunswick	Active
5014	Linwood	4300000015	700	Brunswick	Inactive
5014	Farview	4300000029	350	Brunswick	Active
5015	Midland	2300001046	400	Brunswick	Active
5015	Russell	2300001834	180	Brunswick	Active
5015	Meer	2300001837	275	Brunswick	Active
5015	Lafayette	2300002130	375	Brunswick	Active
5015	Franklin	2300002229	300	Brunswick	Active
5015	Van Houten	2300002230	250	Brunswick	Active
5015	Newtown	2300002319	225	Brunswick	Active
5015	Mountain	2300002620	280	Brunswick	Active
5015	Eder	2300002622	440	Brunswick	Active
5015	Lakeview	2300004273	400	Brunswick	Active
5015	Weisch	2300005158	450	Brunswick	Active
5015	Cedar Hill 1	4300000016	150	Brunswick	Active
5015	Cedar Hill 4	4300000019	320	Brunswick	Inactive
5015	Cedar Hill 5	4300000020	225	Brunswick	Active
5015	Cedar Hill 6	4300000021	150	Brunswick	Active
5015	Ames 3	4300000022	300	Brunswick	Active
5015	Ames 5	4300000023	175	Brunswick	Active
5015	Ames 6	4300000024	175	Brunswick	Active
5015	Ames 7	4300000025	175	Brunswick	Active
5016	Main	2300001443	350	Brunswick	Active
5016	Prospect	2300001770	400	Brunswick	Active
5016	Glen Rock	2300001835	155	Brunswick	Active
5016	Akerman	2300002227	250	Brunswick	Active
5016	Leigh	2300004171	125	Brunswick	Inactive
5017	Waldo	2300001047	325	Brunswick	Active
5017	Goffle	2300004169	250	Brunswick	Inactive
5017	College	2300004573	160	Brunswick	Active
5017	Wortendyke 2	4300013004	125	Brunswick	Active
5017	Wortendyke 6	4300013005	130	Brunswick	Active
5017	Wortendyke 7	4300013006	100	Brunswick	Active

5017	Wortendyke 4	4300013007	280	Brunswick	Inactive
------	--------------	------------	-----	-----------	----------

### Findings of Fact

1. The diversion is used for Public Community Supply and the entire system serves the following communities: Wyckoff, Midland Park, Ridgewood, and Glen Rock.
2. This application request is for a renewal of an allocation granted by the following:

Permit No.	Date Issued	Source of Water	Diversion Amount	
			mgm	mgd
5014X (5017)	4/24/2014	7 wells	70	524
5014X (5017)	10/28/2005	7 wells	49.2	344.4
5017	12/23/2002	7 wells	49.2	344.4
5017	10/06/1994	7 wells	49.2	
5017	2/03/1983	6 wells	49.2	
1466	2/17/1969	New well	20.08	
1378	4/20/1967	New well		13 mgd
1324	3/9/1966	Four proposed wells		1.944 mgd
1292	2/17/1966	Four proposed wells		10 mgd
1193	9/17/1964	Two proposed wells		9.2 mgm
879	11/10/1956	10 wells		8.5 mgd
851	5/12/1955	Two proposed wells		1 mgm
807	7/19/1954	2 wells		6 mgd
702	2/20/1950	Two proposed wells		5 mgd
561	5/04/1942	Groundwater wells		1 mgd
509	4/08/1940	Groundwater wells		0.5 mgd
400	6/08/1932	Groundwater wells		1 mgd
378	6/30/1931	Groundwater wells		1 mgd
172	12/05/1925	8 Groundwater wells		2.5 mgd

3. The applicant's diversion is not located within a designated Area of Critical Water Supply Concern.
4. The system has the following interconnections with adjacent systems:



Location	Supplier	Receiver	Size (in)	Use
Eastgate Road	0251001 (Ridgewood)	0228001 (Ho-Ho-Kus)	6	emergency
Brookside Avenue	0201001 (Allendale)	0251001 (Ridgewood)	6	emergency
North Maple Avenue at First Street	0228001 (Ho-Ho-Kus)	0251001 (Ridgewood)	6	emergency
Northern Parkway at Franklin Turnpike	0228001 (Ho-Ho-Kus)	0251001 (Ridgewood)	6	emergency
Wyckoff Avenue	0233001 (Mahwah)	0251001 (Ridgewood)	8	emergency
Burritt Place	0251001 (Ridgewood)	0220001 (Suez Franklin Lakes)	6	emergency
Covington Place	0251001 (Ridgewood)	0220001 (Suez Franklin Lakes)	6	emergency
Evergreen Street	0251001 (Ridgewood)	0264001 (Waldwick)	6	emergency
Hemlock Street	0251001 (Ridgewood)	0264001 (Waldwick)	6	emergency
Linwood Avenue	0251001 (Ridgewood)	0238001 (Suez Haworth)	6	emergency
Marr Avenue	1604001 (Hawthorne Boro)	0251001 (Ridgewood)	8	bulk purchase
Franklin Avenue	0220001 (Suez Franklin Lakes)	0251001 (Ridgewood)	6	bulk purchase
Hampshire Road	0220001 (Suez Franklin Lakes)	0251001 (Ridgewood)	6	bulk purchase

1. The applicant has agreements for the sale or purchase of water from the following:

Name of System	Sale or Purchase	Quantity	Date of Contract
Borough of Hawthorne	Purchase	1 MGD (with minimum 30 MGM Between June 1st – September 1st annually)	7/11/2001, annual contract through 2018*
Suez Haworth via the Suez Franklin Lakes interconnection	Purchase	0.55 MGD 17.05 MGM 200.75 MGY	1/1/2007



\*This contract is in for review, but has not yet received approval from the Department. Ridgewood has no contracts for the sale of water.

5. A review of quarterly diversion reports indicates the following water use:

A. Total Water Diverted for 5017 – Midland Park

Year	Annual Use (mg)	Maximum Monthly Use (mg)(peak month)	Average Monthly Use (mg)	Existing Allocation	
				(mgm)	(mgy)
2016	255.848	29.300 (Jul)	21.321	70	524
2015	217.488	25.105 (Aug)	18.124	70	524
2014	341.442	37.411 (Aug)	28.454	70	524
2013	359.660	45.600 (Jul)	29.972	49.2	344.4
2012	350.140	45.720 (Jul)	29.178	49.2	344.4
2011	414.270	49.220 (Jul)	34.523	49.2	344.4

B. Total Water Diverted for 5014X (5014, 5015, 5016, & 5017)

Year	Annual Use (mg)	Maximum Monthly Use (mg)(peak month)	Average Monthly Use (mg)	Existing Allocation	
				(mgm)	(mgy)
2016	2584.190	303.710 (Jun)	215.349	403	-
2015	2625.664	326.043 (Aug)	218.805	403	-
2014	2576.331	301.585 (Jul)	214.694	403	-
2013	2603.880	338.450 (Jul)	216.990	403	-
2012	2597.370	331.750 (Jul)	216.448	403	-
2011	2487.420	356.630 (Jul)	207.285	403	-

C. Total Water Purchased from Suez

Year	Annual Use (mg)	Maximum Monthly Use (mg)(peak month)	Average Monthly Use (mg)	Contract Volumes	
				(mgm)	(mgy)
2016	315.367	57.996 (Jul)	26.281	17.05	200.75
2015	227.126	49.018 (Aug)	18.927	17.05	200.75
2014	169.491	18.690 (Jul)	14.124	17.05	200.75
2013	168.680	18.910 (Jul)	14.057	17.05	200.75
2012	188.820	33.330 (Jul)	15.735	17.05	200.75
2011	195.723	38.030 (Jul)	16.310	17.05	200.75

Ridgewood consistently takes more water than their contract guarantees; however, the Bureau of Water System Engineering only counts the guaranteed contractual amount in their firm capacity calculations.

D. Total Water Purchased from Hawthorne Borough

Year	Annual Use (mg)	Maximum Monthly Use (mg)(peak month)	Average Monthly Use (mg)	Contract Volumes	
				(mgm)	(mgy)
2016	75.330	22.464 (Aug)	6.278	30.0	365.0
2015	71.767	19.011 (Jul)	5.981	30.0	365.0
2014	23.598	12.456 (Aug)	1.967	30.0	365.0
2013	16.120	11.410 (Oct)	1.343	30.0	365.0
2012	32.800	22.060 (Jul)	2.733	30.0	365.0
2011	30.500	21.710 (Jul)	2.542	30.0	365.0

E. Total System Use (Water Diverted + Water Imported – Water Exported)

Year	Annual Use (mg)	Maximum Monthly Use (mg)(peak month)	Average Monthly Use (mg)
2016	2974.887	368.881 (Jun)	247.907
2015	2924.557	391.585 (Aug)	243.713
2014	2769.420	325.865 (Sep)	230.785
2013	2788.680	362.070 (Jul)	232.390
2012	2818.990	387.140 (Jul)	234.916
2011	2713.643	416.370 (Jul)	226.137

6. The population served is approximately 61,700, which represents an average monthly consumption of 110 gpcd, and a peak monthly consumption of 198 gpcd based upon 2011 and 2015 water use data, with a 94 percent residential use component.
7. The following information is available for the applicant's diversion sources:

Well Locations

Well Permit No.	Well Name or Designation	Location
4300013006	WORTENDYKE 7	Birch St & Greenwood Ave
4300013005	WORTENDYKE 6	West St & Birch St
4300013007	WORTENDYKE 4	Granite St (White Drive), approximately 130 feet northeast of Well 2

Well Permit No.	Well Name or Designation	Location
4300013004	WORTENDYKE 2	Granite St (White Drive)
2300001047	WALDO	Waldo Ave & Fairview Dr
2300004169	GOFFLE	Goffle Ave
2300004573	COLLEGE	College Rd

#### Well Data

Well Permit No.	Well Name or Designation	Pump Capacity (gpm)	Drilling Completed Date	Finished Depth (feet)	Smallest Diameter (inches)
4300013006	WORTENDYKE 7	100	1937	348	12
4300013005	WORTENDYKE 6	130	1937	337	12
4300013007	WORTENDYKE 4	280	1926	315	16
4300013004	WORTENDYKE 2	125	1926	1137	8
2300001047	WALDO	325	4/15/1954	420	12
2300004169	GOFFLE	250	6/14/1965	300	12
2300004573	COLLEGE	160	6/29/1966	500	12

#### Well Static Water Level Data

Well Permit No.	Well Name or Designation	Historical Static Water Level		Current Static Water Level	
		Date (ft)	Level	Date (ft)	Level
4300013006	WORTENDYKE 7	6/4/1985	10	6/2015	43.9
4300013005	WORTENDYKE 6	6/4/1985	10	6/2015	13.1
4300013007	WORTENDYKE 4	6/4/1985	10	6/2015	6.2
4300013004	WORTENDYKE 2	6/4/1985	10	6/2015	16.2
2300001047	WALDO	4/15/1954	24	4/2015	44.7
2300004169	GOFFLE	6/14/1965	22	6/2015	19
2300004573	COLLEGE	6/23/1966	83	6/2015	55.1

#### Well Test Data (from Well Records)

Well Permit No.	Well Name or Designation	Test Date	Static Level (feet)	Pumping Time (hours)	Yield (gpm)	Drawdown (feet)	Specific Capacity (gpm/ft drawdown)
-----------------	--------------------------	-----------	---------------------	----------------------	-------------	-----------------	-------------------------------------



4300013006	WORTENDYKE 7	-	-	-	-	-	-
4300013005	WORTENDYKE 6	-	-	-	-	-	-
4300013007	WORTENDYKE 4	-	-	-	-	-	-
4300013004	WORTENDYKE 2	-	-	-	-	-	-
2300001047	WALDO	4/15/19 54	24	72	400	174	2.299
2300004169	GOFFLE	6/14/19 65	22	124	350	102	3.431
2300004573	COLLEGE	6/23/19 66	83	30	178	147	2.145

8. The applicant's diversion sources are located within: Planning Area No. 5, Lower Passaic/Rahway River as designated by the New Jersey Water Supply Master Plan; the Northeast Drought Region; and Watershed Management Area No. 4, Lower Passaic and Saddle River Watershed Management Area.

The diversion is not located within the Delaware River Basin, Pinelands, or Highlands Region.

9. Flow meters for all diversion sources have been calibrated within the past five years. The most recent dates of calibration are:

Source Name	Calibration Date
WORTENDYKE 7	12/31/2013
WORTENDYKE 6	12/31/2013
WORTENDYKE 4	12/31/2013
WORTENDYKE 2	12/31/2013
WALDO	12/2016
GOFFLE	12/26/2014
COLLEGE	12/26/2014

10. The following wells have been abandoned, decommissioned, are inactive or unused:

Well Name	Well Permit No.	Previously Permitted	Depth (feet)	Status
Brook	2300004172	5016	300	Decommissioned 3/23/2015
Wycoff	2300002621	5015	300	Decommissioned 6/25/2015
Garden State	2500013251	5015	287	No longer used, not owned by Ridgewood
Cedar Hill 2	4300000017	5015	400	Inactive
Cedar Hill 3	4300000018	5015	500	Inactive

Well Name	Well Permit No.	Previously Permitted	Depth (feet)	Status
Wyckoff Ave Test Well	2300002556	NA	303	Unknown
Carr #2	4300000005	5014	250	Inactive
Carr #5	4300000008	5014	218	Inactive
Carr #8	4300000011	5014	175	Inactive
Carr #9	4300000012	5014	175	Inactive
Newtown Rd test well	2300002558	NA	303	Inactive
East Side	2300005213	?	400	Inactive

11. The applicant is currently in compliance with all permit conditions.
12. For Midland Park Borough, water, after use, is discharged to Northwest Bergen County Utilities Authority for treatment and discharge to the Ho-Ho-Kus Brook under Permit No. NJ0024813. The treatment works are not under a sewer connection ban or other restriction imposed by NJDEP.
13. The system is 99 percent metered.
14. The applicant has indicated that their unaccounted-for-water is 13.5 percent (2016).
15. The water system has storage capacity of 14.1 mg, as compared with a 2015 average water demand of 8.01 mgd.
16. The applicant submitted a Water Conservation Plan on March 30, 2016.
17. The estimated consumptive use of water is 100 percent, which is equivalent to 8.01 mgd.

#### Staff Analysis/Conclusions

1. The applicant's current water use is reasonable.
2. The demands submitted with the application are system-wide demands, because Ridgewood's four permits, 5014, 5015, 5016, and 5017 are all operated as one interconnected system. According to the applicant, the division of the Village's interconnected water supply system into four permits along municipal boundaries is artificial and arbitrary, because the location of the individual wells has little bearing on where the pumped water is actually consumed. However, pursuant to N.J.A.C. 7:19-1.4(f), four permits are required due to the location of the sources. Because of the interconnected nature of the system, it is most appropriate to consider the system as a single entity for water supply purposes. However, because the maximum diversion from

the wells in permit (5017) in the last five years was 49.220 mgm (7/2011) and 414.270 mgy (2011), it seems appropriate to renew the existing monthly and annual allocations specific to 5017, 70 mgm and 524 mgy.

3. System-wide demand projections for the system provided by the applicant indicate that their ten year demands will be 439 mgm, and 2,922 mgy. According to the applicant, the Ridgewood service area experienced a 0.5% annual population growth from 2013 to 2016, which was used to estimate future growth. According to the Bureau of Water System Engineering's Surplus/Deficit table, Ridgewood Water has committed peak demands of 417.347 mgm and 2,854.289 mgy. In addition, according to the applicant, Ridgewood has exceeded their current cross permit limit of 403 mgm on several occasions, July 1993, and July and August 1998, and July 1999. In addition, Ridgewood has been consistently purchasing water in excess of their contract amounts from Suez NJ; in 2015, Ridgewood purchased greater than 17 mgm during 6 months of the year. Analysis of this in conjunction with historical use and supporting documentation provided with the application shows that an overall system-wide allocation of 449 mgm, should be sufficient to meet their needs.

The system-wide allocation limit condition should read consistently in all four permits (Permit Nos. 5014, 5015, 5016, and 5017) as follows: "The total diversion for the entire system, including permit Nos. 5014, 5015, 5016, and 5017, shall not exceed 449 mgm."

4. Natural replenishment of groundwater is probably occurring because the observed fluctuations do not follow a continual decreasing trend.

In order to confirm this, static water level reports should continue to be required as a condition of this permit to determine future trends.

5. No adverse impacts have been reported to the Department regarding the applicant's diversion sources.
6. Though Ridgewood Water wells contain chloride concentrations they are likely not a result of regional saltwater intrusions, since elevated chloride concentrations are not a consideration in the Brunswick aquifer at this location. It is more likely that the elevated concentrations are from road salt or from water treatment. Because the chloride concentrations are not a result of regional saltwater intrusion, the conditions requiring chloride monitoring were removed from the last permit.
7. No changes in diversion rates are proposed and no problems with groundwater contamination associated with the diversion have been reported to the Bureau.

### Summary

The Department has completed its review of this application pursuant to N.J.A.C. 7:19-1 et. seq. The review of this application reveals that it does not have any adverse impacts and meets, based



upon the information certified to in the application, the statutory requirements of N.J.S.A. 58:1A-1 et. seq.

Therefore, based upon a review of the information submitted with the application, and the existing water allocation files, the following conclusions have been reached regarding this application:

- The monthly allocation of 70 mgm should be renewed.
- The annual allocation of 524 mgy should be renewed.
- The maximum diversion rate of 1,370 gpm should be renewed.
- The overall system-wide monthly allocation for permits 5014, 5015, 5016, and 5017 should be increased from 403 mgm to 449 mgm, as requested, and a condition should be placed in all four permits as follows: "The total diversion for the entire system, including permit Nos. 5014, 5015, 5016, and 5017, shall not exceed 449 mgm."

Therefore, this application should be approved in accordance with the following recommendations as the applicant has satisfied the requirements of N.J.A.C. 7:19-2.4 et seq.

#### References

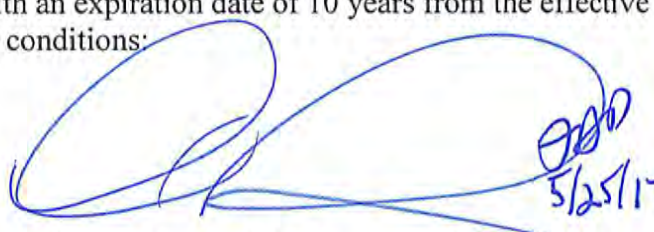
In addition to the historical information on file at the Bureau of Water Allocation & Well Permitting and the application submitted, the following information sources were also utilized to establish the recommendations contained within this Staff Report:

August 1996. Water for the 21<sup>st</sup> Century: Vital Resource. New Jersey Statewide Water Supply Plan. New Jersey Department of Environmental Protection – Office of Environmental Planning, Trenton, New Jersey.

#### Recommendations

Issuance of the permit is recommended with an expiration date of 10 years from the effective date and is subject to the attached specific conditions:

Date: 5/5/17

  
Chelsea Du Brul, Environmental Specialist 3  
Division of Water Supply & Geoscience

5/25/17  
JSG 5/2/17

**RIDGEWOOD WATER DEPT  
5014X**

**Water Allocation Permit : WAP160004**

**Permit Inventory**

**Water Diversion Sources** - Water may be diverted under this permit from the following sources:

Source Designation (Well Permit No. or Intake No.)	Description	Subject Item ID
2300001047	WALDO	WSWL0000064275
2300004169	GOFFLE	WSWL0000064355
2300004573	COLLEGE	WSWL0000064371
4300013004	WORTENDYKE 2	WSWL0000069853
4300013005	WORTENDYKE 6	WSWL0000069854
4300013006	WORTENDYKE 7	WSWL0000069855
4300013007	WORTENDYKE 4	WSWL0000069856

**Group Subject Items** - The following items are grouped sources for the purpose of setting permit requirements outlined in this document:

Group Designation	Group Description	Group Subject Item ID	Group Members
RIDGEWOOD WATER DEPT	5017 WA PERMIT - ALL DIVERSION SOURCES	WSWA0000075722	PASSAIC AQUIFER SOURCES, WELLS WALDO, GOFFLE, COLLEGE, AND WORTENDYKE 2, 4, 6, & 7 (WARG806884)
PASSAIC AQUIFER SOURCES	WELLS WALDO, GOFFLE, COLLEGE, AND WORTENDYKE 2, 4, 6, & 7	WARG0000806884	2300001047, WALDO (WSWL064275)
			2300004169, GOFFLE (WSWL064355)
			2300004573, COLLEGE (WSWL064371)
			4300013004, WORTENDYKE 2 (WSWL069853)
			4300013005, WORTENDYKE 6 (WSWL069854)
			4300013006, WORTENDYKE 7 (WSWL069855)



RIDGEWOOD WATER DEPT  
5014X

Water Allocation Permit : WAP160004

**Group Subject Items** - The following items are grouped sources for the purpose of setting permit requirements outlined in this document:

<b>Group Designation</b>	<b>Group Description</b>	<b>Group Subject Item ID</b>	<b>Group Members</b>
PASSAIC AQUIFER SOURCES	WELLS WALDO, GOFFLE, COLLEGE, AND WORTENDYKE 2, 4, 6, & 7	WARG0000806884	4300013007, WORTENDYKE 4 (WSWL069856)

**RIDGEWOOD WATER DEPT  
5014X**

Water Allocation Permit : WAP160004

**Permit Requirements**

**Limit Requirements**

The following limits apply and are the maximum permitted allocation:

**Final Permit Phase from 06/01/2017 -**

Subject Item	Parameter	Limit
RIDGEWOOD WATER DEPT, 5017 WA PERMIT - ALL DIVERSION SOURCES (WSWA75722)	Maximum Diversion Rate	<= 1370 Gallons Per Minute. [N.J.A.C. 7:19- 2]
	Water Diverted	<= 70 Million Gallons Per Month. [N.J.A.C. 7:19- 2]
		<= 524 Million Gallons Per Year. [N.J.A.C. 7:19- 2]

**Other Limit Requirements**

**Final Permit Phase from 06/01/2017 -**

Subject Item	Parameter	Limit
2300001047, WALDO (WSWL64275)	Rated Pump Capacity	<= 325 Gallons Per Minute. [N.J.A.C. 7:19- 2]
2300004169, GOFFLE (WSWL64355)	Rated Pump Capacity	<= 250 Gallons Per Minute. [N.J.A.C. 7:19- 2]
2300004573, COLLEGE (WSWL64371)	Rated Pump Capacity	<= 160 Gallons Per Minute. [N.J.A.C. 7:19- 2]
4300013004, WORTENDYKE 2 (WSWL69853)	Rated Pump Capacity	<= 125 Gallons Per Minute. [N.J.A.C. 7:19- 2]
4300013005, WORTENDYKE 6 (WSWL69854)	Rated Pump Capacity	<= 130 Gallons Per Minute. [N.J.A.C. 7:19- 2]
4300013006, WORTENDYKE 7 (WSWL69855)	Rated Pump Capacity	<= 100 Gallons Per Minute. [N.J.A.C. 7:19- 2]
4300013007, WORTENDYKE 4 (WSWL69856)	Rated Pump Capacity	<= 280 Gallons Per Minute. [N.J.A.C. 7:19- 2]

**Monitoring Requirements**

**Final Permit Phase from 06/01/2017 -**

Subject Item	Requirement	Frequency	Monitored Parameter	Monitoring Method
2300001047, WALDO (WSWL64275)	Static water levels for each well indicated shall be monitored. [N.J.A.C. 7:19- 2]	Each Month	Static Water Level	Airline, Tape, or Gage
2300004169, GOFFLE (WSWL64355)				

**RIDGEWOOD WATER DEPT  
5014X**

Water Allocation Permit : WAP160004

**Monitoring Requirements**

**Final Permit Phase from 06/01/2017 -**

Subject Item	Requirement	Frequency	Monitored Parameter	Monitoring Method
2300004573, COLLEGE (WSWL64371)	Static water levels for each well indicated shall be monitored. [N.J.A.C. 7:19- 2]	Each Month	Static Water Level	Airline, Tape, or Gage
4300013004, WORTENDYKE 2 (WSWL69853)				
4300013005, WORTENDYKE 6 (WSWL69854)				
4300013006, WORTENDYKE 7 (WSWL69855)				
4300013007, WORTENDYKE 4 (WSWL69856)				
2300001047, WALDO (WSWL64275)	The monthly diversion from each source indicated shall be monitored. [N.J.A.C. 7:19- 2]	Each Month	Water Diverted	Meter
2300004169, GOFFLE (WSWL64355)				
2300004573, COLLEGE (WSWL64371)				
4300013004, WORTENDYKE 2 (WSWL69853)				
4300013005, WORTENDYKE 6 (WSWL69854)				
4300013006, WORTENDYKE 7 (WSWL69855)				
4300013007, WORTENDYKE 4 (WSWL69856)				

**Record Keeping Requirements**

**Final Permit Phase from 06/01/2017 -**

Subject Item	Requirement	Frequency	Monitored Parameter	Record Keeping Method
RIDGEWOOD WATER DEPT, 5017 WA PERMIT - ALL DIVERSION SOURCES (WSWA75722)	A log book of month end meter readings for each diversion source shall be maintained on site. [N.J.A.C. 7:19- 2]	Each Month	Meter Reading	Log Book



**RIDGEWOOD WATER DEPT  
5014X**

Water Allocation Permit : WAP160004

**Submittal/Action Requirements**

**Final Permit Phase from 06/01/2017 -**

Applicable Subject Items	Submittal/Action Type	Requirement
2300001047, WALDO (WSWL64275)	Submit Public Quarterly Report	The required monitoring results shall be recorded on the form provided by the Department. The completed form shall be submitted within 30 days after the end of each quarter. [N.J.A.C. 7:19- 2]
2300004169, GOFFLE (WSWL64355)		
2300004573, COLLEGE (WSWL64371)		
4300013004, WORTENDYKE 2 (WSWL69853)		
4300013005, WORTENDYKE 6 (WSWL69854)		
4300013006, WORTENDYKE 7 (WSWL69855)		
4300013007, WORTENDYKE 4 (WSWL69856)		
RIDGEWOOD WATER DEPT, 5017 WA PERMIT - ALL DIVERSION SOURCES (WSWA75722)	Submit Water Conservation and Drought Management Plan	The permittee shall continue to implement, to the satisfaction of the Department, a water conservation and drought management program. The program shall encourage water conservation in all types of use within the area served by the permittee, including actions taken pursuant to this program and the impact thereof. Ridgewood Village Water Department should provide one update to the water conservation and drought management plan for the entire system (permits 5014, 5015, 5016, & 5017) every two years from the effective date of this permit. [N.J.A.C. 7:19- 2]
RIDGEWOOD WATER DEPT, 5017 WA PERMIT - ALL DIVERSION SOURCES (WSWA75722)	Submit Renewal Application	A renewal application shall be submitted three months prior to the expiration date. [N.J.A.C. 7:19- 2]

**Text Requirements**

**All Phases**

RIDGEWOOD WATER DEPT, 5017 WA PERMIT - ALL DIVERSION SOURCES (WSWA75722)

1. The total diversion for the entire system, including permit Nos. 5014, 5015, 5016, and 5017, shall not exceed 449 mgm. [N.J.A.C. 7:19- 2]

**RIDGEWOOD WATER DEPT  
5014X**

**Water Allocation Permit : WAP160004**

**Text Requirements**

**All Phases**

RIDGEWOOD WATER DEPT, 5017 WA PERMIT - ALL DIVERSION SOURCES (WSWA75722)

2. Water may be diverted under this permit for public community supply. However, water shall not be used to serve non-potable, consumptive purposes for new projects that are greater than 50 percent non-potable and greater than 50 percent consumptive, where, as determined by the Department, alternate water sources, including but not limited to reclaimed water for beneficial reuse, are feasible to serve the non-potable, consumptive needs of the project. [N.J.A.C. 7:19- 2]
3. Water may be diverted under this permit only from the approved diversion sources at the maximum rates specified. [N.J.A.C. 7:19- 1]
4. A major modification of this permit may be required in order to request the approval of any additional diversion sources or an increase in the pumping capacity. [N.J.A.C. 7:19- 2]
5. All diversion sources shall be metered with a totalizing flow meter. [N.J.A.C. 7:19- 2]
6. At a minimum, each diversion source flow meter shall be calibrated at least once every five years. [N.J.A.C. 7:19- 2]
7. Each flow meter shall be calibrated to within five percent accuracy. [N.J.A.C. 7:19- 2]
8. All wells shall be equipped with a metal tag showing the well permit numbers (source designation) as listed in the allocation permit inventory or have the well permit numbers painted on the casings. [N.J.A.C. 7:19- 2]
9. The pumping equipment capacity shall not be increased without prior approval from the Bureau of Water Allocation and Well Permitting. [N.J.A.C. 7:19- 1]
10. Any well not intended for use shall be decommissioned in accordance with N.J.A.C. 7:9D-3.1 et seq. [N.J.A.C. 7: 9D- 3]
11. Any required chemical analysis shall be performed by a New Jersey Certified Laboratory. [N.J.A.C. 7:19- 2]
12. Wells shall be constructed so that static water level (depth to water) can be determined at any time. [N.J.A.C. 7:19- 2]
13. Static water level shall be measured and reported as depth to water, in feet, from ground surface. [N.J.A.C. 7:19- 2]
14. For pumping wells, static water level (depth to water) shall be taken when the well pump has been shut down for a recovery period of at least 12 hours. If the well cannot be shut down for the required period, it must be noted on an addendum to the Quarterly Monitoring Report form. Please note on the addendum the number of hours the well was shut down or that the reading is a pumping level. [N.J.A.C. 7:19- 2]
15. All new services shall be metered in accordance with all applicable laws, regulations or codes including, but not limited to, the Water Supply Management Act. [N.J.A.C. 7:19- 6]
16. All existing services shall be metered. [N.J.A.C. 7:19- 6]
17. Water charges for each service connection shall be based in part on metered usage. [N.J.A.C. 7:19- 6]
18. The monthly quantity of water transferred and delivered to/received from interconnections shall be reported as part of the water system monitoring on separate forms provided by the Department. [N.J.A.C. 7:19- 2]
19. The Department may modify, suspend or terminate this permit, after due process, for violations of permit conditions, N.J.S.A. 58:1A-1, N.J.A.C. 7:19-1 et seq., any orders issued by the Department, or when in the public interest. [N.J.A.C. 7:19- 2]
20. The permittee shall investigate to the Department's satisfaction complaints by users of wells or surface water supplies within the zone of influence of its diversion to determine what impact the diversion has had on such wells or surface water supplies. A report on these investigations shall be forwarded to the Bureau of Water Allocation and Well Permitting. Any well or surface water supply which becomes damaged, dry, has reduced capacity, reduced water quality or is otherwise rendered unusable as a water source as a result of the permittee's diversions shall be repaired or replaced at the expense of the permittee. Work shall be in accordance with all State, County and Municipal construction standards for potable water. After reviewing all applicable investigational reports the Department of Environmental Protection will make the final determination regarding the validity of such complaints, the scope or sufficiency of such investigations, and will determine how to resolve any problems resulting from the diversion. [N.J.A.C. 7:19- 2]
21. This permit is issued for a limited period, and is not subject to automatic renewal. [N.J.A.C. 7:19- 2]
22. The permittee is subject to such fees as may be prescribed by the regulations. [N.J.A.C. 7:19- 3]
23. The permittee shall have the right to apply at any time for modification of this permit by submission of the appropriate application forms. [N.J.A.C. 7:19- 2]



RIDGEWOOD WATER DEPT

5014X

Water Allocation Permit : WAP160004

**Text Requirements**

**All Phases**

RIDGEWOOD WATER DEPT, 5017 WA PERMIT - ALL DIVERSION SOURCES (WSWA75722)

24. The permittee may informally discuss the terms and conditions of this permit at any time with the Bureau of Water Allocation and Well Permitting. [N.J.A.C. 7:19- 2]
25. Approval of this application is subject to the granting of any approval which may be required by the Pinelands Commission. [N.J.S.A. 58: 1A-15.1]
26. The permittee shall obtain approval from the Bureau of Water System Engineering before using the diversion for public water supply. [N.J.A.C. 7:19- 2]
27. In addition to the specific management requirements cited above, and when so directed by the Department, the permittee shall comply with applicable portions of the Water Supply Management Rules (N.J.A.C. 7:19-6 et seq. and N.J.A.C. 7:19-8 et seq.) to include the determination of dependable yield; unaccounted-for water; rehabilitation; system pressure and storage; interconnections; and operation of interconnections. [N.J.A.C. 7:19- 6]
28. If the permittee violates any condition of this permit, the permittee is subject to administrative penalties up to \$25,000 per day per offense as specified. [N.J.S.A. 58: 1A-16]
29. The issuance of this permit shall not be deemed to affect in any way action by the Department of Environmental Protection of the State of New Jersey on any future application. [N.J.A.C. 7:19- 2]
30. No change in plans or specifications shall be made except with the prior written permission of the Department of Environmental Protection of the State of New Jersey. [N.J.A.C. 7:19- 2]
31. The granting of this permit shall not be construed to in any way affect the title or ownership of property, and shall not make the Department of Environmental Protection or the State a party in any suit or question of ownership of property. [N.J.A.C. 7:19- 2]
32. This permit does not waive the obtaining of Federal or other State or local government consent when necessary. This permit is not valid and no work shall be undertaken until such time as all other required approvals and permits have been obtained. [N.J.A.C. 7:19- 2]
33. A copy of this permit shall be kept at the facility site, and shall be exhibited upon request of any authorized Department representative. [N.J.A.C. 7:19- 2]
34. The Department has the right to enter and inspect any site, building, or equipment, or any portion thereof, owned or operated by the permittee, at any time, in order to ascertain compliance or noncompliance with N.J.S.A. 58:1A-1 et seq., 58:4A-4.1 et seq., 58:12A-1 et seq., these rules, or any other agreement or order issued or entered into pursuant thereto. Such right shall include, but not be limited to, the right to require the testing of any equipment at the facility, to sketch or photograph any portion of the site, building or equipment, to copy or photograph any document or records necessary to determine such compliance or noncompliance, and to interview any employees or representative of the owner, operator, or permittee. Such right shall be absolute and shall not be conditioned upon any action by the Department, except the presentation of appropriate credentials as requested and compliance with appropriate standard safety procedures. [N.J.A.C. 7:19- 2]
35. This permit may be transferred, with the consent of the Department, but only for the identical use of the waters. [N.J.A.C. 7:19- 2]
36. If the authorized diversion privileges are not currently diverted, subject to contract, or reasonably required for a demonstrated future need, they shall revert back to the State upon renewal or modification of the permit. [N.J.A.C. 7:19- 2]
37. The permittee shall protect each source from vandalism, tampering, and contamination at all times. [N.J.A.C. 7:19- 2]
38. This permit shall expire as indicated on the permit approval cover page. [N.J.A.C. 7:19- 2]

**Administrative Hearing Request Checklist  
And Tracking Form for Permits**

1. Permit Being Appealed:

\_\_\_\_\_

Title and Type of Permit

\_\_\_\_\_

Issuance Date of Permit

\_\_\_\_\_

Permit Number

2. Person Requesting Hearing:

\_\_\_\_\_

Name/Company

\_\_\_\_\_

Name of Attorney (if applicable)

\_\_\_\_\_

Address

\_\_\_\_\_

Address of Attorney

3. The following information must be included with the request:

- a. The date the permittee received the final permit;
- b. A copy of permit with a list of all permit conditions and issues contested;
- c. The legal and factual questions at issue;
- d. A statement as to whether or not the permittee raised each legal and factual issues during the public comment period of the permit;
- e. Suggested revised or alternative permit conditions;
- f. An estimate of the time required for the hearing;
- g. A request, if necessary, for a barrier-free hearing location for physically disabled persons;
- h. A clear indication of any willingness to negotiate a settlement with the Department prior to the Department's processing of the hearing request to the Office of Administrative Law; and
- i. This form, completed with all of the information listed above, signed, and dated, including attachments, to:
  - i. Office of Legal Affairs  
ATTENTION: Adjudicatory Hearing Requests  
Department of Environmental Protection  
401 East State Street  
P.O. Box 402  
Trenton, New Jersey 08625-0402
  - ii. Terry D. Pilawski, Chief  
Mail Code 401-04Q  
Division of Water Supply & Geoscience  
Bureau of Water Allocation & Well Permitting  
P.O. Box 420  
Trenton, New Jersey 08625
  - iii. All co-permittees (w/attachments)

4. Signature: \_\_\_\_\_ Date: \_\_\_\_\_





State of New Jersey

CHRIS CHRISTIE  
GOVERNOR

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BOB MARTIN  
COMMISSIONER

KIM GUADAGNO  
LT. GOVERNOR

Mail Code 401-04Q  
Division of Water Supply & Geoscience  
New Jersey Geological and Water Survey Element  
Bureau of Water Allocation & Well Permitting  
401 E. State Street - P.O. Box 420  
Trenton, New Jersey 08625-0420  
Tel #: (609) 984-6831 - Fax #: (609) 633-1231  
<http://www.nj.gov/dep/watersupply/>

May 25, 2017

Ridgewood Water Dept  
131 North Maple Avenue  
Ridgewood, NJ 07451  
Attn: Richard Calbi



Dear Mr. Calbi:

Re: **Water Allocation Permit - Renewal**  
**Program Interest ID/ Permit No. 5014X/5015**  
**Activity No. WAP160003**

Enclosed is a permit issued pursuant to the Water Supply Management Act, N.J.S.A. 58:1A-1 et seq. This permit becomes effective on June 1, 2017 and is to divert water from 19 wells in the following Municipalities and County:

MUNICIPALITY	COUNTY
Midland Park Boro	Bergen
Wyckoff Twp	Bergen

5014X is your Program Interest ID and WAP160003 is your Permit Activity Number, and will appear on all forms and correspondence from the Bureau of Water Allocation & Well Permitting. Reference your Program Interest ID and Activity No. in all correspondence.

Be advised that as you are responsible for complying with the terms and conditions of the enclosed permit you should review them thoroughly. Failure to comply with any or all of the terms and conditions could result in penalties and/or revocation of the permit.

Within 20 calendar days following your receipt of this permit you may submit a request for an adjudicatory hearing to contest the conditions of this permit. Regulations regarding the format and requirements for requesting an adjudicatory hearing may be found in N.J.A.C. 7:19-2.13.



To request a hearing, the permittee must complete the enclosed Tracking Form and supply all the information specified in Part III of the Tracking Form. A copy of the completed, signed and dated Tracking Form, together with all of the information required by Part III of the Tracking Form, including attachments where specified, must be submitted to:

1. Janis Hoagland, Director  
New Jersey Department of Environmental Protection  
Office of Legal Affairs  
P.O. Box 402  
Trenton, New Jersey 08625
  
2. Terry D. Pilawski, Chief  
New Jersey Department of Environmental Protection  
Mail Code 401-04Q  
Division of Water Supply & Geoscience  
Bureau of Water Allocation & Well Permitting  
P.O. Box 420  
Trenton, New Jersey 08625-0420

Very truly yours,



Terry D. Pilawski, Chief  
Bureau of Water Allocation & Well Permitting

Enclosure

Certified Mail No.: 7016-3010-0001 - 1450 - 3600

C: Bureau of Water Allocation & Well Permitting  
Northern Bureau of Water Compliance & Enforcement  
Chelsea Du Brul, BWAWP



State of New Jersey  
 Department of Environmental Protection  
 Bureau of Water Allocation & Well Permitting  
 PO Box 426, Trenton, New Jersey 08625-0426



## Water Allocation Permit

The New Jersey Department of Environmental Protection grants this permit\* in accordance with your application, attachments accompanying same application, and applicable laws and regulations. This permit is also subject to further conditions and stipulations enumerated in the supporting documents.

<b>Program Interest ID/ Permit Number:</b> 5014X/5015 <b>Activity Number:</b> WAP160003	<b>Issuance Date:</b> 05/25/2017	<b>Effective Date:</b> 06/01/2017	<b>Expiration Date:</b> 05/31/2027
--	----------------------------------	-----------------------------------	------------------------------------

<b>Name and Address of Applicant</b> RIDGEWOOD WATER DEPT 131 North Maple Avenue Ridgewood, NJ 07451	<b>Location of Activity/Facility</b> Midland Park Boro & Wyckoff Twp Bergen County	
	<b>Type of Permit</b> Water Allocation Permit - Renewal	<b>Statute(s)</b> N.J.S.A. 58:1A-1

This permit grants permission to divert water from the approved sources in the attached permit inventory, in the following municipalities, for the following water uses:

<b>MUNICIPALITY</b> Midland Park Boro Wyckoff Twp	<b>COUNTY</b> Bergen Bergen	<b>Water Uses:</b> Public Community Supply
---	-----------------------------------	--

This permit is subject to the attached Conditions.

Approved by the authority of:  
 Bob Martin, Commissioner  
 Department of Environmental Protection

*Terry D. Pilawski*  
 Terry D. Pilawski, Chief  
 Bureau of Water Allocation & Well Permitting

5/25/17  
 Date

\* Permit means Certification, Approval, Registration, Equivalency, etc.

STAFF REPORT  
PERMIT MODIFICATION WITH RENEWAL

In the matter of:

RIDGEWOOD WATER DEPT  
Water Allocation Permit No. 5014X (5015)

Wyckoff Twp

Bergen

In compliance with the provisions of N.J.S.A. 58:1A-1 et seq., RIDGEWOOD WATER DEPT filed an application with the Department of Environmental Protection on March 31, 2016 for the Renewal of Water Allocation Permit No. 5014X (5015).

Background

On March 24, 2014 Water Allocation Permit No. 5014X (5015) was issued to RIDGEWOOD WATER DEPT, 131 North Maple Avenue, Ridgewood, New Jersey, 07451 with an expiration date of April 30, 2024.

This permit approved the diversion of water from nineteen wells in the above noted Municipality and County.

While Ridgewood Water Department operates one interconnected system under PWSID# 0251001, the diversion sources are broken down into four separate water allocation permits in accordance with N.J.A.C. 7:19-1.6(f). The requested permit changes, in bold, are as follows:

Permit	Currently Permitted Monthly (mgm)	Currently Permitted Annual (mgy)	Currently Permitted Maximum Diversion Rate (gpm)	Proposed Monthly (mgm)	Proposed Annual (mgy)	Proposed Maximum Diversion Rate (gpm)
5014 (Ridgewood)	170.5	1,572.0	6,095.0	170.5	1,572.0	6,095.0
5015 (Wyckoff)	180.0	1,247.0	5,245.0	180.0	1,247.0	5,245.0
5016 (Glen Rock)	62.5	540.0	1,400.0	<b>61.9</b>	540.0	<b>1,280.0</b>
5017 (Midland Park)	70.0	524.0	1,370.0	70.0	524.0	1,370.0
5014X Overall Limit	403.0	-	-	<b>449.0</b>	-	-

This modification with renewal request represents an increase in the overall system wide monthly allocation (encompassing 5014, 5015, 5016, and 5017) from 403 mgm to 449 mgy. The analysis of the requested increase is discussed in detail in permit 5016.

The renewal application filed on March 31, 2016 requests the renewal of the privilege to divert the following:

Allocation Limits

From	Designation	Parameter	Limit
5015 WA PERMIT - ALL DIVERSION SOURCES	RIDGEWOOD WATER DEPT	Water Diverted	<= 1247 Million Gallons Per Year
5015 WA PERMIT - ALL DIVERSION SOURCES	RIDGEWOOD WATER DEPT	Water Diverted	<= 180 Million Gallons Per Month
5015 WA PERMIT - ALL DIVERSION SOURCES	RIDGEWOOD WATER DEPT	Maximum Diversion Rate	<= 5245 Gallons Per Minute

Approved Sources and Maximum Diversion Rates

Groundwater (5015)

Well Permit No.	Well Name or Designation	Pump Capacity (gpm)	Aquifer
2300005158	WEISH	450	Brunswick
2300002230	VAN HOUTEN	250	Brunswick
2300001834	RUSSELL	180	Brunswick
2300002619	NEWTOWN	225	Brunswick
2300002620	MOUNTAIN	280	Brunswick
2300001046	MIDLAND	400	Brunswick
2300001837	MEER	275	Brunswick
2300004273	LAKEVIEW	400	Brunswick
2300002130	LAFAYETTE	375	Brunswick
2300002229	FRANKLIN	300	Brunswick
2300002622	EDER	440	Brunswick
4300000021	CEDAR HILL 6	150	Brunswick
4300000020	CEDAR HILL 5	225	Brunswick
4300000019	CEDAR HILL 4	320	Brunswick
4300000016	CEDAR HILL 1	150	Brunswick
4300000025	AMES 7	175	Brunswick
4300000024	AMES 6	175	Brunswick
4300000023	AMES 5	175	Brunswick
4300000022	AMES 3	300	Brunswick



Groundwater – Permits 5014, 5015, 5016, & 5017 (5014X)

Permit No.	Well Name	Well Permit Number	Pump Capacity gpm	Aquifer	Status
5014	E. Saddle River	2300000333	350	Brunswick	Active
5014	Paramus	2300001445	225	Brunswick	Active
5014	Walthery	2300001643	175	Brunswick	Active
5014	Spring	2300001644	300	Brunswick	Active
5014	Andover	2300001771	125	Brunswick	Inactive
5014	Ravine	2300001836	235	Brunswick	Inactive
5014	Salem	2300003902	400	Brunswick	Active
5014	Irving	2300003903	1,010	Brunswick	Active
5014	Stevens	2300004170	225	Brunswick	Active
5014	Twinney	2300004458	850	Brunswick	Active
5014	King	2300004470	125	Brunswick	Inactive
5014	West End	2300005931	275	Brunswick	Active
5014	Carr #1	4300000004	255	Brunswick	Active
5014	Carr #3	4300000006	300	Brunswick	Active
5014	Carr #4	4300000007	130	Brunswick	Active
5014	Carr #6	4300000009	160	Brunswick	Active
5014	Carr #7	4300000010	160	Brunswick	Active
5014	Grove	4300000013	260	Brunswick	Active
5014	East Ridgewood	4300000014	600	Brunswick	Active
5014	Linwood	4300000015	700	Brunswick	Inactive
5014	Farview	4300000029	350	Brunswick	Active
5015	Midland	2300001046	400	Brunswick	Active
5015	Russell	2300001834	180	Brunswick	Active
5015	Meer	2300001837	275	Brunswick	Active
5015	Lafayette	2300002130	375	Brunswick	Active
5015	Franklin	2300002229	300	Brunswick	Active
5015	Van Houten	2300002230	250	Brunswick	Active
5015	Newtown	2300002319	225	Brunswick	Active
5015	Mountain	2300002620	280	Brunswick	Active
5015	Eder	2300002622	440	Brunswick	Active
5015	Lakeview	2300004273	400	Brunswick	Active
5015	Weisch	2300005158	450	Brunswick	Active
5015	Cedar Hill 1	4300000016	150	Brunswick	Active
5015	Cedar Hill 4	4300000019	320	Brunswick	Inactive
5015	Cedar Hill 5	4300000020	225	Brunswick	Active
5015	Cedar Hill 6	4300000021	150	Brunswick	Active
5015	Ames 3	4300000022	300	Brunswick	Active
5015	Ames 5	4300000023	175	Brunswick	Active
5015	Ames 6	4300000024	175	Brunswick	Active

5015	Ames 7	4300000025	175	Brunswick	Active
5016	Main	2300001443	350	Brunswick	Active
5016	Prospect	2300001770	400	Brunswick	Active
5016	Glen Rock	2300001835	155	Brunswick	Active
5016	Akerman	2300002227	250	Brunswick	Active
5016	Leigh	2300004171	125	Brunswick	Inactive
5017	Waldo	2300001047	325	Brunswick	Active
5017	Goffle	2300004169	250	Brunswick	Inactive
5017	College	2300004573	160	Brunswick	Active
5017	Wortendyke 2	4300013004	125	Brunswick	Active
5017	Wortendyke 6	4300013005	130	Brunswick	Active
5017	Wortendyke 7	4300013006	100	Brunswick	Active
5017	Wortendyke 4	4300013007	280	Brunswick	Inactive

#### Findings of Fact

1. The diversion is used for Public Community Supply and the entire system serves the following communities: Wyckoff, Midland Park, Ridgewood, and Glen Rock.
2. This application request is for a renewal of an allocation granted by the following:

Permit No.	Date Issued	Source of Water	Diversion Amount	
			mgm	mgd
5014X (5015)	4/24/2014	19 Brunswick Wells	180	1247
5014X (5015)	10/28/2005	21 Brunswick Wells	104.8	950
5015	12/23/2002	21 Brunswick Wells	104.8	950
5015	2/03/1983	24 Brunswick wells	104.8	
1466	2/17/1969	New well	20.08	
1378	4/20/1967	New well	13	
1324	9/15/1966	Four proposed wells		80,000 mgd
1292	2/17/1966	Four proposed wells	10	
1193	9/17/1964	Two proposed wells	9.2	
879	11/10/1956	10 wells	8.5	
851	5/12/1954	Two proposed wells	1	
807	7/19/1954	2 wells	6	
702	2/20/1950	Two proposed wells	5	
561	5/04/1942	Groundwater wells	1	



Permit No.	Date Issued	Source of Water	Diversion Amount	
			mgm	mgy
509	4/08/1940	Groundwater wells	0.5	
400	6/08/1932	Groundwater wells	1	
378	6/30/1931	Groundwater wells	1	
172	12/05/1925	8 groundwater wells	2.5	

- The applicant's diversion is not located within a designated Area of Critical Water Supply Concern.
- The system has the following interconnections with adjacent systems:

Location	Supplier	Receiver	Size (in)	Use
Eastgate Road	0251001 (Ridgewood)	0228001 (Ho-Ho-Kus)	6	emergency
Brookside Avenue	0201001 (Allendale)	0251001 (Ridgewood)	6	emergency
North Maple Avenue at First Street	0228001 (Ho-Ho-Kus)	0251001 (Ridgewood)	6	emergency
Northern Parkway at Franklin Turnpike	0228001 (Ho-Ho-Kus)	0251001 (Ridgewood)	6	emergency
Wyckoff Avenue	0233001 (Mahwah)	0251001 (Ridgewood)	8	emergency
Burritt Place	0251001 (Ridgewood)	0220001 (Suez Franklin Lakes)	6	emergency
Covington Place	0251001 (Ridgewood)	0220001 (Suez Franklin Lakes)	6	emergency
Evergreen Street	0251001 (Ridgewood)	0264001 (Waldwick)	6	emergency
Hemlock Street	0251001 (Ridgewood)	0264001 (Waldwick)	6	emergency
Linwood Avenue	0251001 (Ridgewood)	0238001 (Suez Haworth)	6	emergency
Marr Avenue	1604001 (Hawthorne Boro)	0251001 (Ridgewood)	8	bulk purchase
Franklin Avenue	0220001 (Suez Franklin Lakes)	0251001 (Ridgewood)	6	bulk purchase
Hampshire Road	0220001 (Suez Franklin Lakes)	0251001 (Ridgewood)	6	bulk purchase

- The applicant has agreements for the sale or purchase of water from the following:

Name of System	Sale or Purchase	Quantity	Date of Contract
Borough of Hawthorne	Purchase	1 MGD (with minimum 30 MGM Between June 1st – September 1 <sup>st</sup> annually)	7/11/2001, annual contract through 2018*
Suez Haworth via the Suez Franklin Lakes interconnection	Purchase	0.55 MGD 17.05 MGM 200.75 MGY	1/1/2007

\*This contract is in for review, but has not yet received approval from the Department. Ridgewood has no contracts for the sale of water.

5. A review of quarterly diversion reports indicates the following water use:

A. Total Water Diverted for 5015 – Wyckoff

Year	Annual Use (mg)	Maximum Monthly Use (mg)(peak month)	Average Monthly Use (mg)	Existing Allocation	
				(mgm)	(mgy)
2016	1123.494	26.671 (Aug)	93.625	180	1247
2015	1101.551	139.048 (Aug)	91.796	180	1247
2014	960.918	116.577 (Sep)	80.077	180	1247
2013	918.090	126.260 (Jul)	76.508	104.8	950
2012	945.890	122.700 (Jul)	78.824	104.8	950
2011	880.910	124.850 (Jul)	73.409	104.8	950

B. Total Water Diverted for 5014X (5014, 5015, 5016, & 5017)

Year	Annual Use (mg)	Maximum Monthly Use (mg)(peak month)	Average Monthly Use (mg)	Existing Allocation	
				(mgm)	(mgy)
2016	2584.190	303.710 (Jun)	215.349	403	-
2015	2625.664	326.043 (Aug)	218.805	403	-
2014	2576.331	301.585 (Jul)	214.694	403	-
2013	2603.880	338.450 (Jul)	216.990	403	-
2012	2597.370	331.750 (Jul)	216.448	403	-
2011	2487.420	356.630 (Jul)	207.285	403	-



C. Total Water Purchased from Suez

Year	Annual Use (mg)	Maximum Monthly Use (mg)(peak month)	Average Monthly Use (mg)	Contract Volumes (mgm) (mgy)
2016	315.367	57.996 (Jul)	26.281	17.05 200.75
2015	227.126	49.018 (Aug)	18.927	17.05 200.75
2014	169.491	18.690 (Jul)	14.124	17.05 200.75
2013	168.680	18.910 (Jul)	14.057	17.05 200.75
2012	188.820	33.330 (Jul)	15.735	17.05 200.75
2011	195.723	38.030 (Jul)	16.310	17.05 200.75

Ridgewood consistently takes more water than their contract guarantees; however, the Bureau of Water System Engineering only counts the guaranteed contractual amount in their firm capacity calculations.

D. Total Water Purchased from Hawthorne Borough

Year	Annual Use (mg)	Maximum Monthly Use (mg)(peak month)	Average Monthly Use (mg)	Contract Volumes (mgm) (mgy)
2016	75.330	22.464 (Aug)	6.278	30.0 365.0
2015	71.767	19.011 (Jul)	5.981	30.0 365.0
2014	23.598	12.456 (Aug)	1.967	30.0 365.0
2013	16.120	11.410 (Oct)	1.343	30.0 365.0
2012	32.800	22.060 (Jul)	2.733	30.0 365.0
2011	30.500	21.710 (Jul)	2.542	30.0 365.0

E. Total System Use (Water Diverted + Water Imported – Water Exported)

Year	Annual Use (mg)	Maximum Monthly Use (mg)(peak month)	Average Monthly Use (mg)
2016	2974.887	368.881 (Jun)	247.907
2015	2924.557	391.585 (Aug)	243.713
2014	2769.420	325.865 (Sep)	230.785
2013	2788.680	362.070 (Jul)	232.390
2012	2818.990	387.140 (Jul)	234.916
2011	2713.643	416.370 (Jul)	226.137

6. The population served is approximately 61,700, which represents an average monthly

consumption of 110 gpcd, and a peak monthly consumption of 198 gpcd based upon 2011 and 2015 water use data, with a 94 percent residential use component.

7. The following information is available for the applicant's diversion sources:

Well Locations

Well Permit No.	Well Name or Designation	Location
2300005158	WEISH	Weisch Ln & Fox Hollow Rd
2300002230	VAN HOUTEN	Van Houten Ave & West Stevens Ave
2300001834	RUSSELL	Russell Ave & Stony Brook Lane
2300002619	NEWTOWN	Newtown Rd
2300002620	MOUNTAIN	Holly Dr & Mountain Ave
2300001046	MIDLAND	Midland Ave
2300001837	MEER	Meer Ave
2300004273	LAKEVIEW	Wyckoff Ave & Meer Ave
2300002130	LAFAYETTE	Flaker Dr & Starr Pl
2300002229	FRANKLIN	Voorhis Ave
2300002622	EDER	James Way
4300000021	CEDAR HILL 6	Cedar Hill Ave & Bohny Dr
4300000020	CEDAR HILL 5	Cedar Hill Ave & Bohny Dr
4300000019	CEDAR HILL 4	Cedar Hill Ave & Bohny Dr
4300000016	CEDAR HILL 1	Cedar Hill Ave & Calvin Ct
4300000025	AMES 7	Hartung Dr
4300000024	AMES 6	Hartung Dr
4300000023	AMES 5	Hartung Dr & Covington Pl
4300000022	AMES 3	Hartung Dr

Well Data

Well Permit No.	Well Name or Designation	Pump Capacity (gpm)	Drilling Completed Date	Finished Depth (feet)	Smallest Diameter (inches)
2300005158	WEISH	450	3/29/1968	300	12
2300002230	VAN HOUTEN	250	2/28/1958	301	12
2300001834	RUSSELL	180	3/16/1956	300	12
2300002619	NEWTOWN	225	11/15/1959	300	12
2300002620	MOUNTAIN	280	7/9/1959	302	12
2300001046	MIDLAND	400	4/1954	416	12

Well Permit No.	Well Name or Designation	Pump Capacity (gpm)	Drilling Completed Date	Finished Depth (feet)	Smallest Diameter (inches)
2300001837	MEER	275	11/11/1955	300	12
2300004273	LAKEVIEW	400	10/14/1965	300	12
2300002130	LAFAYETTE	375	5/3/1957	350	12
2300002229	FRANKLIN	300	11/1/1957	400	12
2300002622	EDER	440	1/25/1960	300	16
4300000021	CEDAR HILL 6	150	4/1938	385	10
4300000020	CEDAR HILL 5	225	1937	379	10
4300000019	CEDAR HILL 4	320	7/28/1932	315	12
4300000016	CEDAR HILL 1	150	11/1/1933	413.8	10
4300000025	AMES 7	175	1943	352	12
4300000024	AMES 6	175	1941	455	12
4300000023	AMES 5	175	1943	350	12
4300000022	AMES 3	300	1942	352	12

#### Well Static Water Level Data

Well Permit No.	Well Name or Designation	Historical Static Water Level		Current Static Water Level	
		Date (ft)	Level	Date (ft)	Level
2300005158	WEISH	3/25/1968	18	3/2015	48.7
2300002230	VAN HOUTEN	3/1/1958	53	3/2015	31.6
2300001834	RUSSELL	3/16/1956	0	3/2015	7.7
2300002619	NEWTOWN	11/11/1959	6	11/2015	18.9
2300002620	MOUNTAIN	7/6/1959	4	7/2015	18.1
2300001046	MIDLAND	3/29/1954	0	3/2015	4.7
2300001837	MEER	11/11/1956	7	11/2015	26
2300004273	LAKEVIEW	10/11/1965	5	10/2015	16.2
2300002130	LAFAYETTE	5/3/1957	70	5/2015	106.1
2300002229	FRANKLIN	11/1/1957	35	11/2015	76.0
2300002622	EDER	1/25/1960	9	1/2015	18
4300000021	CEDAR HILL 6	4/25/1938	14	4/2015	51.9
4300000020	CEDAR HILL 5	1937	24	4/2015	40.7
4300000019	CEDAR HILL 4	8/1/1932	8	8/2015	48.3



Well Permit No.	Well Name or Designation	Historical Static Water Level		Current Static Water Level	
		Date (ft)	Level	Date (ft)	Level
4300000016	CEDAR HILL 1	11/4/1933	2.5	11/2015	52.6
4300000025	AMES 7	9/15/1943	28	9/2015	37.6
4300000024	AMES 6	10/28/1941	32	10/2015	45.7
4300000023	AMES 5	1/7/1943	42	1/2015	42.3
4300000022	AMES 3	1942	18	1/2015	34.5

Well Test Data (from Well Records)

Well Permit No.	Well Name or Designation	Test Date	Static Level (feet)	Pumping Time (hours)	Yield (gpm)	Drawdown (feet)	Specific Capacity (gpm/ft drawdown)
2300005158	WEISH	3/25/1968	18	72	560	139	4.03
2300002230	VAN HOUTEN	3/1/1958	53	72	300	147	2.04
2300001834	RUSSELL	3/16/1956	0	72	159	200	0.795
2300002619	NEWTOWN	11/11/1959	6	72	385	118	3.26
2300002620	MOUNTAIN	7/6/1959	4	72	450	-	-
2300001046	MIDLAND	3/29/1954	0	72	425	106	4.00
2300001837	MEER	11/11/1956	7	96	258	181	1.43
2300004273	LAKEVIEW	10/11/1965	5	72	503	116	4.34
2300002130	LAFAYETTE	5/3/1957	70	72	450	121	3.72
2300002229	FRANKLIN	11/1/1957	35	3	40	215	0.19
2300002622	EDER	1/25/1960	9	24	138	287	0.48
4300000021	CEDAR HILL 6	4/25/1938	14	72	170	125	1.36
4300000020	CEDAR HILL 5	1937	24	72	160	100	1.6
4300000019	CEDAR HILL 4	8/1/1932	8	72	320	101	3.17
4300000016	CEDAR HILL 1	11/4/1933	2.5	72	350	52.5	6.67
4300000025	AMES 7	9/15/1943	28	56	257	102	2.52
4300000024	AMES 6	10/28/1941	32	32	240	153	1.57
4300000023	AMES 5	1/7/1943	42	32	244	150	1.63
4300000022	AMES 3	1942	18	56	320	162	1.97

8. The applicant's diversion sources are located within: Planning Area No. 5, Lower Passaic/Rahway River as designated by the New Jersey Water Supply Master Plan; the Northeast Drought Region; and Watershed Management Area No. 4, Lower Passaic and Saddle River Watershed Management Area.

The diversion is not located within the Delaware River Basin, Pinelands, or Highlands Region.

9. Flow meters for all diversion sources, except one, have been calibrated within the past five years. The most recent dates of calibration are:

Source Name	Calibration/Replacement Date
WEISH	12/2016
VAN HOUTEN	12/2016
RUSSELL	12/2016
NEWTOWN	12/31/2012
MOUNTAIN	12/31/2015
MIDLAND	12/31/2014
MEER	12/19/2012
LAKEVIEW	12/31/2015
LAFAYETTE	Replaced 12/31/2014
FRANKLIN	12/19/2012
EDER	12/31/2014
CEDAR HILL 6	12/31/2015
CEDAR HILL 5	12/28/2015
CEDAR HILL 4	1/2011 – out of service
CEDAR HILL 1	12/28/2015
AMES 7	12/28/2015
AMES 6	12/28/2015
AMES 5	12/28/2015
AMES 3	12/28/2015

10. The following wells have been abandoned, decommissioned, are inactive or unused:

Well Name	Well Permit No.	Previously Permitted	Depth (feet)	Status
Brook	2300004172	5016	300	Decommissioned 3/23/2015
Wycoff	2300002621	5015	300	Decommissioned 6/25/2015
Garden State	2500013251	5015	287	No longer used, not owned by Ridgewood
Cedar Hill 2	4300000017	5015	400	Inactive
Cedar Hill 3	4300000018	5015	500	Inactive

Well Name	Well Permit No.	Previously Permitted	Depth (feet)	Status
Wyckoff Ave Test Well	2300002556	NA	303	Unknown
Carr #2	4300000005	5014	250	Inactive
Carr #5	4300000008	5014	218	Inactive
Carr #8	4300000011	5014	175	Inactive
Carr #9	4300000012	5014	175	Inactive
Newtown Rd test well	2300002558	NA	303	Inactive
East Side	2300005213	?	400	Inactive

11. The applicant is currently in compliance with all permit conditions.
12. For Wyckoff Township, water, after use, is discharged mainly to Northwest Bergen County Utilities Authority for treatment and discharge to the Ho-Ho-Kus Brook under Permit No. NJ0024813, and also to the Passaic Valley Sewerage Commission for treatment and discharge to Upper New York Bay under Permit No. NJ0021016. The treatment works are not under a sewer connection ban or other restriction imposed by NJDEP.
13. The system is 99 percent metered.
14. The applicant indicated that their unaccounted-for-water is 13.5 percent (2016).
15. The water system has storage capacity of 14.1 MG, as compared with a 2015 average water demand of 8.01 MGD.
16. The applicant submitted a Water Conservation Plan on March 30, 2016.
17. The estimated consumptive use of water is 100 percent, which is equivalent to 8.01 MGD.

#### Staff Analysis/Conclusions

1. The applicant's current water use is reasonable.
2. The demands submitted with the application are system-wide demands, because Ridgewood's four permits, 5014, 5015, 5016, and 5017 are all operated as one interconnected system. According to the applicant, the division of the Village's interconnected water supply system into four permits along municipal boundaries is artificial and arbitrary, because the location of the individual wells has little bearing on



where the pumped water is actually consumed. However, pursuant to N.J.A.C. 7:19-1.4(f), four permits are required due to the location of the sources. Because of the interconnected nature of the system, it is most appropriate to consider the system as a single entity for water supply purposes. However, because the maximum diversion from the wells in permit (5015) in the last five years was 139.048 mgm (8/2015) and 1,101.551 mgy (2015), it seems appropriate to renew the existing monthly and annual allocations specific to 5015, 180 mgm and 1,247 mgy.

3. System-wide demand projections for the system provided by the applicant indicate that their ten year demands will be 439 mgm, and 2,922 mgy. According to the applicant, the Ridgewood service area experienced a 0.5% annual population growth from 2013 to 2016, which was used to estimate future growth. According to the Bureau of Water System Engineering's Surplus/Deficit table, Ridgewood Water has committed peak demands of 394.5 mgm and 2,973.323 mgy. In addition, according to the applicant, Ridgewood has exceeded their current cross permit limit of 403 mgm on several occasions, July 1993, and July and August 1998, and July 1999. In addition, Ridgewood has been consistently purchasing water in excess of their contract amounts from Suez NJ; in 2015, Ridgewood purchased greater than 17 mgm during 6 months of the year. Analysis of this in conjunction with historical use and supporting documentation provided with the application shows that an overall system-wide allocation of 449 mgy, should be sufficient to meet their needs.

The system-wide allocation limit condition should read consistently in all four permits (Permit Nos. 5014, 5015, 5016, and 5017) as follows: "The total diversion for the entire system, including permit Nos. 5014, 5015, 5016, and 5017, shall not exceed 449 mgm."

4. Natural replenishment of groundwater is probably occurring because the observed fluctuations do not follow a continual decreasing trend.

In order to confirm this, static water level reports should continue to be required as a condition of this permit to determine future trends.

5. No adverse impacts have been reported to the Department regarding the applicant's diversion sources.
6. Though Ridgewood Water wells contain chloride concentrations they are likely not a result of regional saltwater intrusions, since elevated chloride concentrations are not a consideration in the Brunswick aquifer at this location. It is more likely that the elevated concentrations are from road salt or from water treatment. Because the chloride concentrations are not a result of regional saltwater intrusion, the conditions requiring chloride monitoring were removed from the last permit.
7. No changes in diversion rates are proposed and no problems with groundwater contamination associated with the diversion have been reported to the Bureau.



## Summary

The Department has completed its review of this application pursuant to N.J.A.C. 7:19-1 et. seq. The review of this application reveals that it does not have any adverse impacts and meets, based upon the information certified to in the application, the statutory requirements of N.J.S.A. 58:1A-1 et. seq.

Therefore, based upon a review of the information submitted with the application, and the existing water allocation files, the following conclusions have been reached regarding this application:

- The monthly allocation of 180 mgm should be renewed.
- The annual allocation of 1,247 mgy should be renewed.
- The maximum diversion rate of 5,245 gpm should be renewed.
- The overall system-wide monthly allocation for permits 5014, 5015, 5016, and 5017 should be increased from 403 mgm to 449 mgm, as requested, and a condition should be placed in all four permits as follows: "The total diversion for the entire system, including permit Nos. 5014, 5015, 5016, and 5017, shall not exceed 449 mgm."
- The totalizing flow meter for Well Ames 7 needs to be recalibrated.

Therefore, this application should be approved in accordance with the following recommendations as the applicant has satisfied the requirements of N.J.A.C. 7:19-2.4 et seq.

## References

In addition to the historical information on file at the Bureau of Water Allocation & Well Permitting and the application submitted, the following information sources were also utilized to establish the recommendations contained within this Staff Report:

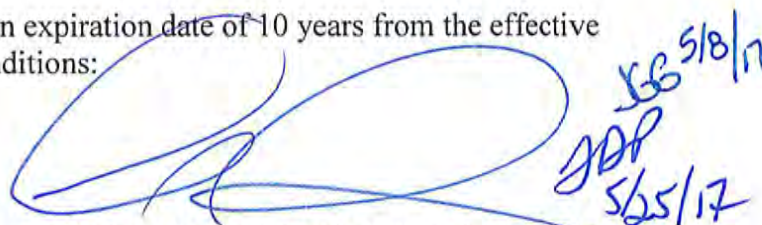
August 1996. Water for the 21<sup>st</sup> Century: Vital Resource, New Jersey Statewide Water Supply Plan. New Jersey Department of Environmental Protection – Office of Environmental Planning, Trenton, New Jersey.

## Recommendations

Issuance of the permit is recommended with an expiration date of 10 years from the effective date and is subject to the attached specific conditions:

Date: \_\_\_\_\_

5/5/17



Chelsea Du Brul, Environmental Specialist 3  
Division of Water Supply & Geoscience

**RIDGEWOOD WATER DEPT  
5014X**

**Water Allocation Permit : WAP160003**

**Permit Inventory**

**Water Diversion Sources -** Water may be diverted under this permit from the following sources:

Source Designation (Well Permit No. or Intake No.)	Description	Subject Item ID
2300001046	MIDLAND	WSWL0000064274
2300001834	RUSSELL	WSWL0000064290
2300001837	MEER	WSWL0000064293
2300002130	LAFAYETTE	WSWL0000064302
2300002229	FRANKLIN	WSWL0000064306
2300002230	VAN HOUTEN	WSWL0000064307
2300002619	NEWTOWN	WSWL0000064314
2300002620	MOUNTAIN	WSWL0000064315
2300002622	EDER	WSWL0000064317
2300004273	LAKEVIEW	WSWL0000064362
2300005158	WEISH	WSWL0000064391
4300000016	CEDAR HILL 1	WSWL0000069790
4300000019	CEDAR HILL 4	WSWL0000069793
4300000020	CEDAR HILL 5	WSWL0000069794
4300000021	CEDAR HILL 6	WSWL0000069795
4300000022	AMES 3	WSWL0000069796
4300000023	AMES 5	WSWL0000069797
4300000024	AMES 6	WSWL0000069798
4300000025	AMES 7	WSWL0000069799

**Group Subject Items -** The following items are grouped sources for the purpose of setting permit requirements outlined in this document:

Group Designation	Group Description	Group Subject Item ID	Group Members
RIDGEWOOD WATER DEPT	5015 WA PERMIT - ALL DIVERSION SOURCES	WSWA0000075720	PASSAIC AQUIFER SOURCES, ALL DIVERSION SOURCES (WARG806444)
PASSAIC AQUIFER SOURCES	ALL DIVERSION SOURCES	WARG0000806444	2300001046, MIDLAND (WSWL064274)
			2300001834, RUSSELL (WSWL064290)
			2300001837, MEER (WSWL064293)
			2300002130, LAFAYETTE (WSWL064302)



**RIDGEWOOD WATER DEPT  
5014X**

**Water Allocation Permit : WAP160003**

**Group Subject Items** - The following items are grouped sources for the purpose of setting permit requirements outlined in this document:

<b>Group Designation</b>	<b>Group Description</b>	<b>Group Subject Item ID</b>	<b>Group Members</b>
PASSAIC AQUIFER SOURCES	ALL DIVERSION SOURCES	WARG0000806444	2300002229, FRANKLIN (WSWL064306)
			2300002230, VAN HOUTEN (WSWL064307)
			2300002619, NEWTOWN (WSWL064314)
			2300002620, MOUNTAIN (WSWL064315)
			2300002622, EDER (WSWL064317)
			2300004273, LAKEVIEW (WSWL064362)
			2300005158, WEISH (WSWL064391)
			4300000016, CEDAR HILL 1 (WSWL069790)
			4300000019, CEDAR HILL 4 (WSWL069793)
			4300000020, CEDAR HILL 5 (WSWL069794)
			4300000021, CEDAR HILL 6 (WSWL069795)
			4300000022, AMES 3 (WSWL069796)
			4300000023, AMES 5 (WSWL069797)
			4300000024, AMES 6 (WSWL069798)
			4300000025, AMES 7 (WSWL069799)

**RIDGEWOOD WATER DEPT  
5014X**

Water Allocation Permit : WAP160003

**Permit Requirements**

**Limit Requirements**

The following limits apply and are the maximum permitted allocation:

**Final Permit Phase from 06/01/2017 -**

Subject Item	Parameter	Limit
RIDGEWOOD WATER DEPT, 5015 WA PERMIT - ALL DIVERSION SOURCES (WSWA75720)	Maximum Diversion Rate	<= 5245 Gallons Per Minute. [N.J.A.C. 7:19- 2]
	Water Diverted	<= 180 Million Gallons Per Month. [N.J.A.C. 7:19- 2]
		<= 1247 Million Gallons Per Year. [N.J.A.C. 7:19- 2]
2300002130, LAFAYETTE (WSWL64302)	Maximum Diversion Rate	<= 300 Gallons Per Minute. [N.J.A.C. 7:19- 2]

**Other Limit Requirements**

**Final Permit Phase from 06/01/2017 -**

Subject Item	Parameter	Limit
2300001046, MIDLAND (WSWL64274)	Rated Pump Capacity	<= 400 Gallons Per Minute. [N.J.A.C. 7:19- 2]
2300001834, RUSSELL (WSWL64290)	Rated Pump Capacity	<= 180 Gallons Per Minute. [N.J.A.C. 7:19- 2]
2300001837, MEER (WSWL64293)	Rated Pump Capacity	<= 275 Gallons Per Minute. [N.J.A.C. 7:19- 2]
2300002130, LAFAYETTE (WSWL64302)	Rated Pump Capacity	<= 375 Gallons Per Minute. [N.J.A.C. 7:19- 2]
2300002229, FRANKLIN (WSWL64306)	Rated Pump Capacity	<= 300 Gallons Per Minute. [N.J.A.C. 7:19- 2]
2300002230, VAN HOUTEN (WSWL64307)	Rated Pump Capacity	<= 250 Gallons Per Minute. [N.J.A.C. 7:19- 2]
2300002619, NEWTOWN (WSWL64314)	Rated Pump Capacity	<= 225 Gallons Per Minute. [N.J.A.C. 7:19- 2]
2300002620, MOUNTAIN (WSWL64315)	Rated Pump Capacity	<= 280 Gallons Per Minute. [N.J.A.C. 7:19- 2]
2300002622, EDER (WSWL64317)	Rated Pump Capacity	<= 440 Gallons Per Minute. [N.J.A.C. 7:19- 2]
2300004273, LAKEVIEW (WSWL64362)	Rated Pump Capacity	<= 400 Gallons Per Minute. [N.J.A.C. 7:19- 2]
2300005158, WEISH (WSWL64391)	Rated Pump Capacity	<= 450 Gallons Per Minute. [N.J.A.C. 7:19- 2]



**RIDGEWOOD WATER DEPT  
5014X**

Water Allocation Permit : WAP160003

**Other Limit Requirements**

Final Permit Phase from 06/01/2017 -

Subject Item	Parameter	Limit
4300000016, CEDAR HILL 1 (WSWL69790)	Rated Pump Capacity	<= 150 Gallons Per Minute. [N.J.A.C. 7:19- 2]
4300000019, CEDAR HILL 4 (WSWL69793)	Rated Pump Capacity	<= 320 Gallons Per Minute. [N.J.A.C. 7:19- 2]
4300000020, CEDAR HILL 5 (WSWL69794)	Rated Pump Capacity	<= 225 Gallons Per Minute. [N.J.A.C. 7:19- 2]
4300000021, CEDAR HILL 6 (WSWL69795)	Rated Pump Capacity	<= 150 Gallons Per Minute. [N.J.A.C. 7:19- 2]
4300000022, AMES 3 (WSWL69796)	Rated Pump Capacity	<= 300 Gallons Per Minute. [N.J.A.C. 7:19- 2]
4300000023, AMES 5 (WSWL69797)	Rated Pump Capacity	<= 175 Gallons Per Minute. [N.J.A.C. 7:19- 2]
4300000024, AMES 6 (WSWL69798)	Rated Pump Capacity	<= 175 Gallons Per Minute. [N.J.A.C. 7:19- 2]
4300000025, AMES 7 (WSWL69799)	Rated Pump Capacity	<= 175 Gallons Per Minute. [N.J.A.C. 7:19- 2]

**Monitoring Requirements**

Final Permit Phase from 06/01/2017 -

Subject Item	Requirement	Frequency	Monitored Parameter	Monitoring Method
2300001046, MIDLAND (WSWL64274)	Static water levels for each well indicated shall be monitored. [N.J.A.C. 7:19- 2]	Each Month	Static Water Level	Airline, Tape, or Gage
2300001834, RUSSELL (WSWL64290)				
2300001837, MEER (WSWL64293)				
2300002130, LAFAYETTE (WSWL64302)				
2300002229, FRANKLIN (WSWL64306)				
2300002230, VAN HOUTEN (WSWL64307)				
2300002619, NEWTOWN (WSWL64314)				
2300002620, MOUNTAIN (WSWL64315)				

**RIDGEWOOD WATER DEPT  
5014X**

Water Allocation Permit : WAP160003

**Monitoring Requirements**

**Final Permit Phase from 06/01/2017 -**

Subject Item	Requirement	Frequency	Monitored Parameter	Monitoring Method
2300002622, EDER (WSWL64317)	Static water levels for each well indicated shall be monitored. [N.J.A.C. 7:19- 2]	Each Month	Static Water Level	Airline, Tape, or Gage
2300004273, LAKEVIEW (WSWL64362)				
2300005158, WEISH (WSWL64391)				
4300000016, CEDAR HILL 1 (WSWL69790)				
4300000019, CEDAR HILL 4 (WSWL69793)				
4300000020, CEDAR HILL 5 (WSWL69794)				
4300000021, CEDAR HILL 6 (WSWL69795)				
4300000022, AMES 3 (WSWL69796)				
4300000023, AMES 5 (WSWL69797)				
4300000024, AMES 6 (WSWL69798)				
4300000025, AMES 7 (WSWL69799)				
2300001046, MIDLAND (WSWL64274)	The monthly diversion from each source indicated shall be monitored. [N.J.A.C. 7:19- 2]	Each Month	Water Diverted	Meter
2300001834, RUSSELL (WSWL64290)				
2300001837, MEER (WSWL64293)				
2300002130, LAFAYETTE (WSWL64302)				
2300002229, FRANKLIN (WSWL64306)				
2300002230, VAN HOUTEN (WSWL64307)				
2300002619, NEWTOWN (WSWL64314)				
2300002620, MOUNTAIN (WSWL64315)				



**RIDGEWOOD WATER DEPT  
5014X**

Water Allocation Permit : WAP160003

**Monitoring Requirements**

**Final Permit Phase from 06/01/2017 -**

<b>Subject Item</b>	<b>Requirement</b>	<b>Frequency</b>	<b>Monitored Parameter</b>	<b>Monitoring Method</b>
2300002622, EDER (WSWL64317)	The monthly diversion from each source indicated shall be monitored. [N.J.A.C. 7:19- 2]	Each Month	Water Diverted	Meter
2300004273, LAKEVIEW (WSWL64362)				
2300005158, WEISH (WSWL64391)				
4300000016, CEDAR HILL 1 (WSWL69790)				
4300000019, CEDAR HILL 4 (WSWL69793)				
4300000020, CEDAR HILL 5 (WSWL69794)				
4300000021, CEDAR HILL 6 (WSWL69795)				
4300000022, AMES 3 (WSWL69796)				
4300000023, AMES 5 (WSWL69797)				
4300000024, AMES 6 (WSWL69798)				
4300000025, AMES 7 (WSWL69799)				

**Record Keeping Requirements**

**Final Permit Phase from 06/01/2017 -**

<b>Subject Item</b>	<b>Requirement</b>	<b>Frequency</b>	<b>Monitored Parameter</b>	<b>Record Keeping Method</b>
RIDGEWOOD WATER DEPT, 5015 WA PERMIT - ALL DIVERSION SOURCES (WSWA75720)	A log book of month end meter readings for each diversion source shall be maintained on site. [N.J.A.C. 7:19- 2]	Each Month	Meter Reading	Log Book

**RIDGEWOOD WATER DEPT  
5014X**

Water Allocation Permit : WAP160003

**Submittal/Action Requirements**

**Final Permit Phase from 06/01/2017 -**

Applicable Subject Items	Submittal/Action Type	Requirement
2300001046, MIDLAND (WSWL64274)	Submit Public Quarterly Report	The required monitoring results shall be recorded on the form provided by the Department. The completed form shall be submitted within 30 days after the end of each quarter. [N.J.A.C. 7:19- 2]
2300001834, RUSSELL (WSWL64290)		
2300001837, MEER (WSWL64293)		
2300002130, LAFAYETTE (WSWL64302)		
2300002229, FRANKLIN (WSWL64306)		
2300002230, VAN HOUTEN (WSWL64307)		
2300002619, NEWTOWN (WSWL64314)		
2300002620, MOUNTAIN (WSWL64315)		
2300002622, EDER (WSWL64317)		
2300004273, LAKEVIEW (WSWL64362)		
2300005158, WEISH (WSWL64391)		
4300000016, CEDAR HILL 1 (WSWL69790)		
4300000019, CEDAR HILL 4 (WSWL69793)		
4300000020, CEDAR HILL 5 (WSWL69794)		



**RIDGEWOOD WATER DEPT  
5014X**

Water Allocation Permit : WAP160003

**Submittal/Action Requirements**

**Final Permit Phase from 06/01/2017 -**

Applicable Subject Items	Submittal/Action Type	Requirement
4300000021, CEDAR HILL 6 (WSWL69795)	Submit Public Quarterly Report	The required monitoring results shall be recorded on the form provided by the Department. The completed form shall be submitted within 30 days after the end of each quarter. [N.J.A.C. 7:19- 2]
4300000022, AMES 3 (WSWL69796)		
4300000023, AMES 5 (WSWL69797)		
4300000024, AMES 6 (WSWL69798)		
4300000025, AMES 7 (WSWL69799)		
RIDGEWOOD WATER DEPT, 5015 WA PERMIT - ALL DIVERSION SOURCES (WSWA75720)	Submit Water Conservation and Drought Management Plan	The permittee shall continue to implement, to the satisfaction of the Department, a water conservation and drought management program. The program shall encourage water conservation in all types of use within the area served by the permittee, including actions taken pursuant to this program and the impact thereof. Ridgewood Village Water Department should provide one update to the water conservation and drought management plan for the entire system (permits 5014, 5015, 5016, & 5017) every two years from the effective date of this permit. [N.J.A.C. 7:19- 2]
RIDGEWOOD WATER DEPT, 5015 WA PERMIT - ALL DIVERSION SOURCES (WSWA75720)	Submit Renewal Application	A renewal application shall be submitted three months prior to the expiration date. [N.J.A.C. 7:19- 2]

**Text Requirements**

**All Phases**

RIDGEWOOD WATER DEPT, 5015 WA PERMIT - ALL DIVERSION SOURCES (WSWA75720)

1. The total diversion for the entire system, including permit Nos. 5014, 5015, 5016, and 5017, shall not exceed 449 mgm. [N.J.A.C. 7:19- 2]
2. Water may be diverted under this permit for public community supply. However, water shall not be used to serve non-potable, consumptive purposes for new projects that are greater than 50 percent non-potable and greater than 50 percent consumptive, where, as determined by the Department, alternate water sources, including but not limited to reclaimed water for beneficial reuse, are feasible to serve the non-potable, consumptive needs of the project. [N.J.A.C. 7:19- 2]
3. Water may be diverted under this permit only from the approved diversion sources at the maximum rates specified. [N.J.A.C. 7:19- 1]
4. A major modification of this permit may be required in order to request the approval of any additional diversion sources or an increase in the pumping capacity. [N.J.A.C. 7:19- 2]

**RIDGEWOOD WATER DEPT  
5014X**

**Water Allocation Permit : WAP160003**

**Text Requirements**

**All Phases**

RIDGEWOOD WATER DEPT, 5015 WA PERMIT - ALL DIVERSION SOURCES (WSWA75720)

5. All diversion sources shall be metered with a totalizing flow meter. [N.J.A.C. 7:19- 2]
6. At a minimum, each diversion source flow meter shall be calibrated at least once every five years. [N.J.A.C. 7:19- 2]
7. Each flow meter shall be calibrated to within five percent accuracy. [N.J.A.C. 7:19- 2]
8. All wells shall be equipped with a metal tag showing the well permit numbers (source designation) as listed in the allocation permit inventory or have the well permit numbers painted on the casings. [N.J.A.C. 7:19- 2]
9. The pumping equipment capacity shall not be increased without prior approval from the Bureau of Water Allocation and Well Permitting. [N.J.A.C. 7:19- 1]
10. Any well not intended for use shall be decommissioned in accordance with N.J.A.C. 7:9D-3.1 et seq. [N.J.A.C. 7: 9D- 3]
11. Wells shall be constructed so that static water level (depth to water) can be determined at any time. [N.J.A.C. 7:19- 2]
12. Static water level shall be measured and reported as depth to water, in feet, from ground surface. [N.J.A.C. 7:19- 2]
13. For pumping wells, static water level (depth to water) shall be taken when the well pump has been shut down for a recovery period of at least 12 hours. If the well cannot be shut down for the required period, it must be noted on an addendum to the Quarterly Monitoring Report form. Please note on the addendum the number of hours the well was shut down or that the reading is a pumping level. [N.J.A.C. 7:19- 2]
14. All new services shall be metered in accordance with all applicable laws, regulations or codes including, but not limited to, the Water Supply Management Act. [N.J.A.C. 7:19- 6]
15. All existing services shall be metered. [N.J.A.C. 7:19- 6]
16. Water charges for each service connection shall be based in part on metered usage. [N.J.A.C. 7:19- 6]
17. The monthly quantity of water transferred and delivered to/received from interconnections shall be reported as part of the water system monitoring on separate forms provided by the Department. [N.J.A.C. 7:19- 2]
18. The Department may modify, suspend or terminate this permit, after due process, for violations of permit conditions, N.J.S.A. 58:1A-1, N.J.A.C. 7:19-1 et seq., any orders issued by the Department, or when in the public interest. [N.J.A.C. 7:19- 2]
19. The permittee shall investigate to the Department's satisfaction complaints by users of wells or surface water supplies within the zone of influence of its diversion to determine what impact the diversion has had on such wells or surface water supplies. A report on these investigations shall be forwarded to the Bureau of Water Allocation and Well Permitting. Any well or surface water supply which becomes damaged, dry, has reduced capacity, reduced water quality or is otherwise rendered unusable as a water source as a result of the permittee's diversions shall be repaired or replaced at the expense of the permittee. Work shall be in accordance with all State, County and Municipal construction standards for potable water. After reviewing all applicable investigational reports the Department of Environmental Protection will make the final determination regarding the validity of such complaints, the scope or sufficiency of such investigations, and will determine how to resolve any problems resulting from the diversion. [N.J.A.C. 7:19- 2]
20. This permit is issued for a limited period, and is not subject to automatic renewal. [N.J.A.C. 7:19- 2]
21. The permittee is subject to such fees as may be prescribed by the regulations. [N.J.A.C. 7:19- 3]
22. The permittee shall have the right to apply at any time for modification of this permit by submission of the appropriate application forms. [N.J.A.C. 7:19- 2]
23. The permittee may informally discuss the terms and conditions of this permit at any time with the Bureau of Water Allocation and Well Permitting. [N.J.A.C. 7:19- 2]
24. The permittee shall obtain approval from the Bureau of Water System Engineering before using the diversion for public water supply. [N.J.A.C. 7:19- 2]
25. In addition to the specific management requirements cited above, and when so directed by the Department, the permittee shall comply with applicable portions of the Water Supply Management Rules (N.J.A.C. 7:19-6 et seq. and N.J.A.C. 7:19-8 et seq.) to include the determination of dependable yield; unaccounted-for water; rehabilitation; system pressure and storage; interconnections; and operation of interconnections. [N.J.A.C. 7:19- 6]



**RIDGEWOOD WATER DEPT  
5014X**

**Water Allocation Permit : WAP160003**

**Text Requirements**

**All Phases**

RIDGEWOOD WATER DEPT, 5015 WA PERMIT - ALL DIVERSION SOURCES (WSWA75720)

26. If the permittee violates any condition of this permit, the permittee is subject to administrative penalties up to \$25,000 per day per offense as specified. [N.J.S.A. 58: 1A-16]
27. The issuance of this permit shall not be deemed to affect in any way action by the Department of Environmental Protection of the State of New Jersey on any future application. [N.J.A.C. 7:19- 2]
28. No change in plans or specifications shall be made except with the prior written permission of the Department of Environmental Protection of the State of New Jersey. [N.J.A.C. 7:19- 2]
29. The granting of this permit shall not be construed to in any way affect the title or ownership of property, and shall not make the Department of Environmental Protection or the State a party in any suit or question of ownership of property. [N.J.A.C. 7:19- 2]
30. This permit does not waive the obtaining of Federal or other State or local government consent when necessary. This permit is not valid and no work shall be undertaken until such time as all other required approvals and permits have been obtained. [N.J.A.C. 7:19- 2]
31. A copy of this permit shall be kept at the facility site, and shall be exhibited upon request of any authorized Department representative. [N.J.A.C. 7:19- 2]
32. The Department has the right to enter and inspect any site, building, or equipment, or any portion thereof, owned or operated by the permittee, at any time, in order to ascertain compliance or noncompliance with N.J.S.A. 58:1A-1 et seq., 58:4A-4.1 et seq., 58:12A-1 et seq., these rules, or any other agreement or order issued or entered into pursuant thereto. Such right shall include, but not be limited to, the right to require the testing of any equipment at the facility, to sketch or photograph any portion of the site, building or equipment, to copy or photograph any document or records necessary to determine such compliance or noncompliance, and to interview any employees or representative of the owner, operator, or permittee. Such right shall be absolute and shall not be conditioned upon any action by the Department, except the presentation of appropriate credentials as requested and compliance with appropriate standard safety procedures. [N.J.A.C. 7:19- 2]
33. This permit may be transferred, with the consent of the Department, but only for the identical use of the waters. [N.J.A.C. 7:19- 2]
34. If the authorized diversion privileges are not currently diverted, subject to contract, or reasonably required for a demonstrated future need, they shall revert back to the State upon renewal or modification of the permit. [N.J.A.C. 7:19- 2]
35. The permittee shall protect each source from vandalism, tampering, and contamination at all times. [N.J.A.C. 7:19- 2]
36. This permit shall expire as indicated on the permit approval cover page. [N.J.A.C. 7:19- 2]



**Administrative Hearing Request Checklist  
And Tracking Form for Permits**

1. Permit Being Appealed:

\_\_\_\_\_

Title and Type of Permit

\_\_\_\_\_

Issuance Date of Permit

\_\_\_\_\_

Permit Number

2. Person Requesting Hearing:

\_\_\_\_\_

Name/Company

\_\_\_\_\_

Name of Attorney (if applicable)

\_\_\_\_\_

Address

\_\_\_\_\_

Address of Attorney

3. The following information must be included with the request:

- a. The date the permittee received the final permit;
- b. A copy of permit with a list of all permit conditions and issues contested;
- c. The legal and factual questions at issue;
- d. A statement as to whether or not the permittee raised each legal and factual issues during the public comment period of the permit;
- e. Suggested revised or alternative permit conditions;
- f. An estimate of the time required for the hearing;
- g. A request, if necessary, for a barrier-free hearing location for physically disabled persons;
- h. A clear indication of any willingness to negotiate a settlement with the Department prior to the Department's processing of the hearing request to the Office of Administrative Law; and
- i. This form, completed with all of the information listed above, signed, and dated, including attachments, to:

- i. Office of Legal Affairs  
ATTENTION: Adjudicatory Hearing Requests  
Department of Environmental Protection  
401 East State Street  
P.O. Box 402  
Trenton, New Jersey 08625-0402

- ii. Terry D. Pilawski, Chief  
Mail Code 401-04Q  
Division of Water Supply & Geoscience  
Bureau of Water Allocation & Well Permitting  
P.O. Box 420  
Trenton, New Jersey 08625

- iii. All co-permittees (w/attachments)

4. Signature: \_\_\_\_\_ Date: \_\_\_\_\_



# State of New Jersey

CHRIS CHRISTIE  
GOVERNOR

KIM GUADAGNO  
LT. GOVERNOR

## DEPARTMENT OF ENVIRONMENTAL PROTECTION

Mail Code 401-04Q  
Division of Water Supply & Geoscience  
New Jersey Geological and Water Survey Element  
Bureau of Water Allocation & Well Permitting  
401 E. State Street - P.O. Box 420  
Trenton, New Jersey 08625-0420  
Tel #: (609) 984-6831 - Fax #: (609) 633-1231  
<http://www.nj.gov/dep/watersupply/>

BOB MARTIN  
COMMISSIONER

May 25, 2017

Ridgewood Water Dept  
131 North Maple Avenue  
Ridgewood, NJ 07451  
Attn: Richard Calbi



Dear Mr. Calbi:

Re: **Water Allocation Permit - Renewal**  
**Program Interest ID/ Permit No. 5014X/5014**  
**Activity No. WAP160002**

Enclosed is a permit issued pursuant to the Water Supply Management Act, N.J.S.A. 58:1A-1 et seq. This permit becomes effective on June 1, 2017 and is to divert water from 21 wells in the following Municipality and County:

MUNICIPALITY	COUNTY
Ridgewood Village	Bergen

5014X is your Program Interest ID and WAP160002 is your Permit Activity Number, and will appear on all forms and correspondence from the Bureau of Water Allocation & Well Permitting. Reference your Program Interest ID and Activity No. in all correspondence.

Be advised that as you are responsible for complying with the terms and conditions of the enclosed permit you should review them thoroughly. Failure to comply with any or all of the terms and conditions could result in penalties and/or revocation of the permit.

Within 20 calendar days following your receipt of this permit you may submit a request for an adjudicatory hearing to contest the conditions of this permit. Regulations regarding the format and requirements for requesting an adjudicatory hearing may be found in N.J.A.C. 7:19-2.13.

To request a hearing, the permittee must complete the enclosed Tracking Form and supply all the information specified in Part III of the Tracking Form. A copy of the completed, signed and dated Tracking Form, together with all of the information required by Part III of the Tracking Form, including attachments where specified, must be submitted to:

1. Janis Hoagland, Director  
New Jersey Department of Environmental Protection  
Office of Legal Affairs  
P.O. Box 402  
Trenton, New Jersey 08625

2. Terry D. Pilawski, Chief  
New Jersey Department of Environmental Protection  
Mail Code 401-04Q  
Division of Water Supply & Geoscience  
Bureau of Water Allocation & Well Permitting  
P.O. Box 420  
Trenton, New Jersey 08625-0420

Very truly yours,



Terry D. Pilawski, Chief  
Bureau of Water Allocation & Well Permitting

Enclosure

Certified Mail No.: 7016-3010-0001-1450-3594

C: Bureau of Water Allocation & Well Permitting  
Northern Bureau of Water Compliance & Enforcement  
Chelsea Du Brul, BWAWP





State of New Jersey  
 Department of Environmental Protection  
 Bureau of Water Allocation & Well Permitting  
 PO Box 426, Trenton, New Jersey 08625-0426



## Water Allocation Permit

The New Jersey Department of Environmental Protection grants this permit\* in accordance with your application, attachments accompanying same application, and applicable laws and regulations. This permit is also subject to further conditions and stipulations enumerated in the supporting documents.

<b>Program Interest ID/ Permit Number:</b> 5014X/5014 <b>Activity Number:</b> WAP160002	<b>Issuance Date:</b> 05/25/2017	<b>Effective Date:</b> 06/01/2017	<b>Expiration Date:</b> 05/31/2027
--	----------------------------------	-----------------------------------	------------------------------------

<b>Name and Address of Applicant</b> RIDGEWOOD WATER DEPT 131 North Maple Avenue Ridgewood, NJ 07451	<b>Location of Activity/Facility</b> Ridgewood Village Bergen	
	<b>Type of Permit</b> Water Allocation Permit - Renewal	<b>Statute(s)</b> N.J.S.A. 58:1A-1

**This permit grants permission to divert water from the approved sources in the attached permit inventory, in the following municipalities, for the following water uses:**

<table> <tr> <td><b>MUNICIPALITY</b></td> <td><b>COUNTY</b></td> </tr> <tr> <td>Ridgewood Village</td> <td>Bergen</td> </tr> </table>	<b>MUNICIPALITY</b>	<b>COUNTY</b>	Ridgewood Village	Bergen	<b>Water Uses:</b> Public Community Supply
<b>MUNICIPALITY</b>	<b>COUNTY</b>				
Ridgewood Village	Bergen				

This permit is subject to the attached Conditions.

Approved by the authority of:  
 Bob Martin, Commissioner  
 Department of Environmental Protection

*Terry D. Pilawski*  
 Terry D. Pilawski, Chief

5/25/17  
 Date

Bureau of Water Allocation & Well Permitting

\* Permit means Certification, Approval, Registration, Equivalency, etc.

STAFF REPORT  
PERMIT MODIFICATION WITH RENEWAL

In the matter of:  
RIDGEWOOD WATER DEPT  
Water Allocation Permit No. 5014X (5014)

Ridgewood Village

Bergen

In compliance with the provisions of N.J.S.A. 58:1A-1 et seq., RIDGEWOOD WATER DEPT filed an application with the Department of Environmental Protection on March 31, 2016 for the Renewal of Water Allocation Permit No. 5014X (5014).

Background

On October 28, 2005, Water Allocation Permit No. 5014X (5014) was issued to RIDGEWOOD WATER DEPT, 131 North Maple Avenue, Ridgewood, New Jersey, 07451 with an expiration date of September 30, 2010. Pursuant to the Permit Extension Act of 2008, N.J.S.A. 40:55D-136 et seq. and subsequent revisions in 2010, 2012, 2014, and 2016, the expiration date was ultimately extended to June 30, 2017.

This permit approved the diversion of water from seven wells in the above noted Municipality and County.

While Ridgewood Water Department operates one interconnected system under PWSID# 0251001, the diversion sources are broken down into four separate water allocation permits in accordance with N.J.A.C. 7:19-1.6(f). The requested permit changes, in bold, are as follows:

Permit	Currently Permitted Monthly (mgm)	Currently Permitted Annual (mgy)	Currently Permitted Maximum Diversion Rate (gpm)	Proposed Monthly (mgm)	Proposed Annual (mgy)	Proposed Maximum Diversion Rate (gpm)
5014 (Ridgewood)	170.5	1,572.0	6,095.0	170.5	1,572.0	6,095.0
5015 (Wyckoff)	180.0	1,247.0	5,245.0	180.0	1,247.0	5,245.0
5016 (Glen Rock)	62.5	540.0	1,400.0	<b>61.9</b>	540.0	<b>1,280.0</b>
5017 (Midland Park)	70.0	524.0	1,370.0	70.0	524.0	1,370.0
5014X Overall Limit	403.0	-	-	<b>449.0</b>	-	-



This modification with renewal request represents an increase in the overall system wide monthly allocation (encompassing 5014, 5015, 5016, and 5017) from 403 mgm to 449 mgy. The analysis of the requested increase is discussed in detail in permit 5016.

The renewal application filed on March 31, 2016 requests the renewal of the privilege to divert the following:

Allocation Limits

From	Designation	Parameter	Limit
5014 WA PERMIT - ALL DIVERSION SOURCES	RIDGEWOOD WATER DEPT	Water Diverted	<= 1,572 Million Gallons Per Year
5014 WA PERMIT - ALL DIVERSION SOURCES	RIDGEWOOD WATER DEPT	Water Diverted	<= 170.5 Million Gallons Per Month
5014 WA PERMIT - ALL DIVERSION SOURCES	RIDGEWOOD WATER DEPT	Maximum Diversion Rate	<= 6095 Gallons Per Minute

Approved Sources and Maximum Diversion Rates

Groundwater (5014)

Well Permit No.	Well Name or Designation	Pump Capacity (gpm)	Aquifer
2300000333	E. Saddle River	350	Brunswick
2300001445	Paramus	225	Brunswick
2300001643	Walthery	175	Brunswick
2300001644	Spring	300	Brunswick
2300001771	Andover	125	Brunswick
2300001836	Ravine	235	Brunswick
2300003902	Salem	400	Brunswick
2300003903	Irving	1,010	Brunswick
2300004170	Stevens	225	Brunswick
2300004458	Twinney	850	Brunswick
2300004470	King	125	Brunswick
2300005931	West End	275	Brunswick
4300000004	Carr #1	255	Brunswick
4300000006	Carr #3	300	Brunswick
4300000007	Carr #4	130	Brunswick
4300000009	Carr #6	160	Brunswick

Well Permit No.	Well Name or Designation	Pump Capacity (gpm)	Aquifer
4300000010	Carr #7	160	Brunswick
4300000013	Grove	260	Brunswick
4300000014	East Ridgewood	600	Brunswick
4300000015	Linwood	700	Brunswick
4300000029	Farview	350	Brunswick

Groundwater – Permits 5014, 5015, 5016, & 5017 (5014X)

Permit No.	Well Name	Well Permit Number	Pump Capacity gpm	Aquifer	Status
5014	E. Saddle River	2300000333	350	Brunswick	Active
5014	Paramus	2300001445	225	Brunswick	Active
5014	Walthery	2300001643	175	Brunswick	Active
5014	Spring	2300001644	300	Brunswick	Active
5014	Andover	2300001771	125	Brunswick	Inactive
5014	Ravine	2300001836	235	Brunswick	Inactive
5014	Salem	2300003902	400	Brunswick	Active
5014	Irving	2300003903	1,010	Brunswick	Active
5014	Stevens	2300004170	225	Brunswick	Active
5014	Twinney	2300004458	850	Brunswick	Active
5014	King	2300004470	125	Brunswick	Inactive
5014	West End	2300005931	275	Brunswick	Active
5014	Carr #1	4300000004	255	Brunswick	Active
5014	Carr #3	4300000006	300	Brunswick	Active
5014	Carr #4	4300000007	130	Brunswick	Active
5014	Carr #6	4300000009	160	Brunswick	Active
5014	Carr #7	4300000010	160	Brunswick	Active
5014	Grove	4300000013	260	Brunswick	Active
5014	East Ridgewood	4300000014	600	Brunswick	Active
5014	Linwood	4300000015	700	Brunswick	Inactive
5014	Farview	4300000029	350	Brunswick	Active
5015	Midland	2300001046	400	Brunswick	Active
5015	Russell	2300001834	180	Brunswick	Active
5015	Meer	2300001837	275	Brunswick	Active
5015	Lafayette	2300002130	375	Brunswick	Active
5015	Franklin	2300002229	300	Brunswick	Active
5015	Van Houten	2300002230	250	Brunswick	Active
5015	Newtown	2300002319	225	Brunswick	Active



5015	Mountain	2300002620	280	Brunswick	Active
5015	Eder	2300002622	440	Brunswick	Active
5015	Lakeview	2300004273	400	Brunswick	Active
5015	Weisch	2300005158	450	Brunswick	Active
5015	Cedar Hill 1	4300000016	150	Brunswick	Active
5015	Cedar Hill 4	4300000019	320	Brunswick	Inactive
5015	Cedar Hill 5	4300000020	225	Brunswick	Active
5015	Cedar Hill 6	4300000021	150	Brunswick	Active
5015	Ames 3	4300000022	300	Brunswick	Active
5015	Ames 5	4300000023	175	Brunswick	Active
5015	Ames 6	4300000024	175	Brunswick	Active
5015	Ames 7	4300000025	175	Brunswick	Active
5016	Main	2300001443	350	Brunswick	Active
5016	Prospect	2300001770	400	Brunswick	Active
5016	Glen Rock	2300001835	155	Brunswick	Active
5016	Akerman	2300002227	250	Brunswick	Active
5016	Leigh	2300004171	125	Brunswick	Inactive
5017	Waldo	2300001047	325	Brunswick	Active
5017	Goffle	2300004169	250	Brunswick	Inactive
5017	College	2300004573	160	Brunswick	Active
5017	Wortendyke 2	4300013004	125	Brunswick	Active
5017	Wortendyke 6	4300013005	130	Brunswick	Active
5017	Wortendyke 7	4300013006	100	Brunswick	Active
5017	Wortendyke 4	4300013007	280	Brunswick	Inactive

#### Findings of Fact

1. The diversion is used for Public Community Supply and the entire system serves the following communities: Wyckoff, Midland Park, Ridgewood, and Glen Rock.
2. This application request is for a renewal of an allocation granted by the following:

Permit No.	Date Issued	Source of Water	Diversion Amount	
			mgm	mgd
5014X (5014)	10/28/2005	21 wells	170.5	1,572.0
5014	12/23/2002	21 wells	170.5	1,572.0
5014	2/03/1983	24 Brunswick wells	170.5	
1466	2/17/1969	New well	20.08	
1378	4/20/1967	New well	12	
1324	9/15/1966	Four proposed wells		180,000 gpd
1292	2/17/1966	Four proposed wells	10	

Permit No.	Date Issued	Source of Water	Diversion Amount	
			mgm	mgy
1193	9/17/64	Two proposed wells	9.2	
879	11/10/1956	10 wells	8.5	
851	5/12/1955	two proposed wells	1	
807	7/19/1954	2 wells	6	
702	2/20/1950	two proposed wells	5	
561	5/04/1942	groundwater wells	1	
509	4/08/1940	groundwater wells	0.5	
400	6/08/1932	groundwater wells	1	
378	6/30/1931	groundwater wells	1	
172	12/05/1925	8 groundwater wells	2.5	

3. The applicant's diversion is not located within a designated Area of Critical Water Supply Concern.
4. The system has the following interconnections with adjacent systems:

Location	Supplier	Receiver	Size (in)	Use
Eastgate Road	0251001 (Ridgewood)	0228001 (Ho-Ho-Kus)	6	emergency
Brookside Avenue	0201001 (Allendale)	0251001 (Ridgewood)	6	emergency
North Maple Avenue at First Street	0228001 (Ho-Ho-Kus)	0251001 (Ridgewood)	6	emergency
Northern Parkway at Franklin Turnpike	0228001 (Ho-Ho-Kus)	0251001 (Ridgewood)	6	emergency
Wyckoff Avenue	0233001 (Mahwah)	0251001 (Ridgewood)	8	emergency
Burritt Place	0251001 (Ridgewood)	0220001 (Suez Franklin Lakes)	6	emergency
Covington Place	0251001 (Ridgewood)	0220001 (Suez Franklin Lakes)	6	emergency
Evergreen Street	0251001 (Ridgewood)	0264001 (Waldwick)	6	emergency
Hemlock Street	0251001 (Ridgewood)	0264001 (Waldwick)	6	emergency
Linwood Avenue	0251001 (Ridgewood)	0238001 (Suez Haworth)	6	emergency
Marr Avenue	1604001 (Hawthorne)	0251001 (Ridgewood)	8	bulk

	Boro)			purchase
Franklin Avenue	0220001 (Suez Franklin Lakes)	0251001 (Ridgewood)	6	bulk purchase
Hampshire Road	0220001 (Suez Franklin Lakes)	0251001 (Ridgewood)	6	bulk purchase

1. The applicant has agreements for the sale or purchase of water from the following:

Name of System	Sale or Purchase	Quantity	Date of Contract
Borough of Hawthorne	Purchase	1 MGD (with minimum 30 MGM Between June 1st – September 1 <sup>st</sup> annually)	7/11/2001, annual contract through 2018*
Suez Haworth via the Suez Franklin Lakes interconnection	Purchase	0.55 MGD 17.05 MGM 200.75 MGY	1/1/2007

\*This contract is in for review, but has not yet received approval from the Department. Ridgewood has no contracts for the sale of water.

5. A review of quarterly diversion reports indicates the following water use:

A. Total Water Diverted for 5014 – Ridgewood Village

Year	Annual Use (mg)	Maximum Monthly Use (mg)(peak month)	Average Monthly Use (mg)	Existing Allocation	
				(mgm)	(mgy)
2016	1042.24	119.492 (Jun)	86.853	170.5	1,572.0
2015	1069.157	138.574 (Jul)	89.096	170.5	1,572.0
2014	1036.550	132.351 (Sep)	86.379	170.5	1,572.0
2013	1029.490	133.260 (Jul)	85.791	170.5	1,572.0
2012	1035.784	134.480 (Jul)	86.315	170.5	1,572.0
2011	942.770	148.82 (Jul)	78.564	170.5	1,572.0

B. Total Water Diverted for 5014X (5014, 5015, 5016, & 5017)

Year	Annual Use (mg)	Maximum Monthly Use (mg)(peak month)	Average Monthly Use (mg)	Existing Allocation	
				(mgm)	(mgy)



2016	2584.190	303.710 (Jun)	215.349	403	-
2015	2625.664	326.043 (Aug)	218.805	403	-
2014	2576.331	301.585 (Jul)	214.694	403	-
2013	2603.880	338.450 (Jul)	216.990	403	-
2012	2597.370	331.750 (Jul)	216.448	403	-
2011	2487.420	356.630 (Jul)	207.285	403	-

C. Total Water Purchased from Suez

Year	Annual Use (mg)	Maximum Monthly Use (mg)(peak month)	Average Monthly Use (mg)	Contract Volumes	
				(mgm)	(mgy)
2016	315.367	57.996 (Jul)	26.281	17.05	200.75
2015	227.126	49.018 (Aug)	18.927	17.05	200.75
2014	169.491	18.690 (Jul)	14.124	17.05	200.75
2013	168.680	18.910 (Jul)	14.057	17.05	200.75
2012	188.820	33.330 (Jul)	15.735	17.05	200.75
2011	195.723	38.030 (Jul)	16.310	17.05	200.75

Ridgewood consistently takes more water than their contract guarantees; however, the Bureau of Water System Engineering only counts the guaranteed contractual amount in their firm capacity calculations.

D. Total Water Purchased from Hawthorne Borough

Year	Annual Use (mg)	Maximum Monthly Use (mg)(peak month)	Average Monthly Use (mg)	Contract Volumes	
				(mgm)	(mgy)
2016	75.330	22.464 (Aug)	6.278	30.0	365.0
2015	71.767	19.011 (Jul)	5.981	30.0	365.0
2014	23.598	12.456 (Aug)	1.967	30.0	365.0
2013	16.120	11.410 (Oct)	1.343	30.0	365.0
2012	32.800	22.060 (Jul)	2.733	30.0	365.0
2011	30.500	21.710 (Jul)	2.542	30.0	365.0

E. Total System Use (Water Diverted + Water Imported – Water Exported)

Year	Annual Use (mg)	Maximum Monthly Use (mg)(peak month)	Average Monthly Use (mg)
2016	2974.887	368.881 (Jun)	247.907

2015	2924.557	391.585 (Aug)	243.713
2014	2769.420	325.865 (Sep)	230.785
2013	2788.680	362.070 (Jul)	232.390
2012	2818.990	387.140 (Jul)	234.916
2011	2713.643	416.370 (Jul)	226.137

6. The population served is approximately 61,700, which represents an average monthly consumption of 110 gpcd, and a peak monthly consumption of 198 gpcd based upon 2011 and 2015 water use data, with a 94 percent residential use component.
7. The following information is available for the applicant's diversion sources:

Well Locations

Well Permit No.	Well Name or Designation	Location
2300000333	E. Saddle River	East Saddle River Rd & Bingham Rd
2300001445	Paramus	Linwood Ave & Sollas Ct
2300001643	Walthery	Walthery Ave & East Glen Ave
2300001644	Spring	Spring St
2300001771	Andover	Andover Terrace
2300001836	Ravine	Goffle Rd & Ravine Ave
2300003902	Salem	Salem Ln & Van Emburgh Ave
2300003903	Irving	East Ridgewood Ave
2300004170	Stevens	Newcomb Rd & Ellington Rd
2300004458	Twinney	Franklin Tpk & Banta St
2300004470	King	Lakeview Dr
2300005931	West End	Cedar Croft Rd & West End Ave
4300000004	Carr #1	East Glen Ave & North Maple Ave
4300000006	Carr #3	East Glen Ave & North Maple Ave
4300000007	Carr #4	East Glen Ave & North Maple Ave
4300000009	Carr #6	East Glen Ave & North Maple Ave
4300000010	Carr #7	East Glen Ave & North Maple Ave
4300000013	Grove	Grove Ave
4300000014	East Ridgewood	East Ridgewood Ave
4300000015	Linwood	Linwood Ave & Northern Pkwy
4300000029	Farview	Fairview St & Van Dyke St



Well Data

Well Permit No.	Well Name or Designation	Pump Capacity (gpm)	Drilling Completed Date	Finished Depth (feet)	Smallest Diameter (inches)
2300000333	E. Saddle River	350	9/26/1950	300	12
2300001445	Paramus	225	12/23/1955	300	12
2300001643	Walthery	175	6/26/1955	300	12
2300001644	Spring	300	1955	300	12
2300001771	Andover	125	10/6/1955	300	12
2300001836	Ravine	235	2/9/1956	300	12
2300003902	Salem	400	2/28/1964	320	12
2300003903	Irving	1,010	5/12/1964	300	12
2300004170	Stevens	225	9/9/1965	300	12
2300004458	Twinney	850	1/1966	298	12
2300004470	King	125	2/14/1966	299	12
2300005931	West End	275	6/1/1974	300	12
4300000004	Carr #1	255	1900	250	8
4300000006	Carr #3	300	1900	250	8
4300000007	Carr #4	130	1900	200	8
4300000009	Carr #6	160	1912	150	8
4300000010	Carr #7	160	1912	175	8
4300000013	Grove	260	1926	298	12
4300000014	East Ridgewood	600	1900	210	12
4300000015	Linwood	700	7/3/1931	261	12
4300000029	Farview	350	1940	402	10

Well Static Water Level Data

Well Permit No.	Well Name or Designation	Historical Static Water Level		Current Static Water Level	
		Date	Level (ft)	Date	Level (ft)
2300000333	E. Saddle River	9/20/1950	1	9/2015	13.7
2300001445	Paramus	12/23/1955	4	12/2015	16.0
2300001643	Walthery	6/26/1955	25	6/2015	35.1
2300001644	Spring	-	-	6/2015	11.8
2300001771	Andover	10/6/1955	12	10/2015	14.7
2300001836	Ravine	2/1/1956	25	12/2015	13

Well Permit No.	Well Name or Designation	Historical Static Water Level		Current Static Water Level	
		Date	Level (ft)	Date	Level (ft)
2300003902	Salem	5/12/1964	5	5/2015	26.8
2300003903	Irving	5/12/1964	5	5/2015	10.9
2300004170	Stevens	9/7/1965	10	9/2015	14.3
2300004458	Twinney	1/4/1966	18	1/2015	16.3
2300004470	King	2/9/1966	31	2/2015	45.2
2300005931	West End	6/1/1974	0	6/2015	14.5
4300000004	Carr #1	9/27/1999	30	9/2015	28.1
4300000006	Carr #3	9/27/1999	30	4/2015	0
4300000007	Carr #4	9/27/1999	30	4/2015	0
4300000009	Carr #6	9/27/1999	30	4/2015	0
4300000010	Carr #7	9/27/1999	30	4/2015	0
4300000013	Grove	-	-	4/2015	9.4
4300000014	East Ridgewood	11/22/1999	13	11/2015	16.3
4300000015	Linwood	8/1/1933	0	8/2015	11.9
4300000029	Farview	-	-	8/2015	84.1

Well Test Data (from Well Records)

Well Permit No.	Well Name or Designation	Test Date	Static Level (feet)	Pumping Time (hours)	Yield (gpm)	Drawdown (feet)	Specific Capacity (gpm/ft drawdown)
2300000333	E. Saddle River	9/20/1950	1	70	490	119	4.12
2300001445	Paramus	12/23/1955	4	96	261	196	1.33
2300001643	Walthery	6/26/1955	25	96	200	175	1.14
2300001644	Spring	-	-	-	-	-	-
2300001771	Andover	10/6/1955	12	96	162	188	0.86
2300001836	Ravine	2/1/1956	25	96	245	165	1.48
2300003902	Salem	5/12/1964	5	80	1230	162	7.59
2300003903	Irving	5/12/1964	5	80	1230	162	7.59
2300004170	Stevens	9/7/1965	10	49	254	210	1.21
2300004458	Twinney	1/4/1966	18	24.5	759	72	10.54
2300004470	King	2/9/1966	31	53	100	80	1.25
2300005931	West End	6/1/1974	0	72	322	117	2.75
4300000004	Carr #1	-	-	-	-	-	-
4300000006	Carr #3	-	-	-	-	-	-
4300000007	Carr #4	-	-	-	-	-	-
4300000009	Carr #6	-	-	-	-	-	-



Well Permit No.	Well Name or Designation	Test Date	Static Level (feet)	Pumping Time (hours)	Yield (gpm)	Drawdown (feet)	Specific Capacity (gpm/ft drawdown)
4300000010	Carr #7	-					
4300000013	Grove	1926	-	-	175	-	
4300000014	East Ridgewood	1900	-	-	250	-	
4300000015	Linwood	8/1/1933	0	72	500	15	33.3
4300000029	Farview	-	-	-	-	-	-

8. The applicant's diversion sources are located within: Planning Area No. 5, Lower Passaic/Rahway River as designated by the New Jersey Water Supply Master Plan; the Northeast Drought Region; and Watershed Management Area No. 4, Lower Passaic and Saddle River Watershed Management Area.

The diversion is not located within the Delaware River Basin, Pinelands, or Highlands Region.

9. Flow meters for all diversion sources have been calibrated within the past five years. The most recent dates of calibration are:

Well Permit No.	Well Name or Designation	Calibration Date
2300000333	E. Saddle River	12/29/2014
2300001445	Paramus	12/27/2013
2300001643	Walthery	12/20/2013
2300001644	Spring	12/27/2013
2300001771	Andover	Inactive
2300001836	Ravine	Inactive
2300003902	Salem	12/2016
2300003903	Irving	12/30/2014
2300004170	Stevens	12/30/2012
2300004458	Twinney	12/30/2013
2300004470	King	12/19/2012
2300005931	West End	12/27/2013
4300000004	Carr #1	12/26/2012
4300000006	Carr #3	12/26/2012
4300000007	Carr #4	12/26/2012
4300000009	Carr #6	12/26/2012
4300000010	Carr #7	12/26/2012
4300000013	Grove	12/30/2012



Well Permit No.	Well Name or Designation	Calibration Date
4300000014	East Ridgewood	12/30/2014
4300000015	Linwood	Inactive
4300000029	Farview	12/31/2014

The inactive wells should have their totalizing flow meters recalibrated prior to placing the sources into use.

10. The following wells have been abandoned, decommissioned, are inactive or unused:

Well Name	Well Permit No.	Previously Permitted	Depth (feet)	Status
Brook	2300004172	5016	300	Decommissioned 3/23/2015
Wyckoff	2300002621	5015	300	Decommissioned 6/25/2015
Garden State	2500013251	5015	287	No longer used, not owned by Ridgewood
Cedar Hill 2	4300000017	5015	400	Inactive
Cedar Hill 3	4300000018	5015	500	Inactive
Wyckoff Ave Test Well	2300002556	NA	303	Unknown
Carr #2	4300000005	5014	250	Inactive
Carr #5	4300000008	5014	218	Inactive
Carr #8	4300000011	5014	175	Inactive
Carr #9	4300000012	5014	175	Inactive
Newtown Rd test well	2300002558	NA	303	Inactive
East Side	2300005213	?	400	Inactive

11. The applicant is currently in compliance with all permit conditions.
12. For Ridgewood Village, water, after use, is discharged to Ridgewood Village WPCF Authority for treatment and discharge to the Ho-Ho-Kus Brook under Permit No. NJ0024791. The treatment works are not under a sewer connection ban or other restriction imposed by NJDEP.
13. The system is 99 percent metered.
14. The applicant has indicated that their unaccounted-for-water is 13.5 percent (2016).
15. The water system has storage capacity of 14.1 mg, as compared with a 2015 average

water demand of 8.01 mgd.

16. The applicant submitted a Water Conservation Plan on March 30, 2016.
17. The estimated consumptive use of water is 100 percent, which is equivalent to 8.01 mgd.

#### Staff Analysis/Conclusions

1. The applicant's current water use is reasonable.
2. The demands submitted with the application are system-wide demands, because Ridgewood's four permits, 5014, 5015, 5016, and 5017 are all operated as one interconnected system. According to the applicant, the division of the Village's interconnected water supply system into four permits along municipal boundaries is artificial and arbitrary, because the location of the individual wells has little bearing on where the pumped water is actually consumed. However, pursuant to N.J.A.C. 7:19-1.4(f), four permits are required due to the location of the sources. Because of the interconnected nature of the system, it is most appropriate to consider the system as a single entity for water supply purposes. However, because the maximum diversion from the wells in permit (5014) in the last five years was 148.82 mgm (7/2011) and 1,069.157 mgy (2015), it seems appropriate to renew the existing monthly and annual allocations specific to 5014, 170.5 mgm and 1,572.0 mgy.
3. System-wide demand projections for the system provided by the applicant indicate that their ten year demands will be 439 mgm, and 2,922 mgy. According to the applicant, the Ridgewood service area experienced a 0.5% annual population growth from 2013 to 2016, which was used to estimate future growth. According to the Bureau of Water System Engineering's Surplus/Deficit table, Ridgewood Water has committed peak demands of 394.5 mgm and 2,973.323 mgy. In addition, according to the applicant, Ridgewood exceeded their current cross permit limit of 403 mgm on several occasions, July 1993, and July and August 1998, and July 1999. In addition, Ridgewood has been consistently purchasing water in excess of their contract amounts from Suez NJ; in 2015, Ridgewood purchased greater than 17 mgm during 6 months of the year. Analysis of this in conjunction with historical use and supporting documentation provided with the application shows that an overall system-wide allocation of 449 mgm, should be sufficient to meet their needs.

The system-wide allocation limit condition should read consistently in all four permits (Permit Nos. 5014, 5015, 5016, and 5017) as follows: "The total diversion for the entire system, including permit Nos. 5014, 5015, 5016, and 5017, shall not exceed 449 mgm."

A detailed analysis of the system-wide allocation limit increase is discussed in the permit modification for 5016. Due to discussions with the Bureau regarding concerns with potential impacts to the Saddle River, upstream of the Suez New Jersey's intake and the ability for Suez to meet their passing flow (13.9 cfs at USGS Gage #01391102), the

applicant requested the increase in the system-wide allocation from all wells, except those in the Saddle River basin. The following wells are located within, or in the case of the Leigh and Stevens wells, close enough to cause impact to the Saddle River basin: Twinney, East Saddle River, Waltherly, Salem, Paramus, East Ridgewood, Stevens, and Leigh (in permit 5016). Therefore, a limit should be added to wells Twinney, East Saddle River, Waltherly, Salem, Paramus, East Ridgewood, and Stevens, to ensure that they are not being used at a rate greater than they had previously been used. The peak usage for these wells was in 2015, 65.394 mgm. Adding a 15 percent cushion, a new limit of 75.2 mgm should be added to this permit for the Saddle River Basin wells (Twinney, East Saddle River, Waltherly, Salem, Paramus, East Ridgewood, and Stevens). A separate limit for the Leigh well is established/discussed in permit 5016.

4. Natural replenishment of groundwater is probably occurring because the observed fluctuations do not follow a continual decreasing trend.

In order to confirm this, static water level reports should continue to be required as a condition of this permit to determine future trends.

5. No adverse impacts have been reported to the Department regarding the applicant's diversion sources.
6. Analysis of the applicant's chloride data indicates that chloride concentrations ranged from 82.5 to 289 mg/l in 2015. The elevated chloride concentrations in the Ridgewood Water wells are likely not a result of regional saltwater intrusion, since elevated chloride concentrations are not a consideration in the Brunswick aquifer at this location. It is more likely that the elevated concentrations are from road salt or from water treatment. Because the chloride concentrations are not a result of regional saltwater intrusion, the conditions requiring chloride monitoring should be removed from this permit.
7. No problems with groundwater contamination associated with the diversion have been reported to the Bureau.

#### Summary

The Department has completed its review of this application pursuant to N.J.A.C. 7:19-1 et. seq. The review of this application reveals that it does not have any adverse impacts and meets, based upon the information certified to in the application, the statutory requirements of N.J.S.A. 58:1A-1 et. seq.

Therefore, based upon a review of the information submitted with the application, and the existing water allocation files, the following conclusions have been reached regarding this application:

- The monthly allocation of 170.5 mgm should be renewed.
- The annual allocation of 1,572 mgy should be renewed.

- The maximum diversion rate of 6,095 gpm should be renewed.
- The overall system-wide monthly allocation for permits 5014, 5015, 5016, and 5017 should be increased from 403 mgm to 449 mgm, as requested, and a condition should be placed in all four permits as follows: "The total diversion for the entire system, including permit Nos. 5014, 5015, 5016, and 5017, shall not exceed 449 mgm."
- The chloride monitoring requirements should be removed from this permit.
- The inactive wells, Andover, Ravine, and Linwood, should have their totalizing flow meters recalibrated prior to placing the sources into use.
- A limit of 75.2 mgm should be added to this permit for the Saddle River Basin wells (Twinney, East Saddle River, Waltherly, Salem, Paramus, East Ridgewood, and Stevens)

Therefore, this application should be approved in accordance with the following recommendations as the applicant has satisfied the requirements of N.J.A.C. 7:19-2.4 et seq.

#### References

In addition to the historical information on file at the Bureau of Water Allocation & Well Permitting and the application submitted, the following information sources were also utilized to establish the recommendations contained within this Staff Report:

August 1996. Water for the 21<sup>st</sup> Century: Vital Resource, New Jersey Statewide Water Supply Plan. New Jersey Department of Environmental Protection – Office of Environmental Planning, Trenton, New Jersey.

#### Recommendations

Issuance of the permit is recommended with an expiration date of 10 years from the effective date and is subject to the attached specific conditions:

Date: \_\_\_\_\_

5/5/17

  
Chelsea Du Brul, Environmental Specialist 3  
Division of Water Supply & Geoscience

*DOB 5/8/17*



**RIDGEWOOD WATER DEPT  
5014X  
Water Allocation Permit : WAP160002**

**Permit Inventory**

**Water Diversion Sources** - Water may be diverted under this permit from the following sources:

Source Designation (Well Permit No. or Intake No.)	Description	Subject Item ID
2300000333	E. SADDLE RIVER	WSWL0000064261
2300001445	PARAMUS	WSWL0000064282
2300001643	WALTHERY	WSWL0000064285
2300001644	SPRING	WSWL0000064286
2300001771	ANDOVER	WSWL0000064288
2300001836	RAVINE	WSWL0000064292
2300003902	SALEM	WSWL0000064342
2300003903	IRVING	WSWL0000064343
2300004170	STEVENS	WSWL0000064356
2300004458	TWINNEY	WSWL0000064367
2300004470	KING	WSWL0000064369
2300005931	WEST END	WSWL0000064414
4300000004	CARR #1	WSWL0000069778
4300000006	CARR #3	WSWL0000069780
4300000007	CARR #4	WSWL0000069781
4300000009	CARR #6	WSWL0000069783
4300000010	CARR #7	WSWL0000069784
4300000013	GROVE	WSWL0000069787
4300000014	EAST RIDGEWOOD	WSWL0000069788
4300000015	LINWOOD	WSWL0000069789
4300000029	FARVIEW	WSWL0000069800

**Group Subject Items** - The following items are grouped sources for the purpose of setting permit requirements outlined in this document:

Group Designation	Group Description	Group Subject Item ID	Group Members
RIDGEWOOD WATER DEPT	5014 WA PERMIT - ALL DIVERSION SOURCES	WSWA0000075719	PASSAIC AQUIFER SOURCES, 5014 WA PERMIT - ALL DIVERSION SOURCES (WARG806105)
PASSAIC AQUIFER SOURCES	5014 WA PERMIT - ALL DIVERSION SOURCES	WARG0000806105	2300000333, E. SADDLE RIVER (WSWL064261) 2300001445, PARAMUS (WSWL064282) 2300001643, WALTHERY (WSWL064285)



**RIDGEWOOD WATER DEPT  
5014X**

**Water Allocation Permit : WAP160002**

**Group Subject Items** - The following items are grouped sources for the purpose of setting permit requirements outlined in this document:

<b>Group Designation</b>	<b>Group Description</b>	<b>Group Subject Item ID</b>	<b>Group Members</b>
PASSAIC AQUIFER SOURCES	5014 WA PERMIT - ALL DIVERSION SOURCES	WARG0000806105	2300001644, SPRING (WSWL064286)
			2300001771, ANDOVER (WSWL064288)
			2300001836, RAVINE (WSWL064292)
			2300003902, SALEM (WSWL064342)
			2300003903, IRVING (WSWL064343)
			2300004170, STEVENS (WSWL064356)
			2300004458, TWINNEY (WSWL064367)
			2300004470, KING (WSWL064369)
			2300005931, WEST END (WSWL064414)
			4300000004, CARR #1 (WSWL069778)
			4300000006, CARR #3 (WSWL069780)
			4300000007, CARR #4 (WSWL069781)
			4300000009, CARR #6 (WSWL069783)
			4300000010, CARR #7 (WSWL069784)
			4300000013, GROVE (WSWL069787)
4300000014, EAST RIDGEWOOD (WSWL069788)			
4300000015, LINWOOD (WSWL069789)			
4300000029, FARVIEW (WSWL069800)			
SADDLE RIVER BASIN SOURCES	TWINNEY, E. SADDLE RIVER, WALTHERLY, PARAMUS, EAST RIDGEWOOD, STEVENS, AND SALEM	WARG0001292142	2300000333, E. SADDLE RIVER (WSWL064261)

**RIDGEWOOD WATER DEPT  
5014X**

**Water Allocation Permit : WAP160002**

**Group Subject Items** - The following items are grouped sources for the purpose of setting permit requirements outlined in this document:

<b>Group Designation</b>	<b>Group Description</b>	<b>Group Subject Item ID</b>	<b>Group Members</b>
SADDLE RIVER BASIN SOURCES	TWINNEY, E. SADDLE RIVER, WALTHERLY, PARAMUS, EAST RIDGEWOOD, STEVENS, AND SALEM	WARG0001292142	2300001445, PARAMUS (WSWL064282)
			2300001643, WALTHERY (WSWL064285)
			2300003902, SALEM (WSWL064342)
			2300004170, STEVENS (WSWL064356)
			2300004458, TWINNEY (WSWL064367)
			4300000014, EAST RIDGEWOOD (WSWL069788)

**RIDGEWOOD WATER DEPT  
5014X**

Water Allocation Permit : WAP160002

**Permit Requirements**

**Limit Requirements**

The following limits apply and are the maximum permitted allocation:

**Final Permit Phase from 06/01/2017 -**

Subject Item	Parameter	Limit
RIDGEWOOD WATER DEPT, 5014 WA PERMIT - ALL DIVERSION SOURCES (WSWA75719)	Maximum Diversion Rate	<= 6095 Gallons Per Minute. [N.J.A.C. 7:19- 2]
	Water Diverted	<= 170.5 Million Gallons Per Month. [N.J.A.C. 7:19- 2]
		<= 1572 Million Gallons Per Year. [N.J.A.C. 7:19- 2]
SADDLE RIVER BASIN SOURCES, TWINNEY, E. SADDLE RIVER, WALTHERLY, PARAMUS, EAST RIDGEWOOD, STEVENS, AND SALEM (WARG1292142)	Water Diverted	<= 75.2 Million Gallons Per Month. [N.J.A.C. 7:19- 2]

**Other Limit Requirements**

**Final Permit Phase from 06/01/2017 -**

Subject Item	Parameter	Limit
2300000333, E. SADDLE RIVER (WSWL64261)	Rated Pump Capacity	<= 350 Gallons Per Minute. [N.J.A.C. 7:19- 2]
2300001445, PARAMUS (WSWL64282)	Rated Pump Capacity	<= 225 Gallons Per Minute. [N.J.A.C. 7:19- 2]
2300001643, WALTHERY (WSWL64285)	Rated Pump Capacity	<= 175 Gallons Per Minute. [N.J.A.C. 7:19- 2]
2300001644, SPRING (WSWL64286)	Rated Pump Capacity	<= 300 Gallons Per Minute. [N.J.A.C. 7:19- 2]
2300001771, ANDOVER (WSWL64288)	Rated Pump Capacity	<= 125 Gallons Per Minute. [N.J.A.C. 7:19- 2]
2300001836, RAVINE (WSWL64292)	Rated Pump Capacity	<= 235 Gallons Per Minute. [N.J.A.C. 7:19- 2]
2300003902, SALEM (WSWL64342)	Rated Pump Capacity	<= 400 Gallons Per Minute. [N.J.A.C. 7:19- 2]
2300003903, IRVING (WSWL64343)	Rated Pump Capacity	<= 1010 Gallons Per Minute. [N.J.A.C. 7:19- 2]
2300004170, STEVENS (WSWL64356)	Rated Pump Capacity	<= 225 Gallons Per Minute. [N.J.A.C. 7:19- 2]



**RIDGEWOOD WATER DEPT  
5014X**

Water Allocation Permit : WAP160002

**Other Limit Requirements**

**Final Permit Phase from 06/01/2017 -**

Subject Item	Parameter	Limit
2300004458, TWINNEY (WSWL64367)	Rated Pump Capacity	<= 850 Gallons Per Minute. [N.J.A.C. 7:19- 2]
2300004470, KING (WSWL64369)	Rated Pump Capacity	<= 125 Gallons Per Minute. [N.J.A.C. 7:19- 2]
2300005931, WEST END (WSWL64414)	Rated Pump Capacity	<= 275 Gallons Per Minute. [N.J.A.C. 7:19- 2]
4300000004, CARR #1 (WSWL69778)	Rated Pump Capacity	<= 255 Gallons Per Minute. [N.J.A.C. 7:19- 2]
4300000006, CARR #3 (WSWL69780)	Rated Pump Capacity	<= 300 Gallons Per Minute. [N.J.A.C. 7:19- 2]
4300000007, CARR #4 (WSWL69781)	Rated Pump Capacity	<= 130 Gallons Per Minute. [N.J.A.C. 7:19- 2]
4300000009, CARR #6 (WSWL69783)	Rated Pump Capacity	<= 160 Gallons Per Minute. [N.J.A.C. 7:19- 2]
4300000010, CARR #7 (WSWL69784)	Rated Pump Capacity	<= 160 Gallons Per Minute. [N.J.A.C. 7:19- 2]
4300000013, GROVE (WSWL69787)	Rated Pump Capacity	<= 260 Gallons Per Minute. [N.J.A.C. 7:19- 2]
4300000014, EAST RIDGEWOOD (WSWL69788)	Rated Pump Capacity	<= 600 Gallons Per Minute. [N.J.A.C. 7:19- 2]
4300000015, LINWOOD (WSWL69789)	Rated Pump Capacity	<= 700 Gallons Per Minute. [N.J.A.C. 7:19- 2]
4300000029, FARVIEW (WSWL69800)	Rated Pump Capacity	<= 350 Gallons Per Minute. [N.J.A.C. 7:19- 2]

**Monitoring Requirements**

**Final Permit Phase from 06/01/2017 -**

Subject Item	Requirement	Frequency	Monitored Parameter	Monitoring Method
2300000333, E. SADDLE RIVER (WSWL64261)	Static water levels for each well indicated shall be monitored. [N.J.A.C. 7:19- 2]	Each Month	Static Water Level	Airline, Tape, or Gage
2300001445, PARAMUS (WSWL64282)				
2300001643, WALTHERY (WSWL64285)				
2300001644, SPRING (WSWL64286)				

**RIDGEWOOD WATER DEPT  
5014X**

Water Allocation Permit : WAP160002

**Monitoring Requirements**

**Final Permit Phase from 06/01/2017 -**

Subject Item	Requirement	Frequency	Monitored Parameter	Monitoring Method
2300001771, ANDOVER (WSWL64288)	Static water levels for each well indicated shall be monitored. [N.J.A.C. 7:19- 2]	Each Month	Static Water Level	Airline, Tape, or Gage
2300001836, RAVINE (WSWL64292)				
2300003902, SALEM (WSWL64342)				
2300003903, IRVING (WSWL64343)				
2300004170, STEVENS (WSWL64356)				
2300004458, TWINNEY (WSWL64367)				
2300004470, KING (WSWL64369)				
2300005931, WEST END (WSWL64414)				
4300000004, CARR #1 (WSWL69778)				
4300000006, CARR #3 (WSWL69780)				
4300000007, CARR #4 (WSWL69781)				
4300000009, CARR #6 (WSWL69783)				
4300000010, CARR #7 (WSWL69784)				
4300000013, GROVE (WSWL69787)				
4300000014, EAST RIDGEWOOD (WSWL69788)				
4300000015, LINWOOD (WSWL69789)				
4300000029, FARVIEW (WSWL69800)				
2300000333, E. SADDLE RIVER (WSWL64261)	The monthly diversion from each source indicated shall be monitored. [N.J.A.C. 7:19- 2]	Each Month	Water Diverted	Meter
2300001445, PARAMUS (WSWL64282)				



**RIDGEWOOD WATER DEPT  
5014X**

Water Allocation Permit : WAP160002

**Monitoring Requirements**

**Final Permit Phase from 06/01/2017 -**

Subject Item	Requirement	Frequency	Monitored Parameter	Monitoring Method
2300001643, WALTHERY (WSWL64285)	The monthly diversion from each source indicated shall be monitored. [N.J.A.C. 7:19- 2]	Each Month	Water Diverted	Meter
2300001644, SPRING (WSWL64286)				
2300001771, ANDOVER (WSWL64288)				
2300001836, RAVINE (WSWL64292)				
2300003902, SALEM (WSWL64342)				
2300003903, IRVING (WSWL64343)				
2300004170, STEVENS (WSWL64356)				
2300004458, TWINNEY (WSWL64367)				
2300004470, KING (WSWL64369)				
2300005931, WEST END (WSWL64414)				
4300000004, CARR #1 (WSWL69778)				
4300000006, CARR #3 (WSWL69780)				
4300000007, CARR #4 (WSWL69781)				
4300000009, CARR #6 (WSWL69783)				
4300000010, CARR #7 (WSWL69784)				
4300000013, GROVE (WSWL69787)				
4300000014, EAST RIDGEWOOD (WSWL69788)				
4300000015, LINWOOD (WSWL69789)				
4300000029, FARVIEW (WSWL69800)				

**RIDGEWOOD WATER DEPT  
5014X**

Water Allocation Permit : WAP160002

**Record Keeping Requirements**

Final Permit Phase from 06/01/2017 -

Subject Item	Requirement	Frequency	Monitored Parameter	Record Keeping Method
RIDGEWOOD WATER DEPT, 5014 WA PERMIT - ALL DIVERSION SOURCES (WSWA75719)	A log book of month end meter readings for each diversion source shall be maintained on site. [N.J.A.C. 7:19- 2]	Each Month	Meter Reading	Log Book

**Submittal/Action Requirements**

Final Permit Phase from 06/01/2017 -

Applicable Subject Items	Submittal/Action Type	Requirement
2300000333, E. SADDLE RIVER (WSWL64261)	Submit Public Quarterly Report	The required monitoring results shall be recorded on the form provided by the Department. The completed form shall be submitted within 30 days after the end of each quarter. [N.J.A.C. 7:19- 2]
2300001445, PARAMUS (WSWL64282)		
2300001643, WALTHERY (WSWL64285)		
2300001644, SPRING (WSWL64286)		
2300001771, ANDOVER (WSWL64288)		
2300001836, RAVINE (WSWL64292)		
2300003902, SALEM (WSWL64342)		
2300003903, IRVING (WSWL64343)		
2300004170, STEVENS (WSWL64356)		
2300004458, TWINNEY (WSWL64367)		

**RIDGEWOOD WATER DEPT  
5014X**

Water Allocation Permit : WAP160002

**Submittal/Action Requirements**

**Final Permit Phase from 06/01/2017 -**

Applicable Subject Items	Submittal/Action Type	Requirement
2300004470, KING (WSWL64369)	Submit Public Quarterly Report	The required monitoring results shall be recorded on the form provided by the Department. The completed form shall be submitted within 30 days after the end of each quarter. [N.J.A.C. 7:19- 2]
2300005931, WEST END (WSWL64414)		
4300000004, CARR #1 (WSWL69778)		
4300000006, CARR #3 (WSWL69780)		
4300000007, CARR #4 (WSWL69781)		
4300000009, CARR #6 (WSWL69783)		
4300000010, CARR #7 (WSWL69784)		
4300000013, GROVE (WSWL69787)		
4300000014, EAST RIDGEWOOD (WSWL69788)		
4300000015, LINWOOD (WSWL69789)		
4300000029, FARVIEW (WSWL69800)		
2300001771, ANDOVER (WSWL64288)	Submit Proof of Flow Meter Calibration	Proof of flow meter calibration for the specified diversion sources shall be submitted prior to placing the source into operation. [N.J.A.C. 7:19- 2]
2300001836, RAVINE (WSWL64292)		
4300000015, LINWOOD (WSWL69789)		



**RIDGEWOOD WATER DEPT  
5014X**

**Water Allocation Permit : WAP160002**

**Submittal/Action Requirements**

**Final Permit Phase from 06/01/2017 -**

Applicable Subject Items	Submittal/Action Type	Requirement
RIDGEWOOD WATER DEPT, 5014 WA PERMIT - ALL DIVERSION SOURCES (WSWA75719)	Submit Water Conservation and Drought Management Plan	The permittee shall continue to implement, to the satisfaction of the Department, a water conservation and drought management program. The program shall encourage water conservation in all types of use within the area served by the permittee, including actions taken pursuant to this program and the impact thereof. Ridgewood Village Water Department should provide one update to the water conservation and drought management plan for the entire system (permits 5014, 5015, 5016, & 5017) every two years from the effective date of this permit. [N.J.A.C. 7:19- 2]
RIDGEWOOD WATER DEPT, 5014 WA PERMIT - ALL DIVERSION SOURCES (WSWA75719)	Submit Renewal Application	A renewal application shall be submitted three months prior to the expiration date. [N.J.A.C. 7:19- 2]

**Text Requirements**

**All Phases**

RIDGEWOOD WATER DEPT, 5014 WA PERMIT - ALL DIVERSION SOURCES (WSWA75719)

1. The total diversion for the entire system, including permit Nos. 5014, 5015, 5016, and 5017, shall not exceed 449 mgm. [N.J.A.C. 7:19- 2]
2. Water may be diverted under this permit for public community supply. However, water shall not be used to serve non-potable, consumptive purposes for new projects that are greater than 50 percent non-potable and greater than 50 percent consumptive, where, as determined by the Department, alternate water sources, including but not limited to reclaimed water for beneficial reuse, are feasible to serve the non-potable, consumptive needs of the project. [N.J.A.C. 7:19- 2]
3. Water may be diverted under this permit only from the approved diversion sources at the maximum rates specified. [N.J.A.C. 7:19- 1]
4. A major modification of this permit may be required in order to request the approval of any additional diversion sources or an increase in the pumping capacity. [N.J.A.C. 7:19- 2]
5. All diversion sources shall be metered with a totalizing flow meter. [N.J.A.C. 7:19- 2]
6. At a minimum, each diversion source flow meter shall be calibrated at least once every five years. [N.J.A.C. 7:19- 2]
7. Each flow meter shall be calibrated to within five percent accuracy. [N.J.A.C. 7:19- 2]
8. All wells shall be equipped with a metal tag showing the well permit numbers (source designation) as listed in the allocation permit inventory or have the well permit numbers painted on the casings. [N.J.A.C. 7:19- 2]
9. The pumping equipment capacity shall not be increased without prior approval from the Bureau of Water Allocation and Well Permitting. [N.J.A.C. 7:19- 1]
10. Any well not intended for use shall be decommissioned in accordance with N.J.A.C. 7:9D-3.1 et seq. [N.J.A.C. 7: 9D- 3]
11. Static water level shall be measured and reported as depth to water, in feet, from ground surface. [N.J.A.C. 7:19- 2]
12. For pumping wells, static water level (depth to water) shall be taken when the well pump has been shut down for a recovery period of at least 12 hours. If the well cannot be shut down for the required period, it must be noted on an addendum to the Quarterly Monitoring Report form. Please note on the addendum the number of hours the well was shut down or that the reading is a pumping level. [N.J.A.C. 7:19- 2]
13. All new services shall be metered in accordance with all applicable laws, regulations or codes including, but not limited to, the Water Supply Management Act. [N.J.A.C. 7:19- 6]
14. All existing services shall be metered. [N.J.A.C. 7:19- 6]



**RIDGEWOOD WATER DEPT  
5014X**

**Water Allocation Permit : WAP160002**

**Text Requirements**

**All Phases**

RIDGEWOOD WATER DEPT, 5014 WA PERMIT - ALL DIVERSION SOURCES (WSWA75719)

15. Water charges for each service connection shall be based in part on metered usage. [N.J.A.C. 7:19- 6]
16. The monthly quantity of water transferred and delivered to/received from interconnections shall be reported as part of the water system monitoring on separate forms provided by the Department. [N.J.A.C. 7:19- 2]
17. The Department may modify, suspend or terminate this permit, after due process, for violations of permit conditions, N.J.S.A. 58:1A-1, N.J.A.C. 7:19-1 et seq., any orders issued by the Department, or when in the public interest. [N.J.A.C. 7:19- 2]
18. The permittee shall investigate to the Department's satisfaction complaints by users of wells or surface water supplies within the zone of influence of its diversion to determine what impact the diversion has had on such wells or surface water supplies. A report on these investigations shall be forwarded to the Bureau of Water Allocation and Well Permitting. Any well or surface water supply which becomes damaged, dry, has reduced capacity, reduced water quality or is otherwise rendered unusable as a water source as a result of the permittee's diversions shall be repaired or replaced at the expense of the permittee. Work shall be in accordance with all State, County and Municipal construction standards for potable water. After reviewing all applicable investigational reports the Department of Environmental Protection will make the final determination regarding the validity of such complaints, the scope or sufficiency of such investigations, and will determine how to resolve any problems resulting from the diversion. [N.J.A.C. 7:19- 2]
19. This permit is issued for a limited period, and is not subject to automatic renewal. [N.J.A.C. 7:19- 2]
20. The permittee is subject to such fees as may be prescribed by the regulations. [N.J.A.C. 7:19- 3]
21. The permittee shall have the right to apply at any time for modification of this permit by submission of the appropriate application forms. [N.J.A.C. 7:19- 2]
22. The permittee may informally discuss the terms and conditions of this permit at any time with the Bureau of Water Allocation and Well Permitting. [N.J.A.C. 7:19- 2]
23. The permittee shall obtain approval from the Bureau of Water System Engineering before using the diversion for public water supply. [N.J.A.C. 7:19- 2]
24. In addition to the specific management requirements cited above, and when so directed by the Department, the permittee shall comply with applicable portions of the Water Supply Management Rules (N.J.A.C. 7:19-6 et seq. and N.J.A.C. 7:19-8 et seq.) to include the determination of dependable yield; unaccounted-for water; rehabilitation; system pressure and storage; interconnections; and operation of interconnections. [N.J.A.C. 7:19- 6]
25. If the permittee violates any condition of this permit, the permittee is subject to administrative penalties up to \$25,000 per day per offense as specified. [N.J.S.A. 58: 1A-16]
26. The issuance of this permit shall not be deemed to affect in any way action by the Department of Environmental Protection of the State of New Jersey on any future application. [N.J.A.C. 7:19- 2]
27. No change in plans or specifications shall be made except with the prior written permission of the Department of Environmental Protection of the State of New Jersey. [N.J.A.C. 7:19- 2]
28. The granting of this permit shall not be construed to in any way affect the title or ownership of property, and shall not make the Department of Environmental Protection or the State a party in any suit or question of ownership of property. [N.J.A.C. 7:19- 2]
29. This permit does not waive the obtaining of Federal or other State or local government consent when necessary. This permit is not valid and no work shall be undertaken until such time as all other required approvals and permits have been obtained. [N.J.A.C. 7:19- 2]
30. A copy of this permit shall be kept at the facility site, and shall be exhibited upon request of any authorized Department representative. [N.J.A.C. 7:19- 2]

RIDGEWOOD WATER DEPT

5014X

Water Allocation Permit : WAP160002

**Text Requirements**

**All Phases**

RIDGEWOOD WATER DEPT, 5014 WA PERMIT - ALL DIVERSION SOURCES (WSWA75719)

31. The Department has the right to enter and inspect any site, building, or equipment, or any portion thereof, owned or operated by the permittee, at any time, in order to ascertain compliance or noncompliance with N.J.S.A. 58:1A-1 et seq., 58:4A-4.1 et seq., 58:12A-1 et seq., these rules, or any other agreement or order issued or entered into pursuant thereto. Such right shall include, but not be limited to, the right to require the testing of any equipment at the facility, to sketch or photograph any portion of the site, building or equipment, to copy or photograph any document or records necessary to determine such compliance or noncompliance, and to interview any employees or representative of the owner, operator, or permittee. Such right shall be absolute and shall not be conditioned upon any action by the Department, except the presentation of appropriate credentials as requested and compliance with appropriate standard safety procedures. [N.J.A.C. 7:19- 2]
32. This permit may be transferred, with the consent of the Department, but only for the identical use of the waters. [N.J.A.C. 7:19- 2]
33. If the authorized diversion privileges are not currently diverted, subject to contract, or reasonably required for a demonstrated future need, they shall revert back to the State upon renewal or modification of the permit. [N.J.A.C. 7:19- 2]
34. The permittee shall protect each source from vandalism, tampering, and contamination at all times. [N.J.A.C. 7:19- 2]
35. This permit shall expire as indicated on the permit approval cover page. [N.J.A.C. 7:19- 2]

**Administrative Hearing Request Checklist  
And Tracking Form for Permits**

1. Permit Being Appealed:

\_\_\_\_\_

Title and Type of Permit

\_\_\_\_\_

Issuance Date of Permit

\_\_\_\_\_

Permit Number

2. Person Requesting Hearing:

\_\_\_\_\_

Name/Company

\_\_\_\_\_

Name of Attorney (if applicable)

\_\_\_\_\_

Address

\_\_\_\_\_

Address of Attorney

3. The following information must be included with the request:

- a. The date the permittee received the final permit;
- b. A copy of permit with a list of all permit conditions and issues contested;
- c. The legal and factual questions at issue;
- d. A statement as to whether or not the permittee raised each legal and factual issues during the public comment period of the permit;
- e. Suggested revised or alternative permit conditions;
- f. An estimate of the time required for the hearing;
- g. A request, if necessary, for a barrier-free hearing location for physically disabled persons;
- h. A clear indication of any willingness to negotiate a settlement with the Department prior to the Department's processing of the hearing request to the Office of Administrative Law; and
- i. This form, completed with all of the information listed above, signed, and dated, including attachments, to:

- i. Office of Legal Affairs  
ATTENTION: Adjudicatory Hearing Requests  
Department of Environmental Protection  
401 East State Street  
P.O. Box 402  
Trenton, New Jersey 08625-0402

- ii. Terry D. Pilawski, Chief  
Mail Code 401-04Q  
Division of Water Supply & Geoscience  
Bureau of Water Allocation & Well Permitting  
P.O. Box 420  
Trenton, New Jersey 08625

- iii. All co-permittees (w/attachments)

4. Signature: \_\_\_\_\_ Date: \_\_\_\_\_





# State of New Jersey

CHRIS CHRISTIE  
GOVERNOR

KIM GUADAGNO  
LT. GOVERNOR

## DEPARTMENT OF ENVIRONMENTAL PROTECTION

Mail Code 401-04Q  
Division of Water Supply & Geoscience  
New Jersey Geological and Water Survey Element  
Bureau of Water Allocation & Well Permitting  
401 E. State Street - P.O. Box 420  
Trenton, New Jersey 08625-0420  
Tel #: (609) 984-6831 - Fax #: (609) 633-1231  
<http://www.nj.gov/dep/watersupply/>

BOB MARTIN  
COMMISSIONER

May 25, 2017

Ridgewood Water Dept  
131 North Maple Avenue  
Ridgewood, NJ 07451  
Attn: Richard Calbi



Dear Mr. Calbi:

Re: **Water Allocation Permit – Renewal & Modification**  
**Program Interest ID/ Permit No. 5014X/5016**  
**Activity No. WAP160005**

Enclosed is a permit issued pursuant to the Water Supply Management Act, N.J.S.A. 58:1A-1 et seq. This permit becomes effective on June 1, 2017 and is to divert water from 5 wells in the following Municipality and County:

MUNICIPALITY	COUNTY
Glen Rock Boro	Bergen

5014X is your Program Interest ID and WAP160005 is your Permit Activity Number, and will appear on all forms and correspondence from the Bureau of Water Allocation & Well Permitting. Reference your Program Interest ID and Activity No. in all correspondence.

Be advised that as you are responsible for complying with the terms and conditions of the enclosed permit you should review them thoroughly. Failure to comply with any or all of the terms and conditions could result in penalties and/or revocation of the permit.

Within 20 calendar days following your receipt of this permit you may submit a request for an adjudicatory hearing to contest the conditions of this permit. Regulations regarding the format and requirements for requesting an adjudicatory hearing may be found in N.J.A.C. 7:19-2.13.

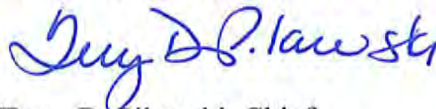


To request a hearing, the permittee must complete the enclosed Tracking Form and supply all the information specified in Part III of the Tracking Form. A copy of the completed, signed and dated Tracking Form, together with all of the information required by Part III of the Tracking Form, including attachments where specified, must be submitted to:

1. Janis Hoagland, Director  
New Jersey Department of Environmental Protection  
Office of Legal Affairs  
P.O. Box 402  
Trenton, New Jersey 08625

2. Terry D. Pilawski, Chief  
New Jersey Department of Environmental Protection  
Mail Code 401-04Q  
Division of Water Supply & Geoscience  
Bureau of Water Allocation & Well Permitting  
P.O. Box 420  
Trenton, New Jersey 08625-0420

Very truly yours,



Terry D. Pilawski, Chief  
Bureau of Water Allocation & Well Permitting

Enclosure

Certified Mail No.: 7016-3010-0001-1450-3631

C: Bureau of Water Allocation & Well Permitting  
Northern Bureau of Water Compliance & Enforcement  
Chelsea Du Brul, BWAWP



State of New Jersey  
 Department of Environmental Protection  
 Bureau of Water Allocation & Well Permitting  
 PO Box 426, Trenton, New Jersey 08625-0426



## Water Allocation Permit

The New Jersey Department of Environmental Protection grants this permit\* in accordance with your application, attachments accompanying same application, and applicable laws and regulations. This permit is also subject to further conditions and stipulations enumerated in the supporting documents.

<b>Program Interest ID/ Permit Number:</b> 5014X/5016 <b>Activity Number:</b> WAP160005	<b>Issuance Date:</b> 05/25/2017	<b>Effective Date:</b> 06/01/2017	<b>Expiration Date:</b> 05/31/2027
--	----------------------------------	-----------------------------------	------------------------------------


<b>Name and Address of Applicant</b> RIDGEWOOD WATER DEPT 131 North Maple Avenue Ridgewood, NJ 07451	<b>Location of Activity/Facility</b> Glen Rock Boro Bergen County	
	<b>Type of Permit</b> Water Allocation Permit - Modification	<b>Statute(s)</b> N.J.S.A. 58:1A-1

**This permit grants permission to divert water from the approved sources in the attached permit inventory, in the following municipalities, for the following water uses:**

<table border="0"> <tr> <td><b>MUNICIPALITY</b></td> <td><b>COUNTY</b></td> </tr> <tr> <td>Glen Rock Boro</td> <td>Bergen</td> </tr> </table>	<b>MUNICIPALITY</b>	<b>COUNTY</b>	Glen Rock Boro	Bergen	<b>Water Uses:</b> Public Community Supply
<b>MUNICIPALITY</b>	<b>COUNTY</b>				
Glen Rock Boro	Bergen				

This permit is subject to the attached Conditions.

Approved by the authority of:  
 Bob Martin, Commissioner  
 Department of Environmental Protection

  
 Terry D. Pilawski, Chief  
 Bureau of Water Allocation & Well Permitting

5/25/17  
 Date

\* Permit means Certification, Approval, Registration, Equivalency, etc.

STAFF REPORT  
MAJOR PERMIT MODIFICATION WITH RENEWAL

In the matter of:  
RIDGEWOOD WATER DEPT  
Water Allocation Permit No. 5014X (5016)

Glen Rock Boro

Bergen

In compliance with the provisions of N.J.S.A. 58:1A-1 et seq., RIDGEWOOD WATER DEPT, 131 North Maple Avenue, Ridgewood, New Jersey, 07451, filed a major modification application with the Department of Environmental Protection on April 1, 2016. The application requests the privilege to divert a maximum of 61.9 million gallons of water during any month (mgm), 540 million gallons of water per year (mgy), at a maximum rate of 1,280 gallons per minute from existing Wells Main, Prospect, Glen Rock, Ackerman, and Leigh; 300 to 303 feet deep completed in the Brunswick aquifer.

While Ridgewood Water Department operates one interconnected system under PWSID# 0251001, the diversion sources are broken down into four separate water allocation permits in accordance with N.J.A.C. 7:19-1.6(f). The requested permit changes, in bold, are as follows:

Permit	Currently Permitted Monthly (mgm)	Currently Permitted Annual (mgy)	Currently Permitted Maximum Diversion Rate (gpm)	Proposed Monthly (mgm)	Proposed Annual (mgy)	Proposed Maximum Diversion Rate (gpm)
5014 (Ridgewood)	170.5	1,572.0	6,095.0	170.5	1,572.0	6,095.0
5015 (Wyckoff)	180.0	1,247.0	5,245.0	180.0	1,247.0	5,245.0
5016 (Glen Rock)	62.5	540.0	1,400.0	<b>61.9</b>	540.0	<b>1,280.0</b>
5017 (Midland Park)	70.0	524.0	1,370.0	70.0	524.0	1,370.0
5014X Overall Limit	403.0	-	-	<b>449.0</b>	-	-

This major modification with renewal request represents a decrease in monthly allocation from 62.5 mgm to 61.9 mgm; a removal of Well Brook (2300004172); a reduction in the maximum diversion rate from 1,400 gpm to 1,280 gpm; and an increase in the overall system wide monthly allocation (encompassing 5014, 5015, 5016, and 5017) from 403 mgm to 449 mgy.

Diversion is for the purpose of Public Community Supply and the entire system serves the following communities: Wyckoff, Midland Park, Ridgewood, and Glen Rock.

Public notice was required due to the requested increase in the overall system-wide monthly allocation.



No requests for a hearing were filed upon the notice published on April 3, 2017 in The Record.

Background/Findings of Fact

1. Water is requested to be diverted under this modification with renewal permit for public water supply from the following sources at the maximum rates specified below:  
Groundwater – Permit 5016

Well Name	Well Permit No.	Pump Capacity (gpm)	Depth (feet)	Aquifer
Main	2300001443	350	302	Brunswick
Prospect	2300001770	400	300	Brunswick
Glen Rock	2300001835	155	300	Brunswick
Ackerman	2300002227	250	303	Brunswick
Leigh	2300004171	125	300	Brunswick

Brook Well 2300004172 was properly decommissioned on March 23, 2015, and is therefore being removed from this permit.

Groundwater – Permits 5014, 5015, 5016, & 5017 (5014X)

Permit No.	Well Name	Well Permit Number	Pump Capacity gpm	Aquifer	Status
5014	E. Saddle River	2300000333	350	Brunswick	Active
5014	Paramus	2300001445	225	Brunswick	Active
5014	Walthery	2300001643	175	Brunswick	Active
5014	Spring	2300001644	300	Brunswick	Active
5014	Andover	2300001771	125	Brunswick	Inactive
5014	Ravine	2300001836	235	Brunswick	Inactive
5014	Salem	2300003902	400	Brunswick	Active
5014	Irving	2300003903	1,010	Brunswick	Active
5014	Stevens	2300004170	225	Brunswick	Active
5014	Twinney	2300004458	850	Brunswick	Active
5014	King	2300004470	125	Brunswick	Inactive
5014	West End	2300005931	275	Brunswick	Active
5014	Carr #1	4300000004	255	Brunswick	Active
5014	Carr #3	4300000006	300	Brunswick	Active
5014	Carr #4	4300000007	130	Brunswick	Active



5014	Carr #6	4300000009	160	Brunswick	Active
5014	Carr #7	4300000010	160	Brunswick	Active
5014	Grove	4300000013	260	Brunswick	Active
5014	East Ridgewood	4300000014	600	Brunswick	Active
5014	Linwood	4300000015	700	Brunswick	Inactive
5014	Farview	4300000029	350	Brunswick	Active
5015	Midland	2300001046	400	Brunswick	Active
5015	Russell	2300001834	180	Brunswick	Active
5015	Meer	2300001837	275	Brunswick	Active
5015	Lafayette	2300002130	375	Brunswick	Active
5015	Franklin	2300002229	300	Brunswick	Active
5015	Van Houten	2300002230	250	Brunswick	Active
5015	Newtown	2300002319	225	Brunswick	Active
5015	Mountain	2300002620	280	Brunswick	Active
5015	Eder	2300002622	440	Brunswick	Active
5015	Lakeview	2300004273	400	Brunswick	Active
5015	Weisch	2300005158	450	Brunswick	Active
5015	Cedar Hill 1	4300000016	150	Brunswick	Active
5015	Cedar Hill 4	4300000019	320	Brunswick	Inactive
5015	Cedar Hill 5	4300000020	225	Brunswick	Active
5015	Cedar Hill 6	4300000021	150	Brunswick	Active
5015	Ames 3	4300000022	300	Brunswick	Active
5015	Ames 5	4300000023	175	Brunswick	Active
5015	Ames 6	4300000024	175	Brunswick	Active
5015	Ames 7	4300000025	175	Brunswick	Active
5016	Main	2300001443	350	Brunswick	Active
5016	Prospect	2300001770	400	Brunswick	Active
5016	Glen Rock	2300001835	155	Brunswick	Active
5016	Akerman	2300002227	250	Brunswick	Active
5016	Leigh	2300004171	125	Brunswick	Inactive
5017	Waldo	2300001047	325	Brunswick	Active
5017	Goffle	2300004169	250	Brunswick	Inactive
5017	College	2300004573	160	Brunswick	Active
5017	Wortendyke 2	4300013004	125	Brunswick	Active
5017	Wortendyke 6	4300013005	130	Brunswick	Active
5017	Wortendyke 7	4300013006	100	Brunswick	Active
5017	Wortendyke 4	4300013007	280	Brunswick	Inactive

2. This application request is for a modification of an allocation granted by the following:

Permit No.	Date Issued	Source of Water	Diversion Amount	
			mgm	mgd
5016	10/28/2005	6 Brunswick wells	62.5	540
5016	12/23/2002	6 Brunswick wells	62.5	540
5016	2/03/1983	6 Brunswick wells	77.8	
1466	2/17/1969	New well	20.08	
1378	4/20/1967	New well		13 mgd
1324	9/15/1966	Four proposed wells	180,000	mgd
1292	2/17/1966	Four proposed wells	10	mgd
1193	9/17/1964	Two proposed wells	9.2	mgm
879	11/10/1956	10 wells	8.5	mgd
851	5/12/1955	Two proposed wells	1	mgm
807	7/19/1954	2 wells	6	mgd
702	2/20/1950	Two proposed wells	5	mgd
561	5/04/1942	Groundwater wells	1	mgd
509	4/08/1940	Groundwater wells	0.5	mgd
400	6/08/1932	Groundwater wells	1	mgd
378	6/30/1931	Groundwater wells	1	mgd
172	12/05/1925	8 Groundwater wells	2.5	mgd

3. The following information is available for the applicant's diversion sources:

Well No.:	Main	Prospect	Glen Rock	Ackerman	Leigh
Well Permit No.:	2300001443	2300001770	2300001835	2300002227	2300004171
Date Constructed:	3/9/1955	10/1/1955	3/3/1956	9/30/1957	8/6/1965
Depth (feet):	300	300	300	303	300
Pump Capacity (gpm):	350	400	155	250	125
<u>Static Water Level</u>					
Date (when constructed):	3/9/1955	10/17/1955	3/3/1956	9/30/1957	8/3/1965
Level (feet):	0	9	0	6.5	4.92
Date (recent):	3/2016	10/2015	3/2016	9/2015	8/2015
Level (feet):	75.4	15.4	5.2	14.9	15.2
<u>Well Test Data (from well records)</u>					



Well No.:	Main	Prospect	Glen Rock	Ackerman	Leigh
Test Date:	3/9/1955	10/17/1955	3/3/1956	9/30/1957	8/3/1965
Yield (gpm):	43	400	198	340	151
Drawdown (feet):	200	181	200	129.5	248
Static Level (feet):	0	9	0	6.5	4.92
Pumping Time (hours):	29	96	96	99	72
Specific Capacity: (gpm/ft drawdown)	0.215	2.2	0.99	2.65	0.61

4. The system has the following interconnections with adjacent systems:

Location	Supplier	Receiver	Size (in)	Use
Eastgate Road	0251001 (Ridgewood)	0228001 (Ho-Ho-Kus)	6	emergency
Brookside Avenue	0201001 (Allendale)	0251001 (Ridgewood)	6	emergency
North Maple Avenue at First Street	0228001 (Ho-Ho-Kus)	0251001 (Ridgewood)	6	emergency
Northern Parkway at Franklin Turnpike	0228001 (Ho-Ho-Kus)	0251001 (Ridgewood)	6	emergency
Wyckoff Avenue	0233001 (Mahwah)	0251001 (Ridgewood)	8	emergency
Burritt Place	0251001 (Ridgewood)	0220001 (Suez Franklin Lakes)	6	emergency
Covington Place	0251001 (Ridgewood)	0220001 (Suez Franklin Lakes)	6	emergency
Evergreen Street	0251001 (Ridgewood)	0264001 (Waldwick)	6	emergency
Hemlock Street	0251001 (Ridgewood)	0264001 (Waldwick)	6	emergency
Linwood Avenue	0251001 (Ridgewood)	0238001 (Suez Haworth)	6	emergency
Marr Avenue	1604001 (Hawthorne Boro)	0251001 (Ridgewood)	8	bulk purchase
Franklin Avenue	0220001 (Suez Franklin Lakes)	0251001 (Ridgewood)	6	bulk purchase
Hampshire Road	0220001 (Suez Franklin Lakes)	0251001 (Ridgewood)	6	bulk purchase

5. The applicant has agreements for the sale or purchase of water from the following:

Name of System	Sale or Purchase	Quantity	Date of Contract
Borough of Hawthorne	Purchase	1 MGD (with minimum 30 MGM Between June 1st – September 1 <sup>st</sup> annually)	7/11/2001, annual contract through 2018*
Suez Haworth via the Suez Franklin Lakes interconnection	Purchase	0.55 MGD 17.05 MGM 200.75 MGY	1/1/2007

\*This contract is in for review, but has not yet received approval from the Department. Ridgewood has no contracts for the sale of water.

6. A review of quarterly diversion reports indicates the following water use:

A. Total Water Diverted for 5016 – Glen Rock

Year	Annual Use (mg)	Maximum Monthly Use (mg)(peak month)	Average Monthly Use (mg)	Existing Allocation	
				(mgm)	(mgy)
2016	233.664	29.064 (Jun)	19.472	62.5	540
2015	247.498	34.580 (May)	20.625	62.5	540
2014	248.998	28.710 (Jun)	20.750	62.5	540
2013	309.650	33.320 (Jul)	25.804	62.5	540
2012	270.528	30.200 (Aug)	22.544	62.5	540
2011	316.630	33.740 (Jul)	26.386	62.5	540

B. Total Water Diverted for 5014X (5014, 5015, 5016, & 5017)

Year	Annual Use (mg)	Maximum Monthly Use (mg)(peak month)	Average Monthly Use (mg)	Existing Allocation	
				(mgm)	(mgy)
2016	2584.190	303.710 (Jun)	215.349	403	-
2015	2625.664	326.043 (Aug)	218.805	403	-
2014	2576.331	301.585 (Jul)	214.694	403	-
2013	2603.880	338.450 (Jul)	216.990	403	-
2012	2597.370	331.750 (Jul)	216.448	403	-
2011	2487.420	356.630 (Jul)	207.285	403	-



C. Total Water Purchased from Suez

Year	Annual Use (mg)	Maximum Monthly Use (mg)(peak month)	Average Monthly Use (mg)	Contract Volumes (mgm) (mgy)
2016	315.367	57.996 (Jul)	26.281	17.05 200.75
2015	227.126	49.018 (Aug)	18.927	17.05 200.75
2014	169.491	18.690 (Jul)	14.124	17.05 200.75
2013	168.680	18.910 (Jul)	14.057	17.05 200.75
2012	188.820	33.330 (Jul)	15.735	17.05 200.75
2011	195.723	38.030 (Jul)	16.310	17.05 200.75

Ridgewood consistently takes more water than their contract guarantees; however, the Bureau of Water System Engineering only counts the guaranteed contractual amount in their firm capacity calculations.

D. Total Water Purchased from Hawthorne Borough

Year	Annual Use (mg)	Maximum Monthly Use (mg)(peak month)	Average Monthly Use (mg)	Contract Volumes (mgm) (mgy)
2016	75.330	22.464 (Aug)	6.278	30.0 365.0
2015	71.767	19.011 (Jul)	5.981	30.0 365.0
2014	23.598	12.456 (Aug)	1.967	30.0 365.0
2013	16.120	11.410 (Oct)	1.343	30.0 365.0
2012	32.800	22.060 (Jul)	2.733	30.0 365.0
2011	30.500	21.710 (Jul)	2.542	30.0 365.0

E. Total System Use (Water Diverted + Water Imported – Water Exported)

Year	Annual Use (mg)	Maximum Monthly Use (mg)(peak month)	Average Monthly Use (mg)
2016	2974.887	368.881 (Jun)	247.907
2015	2924.557	391.585 (Aug)	243.713
2014	2769.420	325.865 (Sep)	230.785
2013	2788.680	362.070 (Jul)	232.390
2012	2818.990	387.140 (Jul)	234.916
2011	2713.643	416.370 (Jul)	226.137

7. The population served is approximately 61,700, which represents an average monthly

consumption of 110 gpcd, and a peak monthly consumption of 198 gpcd based upon 2011 and 2015 water use data, with a 94 percent residential use component.

8. The applicant's diversion sources are located with: Planning Area 5, Lower Passaic/Rahway River as designated by the New Jersey State Water Supply Master Plan; the Northeast Drought Region; and the 4, Lower Passaic and Saddle River Watershed Management Area.

9. The sources are located as follows:

Well Name	Well Permit No.	Location
Main	2300001443	DeBoer Dr & Rte 208
Prospect	2300001770	Approximately 400 ft northeast of Prospect St and 980 ft north of Alan Ave
Glen Rock	2300001835	Approximately 600 ft northwest of Doremus Ave and 1,250 ft northeast of Rutland Rd
Ackerman	2300002227	Chadwick Pl & Prospect St
Leigh	2300004171	Approximately 270 ft southeast of the end of Leigh Terrace and 180 northeast of Herold Dr

10. Flow meters for all diversion sources have been calibrated within the past 5 years. The most recent dates of calibration are as follows:

Well Name or Designation	Well Permit No.	Date of Calibration
Main	2300001443	12/19/2012
Prospect	2300001770	12/26/2013
Glen Rock	2300001835	12/21/2012
Ackerman	2300002227	12/19/2012
Leigh	2300004171	*

\*Leigh well is currently out of service and has not been calibrated. This well's totalizing flow meter will have to be calibrated prior to putting the well back into service.

11. The following wells have been decommissioned:

Well Name	Well Permit No.	Previously Permitted	Depth (feet)	Status
Brook	2300004172	5016	300	Decommissioned 3/23/2015
Wycoff	2300002621	5015	300	Decommissioned 6/25/2015
Garden State	2500013251	5015	287	No longer used, not owned by Ridgewood
Cedar Hill 2	4300000017	5015	400	Inactive
Cedar Hill 3	4300000018	5015	500	Inactive
Wyckoff Ave Test	2300002556	NA	303	Unknown
Carr #2	4300000005	5014	250	Inactive
Carr #5	4300000008	5014	218	Inactive
Carr #8	4300000011	5014	175	Inactive
Carr #9	4300000012	5014	175	Inactive
Newtown Rd test	2300002558	NA	303	Inactive
East Side	2300005213	?	400	Inactive

12. The applicant is currently in compliance with their permit.
13. Water, after use, is discharged to the Passaic Valley Sewerage Commission (Glen Rock only) for treatment and discharge to Passaic River under Permit No. NJ0021016. The treatment works are not under a sewer connection ban or other restriction imposed by NJDEP.
14. The system is 99.9 percent metered.
15. The applicant indicated that their unaccounted-for-water is 13.5 percent (2016).
16. The water system has storage capacity of 14.1 MG, as compared with a 2015 average water demand of 8.01 MGD.
17. The applicant submitted a Water Conservation Plan on March 30, 2016.
18. Subsurface diversions in the same aquifer within the radius of influence include the following:

Owner	Name	Total Depth (ft)
Hohokus Water Dept	Well 4	301



Hawthorne Borough	Utter Ave Well	300
Hawthorne Borough	Goffle Rd Well 6	485
Hawthorne Borough	Goffle Rd Well 5	300
Fair Lawn Water Dept	Well 10	300
Waldwick Borough	Well 5	300
Hawthorne Borough	Goffle Rd Well 1	293
Hawthorne Borough	Goffle Hill Well	350
Hawthorne Borough	Goffle Rd Well 4	315
Hohokus Water Dept	Well 6	300
Waldwick Borough	Well 4	600
Fair Lawn Water Dept	Well 14	400
Hohokus Water Dept	Well 1	412
Hawthorne Borough	Goffle Rd Well 3	300
Fair Lawn Water Dept	Well 2	300
Hohokus Water Dept	Well 5	300
Fair Lawn Water Dept	Well 7	458
Fair Lawn Water Dept	Well 8	430
Hawthorne Borough	First Ave Well	400
Hawthorne Borough	Grand Ave Well (Borough Hall)	300
Bogerts Ranch Estates Inc	Well A	265
Fair Lawn Water Dept	Well 17	350
Bogerts Ranch Estates Inc	Well B	245
Hawthorne Borough	Rea Ave Well	400
Fair Lawn Water Dept	Well 15	402
Fair Lawn Water Dept	Well 16	413
Fair Lawn Water Dept	Well 19	400
Fair Lawn Water Dept	Well 9	404
Waldwick Borough	Well 7	300
Waldwick Borough	Well 6	300
Hawthorne Borough	Bamford Ave Well (High School)	300
Waldwick Borough	Well 2	256
Fair Lawn Water Dept	Well 28	370
Bogerts Ranch Estates Inc	Well B	245
Bogerts Ranch Estates Inc	Well A	265
Mondelez Global	Well 1	301
Fischer Scientific Chemical	PW-2	335
Fischer Scientific Chemical	PW-4	400
Fischer Scientific Chemical	PW-5	350

19. According to the applicant, there are approximately 131 domestic wells within a ¼-mile of the 1-foot drawdown zone of influence including the following:



Permit	Date	Address	Borough	Distance	Depth
2300001148	2/11/1955	313 Grayden Trail	Ridgewood Village	414	103
E201015895	12/20/2010	547 Eder Ave	Wyckoff Twp	628	400
2300000008	12/15/1947	Eder Ave	Wyckoff Twp	777	84
2300000801	3/7/1953	Eder Ave	Wyckoff Twp	777	87
2300001525	4/12/1955	Fair View Ave	Wyckoff Twp	777	125
2300001767	9/8/1956	308 W. Stevens Ave	Wyckoff Twp	804	125
2300004733	11/1/1966	25 Neelen Dr	Wyckoff Twp	804	135
2300004823	11/1/1966	25 Neelen Dr	Wyckoff Twp	804	125
2300006388	11/30/1977	257 Demarest Ave	Wyckoff Twp	822	125
2300002997	10/21/1960	Miller Road	Wyckoff Twp	838	80
2300004822	10/18/1966	Edar Ave	Wyckoff Twp	838	165
2300002383	4/1/1958	Packard Avenue	Wyckoff Twp	874	98
2300003155	7/5/1961	Vance Avenue	Wyckoff Twp	917	170
2300003313	1/19/1962	679 Vance Ave	Franklin Lakes Boro	917	160
2300003522	11/14/1962	510 Vance Avenue	Wyckoff Twp	917	150
2300004029	10/6/1964	Vance Ave	Wyckoff Twp	917	145
2300001320	3/4/1949	N Maple Ave	Ridgewood Village	930	260
2300000407	5/5/1951	80 Harristown Rd.	Fair Lawn Boro	1012	200
2300001056	2/11/1955	313 Grayden Trail	Ridgewood Village	1154	103
2300001155	8/12/1955	Brookmere Court	Ridgewood Village	1292	102
2300001219	8/21/1955	Brookmere Court	Ridgewood Village	1292	197
2300001639	7/10/1956	Brookmere Ct	Ridgewood Village	1292	110
2300002074	12/7/1957	Maple & Waldron Aves	Glen Rock Boro	1304	110
2300000024	3/6/1948	Van Schalk Lane	Wyckoff Twp	?	105
2300000025	2/6/1948	unknown	Wyckoff Twp	?	110
2300000056	6/2/1948	Eder Ave	Wyckoff Twp	?	135
2300000068	11/18/1948	Russell Ave	Wyckoff Twp	?	110
2300000138	3/8/1949	unknown	Ridgewood Village	?	500
2300000216	11/23/1949	unknown	Wyckoff Twp	?	110
2300000232	6/6/1950	143 Elmwood Pl	Wyckoff Twp	?	110
2300000283	9/1/1951	Highview Dr & Smith Pl	Wyckoff Twp	?	132
2300000410	2/28/2007	115 Petersburg Road	Independence Twp	?	300
2300000466	9/20/1951	Cottage Place	Ridgewood Village	?	178
2300000565	9/12/1952	unknown	Saddle River Boro	?	80
2300000596	7/14/1952	Greenwood Ave	Midland Park Boro	?	142
2300000859	7/30/1953	Sicamac Rd & Russell Ave	Wyckoff Twp	?	120
2300000875	6/18/1953	unknown	Ridgewood Village	?	125
2300000986	11/5/1953	unknown	Ridgewood Village	?	150
2300001055	2/5/1954	unknown	Ridgewood Village	?	125
2300001068	3/8/1954	Roger Ct	Mahwah Twp	?	125
2300001177	6/15/1954	unknown	Ridgewood Village	?	100
2300001196	7/7/1954	unknown	Ridgewood Village	?	150



2300001234	9/14/1954	unknown	Ridgewood Village	?	100
2300001240	9/14/1954	unknown	Midland Park Boro	?	150
2300001317	9/29/1955	474 Colonial Road	Ridgewood Village	?	111
2300001328	2/10/1955	Hillcrest Ave.	Hawthorne Boro	?	260
2300001337	10/26/1954	150 Revine Ave.	Wyckoff Twp	?	145
2300001345	2/6/1948	unknown	Wyckoff Twp	?	115
2300001458	12/5/1955	Russel Ave	Wyckoff Twp	?	83
2300001496	6/27/1955	Maple Ave	Glen Rock Boro	?	80
2300001512	4/25/1955	unknown	Ridgewood Village	?	100
2300001539	4/26/1955	unknown	Ridgewood Village	?	100
2300001542	6/21/1955	unknown	Ridgewood Village	?	120
2300001543	5/11/1955	461 George St	Ridgewood Village	?	80
2300001585	6/1/1955	unknown	Glen Rock Boro	?	100
2300001622	7/13/1955	unknown	Upper Saddle River	?	125
2300001690	12/15/1955	unknown	Ridgewood Village	?	100
2300001704	5/1/1956	Mabel Pl	Franklin Lakes Boro	?	190
2300001766	8/20/1956	Boorhis Ave	Wyckoff Twp	?	141
2300001791	6/1/1956	Farview Ave.	Wyckoff Twp	?	122
2300001821	6/1/1956	Fairview Ave.	Wyckoff Twp	?	102
2300001828	2/28/1956	unknown	Ridgewood Village	?	100
2300001886	5/15/1956	346 Graden Terrace	Ridgewood Village	?	112
2300001887	5/11/1956	unknown	Fair Lawn Boro	?	300
2300001919	3/26/1956	unknown	Wyckoff Twp	?	100
2300001925	4/3/1956	unknown	Ridgewood Village	?	100
2300001938	6/1/1956	587 Farview Ave	Wyckoff Twp	?	126
2300001954	5/22/1956	unknown	Glen Rock Boro	?	100
2300001955	5/22/1956	unknown	Ridgewood Village	?	100
2300001991	7/1/1956	Eder Ave	Wyckoff Twp	?	102
2300002004	8/31/1956	Eder Ave	Wyckoff Twp	?	90
2300002278	3/21/1958	unknown	Wyckoff Twp	?	125
2300002367	5/20/1958	Carriage Ln	Wyckoff Twp	?	125
2300002462	7/28/1958	unknown	Wyckoff Twp	?	100
2300002465	6/4/1958	Eder Ave	Wyckoff Twp	?	135
2300002525	10/2/1958	Sicome Ave.	Wyckoff Twp	?	158
2300002555	11/26/1958	618 Mountain Ave	Wyckoff Twp	?	90
2300002604	3/21/1959	314 George Street	Franklin Lakes Boro	?	248
2300002608	5/8/1959	583 Fairview Avenue	Wyckoff Twp	?	105
2300002633	4/10/1959	unknown	Ridgewood Village	?	150
2300002907	11/7/1960	unknown	Wyckoff Twp	?	150
2300003025	11/3/1960	Van Schant Lane	Wyckoff Twp	?	150
2300003173	8/8/1961	Grankview Terrace	Franklin Lakes Boro	?	29
2300003677	3/11/1964	26 Myrtle Ave	Midland Park Boro	?	91
2300003682	4/22/1963	174 Packard Ave	Wyckoff Twp	?	110

2300003687	4/19/1963	unknown	Wyckoff Twp	?	100
2300004061	10/23/1964	Vance Ave	Wyckoff Twp	?	135
2300004147	12/16/1992	12-31 Route 208	Fair Lawn Boro	?	
2300004240	7/12/1965	560 Eder Ave	Wyckoff Twp	?	105
2300004258	6/29/1965	unknown	Ridgewood Village	?	75
2300004337	7/8/1966	unknown	Hawthorne Boro	?	
2300004598	4/1/1966	unknown	Ridgewood Village	?	100
2300004715	6/28/1966	unknown	Fair Lawn Boro	?	100
2300004809	7/3/1967	unknown	Wayne Twp	?	125
2300005067	9/21/1967	unknown	Ridgewood Village	?	100
2300005313	11/10/1968	Peach Tree Lane	Franklin Lakes Boro	?	300
2300005702	2/26/1965	unknown	Fair Lawn Boro	?	300
2300005738	4/11/1972	102 High Mt. Road	Franklin Lakes Boro	?	148
2300006077	8/11/1965	unknown	Washington Twp	?	150
2300006422	10/25/1974	unknown	Midland Park Boro	?	125
2300006619	2/26/1979	552 Franklin Lakes Rd	Franklin Lakes Boro	?	410
2300007288	11/18/1982	765 Ewing Avenue	Franklin Lakes Boro	?	285
2300007484	12/5/1983	unknown	Wyckoff Twp	?	150
2300007528	9/22/1977	unknown	Franklin Lakes Boro	?	200
2300007885	7/18/1985	unknown	Fair Lawn Boro	?	200
2300008134	12/5/1985	658 Ewing Ave	Franklin Lakes Boro	?	205
2300010069	3/12/1990	105 Sicomac Road	North Haledon Boro	?	410
2300012740	6/7/1994	24 Van Schaik Lane	Wyckoff Twp	?	200
2300012843	1/31/1995	706 Saber Drive	Franklin Lakes Boro	?	310
2300013283	3/14/1995	3 Serafin Place	Glen Rock Boro	?	200
2300018566	11/4/2004	15 Brookside Ave.	Ridgewood Village	?	200
unknown	4/25/2006	529 Helena Avenue	Wyckoff Twp	?	160
2400045545	5/22/2007	115 Petersburg Road	Independence Twp	?	220
2500014864	4/2/1963	unknown	Midland Park Boro	?	100
unknown	8/28/1991	271 Godwin Ave.	Wyckoff Twp	?	
unknown	7/10/1997	880 S Maple Ave	Glen Rock Boro	?	
unknown	4/21/1997	73 Parker Ave	Hawthorne Boro	?	
unknown	4/17/1995	3 Serafin Place	Glen Rock Boro	?	245
unknown	7/31/1995	442 Wyckoff Ave	Wyckoff Twp	?	
unknown	5/14/1993	376 Sunset Blvd	Wyckoff Twp	?	
unknown	12/15/1993	75 Saxonia Ave	Wyckoff Twp	?	
unknown	10/10/1955	unknown	Wyckoff Twp	?	125
unknown	6/23/2003	170 Packard Ave	Wyckoff Twp	?	
unknown	9/30/1983	unknown	North Haledon Boro	?	200
unknown	11/6/2002	2 Elmwood Place	Wyckoff Twp	?	
unknown	9/9/1994	24 Van Schaik Lane	Wyckoff Twp	?	165
unknown	5/10/1995	224 S. Irving Street	Ridgewood Village	?	
unknown	7/20/2011	315 Libby Avenue	Ridgewood Village	?	



unknown	5/3/1965	unknown	Ridgewood Village	?	125
unknown	3/3/2003	54 North Pleasant Ave.	Ridgewood Village	?	
unknown	5/3/1965	unknown	Ridgewood Village	?	125

20. Public water supply wells regulated by the Water Allocation Permit program, within a 5-mile radius include the following:

Well Owner	No. Of Wells	Depth (feet)	Aquifer	Capacity (gpm)	Distance (feet)
Mahwah Township	3	85	Brunswick & Stratified Drift	150-700	6,358 - 26,060
Oakland Borough	7	83-130	Stratified Drift	200-1300	14,733 – 20,562
Suez Franklin Lakes	6	56-138	Brunswick & Stratified Drift	250-750	6,354 – 11,121
Hawthorne Borough	22	285-485	Brunswick	125-600	3,229 – 6,656
Fair Lawn Water Department	16	300-458	Brunswick	70-275	4,083 – 11,770
Garfield Water Department	11	307-415	Brunswick	100-550	15,985 – 16,624
Ho-Ho-Kus Borough DPW	5	300-412	Brunswick	250-350	2,126 – 4,184
Waldwick Borough	6	256-300	Brunswick	200-700	2,271 – 8,362
Allendale Water Department	5	115-550	Brunswick	120-250	6,108 - 13,224
Park Ridge Borough	18	36-665	Brunswick & Stratified Drift	105 - 600	12,169 – 25,807
Suez - Haworth	2	428-451	Brunswick	150 - 550	18,539 - 23,779

21. According to the DEP-GIS-Geoweb 2012 Contaminated Sites list, and OPRA On-line Report web page information, potential pollution sites within twice the radius of influence, up to one mile, of the diversion include:

Name	Address	Distance to RW Well (ft)
GODWIN AVE NJ 0247	119 Godwin Ave, Midland Park	612
DELTA	102 Godwin Ave, Midland Park	770
MIDLAND PARK DPW/FIRE	45 Witte Dr., Midland Park	179
HOME FUEL OIL CO INC	471 Doremus Ave, Glen Rock	1,177
RICHTERS SERVICE STATION INC	209 S Maple Ave, Ridgewood	1,938
CITGO SERVICE CENTER	22-32 Maple Ave, Fair Lawn	1,732
ITT MARLOW	445 Godwin Ave, Midland Park	422



HASCO SITE #1	585 Goffle Rd, Wyckoff	1,445
132 FRANKLIN AVENUE	132 Franklin Ave, Ridgewood	2,502
TOWN GARAGE FORMER	120 Franklin Ave, Ridgewood	2,487
THE CORNER GARAGE	24 Franklin Ave, Ridgewood	2,841
TOSCANO & TACCETTA REALTY	464 Broad St, Glen Rock	1,570
TRIANGLE TIGER LLC SERVICE ST	10 Godwin Ave, Ridgewood	3,322
CARVIC CORP	122 Greenwood Ave, Midland Park	976
46 CHESTNUT STREET	46 Chestnut St, Ridgewood	3,003
BUDGET RENT A CAR	103 Franklin Ave, Ridgewood	3,488
NJMVC INSPECTION STATION	156 Chestnut St, Ridgewood	3,272
BROGAN CADILLAC INC	100 South Broad St, Ridgewood	3,354
SON SIX INC	31 N Broad St, Ridgewood	3,413

22. The applicant has the following wells, included in the increase in the system-wide overall monthly allocation, that are in wetlands or transition area per N.J.A.C. 7:19-2.2(f)6: Glen Rock, Ackerman, Grove, West End, Spring, Irving, Linwood, Kings, Carr Well 8, Mountain, Midland, Van Houten, Lakeview, Ames Well 3, Ames Well 5, Ames Well 6, and Ames Well 7. The following wells are located in wetlands or transition area per N.J.A.C. 7:19-2.2(f)6, but are not going to be included in the increase in the system-wide overall monthly allocation: Leigh, Paramus, East Saddle River, and Twinney.
23. The estimated consumptive use of water is 100 percent, which is equivalent to 8.01 mgd.

#### Staff Analysis and Conclusions

1. The applicant's consultant conducted two separate modelling scenarios, Simulation 1 and Simulation 2. Both simulations analyzed the projected drawdown from the 46 mgm increase distributed evenly over all of the wells, excluding the 9 wells in the Saddle River sub-basin (Salem, East Saddle River, Twinney, Walthery, Paramus, East Ridgewood, Stevens, Leigh, and Prospect). Simulation 1 analyzed the increase evenly over the entire year, while Simulation 2 accounted for the increase occurring only during the four-month summer peak. Since Simulation 2 is considered a better representation of the effects of the additional pumping, the applicant based their impact analyses on Simulation 2. The results of the modeling analysis indicated that the maximum amount of additional drawdown that would occur under steady state conditions is just over three feet near the Ho-Ho-Kus brook, near the Irving supply well. The one-foot drawdown contour extends over the majority of the service area and up to one mile beyond the service area boundary.

Table 1 – Calculation of the volumetric aquifer depletion indicated by Simulation 1 (LBG figure 11) and Simulation 2 (LBG figure 12). Areas estimated using ARCGIS tools on geo-registered images of figures 11 and 12 of the hydrogeologic report (LBG, 2016). Storage coefficient of 0.2 is the value quoted on page 6 of the hydrogeologic report and found in the model files submitted with the application package.

<b>Simulation 1</b>						
<b>drawdown contour (ft)</b>	<b>AREA (acres)</b>	<b>AREA (ft<sup>2</sup>)</b>	<b>AREA (mi<sup>2</sup>)</b>	<b>polygon height (ft)</b>	<b>polygon volume (ft<sup>3</sup>)</b>	<b>groundwater volume (MG)</b>
0.5	19,076.35	830,965,780	29.81	0.50	415,482,890	621.6
1	11,124.65	484,589,883	17.38	0.50	242,294,942	362.5
2	1,376.24	59,948,970	2.15	1.00	59,948,970	89.7
3	98.89	4,307,743	0.15	1.00	4,307,743	6.4
<b>Storage Coef: 0.2</b>				<b>Σ</b>	<b>722,034,545</b>	<b>1,080</b>
<b>Simulation 2</b>						
<b>drawdown contour (ft)</b>	<b>AREA (acres)</b>	<b>AREA (ft<sup>2</sup>)</b>	<b>AREA (mi<sup>2</sup>)</b>	<b>polygon height (ft)</b>	<b>polygon volume (ft<sup>3</sup>)</b>	<b>groundwater volume (MG)</b>
0.5	5,305.93	231,126,368	8.29	0.50	115,563,184	172.9
1	96.01	4,182,055	0.15	0.50	2,091,028	3.1
<b>Storage Coef: 0.2</b>				<b>Σ</b>	<b>117,654,211</b>	<b>176.0</b>

Based upon the modeling in Simulations 1 & 2, the New Jersey Geologic and Water Survey created the following three figures, shown below, to demonstrate the projected drawdown.



Figure 1. Drawdown increase projected by BWR&G for 31-day period in comparison with LBG Simulation 1, 0.5-foot drawdown contour. BWR&G impact areas shown in shaded areas: yellow indicates drawdown increase >0.5 ft and brown indicates drawdown increase greater than 1 ft. The LBG 0.5 ft contour (purple dashed line) was digitized from a geo-registered image of figure 11 from the hydrogeologic report. Saddle River basin above the confluence with Hohokus Brook shown in cross-hatch pattern and purple triangles indicate surface water intakes. Base map includes DEP coverages of 1:100,000 bedrock geology, municipal boundaries, and 2002 hydrography.



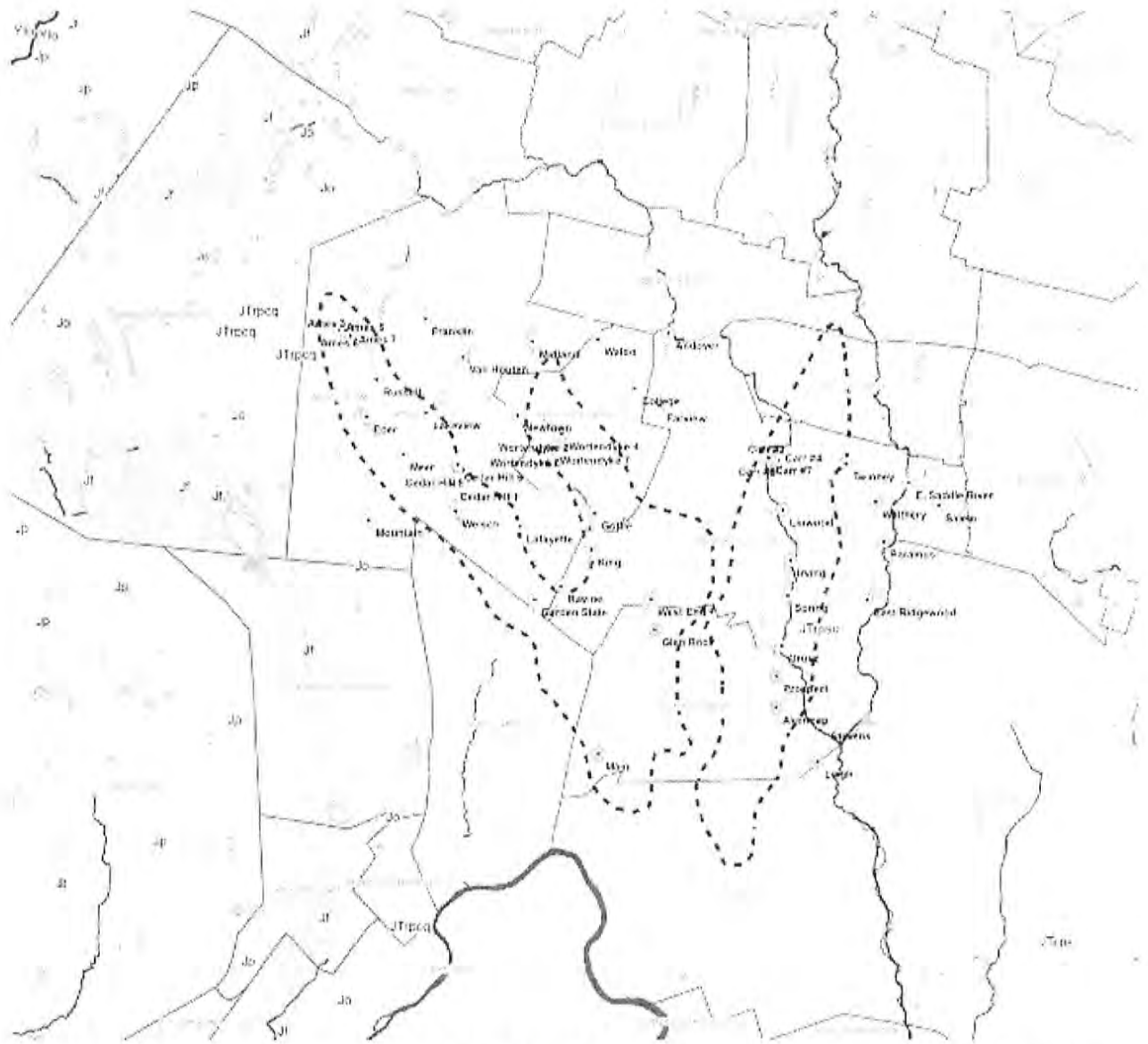


Figure 2. Drawdown increase projected by BWR&G for 31-day period in comparison with LBG Simulation 2, 0.5-foot drawdown contour. BWR&G impact areas shown in shaded areas: yellow indicates drawdown increase >0.5 ft and brown indicates drawdown increase greater than 1 ft. The LBG 0.5 ft contours (purple dashed lines) were digitized from a geo-registered image of figure 12 from the hydrogeologic report. Saddle River basin above the confluence with Hohokus Brook shown in cross-hatch pattern and purple triangles indicate surface water intakes. Base map includes DEP coverages of 1:100,000 bedrock geology, municipal boundaries, and 2002 hydrography.





Figure 3. Recapitulation of BWR&G impact analysis using a storage coefficient of 0.02 and Tx/Ty ratio of 10:1. The impact areas shown in shaded areas: yellow indicates drawdown increase >0.5 ft and brown indicates drawdown increase greater than 1 ft. The Saddle River basin above the confluence with Hohokus Brook is shown in cross-hatch pattern and purple triangles indicate surface water intakes. Base map includes DEP coverages of 1:100,000 bedrock geology, municipal boundaries, and 2002 hydrography.

Also, according to the NJGWS, the use of Prospect well should have no impact on the Saddle River HUCs contributing flow to the Suez intake. Therefore, the Prospect well should not be excluded from the system-wide cross permit limit increase.

2. The applicant's proposed water use is reasonable.
3. The demands submitted with the application are system-wide demands, because Ridgewood's four permits, 5014, 5015, 5016, and 5017 are all operated as one interconnected system. Per the applicant, the division of the Village's interconnected water supply system into four permits along municipal boundaries is artificial and

arbitrary, because the location of the individual wells has little bearing on where the pumped water is actually consumed. However, pursuant to N.J.A.C. 7:19-1.4(f), four permits are required due to the location of the sources. Because of the interconnected nature of the system, it is most appropriate to consider the system as a single entity for water supply purposes. However, because the maximum monthly diversion from the wells in permit (5016) in the last five years was 34.580 mgm (5/2015), it seems appropriate to reduce the monthly allocation of this permit from 62.5 mgm to 61.9 mgm, as requested. Also, since the maximum annual diversion in the last five years was 316.630 mgy (2011), it seems appropriate to renew the existing annual allocation of 540 mgy.

4. System-wide demand projections for the system provided by the applicant indicate that their ten-year demands will be 439 mgm, and 2,922 mgy. According to the applicant, the Ridgewood service area experienced a 0.5% annual population growth from 2013 to 2016, which was used to estimate future growth. According to the Bureau of Water System Engineering's Surplus/Deficit table, Ridgewood Water has committed peak demands of 394.5 mgm and 2,973.323 mgy. In addition, according to the applicant, Ridgewood has exceeded their current cross permit limit of 403 mgm on several occasions, July 1993, and July and August 1998, and July 1999. In addition, Ridgewood has been consistently purchasing water in excess of their contract amounts from Suez NJ; in 2015, Ridgewood purchased greater than 17 mgm during 6 months of the year. Analysis of this in conjunction with historical use and supporting documentation provided with the application shows that an overall system-wide allocation of 449 mgm, should be sufficient to meet their needs.

The system-wide allocation limit condition should read consistently in all four permits (Permit Nos. 5014, 5015, 5016, and 5017) as follows: "The total diversion for the entire system, including permit Nos. 5014, 5015, 5016, and 5017, shall not exceed 449 mgm."

5. Public community water supply systems are in the public interest because they are generally safer and more reliable than individual domestic wells that are not subject to the same testing, monitoring and standards as a public community supply well. Historically, the Department has viewed local governmental approval of a project as signifying that it is in the public interest. Once all necessary local approvals are granted, the proposed diversion will be considered to be in the public interest in accordance with N.J.A.C. 7:19-2.2(f)1.
6. Natural replenishment of groundwater is probably occurring because the observed fluctuations do not follow a continual decreasing trend.

Therefore, approval of this application at the recommended rates is in accordance with N.J.A.C. 7:19-2.2(f)2.

7. According to the applicant's consultant there are 33 permitted groundwater users located within the full area of influence (Simulation 1) of the proposed increase. However, only three permitted groundwater users are located within the estimated area of influence of

the proposed increase which is more reflective of seasonal demands (Simulation 2). Under simulation 2, the most affected wells are the Borough of Ho-Ho-Kus's Well 4, where the maximum drawdown is projected to be 0.6 to 1.9 gpm/ft, the maximum impact is expected to be 1 to 3.4 gpm, which is within the range of normal fluctuation for this well. The other wells that would be most affected are the Borough of Hawthorne's Utter Avenue and Goffle Road Well 6 wells, where the maximum drawdown is 0.5 to 1.6 ft. According to the applicant's consultant, based on the minimal impact to the three permitted groundwater users affected by the proposed discharge, it is concluded that the proposed increase will not have a significant impact on the ability of these sources to continue operating as permitted.

There are 131 small capacity private wells located within a mile of the proposed diversion. According to the applicant, review of the well records indicates that the wells are installed to an average depth of 150 feet with an estimated average available drawdown within each well of over 100 feet. Therefore, concluding that the additional one-foot of drawdown would not be likely to have any operational impact on the water availability.

The Bureau agrees that the wells identified as being within the radius of influence should have sufficient water above their pumps under normal conditions so that interference experienced should not adversely impact their ability to pump their allocations.

Therefore, approval of this application at the recommended rates is in accordance with N.J.A.C. 7:19-2.2(f)2.

8. After discussions with the Bureau regarding concerns with potential impacts to the Saddle River, upstream of the Suez New Jersey's intake and the ability for Suez to meet their passing flow (13.9 cfs at USGS Gage #01391102), the applicant is requesting the increase in the system-wide allocation from all wells, except those in the Saddle River basin. The following wells are located within, or in the case of the Leigh and Stevens wells, close enough to cause impact to the Saddle River basin: Twinney, East Saddle River, Waltherly, Salem, Paramus, East Ridgewood, Stevens, and Leigh. According to the applicant's consultant, the Saddle River basin tapped by the Suez intake extends upstream from the intake and into neighboring New York State. Only a small portion of the drainage area lies within the Ridgewood service area.

Therefore, limits should be added to wells Twinney, East Saddle River, Waltherly, Salem, Paramus, East Ridgewood, and Stevens (permit 5014) as well as the Leigh well (5016), to ensure that they are not being used at a rate greater than they had previously been used. The limit for wells Twinney, East Saddle River, Waltherly, Salem, Paramus, East Ridgewood, and Stevens is discussed in permit 5014. The peak usage for the Leigh well was in 2007, 3.1 mgm. With the addition of a 15 percent cushion, a limit of 3.6 mgm should be established for the Leigh well.

Because, the increase being proposed by Ridgewood in this application was designed to specifically exclude any new diversion from those Ridgewood wells along the Saddle

River sub-basin in order to reduce the potential impacts on this intake, the proposed diversion is just and equitable to the other Saddle River basin water users as it does not adversely affect other existing withdrawals, in accordance with N.J.A.C. 7:19-2.2(f)3.

In addition, according to the applicant, due to the indirect connection between the bedrock aquifer and the overlying surface water, the impacts of up to 0.5 to 1 foot of drawdown beneath these areas are not considered likely to have a significant negative impact. The Bureau agrees, that due to the relatively modest increase, spread out over a large area, that potential impacts will be minimal.

Therefore, approval of this application at the recommended rates is in accordance with N.J.A.C. 7:19-2.2(f)3.

9. Analysis of the applicant's chloride data indicates that chloride concentrations ranged from 66.6 to 104 mg/l in 2015. The elevated chloride concentrations in the Ridgewood Water wells are likely not a result of regional saltwater intrusion, since elevated chloride concentrations are not a consideration in the Brunswick aquifer at this location. It is more likely that the elevated concentrations are from road salt. Because the chloride concentrations are not a result of regional saltwater intrusion, the conditions requiring chloride monitoring should be removed from this permit.

Therefore, approval of this application at the recommended rates is in accordance with N.J.A.C. 7:19-2.2(f)4.

10. Based upon the information provided by the applicant, the diversion is not expected to contribute to the spread of groundwater pollution. According to the applicant's consultant, the diversion is not expected to contribute to the spread of groundwater pollution because 0.7 feet of modeled drawdown would occur in the bedrock, not in the overburden, where most of the hydrocarbon contamination sites are involved. The applicant's consultant stated that while several sites involve chlorinated organic contaminants that have entered the bedrock, the minimal amount of potential incremental drawdown which could occur at these sites due to the increased pumping are unlikely to affect the extent of remediation at these sites. The Bureau agrees that the increased pumping is relatively minimal and widely spread out across four towns and approximately five square miles, that it is unlikely to affect any remediation activities.

Therefore, the proposed diversion will not spread groundwater contamination nor interfere with any groundwater remediation in accordance with N.J.A.C. 7:19-2.2(f)4.

11. The Bureau of Freshwater Wetlands has been notified of the proposed diversion since the new diversion source is located in a freshwater wetlands or transition area.
12. The proposed diversion is located within Planning Area 5, Lower Passaic/Rahway River of the New Jersey Statewide Water Supply Plan, August 1996 (NJSWSP). According to the NJSWSP, while Area 5 is technically in a deficit, the deficit is easily satisfied by interbasin transfers from Upper Passaic and Raritan basins. Because Ridgewood Water is



going to be operating their system in the same manner as they have been for the last 30 years, this application is in accordance with N.J.A.C. 7:19-2.2(h).

13. The applicant has an approved alternate source of water from Suez New Jersey through a purchase contract and has an unapproved alternate source of water from Hawthorne Borough through a purchase contract (this contract has not received approval from the Bureau).

### Summary

The Department has completed its review of this application pursuant to N.J.A.C. 7:19-1 et. seq. The review of this application reveals that it does not have any adverse impacts and meets, based upon the information certified to in the application, the statutory requirements of N.J.S.A. 58:1A-1 et. seq.

Therefore, based upon a review of the information submitted with the application, existing water allocation files, and the attached New Jersey Geological and Water Survey review of the application, the following conclusions have been reached regarding this application:

- The monthly allocation of 62.5 mgm should be reduced to 61.9 mgm, as requested.
- The annual allocation of 540 mgy should be renewed.
- The maximum diversion rate of 1,400 gpm should be reduced to 1,280 gpm to match the pumping capacity of the sources combined on this permit, as requested.
- Brook Well 2300004172 should be removed from this permit.
- The overall system-wide monthly allocation for permits 5014, 5015, 5016, and 5017 should be increased from 403 mgm to 449 mgm, as requested, and a condition should be placed in all four permits as follows: "The total diversion for the entire system, including permit Nos. 5014, 5015, 5016, and 5017, shall not exceed 449 mgm."
- A limit of 3.6 mgm should be established for the Leigh well.
- The chloride monitoring requirements should be removed from this permit.
- The totalizing flow meter for Leigh well should be calibrated prior to placing the source back into operation.

Therefore, this application should be approved in accordance with the following recommendations as the applicant has satisfied the requirements of N.J.A.C. 7:19-2.2 et seq.

### References

In addition to the historical information on file at the Bureau of Water Allocation & Well Permitting and the application submitted, the following information sources were also utilized to establish the recommendations contained within this Staff Report:

August 1996. Water for the 21<sup>st</sup> Century: Vital Resource, New Jersey Statewide Water Supply Plan. New Jersey Department of Environmental Protection – Office of Environmental Planning, Trenton, New Jersey.

Recommendations

Issuance of the modification with renewal permit is recommended with an expiration date of 10 years from the effective date and is subject to the attached Permit Requirements:

*Handwritten initials and date:* JGG 5/5/17 5/17

Date: 5/5/17



Chelsea Du Brul, Environmental Specialist 3  
Division of Water Supply & Geoscience

**RIDGEWOOD WATER DEPT  
5014X**

**Water Allocation Permit : WAP160005**

**Permit Inventory**

**Water Diversion Sources** - Water may be diverted under this permit from the following sources:

Source Designation (Well Permit No. or Intake No.)	Description	Subject Item ID
2300001443	MAIN	WSWL0000064281
2300001770	PROSPECT	WSWL0000064287
2300001835	GLEN ROCK	WSWL0000064291
2300002227	AKERMAN	WSWL0000064305
2300004171	LEIGH	WSWL0000064357

**Group Subject Items** - The following items are grouped sources for the purpose of setting permit requirements outlined in this document:

Group Designation	Group Description	Group Subject Item ID	Group Members
RIDGEWOOD WATER DEPT	5016 WA PERMIT - ALL DIVERSION SOURCES	WSWA0000075721	PASSAIC AQUIFER SOURCES, WELLS MAIN, PROSPECT, GLEN ROCK, LEIGH, & ACKERMAN (WARG806865)
PASSAIC AQUIFER SOURCES	WELLS MAIN, PROSPECT, GLEN ROCK, LEIGH, & ACKERMAN	WARG0000806865	2300001443, MAIN (WSWL064281)
			2300001770, PROSPECT (WSWL064287)
			2300001835, GLEN ROCK (WSWL064291)
			2300002227, AKERMAN (WSWL064305)
			2300004171, LEIGH (WSWL064357)



**RIDGEWOOD WATER DEPT  
5014X**

Water Allocation Permit : WAP160005

**Permit Requirements**

**Limit Requirements**

The following limits apply and are the maximum permitted allocation:

**Final Permit Phase from 06/01/2017 -**

Subject Item	Parameter	Limit
RIDGEWOOD WATER DEPT, 5016 WA PERMIT - ALL DIVERSION SOURCES (WSWA75721)	Maximum Diversion Rate	<= 1280 Gallons Per Minute. [N.J.A.C. 7:19- 2]
	Water Diverted	<= 61.9 Million Gallons Per Month. [N.J.A.C. 7:19- 2]
		<= 540 Million Gallons Per Year. [N.J.A.C. 7:19- 2]
2300004171, LEIGH (WSWL64357)	Water Diverted	<= 3.6 Million Gallons Per Month. [N.J.A.C. 7:19- 2]

**Other Limit Requirements**

**Final Permit Phase from 06/01/2017 -**

Subject Item	Parameter	Limit
2300001443, MAIN (WSWL64281)	Rated Pump Capacity	<= 350 Gallons Per Minute. [N.J.A.C. 7:19- 2]
2300001770, PROSPECT (WSWL64287)	Rated Pump Capacity	<= 400 Gallons Per Minute. [N.J.A.C. 7:19- 2]
2300001835, GLEN ROCK (WSWL64291)	Rated Pump Capacity	<= 155 Gallons Per Minute. [N.J.A.C. 7:19- 2]
2300002227, AKERMAN (WSWL64305)	Rated Pump Capacity	<= 250 Gallons Per Minute. [N.J.A.C. 7:19- 2]
2300004171, LEIGH (WSWL64357)	Rated Pump Capacity	<= 125 Gallons Per Minute. [N.J.A.C. 7:19- 2]

**Monitoring Requirements**

**Final Permit Phase from 06/01/2017 -**

Subject Item	Requirement	Frequency	Monitored Parameter	Monitoring Method
2300001443, MAIN (WSWL64281)	Static water levels for each well indicated shall be monitored. [N.J.A.C. 7:19- 2]	Each Month	Static Water Level	Airline, Tape, or Gage
2300001770, PROSPECT (WSWL64287)				
2300001835, GLEN ROCK (WSWL64291)				



**RIDGEWOOD WATER DEPT  
5014X**

Water Allocation Permit : WAP160005

**Monitoring Requirements**

Final Permit Phase from 06/01/2017 -

Subject Item	Requirement	Frequency	Monitored Parameter	Monitoring Method
2300002227, AKERMAN (WSWL64305)	Static water levels for each well indicated shall be monitored. [N.J.A.C. 7:19- 2]	Each Month	Static Water Level	Airline, Tape, or Gage
2300004171, LEIGH (WSWL64357)				
2300001443, MAIN (WSWL64281)	The monthly diversion from each source indicated shall be monitored. [N.J.A.C. 7:19- 2]	Each Month	Water Diverted	Meter
2300001770, PROSPECT (WSWL64287)				
2300001835, GLEN ROCK (WSWL64291)				
2300002227, AKERMAN (WSWL64305)				
2300004171, LEIGH (WSWL64357)				

**Record Keeping Requirements**

Final Permit Phase from 06/01/2017 -

Subject Item	Requirement	Frequency	Monitored Parameter	Record Keeping Method
RIDGEWOOD WATER DEPT, 5016 WA PERMIT - ALL DIVERSION SOURCES (WSWA75721)	A log book of month end meter readings for each diversion source shall be maintained on site. [N.J.A.C. 7:19- 2]	Each Month	Meter Reading	Log Book

**Submittal/Action Requirements**

Final Permit Phase from 06/01/2017 -

Applicable Subject Items	Submittal/Action Type	Requirement
2300001443, MAIN (WSWL64281)	Submit Public Quarterly Report	The required monitoring results shall be recorded on the form provided by the Department. The completed form shall be submitted within 30 days after the end of each quarter. [N.J.A.C. 7:19- 2]
2300001770, PROSPECT (WSWL64287)		

**RIDGEWOOD WATER DEPT  
5014X**

**Water Allocation Permit : WAP160005**

**Submittal/Action Requirements**

**Final Permit Phase from 06/01/2017 -**

Applicable Subject Items	Submittal/Action Type	Requirement
2300001835, GLEN ROCK (WSWL64291)	Submit Public Quarterly Report	The required monitoring results shall be recorded on the form provided by the Department. The completed form shall be submitted within 30 days after the end of each quarter. [N.J.A.C. 7:19- 2]
2300002227, AKERMAN (WSWL64305)		
2300004171, LEIGH (WSWL64357)		
2300004171, LEIGH (WSWL64357)	Submit Proof of Flow Meter Calibration	Proof of flow meter calibration for the specified diversion source shall be submitted prior to placing the source into operation. [N.J.A.C. 7:19- 2]
RIDGEWOOD WATER DEPT, 5016 WA PERMIT - ALL DIVERSION SOURCES (WSWA75721)	Submit Water Conservation and Drought Management Plan	The permittee shall continue to implement, to the satisfaction of the Department, a water conservation and drought management program. The program shall encourage water conservation in all types of use within the area served by the permittee, including actions taken pursuant to this program and the impact thereof. Ridgewood Village Water Department should provide one update to the water conservation and drought management plan for the entire system (permits 5014, 5015, 5016, & 5017) every two years from the effective date of this permit. [N.J.A.C. 7:19- 2]
RIDGEWOOD WATER DEPT, 5016 WA PERMIT - ALL DIVERSION SOURCES (WSWA75721)	Submit Renewal Application	A renewal application shall be submitted three months prior to the expiration date. [N.J.A.C. 7:19- 2]

**Text Requirements**

**All Phases**

RIDGEWOOD WATER DEPT, 5016 WA PERMIT - ALL DIVERSION SOURCES (WSWA75721)

1. The total diversion for the entire system, including permit Nos. 5014, 5015, 5016, and 5017, shall not exceed 449 mgm. [N.J.A.C. 7:19- 2]
2. Water may be diverted under this modified permit for public community supply. However, water shall not be used to serve non-potable, consumptive purposes for new projects that are greater than 50 percent non-potable and greater than 50 percent consumptive, where, as determined by the Department, alternate water sources, including but not limited to reclaimed water for beneficial reuse, are feasible to serve the non-potable, consumptive needs of the project. [N.J.A.C. 7:19- 2]
3. Water may be diverted under this permit only from the approved diversion sources at the maximum rates specified. [N.J.A.C. 7:19- 1]
4. A major modification of this permit may be required in order to request the approval of any additional diversion sources or an increase in the pumping capacity. [N.J.A.C. 7:19- 2]
5. All diversion sources shall be metered with a totalizing flow meter. [N.J.A.C. 7:19- 2]
6. At a minimum, each diversion source flow meter shall be calibrated at least once every five years. [N.J.A.C. 7:19- 2]
7. Each flow meter shall be calibrated to within five percent accuracy. [N.J.A.C. 7:19- 2]



RIDGEWOOD WATER DEPT

5014X

Water Allocation Permit : WAPI60005

**Text Requirements**

**All Phases**

RIDGEWOOD WATER DEPT, 5016 WA PERMIT - ALL DIVERSION SOURCES (WSWA75721)

8. All wells shall be equipped with a metal tag showing the well permit numbers (source designation) as listed in the allocation permit inventory or have the well permit numbers painted on the casings. [N.J.A.C. 7:19- 2]
9. The pumping equipment capacity shall not be increased without prior approval from the Bureau of Water Allocation and Well Permitting. [N.J.A.C. 7:19- 1]
10. Any well not intended for use shall be decommissioned in accordance with N.J.A.C. 7:9D-3.1 et seq. [N.J.A.C. 7: 9D- 3]
11. Wells shall be constructed so that static water level (depth to water) can be determined at any time. [N.J.A.C. 7:19- 2]
12. Static water level shall be measured and reported as depth to water, in feet, from ground surface. [N.J.A.C. 7:19- 2]
13. For pumping wells, static water level (depth to water) shall be taken when the well pump has been shut down for a recovery period of at least 12 hours. If the well cannot be shut down for the required period, it must be noted on an addendum to the Quarterly Monitoring Report form. Please note on the addendum the number of hours the well was shut down or that the reading is a pumping level. [N.J.A.C. 7:19- 2]
14. All new services shall be metered in accordance with all applicable laws, regulations or codes including, but not limited to, the Water Supply Management Act. [N.J.A.C. 7:19- 6]
15. All existing services shall be metered. [N.J.A.C. 7:19- 6]
16. Water charges for each service connection shall be based in part on metered usage. [N.J.A.C. 7:19- 6]
17. The monthly quantity of water transferred and delivered to/received from interconnections shall be reported as part of the water system monitoring on separate forms provided by the Department. [N.J.A.C. 7:19- 2]
18. The Department may modify, suspend or terminate this permit, after due process, for violations of permit conditions, N.J.S.A. 58:1A-1, N.J.A.C. 7:19-1 et seq., any orders issued by the Department, or when in the public interest. [N.J.A.C. 7:19- 2]
19. The permittee shall investigate to the Department's satisfaction complaints by users of wells or surface water supplies within the zone of influence of its diversion to determine what impact the diversion has had on such wells or surface water supplies. A report on these investigations shall be forwarded to the Bureau of Water Allocation and Well Permitting. Any well or surface water supply which becomes damaged, dry, has reduced capacity, reduced water quality or is otherwise rendered unusable as a water source as a result of the permittee's diversions shall be repaired or replaced at the expense of the permittee. Work shall be in accordance with all State, County and Municipal construction standards for potable water. After reviewing all applicable investigational reports the Department of Environmental Protection will make the final determination regarding the validity of such complaints, the scope or sufficiency of such investigations, and will determine how to resolve any problems resulting from the diversion. [N.J.A.C. 7:19- 2]
20. This permit is issued for a limited period, and is not subject to automatic renewal. [N.J.A.C. 7:19- 2]
21. The permittee is subject to such fees as may be prescribed by the regulations. [N.J.A.C. 7:19- 3]
22. The permittee shall have the right to apply at any time for modification of this permit by submission of the appropriate application forms. [N.J.A.C. 7:19- 2]
23. The permittee may informally discuss the terms and conditions of this permit at any time with the Bureau of Water Allocation and Well Permitting. [N.J.A.C. 7:19- 2]
24. The permittee shall obtain approval from the Bureau of Water System Engineering before using the diversion for public water supply. [N.J.A.C. 7:19- 2]
25. In addition to the specific management requirements cited above, and when so directed by the Department, the permittee shall comply with applicable portions of the Water Supply Management Rules (N.J.A.C. 7:19-6 et seq. and N.J.A.C. 7:19-8 et seq.) to include the determination of dependable yield; unaccounted-for water; rehabilitation; system pressure and storage; interconnections; and operation of interconnections. [N.J.A.C. 7:19- 6]
26. If the permittee violates any condition of this permit, the permittee is subject to administrative penalties up to \$25,000 per day per offense as specified. [N.J.S.A. 58: 1A-16]
27. The issuance of this permit shall not be deemed to affect in any way action by the Department of Environmental Protection of the State of New Jersey on any future application. [N.J.A.C. 7:19- 2]

RIDGEWOOD WATER DEPT

5014X

Water Allocation Permit : WAP160005

**Text Requirements**

**All Phases**

RIDGEWOOD WATER DEPT, 5016 WA PERMIT - ALL DIVERSION SOURCES (WSWA75721)

28. No change in plans or specifications shall be made except with the prior written permission of the Department of Environmental Protection of the State of New Jersey. [N.J.A.C. 7:19- 2]
29. The granting of this permit shall not be construed to in any way affect the title or ownership of property, and shall not make the Department of Environmental Protection or the State a party in any suit or question of ownership of property. [N.J.A.C. 7:19- 2]
30. This permit does not waive the obtaining of Federal or other State or local government consent when necessary. This permit is not valid and no work shall be undertaken until such time as all other required approvals and permits have been obtained. [N.J.A.C. 7:19- 2]
31. A copy of this permit shall be kept at the facility site, and shall be exhibited upon request of any authorized Department representative. [N.J.A.C. 7:19- 2]
32. The Department has the right to enter and inspect any site, building, or equipment, or any portion thereof, owned or operated by the permittee, at any time, in order to ascertain compliance or noncompliance with N.J.S.A. 58:1A-1 et seq., 58:4A-4.1 et seq., 58:12A-1 et seq., these rules, or any other agreement or order issued or entered into pursuant thereto. Such right shall include, but not be limited to, the right to require the testing of any equipment at the facility, to sketch or photograph any portion of the site, building or equipment, to copy or photograph any document or records necessary to determine such compliance or noncompliance, and to interview any employees or representative of the owner, operator, or permittee. Such right shall be absolute and shall not be conditioned upon any action by the Department, except the presentation of appropriate credentials as requested and compliance with appropriate standard safety procedures. [N.J.A.C. 7:19- 2]
33. This permit may be transferred, with the consent of the Department, but only for the identical use of the waters. [N.J.A.C. 7:19- 2]
34. If the authorized diversion privileges are not currently diverted, subject to contract, or reasonably required for a demonstrated future need, they shall revert back to the State upon renewal or modification of the permit. [N.J.A.C. 7:19- 2]
35. The permittee shall protect each source from vandalism, tampering, and contamination at all times. [N.J.A.C. 7:19- 2]
36. This permit shall expire as indicated on the permit approval cover page. [N.J.A.C. 7:19- 2]



**Administrative Hearing Request Checklist  
And Tracking Form for Permits**

1. Permit Being Appealed:

\_\_\_\_\_

Title and Type of Permit

\_\_\_\_\_

Issuance Date of Permit

\_\_\_\_\_

Permit Number

2. Person Requesting Hearing:

\_\_\_\_\_

Name/Company

\_\_\_\_\_

Name of Attorney (if applicable)

\_\_\_\_\_

Address

\_\_\_\_\_

Address of Attorney

3. The following information must be included with the request:

- a. The date the permittee received the final permit;
- b. A copy of permit with a list of all permit conditions and issues contested;
- c. The legal and factual questions at issue;
- d. A statement as to whether or not the permittee raised each legal and factual issues during the public comment period of the permit;
- e. Suggested revised or alternative permit conditions;
- f. An estimate of the time required for the hearing;
- g. A request, if necessary, for a barrier-free hearing location for physically disabled persons;
- h. A clear indication of any willingness to negotiate a settlement with the Department prior to the Department's processing of the hearing request to the Office of Administrative Law; and
- i. This form, completed with all of the information listed above, signed, and dated, including attachments, to:

- i. Office of Legal Affairs  
ATTENTION: Adjudicatory Hearing Requests  
Department of Environmental Protection  
401 East State Street  
P.O. Box 402  
Trenton, New Jersey 08625-0402

- ii. Terry D. Pilawski, Chief  
Mail Code 401-04Q  
Division of Water Supply & Geoscience  
Bureau of Water Allocation & Well Permitting  
P.O. Box 420  
Trenton, New Jersey 08625

- iii. All co-permittees (w/attachments)

4. Signature: \_\_\_\_\_

Date: \_\_\_\_\_

## **D. Gravity Sewer and Force Main Costs**

Appendix D: Gravity Sewer and Force Main Costs							Gravity Sewer		4-inch HDPE Force Main	
Site Name:	Recommended Vessel Size	Sewer Flow Rate (gpm)	Sewer Flow Rate (MGD)	Feasibility	Estimated Distance to Sewer (ft)	Required Sewer Diameter	Estimated Cost per Foot	Estimated Sewer Cost	Estimated Cost per Foot	Estimated Sewer Cost
Ames TF	Model 12-40	970	1.40	1	100	10 inch	\$550	\$55,000	\$150	\$15,000
Cedar Hill Wellfield	Model 12-40	970	1.40	1	50	10 inch	\$550	\$27,500	\$150	\$7,500
College Well	Model 6	250	0.36	1	250	8 inch	\$500	\$125,000	\$150	\$37,500
E. Saddle River Well	Model 8	430	0.62	3	50	8 inch	\$500	\$25,000	\$150	\$7,500
East Ridgewood TF	Model 12-40	970	1.40	2	250	10 inch	\$550	\$137,500	\$150	\$37,500
Eder Well	Model 10	670	0.97	2	100	10 inch	\$550	\$55,000	\$150	\$15,000
Farview Well	Model 10	670	0.97	2	200	10 inch	\$550	\$110,000	\$150	\$30,000
Glen Rock TF	Model 8	430	0.62	3	50	8 inch	\$500	\$25,000	\$150	\$7,500
Irving	Model 12-40	970	1.40	3	500	10 inch	\$550	\$275,000	\$150	\$75,000
Lafayette Well	Model 10	670	0.97	1	250	10 inch	\$550	\$137,500	\$150	\$37,500
Lakeview Well	Model 8	430	0.62	1	100	8 inch	\$500	\$50,000	\$150	\$15,000
Linwood TF	Model 12-40	970	1.40	3	400	10 inch	\$550	\$220,000	\$150	\$60,000
Main TF	Model 8	430	0.62	2	350	8 inch	\$500	\$175,000	\$150	\$52,500
Marr Well	Model 10	670	0.97	2	100	10 inch	\$550	\$55,000	\$150	\$15,000
Meer Well	Model 8	430	0.62	1	200	8 inch	\$500	\$100,000	\$150	\$30,000
Midland Well	Model 8	430	0.62	1	250	8 inch	\$500	\$125,000	\$150	\$37,500
Mountain Well	Model 8	430	0.62	1	250	8 inch	\$500	\$125,000	\$150	\$37,500
Prospect TF	Model 12-40	970	1.40	1	400	10 inch	\$550	\$220,000	\$150	\$60,000
Ravine Well	Model 8	430	0.62	2	50	8 inch	\$500	\$25,000	\$150	\$7,500
Russell Well	Model 6	250	0.36	1	100	8 inch	\$500	\$50,000	\$150	\$15,000
Salem Well	Model 10	670	0.97	2	500	10 inch	\$550	\$275,000	\$150	\$75,000
Stevens Well	Model 8	430	0.62	3	250	8 inch	\$500	\$125,000	\$150	\$37,500
Twinney TF	Model 12-40	970	1.40	2	400	10 inch	\$550	\$220,000	\$150	\$60,000
Van Houten TF	Model 12-40	970	1.40	2	300	10 inch	\$550	\$165,000	\$150	\$45,000
Waldo Well	Model 10	670	0.97	1	200	10 inch	\$550	\$110,000	\$150	\$30,000
Weisch Well	Model 10	670	0.97	1	450	10 inch	\$550	\$247,500	\$150	\$67,500
West End TF	Model 8	430	0.62	2	100	8 inch	\$500	\$50,000	\$150	\$15,000
Wortendyke TF	Model 12-40	970	1.40	1	50	10 inch	\$550	\$27,500	\$150	\$7,500

## **E. Detailed Construction Cost Estimates**





PROJECT TITLE/LOCATION Ridgewood Water PFAS Master Plan  
 PROJECT MANAGER Scott Pendergrass CLIENT Ridgewood Water  
 PREPARED BY SBP CHECKED BY \_\_\_\_\_

**CONSTRUCTION COST ESTIMATE FORM**

**GAC INSTALLATIONS AT WELL FACILITIES**

CSI # or Dwg #	Description	Quantity		Material		Labor		Total Cost	
		Amount	Unit	Unit Material \$	Total \$	Unit Labor \$	Total \$	Unit Price \$	Total Cost \$
	<b>Installation of GAC Model 6 Treatment System (2 Vessels) @ Well Facilities</b>								
Div 01	Mobilization/Demobilization	1	LS	\$ -	\$ -	\$ 60,000.00	\$ 60,000.00	\$ 60,000.00	\$ 60,000.00
Div 01	Bonding and Insurance	1	LS	\$ 12,000.00	\$ 12,000.00	\$ -	\$ -	\$ 12,000.00	\$ 12,000.00
Div 01	Contractor's Project Management	1	LS	\$ -	\$ -	\$ 50,000.00	\$ 50,000.00	\$ 50,000.00	\$ 50,000.00
Div 02	Landscaping and Screening	1	LS	\$ 7,500.00	\$ 7,500.00	\$ 2,600.00	\$ 2,600.00	\$ 10,100.00	\$ 10,100.00
Div 03	Concrete Foundation, Treatment Vessels	1	LS	\$ 21,100.00	\$ 21,100.00	\$ -	\$ -	\$ 21,100.00	\$ 21,100.00
Div 03	Concrete On Site Backwash Storage Chambers	1	LS	\$ 53,500.00	\$ 53,500.00	\$ -	\$ -	\$ 53,500.00	\$ 53,500.00
Div 11	GAC Equipment (Vessels, Piping, Valves)	1	LS	\$ 191,000.00	\$ 191,000.00	\$ 20,200.00	\$ 20,200.00	\$ 211,200.00	\$ 211,200.00
Div 11	GAC Media (Fresh Carbon with pH Adjustment)	1	LS	\$ 21,600.00	\$ 21,600.00	\$ -	\$ -	\$ 21,600.00	\$ 21,600.00
Div 11	Well Pump and Motor Upsizing	1	LS	\$ 30,000.00	\$ 30,000.00	\$ -	\$ -	\$ 30,000.00	\$ 30,000.00
Div 11	Piping/Chlorine Feed Modifications	1	LS	\$ 70,000.00	\$ 70,000.00	\$ 17,500.00	\$ 17,500.00	\$ 87,500.00	\$ 87,500.00
Div 11	Chlorine Contact Pipe at 30 inch Diameter	1	LS	\$ 22,400.00	\$ 22,400.00	\$ 5,600.00	\$ 5,600.00	\$ 28,000.00	\$ 28,000.00
Div 11	Backflow Preventer	1	LS	\$ 10,000.00	\$ 10,000.00	\$ 5,000.00	\$ 5,000.00	\$ 15,000.00	\$ 15,000.00
Div 11	Equipment Startup and Testing	1	LS	\$ -	\$ -	\$ 50,000.00	\$ 50,000.00	\$ 50,000.00	\$ 50,000.00
Div 11	Initial Backwash, Rinsing and Vessels Startup	1	LS	\$ -	\$ -	\$ 25,600.00	\$ 25,600.00	\$ 25,600.00	\$ 25,600.00
Div 13	CMU Enclosure, Complete	1	LS	\$ 324,000.00	\$ 324,000.00	\$ -	\$ -	\$ 324,000.00	\$ 324,000.00
Div 16	Electrical	1	LS	\$ 80,000.00	\$ 80,000.00	\$ 20,000.00	\$ 20,000.00	\$ 100,000.00	\$ 100,000.00
Div 16	Instrumentation and Controls	1	LS	\$ 81,000.00	\$ 81,000.00	\$ 54,000.00	\$ 54,000.00	\$ 135,000.00	\$ 135,000.00
	Subtotal				\$ 924,100.00		\$ 310,500.00		\$ 1,234,600.00
	Contractor Overhead and Profit (20%)								\$ 246,920.00
	AACE Class IV Estimate Contingencies (30%)								\$ 444,456.00
	Engineering Fees and Other Costs (20%)								\$ 385,195.20
	<b>Total Capital Cost</b>								<b>\$ 2,311,200.00</b>

CSI # or Dwg #	Description	Quantity		Material		Labor		Total Cost	
		Amount	Unit	Unit Material \$	Total \$	Unit Labor \$	Total \$	Unit Price \$	Total Cost \$
	<b>Installation of GAC Model 8 Treatment System (2 Vessels) @ Well Facilities</b>								
Div 01	Mobilization/Demobilization	1	LS	\$ -	\$ -	\$ 90,000.00	\$ 90,000.00	\$ 90,000.00	\$ 90,000.00
Div 01	Bonding and Insurance	1	LS	\$ 14,000.00	\$ 14,000.00	\$ -	\$ -	\$ 14,000.00	\$ 14,000.00
Div 01	Contractor's Project Management	1	LS	\$ -	\$ -	\$ 50,000.00	\$ 50,000.00	\$ 50,000.00	\$ 50,000.00
Div 02	Landscaping and Screening	1	LS	\$ 7,500.00	\$ 7,500.00	\$ 2,600.00	\$ 2,600.00	\$ 10,100.00	\$ 10,100.00
Div 03	Concrete Foundation, Treatment Vessels	1	LS	\$ 32,000.00	\$ 32,000.00	\$ -	\$ -	\$ 32,000.00	\$ 32,000.00
Div 03	Concrete On Site Backwash Storage Chambers	1	LS	\$ 77,000.00	\$ 77,000.00	\$ -	\$ -	\$ 77,000.00	\$ 77,000.00
Div 11	GAC Equipment (Vessels, Piping, Valves)	1	LS	\$ 215,000.00	\$ 215,000.00	\$ 20,200.00	\$ 20,200.00	\$ 235,200.00	\$ 235,200.00
Div 11	GAC Media (Fresh Carbon with pH Adjustment)	1	LS	\$ 36,000.00	\$ 36,000.00	\$ -	\$ -	\$ 36,000.00	\$ 36,000.00
Div 11	Well Pump and Motor Upsizing	1	LS	\$ 30,000.00	\$ 30,000.00	\$ -	\$ -	\$ 30,000.00	\$ 30,000.00
Div 11	Piping/Chlorine Feed Modifications	1	LS	\$ 70,000.00	\$ 70,000.00	\$ 17,500.00	\$ 17,500.00	\$ 87,500.00	\$ 87,500.00
Div 11	Chlorine Contact Pipe at 30 inch Diameter	1	LS	\$ 22,400.00	\$ 22,400.00	\$ 5,600.00	\$ 5,600.00	\$ 28,000.00	\$ 28,000.00
Div 11	Backflow Preventer	1	LS	\$ 10,000.00	\$ 10,000.00	\$ 5,000.00	\$ 5,000.00	\$ 15,000.00	\$ 15,000.00
Div 11	Equipment Startup and Testing	1	LS	\$ -	\$ -	\$ 50,000.00	\$ 50,000.00	\$ 50,000.00	\$ 50,000.00
Div 11	Initial Backwash, Rinsing and Vessels Startup	1	LS	\$ -	\$ -	\$ 25,600.00	\$ 25,600.00	\$ 25,600.00	\$ 25,600.00
Div 13	CMU Enclosure, Complete	1	LS	\$ 408,000.00	\$ 408,000.00	\$ -	\$ -	\$ 408,000.00	\$ 408,000.00
Div 16	Electrical	1	LS	\$ 80,000.00	\$ 80,000.00	\$ 20,000.00	\$ 20,000.00	\$ 100,000.00	\$ 100,000.00
Div 16	Instrumentation and Controls	1	LS	\$ 81,000.00	\$ 81,000.00	\$ 54,000.00	\$ 54,000.00	\$ 135,000.00	\$ 135,000.00
	Subtotal				\$ 1,082,900.00		\$ 340,500.00		\$ 1,423,400.00
	Contractor Overhead and Profit (20%)								\$ 284,680.00
	AACE Class IV Estimate Contingencies (30%)								\$ 512,424.00
	Engineering Fees and Other Costs (20%)								\$ 444,100.80
	<b>Total Capital Cost</b>								<b>\$ 2,664,600.00</b>

CSI # or Dwg #	Description	Quantity		Material		Labor		Total Cost	
		Amount	Unit	Unit Material \$	Total \$	Unit Labor \$	Total \$	Unit Price \$	Total Cost \$
	<b>Installation of GAC Model 10 Treatment System (2 Vessels) @ Well Facilities</b>								
Div 01	Mobilization/Demobilization	1	LS	\$ -	\$ -	\$ 90,000.00	\$ 90,000.00	\$ 90,000.00	\$ 90,000.00
Div 01	Bonding and Insurance	1	LS	\$ 16,000.00	\$ 16,000.00	\$ -	\$ -	\$ 16,000.00	\$ 16,000.00
Div 01	Contractor's Project Management	1	LS	\$ -	\$ -	\$ 50,000.00	\$ 50,000.00	\$ 50,000.00	\$ 50,000.00
Div 02	Landscaping and Screening	1	LS	\$ 7,500.00	\$ 7,500.00	\$ 2,600.00	\$ 2,600.00	\$ 10,100.00	\$ 10,100.00
Div 03	Concrete Foundation, Treatment Vessels	1	LS	\$ 43,600.00	\$ 43,600.00	\$ -	\$ -	\$ 43,600.00	\$ 43,600.00
Div 03	Concrete On Site Backwash Storage Chambers	1	LS	\$ 104,300.00	\$ 104,300.00	\$ -	\$ -	\$ 104,300.00	\$ 104,300.00
Div 11	GAC Equipment (Vessels, Piping, Valves)	1	LS	\$ 269,000.00	\$ 269,000.00	\$ 20,200.00	\$ 20,200.00	\$ 289,200.00	\$ 289,200.00
Div 11	GAC Media (Fresh Carbon with pH Adjustment)	1	LS	\$ 72,000.00	\$ 72,000.00	\$ -	\$ -	\$ 72,000.00	\$ 72,000.00
Div 11	Well Pump and Motor Upsizing	1	LS	\$ 30,000.00	\$ 30,000.00	\$ -	\$ -	\$ 30,000.00	\$ 30,000.00
Div 11	Piping/Chlorine Feed Modifications	1	LS	\$ 70,000.00	\$ 70,000.00	\$ 17,500.00	\$ 17,500.00	\$ 87,500.00	\$ 87,500.00
Div 11	Chlorine Contact Pipe at 30 inch Diameter	1	LS	\$ 22,400.00	\$ 22,400.00	\$ 5,600.00	\$ 5,600.00	\$ 28,000.00	\$ 28,000.00
Div 11	Backflow Preventer	1	LS	\$ 10,000.00	\$ 10,000.00	\$ 5,000.00	\$ 5,000.00	\$ 15,000.00	\$ 15,000.00
Div 11	Equipment Startup and Testing	1	LS	\$ -	\$ -	\$ 50,000.00	\$ 50,000.00	\$ 50,000.00	\$ 50,000.00
Div 11	Initial Backwash, Rinsing and Vessels Startup	1	LS	\$ -	\$ -	\$ 25,600.00	\$ 25,600.00	\$ 25,600.00	\$ 25,600.00
Div 13	CMU Enclosure, Complete	1	LS	\$ 543,400.00	\$ 543,400.00	\$ -	\$ -	\$ 543,400.00	\$ 543,400.00
Div 16	Electrical	1	LS	\$ 80,000.00	\$ 80,000.00	\$ 20,000.00	\$ 20,000.00	\$ 100,000.00	\$ 100,000.00
Div 16	Instrumentation and Controls	1	LS	\$ 81,000.00	\$ 81,000.00	\$ 54,000.00	\$ 54,000.00	\$ 135,000.00	\$ 135,000.00
	Subtotal				\$ 1,349,200.00		\$ 340,500.00		\$ 1,689,700.00
	Contractor Overhead and Profit (20%)								\$ 337,940.00
	AACE Class IV Estimate Contingencies (30%)								\$ 608,292.00
	Engineering Fees and Other Costs (20%)								\$ 527,186.40
	<b>Total Capital Cost</b>								<b>\$ 3,163,100.00</b>

CSI # or Dwg #	Description	Quantity		Material		Labor		Total Cost	
		Amount	Unit	Unit Material \$	Total \$	Unit Labor \$	Total \$	Unit Price \$	Total Cost \$
	<b>Installation of GAC Model 12-40 Treatment System (2 Vessels) @ Well Facilities</b>								
Div 01	Mobilization/Demobilization	1	LS	\$ -	\$ -	\$ 125,000.00	\$ 125,000.00	\$ 125,000.00	\$ 125,000.00
Div 01	Bonding and Insurance	1	LS	\$ 26,000.00	\$ 26,000.00	\$ -	\$ -	\$ 26,000.00	\$ 26,000.00
Div 01	Contractor's Project Management	1	LS	\$ -	\$ -	\$ 50,000.00	\$ 50,000.00	\$ 50,000.00	\$ 50,000.00
Div 02	Landscaping and Screening	1	LS	\$ 7,500.00	\$ 7,500.00	\$ 2,600.00	\$ 2,600.00	\$ 10,100.00	\$ 10,100.00
Div 03	Concrete Foundation, Treatment Vessels	1	LS	\$ 60,400.00	\$ 60,400.00	\$ -	\$ -	\$ 60,400.00	\$ 60,400.00
Div 03	Concrete On Site Backwash Storage Chambers	1	LS	\$ 139,300.00	\$ 139,300.00	\$ -	\$ -	\$ 139,300.00	\$ 139,300.00
Div 11	GAC Equipment (Vessels, Piping, Valves)	1	LS	\$ 353,000.00	\$ 353,000.00	\$ 20,200.00	\$ 20,200.00	\$ 373,200.00	\$ 373,200.00
Div 11	GAC Media (Fresh Carbon with pH Adjustment)	1	LS	\$ 144,000.00	\$ 144,000.00	\$ -	\$ -	\$ 144,000.00	\$ 144,000.00
Div 11	Well Pump and Motor Upsizing	1	LS	\$ 30,000.00	\$ 30,000.00	\$ -	\$ -	\$ 30,000.00	\$ 30,000.00
Div 11	Piping/Chlorine Feed Modifications	1	LS	\$ 140,000.00	\$ 140,000.00	\$ 35,000.00	\$ 35,000.00	\$ 175,000.00	\$ 175,000.00
Div 11	Chlorine Contact Pipe at 30 inch Diameter	1	LS	\$ 22,400.00	\$ 22,400.00	\$ 5,600.00	\$ 5,600.00	\$ 28,000.00	\$ 28,000.00
Div 11	Backflow Preventer	1	LS	\$ 10,000.00	\$ 10,000.00	\$ 5,000.00	\$ 5,000.00	\$ 15,000.00	\$ 15,000.00
Div 11	Equipment Startup and Testing	1	LS	\$ -	\$ -	\$ 50,000.00	\$ 50,000.00	\$ 50,000.00	\$ 50,000.00
Div 11	Initial Backwash, Rinsing and Vessels Startup	1	LS	\$ -	\$ -	\$ 25,600.00	\$ 25,600.00	\$ 25,600.00	\$ 25,600.00
Div 13	CMU Enclosure, Complete	1	LS	\$ 756,000.00	\$ 756,000.00	\$ -	\$ -	\$ 756,000.00	\$ 756,000.00
Div 16	Electrical	1	LS	\$ 80,000.00	\$ 80,000.00	\$ 20,000.00	\$ 20,000.00	\$ 100,000.00	\$ 100,000.00
Div 16	Instrumentation and Controls	1	LS	\$ 81,000.00	\$ 81,000.00	\$ 54,000.00	\$ 54,000.00	\$ 135,000.00	\$ 135,000.00
	Subtotal				\$ 1,849,600.00		\$ 393,000.00		\$ 2,242,600.00
	Contractor Overhead and Profit (20%)								\$ 448,520.00
	AACE Class IV Estimate Contingencies (30%)								\$ 807,336.00
	Engineering Fees and Other Costs (20%)								\$ 699,691.20
	<b>Total Capital Cost</b>								<b>\$ 4,198,100.00</b>



**CONSTRUCTION COST ESTIMATE FORM**

**GAC INSTALLATIONS AT TREATMENT FACILITIES**

CSI # or Dwg #	Description	Quantity		Material		Labor		Total Cost	
		Amount	Unit	Unit Material \$	Total \$	Unit Labor \$	Total \$	Unit Price \$	Total Cost \$
	<b>Installation of GAC Model 6 Treatment System (2 Vessels) @ Treatment Facilities</b>								
Div 01	Mobilization/Demobilization	1	LS	\$ -	\$ -	\$ 90,000.00	\$ 90,000.00	\$ 90,000.00	\$ 90,000.00
Div 01	Bonding and Insurance	1	LS	\$ 14,000.00	\$ 14,000.00	\$ -	\$ -	\$ 14,000.00	\$ 14,000.00
Div 01	Contractor's Project Management	1	LS	\$ -	\$ -	\$ 50,000.00	\$ 50,000.00	\$ 50,000.00	\$ 50,000.00
Div 02	Landscaping and Screening	1	LS	\$ 7,500.00	\$ 7,500.00	\$ 2,600.00	\$ 2,600.00	\$ 10,100.00	\$ 10,100.00
Div 03	Concrete Foundation Installation Foundation	1	LS	\$ 21,100.00	\$ 21,100.00	\$ -	\$ -	\$ 21,100.00	\$ 21,100.00
Div 03	Intermediate Wet Well, Concrete Only	1	LS	\$ 25,000.00	\$ 25,000.00	\$ 5,000.00	\$ 5,000.00	\$ 30,000.00	\$ 30,000.00
Div 03	Concrete On Site Backwash Storage Chambers	1	LS	\$ 53,500.00	\$ 53,500.00	\$ -	\$ -	\$ 53,500.00	\$ 53,500.00
Div 11	GAC Equipment (Vessels, Piping, Valves)	1	LS	\$ 191,000.00	\$ 191,000.00	\$ 20,200.00	\$ 20,200.00	\$ 211,200.00	\$ 211,200.00
Div 11	GAC Media (Fresh Carbon with pH Adjustment)	1	LS	\$ 21,600.00	\$ 21,600.00	\$ -	\$ -	\$ 21,600.00	\$ 21,600.00
Div 11	Piping/Chlorine Feed Modifications	1	LS	\$ 70,000.00	\$ 70,000.00	\$ 17,500.00	\$ 17,500.00	\$ 87,500.00	\$ 87,500.00
Div 11	Intermediate Wet Well, Submersible Pumps	1	LS	\$ 180,000.00	\$ 180,000.00	\$ 20,000.00	\$ 20,000.00	\$ 200,000.00	\$ 200,000.00
Div 11	Backflow Preventer	1	LS	\$ 10,000.00	\$ 10,000.00	\$ 5,000.00	\$ 5,000.00	\$ 15,000.00	\$ 15,000.00
Div 11	Equipment Startup and Testing	1	LS	\$ -	\$ -	\$ 50,000.00	\$ 50,000.00	\$ 50,000.00	\$ 50,000.00
Div 11	Initial Backwash, Rinsing and Vessels Startup	1	LS	\$ -	\$ -	\$ 25,600.00	\$ 25,600.00	\$ 25,600.00	\$ 25,600.00
Div 13	CMU Enclosure, Complete	1	LS	\$ 324,000.00	\$ 324,000.00	\$ -	\$ -	\$ 324,000.00	\$ 324,000.00
Div 16	Electrical	1	LS	\$ 80,000.00	\$ 80,000.00	\$ 20,000.00	\$ 20,000.00	\$ 100,000.00	\$ 100,000.00
Div 16	Instrumentation and Controls	1	LS	\$ 81,000.00	\$ 81,000.00	\$ 54,000.00	\$ 54,000.00	\$ 135,000.00	\$ 135,000.00
	Subtotal				\$ 1,078,700.00		\$ 359,900.00		\$ 1,438,600.00
	Contractor Overhead and Profit (20%)								\$ 287,720.00
	AACE Class IV Estimate Contingencies (30%)								\$ 517,896.00
	Engineering Fees and Other Costs (20%)								\$ 448,843.20
	<b>Total Capital Cost</b>								<b>\$ 2,693,100.00</b>

CSI # or Dwg #	Description	Quantity		Material		Labor		Total Cost	
		Amount	Unit	Unit Material \$	Total \$	Unit Labor \$	Total \$	Unit Price \$	Total Cost \$
	<b>Installation of GAC Model 8 Treatment System (2 Vessels) @ Treatment Facilities</b>								
Div 01	Mobilization/Demobilization	1	LS	\$ -	\$ -	\$ 90,000.00	\$ 90,000.00	\$ 90,000.00	\$ 90,000.00
Div 01	Bonding and Insurance	1	LS	\$ 16,000.00	\$ 16,000.00	\$ -	\$ -	\$ 16,000.00	\$ 16,000.00
Div 01	Contractor's Project Management	1	LS	\$ -	\$ -	\$ 50,000.00	\$ 50,000.00	\$ 50,000.00	\$ 50,000.00
Div 02	Landscaping and Screening	1	LS	\$ 7,500.00	\$ 7,500.00	\$ 2,600.00	\$ 2,600.00	\$ 10,100.00	\$ 10,100.00
Div 03	Concrete Foundation Installation Foundation	1	LS	\$ 32,000.00	\$ 32,000.00	\$ -	\$ -	\$ 32,000.00	\$ 32,000.00
Div 03	Intermediate Wet Well, Concrete Only	1	LS	\$ 25,000.00	\$ 25,000.00	\$ 5,000.00	\$ 5,000.00	\$ 30,000.00	\$ 30,000.00
Div 03	Concrete On Site Backwash Storage Chambers	1	LS	\$ 77,000.00	\$ 77,000.00	\$ -	\$ -	\$ 77,000.00	\$ 77,000.00
Div 11	GAC Equipment (Vessels, Piping, Valves)	1	LS	\$ 215,000.00	\$ 215,000.00	\$ 20,200.00	\$ 20,200.00	\$ 235,200.00	\$ 235,200.00
Div 11	GAC Media (Fresh Carbon with pH Adjustment)	1	LS	\$ 36,000.00	\$ 36,000.00	\$ -	\$ -	\$ 36,000.00	\$ 36,000.00
Div 11	Piping/Chlorine Feed Modifications	1	LS	\$ 70,000.00	\$ 70,000.00	\$ 17,500.00	\$ 17,500.00	\$ 87,500.00	\$ 87,500.00
Div 11	Intermediate Wet Well, Submersible Pumps	1	LS	\$ 180,000.00	\$ 180,000.00	\$ 20,000.00	\$ 20,000.00	\$ 200,000.00	\$ 200,000.00
Div 11	Backflow Preventer	1	LS	\$ 10,000.00	\$ 10,000.00	\$ 5,000.00	\$ 5,000.00	\$ 15,000.00	\$ 15,000.00
Div 11	Equipment Startup and Testing	1	LS	\$ -	\$ -	\$ 50,000.00	\$ 50,000.00	\$ 50,000.00	\$ 50,000.00
Div 11	Initial Backwash, Rinsing and Vessels Startup	1	LS	\$ -	\$ -	\$ 25,600.00	\$ 25,600.00	\$ 25,600.00	\$ 25,600.00
Div 13	CMU Enclosure, Complete	1	LS	\$ 408,000.00	\$ 408,000.00	\$ -	\$ -	\$ 408,000.00	\$ 408,000.00
Div 16	Electrical	1	LS	\$ 80,000.00	\$ 80,000.00	\$ 20,000.00	\$ 20,000.00	\$ 100,000.00	\$ 100,000.00
Div 16	Instrumentation and Controls	1	LS	\$ 81,000.00	\$ 81,000.00	\$ 54,000.00	\$ 54,000.00	\$ 135,000.00	\$ 135,000.00
	Subtotal				\$ 1,237,500.00		\$ 359,900.00		\$ 1,597,400.00
	Contractor Overhead and Profit (20%)								\$ 319,480.00
	AACE Class IV Estimate Contingencies (30%)								\$ 575,064.00
	Engineering Fees and Other Costs (20%)								\$ 498,388.80
	<b>Total Capital Cost</b>								<b>\$ 2,990,300.00</b>

CSI # or Dwg #	Description	Quantity		Material		Labor		Total Cost	
		Amount	Unit	Unit Material \$	Total \$	Unit Labor \$	Total \$	Unit Price \$	Total Cost \$
	<b>Installation of GAC Model 10 Treatment System (2 Vessels) @ Treatment Facilities</b>								
Div 01	Mobilization/Demobilization	1	LS	\$ -	\$ -	\$ 90,000.00	\$ 90,000.00	\$ 90,000.00	\$ 90,000.00
Div 01	Bonding and Insurance	1	LS	\$ 18,000.00	\$ 18,000.00	\$ -	\$ -	\$ 18,000.00	\$ 18,000.00
Div 01	Contractor's Project Management	1	LS	\$ -	\$ -	\$ 50,000.00	\$ 50,000.00	\$ 50,000.00	\$ 50,000.00
Div 02	Landscaping and Screening	1	LS	\$ 7,500.00	\$ 7,500.00	\$ 2,600.00	\$ 2,600.00	\$ 10,100.00	\$ 10,100.00
Div 03	Concrete Foundation, Treatment Vessels	1	LS	\$ 43,600.00	\$ 43,600.00	\$ -	\$ -	\$ 43,600.00	\$ 43,600.00
Div 03	Intermediate Wet Well, Concrete Only	1	LS	\$ 25,000.00	\$ 25,000.00	\$ 5,000.00	\$ 5,000.00	\$ 30,000.00	\$ 30,000.00
Div 03	Concrete On Site Backwash Storage Chambers	1	LS	\$ 104,300.00	\$ 104,300.00	\$ -	\$ -	\$ 104,300.00	\$ 104,300.00
Div 11	GAC Equipment (Vessels, Piping, Valves)	1	LS	\$ 269,000.00	\$ 269,000.00	\$ 20,200.00	\$ 20,200.00	\$ 289,200.00	\$ 289,200.00
Div 11	GAC Media (Fresh Carbon with pH Adjustment)	1	LS	\$ 72,000.00	\$ 72,000.00	\$ -	\$ -	\$ 72,000.00	\$ 72,000.00
Div 11	Piping/Chlorine Feed Modifications	1	LS	\$ 70,000.00	\$ 70,000.00	\$ 17,500.00	\$ 17,500.00	\$ 87,500.00	\$ 87,500.00
Div 11	Intermediate Wet Well, Submersible Pumps	1	LS	\$ 180,000.00	\$ 180,000.00	\$ 20,000.00	\$ 20,000.00	\$ 200,000.00	\$ 200,000.00
Div 11	Backflow Preventer	1	LS	\$ 10,000.00	\$ 10,000.00	\$ 5,000.00	\$ 5,000.00	\$ 15,000.00	\$ 15,000.00
Div 11	Equipment Startup and Testing	1	LS	\$ -	\$ -	\$ 50,000.00	\$ 50,000.00	\$ 50,000.00	\$ 50,000.00
Div 11	Initial Backwash, Rinsing and Vessels Startup	1	LS	\$ -	\$ -	\$ 25,600.00	\$ 25,600.00	\$ 25,600.00	\$ 25,600.00
Div 13	CMU Enclosure, Complete	1	LS	\$ 543,400.00	\$ 543,400.00	\$ -	\$ -	\$ 543,400.00	\$ 543,400.00
Div 16	Electrical	1	LS	\$ 80,000.00	\$ 80,000.00	\$ 20,000.00	\$ 20,000.00	\$ 100,000.00	\$ 100,000.00
Div 16	Instrumentation and Controls	1	LS	\$ 81,000.00	\$ 81,000.00	\$ 54,000.00	\$ 54,000.00	\$ 135,000.00	\$ 135,000.00
	Subtotal				\$ 1,503,800.00		\$ 359,900.00		\$ 1,863,700.00
	Contractor Overhead and Profit (20%)								\$ 372,740.00
	AACE Class IV Estimate Contingencies (30%)								\$ 670,932.00
	Engineering Fees and Other Costs (20%)								\$ 581,474.40
	<b>Total Capital Cost</b>								<b>\$ 3,488,800.00</b>

CSI # or Dwg #	Description	Quantity		Material		Labor		Total Cost	
		Amount	Unit	Unit Material \$	Total \$	Unit Labor \$	Total \$	Unit Price \$	Total Cost \$
	<b>Installation of GAC Model 12-40 Treatment System (2 Vessels) @ Treatment Facilities</b>								
Div 01	Mobilization/Demobilization	1	LS	\$ -	\$ -	\$ 125,000.00	\$ 125,000.00	\$ 125,000.00	\$ 125,000.00
Div 01	Bonding and Insurance	1	LS	\$ 28,000.00	\$ 28,000.00	\$ -	\$ -	\$ 28,000.00	\$ 28,000.00
Div 01	Contractor's Project Management	1	LS	\$ -	\$ -	\$ 50,000.00	\$ 50,000.00	\$ 50,000.00	\$ 50,000.00
Div 02	Landscaping and Screening	1	LS	\$ 7,500.00	\$ 7,500.00	\$ 2,600.00	\$ 2,600.00	\$ 10,100.00	\$ 10,100.00
Div 03	Concrete Foundation Installation Foundation	1	LS	\$ 60,400.00	\$ 60,400.00	\$ -	\$ -	\$ 60,400.00	\$ 60,400.00
Div 03	Intermediate Wet Well, Concrete Only	1	LS	\$ 25,000.00	\$ 25,000.00	\$ 5,000.00	\$ 5,000.00	\$ 30,000.00	\$ 30,000.00
Div 03	Concrete On Site Backwash Storage Chambers	1	LS	\$ 139,300.00	\$ 139,300.00	\$ -	\$ -	\$ 139,300.00	\$ 139,300.00
Div 11	GAC Equipment (Vessels, Piping, Valves)	1	LS	\$ 353,000.00	\$ 353,000.00	\$ 20,200.00	\$ 20,200.00	\$ 373,200.00	\$ 373,200.00
Div 11	GAC Media (Fresh Carbon with pH Adjustment)	1	LS	\$ 144,000.00	\$ 144,000.00	\$ -	\$ -	\$ 144,000.00	\$ 144,000.00
Div 11	Piping/Chlorine Feed Modifications	1	LS	\$ 140,000.00	\$ 140,000.00	\$ 35,000.00	\$ 35,000.00	\$ 175,000.00	\$ 175,000.00
Div 11	Intermediate Wet Well, Submersible Pumps	1	LS	\$ 180,000.00	\$ 180,000.00	\$ 20,000.00	\$ 20,000.00	\$ 200,000.00	\$ 200,000.00
Div 11	Backflow Preventer	1	LS	\$ 10,000.00	\$ 10,000.00	\$ 5,000.00	\$ 5,000.00	\$ 15,000.00	\$ 15,000.00
Div 11	Equipment Startup and Testing	1	LS	\$ -	\$ -	\$ 50,000.00	\$ 50,000.00	\$ 50,000.00	\$ 50,000.00
Div 11	Initial Backwash, Rinsing and Vessels Startup	1	LS	\$ -	\$ -	\$ 25,600.00	\$ 25,600.00	\$ 25,600.00	\$ 25,600.00
Div 13	CMU Enclosure, Complete	1	LS	\$ 756,000.00	\$ 756,000.00	\$ -	\$ -	\$ 756,000.00	\$ 756,000.00
Div 16	Electrical	1	LS	\$ 80,000.00	\$ 80,000.00	\$ 20,000.00	\$ 20,000.00	\$ 100,000.00	\$ 100,000.00
Div 16	Instrumentation and Controls	1	LS	\$ 81,000.00	\$ 81,000.00	\$ 54,000.00	\$ 54,000.00	\$ 135,000.00	\$ 135,000.00
	Subtotal				\$ 2,004,200.00		\$ 412,400.00		\$ 2,416,600.00
	Contractor Overhead and Profit (20%)								\$ 483,320.00
	AACE Class IV Estimate Contingencies (30%)								\$ 869,976.00
	Engineering Fees and Other Costs (20%)								\$ 753,979.20
	<b>Total Capital Cost</b>								<b>\$ 4,523,900.00</b>





PROJECT TITLE/LOCATION Ridgewood Water PFAS Master Plan  
 PROJECT MANAGER Scott Pendergrass CLIENT Ridgewood Water  
 PREPARED BY SBP CHECKED BY \_\_\_\_\_

**CONSTRUCTION COST ESTIMATE FORM ION EXCHANGE INSTALLATIONS AT WELL FACILITIES/TREATMENT FACILITIES**

CSI # or Dwg #	Description	Quantity		Material		Labor		Total Cost	
		Amount	Unit	Unit Material \$	Total \$	Unit Labor \$	Total \$	Unit Price \$	Total Cost \$
	<b>Installation of IX Model 6 Treatment System (2 Vessels) @ Well/Treatment Facilities</b>								
Div 01	Mobilization/Demobilization	1	LS	\$ -	\$ -	\$ 60,000.00	\$ 60,000.00	\$ 60,000.00	\$ 60,000.00
Div 01	Bonding and Insurance	1	LS	\$ 12,000.00	\$ 12,000.00	\$ -	\$ -	\$ 12,000.00	\$ 12,000.00
Div 01	Contractor's Project Management	1	LS	\$ -	\$ -	\$ 50,000.00	\$ 50,000.00	\$ 50,000.00	\$ 50,000.00
Div 02	Landscaping and Screening	1	LS	\$ 7,500.00	\$ 7,500.00	\$ 2,600.00	\$ 2,600.00	\$ 10,100.00	\$ 10,100.00
Div 03	Concrete Foundation, Treatment Vessels	1	LS	\$ 21,100.00	\$ 21,100.00	\$ -	\$ -	\$ 21,100.00	\$ 21,100.00
Div 03	Concrete On Site Backwash Storage Chambers	1	LS	\$ 53,500.00	\$ 53,500.00	\$ -	\$ -	\$ 53,500.00	\$ 53,500.00
Div 11	Ion Exchange Equipment (Vessels, Piping, Valves)	1	LS	\$ 207,500.00	\$ 207,500.00	\$ 20,200.00	\$ 20,200.00	\$ 227,700.00	\$ 227,700.00
Div 11	Ion Exchange Media	1	LS	\$ 96,800.00	\$ 96,800.00	\$ -	\$ -	\$ 96,800.00	\$ 96,800.00
Div 11	Pre-Filtration Units	1	LS	\$ 25,000.00	\$ 25,000.00	\$ 2,600.00	\$ 2,600.00	\$ 27,600.00	\$ 27,600.00
Div 11	Well Pump and Motor Upsizing	1	LS	\$ 30,000.00	\$ 30,000.00	\$ -	\$ -	\$ 30,000.00	\$ 30,000.00
Div 11	Piping/Chlorine Feed Modifications	1	LS	\$ 70,000.00	\$ 70,000.00	\$ 17,500.00	\$ 17,500.00	\$ 87,500.00	\$ 87,500.00
Div 11	Chlorine Contact Pipe at 30 inch Diameter	1	LS	\$ 22,400.00	\$ 22,400.00	\$ 5,600.00	\$ 5,600.00	\$ 28,000.00	\$ 28,000.00
Div 11	Backflow Preventer	1	LS	\$ 10,000.00	\$ 10,000.00	\$ 5,000.00	\$ 5,000.00	\$ 15,000.00	\$ 15,000.00
Div 11	Equipment Startup and Testing	1	LS	\$ -	\$ -	\$ 50,000.00	\$ 50,000.00	\$ 50,000.00	\$ 50,000.00
Div 11	Initial Backwash, Rinsing and Vessels Startup	1	LS	\$ -	\$ -	\$ 25,600.00	\$ 25,600.00	\$ 25,600.00	\$ 25,600.00
Div 13	CMU Enclosure, Complete	1	LS	\$ 324,000.00	\$ 324,000.00	\$ -	\$ -	\$ 324,000.00	\$ 324,000.00
Div 16	Electrical	1	LS	\$ 80,000.00	\$ 80,000.00	\$ 20,000.00	\$ 20,000.00	\$ 100,000.00	\$ 100,000.00
Div 16	Instrumentation and Controls	1	LS	\$ 81,000.00	\$ 81,000.00	\$ 54,000.00	\$ 54,000.00	\$ 135,000.00	\$ 135,000.00
	Subtotal				\$ 1,040,800.00		\$ 313,100.00		\$ 1,353,900.00
	Contractor Overhead and Profit (20%)								\$ 270,780.00
	AACE Class IV Estimate Contingencies (30%)								\$ 487,404.00
	Engineering Fees and Other Costs (20%)								\$ 422,416.80
	<b>Total Capital Cost</b>								<b>\$ 2,534,500.00</b>

CSI # or Dwg #	Description	Quantity		Material		Labor		Total Cost	
		Amount	Unit	Unit Material \$	Total \$	Unit Labor \$	Total \$	Unit Price \$	Total Cost \$
	<b>Installation of IX Model 8 Treatment System (2 Vessels) @ Well/Treatment Facilities</b>								
Div 01	Mobilization/Demobilization	1	LS	\$ -	\$ -	\$ 60,000.00	\$ 60,000.00	\$ 60,000.00	\$ 60,000.00
Div 01	Bonding and Insurance	1	LS	\$ 12,000.00	\$ 12,000.00	\$ -	\$ -	\$ 12,000.00	\$ 12,000.00
Div 01	Contractor's Project Management	1	LS	\$ -	\$ -	\$ 50,000.00	\$ 50,000.00	\$ 50,000.00	\$ 50,000.00
Div 02	Landscaping and Screening	1	LS	\$ 7,500.00	\$ 7,500.00	\$ 2,600.00	\$ 2,600.00	\$ 10,100.00	\$ 10,100.00
Div 03	Concrete Foundation, Treatment Vessels	1	LS	\$ 32,000.00	\$ 32,000.00	\$ -	\$ -	\$ 32,000.00	\$ 32,000.00
Div 03	Concrete On Site Backwash Storage Chambers	1	LS	\$ 77,000.00	\$ 77,000.00	\$ -	\$ -	\$ 77,000.00	\$ 77,000.00
Div 11	Ion Exchange Equipment (Vessels, Piping, Valves)	1	LS	\$ 231,500.00	\$ 231,500.00	\$ 20,200.00	\$ 20,200.00	\$ 251,700.00	\$ 251,700.00
Div 11	Ion Exchange Media	1	LS	\$ 116,600.00	\$ 116,600.00	\$ -	\$ -	\$ 116,600.00	\$ 116,600.00
Div 11	Pre-Filtration Units	1	LS	\$ 25,000.00	\$ 25,000.00	\$ 2,600.00	\$ 2,600.00	\$ 27,600.00	\$ 27,600.00
Div 11	Well Pump and Motor Upsizing	1	LS	\$ 30,000.00	\$ 30,000.00	\$ -	\$ -	\$ 30,000.00	\$ 30,000.00
Div 11	Piping/Chlorine Feed Modifications	1	LS	\$ 70,000.00	\$ 70,000.00	\$ 17,500.00	\$ 17,500.00	\$ 87,500.00	\$ 87,500.00
Div 11	Chlorine Contact Pipe at 30 inch Diameter	1	LS	\$ 22,400.00	\$ 22,400.00	\$ 5,600.00	\$ 5,600.00	\$ 28,000.00	\$ 28,000.00
Div 11	Backflow Preventer	1	LS	\$ 10,000.00	\$ 10,000.00	\$ 5,000.00	\$ 5,000.00	\$ 15,000.00	\$ 15,000.00
Div 11	Equipment Startup and Testing	1	LS	\$ -	\$ -	\$ 50,000.00	\$ 50,000.00	\$ 50,000.00	\$ 50,000.00
Div 11	Initial Backwash, Rinsing and Vessels Startup	1	LS	\$ -	\$ -	\$ 25,600.00	\$ 25,600.00	\$ 25,600.00	\$ 25,600.00
Div 13	CMU Enclosure, Complete	1	LS	\$ 408,000.00	\$ 408,000.00	\$ -	\$ -	\$ 408,000.00	\$ 408,000.00
Div 16	Electrical	1	LS	\$ 80,000.00	\$ 80,000.00	\$ 20,000.00	\$ 20,000.00	\$ 100,000.00	\$ 100,000.00
Div 16	Instrumentation and Controls	1	LS	\$ 81,000.00	\$ 81,000.00	\$ 54,000.00	\$ 54,000.00	\$ 135,000.00	\$ 135,000.00
	Subtotal				\$ 1,203,000.00		\$ 313,100.00		\$ 1,516,100.00
	Contractor Overhead and Profit (20%)								\$ 303,220.00
	AACE Class IV Estimate Contingencies (30%)								\$ 545,796.00
	Engineering Fees and Other Costs (20%)								\$ 473,023.20
	<b>Total Capital Cost</b>								<b>\$ 2,838,100.00</b>

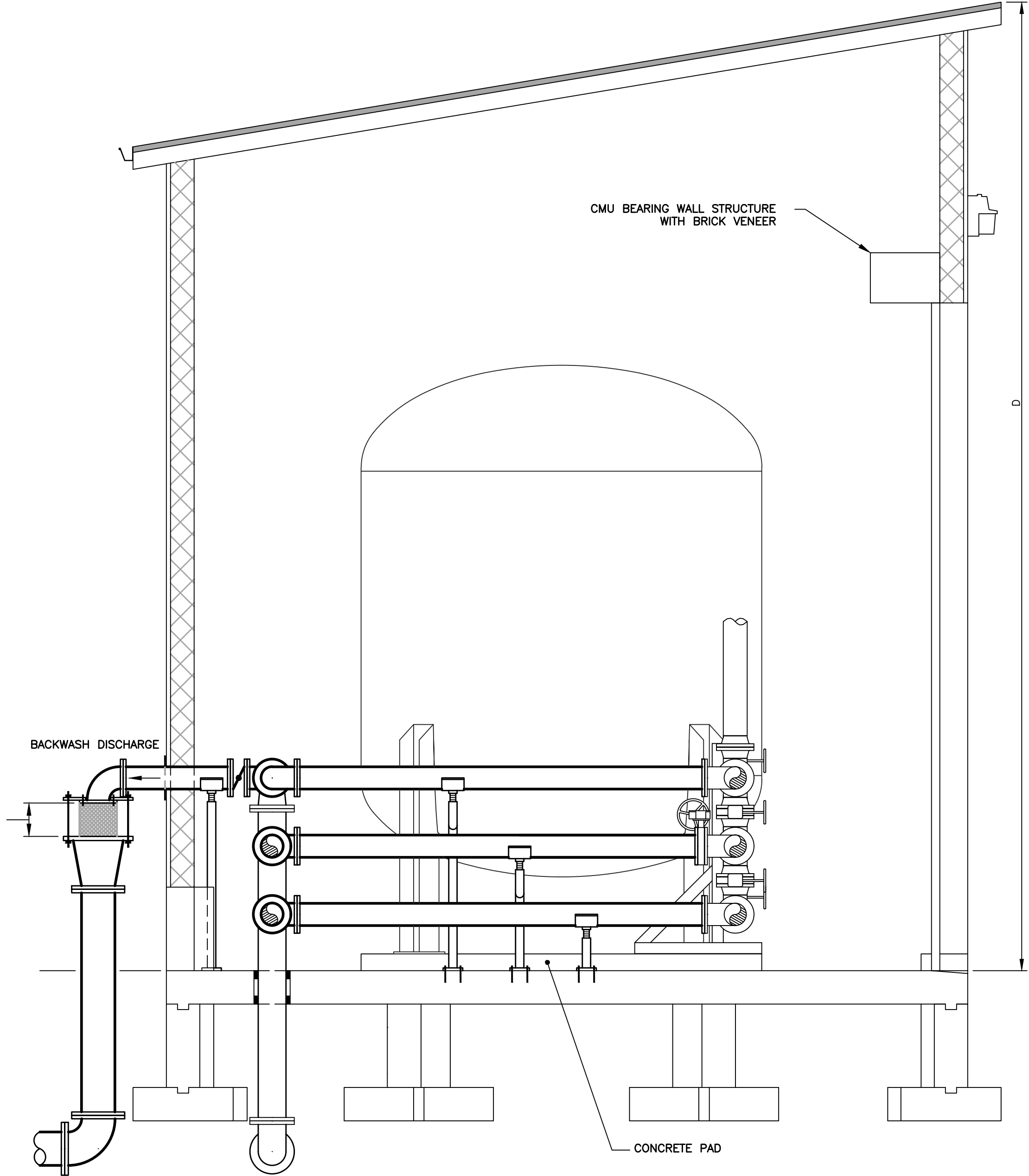
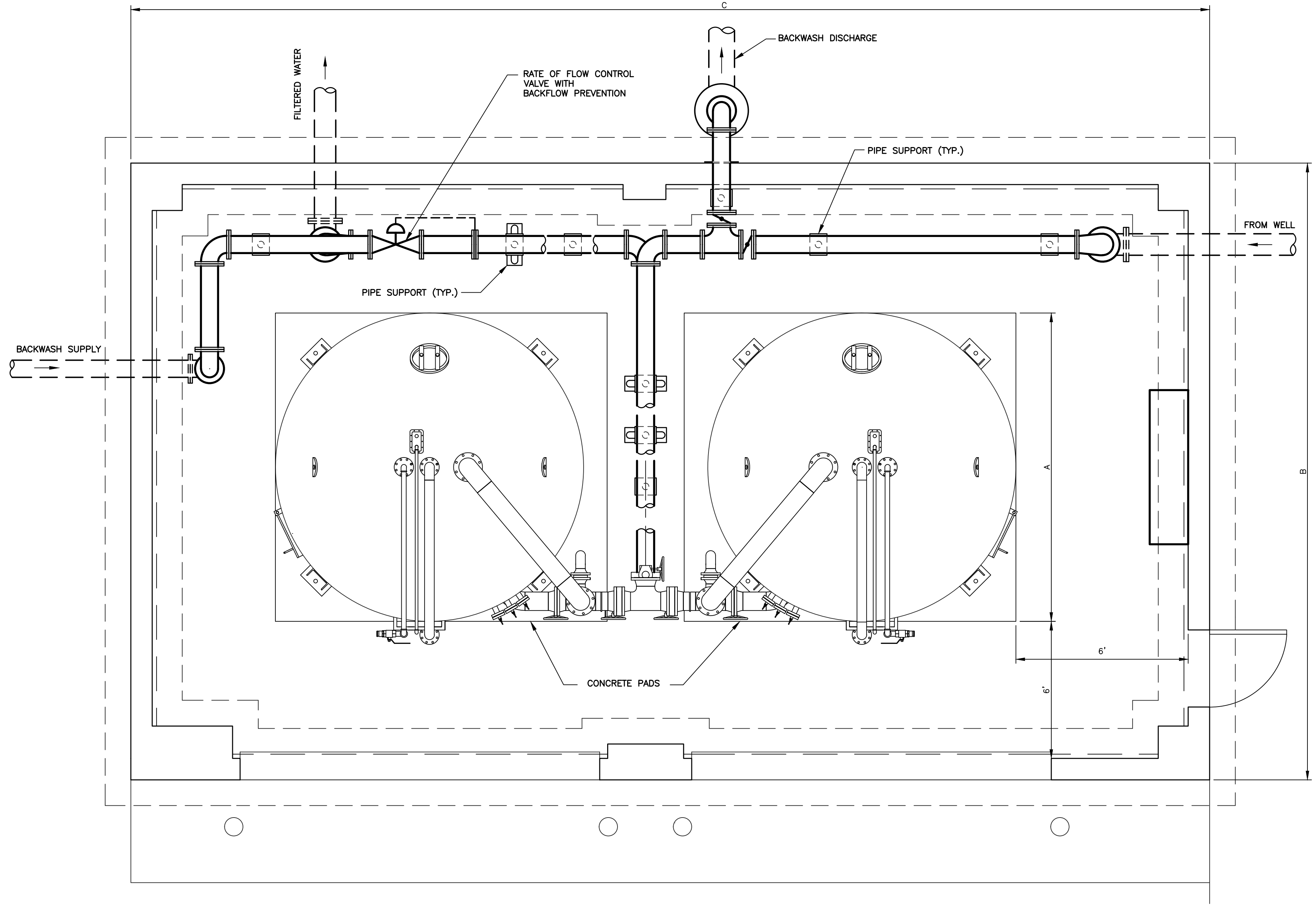
CSI # or Dwg #	Description	Quantity		Material		Labor		Total Cost	
		Amount	Unit	Unit Material \$	Total \$	Unit Labor \$	Total \$	Unit Price \$	Total Cost \$
	<b>Installation of IX Model 10 Treatment System (2 Vessels) @ Well/Treatment Facilities</b>								
Div 01	Mobilization/Demobilization	1	LS	\$ -	\$ -	\$ 60,000.00	\$ 60,000.00	\$ 60,000.00	\$ 60,000.00
Div 01	Bonding and Insurance	1	LS	\$ 12,000.00	\$ 12,000.00	\$ -	\$ -	\$ 12,000.00	\$ 12,000.00
Div 01	Contractor's Project Management	1	LS	\$ -	\$ -	\$ 50,000.00	\$ 50,000.00	\$ 50,000.00	\$ 50,000.00
Div 02	Landscaping and Screening	1	LS	\$ 7,500.00	\$ 7,500.00	\$ 2,600.00	\$ 2,600.00	\$ 10,100.00	\$ 10,100.00
Div 03	Concrete Foundation, Treatment Vessels	1	LS	\$ 43,600.00	\$ 43,600.00	\$ -	\$ -	\$ 43,600.00	\$ 43,600.00
Div 03	Concrete On Site Backwash Storage Chambers	1	LS	\$ 104,300.00	\$ 104,300.00	\$ -	\$ -	\$ 104,300.00	\$ 104,300.00
Div 11	Ion Exchange Equipment (Vessels, Piping, Valves)	1	LS	\$ 280,200.00	\$ 280,200.00	\$ 20,200.00	\$ 20,200.00	\$ 300,400.00	\$ 300,400.00
Div 11	Ion Exchange Media	1	LS	\$ 195,150.00	\$ 195,150.00	\$ -	\$ -	\$ 195,150.00	\$ 195,150.00
Div 11	Pre-Filtration Units	1	LS	\$ 25,000.00	\$ 25,000.00	\$ 2,600.00	\$ 2,600.00	\$ 27,600.00	\$ 27,600.00
Div 11	Well Pump and Motor Upsizing	1	LS	\$ 30,000.00	\$ 30,000.00	\$ -	\$ -	\$ 30,000.00	\$ 30,000.00
Div 11	Piping/Chlorine Feed Modifications	1	LS	\$ 70,000.00	\$ 70,000.00	\$ 17,500.00	\$ 17,500.00	\$ 87,500.00	\$ 87,500.00
Div 11	Chlorine Contact Pipe at 30 inch Diameter	1	LS	\$ 22,400.00	\$ 22,400.00	\$ 5,600.00	\$ 5,600.00	\$ 28,000.00	\$ 28,000.00
Div 11	Backflow Preventer	1	LS	\$ 10,000.00	\$ 10,000.00	\$ 5,000.00	\$ 5,000.00	\$ 15,000.00	\$ 15,000.00
Div 11	Equipment Startup and Testing	1	LS	\$ -	\$ -	\$ 50,000.00	\$ 50,000.00	\$ 50,000.00	\$ 50,000.00
Div 11	Initial Backwash, Rinsing and Vessels Startup	1	LS	\$ -	\$ -	\$ 25,600.00	\$ 25,600.00	\$ 25,600.00	\$ 25,600.00
Div 13	CMU Enclosure, Complete	1	LS	\$ 543,400.00	\$ 543,400.00	\$ -	\$ -	\$ 543,400.00	\$ 543,400.00
Div 16	Electrical	1	LS	\$ 80,000.00	\$ 80,000.00	\$ 20,000.00	\$ 20,000.00	\$ 100,000.00	\$ 100,000.00
Div 16	Instrumentation and Controls	1	LS	\$ 81,000.00	\$ 81,000.00	\$ 54,000.00	\$ 54,000.00	\$ 135,000.00	\$ 135,000.00
	Subtotal				\$ 1,504,550.00		\$ 313,100.00		\$ 1,817,650.00
	Contractor Overhead and Profit (20%)								\$ 363,530.00
	AACE Class IV Estimate Contingencies (30%)								\$ 654,354.00
	Engineering Fees and Other Costs (20%)								\$ 567,106.80
	<b>Total Capital Cost</b>								<b>\$ 3,402,600.00</b>

CSI # or Dwg #	Description	Quantity		Material		Labor		Total Cost	
		Amount	Unit	Unit Material \$	Total \$	Unit Labor \$	Total \$	Unit Price \$	Total Cost \$
	<b>Installation of IX Model 12 Treatment System (2 Vessels) @ Well/Treatment Facilities</b>								
Div 01	Mobilization/Demobilization	1	LS	\$ -	\$ -	\$ 60,000.00	\$ 60,000.00	\$ 60,000.00	\$ 60,000.00
Div 01	Bonding and Insurance	1	LS	\$ 12,000.00	\$ 12,000.00	\$ -	\$ -	\$ 12,000.00	\$ 12,000.00
Div 01	Contractor's Project Management	1	LS	\$ -	\$ -	\$ 50,000.00	\$ 50,000.00	\$ 50,000.00	\$ 50,000.00
Div 02	Landscaping and Screening	1	LS	\$ 7,500.00	\$ 7,500.00	\$ 2,600.00	\$ 2,600.00	\$ 10,100.00	\$ 10,100.00
Div 03	Concrete Foundation, Treatment Vessels	1	LS	\$ 60,400.00	\$ 60,400.00	\$ -	\$ -	\$ 60,400.00	\$ 60,400.00
Div 03	Concrete On Site Backwash Storage Chambers	1	LS	\$ 139,300.00	\$ 139,300.00	\$ -	\$ -	\$ 139,300.00	\$ 139,300.00
Div 11	Ion Exchange Equipment (Vessels, Piping, Valves)	1	LS	\$ 327,500.00	\$ 327,500.00	\$ 20,200.00	\$ 20,200.00	\$ 347,700.00	\$ 347,700.00
Div 11	Ion Exchange Media	1	LS	\$ 271,700.00	\$ 271,700.00	\$ -	\$ -	\$ 271,700.00	\$ 271,700.00
Div 11	Pre-Filtration Units	1	LS	\$ 25,000.00	\$ 25,000.00	\$ 2,600.00	\$ 2,600.00	\$ 27,600.00	\$ 27,600.00
Div 11	Well Pump and Motor Upsizing	1	LS	\$ 30,000.00	\$ 30,000.00	\$ -	\$ -	\$ 30,000.00	\$ 30,000.00
Div 11	Piping/Chlorine Feed Modifications	1	LS	\$ 140,000.00	\$ 140,000.00	\$ 35,000.00	\$ 35,000.00	\$ 175,000.00	\$ 175,000.00
Div 11	Chlorine Contact Pipe at 30 inch Diameter	1	LS	\$ 22,400.00	\$ 22,400.00	\$ 5,600.00	\$ 5,600.00	\$ 28,000.00	\$ 28,000.00
Div 11	Backflow Preventer	1	LS	\$ 10,000.00	\$ 10,000.00	\$ 5,000.00	\$ 5,000.00	\$ 15,000.00	\$ 15,000.00
Div 11	Equipment Startup and Testing	1	LS	\$ -	\$ -	\$ 50,000.00	\$ 50,000.00	\$ 50,000.00	\$ 50,000.00
Div 11	Initial Backwash, Rinsing and Vessels Startup	1	LS	\$ -	\$ -	\$ 25,600.00	\$ 25,600.00	\$ 25,600.00	\$ 25,600.00
Div 13	CMU Enclosure, Complete	1	LS	\$ 655,200.00	\$ 655,200.00	\$ -	\$ -	\$ 655,200.00	\$ 655,200.00
Div 16	Electrical	1	LS	\$ 80,000.00	\$ 80,000.00	\$ 20,000.00	\$ 20,000.00	\$ 100,000.00	\$ 100,000.00
Div 16	Instrumentation and Controls	1	LS	\$ 81,000.00	\$ 81,000.00	\$ 54,000.00	\$ 54,000.00	\$ 135,000.00	\$ 135,000.00
	Subtotal				\$ 3,527,550.00		\$ 717,700.00		\$ 2,192,600.00
	Contractor Overhead and Profit (20%)								\$ 438,520.00
	AACE Class IV Estimate Contingencies (30%)								\$ 789,336.00
	Engineering Fees and Other Costs (20%)								\$ 684,091.20
	<b>Total Capital Cost</b>								<b>\$ 4,104,500.00</b>



## **F. Plan and Section of Vessel Layout**

Reference Table for Dimension Lengths (feet)				
Vessel Model	A	B	C	D
Model 6	6	18	30	26
Model 8	8	20	34	26
Model 10	10	22	38	26
Model 12	12	24	42	26
Model 12-40	12	24	42	33



GAC VESSELS – PLAN

SECTION A – A

© Mott MacDonald  
 This document is issued for the party which commissioned it and for specific purposes connected with the captioned project only. It should not be relied upon by any other party or used for any other purpose. We accept no responsibility for the consequences of this document being relied upon by any other party, or being used for any other purpose, or containing any error or omission which is due to an error or omission in data supplied to us by other parties.

	111 Wood Avenue South Iselin NJ 08830-4112 United States of America Certificate No. 24GA28016600	<b>RIDGEWOOD WATER</b> 131 NORTH MAPLE AVENUE RIDGEWOOD, NJ 08541	<b>EARL C. SCHNEIDER</b> NJ PROFESSIONAL ENGINEER LIC. No. 39397	Designed Drawn Dwg check Scale at ANSI D	Eng check Coordination Approved Status <b>PRE</b>	Rev Security <b>STD</b>	Title <b>PLAN AND SECTION FOR          FILTER VESSEL LAYOUT          GAC VESSELS</b>	
	T +1 (800) 832 3272 F +1 (973) 376 1072 www.mottmacamericas.com	Project Number <b>403527</b>	B/O 	Total <b>2</b>	Drawing Number 	Date 		
	Rev 	Date 	Drawn 	Description 	Ch'k'd 	App'd 		

## G. Orthographic Site Mapping with Preliminary Treatment Layout

**REDACTED**

## H. Site Investigation Forms



### Appendix H - Table of Contents

Site Name	Municipality	Appendix Form #
Irving	Ridgewood	1
Twinney TF	Ridgewood	2
Salem	Ridgewood	3
E. Saddle River	Ridgewood	4
Glen Rock	Glen Rock Borough	5
East Ridgewood TF	Ridgewood	6
West End	Ridgewood	7
Prospect TF	Glen Rock Borough	8
Stevens	Glen Rock Borough	9
Main TF/South Side	Glen Rock Borough	10
Lafayette	Wyckoff Township	11
Weisch	Wyckoff Township	12
Farview	Ridgewood	13
College	Midland Park Borough	14
Cedar Hill Wellfield	Wyckoff Township	15
Mountain	Wyckoff Township	16
Russell	Wyckoff Township	17
Ames TF	Wyckoff Township	18
Meer	Wyckoff Township	19
Eder	Wyckoff Township	20
Van Houten TF	Wyckoff Township	21
Midland	Wyckoff Township	22
Waldo	Midland Park Borough	23
Wortendyke TF	Midland Park Borough	24
Marr Well	Ridgewood	25
Ravine	Ridgewood	26
Lakeview	Wyckoff Township	27

**403527 - Ridgewood PFAS Master Plan**

**Survey Date:** Aug 9, 2019

**Site Name:** Irving Well

**Inspector Name:** ASK

**Site Characteristics**

**How is the site secured?**

Fence with locked gate

**Does the proposed treatment location seem feasible?**

No

**Are there any conditions not visible in the orthophotography that would prohibit installation of treatment?**

Not enough space, overhanging trees, flood hazard area. Owner notes that NJDEP would not allow permanent generator due to flood hazard concerns. Temporary unit suggested.

**What surface types are at the proposed treatment location?**

Grass, gravel

**Are there any site features that prohibit installation of a concrete equipment pad?**

Shape of site.

**Community Impact**

**Describe the surrounding area:**

Residential

**Add note:**

**Are there any residential neighbors within 200 ft?**

Yes

**Is there any screening on the site for neighbors within 200 ft?**

Adequate existing trees for screening.

**If applicable, approximately how tall is the screening?**

Taller than power lines

**Would construction activities cause temporary hardships to surrounding neighbors?**

**Notes:**

**Constructability**

**Is there adequate distance from power lines for crane operation?**

Yes

**Notes:**

**Is there room on site for staging and parking construction equipment?**

Yes

**Notes:**

**Are there issues with access to the site for construction vehicles?**

Yes

**Add Note:**

Power lines may make delivery of equipment and crane challenging.

**Environmental**

**Are there any streams or creeks near the site?**

Yes

**Notes:**

Adjacent. Within 50 ft

**Is the site adequately drained?**

No

**Notes:**

No pooling, high potential for flooding due to river.

**Would the installation of treatment potentially require removal of existing trees?**

Yes

**Notes:**

**Operational Considerations**

**Is there a sewer manhole near the site?**

No

**What is the approximate distance to the sewer manhole?**

**Would it be possible to get a trailer and pickup truck on site?**

Yes

**Notes:**

**What is the size of the incoming electrical service (Volts)?**

480

**Future Accessibility and Maintenance**

**Will proposed location conflict with access to existing facilities?**

Yes

**Notes:**



**Photo Section**



**Notes:**

**403527 - Ridgewood PFAS Master Plan**

**Survey Date:** Aug 9, 2019

**Site Name:** Twinney TF

**Inspector Name:** Ask

**Site Characteristics**

**How is the site secured?**

Fence with gate locked

**Does the proposed treatment location seem feasible?**

Yes

**Are there any conditions not visible in the orthophotography that would prohibit installation of treatment?**

No

**What surface types are at the proposed treatment location?**

Vessels on concrete pad existing.

**Are there any site features that prohibit installation of a concrete equipment pad?**

No. Pad existing

**Community Impact**

**Describe the surrounding area:**

Residential

**Add note:**

**Are there any residential neighbors within 200 ft?**

Yes

**Is there any screening on the site for neighbors within 200 ft?**

Small amount of trees. Additional trees potentially required.

**If applicable, approximately how tall is the screening?**

Adequate

**Would construction activities cause temporary hardships to surrounding neighbors?**

**Notes:**

**Constructability**

**Is there adequate distance from power lines for crane operation?**

Yes

**Notes:**

**Is there room on site for staging and parking construction equipment?**

Yes

**Notes:**

**Are there issues with access to the site for construction vehicles?**

No

**Add Note:**

**Environmental**

**Are there any streams or creeks near the site?**

No

**Notes:**

**Is the site adequately drained?**

No

**Notes:**

**Would the installation of treatment potentially require removal of existing trees?**

Yes

**Notes:**

**Operational Considerations**

**Is there a sewer manhole near the site?**

Yes

**What is the approximate distance to the sewer manhole?**

In Franklin Turnpike, 400 ft

**Would it be possible to get a trailer and pickup truck on site?**

Yes

**Notes:**

**What is the size of the incoming electrical service (Volts)?**

480

**Future Accessibility and Maintenance**

**Will proposed location conflict with access to existing facilities?**

No

**Notes:**



**Photo Section**



Sewer manhole





Entrance to site





Power supply





Air stripper

Notes:

**403527 - Ridgewood PFAS Master Plan**

**Survey Date:** Aug 9, 2019

**Site Name:** Salem Well

**Inspector Name:** Ask

**Site Characteristics**

**How is the site secured?**

Unsecured site

**Does the proposed treatment location seem feasible?**

No

**Are there any conditions not visible in the orthophotography that would prohibit installation of treatment?**

Steep slope, field

**What surface types are at the proposed treatment location?**

Pavement driveway, grass

**Are there any site features that prohibit installation of a concrete equipment pad?**

Slope

**Community Impact**

**Describe the surrounding area:**

Residential

**Add note:**

**Are there any residential neighbors within 200 ft?**

Yes

**Is there any screening on the site for neighbors within 200 ft?**

Screening will be required for school

**If applicable, approximately how tall is the screening?**

Need

**Would construction activities cause temporary hardships to surrounding neighbors?**

**Notes:**

**Constructability**

**Is there adequate distance from power lines for crane operation?**

Yes

**Notes:**

**Is there room on site for staging and parking construction equipment?**

Yes

**Notes:**

**Are there issues with access to the site for construction vehicles?**

No

**Add Note:**

**Environmental**

**Are there any streams or creeks near the site?**

No

**Notes:**

**Is the site adequately drained?**

No

**Notes:**

**Would the installation of treatment potentially require removal of existing trees?**

No

**Notes:**

### Operational Considerations

**Is there a sewer manhole near the site?**

Yes

**What is the approximate distance to the sewer manhole?**

From GIS

**Would it be possible to get a trailer and pickup truck on site?**

Yes

**Notes:**

**What is the size of the incoming electrical service (Volts)?**

480

### Future Accessibility and Maintenance

**Will proposed location conflict with access to existing facilities?**

No

**Notes:**



**Photo Section**



New location for treatment



Back of building



Adjacent to school



**Notes:**

**403527 - Ridgewood PFAS Master Plan**

**Survey Date:** Aug 9, 2019

**Site Name:** East Saddle River Well

**Inspector Name:** Ask

**Site Characteristics**

**How is the site secured?**

Fence with locked gate

**Does the proposed treatment location seem feasible?**

No

**Are there any conditions not visible in the orthophotography that would prohibit installation of treatment?**

No

**What surface types are at the proposed treatment location?**

Grass

**Are there any site features that prohibit installation of a concrete equipment pad?**

No space

**Community Impact**

**Describe the surrounding area:**

Residential

**Add note:**

**Are there any residential neighbors within 200 ft?**

Yes

**Is there any screening on the site for neighbors within 200 ft?**

Yes, tree screening



**If applicable, approximately how tall is the screening?**

10 ft

**Would construction activities cause temporary hardships to surrounding neighbors?**

**Notes:**

**Constructability**

**Is there adequate distance from power lines for crane operation?**

No

**Notes:**

**Is there room on site for staging and parking construction equipment?**

No

**Notes:**

**Are there issues with access to the site for construction vehicles?**

Yes

**Add Note:**

Lack of space

**Environmental**

**Are there any streams or creeks near the site?**

Yes

**Notes:**

Adjacent

**Is the site adequately drained?**

No

**Notes:**

**Would the installation of treatment potentially require removal of existing trees?**

Yes

**Notes:**

### Operational Considerations

**Is there a sewer manhole near the site?**

Yes

**What is the approximate distance to the sewer manhole?**

**Would it be possible to get a trailer and pickup truck on site?**

Yes

**Notes:**

**What is the size of the incoming electrical service (Volts)?**

240

### Future Accessibility and Maintenance

**Will proposed location conflict with access to existing facilities?**

No

**Notes:**

**Photo Section**

















River

**403527 - Ridgewood PFAS Master Plan**

**Survey Date:** Aug 9, 2019

**Site Name:** Glen Rock TF

**Inspector Name:** Ask

**Site Characteristics**

**How is the site secured?**

Fence with locked gate

**Does the proposed treatment location seem feasible?**

No

**Are there any conditions not visible in the orthophotography that would prohibit installation of treatment?**

Additional driveway for pool

**What surface types are at the proposed treatment location?**

Grass, pavement

**Are there any site features that prohibit installation of a concrete equipment pad?**

No

**Community Impact**

**Describe the surrounding area:**

Residential

**Add note:**

**Are there any residential neighbors within 200 ft?**

No

**Is there any screening on the site for neighbors within 200 ft?**



**If applicable, approximately how tall is the screening?**

**Would construction activities cause temporary hardships to surrounding neighbors?**

**Notes:**

**Constructability**

**Is there adequate distance from power lines for crane operation?**

Yes

**Notes:**

**Is there room on site for staging and parking construction equipment?**

Yes

**Notes:**

**Are there issues with access to the site for construction vehicles?**

Yes

**Add Note:**

Additional building

**Environmental**

**Are there any streams or creeks near the site?**

No

**Notes:**

**Is the site adequately drained?**

No

**Notes:**

**Would the installation of treatment potentially require removal of existing trees?**

No

**Notes:**

**Operational Considerations**

**Is there a sewer manhole near the site?**

No

**What is the approximate distance to the sewer manhole?**

**Would it be possible to get a trailer and pickup truck on site?**

Yes

**Notes:**

**What is the size of the incoming electrical service (Volts)?**

240

**Future Accessibility and Maintenance**

**Will proposed location conflict with access to existing facilities?**

No

**Notes:**

**Photo Section**











**Notes:**

Potential to route to/from west end.. Possible to add treatment but not ideal Jose

**403527 - Ridgewood PFAS Master Plan**

**Survey Date:** Aug 9, 2019

**Site Name:** East Ridgewood TF

**Inspector Name:** Ask

**Site Characteristics**

**How is the site secured?**

Fence w locked gate

**Does the proposed treatment location seem feasible?**

Yes

**Are there any conditions not visible in the orthophotography that would prohibit installation of treatment?**

No

**What surface types are at the proposed treatment location?**

Pavement driveway, grass

**Are there any site features that prohibit installation of a concrete equipment pad?**

No

**Community Impact**

**Describe the surrounding area:**

Commercial

**Add note:**

**Are there any residential neighbors within 200 ft?**

No

**Is there any screening on the site for neighbors within 200 ft?**

**If applicable, approximately how tall is the screening?**

**Would construction activities cause temporary hardships to surrounding neighbors?**

**Notes:**

**Constructability**

**Is there adequate distance from power lines for crane operation?**

Yes

**Notes:**

**Is there room on site for staging and parking construction equipment?**

Yes

**Notes:**

**Are there issues with access to the site for construction vehicles?**

No

**Add Note:**

**Environmental**

**Are there any streams or creeks near the site?**

No

**Notes:**

**Is the site adequately drained?**

No



**Notes:**

**Would the installation of treatment potentially require removal of existing trees?**

No

**Notes:**

**Operational Considerations**

**Is there a sewer manhole near the site?**

Yes

**What is the approximate distance to the sewer manhole?**

**Would it be possible to get a trailer and pickup truck on site?**

Yes

**Notes:**

**What is the size of the incoming electrical service (Volts)?**

240

**Future Accessibility and Maintenance**

**Will proposed location conflict with access to existing facilities?**

No

**Notes:**

**Photo Section**









Pole for old radio ant — can be removed Jose M







Roof hatches for pump replacement

**Notes:**

22 x 42 available

**403527 - Ridgewood PFAS Master Plan**

**Survey Date:** Aug 9, 2019

**Site Name:** West End TF

**Inspector Name:** Ask

**Site Characteristics**

**How is the site secured?**

Fence with locked fence

**Does the proposed treatment location seem feasible?**

Yes

**Are there any conditions not visible in the orthophotography that would prohibit installation of treatment?**

No

**What surface types are at the proposed treatment location?**

Pavement driveway, grass

**Are there any site features that prohibit installation of a concrete equipment pad?**

No

**Community Impact**

**Describe the surrounding area:**

Residential

**Add note:**

**Are there any residential neighbors within 200 ft?**

Yes

**Is there any screening on the site for neighbors within 200 ft?**

Not enough trees to screen site, more trees needed for screening

**If applicable, approximately how tall is the screening?**

Height adequate, density needed

**Would construction activities cause temporary hardships to surrounding neighbors?**

**Notes:**

**Constructability**

**Is there adequate distance from power lines for crane operation?**

Yes

**Notes:**

**Is there room on site for staging and parking construction equipment?**

Yes

**Notes:**

**Are there issues with access to the site for construction vehicles?**

No

**Add Note:**

**Environmental**

**Are there any streams or creeks near the site?**

No

**Notes:**

**Is the site adequately drained?**

No



**Notes:**

**Would the installation of treatment potentially require removal of existing trees?**

No

**Notes:**

### Operational Considerations

**Is there a sewer manhole near the site?**

Yes

**What is the approximate distance to the sewer manhole?**

Available on street

**Would it be possible to get a trailer and pickup truck on site?**

Yes

**Notes:**

**What is the size of the incoming electrical service (Volts)?**

240

### Future Accessibility and Maintenance

**Will proposed location conflict with access to existing facilities?**

No

**Notes:**

**Photo Section**





Proposed location to treat west end and glen rock











**Notes:**

**403527 - Ridgewood PFAS Master Plan**

**Survey Date:** Aug 9, 2019

**Site Name:** Prospect TF

**Inspector Name:** Ask

**Site Characteristics**

**How is the site secured?**

Not secured

**Does the proposed treatment location seem feasible?**

Yes

**Are there any conditions not visible in the orthophotography that would prohibit installation of treatment?**

No

**What surface types are at the proposed treatment location?**

Pavement driveway

**Are there any site features that prohibit installation of a concrete equipment pad?**

No

**Community Impact**

**Describe the surrounding area:**

Industrial

**Add note:**

**Are there any residential neighbors within 200 ft?**

No

**Is there any screening on the site for neighbors within 200 ft?**

**If applicable, approximately how tall is the screening?**

**Would construction activities cause temporary hardships to surrounding neighbors?**

**Notes:**

**Constructability**

**Is there adequate distance from power lines for crane operation?**

Yes

**Notes:**

**Is there room on site for staging and parking construction equipment?**

Yes

**Notes:**

**Are there issues with access to the site for construction vehicles?**

No

**Add Note:**

**Environmental**

**Are there any streams or creeks near the site?**

No

**Notes:**

**Is the site adequately drained?**

No

**Notes:**

**Would the installation of treatment potentially require removal of existing trees?**

Yes

**Notes:**

Along fence line

**Operational Considerations**

**Is there a sewer manhole near the site?**

Yes

**What is the approximate distance to the sewer manhole?**

50 ft

**Would it be possible to get a trailer and pickup truck on site?**

Yes

**Notes:**

**What is the size of the incoming electrical service (Volts)?**

240

**Future Accessibility and Maintenance**

**Will proposed location conflict with access to existing facilities?**

No

**Notes:**



**Photo Section**





Proposed location











IX pilot









**Notes:**



**403527 - Ridgewood PFAS Master Plan**

**Survey Date:** Aug 9, 2019

**Site Name:** Stevens Well

**Inspector Name:** Ask

**Site Characteristics**

**How is the site secured?**

Fence with locked gate

**Does the proposed treatment location seem feasible?**

Yes

**Are there any conditions not visible in the orthophotography that would prohibit installation of treatment?**

No

**What surface types are at the proposed treatment location?**

Pavement driveway, grass

**Are there any site features that prohibit installation of a concrete equipment pad?**

No

**Community Impact**

**Describe the surrounding area:**

Residential

**Add note:**

**Are there any residential neighbors within 200 ft?**

Yes

**Is there any screening on the site for neighbors within 200 ft?**

No screening

**If applicable, approximately how tall is the screening?**

**Would construction activities cause temporary hardships to surrounding neighbors?**

**Notes:**

**Constructability**

**Is there adequate distance from power lines for crane operation?**

Yes

**Notes:**

**Is there room on site for staging and parking construction equipment?**

Yes

**Notes:**

**Are there issues with access to the site for construction vehicles?**

No

**Add Note:**

**Environmental**

**Are there any streams or creeks near the site?**

No

**Notes:**

**Is the site adequately drained?**

No

**Notes:**

**Would the installation of treatment potentially require removal of existing trees?**

Yes

**Notes:**

And unused radio pole

**Operational Considerations**

**Is there a sewer manhole near the site?**

Yes

**What is the approximate distance to the sewer manhole?**

50 ft

**Would it be possible to get a trailer and pickup truck on site?**

Yes

**Notes:**

**What is the size of the incoming electrical service (Volts)?**

240

**Future Accessibility and Maintenance**

**Will proposed location conflict with access to existing facilities?**

Yes

**Notes:**

**Photo Section**













**Notes:**



**403527 - Ridgewood PFAS Master Plan**

**Survey Date:** Aug 9, 2019

**Site Name:** Main Treatment Facility/Southside Reservoir

**Inspector Name:** Ask

**Site Characteristics**

**How is the site secured?**

Fence with locked gate

**Does the proposed treatment location seem feasible?**

Yes

**Are there any conditions not visible in the orthophotography that would prohibit installation of treatment?**

PVWC interconnection proposed location will not interfere with PFAS treatment location

**What surface types are at the proposed treatment location?**

Pavement driveway, grass

**Are there any site features that prohibit installation of a concrete equipment pad?**

Steep slope of tank

**Community Impact**

**Describe the surrounding area:**

Mixed

**Add note:**

**Are there any residential neighbors within 200 ft?**

No

**Is there any screening on the site for neighbors within 200 ft?**

**If applicable, approximately how tall is the screening?**

**Would construction activities cause temporary hardships to surrounding neighbors?**

**Notes:**

**Constructability**

**Is there adequate distance from power lines for crane operation?**

Yes

**Notes:**

**Is there room on site for staging and parking construction equipment?**

Yes

**Notes:**

**Are there issues with access to the site for construction vehicles?**

No

**Add Note:**

**Environmental**

**Are there any streams or creeks near the site?**

No

**Notes:**

**Is the site adequately drained?**

No

**Notes:**

**Would the installation of treatment potentially require removal of existing trees?**

No

**Notes:**

### Operational Considerations

**Is there a sewer manhole near the site?**

Yes

**What is the approximate distance to the sewer manhole?**

Need to find

**Would it be possible to get a trailer and pickup truck on site?**

Yes

**Notes:**

**What is the size of the incoming electrical service (Volts)?**

480

### Future Accessibility and Maintenance

**Will proposed location conflict with access to existing facilities?**

No

**Notes:**

**Photo Section**



Fence can be moved by 10 ft – Location of future PVWC interconnect chamber shown in red







Location of future PVWC interconnect chamber





**Notes:**



**403527 - Ridgewood PFAS Master Plan**

**Survey Date:** Aug 9, 2019

**Site Name:** Lafayette Well

**Inspector Name:** Ask

**Site Characteristics**

**How is the site secured?**

Fence with locked gate

**Does the proposed treatment location seem feasible?**

Yes

**Are there any conditions not visible in the orthophotography that would prohibit installation of treatment?**

No

**What surface types are at the proposed treatment location?**

Pavement driveway and grass

**Are there any site features that prohibit installation of a concrete equipment pad?**

No

**Community Impact**

**Describe the surrounding area:**

Residential

**Add note:**

**Are there any residential neighbors within 200 ft?**

No

**Is there any screening on the site for neighbors within 200 ft?**

**If applicable, approximately how tall is the screening?**

**Would construction activities cause temporary hardships to surrounding neighbors?**

**Notes:**

**Constructability**

**Is there adequate distance from power lines for crane operation?**

Yes

**Notes:**

**Is there room on site for staging and parking construction equipment?**

Yes

**Notes:**

**Are there issues with access to the site for construction vehicles?**

No

**Add Note:**

**Environmental**

**Are there any streams or creeks near the site?**

No

**Notes:**

**Is the site adequately drained?**

No

**Notes:**

**Would the installation of treatment potentially require removal of existing trees?**

No

**Notes:**

**Operational Considerations**

**Is there a sewer manhole near the site?**

No

**What is the approximate distance to the sewer manhole?**

**Would it be possible to get a trailer and pickup truck on site?**

Yes

**Notes:**

**What is the size of the incoming electrical service (Volts)?**

480

**Future Accessibility and Maintenance**

**Will proposed location conflict with access to existing facilities?**

No

**Notes:**

**Photo Section**







**Notes:**

Ample space

**403527 - Ridgewood PFAS Master Plan**

**Survey Date:** Aug 9, 2019

**Site Name:** Weisch Well

**Inspector Name:** Ask

**Site Characteristics**

**How is the site secured?**

Fence with locked gate

**Does the proposed treatment location seem feasible?**

Yes

**Are there any conditions not visible in the orthophotography that would prohibit installation of treatment?**

Power line

**What surface types are at the proposed treatment location?**

Pavement driveway and grass

**Are there any site features that prohibit installation of a concrete equipment pad?**

No

**Community Impact**

**Describe the surrounding area:**

Residential

**Add note:**

**Are there any residential neighbors within 200 ft?**

Yes

**Is there any screening on the site for neighbors within 200 ft?**

Adequate screening

**If applicable, approximately how tall is the screening?**

Adequate

**Would construction activities cause temporary hardships to surrounding neighbors?**

**Notes:**

**Constructability**

**Is there adequate distance from power lines for crane operation?**

No

**Notes:**

Need to shift power line

**Is there room on site for staging and parking construction equipment?**

Yes

**Notes:**

**Are there issues with access to the site for construction vehicles?**

No

**Add Note:**

**Environmental**

**Are there any streams or creeks near the site?**

No

**Notes:**

**Is the site adequately drained?**

No



**Notes:**

**Would the installation of treatment potentially require removal of existing trees?**

Yes

**Notes:**

### Operational Considerations

**Is there a sewer manhole near the site?**

No

**What is the approximate distance to the sewer manhole?**

**Would it be possible to get a trailer and pickup truck on site?**

Yes

**Notes:**

**What is the size of the incoming electrical service (Volts)?**

480

### Future Accessibility and Maintenance

**Will proposed location conflict with access to existing facilities?**

No

**Notes:**

**Photo Section**









**Notes:**



**403527 - Ridgewood PFAS Master Plan**

**Survey Date:** Aug 12, 2019

**Site Name:** Farview Well

**Inspector Name:** Ask

**Site Characteristics**

**How is the site secured?**

Fence with locked gate

**Does the proposed treatment location seem feasible?**

Yes

**Are there any conditions not visible in the orthophotography that would prohibit installation of treatment?**

Large tree in front yard

**What surface types are at the proposed treatment location?**

Sidewalk

**Are there any site features that prohibit installation of a concrete equipment pad?**

No

**Community Impact**

**Describe the surrounding area:**

Residential

**Add note:**

**Are there any residential neighbors within 200 ft?**

Yes

**Is there any screening on the site for neighbors within 200 ft?**

No screening

**If applicable, approximately how tall is the screening?**

None

**Would construction activities cause temporary hardships to surrounding neighbors?**

Yes

**Notes:**

### Constructability

**Is there adequate distance from power lines for crane operation?**

No

**Notes:**

Overhead branches and power lines

**Is there room on site for staging and parking construction equipment?**

No

**Notes:**

Small yard

**Are there issues with access to the site for construction vehicles?**

No

**Add Note:**

### Environmental

**Are there any streams or creeks near the site?**

No

**Notes:**

**Is the site adequately drained?**

No

**Notes:**

**Would the installation of treatment potentially require removal of existing trees?**

Yes

**Notes:**

### Operational Considerations

**Is there a sewer manhole near the site?**

Yes

**What is the approximate distance to the sewer manhole?**

**Would it be possible to get a trailer and pickup truck on site?**

Yes

**Notes:**

**What is the size of the incoming electrical service (Volts)?**

240

Current facility upgrade design proposes new 480 V service, coordination already in place with PSEG

### Future Accessibility and Maintenance

**Will proposed location conflict with access to existing facilities?**

No

**Notes:**

**Photo Section**









**Notes:**

Lots of screening required

New Fence and site/facility improvements under design (electric upgrade to 480V service, new wider grass paver driveway to replace sidewalk-can be postponed)

**403527 - Ridgewood PFAS Master Plan**

**Survey Date:** Aug 12, 2019

**Site Name:** College Well

**Inspector Name:** Ask

**Site Characteristics**

**How is the site secured?**

Unsecured

**Does the proposed treatment location seem feasible?**

Yes

**Are there any conditions not visible in the orthophotography that would prohibit installation of treatment?**

Additional trees, power lines

**What surface types are at the proposed treatment location?**

Pavement driveway and grass

**Are there any site features that prohibit installation of a concrete equipment pad?**

No

**Community Impact**

**Describe the surrounding area:**

Residential

**Add note:**

**Are there any residential neighbors within 200 ft?**

Yes

**Is there any screening on the site for neighbors within 200 ft?**

Inadequate tree coverage

**If applicable, approximately how tall is the screening?**

Adequate height

**Would construction activities cause temporary hardships to surrounding neighbors?**

**Notes:**

**Constructability**

**Is there adequate distance from power lines for crane operation?**

Yes

**Notes:**

**Is there room on site for staging and parking construction equipment?**

Yes

**Notes:**

**Are there issues with access to the site for construction vehicles?**

No

**Add Note:**

**Environmental**

**Are there any streams or creeks near the site?**

No

**Notes:**

**Is the site adequately drained?**

No



**Notes:**

**Would the installation of treatment potentially require removal of existing trees?**

Yes

**Notes:**

### Operational Considerations

**Is there a sewer manhole near the site?**

No

**What is the approximate distance to the sewer manhole?**

**Would it be possible to get a trailer and pickup truck on site?**

Yes

**Notes:**

**What is the size of the incoming electrical service (Volts)?**

240

### Future Accessibility and Maintenance

**Will proposed location conflict with access to existing facilities?**

No

**Notes:**

**Photo Section**









Treatment location



**403527 - Ridgewood PFAS Master Plan**

**Survey Date:** Aug 12, 2019

**Site Name:** Cedar Hill Wellfield

**Inspector Name:** Ask

**Site Characteristics**

**How is the site secured?**

Fence with locked gate

**Does the proposed treatment location seem feasible?**

Yes

**Are there any conditions not visible in the orthophotography that would prohibit installation of treatment?**

No

**What surface types are at the proposed treatment location?**

Grass

**Are there any site features that prohibit installation of a concrete equipment pad?**

No

**Community Impact**

**Describe the surrounding area:**

Residential

**Add note:**

**Are there any residential neighbors within 200 ft?**

Yes

**Is there any screening on the site for neighbors within 200 ft?**

Inadequate tree cover

**If applicable, approximately how tall is the screening?**

**Would construction activities cause temporary hardships to surrounding neighbors?**

**Notes:**

**Constructability**

**Is there adequate distance from power lines for crane operation?**

Yes

**Notes:**

**Is there room on site for staging and parking construction equipment?**

Yes

**Notes:**

**Are there issues with access to the site for construction vehicles?**

No

**Add Note:**

**Environmental**

**Are there any streams or creeks near the site?**

No

**Notes:**

**Is the site adequately drained?**

No

**Notes:**

**Would the installation of treatment potentially require removal of existing trees?**

No

**Notes:**

**Operational Considerations**

**Is there a sewer manhole near the site?**

Yes

**What is the approximate distance to the sewer manhole?**

In street

**Would it be possible to get a trailer and pickup truck on site?**

Yes

**Notes:**

**What is the size of the incoming electrical service (Volts)?**

480

**Future Accessibility and Maintenance**

**Will proposed location conflict with access to existing facilities?**

No

**Notes:**

**Photo Section**



Inadequate tree cover





Proposed treatment location just inside gate

**Notes:**

Other wells can be piped to here. Ample space

**403527 - Ridgewood PFAS Master Plan**

**Survey Date:** Aug 12, 2019

**Site Name:** Mountain Well

**Inspector Name:** Ask

**Site Characteristics**

**How is the site secured?**

Fence with locked gate

**Does the proposed treatment location seem feasible?**

Yes

**Are there any conditions not visible in the orthophotography that would prohibit installation of treatment?**

Underground pipes and utilities

**What surface types are at the proposed treatment location?**

Pavement driveway and grass

**Are there any site features that prohibit installation of a concrete equipment pad?**

No

**Community Impact**

**Describe the surrounding area:**

Residential

**Add note:**

**Are there any residential neighbors within 200 ft?**

Yes

**Is there any screening on the site for neighbors within 200 ft?**

Inadequate screening by small bushes

**If applicable, approximately how tall is the screening?**

**Would construction activities cause temporary hardships to surrounding neighbors?**

Yes

**Notes:**

**Constructability**

**Is there adequate distance from power lines for crane operation?**

Yes

**Notes:**

**Is there room on site for staging and parking construction equipment?**

Yes

**Notes:**

**Are there issues with access to the site for construction vehicles?**

No

**Add Note:**

**Environmental**

**Are there any streams or creeks near the site?**

No

**Notes:**

**Is the site adequately drained?**

No



**Notes:**

**Would the installation of treatment potentially require removal of existing trees?**

No

**Notes:**

**Operational Considerations**

**Is there a sewer manhole near the site?**

Yes

**What is the approximate distance to the sewer manhole?**

In street

**Would it be possible to get a trailer and pickup truck on site?**

Yes

**Notes:**

**What is the size of the incoming electrical service (Volts)?**

480

**Future Accessibility and Maintenance**

**Will proposed location conflict with access to existing facilities?**

No

**Notes:**

**Photo Section**







Additional room available to move fence back by 20 ft



Mains underground

**Notes:**

new fence design underway to be bid. Coordinate relocation of fence now to accommodative GAC, to be discussed



**403527 - Ridgewood PFAS Master Plan**

**Survey Date:** Aug 12, 2019

**Site Name:** Russell Well

**Inspector Name:** Ask

**Site Characteristics**

**How is the site secured?**

Unsecured

**Does the proposed treatment location seem feasible?**

Yes

**Are there any conditions not visible in the orthophotography that would prohibit installation of treatment?**

No

**What surface types are at the proposed treatment location?**

Grass

**Are there any site features that prohibit installation of a concrete equipment pad?**

No

**Community Impact**

**Describe the surrounding area:**

Residential

**Add note:**

**Are there any residential neighbors within 200 ft?**

Yes

**Is there any screening on the site for neighbors within 200 ft?**

Yes,

**If applicable, approximately how tall is the screening?**

Adequatey

**Would construction activities cause temporary hardships to surrounding neighbors?**

**Notes:**

**Constructability**

**Is there adequate distance from power lines for crane operation?**

Yes

**Notes:**

**Is there room on site for staging and parking construction equipment?**

Yes

**Notes:**

**Are there issues with access to the site for construction vehicles?**

No

**Add Note:**

**Environmental**

**Are there any streams or creeks near the site?**

Yes

**Notes:**

**Is the site adequately drained?**

No

**Notes:**

**Would the installation of treatment potentially require removal of existing trees?**

Yes

**Notes:**

### Operational Considerations

**Is there a sewer manhole near the site?**

Yes

**What is the approximate distance to the sewer manhole?**

In street

**Would it be possible to get a trailer and pickup truck on site?**

Yes

**Notes:**

**What is the size of the incoming electrical service (Volts)?**

240

### Future Accessibility and Maintenance

**Will proposed location conflict with access to existing facilities?**

No

**Notes:**

**Photo Section**













Front yard



Proposed location

**Notes:**

Good location ample space



**403527 - Ridgewood PFAS Master Plan**

**Survey Date:** Aug 12, 2019

**Site Name:** Ames TF

**Inspector Name:** Ask

**Site Characteristics**

**How is the site secured?**

Unsecured

**Does the proposed treatment location seem feasible?**

No

**Are there any conditions not visible in the orthophotography that would prohibit installation of treatment?**

Generator

**What surface types are at the proposed treatment location?**

Grass and pavement driveway

**Are there any site features that prohibit installation of a concrete equipment pad?**

No

**Community Impact**

**Describe the surrounding area:**

Residential

**Add note:**

**Are there any residential neighbors within 200 ft?**

Yes

**Is there any screening on the site for neighbors within 200 ft?**

Yes

**If applicable, approximately how tall is the screening?**

Adequate

**Would construction activities cause temporary hardships to surrounding neighbors?**

**Notes:**

**Constructability**

**Is there adequate distance from power lines for crane operation?**

Yes

**Notes:**

**Is there room on site for staging and parking construction equipment?**

Yes

**Notes:**

**Are there issues with access to the site for construction vehicles?**

No

**Add Note:**

**Environmental**

**Are there any streams or creeks near the site?**

No

**Notes:**

**Is the site adequately drained?**

No

**Notes:**

**Would the installation of treatment potentially require removal of existing trees?**

Yes

**Notes:**

**Operational Considerations**

**Is there a sewer manhole near the site?**

No

**What is the approximate distance to the sewer manhole?**

**Would it be possible to get a trailer and pickup truck on site?**

Yes

**Notes:**

**What is the size of the incoming electrical service (Volts)?**

480

**Future Accessibility and Maintenance**

**Will proposed location conflict with access to existing facilities?**

No

**Notes:**

**Photo Section**







Across street





**Notes:**

**403527 - Ridgewood PFAS Master Plan**

**Survey Date:** Aug 12, 2019

**Site Name:** Meer Well

**Inspector Name:** Ask

**Site Characteristics**

**How is the site secured?**

Unsecured

**Does the proposed treatment location seem feasible?**

Yes

**Are there any conditions not visible in the orthophotography that would prohibit installation of treatment?**

No

**What surface types are at the proposed treatment location?**

Grass

**Are there any site features that prohibit installation of a concrete equipment pad?**

No

**Community Impact**

**Describe the surrounding area:**

Residential

**Add note:**

**Are there any residential neighbors within 200 ft?**

Yes

**Is there any screening on the site for neighbors within 200 ft?**

Inadequate screening

**If applicable, approximately how tall is the screening?**

10 ft

**Would construction activities cause temporary hardships to surrounding neighbors?**

**Notes:**

**Constructability**

**Is there adequate distance from power lines for crane operation?**

Yes

**Notes:**

**Is there room on site for staging and parking construction equipment?**

Yes

**Notes:**

**Are there issues with access to the site for construction vehicles?**

No

**Add Note:**

**Environmental**

**Are there any streams or creeks near the site?**

No

**Notes:**

**Is the site adequately drained?**

No



**Notes:**

**Would the installation of treatment potentially require removal of existing trees?**

Yes

**Notes:**

**Operational Considerations**

**Is there a sewer manhole near the site?**

No

**What is the approximate distance to the sewer manhole?**

**Would it be possible to get a trailer and pickup truck on site?**

Yes

**Notes:**

**What is the size of the incoming electrical service (Volts)?**

240

**Future Accessibility and Maintenance**

**Will proposed location conflict with access to existing facilities?**

No

**Notes:**

**Photo Section**









**Notes:**

Can bring to cedar hill



**403527 - Ridgewood PFAS Master Plan**

**Survey Date:** Aug 12, 2019

**Site Name:** Eder Well

**Inspector Name:** Ask

**Site Characteristics**

**How is the site secured?**

Unsecured (Proposed fence around immediate facility)

**Does the proposed treatment location seem feasible?**

Yes

**Are there any conditions not visible in the orthophotography that would prohibit installation of treatment?**

Power line

**What surface types are at the proposed treatment location?**

Grass

**Are there any site features that prohibit installation of a concrete equipment pad?**

No

**Community Impact**

**Describe the surrounding area:**

Residential

**Add note:**

**Are there any residential neighbors within 200 ft?**

Yes

**Is there any screening on the site for neighbors within 200 ft?**

Adequate

**If applicable, approximately how tall is the screening?**

**Would construction activities cause temporary hardships to surrounding neighbors?**

**Notes:**

**Constructability**

**Is there adequate distance from power lines for crane operation?**

Yes

**Notes:**

**Is there room on site for staging and parking construction equipment?**

Yes

**Notes:**

**Are there issues with access to the site for construction vehicles?**

No

**Add Note:**

**Environmental**

**Are there any streams or creeks near the site?**

No

**Notes:**

**Is the site adequately drained?**

No

**Notes:**

**Would the installation of treatment potentially require removal of existing trees?**

Yes

**Notes:**

### Operational Considerations

**Is there a sewer manhole near the site?**

No

**What is the approximate distance to the sewer manhole?**

**Would it be possible to get a trailer and pickup truck on site?**

Yes

**Notes:**

**What is the size of the incoming electrical service (Volts)?**

480

### Future Accessibility and Maintenance

**Will proposed location conflict with access to existing facilities?**

No

**Notes:**

**Photo Section**



















**Notes:**

Current site and facility upgrades under construction, including new shed above existing vault, new stairway entrance to vault, fence around immediate facility (not entire property), driveway turnaround in rear

**403527 - Ridgewood PFAS Master Plan**

**Survey Date:** Aug 12, 2019

**Site Name:** Van Houten TF

**Inspector Name:** Ask

**Site Characteristics**

**How is the site secured?**

Fence with locked gate

**Does the proposed treatment location seem feasible?**

Yes

**Are there any conditions not visible in the orthophotography that would prohibit installation of treatment?**

Train tracks

**What surface types are at the proposed treatment location?**

Grass and pavement driveway

**Are there any site features that prohibit installation of a concrete equipment pad?**

No

**Community Impact**

**Describe the surrounding area:**

Residential

**Add note:**

**Are there any residential neighbors within 200 ft?**

Yes

**Is there any screening on the site for neighbors within 200 ft?**

Adequate

**If applicable, approximately how tall is the screening?**

**Would construction activities cause temporary hardships to surrounding neighbors?**

**Notes:**

**Constructability**

**Is there adequate distance from power lines for crane operation?**

Yes

**Notes:**

**Is there room on site for staging and parking construction equipment?**

Yes

**Notes:**

**Are there issues with access to the site for construction vehicles?**

No

**Add Note:**

**Environmental**

**Are there any streams or creeks near the site?**

No

**Notes:**

**Is the site adequately drained?**

No

**Notes:**

**Would the installation of treatment potentially require removal of existing trees?**

Yes

**Notes:**

### Operational Considerations

**Is there a sewer manhole near the site?**

No

**What is the approximate distance to the sewer manhole?**

**Would it be possible to get a trailer and pickup truck on site?**

Yes

**Notes:**

**What is the size of the incoming electrical service (Volts)?**

480

### Future Accessibility and Maintenance

**Will proposed location conflict with access to existing facilities?**

No

**Notes:**



**Photo Section**













**Notes:**

**403527 - Ridgewood PFAS Master Plan**

**Survey Date:** Aug 12, 2019

**Site Name:** Midland Well

**Inspector Name:** Ask

**Site Characteristics**

**How is the site secured?**

Locked gate

**Does the proposed treatment location seem feasible?**

Yes

**Are there any conditions not visible in the orthophotography that would prohibit installation of treatment?**

Trees and neighbors property

**What surface types are at the proposed treatment location?**

Grass

**Are there any site features that prohibit installation of a concrete equipment pad?**

No

**Community Impact**

**Describe the surrounding area:**

Residential

**Add note:**

**Are there any residential neighbors within 200 ft?**

Yes

**Is there any screening on the site for neighbors within 200 ft?**

Adequate bushes for now, larger needed for vessels

**If applicable, approximately how tall is the screening?**

**Would construction activities cause temporary hardships to surrounding neighbors?**

**Notes:**

**Constructability**

**Is there adequate distance from power lines for crane operation?**

Yes

**Notes:**

**Is there room on site for staging and parking construction equipment?**

Yes

**Notes:**

**Are there issues with access to the site for construction vehicles?**

Yes

**Add Note:**

Narrow driveway

**Environmental**

**Are there any streams or creeks near the site?**

No

**Notes:**

**Is the site adequately drained?**

No

**Notes:**

**Would the installation of treatment potentially require removal of existing trees?**

Yes

**Notes:**

### Operational Considerations

**Is there a sewer manhole near the site?**

Yes

**What is the approximate distance to the sewer manhole?**

In street

**Would it be possible to get a trailer and pickup truck on site?**

Yes

**Notes:**

**What is the size of the incoming electrical service (Volts)?**

240

### Future Accessibility and Maintenance

**Will proposed location conflict with access to existing facilities?**

No

**Notes:**



**Photo Section**











Access through driveway

**Notes:**



**403527 - Ridgewood PFAS Master Plan**

**Survey Date:** Aug 12, 2019

**Site Name:** Waldo Well

**Inspector Name:** Ask

**Site Characteristics**

**How is the site secured?**

Unsecured

**Does the proposed treatment location seem feasible?**

Yes

**Are there any conditions not visible in the orthophotography that would prohibit installation of treatment?**

Neighbors

**What surface types are at the proposed treatment location?**

Grass

**Are there any site features that prohibit installation of a concrete equipment pad?**

No

**Community Impact**

**Describe the surrounding area:**

Residential

**Add note:**

**Are there any residential neighbors within 200 ft?**

Yes

**Is there any screening on the site for neighbors within 200 ft?**

No screening

**If applicable, approximately how tall is the screening?**

None

**Would construction activities cause temporary hardships to surrounding neighbors?**

**Notes:**

**Constructability**

**Is there adequate distance from power lines for crane operation?**

Yes

**Notes:**

**Is there room on site for staging and parking construction equipment?**

Yes

**Notes:**

**Are there issues with access to the site for construction vehicles?**

Yes

**Add Note:**

Narrow driveway

**Environmental**

**Are there any streams or creeks near the site?**

No

**Notes:**

**Is the site adequately drained?**

No

**Notes:**

**Would the installation of treatment potentially require removal of existing trees?**

Yes

**Notes:**

### Operational Considerations

**Is there a sewer manhole near the site?**

Yes

**What is the approximate distance to the sewer manhole?**

In street

**Would it be possible to get a trailer and pickup truck on site?**

Yes

**Notes:**

**What is the size of the incoming electrical service (Volts)?**

480

### Future Accessibility and Maintenance

**Will proposed location conflict with access to existing facilities?**

No

**Notes:**

**Photo Section**















Notes:



**403527 - Ridgewood PFAS Master Plan**

**Survey Date:** Aug 12, 2019

**Site Name:** Wortendyke TF

**Inspector Name:** Ask

**Site Characteristics**

**How is the site secured?**

Fence with locked gate

**Does the proposed treatment location seem feasible?**

Yes

**Are there any conditions not visible in the orthophotography that would prohibit installation of treatment?**

Trees

**What surface types are at the proposed treatment location?**

Grass and trees

**Are there any site features that prohibit installation of a concrete equipment pad?**

No

**Community Impact**

**Describe the surrounding area:**

Industrial

**Add note:**

**Are there any residential neighbors within 200 ft?**

Yes

**Is there any screening on the site for neighbors within 200 ft?**

No screening

**If applicable, approximately how tall is the screening?**

**Would construction activities cause temporary hardships to surrounding neighbors?**

**Notes:**

**Constructability**

**Is there adequate distance from power lines for crane operation?**

Yes

**Notes:**

**Is there room on site for staging and parking construction equipment?**

Yes

**Notes:**

**Are there issues with access to the site for construction vehicles?**

No

**Add Note:**

**Environmental**

**Are there any streams or creeks near the site?**

No

**Notes:**

**Is the site adequately drained?**

No

**Notes:**

**Would the installation of treatment potentially require removal of existing trees?**

No

**Notes:**

**Operational Considerations**

**Is there a sewer manhole near the site?**

Yes

**What is the approximate distance to the sewer manhole?**

**Would it be possible to get a trailer and pickup truck on site?**

Yes

**Notes:**

**What is the size of the incoming electrical service (Volts)?**

480

**Future Accessibility and Maintenance**

**Will proposed location conflict with access to existing facilities?**

No

**Notes:**

**Photo Section**



















Jose recommendation location

**Notes:**

King and goffle piped here

**403527 - Ridgewood PFAS Master Plan**

**Survey Date:** Aug 12, 2019

**Site Name:** Marr Well

**Inspector Name:** Ask

**Site Characteristics**

**How is the site secured?**

Unsecured

**Does the proposed treatment location seem feasible?**

Yes

**Are there any conditions not visible in the orthophotography that would prohibit installation of treatment?**

No

**What surface types are at the proposed treatment location?**

Gravel

**Are there any site features that prohibit installation of a concrete equipment pad?**

No

**Community Impact**

**Describe the surrounding area:**

Industrial

**Add note:**

**Are there any residential neighbors within 200 ft?**

Yes

**Is there any screening on the site for neighbors within 200 ft?**

Adequate

If applicable, approximately how tall is the screening?

Would construction activities cause temporary hardships to surrounding neighbors?

Notes:

Constructability

Is there adequate distance from power lines for crane operation?

Yes

Notes:

Is there room on site for staging and parking construction equipment?

Yes

Notes:

Are there issues with access to the site for construction vehicles?

No

Add Note:

Environmental

Are there any streams or creeks near the site?

Yes

Notes:

Is the site adequately drained?

Yes

**Notes:**

**Would the installation of treatment potentially require removal of existing trees?**

No

**Notes:**

### Operational Considerations

**Is there a sewer manhole near the site?**

No

**What is the approximate distance to the sewer manhole?**

**Would it be possible to get a trailer and pickup truck on site?**

Yes

**Notes:**

**What is the size of the incoming electrical service (Volts)?**

None

### Future Accessibility and Maintenance

**Will proposed location conflict with access to existing facilities?**

No

**Notes:**



**Photo Section**



**Notes:**

Proposed pitiless adapter for marr well

**403527 - Ridgewood PFAS Master Plan**

**Survey Date:** Aug 12, 2019

**Site Name:** Ravine Well

**Inspector Name:** Ask

**Site Characteristics**

**How is the site secured?**

Fence with locked gate

**Does the proposed treatment location seem feasible?**

Yes

**Are there any conditions not visible in the orthophotography that would prohibit installation of treatment?**

No

**What surface types are at the proposed treatment location?**

Gravel

**Are there any site features that prohibit installation of a concrete equipment pad?**

No

**Community Impact**

**Describe the surrounding area:**

Mixed

**Add note:**

**Are there any residential neighbors within 200 ft?**

Yes

**Is there any screening on the site for neighbors within 200 ft?**

No screening

**If applicable, approximately how tall is the screening?**

**Would construction activities cause temporary hardships to surrounding neighbors?**

**Notes:**

**Constructability**

**Is there adequate distance from power lines for crane operation?**

Yes

**Notes:**

**Is there room on site for staging and parking construction equipment?**

Yes

**Notes:**

**Are there issues with access to the site for construction vehicles?**

No

**Add Note:**

**Environmental**

**Are there any streams or creeks near the site?**

No

**Notes:**

**Is the site adequately drained?**

No

**Notes:**

**Would the installation of treatment potentially require removal of existing trees?**

Yes

**Notes:**

**Operational Considerations**

**Is there a sewer manhole near the site?**

Yes

**What is the approximate distance to the sewer manhole?**

**Would it be possible to get a trailer and pickup truck on site?**

Yes

**Notes:**

**What is the size of the incoming electrical service (Volts)?**

240

**Future Accessibility and Maintenance**

**Will proposed location conflict with access to existing facilities?**

No

**Notes:**



**Photo Section**





Railroad







House basement as proposed clear well

**Notes:**

