



2023 Annual Facilities Inspection Report

Hackettstown Municipal Utilities Authority

January 2024

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Executive Summary

The HMUA was formed in 1965 and took over the operation of the Town of Hackettstown Water Supply System and a sewage treatment plant that served a small portion of the Town. Today, the HMUA provides service to portions of five municipalities in the Hackettstown Area. The five municipalities include the Town of Hackettstown, Independence Township and Mansfield Township in Warren County and Mt. Olive Township and Washington Township in Morris County.

Mott MacDonald conducted the Annual Inspection of the operation and maintenance of the Hackettstown Municipal Utilities Authority's (HMUA) water facilities and sanitary sewer facilities on November 20, 2023 covering the following:

Wastewater Facilities:

- One (1) water pollution control plant; and
- Four (4) sewage pump stations in the collection and transmission system*

Water Facilities:

- Six (6) water supply wells;
- Two (2) booster pump stations; and
- Four (4) water storage tanks**

The utilities are well maintained, capably operated and remain in excellent overall operating condition.

* The Seber Road Well Property sewage pump station was not opened during the inspection since it is in satisfactory condition.

** The 1.0 MG Water Storage Tank was not visited during the inspection since it has been recently visited for the ongoing project.

Water Supply

The Hackettstown Municipal Utilities Authority completed an extensive potable water supply system improvement program between 1975 and 1981. This program included water transmission, water treatment, water supply and water storage projects and was necessary to meet State and Federal standards promulgated at that time and to keep pace with the growth in the Hackettstown area. Following completion of the aforementioned water system improvements, the HMUA undertook a series of individual projects designed to further increase the water supply capacity of the system and to replace the oldest, and in some cases undersized, water mains comprising the distribution system.

The HMUA has been and continues to be proactive in its maintenance of their water system as demonstrated by the HMUA undertaking eleven (11) water distribution and transmission main replacement Contracts since 1993, including the installation of more than 91,650 linear feet (over 17.5 miles) of new replacement water mains. This includes Contract 47W completed in 2018 with installation of 7,650 linear feet of replacement water mains. The investment in new infrastructure allows the HMUA to maintain a high quality of service to its patrons by reducing main breaks, service interruptions and O&M costs.

The water supply system is being competently operated by seven (7) total personnel with two (2) licensed operators, including the water utility superintendent and chief operator. Through New Jersey Water Association (NJWA), the HMUA has a two-year apprenticeship program to help apprentices obtain licensure. The water supply side of HMUA currently has two (2) apprentices through this program. The average daily water production for the period between September 1, 2022 and August 31, 2023 was approximately 2.16 MGD and the maximum monthly rate was 2.926 MGD (August 2023). These figures compare to 2.01 MGD and 2.45 MGD (August 2022), respectively, for the period between September 1, 2021 and August 31, 2022.

Prior to the utilization of 100% ground water well sources, the HMUA Water Filtration Plant had derived its water supply from the Mine Hill Upper and Lower Reservoirs and the Burd Reservoir. These properties have all been sold as the HMUA now solely utilizes groundwater.

1.1. Water Allocation Permit

The HMUA received a modified NJDEP Water Allocation Permit (NJDEP Program Interest ID No. 5145 and Water Allocation Permit No. WAP110002) on June 20, 2012 with an effective date of July 1, 2012. The permit is a 10-year permit with an expiration date of June 30, 2022. The modified Water Allocation Permit combined the HMUA's two (2) Water Allocation Permits into one (1) combined Permit, eliminated surface water reservoirs and the water filtration plant, added Well No. 9 (Heath), increased pumping capacity of Well No. 8 (Claremont Well No. 1R) to 800 gpm and eliminated Well No. 2. A permit renewal application was sent to the NJDEP on April 8, 2022 and as of November 2023, the HMUA is awaiting response from the NJDEP. The renewal of the Water Allocation Permit reflects the reactivation of Well No. 4.

1.2. Water Distribution System

Since 2000, the HMUA has completed five (5) major water transmission main projects to improve the fire flow capacity in the distribution system. During 2010 and 2011, the HMUA undertook the construction of a water main replacement project (Contract No. 38W) to replace undersized water mains located on Fifth Avenue, Reese Avenue, Liberty Street and Cook Street

in the Town of Hackettstown. The Claremont Water Transmission Main Project (Contract No. 40W) was completed in April 2013. The project followed the recommendations of a 2011 hydraulic model of the water system for the Diamond Hill area which evaluated the effect on the water distribution system with an increase in capacity of the Diamond Hill Well No. 8.

During 2014, HMUA undertook the construction of a water main replacement project (Contract No. 43W) to replace unlined cast iron water main with cement lined ductile iron pipe within the Arthur Terrace and College View areas of the Town of Hackettstown. Contract No. 43W included the construction of 17,000 LF of water main replacement which included a change order to construct approximately 6,000 LF of water main to replace the remainder of water main in the College View area due to concerns with water main breaks. During 2014, there were several sink holes in the College View area of Hackettstown on College View Drive and Ferris Place related to water main breaks. The HMUA repaired the water main breaks, authorized Mott MacDonald to investigate the extent of sinkholes, and provide recommendations, and remediated the affected areas.

During 2016, under Contract No. 45W HMUA replaced an additional 5,177 LF of water main within areas of Hackettstown and Mount Olive. Contract 47W, replaced 7,650 LF of water main within the Town of Hackettstown in 2018.

The water main projects also included the replacement of almost all of the old non-pumper fire hydrants. In 2007 the ISO upgraded the classification of the Town of Hackettstown from a Class 5 to a Class 4 Public Fire Protection Classification, which is in the top 10% among all communities in the entire country. HMUA has been painting hydrants on an ongoing basis, in November 2022, HMUA noted approximately 48 additional hydrants had been painted in the past year.

In 2013, HMUA contracted with Mott MacDonald to prepare a hydraulic model of the entire water system. As part of this project the model was used to simulate the hydraulics associated with the replacement of the existing one million gallon (MG) ground storage level tank. The tank has a high water elevation of approximately 830 feet which is approximately 26 feet above the prevailing hydraulic grade line (HGL) of the Main Zone of the system. The HGL of the Main Zone is currently established by a 2.4 MG Tank in the southern portion of the distribution system, in Washington Township. Because of the tank's high elevation, it was unable to "float" on the existing system, and was instead filled via a small booster pumping station. Water within the tank had been stored for fire protection use by the Mars Company with a dedicated 10-inch diameter water main from the tank to the Mars Company (which is approximately 4,000 feet away). One of the main observations from the modeling was that a new tank located in the northern part of the system would have a significant impact on overall hydraulics, pressures, and fire protection in this area. The modeling effort also established a general prioritized ranking for potential tank sites. The 1 MG Tank, which had been out of service since September 2015, was inspected by DN Tanks in August 2016 and underwent repairs to allow it to be placed back into service to facilitate painting of the 2.4 MG Tank in 2017. In September 2020, Mott MacDonald was authorized to proceed with the design of the new 1.0 MG Tank. Design and permitting for the 1.0 MG Tank is currently underway.

During 2011, the HMUA undertook a project to install water pressure transmitters at up to seven (7) locations throughout the distribution system to continuously monitor the pressures at these locations within the water system, including any pressure spikes that may be present. Mott MacDonald completed preparation of plans and specifications for the project. The HMUA completed the installation of transmitters at Well 2, the Mount Olive Booster Station, and the Independence Booster Station.

In 2013, HMUA added confined space equipment (hoist mounts) at the Ketcham Road PRV vault, Route 57 vault, Vienna Hills PRV vault, Well 5 & 7 Chlorine vault, Well 7 vault, Mount Olive Tank vault, Independence Tank vault, and Vienna Hill Road PRV vault.

In 2016, Mott MacDonald completed an evaluation of 2,170 LF of 8” and 470 LF of 6” water main located on State Highway 46 between Willow Grove Avenue and Valentine Street. This evaluation provided options for the HMUA regarding this approximately 90-year old asset based on upcoming road improvements in the area. As the main appeared to be in good condition, a full replacement was not required at the time. HMUA is making repairs on an as-needed basis.

In 2020, HMUA reported that new leak detection equipment had been obtained. As of November 2023, HMUA is utilizing both the old and new equipment, and is continuing to evaluate other equipment. In 2023, HMUA reported that they are researching additional leak detection equipment including Itron leak detection and possible use of a logger at each house.

HMUA worked to identify unknowns within the service line inventory via test pits. 65 Identified galvanized service lines have been replaced under Contract 53W, and six additional locations identified during the course of the project will be replaced in early 2024 (see Section 1.8).

During the November 2023 inspection, the HMUA reported that the Vienna Hills PRV clay valve and piping were recently replaced. The HMUA noted this was done for the Ketcham Road PRV in 2021.

Water Distribution System		
2023 Findings by Mott MacDonald	Ongoing Issues / Items to be Addressed	Items addressed / Completed Upgrades in 2022-2023
Vienna Hills PRV clay valve and piping were replaced.	Advancing compliance with the LCRR under Contract 53W Leak detection alternatives are being evaluated.	Main replacement on Ashley Avenue is nearly complete

1.3. Seber Road Well Property

The HMUA surface water treatment plant was constructed at the Seber tract in the Town of Hackettstown in 1981 to treat surface waters derived both from the Mine Hill Reservoir and Burd Reservoir which are now sold off and not part of the HMUA water supply.

The WFP (Seber Road Well Property – Formally Water Filtration Plant) has been permanently out of service since August 2008. HMUA continues to maintain the site and building on an as needed basis. The SCADA RTU is also still actively used.

In 2020, the HMUA completed a spoil disposal project under Contract 49W. HMUA has put some temporary spoils at the site from various water main break repairs throughout the past years. During November 2022, temporary spoils and stockpiles were all removed from the site. During November 2023 inspection, the site was being used by the HMUA to stockpile.

In 2021, the northeast fence behind the site was temporarily repaired, and damage was noted on the fence in the southwest portion of the site was damaged. Both remain to be addressed.

In October 2021, it was noted the site generator would be replaced, as the current generator was beyond repair. In November 2022, an external temporary generator had been installed at the site outside of the building. A new outdoor pad and conduits to the automatic transfer

switch in the Generator room were installed. The new generator arrived on 11/28/2022 and was fully installed on site. During the November 2023 inspection, it was noted the HMUA is waiting on SCADA connection to the generator.

In November 2022, a leak was found near a window inside the site, it was noted to be an ongoing leak for approximately 6 months. During the November 2023 inspection, water damage to some ceiling panels was noted at the water filtration plant building. The external contact tanks on site were reported as being drained monthly.



New Generator



Stockpile and Damaged Fence



Damaged Ceiling Panels - Old Generator Room

Seber Road Well Property (Formerly Water Filtration Plant)		
2023 Findings by Mott MacDonald	Ongoing Issues / Items to be Addressed	Items addressed / Completed Upgrades in 2022-2023
<p>Site is being used by HMUA for stockpiling.</p> <p>The building has some leaks and damaged ceiling panels.</p>	<p>There is a small hole in the fence behind the site.</p> <p>There is a damaged area on the southwest fence.</p> <p>SCADA is pending connection to the generator.</p>	<p>New Generator was installed.</p> <p>External contact tanks are drained monthly.</p>

1.4. Well Stations

As of July 1, 2012, the HMUA potable water distribution system derives all supply from groundwater sources (wells). The HMUA water system now operates under a single NJDEP Water Allocation Permit. The HMUA Water Allocation Permit (NJDEP Program Interest ID No. 5145 and Water Allocation Permit No. WAP110002) was issued for a ten-year term, effective on July 1, 2012 with an expiration date of June 30, 2022. A permit application was sent to the NJDEP on April 8, 2022 and the HMUA is awaiting response from the NJDEP.

Well No. 9 (Heath) was placed into operation in 2015, making the total permitted pumping capacity from the six (6) operational wells 5,100 GPM as shown in the table below.

HMUA Potable Water Wells

Well Designation	Current Production Rate	Permitted Pumping Rate *
Well No. 4 – Seber	200 GPM	300 GPM **
Well No. 5 – Seber	450 GPM	1,000 GPM **
Well No. 6 – Heath	380 GPM	700 GPM **
Well No. 7 – Seber	1,100 GPM	1,500 GPM **
Well No. 8 – Claremont 1R	550 GPM ***	800 GPM
Well No. 9 – Heath	730 GPM	800 GPM
Totals	3,410 GPM	5,100 GPM

* Maximum Diversion Rate for all groundwater sources is 4,000 gpm.

** Maximum Diversion Rate for Wells 4, 5, 6 & 7 is 3,200 gpm. Maximum Diversion for Well 4 is 200 GPM.

*** Well No. 8 is currently awaiting pump replacement

The maximum yearly water diversion allowed in the HMUA’s current Water Allocation Permit is 1,165 MG (3.19 MGD) and the maximum monthly diversion is 123.7 MG (4.12 MGD). The actual water diversion for the 12-month period ending August 31, 2023 was 709.384 MG (1.943 MGD) and the maximum monthly diversion was 81.304 MG (2.62 MGD) (Aug. 2023), both well within permit limits.

The active HMUA wells are in good operating condition. The static water levels at the well sites remain relatively constant from year to year indicating that these sources are not being over pumped.

1.4.1 Well No. 4 – Seber

During 2021, Well No. 4, which had been out of service since November 2012, was placed back into service. The well was used periodically, to avoid the risk of the well being removed from the Water Allocation Permit. The well is currently capable of running at approximately 200 gpm. The HMUA is considering adding ortho-phosphate to the system at this point as well. The Well No. 4 building houses the controls for Wells No. 5 & 7. In 2021 the pressure relief valve was changed, piping was replaced, a new 6" blow off leaving the back of the building was installed, and flow gauges were installed. Air release and altitude valves were installed during 2022. A new flow totalizer was installed in April/May of 2022. During the November 2023 inspection, Well No. 4 was noted to be running satisfactorily and pumping around 8 hours a day while Well No. 8 is out of service. The well is currently being operated and monitored.



Well No. 4 – Booster Pump

Well No. 4 – Seber		
2023 Findings by Mott MacDonald	Ongoing Issues / Items to be Addressed	Items addressed / Completed Upgrades in 2022-2023
Well No. 4 is running around 8 hours a day while Well No. 8 is out of service	Water mark on ceiling tile is being monitored, there is a hatch on the roof above the water mark	n/a

1.4.2 Well No. 5 – Seber

The HMUA received bids for Contract 35W in January 2008 to rehabilitate the well pumps for Well No. 5 to restore the pumping capacity to 1,000 GPM. Minor masonry damage at Well No. 5 as noted during previous inspections was repaired in 2016. Controls for Well No. 5 are housed in the Well No. 4 building. The pressure relief valve was replaced during 2021. During the November 2023 inspection, Well No. 5 was noted to be in good condition and not run recently. It is recommended that Well No. 5 is run periodically to avoid possible removal of well from Water Allocation Permit by NJDEP.

Well No. 5 - Seber		
2023 Findings by Mott MacDonald	Ongoing Issues / Items to be Addressed	Items addressed / Completed Upgrades in 2022-2023
Good condition and the well has not been run recently	n/a	n/a

1.4.3 Well No. 6 – Heath

The HMUA received bids for Contract 35W in January 2008 to rehabilitate the well pumps for Well No. 6 to restore the pumping capacity to 700 GPM. The well pump and motor were replaced in December 2014. Corrosion on the existing doors and some concrete damage has been previously noted at the Well No. 6 facility.

During November 2022, it was noted that the planned pilot study for the chlorine tab equipment had been run, following the pump VFD replacement in May 2022. It was noted that due to the time and labor required for the manufacturer to remove the pilot equipment, the manufacturer has given the HMUA the chlorine tab equipment. The HMUA was planning to try accu-tabs with the Constant Chlor equipment to see if this will generate better results. It was reported that the dehumidifier is working well.

During the November 2023 inspection, the HMUA reported they have had no issues with the current chlorine tab equipment. The Constant Chlor equipment has been moved to the chlorine room at Well No. 6, and the HMUA reported that a more permanent installation is planned during the 2023 winter.

Concrete damage has been noted on the walls during recent inspections, though it appears to be mostly a cosmetic issue.

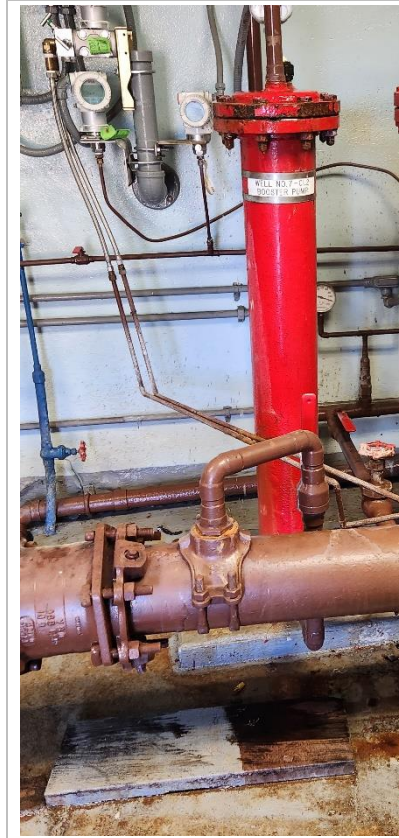


Well No. 6

Well No. 6 - Heath		
2023 Findings by Mott MacDonald	Ongoing Issues / Items to be Addressed	Items addressed / Completed Upgrades in 2022-2023
<p>Cosmetic concrete damage is still present on walls</p> <p>Constant ChlorPlus equipment has been moved to the Chlorine Room.</p>	<p>The HMUA is planning to install the chlorine tab equipment in a more permanent manner.</p>	<p>n/a</p>

1.4.4 Well No. 7 – Seber

The detention main butterfly valve for Well No. 7 remains out of service (in the open position). Controls for Well No. 7 are housed in the Well No. 4 building. The pressure relief valve was replaced during 2021. During the November 2023 inspection, it was noted that the Well No. 7 Booster Pump was leaking; however, this is typical for this well.



Well No. 7 - Leaking

Well No. 7 – Seber		
2023 Findings by Mott MacDonald	Ongoing Issues / Items to be Addressed	Items addressed / Completed Upgrades in 2022-2023
Well No. 7 is leaky, however HMUA noted this is typical for when this well is running.	n/a	n/a

1.4.5 Well No. 8 – Claremont 1R

The HMUA acquired three (3) wells as part of the takeover of the Diamond Hill water system. However, the HMUA only operates the Claremont Avenue Diamond Hill Well No. 8 (also known as Claremont Well No. 1R). The Elmwood Drive Well (Diamond Hill Area) was abandoned and sealed by the HMUA. The Brookside Avenue Well (Diamond Hill Area) has been abandoned by the HMUA and will be sealed by the HMUA once it is no longer needed as a monitoring well. M-scope readings are taken monthly for HMUA tracking purposes.

To increase the capacity of Well No. 8 (Claremont Avenue – Diamond Hill), in 2013 a new well was drilled on the existing Well No. 8 site and the existing well was abandoned. The NJDEP approved and issued a Construction Permit in 2012, and authorized use of the 800 gpm permanent pump in 2013 by issuance of the NJDEP Permit to Operate. The permanent submersible well pump and VFD has a maximum pumping capacity of 800 gpm. Well No. 8 is permitted by the NJDEP for 800 gpm and is capable of operating at 800 gpm. However, when

the well was operated at 800 gpm, the operation resulted in impacts nearby wells. At the time of the October 2021 inspection, Well No. 8 was operating at approximately 90% (575 GPM). The HMUA has connected the one known property that was adversely affected by Well No. 8 to the HMUA water system. HMUA has continued to monitor impacts to nearby wells and has been able to increase the Well No. 8 pumping rates and operation times accordingly. During November 2022, Well No. 8 was pumping 550 gpm and running 12 hours a day. Under Contract No. 42WS, an emergency generator was installed at Well No. 8. In 2017, HMUA staff added an enclosure above the well pump as a security improvement. A 4-inch diameter surge relief valve leak to the site drain and was resolved in 2020 with the installation of a new surge relief valve. In 2021 previous electric issues at this well along with the Meadow Lane Pump Station, have been addressed by the utility.

During November 2022, it was noted that yellow jackets were living directly above the entry door to the well building. As of November 2023, the HMUA has satisfactorily removed the yellow jacket nest.

During the November 2023 inspection, Well No. 8 was noted to have failed in mid-October 2023. The Well is not functioning as the pump and motor have failed and will be replaced. The well's piping is currently on the grass behind the Well No. 8 building while the pump and motor for the well are being replaced. The check valve was replaced in September 2023. The hatch in the ceiling of the building was noted to have minor damage during November 2023 and should be monitored. One of the trees in the back of the property one fell on a neighbor's garage. The HMUA has since cut down trees on the property.



New Check Valve



Pipes behind building



Damaged Hatch

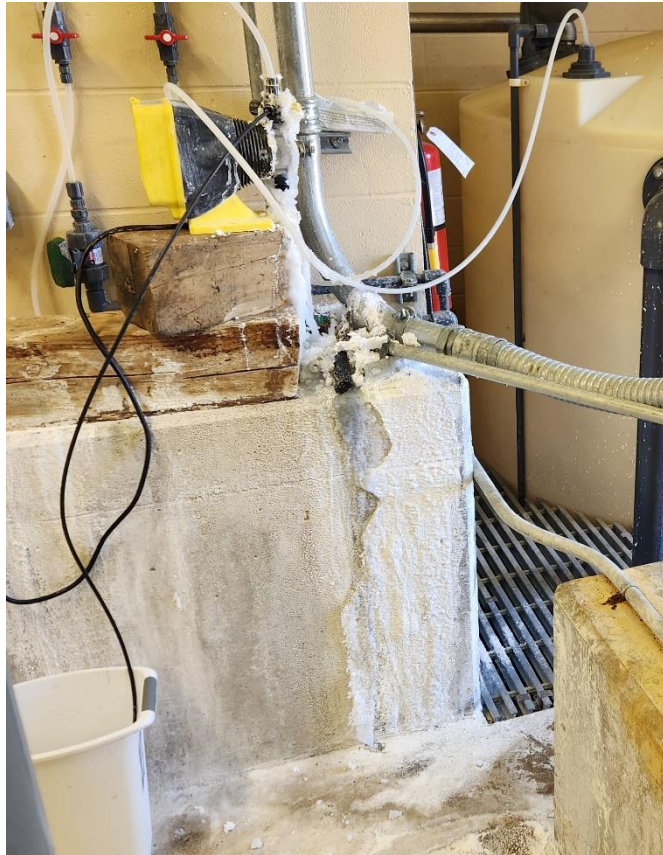


Tree removal at Site

Well No. 8 – Claremont 1R		
2023 Findings by Mott MacDonald	Ongoing Issues / Items to be Addressed	Items addressed / Completed Upgrades in 2022-2023
Some trees on the property have been cut. There is damage to the hatch on the ceiling of the building. .	Well No. 8 pump and motor have failed, HMUA is awaiting quotes.	Yellow Jackets near entry door have been removed. Check valve was replaced in September 2023.

1.4.6 Well No. 9 – Heath

Well No. 9 became operational in 2015 and has been in continuous use since that time. Since being placed into service, HMUA added a radar sensor for monitoring the chemical tank level at Well No. 9 and installed a gate as required by Washington Township. During 2021 and 2022, the HMUA noted that water on the floor of the well house is a common occurrence due to condensation and the lack of a floor drain, the HMUA noted the quantity of water is greater than normal when a sample is taken. During the November 2023 inspection, the floor of the building was dry. Currently Well No. 9 is the only well adding ortho-phosphate to the system. During the November 2023 inspection, there was a buildup of chemicals near the pump. This is due to a leaky dosing pump which the HMUA has plans to replace.



Well No. 9 – Leaky Dosing Pump

Well No. 9 - Heath		
2023 Findings by Mott MacDonald	Ongoing Issues / Items to be Addressed	Items addressed / Completed Upgrades in 2022-2023
Floor of the Well House was dry. Currently Well No. 9 is the only well adding ortho-phosphate to the system.	Chemical Dosing Pump is leaky and HMUA plans to replace.	n/a

1.5. Water Storage Tanks

The HMUA's Water System includes four (4) Water Storage Tanks as follows:

- 2.4 MG Water Storage Tank (Washington Township)
- 1.0 MG Water Storage Tank (Independence Township)
- 0.5 MG Mount Olive Water Storage Tank (Mount Olive Township)
- 0.42 MG Independence Water Storage Tank (Asbury Road, Independence Township)

The two (2) newest water storage tanks were constructed in the HMUA service area in the 1998-1999 time frame to allow the water system to be extended to areas in Independence Township (0.5 MG) and Mt. Olive Township (0.42 MG) which are situated at elevations above the high water level of the 2.4 and 1.0 million gallon tanks.

1.5.1 2.4 MG Water Storage Tank

In 1979, the HMUA completed construction of a 2.4 million-gallon (MG) water storage tank which maintains pressure in the distribution system and provides storage capacity for peak demand periods. The 2.4 MG Water Storage Tank is located in the southeasterly section of the HMUA service area in Washington Township off Schooley’s Mountain Road.

Over the years, things have been noted and repairs have been done:

- 1998 – The HMUA had replaced the cathodic protection system and completed the repainting of the tank exterior under Contract No. 22W.
- 2012 through 2014 – Areas of corrosion were noted on the tank exterior during the November 2014 inspection as well as during the 2012 and 2013 facilities inspections.
- 2017 – The Tank was repainted under Contract No. 46W. The Tank was taken out of service in April 2017 and returned to service on July 20, 2017. Under this contract, the rectifier for the cathodic protection system was removed (this had not been replaced with the remainder of the system in 1998). A 9’ high security fence was also constructed around the tank in 2017.
- 2018 – An anniversary inspection was conducted by MBA prior to the end of the Contract 46W maintenance period. A few minor punch list items were noted by the inspection and addressed by the contractor.
- 2019 – Some growth on the exterior of the tank was noted; however, the tank coating still appears to be in good condition.
- 2020 – Growth on the exterior of the tank was again noted. An area was then power washed to confirm coating can be cleaned. New batteries were installed for the SCADA system, and a vent screen was added to panel.
- 2021 – Growth was still noted on the exterior of the tank. The antenna was struck by lightning, and a partial replacement of the antenna was required. The grass around the tank has been maintained.
- 2022 – Growth was noted on the exterior of the tank. Tank appears to be in good condition.
- 2023 – Growth was noted on the exterior of the tank. Vegetation around the tank should be addressed. Overall, the tank appears to be in good condition.

2.4 MG Water Storage Tank		
2023 Findings by Mott MacDonald	Ongoing Issues / Items to be Addressed	Items addressed / Completed Upgrades in 2022-2023
Growth noted on exterior of tank	n/a	n/a
Vegetation around tank should be addressed		

1.5.2 1.0 MG Water Storage Tank

The HMUA also owns and operates a 1.0-million-gallon water storage tank located on the western side of its service area in Independence Township. Prior to being taken out of service in September 2015, the tank served primarily as a storage reservoir for fire protection water for the M&M Mars factory located in the northwestern section of the Town of Hackettstown. Fire service for M&M Mars is now provided by the main system in addition to M&M Mars’ onsite fire suppression system and storage tank.

The tank is currently operated on “float” based on the water storage elevation in the 2.4 MG storage tank, with approximately 1.5 feet of water typically in the tank.

- 1994 – Inspection of the tank in July 1994 noted a small amount of weepage at the base of the tank sidewall near the valve vault. The HMUA caulked this crack although the caulk has held up well for 10 years, the crack appears to have opened slightly since our 2004 facilities inspection.
- 2005 through 2014 – Weepage along the tank wall was noted in varying degrees in the inspections from 2005 – 2014.
- 2015 - In September 2015, it was observed that the booster pump serving the tank was running continuously, indicating leakage at the tank. The tank was taken out of service, but the location of the leak was not identified.
- 2016 – A condition assessment was carried out by DN Tanks in August 2016 and HMUA undertook repairs to allow the tank to be placed back into service while the 2.4 MG Tank was repainted. When the tank was first placed back into service, water main breaks were reported. Review of these breaks found that the tank level was higher than required resulting in increased system pressure. Replacement of the tank level sensor and booster pump pressure gauges addressed the issue. The tank is currently being maintained with 1.5' of water from the system.
- 2016 – The condition assessment notes a build-up of hard dry efflorescence about 6 feet down from the roof slab. HMUA should monitor for vegetation on top of the tank.
- 2017 - As noted previously, the HMUA completed hydraulic modeling as part of continued planning for a new storage tank in the vicinity of the existing 1.0 MG tank. In 2017, Mott MacDonald prepared a conceptual site plan for tank replacement on a site northeast of the existing tank with a lower elevation. Discussions are ongoing with NJDEP, the Highlands Council and Warren County regarding siting.
- 2018 – A site survey was conducted to identify trees and to establish the corners of the new tank site.
- 2019 – Survey Updates noted water main easements and access rights, and the new property acquisition process with Warren County is ongoing.
- 2020 – Mott MacDonald awarded contract for design and permitting of new tank. HMUA has continued with the property agreement.
- 2021 – The property agreement was executed with the County. Mott MacDonald has been progressing the new tank project. The Authority has been maintaining the access road in advance of the construction project.
- 2022 – Mott MacDonald has been progressing the new tank project. The Authority has been maintaining the access road in advance of the construction project. The project is currently in the permitting and planning board approval phase.
- 2023 – Mott MacDonald has been progressing the new tank project. The project is currently in the permitting and County planning board approval phase. There are ongoing discussions with the County on the access driveway requirements.

The concrete tank sidewalls of the 1.0 MG Tank have shown minor signs of cracking during past site inspections. During the 2022 inspection, the HMUA, Mott MacDonald, and the N.J. Water Association met at the 1.0 MG Tank site. N.J. Water Association used a drone to view the site from above. The drone footage showed the visibility of the existing tank and the proposed tank from nearby properties. Due to the height of the trees compared to the tank height and the distance from nearby properties, the tank is not suspected to be visible from nearby properties. The existing 1.0 MG Tank will be demolished and replaced with a new 1.0 MG tank as a part of Contract 52W.

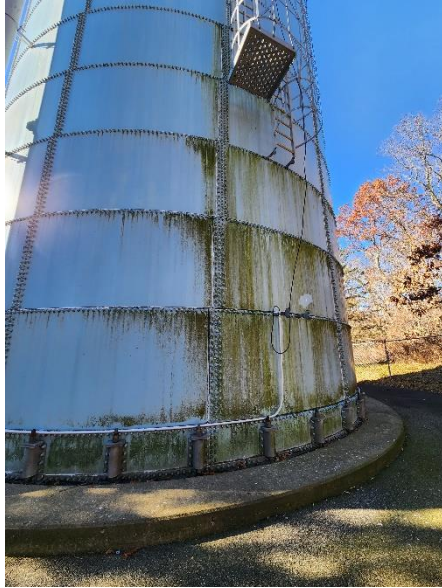
The 1.0 MG Tank was not visited during the November 2023 inspection, since it has been recently visited as part of the design for Contract 52W.

1.0 MG Water Storage Tank		
2023 Findings by Mott MacDonald	Ongoing Issues / Items to be Addressed	Items addressed / Completed Upgrades in 2022-2023
n/a	<p>A project is currently underway to design a new 1 MG water storage tank and demolish existing tank. Permitting and County planning Board approval is underway.</p> <p>On going discussions with County on access driveway requirements.</p>	n/a

1.5.3 Mount Olive Twp. Storage Tank and Booster Station

The Mount Olive Township Water Storage Tank is a bolted, fused glass coated steel type construction. During the spring of 2021, the Mount Olive Storage Tank was inspected via a robot. The robot entered the tank from the top hatch and video inspected the interior of the tank. The tank interior appeared to be in excellent condition, no repairs were needed. Some minor growth near the tank base was noted.

Following previous 2016 repairs to the altitude valve at the Booster Station, HMUA replaced the valve in 2021. Both booster station pumps have been retrofitted with stainless steel impellers following an investigation by Mott MacDonald which found that dezincification of the original Silicon Bronze impellers had occurred. In addition, HMUA has upsized 2” discharge piping to 4” on the pumps. One pump motor was repaired and the other was replaced with a new motor, as it likely was damaged by the leak noted in 2020. During 2021, it was noted that the Well No. 2 antenna was relocated to this location. During the 2023 inspection, as noted in previous reports, growth was observed on the Booster Station roof, roots are growing over the edges of the roof, and the floor coating has failed. Some ongoing leakage at Pump No. 1 was noted as typical. The HMUA plans to replace Pump No. 1 with a spare pump over the winter and send Pump No. 1 out for repair. Pump No. 1 will become the spare pump once it has been rebuilt. Some trees on the site have been trimmed and cut.



Mount Olive Storage Tank Exterior Growth



Mount Olive Booster Station Pump and Spare

Mount Olive Twp. Water Storage Tank		
2023 Findings by Mott MacDonald	Ongoing Issues / Items to be Addressed	Items addressed / Completed Upgrades in 2022-2023
Growth near base of tank	n/a	n/a

Mount Olive Twp. Booster Station		
2023 Findings by Mott MacDonald	Ongoing Issues / Items to be Addressed	Items addressed / Completed Upgrades in 2022-2023
Pump No. 1 will be replaced with the spare pump and sent out for repairs.	Significant growth on roof was noted, roots growing off the edge of the roof. Floor coating has failed Wall coating impacted by previous piping leak.	Some trees have been trimmed and cut on the property.

1.5.4 Independence Twp. Water Storage Tanks and Booster Stations

The Independence Township Water Storage Tank has been repaired for leaks in 2008, 2012, 2015, 2016 and again in August 2018. During the spring of 2021, the Independence Water Storage Tank was inspected via a robot. The robot entered the tank from the top hatch and video inspected the interior of the tank. The video inspection noticed some cracked fiberglass on the interior of the tank. The tank was drained, and repairs were done to the interior of the tank. When the tank was empty, it was discovered that a bracket on the outside was bad which caused the problems. The repairs required were not as severe as they appeared to be on video. The tank interior didn't require much cleaning, only the seams needed to be cleaned. Seven anodes were installed at the base.

In the fall of 2021, a temporary tanker truck was used to service the system while the tank was down for repairs. The repairs to the interior of the tank and the curing of the interior of the tank were completed in fall of 2021.

Following the 2021 repairs to the tank, one homeowner had reported pressure issues when HMUA was operating off the temporary tanker truck. HMUA investigated this concern and it was no longer an issue at the time of the November 2023 inspection.

During the November 2023 inspection, the tank appeared to be operating in satisfactory condition and the fence behind the tank was slightly damaged.

During the November 2023 inspection, it was noted that the Pump #2 and motor have been repaired. The altitude valve was replaced. A spare motor was ordered during 2022. A spare pump has been received but has not been installed. Pump No. 2 has a slight leak at the flexible coupling.



Independence Water Storage Tank



Damaged Fence

Independence Water Storage Tank		
2023 Findings by Mott MacDonald	Ongoing Issues / Items to be Addressed	Items addressed / Completed Upgrades in 2022-2023
Tank is in satisfactory condition	The fence behind the water storage tank is damaged.	The low water pressure issues at one house have been resolved



Independence Booster Station – Altitude Valve

Independence Booster Station – Pump #2 Flexible Coupling

Independence Water Booster Station		
2023 Findings by Mott MacDonald	Ongoing Issues / Items to be Addressed	Items addressed / Completed Upgrades in 2022-2023
There is a slight leak with the Pump No. 2 flexible coupling.	n/a	Spare pump has been received. Altitude valve has been replaced. Pump No. 2 and motor have been repaired

1.6. Development of Additional Water Supply and Firm Capacity

The New Jersey Department of Environmental Protection firm capacity regulations require water utilities to be able to meet their peak water demands with their largest water source out of service. The completion of Well No. 7 in 2007 on the Seber site provides additional firm capacity in the HMUA system and provides additional water quantity on a monthly and annual basis. Well No. 7 has been operating satisfactorily with a peak pumping rate of 1,500 GPM since the end of May 2007.

Aside from the amount of water which the HMUA is allowed to pump from its wells, the Bureau of Water Supply requires that adequate water source capacity be available to meet the peak system demands (as defined by the NJDEP) with the largest water source out of service. Currently, the HMUA water system meets the Bureau of Water Supply's definition of adequate supply capacity with a firm capacity of 3,500 gpm (5.04 MGD) as indicated in the table below. As of 2012, the WFP and Well No. 2 have been removed from the Water Allocation Permit.

Source	Source Capacity	
	(MGD)	(GPM)
Well No. 4	0.288	200
Well No. 5	1.440	1,000
Well No. 6	1.008	700
Well No. 7	2.16	1,500
Well No. 4 – Well No. 7 Total	4.896 MGD	3,400 GPM
DH Well No. 8 (Claremont 1R)	1.152	800
Well No. 9	1.152	800
Total Source Capacity	7.2 MGD	5,000 GPM
Less Largest Source	2.16	1,500
Firm Capacity	5.040	3,500

The issue of firm capacity relates to a water system’s source water reliability, and specifically to its ability to continue to meet peak system demands without the use of its largest water supply source. With Well No. 9 commencing operation in 2015, HMUA has added to its production and firm capacities.

In 2013, the HMUA increased the capacity of the Claremont (Diamond Hill) Well No. 8 located in Mansfield Township to 800 gpm (refer to previous comments on current operating level). In 2015, the HMUA increased the system capacity with the construction of the 800 gpm Well No. 9 located in Washington Township on Schooleys Mountain Road. In 2021, Mott MacDonald developed a spreadsheet to track the demands related to proposed projects and document connection dates going forward.

During the November 2023 inspection, it was reported that Well No. 8 was out of service. While repairs are being completed to Well No. 8, Well No. 4 is pumping more to meet the demands.

1.7. Leak Detection

The HMUA pursues an ongoing leak detection effort within its potable water distribution system. The leak detection program is a continuous long-range maintenance program to ensure that unaccounted for water within the HMUA distribution system is minimized as required by the NJDEP. The HMUA purchased advanced leak detection equipment, ZCorr Correlating Loggers, in 2003 to improve its in-house leak detection efforts. Additional leak detection loggers (SePem 155 noise loggers) were purchased in 2020 and eight (8) additional loggers were purchased in 2022 to take the place of the ZCorr loggers’ daily deployment. ZCorr loggers are still used when correlation of a suspected leak is required. In 2021, the HMUA used new leak detection equipment and ZCorr loggers which have been working well. The HMUA has also continued metering water flow to the high-pressure zones at the two booster stations. Unaccounted for water was reported to be approximately 11.5% during the 12-month period ending August 31, 2023, which is just below the NJDEP goal of 15%. The HMUA is actively taking measures to reduce the amount of unaccounted water. Comparing the amount of unaccounted for water from the last few calendar years to this year (2022), the HMUA has been successful in working to reduce the amount of unaccounted for water. The table below summarizes the reported approximate unaccounted water percentages since 2005.

Calendar Year	Unaccounted for Water (%)
2005	19.5
2006	14.1
2007	15.1
2008	12.7
2009	12.2
2010	13.5
2011	16.8
2012	21.7
2013	22.2
2014	15.6
2015	19.8
2016	18.1
2017	15.4
2018	23
2019	21.7
2020	20
2021	14.1
2022	16.4
2023*	11.5

* For 12 months ending August 31, 2023

1.8. Water Quality

The HMUA has complied with the Federal and State regulations requiring analysis of water samples for organic and volatile chemicals, inorganic chemicals, trihalomethanes, disinfection byproducts and secondary drinking water constituents. The routine water analysis results indicate that the finished water is in compliance with the Safe Drinking Water Standards for these parameters.

The United States Environmental Protection Agency (USEPA) is enforcing more stringent standards for lead and copper concentrations in potable water with adoption of the Lead and Copper Rule. Lead and copper in potable water typically originates as a result of corrosion occurring in plumbing systems within private homes rather than existing in the raw water the utility treats and pumps into the distribution system. The Lead and Copper Rule requires water utilities to optimize the treatment of potable water such that any corrosive tendency of the water is minimized.

The HMUA applies a polyphosphate/orthophosphate blended corrosion inhibitor at its Well No. 9 to minimize corrosion within the plumbing systems of its customers. The Authority is considering the addition of dosing equipment at other locations. The bi-annual sampling of patron services conducted during 2002 achieved compliance with the EPA Lead Maximum Contaminant Level Goal (MCLG) of 0.015 M/L. It therefore appeared that optimal corrosion control had been achieved through the application of the polyphosphate/orthophosphate blend. However, the results of the first of the two annual sampling events from 2004 slightly exceeded the threshold for compliance with the Lead and Copper Rule. The HMUA met with the NJDEP to review the range of possible alternatives to ensure consistent compliance with the Lead and Copper Rule. The HMUA has replaced customer water meters with units which have almost no lead content, increased its effort in instructing customers on the proper water sampling

techniques, and increased its frequency of corrosion inhibitor concentration monitoring within its water distribution system. The results from subsequent customer water sampling conducted in late 2004 and during the summers of 2005 through 2009, inclusive, have conformed to the Lead and Copper Rule. The results of the sampling in the summer of 2010 slightly exceeded the EPA's limits for the Lead and Copper Rule, but 2011, 2012 and 2013 samplings were in conformance. No sampling was required in 2014 and 2015, but standard sampling resumed in 2016. Sampling conducted in August 2017, April 2018, August 2019, July 2020 and July 2021 was in conformance. An extensive Public Education Program was completed by the HMUA.

Specific to the Lead Service Line Replacement and in accordance with NJ Legislation Senate Bill S3398 / A5343, HMUA has undertaken the following:

- Certified letter mailing to the 68 customers advising them of the presence of a customer side galvanized service line, which is considered as lead. This initial communication was issued on February 19, 2022.
- Ordinance requiring replacement of Customer side Galvanized Water Service Lines. The HMUA has coordinated with the Town of Hackettstown to prepare an ordinance that requires customers to cooperate with the HMUA such that the galvanized water services can be replaced by HMUA on customer property.
- Contract 53W awarded in June 2022. 65 Lines completed in 2023 and 6 six additional locations to be addressed in early 2024,
- Lead Frequently Asked Questions – The HMUA has provided a web-site link to lead FAQs which are presently posted on the NJDEP lead in drinking water web site.
- Post Replacement Customer Flushing Instructions – As galvanized lines were replaced, it is important for the contractor to flush the line and the customer to flush their home plumbing to remove any particulates that may remain as a residual to the replacement work. Instruction for flushing immediately following the replacement and for the next 6 months were provided to customer(s) in the form of a door hanger.
- Water Filter Pitcher Distribution – Immediately following each replacement, the Contract 53W Contractor provided the customer(s) with a Water Filter Pitcher (with 6 months of filter cartridges) for use by the customer. Instructions would typically be provided to the customer with the filter pitcher.

Well No. 8 was temporarily taken out of service due to failed water quality tests (positive e-coli in raw water sample) in June 2012. Due to the failed water quality tests, the HMUA and Mott MacDonald prepared a Ground Water Rules/4-Log Virus Inactivation Certification Form, calculations and plans which were submitted to the NJDEP, and in 2012 a 4-log analyzer was installed at Well No. 8. The 2012 forms were resubmitted in December 2017 in response to an NJDEP letter dated October 25, 2017. NJDEP approval was received on March 12, 2018. Since this approval, one notification has been issued to NJDEP when the chlorine residual dropped below the required value of 0.88 ppm. In 2021, HMUA considered requesting to discontinue the certification, but during the 2022 annual inspection, the HMUA noted they decided to keep the certification.

Commencing in 2020, HMUA has sampled for PFNA, 1,2,3-trichloropropane, ethylene dibromide, and 1,2-dibromo-3-chloropropane (DBCP) on a quarterly basis at all wells, and results have been below action levels.

As of October 19, 2017, HMUA is subject to requirements under the New Jersey Water Quality Accountability Act (WQAA). This Act requires purveyors to demonstrate and report upon the planning, operation, maintenance and reinvestment of its water systems. HMUA contracted with Mott MacDonald to assist in developing the Asset Management Plan (AMP) and the

Cybersecurity assessment and is taking steps to achieve compliance and review required manpower associated with requirements for:

1. Water System Maintenance
2. Asset Management Plan
 - a. Initial Plan prepared as of April 12, 2019. HMUA has updated as necessary.
 - b. 2023 Action Items
 - i. Valve Exercising – All valves have been exercised as part of the exercising process to date. A new exercising cycle will commence.
 - ii. Leak Detection – New equipment was purchased in 2020 and 2022, which is being used in conjunction with existing equipment. Additional leak detection equipment is being evaluated.
 - iii. The main replacement on Ashley Avenue (between Cook and Franklin) was started in November 2022, the main is installed, and testing is almost completed.
3. Mitigation Plans for Notice of Violations
4. Cybersecurity Program
 - a. An updated form prepared by the NJ Dept. of Homeland Security & Preparedness' New Jersey Cybersecurity and Communications Integration Cell (NJCCIC) was submitted by the November 16, 2018 deadline.
5. Annual Certifications
 - a. The 2022 Annual Certification Form was submitted on December 12, 2022.
 - b. Capital Improvement Report was uploaded on April 28, 2023.

Sewerage System

The HMUA Water Pollution Control Plant is being operated by seven (7) personnel under the supervision of three (3) licensed operators. The collection system is operated with three (3) licensed operators. Through the NJWA, the HMUA has a two-year apprenticeship program to help apprentices obtain licensure (1 license). The sewer side of HMUA currently has three (3) apprentices through this program.

The Water Pollution Control Plant (WPCP) constructed in 1971 had an original permitted capacity of 1.65 MGD and was designed to provide advanced secondary treatment. Development which occurred within the HMUA service area in the 1970's and early 1980's required that the HMUA undertake a plant expansion. The enactment of more stringent effluent requirements by the U.S. Environmental Protection Agency and the New Jersey DEP also dictated that the treatment process be upgraded. The HMUA embarked upon the planning and design for the upgrade/expansion in 1984. The necessary construction permits and low interest rate financing received from the New Jersey Wastewater Treatment Trust were received in 1991. Construction of the WPCP upgrade/expansion to a capacity of 3.30 MGD was substantially completed in September 1993 and the construction contract was finalized in September 1995 at \$10,510,210.

2.1. Water Pollution Control Plant

The amount of treated effluent that can be discharged to the Musconetcong River from the Water Pollution Control Plant (WPCP) is limited by the NJPDES Permit (NJPDES Permit No. NJ0021369) issued to the HMUA for operation of the plant. Currently, the permitted capacity of the plant is rated at 3.30 MGD. The August 2008 NJPDES Permit with an expiration date of July 31, 2013 included provisions to formally increase the plant capacity rating from 3.30 MGD to 3.39 MGD due to additional flow from the Diamond Hill area of Mansfield Township. A renewal NJPDES permit was submitted to NJDEP in January 2013, and a draft permit was received and comments provided to NJDEP in August 2016. The draft permit included proposed arsenic and mercury limits. A final NJPDES permit dated September 18, 2017 was issued. Based on concerns with the mercury limit, a stay request was submitted on October 16, 2017. NJDEP issued the stay for mercury in a letter dated November 17, 2017 and the NJPDES Permit Modification dated December 6, 2017. The final permit also included a limit for arsenic. However, NJDEP simultaneously stayed the limit to allow time to study background arsenic levels and HMUA has been participating in an arsenic treatability study at the WPCP, conducted by NJDEP and Stevens Institute of Technology. A meeting of the Arsenic Study group was held on September 19, 2019 to discuss results of pilot testing to date, and it is anticipated that a waiver program will be developed to relieve utilities of the proposed limits.

As a result of requirements contained in the HMUA's NJPDES Permit, the amount of flow to the treatment plant could have a significant impact on whether the existing WPCP can meet the stringent load-based limitations. The HMUA already removes most of the phosphorus present in its effluent by application of alum. HMUA has determined, based upon findings from a Chemically Enhanced Primary Treatment (CEPT) study, that use of chemicals will be adequate to meet the permit limit.

A renewal NJPDES permit was submitted to NJDEP on June 14, 2022 and a preliminary draft renewal NJPDES permit was issued to HMUA on October 26, 2022. The HMUA provided

comments to NJDEP on November 1st and the NJDEP issued revised preliminary draft NJPDES permit to HMUA on December 9, 2022.

The Delaware River Basin Commission added a new quarterly color sample requirement in the current permit; with sampling required to be performed between +3.5 & +4.5-years (6/1/2021 – 6/1/2022) from the effective date of the permit (EDP). The results are to be submitted to the DRBC and NJDEP with the permit renewal application.

The WPCP operated at an average daily flow of 2.049 MGD between September 1, 2022 and August 31, 2023, compared to 2.046 MGD for the prior 12-month period. This equates to approximately 62 percent of the permitted plant capacity of 3.30 MGD. The maximum monthly flow during the period between September 1, 2022 and August 31, 2023 was 2.394 MGD (July 2023). The ratio of the maximum monthly flow to the 12-month average daily flow was 1.17 times. The plant performance results for the major effluent parameters of concern, Biochemical Oxygen Demand (BOD), Total Suspended Solids (TSS), Ammonia and Phosphorus, averaged 2.2, 5.7, 0.11, 0.29 mg/l, respectively, over the past year, well within the NJDEP permit values of 20, 25, 1.0 and 0.49 mg/l assigned to the plant in the NJPDES Permit.

The upgraded and expanded WPCP has now been in service for thirty (30) years. The major treatment reactors and equipment were found to be in good physical and mechanical condition during the November 2023 facilities inspection. Routine maintenance and occasional hardware replacement, particularly for equipment which has been installed since the original plant construction completed in 1971, will continue to be required on an as needed basis.

The HMUA has recently completed seven (7) construction projects at the WPCP as follows. Work was completed on Contract 51S to replace the UV disinfection equipment in May 2022.

Contract No. 37S - 2010

- Site Piping Improvements
- Inlet Facilities Improvements including new Screening/Washer/Compactor unit and “bus stop” Enclosure
- New Motors and variable frequency drives (VFDs) for the two (2) main Raw Sewage Pumps
- Improvements to the existing Anaerobic Digesters

Contract No. 39S - 2012

- Installation of two (2) new Nitrification Tank aeration blowers and associated controls

Contract No. 42WS - 2014

- Installation of equipment to connect the two generators at the site
- Installation of a new power monitor allowing HMUA staff to operate additional equipment on the 660kW generator.

Contract No. 44S - 2015

- Building Architectural Improvements and Interior Painting
- Replacement of non-potable water pumps and site piping
- Elimination of Ponding Issue at lower level of Advanced Treatment Building
- Removal and decommissioning of Equalization Basin

Contract No. 48S - 2019

- Replacement of the Nitrification Tank diffusers

- Revision to Neuros Blower 10" Intake Piping
- Replacement of Anoxic Zone Mixers

Contract No. 50S - 2021

- Rebuilt one gravity belt thickener and provided new controls

Contract No. 51S – 2021-2022

- Replacement of ultraviolet disinfection equipment with a vertical UV design
- Replacement of channel gates

The HMUA, under a separate procurement Contract No. 36S, purchased new Digester Mixing and Heating Equipment that was installed by the Contractor under Contract No. 37S in 2010.

A 31.7 kW solar array was installed at the WPCP Site under a Power Purchase Agreement. The installation of the solar array was completed in September 2011, with an official ribbon-cutting ceremony on October 6, 2011. On November 13, 2018, the HMUA Board voted to accept ownership of the solar array and related appurtenances from SSE-NJ001, LLC at no cost as per a bill of sale dated November 16, 2018.

Since approximately 2006, the HMUA has been utilizing a maintenance management program software called "E-Maint" to keep track of the numerous routine maintenance tasks required to keep the equipment throughout the treatment plant operating efficiently and to increase the longevity of the equipment. The Sewer Utility's Chief Operator indicated that the "E-Maint" software has proven to be very helpful in keeping track and scheduling of the required maintenance tasks throughout the facility.

HMUA continues to accept wastewater from the M&M Mars pretreatment facilities which were constructed in 2015.

2.1.1 Inlet Facilities & Raw Sewage Pumping

The influent flow meter was last calibrated on 3/30/2021. The HMUA plans to calibrate the influent and effluent meters yearly (NJDEP requires a minimum interval of 1/5-years). The Division Box No. 1 flow control cones manufactured in 2013 have begun to exhibit pitting. Grit is removed at the Division Box using the HMUA Jet Truck. In 2022 it was noted that the Division Box is cleaned out approximately every 6 months.

Screening, Washing and Compacting Equipment was replaced in November 2010. The HMUA reported that equipment requires a gearbox replacement. One 3 CY dumpster of material is collected during a typical week. In 2020, the washer/compactor motor and VFD was replaced and the drive head and VFD was replaced on the screens. The discharge chute insulation was replaced in 2020 to address rodent damage from recent years. The compactor was not working during November 2022 and HMUA was manually removing material with a pitchfork. HMUA received a replacement gearbox. During the November 2023 inspection, the bar screen compactor was working again, and all issues have been resolved.

Recent Chronology for Raw Sewage Pumps

- HMUA personnel replaced the impeller and shaft sleeve for Raw Sewage Pump No. 3 in April 2011. The pump bearings and suction cover wear ring for this pump were also replaced by the HMUA in August 2011. During 2011, the HMUA investigated pump noise and bearing temperature concerns for Raw Sewage Pump No. 3; however, a

report by Rapid Pump and Meter in November 2011 found the pump to be operating within limits and the pump was returned to service.

- Raw Sewage Pump No. 1 was replaced in December 2012.
- In 2016, HMUA personnel replaced the rotating assembly for Pump No. 3.
- Raw Sewage Pump No. 2 was rebuilt in 2017
- Following a 2018 safety inspection, HMUA added shields below the motors where the pump shafts are exposed.
- In 2020, Raw Sewage Pump No. 1 was rebuilt.
- In 2021, HMUA re-packed Pump No. 3.

New motors and VFDs for Raw Sewage Pumps No. 1 and No. 2 were installed under Contract No. 37S, in 2010. During 2013, the HMUA completed the replacement of the existing Raw Sewage Pump Control Panel. HMUA staff also removed recirculation piping associated with future filters and repaired a damaged plug valve on the recirculation system during 2013. In 2020, HMUA reported that a sporadic issue with the use of Pump No. 3 VFD (original) while on generator power is still present.

The pump room floor, raw sewage piping, valves and pumps in the lower level of the WPCP Administration Building were coated under Contract No. 44S, in 2015.

The influent wet well is cleaned out by outside Contractors periodically as required. The refrigerant unit for the influent sampler was replaced in 2017.

Inlet Facilities and Raw Sewage Pumping		
2023 Findings by Mott MacDonald	Ongoing Issues / Items to be Addressed	Items addressed / Completed Upgrades in 2022-2023
n/a	n/a	Compactor gearbox has been replaced and Bar Screen Compactor is working well.

2.1.2 Primary & Secondary Treatment

During the November 2023 inspection of the site, Primary Clarifier No. 1 was in service. Primary Clarifier 1 has been in service for 50 years and replacement of equipment has been identified as a capital improvement project. During the November 2023 inspection of the site, Primary Clarifier No. 2 was currently not in service and no issues were reported with the unit.

Trickling Filter No. 2 and Intermediate Clarifier No. 2 were activated in preparation for Hurricane Ida in late August 2021, and as of the November 2023 inspection, they are both offline and out of service. Intermediate Clarifier No. 2 is currently empty and the HMUA has obtained a quote to re-coat the clarifier. The HMUA has also obtained on a quote for concrete repairs on the outside of Trickling Filter No. 1. All three (3) of the Trickling Filter Recirculation Pumps were reported to be operating properly. Pump No. 2 has been repacked.

During the November 2023 inspection, Intermediate Clarifier No. 1 was in service. Intermediate Clarifier No. 1 will eventually require sandblasting and painting. Some minor concrete damage was observed near the center column of Intermediate Clarifier No. 2 during the 2018 inspection and is still present.

The Intermediate Pumping Station was constructed during the WPCP Upgrade and Expansion in 1993. The Intermediate Pumping Station includes three (3) pumps with 25 HP motors equipped with VFDs. Prior to the April 2019 reactivation, the station had been off-line since February 2012 and was operated occasionally to test the equipment. During the November 2014 inspection, it was noted that the floor coating system has failed. The Pumping Station roof will require replacement at a future date. An upgrade of the pump controls is recommended as part of any upgrade to the Intermediate Pumping Station. During the November 2023 inspection, it was noted that the pump station is currently not in use. This building still has an original roof. The HMUA received prices for roof repairs and pump controls.

The Equalization Basin was abandoned in 2015 as part of Contract No. 44S.



Intermediate Clarifier No. 2



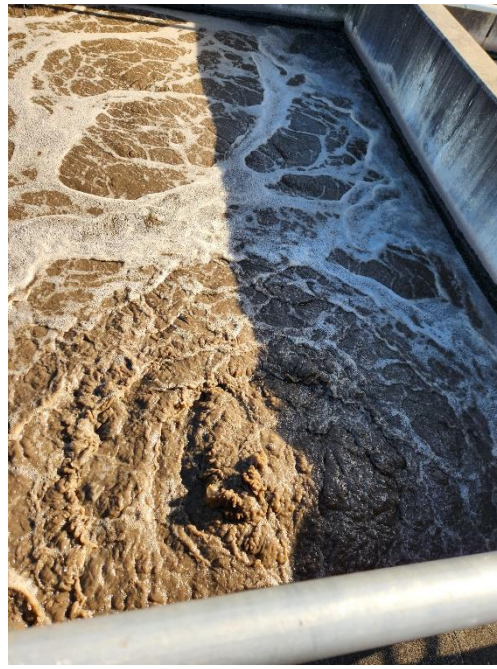
Trickling Filter No. 1

Primary & Secondary Treatment		
2023 Findings by Mott MacDonald	Ongoing Issues / Items to be Addressed	Items addressed / Completed Upgrades in 2022-2023
Minor Spalling near center column in Intermediate Clarifier No. 2 have been noted previously.	Several items at Intermediate Pump Station – Floor, Roof and Pump Controls. HMUA received prices for some of these repairs. HMUA is obtaining a quote to re-coat Intermediate Clarifier No. 2 HMUA is obtaining a quote for concrete repairs at Trickling Filter No. 1	n/a

2.1.3 Advanced Treatment

In 2017, Mott MacDonald carried out an evaluation of options for diffuser replacement as the existing swing-arm mechanisms were no longer manufactured, and other diffuser designs offer higher efficiency. HMUA completed Contract 48S which included diffuser and mixer replacement in July 2019. During the October 2020 inspection, large darker bubbles were noted in the Nitrification Tank, the bubbles appear to start midway through the tanks. HMUA monitored this throughout 2021 and determined it didn't impact their system and wasn't a concern. In October 2021, it was noted that a leak has been detected at the bleed-off connection point to the new diffusers in one tank. During the November 2023 inspection, the leak in the aerator was still present in the anoxic tank. To resolve this, the entire tank will need to be drained.

The three (3) Nitrification Tank Internal Recycle Pumps were reported to be in satisfactory operating condition. During the 2020 inspection, it was noted that upgrades would be required to the Internal Recycle System if regular use was required at a future date.



Nitrification Tanks – Leak at diffuser bleed-off

The HMUA aerated both of the Nitrification Tanks with a single 125 hp constant speed blower for many years. The 1991 plant upgrade and expansion provided four (4) constant speed centrifugal blowers with 125 hp motors. As recommended by the Energy Audit prepared by CDM, the HMUA completed Contract No. 39S to replace two (2) of the four (4) existing 125 hp constant speed centrifugal blowers with more efficient variable speed turbo blowers and to reduce the air flow capacity of the blowers based on the actual plant operating conditions. Two (2) new 75 hp turbo blowers with VFDs and controls were installed and have been operational since early 2012. A single turbo blower typically meets plant air demands for both Nitrification Tanks. The installation of the new turbo blowers has resulted in energy costs savings to the HMUA. In 2015, a VFD issue with one of the blowers was reported. Though repairs occurred in 2016, VFD issues persisted and a constant speed blower had been in operation. In 2017, HMUA worked with Neuros to analyze the blower issues. Air sampling suggested that H₂S from

thickening operations was resulting in corrosion of the electronic components. Replacement of one VFD (with enhanced coatings) and the PLC was completed in 2017. A second replacement VFD was also installed. HMUA improved the seal on the door leading to the blower room, maintained louvers in the open position and tested a new filter style as part of addressing the corrosion issue. With the diffuser replacement under Contract 48S, the turbo blowers have been operating at reduced speeds while meeting the plant air demands. In 2020 the Master Control Panel PLC was replaced, the programming was updated, and replacement PLCs were installed for both blowers. In 2021, the communication cable from Blower 4 to Master Blower Control Panel had issues, the issue has been resolved with the use of an external cable. During 2022, it was noted that a positive pressure system was being utilized for the blower room. Air corrosivity is being monitored via coupons installed outside the Blower Room. During the November 2023 inspection, it was noted that the two newer blowers aren't working, and the old blowers are back in use. Blower No. 2 requires PLC updates and may require replacements. Blower No. 4 has had work done; the core was replaced under previous warranty. The HMUA is looking into an odor logger that can measure in parts per billion. The HMUA is considering fully sealing the door that leads to the belt thickeners to help with the corrosion issues.



Blower No. 4

During the November 2023 inspection, it was reported that the Non-Potable Tank was replaced.



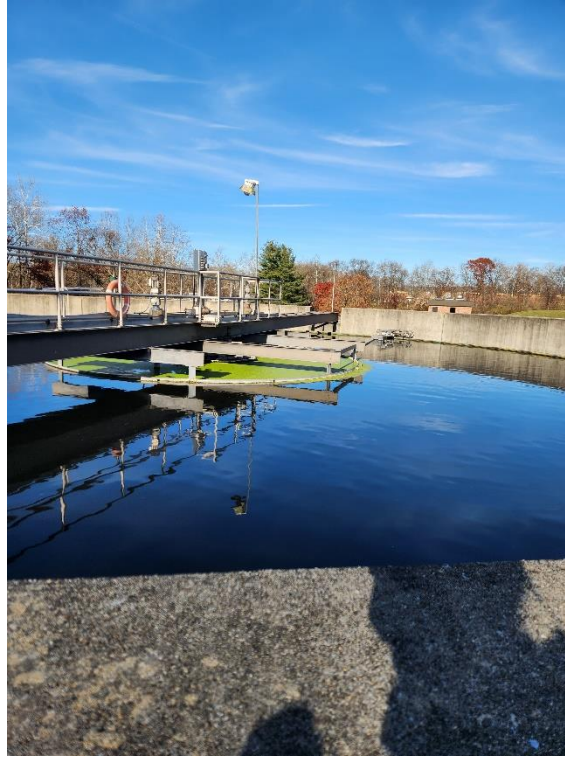
Non-Potable Tank

Both Final Clarifiers were operating during our site inspection in November 2023. During 2013, a Weir Wolf algae removal brush system was installed in Final Clarifier #2 and appears to be working satisfactorily. In June 2019, the same system was installed on Final Clarifier #1 and brushes have been replaced as needed. In 2013, HMUA installed new 8" WAS valves and replaced the WAS meter. In 2017, a new motor was installed on Final Clarifier #2.

In 2021 and 2022, it was noted that the Final Clarifier #1 shut off valve will require replacement.

During 2022, HMUA installed a new WinSmith in the Final Clarifier No. 1.

During the November 2023 inspection, the HMUA reported that the floc was down in both Final Clarifiers. Final Clarifier No. 1 is having the floc motor and speed controller rebuilt. This will be tested in Final Clarifier No. 1 before the Final Clarifier No. 2 floc motor and speed controller is rebuilt.



Final Clarifier No. 2

Advanced Treatment		
2023 Findings by Mott MacDonald	Ongoing Issues / Items to be Addressed	Items addressed / Completed Upgrades in 2022-2023
n/a	Address diffuser blow-off leak. Blowers No. 2 and No. 4 are down and being repaired. Floc motor and speed controller at final clarifiers are being repaired.	Non-Potable Tank was replaced. Shut off Valve on Final Clarifier No. 1 was replaced.

2.1.4 Post Aeration & Disinfection

Post aeration of Final Clarifier effluent is provided by a step cascade which is a concrete structure with no mechanical or electrical components. The unit is in sound condition. Effluent disinfection is provided in a two-channel UV disinfection system. The HMUA replaced the UV equipment and installed weather protection housing around the UV channels in 2002. The system has been having issues in automatic operation, and the HMUA staff completed a bulb change operation in 2017. However, as replacement parts had become difficult to obtain, design was completed under Contract 51S to upgrade the UV system to a vertical style UV system. In 2018, Mott MacDonald completed an evaluation, including jar testing, comparing use of Peracetic Acid (PAA) in place of an upgrade to the UV system. A pilot study of PAA was conducted in 2019 and a report was prepared in November 2019. HMUA successfully utilized PAA to provide temporary disinfection while the UV upgrade was under construction. Contract

51S work commenced in October 2021 and was completed in May 2022. Additional post aeration equipment is also installed in the UV tank, but is rarely, if ever needed at current flows due to the effectiveness of the step cascade. The blowers are used when the UV tanks are cleaned.

HMUA changed out two (2) aluminum gates during 2020 on Tanks 1 & 2 and repaired the Tank 3 effluent gate bottom gasket.

In 2020 HMUA installed three new mud valves. The remaining valve in the UV tank was replaced under Contract 51S.

During the November 2023 inspection, the HMUA noted that an Allen Bradley screen for the UV unit was replaced.

Post Aeration & Disinfection		
2023 Findings by Mott MacDonald	Ongoing Issues / Items to be Addressed	Items addressed / Completed Upgrades in 2022-2023
n/a	n/a	UV unit's Allen Bradley screen was replaced.

2.1.5 Auxiliary & Electrical Systems

In 2007, the HMUA switched from the use of aluminum chloride to aluminum sulfate for phosphorus reduction. The HMUA continues to be very satisfied with the performance and use of the aluminum sulfate, but has reviewed the use of DEL-PAC. The HMUA has a total of (4) Storage Tanks available for Alum Storage and the tanks were reported and appeared to be in satisfactory condition. During our site inspection, one Alum Storage Tank had a small leak at the base of the tank, it has been fixed and the tank will be filled up soon. The seal water pumping systems at both the Administration and Advanced Treatment Buildings are in satisfactory operating condition and the service water pumping equipment in the Administration Building was replaced under Contract No. 44S. HMUA staff installed a stainless steel seal water filter in 2014. In 2021, HMUA installed a dual basket strainer on the influent of the service water pumps, and it was reported to be working well. A basket screen was installed on the intake line under Contract 51S.



Fixed Alum Tank Leak



Alum Tank

The WPCP has two (2) emergency generators. The original 300 Kw emergency generator was installed with the original plant construction in the 1970's. The other generator is a 660 Kw generator that was installed as part of the 1991 WPCP upgrade and expansion project. The emergency generators and automatic transfer switches (ATS) were reported to have damaged control boards from 7/18/2022, by the November 2023 inspection this issue has been resolved. The emergency generators are exercised under load once per month. Maintenance and inspection of the emergency generator is performed quarterly by an outside contractor. With the completion of Contract No. 42WS, HMUA staff can use a new power monitor to operate additional equipment on the 660Kw generator. One of the main breakers was tested in November 2017, and a replacement was installed in April 2018.

During 2011, Mott MacDonald reviewed, investigated and evaluated the existing electrical distribution system at the WPCP to determine the feasibility of providing emergency back-up power to the Digester Building. The evaluation included preparation of Equipment List and Load Calculations for the existing 300 Kw generator. Based on the theoretical load analysis of the generator, the existing Digester Building feeder was connected to the existing 300 Kw generator to provide emergency power to the Digester Building.

The original boiler for the WPCP Administration Building, also constructed in the 1970's, was replaced in 2002 and is reported to be in satisfactory operating condition. As of the 2023 inspection, it has been modified to use natural gas. An electric hot water heater has been added.

In 2019 Mott MacDonald carried out a review of the USTs and associated equipment. HMUA is planning a three-phase approach to remove the USTs and install one new AST to serve the 660 Kw generator. HMUA worked with Elizabethtown Gas to extend natural gas service to the plant for use in heating and for the eventual replacement of the existing 300 Kw standby generator. As of the November 2022 inspection, the new line was installed along Esna Road and into the

plant site with a new meter located at the Digester Building. Some of the plant is using natural gas including the generator in the Admin Building, the digester flare and the digester is backup natural gas.

In 2020, HMUA tested oil in the 500kVA Transformer in both February and June. An inspection was also carried out by Jet Electrical Testing. HMUA staff caulked a gap found in the high side transition cabinet. HMUA is reviewing options for transformer oil replacement. In 2022, the HMUA was continuing to monitor oil conditions.

During November 2022, it was noted that a storm on July 18th, 2022, damaged the control boards for both Automatic transfer switches. A purchase order has been issued for replacements. During the November 2023 inspection, it was noted that the damaged control boards have been replaced.

Auxiliary & Electrical Systems		
2023 Findings by Mott MacDonald	Ongoing Issues / Items to be Addressed	Items addressed / Completed Upgrades in 2022-2023
n/a	Change oil in the transformer Automatic transfer switches for Generator require replacement Leak at base of Alum tank has been repaired, tank to be put back in service	Control boards damaged during 2022 storm have been replaced. Converted two boilers to natural gas.

2.1.6 Solids Handling Systems

Sludge collected in the primary and intermediate clarifiers is removed from the treatment process to the Anaerobic Digester System which was part of the original 1971 plant construction.

The HMUA undertook a Digester Repair Contract that included the construction of a new roof on the Digester Building, new waste gas burner, new gas piping and appurtenances. The Contract work for this project was completed during 2007.

As recommended by the WPCP Feasibility Study prepared by CH2M Hill and the Energy Audit prepared by CDM, the HMUA completed construction of Contract No. 37S to improve the gas production and performance of the anaerobic digestion system. The project included the installation of new sludge mixers. Air testing of the upgraded digesters occurred in late October 2011. HMUA staff added anti-slip pads to the digester covers to better facilitate flare maintenance. In 2014, the digester boiler was replaced and the existing oil tank was removed & replaced with a propane tank. In 2015, boiler piping was replaced in stainless steel. In 2015, HMUA staff replaced an 8" digested sludge valve, which required draining the associated tank. The boiler receives quarterly maintenance. After the 2018 inspection, HMUA has replaced the mixing valve and mixer compressor and has a spare unit available. During the 2020 inspection, it was noted that a new ATB Boiler fuel monitoring system was installed and the gasket was replaced on the Digester boiler's upper door. During the 2023 Inspection, the HMUA reported that they plan to take the digester down next year to clean. It was reported that the old propane tank is now removed and the plant is now mainly natural gas.

During November 2022, the flare on the roof of the digester building was working and some of the piping to the flare was rusted. Water ponding on the roof was observed.



Piping for Flare



Leaking Hot Water Heater

During the November 2023 inspection, the flare now is connected to natural gas and has a natural gas pilot. An old pipe opening was utilized and the natural gas piping goes through the wall for the flare. The water heater is leaking in the room with the generator; by the end of this year the HMUA will replace the heater and send the leaking one out for repair. The insulation on some of the piping for the generator is damaged.

In 2022, two check valves on the sludge lines were replaced by HMUA and two check valves were cleaned for proper operation.

HMUA staff had previously noted clarifier issues when the supernatant is recycled, so the flow had been directed to the pre-thickened sludge wet well. During November 2022, supernatant was being returned to the head of the plant, but during the November 2023 inspection, it was noted this was causing issues and the sludge is being directed to the pre-thickened sludge wet well. In 2021 the HMUA redid the exterior coating on the supernatant piping. A struvite build-up has been identified in the digested sludge line – the pipe clogs over the course of a three-year period. HMUA staff cleaned sections of digester overflow piping in September 2019 and again in 2021. In 2021 the HMUA staff took apart the fittings twice throughout the year to clean portions of the digested sludge piping that was clogging. The HMUA is considering replacing the pipes with PVC.



Flare on roof of Digester Building



Flare Piping

Sludge collected in the final clarifiers is wasted from the treatment system to a pre-thickened sludge holding tank at the Advanced Treatment Building. The waste sludge is thickened using gravity belt thickeners located in the Advanced Treatment Building prior to being trucked off-site (PVSC) for ultimate disposal. The two (2) gravity belt thickeners are now over twenty-five (25) years old. Under Contract 50S one unit was rebuilt and provided with new controls. The gravity belt thickeners are typically operated three (3) days per week. The positive displacement pumps (rotary lobe) used in conjunction with the gravity belts are reported to have operated satisfactorily over the past year. In 2015, HMUA replaced one of the polymer feed control panels and two polymer feed pumps. Spare parts are not readily available for the remaining existing polymer feed equipment. The thickened sludge mixer was replaced in 2016. A new hatch was installed between the belt thickeners. Commencing with the 2018 inspection, it was noted that some of the newer floor coatings in the Advanced Treatment Building installed in 2015 under Contract 44W are already peeling, particularly in the stairwells. HMUA also completed cleaning the sump pumps and replacing a small section of fire system piping on the lower level. In 2019, Fischer Electric replaced the sump pumps' floats. HMUA is monitoring the operation of the sump pumps and may need to have one or two pumps rebuilt or replaced in the near future. In 2021, the RAS Pumps No. 1 and No. 2 were rebuilt. In 2022, new RAS meters were installed.

During the November 2023 inspection, it was reported that one polymer pump has been replaced.



Polymer Pump

During the 2022 inspection it was noted that the thickened sludge mixer will be replaced and options for thickened sludge pump replacement are being considered. During the November 2023 inspection, it was noted that the HMUA has a quote for replacement in kind. The HMUA installed a new thickened sludge level gauge in 2022.

Solids Handling Systems		
2023 Findings by Mott MacDonald	Ongoing Issues / Items to be Addressed	Items addressed / Completed Upgrades in 2022-2023
The old propane tank has been removed and the plant is now run mainly on natural gas.	The HMUA is planning to clean the digester within the next year. A spare hot water heater will replace the current leaking hot water heater.	New conduits and natural gas for flare. The flare is using natural gas

2.1.7 Plant Laboratory

The existing WPCP water quality analysis laboratory, located within the plant Administration Building was modified under Contract No. 44S. The laboratory has been certified by the NJDEP to conduct chemical analyses and had recently been audited by NJDEP in October 2022. The laboratory is used to monitor select parameters used for routine process control of the treatment process and those for which the NJDEP requires monthly reporting from both the sewer utility and the water utility. Certain testing which is required on a monthly or less frequent basis does not justify the costs associated with purchasing additional laboratory equipment and maintaining a full-time lab technician on staff. These analyses continue to be performed by a private laboratory certified by the NJDEP.

Plant Laboratory		
2023 Findings by Mott MacDonald	Ongoing Issues / Items to be Addressed	Items addressed / Completed Upgrades in 2022-2023
n/a	n/a	n/a

2.1.8 Buildings

The buildings at the WPCP remain in good, well-maintained condition. A roofing repair project was undertaken in 2006. As the 2006 project didn't include the roofs for the Intermediate Pumping Station or the Advanced Treatment Building, the HMUA should plan for replacement

and has a quote to replace the roof at the Intermediate Pumping Station. A new heating unit was installed in the Advanced Treatment Building during 2008 and stairwell radiators were replaced in 2016 due to corrosion. Building lighting improvements recommended by the Energy Audit were completed in August 2011 and a further upgrade to LED was carried out in 2020. In 2015, building fire alarm systems were replaced and replacement emergency lighting was installed. During the November 2023 inspection, the HMUA reported a new fire alarm control panel and new sprinkler system were installed in the Advanced Treatment Building. The HMUA reported that painting will be done in all buildings during 2024.

The HMUA received BPU approval on December 17, 2010 for an Energy Reduction Plan for the WPCP. The ERP provides for up to \$361,836 in rebates, including Lighting Retrofits that were completed in 2011. The ERP also includes many of the improvements constructed under Contract No. 37S such as piping upgrades and VFD’s for the Raw Sewage Pumps as well as the Blower upgrades constructed under Contract No. 39S. The HMUA received \$250,546 in rebates from the ERP. The final report certified a 33.4% reduction in electricity costs, providing an annual savings of approximately \$70,000.

Buildings		
2023 Findings by Mott MacDonald	Ongoing Issues / Items to be Addressed	Items addressed / Completed Upgrades in 2022-2023
HMUA has a quote for replacement of Intermediate Pumping Station roof	Painting will be done in all buildings in the upcoming year.	A new fire alarm control panel and sprinkler system were installed in the Advanced Treatment Building

2.1.9 Site

The HMUA installed new landscaping throughout most of the plant site during 2009. Since 2017, HMUA has been cutting brush along the existing fence line. Some of the site paving is reaching the end of its life, and the HMUA may consider milling and providing a new topcoat. During the 2020 inspection, a large crack was noted in asphalt on main entrance into the treatment plant. Paving should be considered in the near future.

During 2020, the lawn hydrant near the UV disinfection system was upgraded to match the other lawn hydrants installed under Contract 44S in 2015.

During 2021, Mott MacDonald prepared an updated site plan of all underground utilities on the WPCP site.

During the November 2023 inspection, it was reported that HMUA is considering a SCADA upgrade.

Site		
2023 Findings by Mott MacDonald	Ongoing Issues / Items to be Addressed	Items addressed / Completed Upgrades in 2022-2023
HMUA is considering a SCADA upgrade	Cracks in asphalt along the main road.	n/a

2.2. Sewage Collection System

The HMUA continued to conduct internal television inspections of its sanitary sewer collection system during the past year in an effort to define areas where infiltration (groundwater leakage)

may be entering the sewer system. Mott MacDonald completed a Phase I I/I investigation in the Spring of 2003 which identified which sections of the HMUA collection system warranted further investigation to locate and repair specific leaks. The majority of the system was found to be in sound shape. However, there were a number of areas identified in the Phase I study where the collection system requires further investigation and repair of leakage sources. In 2018, grouting was done in the Kenwood area.

The HMUA purchased new TV Inspection equipment during 2008. TV Inspection equipment owned by the HMUA includes a sewer lateral camera to allow for the inspection of sewer service laterals within the collection system. The HMUA also owns a Jet/Vacuum Truck that is utilized to periodically clean the sanitary sewers within the HMUA's sanitary sewer collection system. Issues with the truck were noted during the 2019 inspection and subsequently corrected. The HMUA has established a Sewer System Cleaning Program as well as a TV Inspection Program. The HMUA performs TV Inspections of the sanitary sewers periodically as time permits. HMUA noted that they continue to monitor grease that collects in the 16" river crossing, which has minimal slope. The wet wells of the pump stations within the collection system are typically cleaned by the HMUA every two (2) months.

The HMUA owns and operates three (3) sewage pumping stations and operates one (1) sewage pumping station, the House of Good Shepherd Pump Station, which is privately owned. The Hills of Independence sewage pumping station is privately owned and operated. The HMUA has one (1) spare pump available for each pumping station.

The HMUA has taken efforts to identify sump pump discharges to the collection system. When identified, homeowners are contacted and follow-up inspections are conducted to confirm that sump pumps were disconnected.

HMUA has installed new confined space signage for the stations since the 2017 inspection.

During September 2020, a portable flow meter was purchased for use in measuring I&I.

During 2023, the HMUA purchased a new VAC truck and sold their other VAC truck.

Sewage Collection System		
2023 Findings by Mott MacDonald	Ongoing Issues / Items to be Addressed	Items addressed / Completed Upgrades in 2022-2023
The HMUA purchased a new VAC truck	n/a	n/a

2.2.1 Mt. Olive (formerly Oak Hill) Sewage Pumping Station

The HMUA owns and operates a small sewage pumping station serving a section of the Oak Hill at Mt. Olive subdivision along Stephens State Park Road. The sewage pumping station is located off Dorset Drive. The facility appeared to be in excellent physical condition and well maintained during our inspection. The discharge piping in the wet well is showing some signs of corrosion. In 2017, HMUA had installed new shock absorbers on the generator enclosure. The Oak Hill sewage pumping station includes two (2) submersible pumps, valve chamber, alarm dialer and emergency generator.

Mt. Olive (formerly Oak Hill) Sewage Pumping Station		
2023 Findings by Mott MacDonald	Ongoing Issues / Items to be Addressed	Items addressed / Completed Upgrades in 2022-2023
n/a	n/a	n/a

2.2.2 House of Good Shepard Sewage Pumping Station

The House of Good Shepard sewage pumping station located in Hackettstown is privately owned, but is operated by the HMUA. This pumping station was constructed in approximately 1998. During the November 2023 inspection, the pumping station appeared to be operating satisfactorily.

House of Good Shepard Sewage Pumping Station		
2023 Findings by Mott MacDonald	Ongoing Issues / Items to be Addressed	Items addressed / Completed Upgrades in 2022-2023
n/a	n/a	n/a

2.2.3 Diamond Hill (Meadow Lane) Sewage Pumping Station

The Diamond Hill (Meadow Lane) sewage pumping station located in the Township of Mansfield is owned and operated by the HMUA. This pumping station was constructed in 2004. The pumping station includes two (2) submersible pumps and emergency natural gas generator. The Diamond Hill sewage pumping station appeared to be in good physical condition and well maintained. In 2017, a new pump plate, lead pump float and replacement of controls was required at the facility. During the 2020 inspection, it was noted that the well and pump station were moved to a new circuit to address a power issue. In 2021, it was noted that the issue was resolved. During the November 2023 inspection, it was noted that there have been no electrical issues since this was previously resolved.

Diamond Hill (Meadow Lane) Sewage Pumping Station		
2023 Findings by Mott MacDonald	Ongoing Issues / Items to be Addressed	Items addressed / Completed Upgrades in 2022-2023
n/a	Board replaced in ATS	One pump being rebuilt.

2.2.4 Seber Road Well Property (Formerly Water Filtration Plant) Sewage Pumping Station

The HMUA also owns and operates a small sewage pumping station located at the Seber Road Well Property in Hackettstown. In 2010, the existing grinder at the station was removed due to failure, and both pumps were replaced with non-clog pumps. Pump 1 was replaced and rebuilt as a spare in August 2022. The station was reported to be operating satisfactorily and replacement of the site generator was completed on 11/28/2022 as noted in Section 1.3.

Seber Road Well Property (Formerly Water Filtration Plant) Sewage Pumping Station		
2023 Findings by Mott MacDonald	Ongoing Issues / Items to be Addressed	Items addressed / Completed Upgrades in 2022-2023
n/a	n/a	n/a

2.3. Wastewater Service Area and Wastewater System Planning

The HMUA's Future Sewer Service Area and water service areas were significantly reduced through implementation of the Highlands Preservation Act. The Highlands Regional Plan was approved by the Highlands Council on July 17, 2008 and was approved by the Governor. Amendments in the State's Water Quality Management Plan rules including the designation of the Musconetcong River as a "C-1" waterway has further limited the extent of the HMUA's sewer service area. Following a period with few requests, there has been an increase in requests received by the HMUA for centralized sanitary sewer and potable water service from undeveloped or underdeveloped properties situated within its service within the past three years. The HMUA completed a project to update the November 2003 HMUA Wastewater and Water Flow Projections and the updated flow projections are included in a report entitled "Water and Wastewater Flow Projections dated September 2008". As detailed in the September 2008 Water and Wastewater Flow Projections Report, it was projected that the WPCP peak monthly flows would exceed the current permitted plant capacity rating of 3.30 MGD in 2017. However, the actual average plant flows had decreased at several points during the last 10-year period due to efforts by the HMUA to reduce inflow and infiltration (I/I) flows and slowed development within the HMUA Sewer Service Area. The current average flow has reduced back to the values typically experienced over the past 10 years. The average flow in the 2019 report had been reported to be an increase of approximately 12% from the previous 12-month period (average daily flow of 2.345 MGD from September 1, 2018 to August 31, 2019 compared to 2.096 MGD from September 1, 2017 to August 31, 2018). It should be noted that 2018 was the wettest year in the State since record keeping began in 1895. In 2012, HMUA staff made adjustments to the values in the Flow Projections Report (as suggested in previous Annual reports) to reflect properties removed from the sewer service area and connections which have occurred since 2008 and excess capacity was shown for the WPCP. At this time, it is recommended that the HMUA continue to monitor and evaluate the existing and projected flows.

To comply with the recent NJDEP Water Quality Management Plan (WQMP) requirements that became effective in July 2008 requiring updates to the Hackettstown Wastewater Management Plan (WMP), the HMUA and Town of Hackettstown sent initial draft NJDEP Sewer Service Area (SSA) maps to the NJDEP on October 1, 2009. Following the initial submission to the NJDEP, numerous revised SSA Maps, documentation and emails were sent to the NJDEP based on comments received from the NJDEP on the SSA Maps. Agreement was reached with NJDEP on two (2) lots that the NJDEP was excluding from the Sewer Service Area (due to lots being designated as Rank 4 Habitat in the State's database) that the Town of Hackettstown and the HMUA wanted included in the HMUA's Sewer Service Area. The Sewer Service Area, including these two lots, was the subject of an April 6, 2011 Public Hearing by NJDEP. In June 2011, information from the 2008 Flow Projections Report was provided to the Highlands Council, which had become responsible for completing the Hackettstown WMP. In June 2012, April 2013 & December 2013 formal comments were provided to the Highlands Council regarding future flow estimates developed by the Highlands Council. In November 2014, the Town of Hackettstown met with the Highlands Council and was assured that the WMP will be completed and submitted to NJDEP. The proposed amendment covering the Town was adopted on February 12, 2016.

In 2011 and 2012, Mott MacDonald reviewed and prepared comments on the Washington Township WMP Chapter prepared by the Highlands Council, which included future flow estimates for the five (5) contributing municipalities. The HMUA elected to submit no comments on the final document and the Washington Township WMP was adopted by NJDEP in July 2012. In February 2016, HMUA provided comments on a proposed Washington Township Zoning amendment (RO-03-16) impacting the Musconetcong Age-Restricted Housing Overlay

zone. An Amendment related to the Heath Village West development was approved on March 20, 2018.

In 2012, Mott MacDonald reviewed WMP mapping for Mount Olive Township prepared by the Morris County Department of Planning. Comments were submitted on July 12, 2012 stating that only existing served/approved properties should be shown in the Future Sewer Service Area.

In 2016, Mott MacDonald updated the service area mapping from the 2008 Flow Projections Report reflecting the various updated municipal chapters. In 2021, Mott MacDonald developed a spreadsheet to track proposed projects and document connection dates going forward.

HMUA HEADQUARTERS COMPLEX & OVERALL FACILITIES

3.1. Facility Site Improvements

In 2016, the HMUA undertook several minor building repair/update projects at the HMUA Headquarters Complex at 424 Hurley Drive which includes the Administration Building, Storage Building, Operations Building and Material Storage Yard.

In 2023, the HMUA Headquarters complex remained in good condition. It was noted that the parking area and driveway were repaved during 2023.

3.2. Energy Audit of HMUA Facilities

During 2009, the HMUA completed an Energy Audit of the HMUA's facilities that included the Water Pollution Control Plant, Water Filtration Plant, Administration Building, Operations Building, Storage Building and Well and Booster Stations. The Energy Audit prepared by CDM included recommendations with potential areas to reduce energy usage and to reduce energy costs. The HMUA has undertaken several projects to implement some of the energy saving recommendations made in the Energy Audit report as discussed above.

3.3. Air Permitting

The table below summarizes the status of air permits for HMUA facilities. With the installation of the new generator at the WFP site, a new permit replaced the existing permit.

HMUA Air Permit Summary

Facility Name and ID	Air Permit Number	Permit Type	Equipment	Effective Date	Expiration Date
Water Pollution Control Plant (25591)	GEN100001	GP-017A	Boilers (3)	1/27/2020	1/27/2025
	GEN180001	GP-005A	Emergency Generators (2)	1/10/2018	1/10/2028
	PCP960002	PCP	Primary Digester	4/2/1998	4/2/2028
Water Filtration Plant (85495)	GEN220001	GP-005A	Emergency Generator	11/21/2022	11/21/2027
Mount Olive Booster Pump Station (85547)	GEN170001	GP-005A	Emergency Generator	12/8/2017	12/7/2027
Independence Booster Pump Station (85546)	GEN170001	GP-005A	Emergency Generator	12/8/2017	12/7/2027
Claremont Well #8 (85654)	GEN180001	GP-005B	Emergency Generator	11/7/2018	11/07/2028
Well #9 (26976)	GEN150001	GP-005B	Emergency Generator	5/19/2020	5/19/2025

3.4. Security Improvements

As mentioned previously, in 2017, HMUA added a security fence at the 2.4 MG tank and an enclosure around the Well No. 8 pump equipment. The damaged fence areas at the Seber Road Well Property site should be addressed.

3.5. Electrical Testing Reports

In July 2017, three thermographic surveys were completed by CNA and a follow up survey was done in September 2019. The purpose of these reports was to generate an infrared thermographic scan of the building's electrical systems in order to identify points with elevated temperatures within the electrical systems. Points of elevated temperatures can indicate potential wear or deterioration.

If an issue was detected, it was rated on a scale of severity ranging from minor to intermediate to serious to critical. The severity of the issues was determined based on temperature.

In July 2017, the Office building was scanned. There were no issues identified.

In July 2017, the WPCP was scanned. There were seven (7) intermediate issues identified, five (5) serious issues identified, and one (1) critical issue identified. All but two of these identified issues were confirmed as resolved in the 2019 follow-up.

In July 2017, the WFP Building was scanned. There was one (1) serious issue identified. This issue was confirmed as resolved in the 2019 follow-up.

In September 2019, a follow up survey was completed. In this scan, there were two (2) intermediate issues identified at the WPCP, which were subsequently addressed

It is recommended that these surveys be conducted annually until all critical and serious faults are verified as corrected and thereafter every three (3) years. It is recommended the HMUA complete thermographic surveys within the upcoming year since it has been more than three (3) years since the follow up survey for the electrical testing reports was completed.

SUMMARY

The HMUA potable water and sanitary sewer utility infrastructure is in sound condition and updated to comply with current environmental requirements. Potable water production capacity has been increased to meet growth occurring in the service area and this has allowed for the sale of the HMUA's surface water supply properties and the abandonment of the Water Filtration Plant. The HMUA has completed the replacement of its surface water reservoirs with groundwater with the completion of Well No. 9 located in Washington Township and the increased capacity of Diamond Hill (Claremont) Well No. 8. HMUA has continued with the design and permitting for construction of a new water storage tank on the northerly side of its distribution system. Additional capital projects have been identified in the Asset Management Plan and will be reviewed and prioritized on an annual basis. The Authority successfully updated its service line inventory and Contract 53W has removed the majority of remaining galvanized service lines in 2023, and the remaining six locations will be addressed in early 2024.

The WPCP upgrade/expansion was completed in 1993 and the plant is operating at approximately 62 percent of its permitted capacity and complying with its NJDEP effluent limits. Contract 51S was completed to replace the UV disinfection system. Other Capital expenditures for the next five years should include the miscellaneous replacement of mechanical and electrical equipment on an as needed basis which reaches the end of its useful life. As mentioned previously, the HMUA has completed the following projects at the WPCP:

- Sludge Digester Mixer Project to improve gas production and performance of Anaerobic Digestion System (Contract No. 37S, 2010)
- New screening/washing equipment at headworks of plant (Contract No. 37S, 2010)
- Raw Sewage Pump (RSP) motors and VFDs for RSP No. 1 and No. 2 (Contract No. 37S, 2010)
- Site piping modifications (Contract No. 37S, 2010)
- Blower Replacement (Contract No. 39S, 2012)
- Generator Interconnection (Contract No. 42WS, 2014)
- Removal of Equalization Basin and other improvements (Contract No. 44S, 2015)
- Replacement of Nitrification tank Diffuser System (Contract No. 48S, 2019)
- Rebuilt Gravity Belt Thickener (Contract No. 50S, 2021)
- UV System Replacement (Contract No. 51S, 2022-2022)

The HMUA water and sewer facilities are well maintained and capably operated. In order to continue this level of performance and keep pace with technological advances in the water supply and wastewater treatment field, HMUA personnel are encouraged to continue attending training seminars.