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VILLAGE OF WARWICK
INCORPORATED 1867

May 9, 2018

Dear Village Residents and Water Users,

The Village of Warwick is blessed with incredible water resources. Our drinking water is obtained through a system of three reservoirs and three wells. The Village maintains two purification plants and a distribution system of 34 miles of water mains.

The Village has worked diligently over the years to make important upgrades in both the purification and distribution systems. Those upgrades include a new microfiltration plant for Well #2 and essential rehabilitation to the Water Treatment Plant.

We also work continuously to maintain the watershed lands, the dams and spillways of our reservoirs.

Well #3 has been off line since 2012. This year we will be doing the necessary engineering and redevelopment to bring it back on line. This will be a welcome additional water source, especially during periods of drought.

The Annual Report has valuable information about our drinking water. Please take a moment to review it. The information the report contains will give you, as a water user, a greater understanding of the complexity and challenges to operate and deliver the cleanest and best water possible.

Thank you.

Very truly yours,

Michael J. Newhard
Mayor

Annual Drinking Water Quality Report for 2017
Village of Warwick
77 Main Street
Warwick, N.Y. 10990
(Public Water Supply ID# 3503561)

INFORMATION FOR NON-ENGLISH SPEAKING RESIDENTS

Spanish

Este informe contiene información muy importante sobre su agua beber. Tradúzcalo ó hable con alguien que lo entienda bien.

INTRODUCTION

To comply with State and Federal regulations, the Village of Warwick annually issues a report describing the quality of your drinking water. The purpose of this report is to raise your understanding and awareness of the need to protect our drinking water sources. This report provides an overview of last year's water quality results. Included are details about where your water comes from, what it contains, and how it compares to state and federal standards.

If you have any questions regarding your drinking water or this report, please consult the Village website www.villageofwarwick.org. if you need further information contact Cathy Schweizer, Village DPW office at (845) 986-2031 ext. 110, between the hours of 8:30 am and 4:00 p.m. Monday through Friday. The Village wants you to be informed about your drinking water. If you want to learn more, please attend any of the regularly scheduled Village Board meetings. These meetings are held on the first and third Monday of each month.

WHERE DOES OUR WATER COME FROM?

In general, the sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activities. Contaminants that may be present in source water include microbial contaminants; inorganic contaminants; pesticides and herbicides; organic chemical contaminants; and radioactive contaminants. In order to ensure that tap water is safe to drink, the State and the EPA prescribe regulations, which limit the amount of certain contaminants in water provided by public water systems. The New York State Department of Health (NYSDOH) and the FDA regulations establish limits for contaminants in bottled water, which are required to provide the same protection for public health.

Reservoir Filtration Plant (a.k.a. RWTP)

Our main surface water source is the Village of Warwick's three reservoirs located on Village owned property north of Black Rock Road in the Town of Warwick. The water from these reservoirs is gravity fed into the Reservoir Filtration Plant where it is treated with Sodium Permanganate for taste and odor control, treated with a Pacl coagulant, then filtered to remove particulate matter; it is then chlorinated to destroy microorganisms prior to entering the distribution system. The plant injects Orthophosphate into the treated water to sequester iron and manganese, which can cause discoloration of the water without this treatment.

Well #1

Well #1 is located in Memorial Park and is a small supply source that has not been in service for many years primarily because of its hydraulic connection to Well #2.

Well #2 / Microfiltration Plant (a.k.a. MWTP)

Well #2 is a substantial supply, which supplies the new Microfiltration Plant. Both are located in Memorial Park. This facility is the most substantial improvement made to the water system in recent years; this plant is state of the art membrane filter system with a rated capacity to treat 1,000,000 gallons per day. This facility went into service in April

2012. The plant has been producing water of outstanding quality from a source that previously had no filtration and was determined to be Groundwater Under Direct Influence (GWUDI) of surface water. Chlorine for disinfection and Ortho Phosphate for sequestering are the only chemicals added to the water at this plant.

Well # 3

Well #3 is a backup source, and is located north of Route17A at the east end of the Village. Well #3 has been off line since May 2nd, 2012 shortly after the Microfiltration Plant came on line on April 30th, 2012. In the past when Well #3 was used, the water was disinfected with chlorine to destroy microorganisms prior to entering the distribution system. The water from Well #3 has been determined to be Groundwater Under Direct Influence (GWUDI) of surface water, which requires treatment by filtration. Because of this determination, this supply, currently without filtration would only used in a very limited fashion, generally during emergency situations. Were the well to be used without filtration the Village would issue a Boil Water Order for its customers. In 2017 the Village commenced an engineering evaluation for a treatment system that will provide the Village the ability to use the well as a safe water resource, which meets Federal requirements. Phase one of the evaluation was completed and phase two will be performed in 2018.

SOURCE WATER ASSESSMENT PROGRAM SUMMARY

The NYS DOH has evaluated this Public Drinking Water Sources (PWS)'s susceptibility to contamination under the Source Water Assessment Program (SWAP), and their findings are summarized in the paragraph below. It is important to stress that these assessments were created using available information and only estimate the potential for source water contamination. Elevated susceptibility ratings do not mean that source water contamination has or will occur for the PWS. This PWS provides treatment and regular monitoring to ensure the water delivered to consumers meets all applicable standards.

The assessment area for this drinking water source contains no discrete Potential Contaminant Sources (PCS)'s, and the amount of pastureland in the watershed results in this reservoir system having a high susceptibility to protozoa. However, the high mobility of microbial contaminants in reservoirs results in this drinking water intake also having medium-high susceptibility ratings for enteric bacteria and viruses. Furthermore, reservoirs are highly susceptible to water quality problems caused by phosphorus additions. A copy of this assessment, including a map of assessment area, can be obtained by contacting the Village of Warwick.

FACTS AND FIGURES

Our water system serves approximately 6,800 people and numerous businesses through 2,558 service connections. The highest single day was 1,107,000 gallons, which occurred on August 12th, 2017. Village unmetered usage includes water main breaks, hydrant flushing, storage tank overflows, cemetery usage, park usage, wastewater treatment plant hydrant, and Fire Department tanker filling. Uunaccounted for water was 28% of the total amount of water produced. The unaccounted for water can be attributed to undetected leaks, fire fighting, losses through failed meters and estimating accuracy.

Water Use Figures	2017	2016	2015
Produced Annual (gallons)	236,200,000	224,651,000	232,433,000
Produced- Average Daily (gallons/day)	647,123	615,482	638,552
Produced Highest Single Day (gallons)	1,107,000	1,446,000	1,095,000
Metered Delivered Annually (gallons)	156,017,000	160,804,000	157,557,000
Village Usage- Metered and Unmetered (gallons)	13,180,000	9,597,000	10,654,000
Total Accountable Water (gallons)	169,197,000	170,401,000	168,202,000
Accountable Water Average Daily (gallons/day)	463,553	466,852	471,381
Unaccounted for Usage Annual	67,003,000	54,250,000	64,231,000
Percent Unaccounted Water (%)	28.37	24.14	27.63

Village Of Warwick Water Rates 2017	Residential/ Commercial Customer In Village	Industrial Customer In Village	Residential/ Commercial Customer Outside Village	Industrial Customer Outside Village
Minimum Service Charge per Quarter	$12.25	$12.25	$14.68	$14.68
1000-25,000 gallons (per 1000 gallons)	$5.02	$8.65	$14.76	$18.88
26,000-75,000 gallons (per 1000 gallons)	$6.29	$8.65	$16.36	$18.88
Over 76,000 gallons (per 1000 gallons)	$8.65	$8.65	$18.88	$18.88

ARE THERE CONTAMINANTS IN OUR DRINKING WATER?

As the State regulations require, we routinely test your drinking water for numerous contaminants. These contaminants include: total coliform, turbidity, inorganic compounds, nitrate, nitrite, lead and copper, volatile organic compounds, total trihalomethanes, haloacetic acids, radiological and synthetic organic compounds. The table presented below depicts the results of that testing. The State allows us to test for some contaminants less than once per year because the concentrations of these contaminants do not change frequently. Some of our data, though representative, is more than one year old. It should be noted that all drinking water, including bottled drinking water, might be reasonably expected to contain small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the EPA's Safe Drinking Water Hotline (800-426-4791) or the Orange County Health Department at (845-291-2331).

Table of Detected Contaminants

Contaminant	Violation Yes/No	Date of Sample	Level Detected	Unit Measure-ment	MCLG	Regulatory Limit (MCL, TT or AL)	Likely Source of Contamination
Barium	No	1/18/2017	.026	mg/l	2.0	MCL = 2.0	Erosion of natural deposits.
Sulfate	No	2/8/2017	16.0	mg/l	250	MCL = 250	Naturally occurring
Nickel	No	1/18/2017	3.2	ug/l	N/A	MCL = 100	Erosion of natural deposits
Selenium	No	1/18/2017	4.5	ug/l	50	MCL = 50	Enters environment from naturally occurring geologic sources, sulfur, and coal.
Chromium	No	2/22/2017	25	ug/l	0	MCL = 100	Erosion of natural deposits
Zinc	No	2/18/2017	20	ug/l	N/A	MCL = 5000	Naturally occurring.
Nitrate	No	4/12/2017	2.9	mg/l	10	MCL = 10	Runoff from fertilizer use.
Manganese	No	2/22/2017	10	ug/l	N/A	MCL = 300	Naturally occurring.
Five Haloacetic Acids** (HAA5)	No	Quarterly	Max=30.8 Range= 24.5 to 34.	ug/l	N/A	MCL = 60	By-product of drinking water disinfection needed to kill harmful organisms.
Total Trihalo-methanes** (TTHMs)	No	Quarterly	Max=45.5 Range= 20 to 53	ug/l	N/A	MCL = 80	By-product of drinking water chlorination needed to kill harmful organisms. TTHMs are formed when source water contains large amounts of organic matter.
Copper (see note 1)	No	6/20/2014	90th=0.1600 Range = 0.0260 - .3660	mg/l	1.3	AL=1.3	Corrosion of household plumbing

Lead (see note 2)	No	6/2017	90th= 1.3 Range =1.0 – 4.2	ug/l	0	AL=15	Corrosion of household plumbing
Turbidity MWTP	No	9/24/2017	0.137	NTU	N/A	TT=< 1	Soil Runoff
Turbidity MWTP	No	Monthly	100%	NTU	N/A	TT=95% of samples< 0.3 NTU	Soil Runoff
Turbidity RWTP	No	2/23/2017	0.230	NTU	N/A	TT=< 1	Soil Runoff
Turbidity RWTP	No	Monthly	100%	NTU	N/A	TT=95% of samples< 0.3 NTU	Soil Runoff
Distribution System Turbidity [3]	No	August 2017	0.789	NTU	N/A	MCL ≤ 5	Soil runoff

** The values shown in the table represent the highest locational running annual average calculated from data collected for Stage 2 compliance monitoring; however, the range of values includes Stage 2 and any Health Department surveillance samples.

1. The copper level presented represents the 90th percentile of the 20 customer locations tested. A percentile is a value on a scale of 100 that indicates the percent of a distribution that is equal to or below it. The 90th percentile is equal to or greater than 90% of the copper values detected at your water system. In this case, 20 samples were collected at your water system and the 90th percentile value was the eighteenth highest value, 0.2860 mg/l with a range of .0404 - .7660 mg/l. The action level for copper was not exceeded at any of the sites tested.
2. The lead level presented represents the 90th percentile of the 20 customer samples collected. The Action level for lead was not exceeded at any of the 20 sites tested. If present, elevated levels of lead can cause serious health problems, especially for pregnant women, infants, and young children. It is possible that lead levels at your home may be higher than at other homes in the community as a result of materials used in customers plumbing components. The Village of Warwick is responsible for providing high quality drinking water, but cannot control the variety of materials used in a customer's plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline (1-800-426-4791) or at http://www.epa.gov/safewater/lead.
3. Five samples are collected per week, averaged for the month and compared to the MCL; here we report the highest monthly average for the year.

Definitions:

Maximum Contaminant Level (MCL): The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible.

Maximum Contaminant Level Goal (MCLG): The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

Maximum Residual Disinfectant Level (MRDL): The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

Maximum Residual Disinfectant Level Goal (MRDLG): The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contamination.

Action Level (AL): The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.

Treatment Technique (TT): A required process intended to reduce the level of a contaminant in drinking water.

Non-Detects (ND): Laboratory analysis indicates that the constituent is not present.

Nephelometric Turbidity Unit (NTU): A measure of the clarity of water. Turbidity in excess of 5 NTU is just noticeable to the average person.

Milligrams per liter (mg/l): Corresponds to one part of liquid in one million parts of liquid (parts per million - ppm).

Micrograms per liter (ug/l): Corresponds to one part of liquid in one billion parts of liquid (parts per billion - ppb).

Picocuries per liter (pCi/L): A measure of the radioactivity in water.

MWTP: Well #2 / Microfiltration Plant.

RWTP: Reservoir Filtration Plant.

2017 NYSDOH PFC Sample Results	Sample date 9/7/2017		
Source: Well 2		**Results are in units of ng/l**	
Compound	**MRL**	**Raw Water**	**Finished Water**
Perfluorobutanesulfonic acid (PFBS)	1.77 ng/l	4.97 - 5.37	4.56
Perfluorohexanesulfonic acid (PFHxS)	1.89 ng/l	ND	ND
Perfluoroheptanesulfonic acid (PFHpS)	2.00 ng/l	2.45 - 2.48	2.51
Perflurooctanoic acid (PFOA)	2.00 ng/l	5.52 - 5.63	4.99
Perfluorooctanesulfonic acid (PFOS)	1.91 ng/l	3.25 - 3.59	2.84
Perfluorononanoic acid (PFNA)	2.00 ng/l	ND	ND

MRL
Method Reporting Limit - The minimum concentration of a contaminant that can be reported with a specified degree of confidence.

ng/l- Nanograms per liter: Corresponds to one part of liquid to one trillion parts of liquid (parts per trillion - ppt).

To provide Americans, including the most sensitive populations, with a margin of protection from a lifetime of exposure to PFOA and PFOS from drinking water, EPA established the health advisory levels at 70 parts per trillion. When both PFOA and PFOS are found in drinking water, the combined concentrations of PFOA and PFOS should be compared with the 70 parts per trillion health advisory level. This health advisory level offers a margin of protection for all Americans throughout their life from adverse health effects resulting from exposure to PFOA and PFOS in drinking water.

WHAT DOES THIS INFORMATION MEAN?

As you can see by the table, our system had no violations. We have learned through our testing that some contaminants have been detected; however, these contaminants were detected below the level allowed by the State.

DO I NEED TO TAKE SPECIAL PRECAUTIONS?

Some people may be more vulnerable to disease causing microorganisms or pathogens in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice from their health care provider about their drinking water. EPA/CDC guidelines on appropriate means to lessen the risk of infection by Cryptosporidium, Giardia and other microbial pathogens are available from the Safe Drinking Water Hotline (800-426-4791). Please note that after May 2, 2012 all water delivered to customers was treated to remove these microorganisms.

IS OUR WATER SYSTEM MEETING OTHER RULES THAT GOVERN OPERATIONS?

During 2017, our system was in compliance with applicable State drinking water operating, monitoring and reporting requirements.

LEAD IN DRINKING WATER

Lead in drinking water is due to leaching from lead service lines and lead solder joints in service lines and interior building piping. The Village does not believe that it has any lead water lines and in replacing service lines between the main and the curb stop has no history of finding lead lines. The customer is responsible for the line from the curb stop to the structure and all internal piping. If lead is a concern you should check the materials in your system. The Village of Warwick is responsible for providing high quality drinking water, but cannot control the variety of materials used in a customer's plumbing components. When water has been sitting in the pipes for several hours, the potential for lead exposure can be minimized by flushing the tap for 30 seconds to 2 minutes before using water for drinking or cooking.

Further the Village of Warwick injects Orthophosphate into the treated water prior to it entering the distribution system. Orthophosphate works as a sequestering agent which provides a coating on the inside of the pipes creating a shield that prevents corrosion and minimizes leaching of lead and other metals. Scientific American has a brief explanation about how this chemical works: http://www.scientificamerican.com/video/corrosive-chemistry-how-lead-ended-up-in-flint-s-drinking-water1/

The Village of Warwick tests for lead at 20 locations in the system. Samples are taken from tap water inside customer locations and are taken as a first draw after the water has remained in the internal piping for 6 hours. The Action level for lead was not exceeded at any of the 20 sites tested. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline (1-800-426-4791) or at http://www.epa.gov/safewater/lead.

WHY SAVE WATER AND HOW TO AVOID WASTING IT?

Although the Village's system has an adequate amount of water to meet present and future demands, there are a number of reasons why it is important to conserve water:

- Saving water saves energy and some of the costs associated with both of these necessities of life;
- Saving water reduces the cost of energy required to pump water and the need to construct costly new wells, pumping systems and water towers; and
- Saving water lessens the strain on the water system during a dry spell or drought, helping to avoid severe water use restrictions so that essential fire fighting needs are met.
- You can play a role in conserving water by becoming conscious of the amount of water your household is using, and by looking for ways to use less whenever you can. It is not hard to conserve water. Conservation tips include:
- Automatic dishwashers use 15 gallons for every cycle, regardless of how many dishes are loaded. So get a run for your money and load it to capacity.
- Turn off the tap when brushing your teeth.
- Check every faucet in your home for leaks. Just a slow drip can waste 15 to 20 gallons a day. Fix it and you can save almost 6,000 gallons per year.
- Check your toilets for leaks by putting a few drops of food coloring in the tank, watch for a few minutes to see if the color shows up in the bowl. It is not uncommon to lose up to 100 gallons a day from one of these otherwise invisible toilet leaks. Fix it and you save more than 30,000 gallons a year.
- Use your water meter to detect hidden leaks. Simply turn off all taps and water using appliances, then check the meter after 15 minutes. If it moved, you have a leak.

SYSTEM IMPROVEMENTS

The Village of Warwick during 2017 made a substantial investment into its overall water system through multiple improvements and upgrades.

Microfiltration Plant

- Purchased and installed new computers to provide communication between the RWTP and MWTP.
- Removed neutralization tank and constructed office, lab and rest room.
- Butterfly valves on treatment skids were replaced.
- Upgraded lab bench chlorine equipment.

Reservoir Filtration Plant

- Completed and commenced operation of new pump station to pump lagoon backwash water to sewer.
- New actuated valves were installed on the lagoon waste lines.
- Replaced failing air release valves.
- Upgraded orthophosphate feed pump.
- Upgraded several pieces of lab bench equipment.

Reservoirs

Raw water in the reservoir and well sources were experiencing diminished capacity during the last four months of the year. The Village Water Department monitored and reported the water levels on a biweekly basis. The Village reduced the water production from the reservoirs by half and increased water production from the well and considered the need to impose water restrictions.

Listed below are the accomplishments made during 2017 to our reservoir system.

- Middle Reservoir concrete spillway where cracking was observed was reinspected and it was found to be structurally sound with no remediation required at this time. The spillway will be inspected every 6 months and after a major storm.

Pump Stations and Storage Tanks

During Hurricane Sandy in 2012 the Village was able to provide water to customers without interruption. To do so required the use of stationary and rented portable auxiliary power. This event demonstrated the importance of auxiliary power and the Village is working toward additional stationary supplemental power systems at critical facilities.
The Village has made application for a state sponsored grant to install backup power generation to most of our pumping stations. Should the Village be awarded these grants, we will be able to strengthen our ability to deliver a safe and reliable supply of drinking water to your homes and businesses during long-term power outages.

Improvements were made to the following:

- Maintenance only. No major activity.

Distribution

The Village Water Department is responsible for maintaining approximately 45 miles of water main, with major portions originally installed during the early 1900's. Given the length of pipe in the system and its age it is understandable breaks occur from time to time.

Below is a listing of the Distribution projects performed during 2017:

- Performed system-wide flushing in April and August.
- Installed 10 new service connections.
- Updated 155 residential water meters to Sensus iPERL meter and 179 MXU's
- Installed 4 new hydrants to replace existing.
- Repaired 18 hydrants that had failed.
- Repaired 5 water main breaks.
- Repaired 4 service lines.
- Valves- Checked 200; opened approx. 5; located and raised approx. 55
- Pond Hill Pressure Reducing Valve (PRV) was inspected by Ross Valve to evaluate whether an altitude valve would provide function at that location.
- Altitude valves and Pressure Reducing Valves (PRV) were inspected for proper operation and adjusted as required.
- Commenced an engineering evaluation of the distribution system to determine changes that would optimize the long-term operation of the pump stations and water storage tanks. The first phase of the study was completed and presented to the Village Board.
- Rebuilt 6" PRV and 2" Pilot valve at Woodside vault.
- New RPZ valve installed at Orchard Street Sewerage Pump Station.

General

Maintained and updated the GIS-based system for inventory, management and maintenance of water infrastructure.
Submitted updated Emergency Response Plan and Vulnerability Assessment to Orange County Health Department and received approval of the documents.
An engineering evaluation of treatment options for Well #3 was performed and presented to the Village Board.
A Safe Yield Analysis of system was commenced in 2017 with the engineering firm of Barton & Loguidice and will continue into 2018. This project is funded in part by the Orange County Water Authority.

CLOSING

Thank you for allowing us to continue to provide you with quality drinking water. We ask that all our customers help us protect our water sources, which are the heart of our community. Please call our office at the Village Hall (845) 986-2031 ext. 110 if you have any questions.