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CITY OF WILMINGTON
PUBLIC WATER SYSTEM
IDENTIFICATION # DE0000663

CITY OF WILMINGTON

WATER QUALITY REPORT 2018

Published by the City of Wilmington Department of Public Works Water Division

To ensure that tap water is safe to drink, the Environmental Protection Agency (EPA) prescribes regulations which limit the amount of certain contaminants in public water systems. The EPA requires the City of Wilmington, and all other water suppliers in the US, to report annually on specific details about testing for a number of contaminants in our water. Chemical and biological monitoring provide the data that helps suppliers, such as the City of Wilmington, make key water quality management decisions to ensure freshness and purity. This report, published in the spring of 2019, includes water quality information for the 2018 calendar year.

(Full report continues on page 2)

Kelly Williams, Commissioner,
Department of Public Works

A Word from the Commissioner

The City of Wilmington continues its commitment of providing our consumers with clean and reliable drinking water today and for future generations.

The Wilmington Water Division monitors for over 100 contaminants, including herbicides, pesticides, Cryptosporidia, Giardia and coliform bacteria. We collect samples from the Brandywine Creek, Hoopes Reservoir, Porter Reservoir, Cool Spring Reservoir, the filtration plants, and at customers' taps in the distribution system.

Last year, over 30,000 water samples were drawn from the City's fresh water supply treatment plants and distribution system. Our laboratory performed over 70,000 water analyses on those samples. This data demonstrates that Wilmington's water system exceeds Safe Drinking Water Standards.

We are proud to bring you this year's Water Quality Report. I hope you find it helpful and informative.

JR. WATER WORKS
KIDS ACTIVITY SHEET

2018 WATER QUALITY REPORT

Why We Test Your Drinking Water

The City of Wilmington's water supply source is surface water from the Brandywine Creek and Hoopes Reservoir. 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 activity.

Drinking water, including bottled water, may reasonably be expected to contain at least 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**. Contaminants that may be present in source water include:

- Microbial contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
- Inorganic contaminants, such as salts and metals, which can be naturally-occurring or result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.
- Pesticides and herbicides, which may come from a variety of sources such as agriculture, urban storm water runoff, and residential uses.
- Organic chemical contaminants, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban storm water runoff, and septic systems.
- Radioactive contaminants, which can be naturally-occurring or be the result of oil and gas production and mining activities.

During disinfection, certain byproducts form as a result of chemical reactions between chlorine and naturally occurring organic matter in water. These are carefully controlled to keep disinfection effective and byproduct levels low.

The state allows us to monitor for some contaminants less than once per year because the concentrations of these contaminants do not change frequently. Some of our data, though representative, are more than one year old. If this is the case, the sample year will be noted in the report.

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 about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline, **(800) 426-4791**.

The Division of Public Health, in conjunction with the Department of Natural Resources and Environmental Control (DNREC), has conducted source water assessments for nearly all community water systems in the state. Contact the City at **(302) 571-4158** regarding the availability of the assessment and how you may obtain a copy. The assessment may also be viewed at: **delawaresourcewater.org**.

Contact Us

You can help us ensure the safety of our water supply by reporting any unusual or suspicious activity either on our waterways, near our reservoirs, water filtration plants, water towers or pumping stations.

To report an incident or general water quality concerns, call the City Call Center at (302) 576-3878.

If you have questions about this report, call the Water Quality Laboratory at (302) 571-4158.

Weekends or after 5 P.M., (302) 571-4158.

Table 1: Water Quality Results - Detected Primary[1] Parameters at ENTRY POINTS to Distribution System

				Brandywine Filter Plant			Porter Filter Plant			
Contaminant	Units	MCLG[2]	MCL[3] or TT[4][5]	Range of Levels Detected	Highest Detected Level	Violation	Range of Levels Detected	Highest Detected Level	Violation	Likely Source of Contamination
Microbiological Indicators - (2018 unless noted)										
Turbidity - Percentile	% of samples below 0.3	N/A	95% of monthly samples must be less than 0.3	100 - 100	100	No	100 - 100	100	No	Soil runoff
Turbidity - Values	NTU		No sample must ever exceed 1.0	0.046 - 0.096	0.096	No	0.052 - 0.104	0.104	No	Soil runoff
Inorganic Chemicals (Metals and Nutrients) - (2018 unless noted)										
Barium	ppm	2	2	0.0348 - 0.0348	0.0348	No[14]	0.0414 - 0.0414	0.0414	No[15]	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits
Nickel	ppb	N/A	100	1.5 - 1.5	1.5	No[14]	2.0 - 2.0	2.0	No[15]	Discharge from industrial sources; Erosion of natural deposits
Chromium	ppb	100	100	1.0 - 1.0	1.0	No[14]	1.9 - 1.9	1.9	No[15]	Discharge from steel and pulp mills; Erosion of natural deposits
Fluoride	ppm	2	Delaware State MCL: 2 ppm[6]	0.32 - 1.14	1.14	No	0.29 - 1.11	1.11	No	Erosion of natural deposits; Water additive which promotes strong teeth; Discharge from fertilizer and aluminum factories
Nitrate	ppm	10	10	1.1 - 3.2	3.2	No	0.03 - 3.7	3.7	No	Runoff from fertilizer use; Leaching from septic tanks; Sewage; Erosion of natural deposits
Nitrite	ppm	1	1	0.002 - 0.008	0.008	No	0.002 - 0.008	0.008	No	Runoff from fertilizer use; Leaching from septic tanks; Sewage; Erosion of natural deposits
Disinfectants - (2018 unless noted)										
Chlorine	ppm	N/A	At least 0.3 residual entering Distribution System	0.97 - 2.18	2.18	No	0.9 - 2.7	2.7	No	Water additive used to control microbes
Disinfection Byproduct Precursors - (2018 unless noted)										
Total Organic Carbon	ppm	N/A		0.89 - 2.50	2.50	N/A	0.77 - 2.00	2.00	N/A	
Total Organic Carbon	% Removal (Raw to Treated)	N/A	Must exceed 35% (25% in certain instances)	27% - 75%	75%	No	24% - 67%	67%	No	Naturally present in the environment. Total organic carbon (TOC) has no health effects. However TOC provides a medium for the formation of disinfection byproducts.
Total Organic Carbon	Compliance Ratio (rolling annual avg)	N/A	Ratio of Actual to Required Removal - must be greater than or equal to 1.	1.14 - 1.20	1.20	No	1.24 - 1.41	1.41	No	
Synthetic Organic Chemicals (pesticides, defoliants, fuel additives) - (2016 unless noted)										
Dalapon	ug/L	200	200	0.79 - 0.79	0.79	No	-	-	-	Runoff from herbicide on rights of way
Atrazine	ug/L	3	3	-	-	-	0.031 - 0.031	0.031	No	Runoff from herbicide on rights of way
Di (2-ethylhexyl) phthalate	ug/L	0	6	0.27 - 0.27	0.27	No	0.28 - 0.28	0.28	No	Discharge from plastic production
Hexachlorocyclopentadiene	ug/L	50	50	-	-	-	0.077 - 0.077	0.077	No	Runoff from herbicide on rights of way
Simazine	ug/L	4	4	-	-	-	0.072 - 0.072	0.072	No	Runoff from herbicide on rights of way

Table 2: Water Quality Results - Detected Primary[1] Parameters in Distribution System

Contaminant	Units	MCLG[2]	MCL[3] or TT[4][5]	Range of Levels Detected	Highest Detected Level	Violation	Likely Source of Contamination
Microbiological Indicators							
Total Coliform	"% of samples positive each month"	0%	5.0%	0.0 - 0.0	0.0	No	Bacteria that are naturally present in the environment. Used as an indicator of the presence of other potentially harmful bacteria.
Disinfectants							
Chlorine	ppm	MRDLG = 4.0[9]	MRDL = 4.0[8]	0.0 - 2.2	2.2[10]	No	Water additive used to control microbes
Disinfection Byproducts							
Total Trihalomethanes	ppb	No goal for the total	80	12 - 81[7]	67[11]	No	Byproduct of drinking water disinfection. Forms due to reaction of chlorine with total organic carbon. **Health effects:** Some people who drink water containing TTHMs in excess of the MCL over many years could experience problems with their liver, kidneys, or central nervous system, and may have an increased risk of getting cancer.
Haloacetic Acids	ppb	No goal for the total	60	12 - 52[7]	51[11]	No	Byproduct of drinking water disinfection. Forms due to reaction of chlorine with total organic carbon.

Sources of Lead in Drinking Water

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. The City of Wilmington is responsible for providing high quality drinking water, but cannot control the variety of materials used in consumer'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 by the City's Water Quality Lab. For more information on lead in drinking water, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline **(800) 426-4791**, or at **epa.gov/safewater/lead**.

Table 3: Detection of Unregulated Contaminants[12]

Chemical or Constituent	Units	Average	Range of Levels Detected	Likely Source of Contamination
Chromium 6+	ug/L	0.33	0.24 - 0.41	Naturally occurring from geological formations, also from manufacturing textile dyes, wood preservation, leather tanning & anti-corrosion coatings
Chromium, Total	ug/L	0.46	0.38 - 0.54	Discharge from steel & pulp mills & chrome plating; Erosion of natural deposits. Allergic dermatitis may occur in sensitive individuals who use water containing chromium in excess of the MCL over many years.
Strontium	ug/L	135	130 - 140	Found in rocks & soil; Use of phosphate fertilizers
Vanadium	ug/L	0.4	0.4 - 0.4	Naturally occurring metal; Steel manufacture
Molybdenum	ug/L	2.9	1.5 - 4.2	Naturally occurring element in ores & present in plants, animals & bacteria; Used as a chemical reagent in the form molybdenum trioxide
Chlorate	ug/L	382	270 - 500	Agricultural defoliant or desiccant; Disinfection byproduct & used in the production of chlorine dioxide
1,4-dioxane	ug/L	0.1	0.1 - 0.1	A clear liquid used as a solvent in the manufacture of chemicals

Table 4: Radioactive Contaminants
(2016 unless noted)

Radioactive Contaminants	Units	MCLG	MCL	Highest Detected Level	Range of Levels Detected	Violation	Likely Source of Contamination
Beta/photon emitters	pCi/L	0	50[14]	3.5	3.5 - 3.5	No	Decay of natural and man-made deposits

Table 5: Secondary[17] Parameters and Other Parameters of Interest Detected in Water as it Enters Distribution System

			Brandywine Filter Plant			Porter Filter Plant			
Contaminant	Units	SMCL[17]	Average	Lowest	Highest	Average	Lowest	Highest	Source
Conventional Physical and Chemical Parameters									
pH	units	6.5 - 8.5	7.2	6.9	7.5	7.5	6.9	8.1	Waters with pH = 7.0 are neutral
Alkalinity	ppm as $CaCO_3$	N/A	60	38	71	59	45	71	Measure of buffering capcity of water or ability to neutralize an acid
Hardness	ppm as $CaCO_3$	N/A	117	76	160	121	88	176	Naturally occurring; Measures Calcium and Magnesium
Conductivity	µmhos/cm	N/A	329	201	556	364	247	588	General measure of mineral content
Sodium	ppm	N/A	20.6	20.6	20.6	19.8	19.8	19.8	Naturally occuring; Chemical additive to treat the water; Road salt application and run-off
Sulfate	ppm	250	15.7	15.7	15.7	12.1	12.1	12.1	Naturally occuring; Can cause objectionable taste and odor in water
Chloride	ppm	250	65	35	155	75	49	130	Naturally occurring; Chemical additive to treat the water; Road salt application and run-off
Metals									
Manganese	ppb	50	0.014	0.006	0.029	0.011	0.006	0.027	Naturally occurring; Can cause discoloration and objectionable taste in water
Zinc	ppm	5	0.11	0.08	0.15	0.10	0.05	0.14	Naturally occurring; Chemical additive to treat the water

Table 6: Lead and Copper
(based on 2017 sampling–testing is done every 3 years)

Contaminant	MCLG	Action Level (AL)[13]	90th Percentile	# Sites Over AL	Units	Violation	Likely Source of Contamination
Copper	1.3	1.3	0.247	0	ppm	No	Erosion of natural deposits; Leaching from wood preservatives; Corrosion of household plumbing systems
Lead	0	15	5.60	3	ppb	No	Corrosion of household plumbing systems; Erosion of natural deposits

Key to Tables

[1] Primary parameters are contaminants that are regulated by a maximum contaminant level (MCL), because above this level consumption may adversely affect the health of a consumer.

[2] MCLG - Maximum Contaminant Level Goal is the level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow no margin of safety.

[3] MCL - Maximum Contaminant Level is the highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.

[4] TT - Treatment Technique refers to the required process intended to reduce the level of a contaminant in drinking water. EPA's surface water treatment rules require systems to (1) disinfect their water and (2) filter their water such that the specific contaminant levels cited are met. Lead and copper are regulated by a Treatment Technique that requires systems to control the corrosiveness of their water. Total organic carbon is regulated by a Treatment Technique that requires systems operate with enhanced coagulation or enhanced softening to meet specified percent removals.

[5] Unless otherwise indicated value given is a MCL.

[6] State limit is to not exceed 2.0 mg/L.

[7] Cited range is the range of all individual results in 2017.

[8] MRDL - Maximum Residual Disinfectant Level is 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.

[9] MRDLG - Maximum Residual Disinfectant Level Goal is the level of drinking water disinfectant below which there is no known or expected health risk. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

[10] Cited value is the lowest and/or highest average of a minimum of 100 routine samples per month.

[11] Cited value is the highest Locational Running Annual Average (LRAA). MCL is based on the LRAA, which is compiled to include data from previous quarters.

[12] Unregulated contaminant monitoring helps EPA to determine where certain contaminants occur and whether the Agency should consider regulating those contaminants in the future.

[13] AL - Action Level: The concentration of a contaminant, which, if exceeded, triggers treatment or other requirements which a water system must follow.

[14] Collected in 2014.

[15] Collected in 2015.

[16] The MCL for beta particles is 4 mrem/year. EPA considers 50 pCi/L to be the level of concern for beta particles.

[17] SMCL - Secondary Maximum Contaminant Level

ppm: milligrams per liter or parts per million - or one ounce in 7,350 gallons of water

ppb: micrograms per liter or parts per billion - or one ounce in 7,350,000 gallons of water

ND: not detected

WILMINGTON WATERWAYS

HOW CAN YOU AND YOUR FAMILY PROTECT OUR WATER?

1. PROPERLY DISPOSE OF CHEMICALS AND OTHER WASTE PRODUCTS, SUCH AS PAINT. CHECK WITH YOUR COUNTY'S HAZARDOUS WASTE PROGRAM TO FIND OUT MORE.
2. RECYCLE (THIS HELPS PREVENT UNNECESSARY WASTE).
3. PARTICIPATE IN COMMUNITY CLEAN-UPS.
4. PLANT A TREE (TREES HELP PREVENT EROSION, CLEAN UP THE SOIL AND GIVE OFF OXYGEN).

HOW DO WE KEEP POLLUTION FROM GETTING INTO OUR WATERSHED?

CAN YOU FIND THE POLLUTION SITES?

PUT A CIRCLE AROUND THE TWO **POINT SOURCES** AND PUT A SQUARE AROUND THE SIX **NON-POINT SOURCES!**

FIRST, WE NEED TO KNOW THE DIFFERENT KINDS OF POLLUTION: **POINT SOURCE** AND **NON-POINT SOURCE.**

NON-POINT SOURCE

THIS POLLUTION HAS NO OBVIOUS POINT OF ORIGIN. IF YOU SEE OIL FLOATING ON TOP OF THE RIVER OR A PLASTIC CUP OR SODA CAN FLOATING AROUND THEN YOU KNOW IT'S A NON-POINT SOURCE, BECAUSE YOU CAN'T SEE WHERE IT CAME FROM.

POINT SOURCE

THIS POLLUTION IS MORE OBVIOUS. YOU CAN SEE THE ACTUAL SOURCE, AS IT USUALLY IS A PERMANENT FIXTURE. FOR EXAMPLE, IF YOU SEE A DRAIN PIPE WITH ORANGE WATER FLOWING INTO THE RIVER, OR A CHIMNEY STACK WITH SMOKE COMING OUT, THEN YOU KNOW IT IS POINT SOURCE.

ANSWER KEY

Questions/Concerns?

If you have questions about the quality of your water or are experiencing an issue such as low water pressure, rusty/discolored water, or unusual taste and smell, please call our Call Center at **(302) 576-3878** or the Water Quality Lab at **(302) 571-4158**. You will be asked a series of questions regarding your concern and then the appropriate Water Department personnel will be contacted to address your problem. If you would like your water to be sampled, one of our Water Quality Specialists will call you to schedule a time that is convenient for you.

The City of Wilmington Water Department's Water Refill Station

In 2018 the City purchased a water station to provide free water at City sponsored festivals.

Kelly Williams, Commissioner
Department of Public Works
Louis L. Redding City/County Bldg.
800 French Street, Wilmington, DE 19801-3537

Velda Jones-Potter, City Treasurer

wilmingtonde.gov

An electronic version of this document is available at **ccrwilmingtonde.com**.

Una versión en español de este documento está disponible por correo, previa solicitud.

100% From well-managed forests

Michael S. Purzycki, Mayor

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In accordance with Title VI of the Civil Rights Act of 1964, state and federal law, "no person or group shall be excluded from participation, denied any benefits, or subjected to discrimination on the basis of race, color, national origin, age, sex, religion, handicap, and/or disability." General complaints or inquiries should be directed to: Affirmative Action Officer (302) 576-2460, and persons with disabilities may contact 504 Coordinator (302) 576-2460, City of Wilmington, Personnel Department, 4th Floor, 800 French Street, Wilmington, Delaware 19801. TDD is available at (302) 571-4546.

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