



Water ²⁰¹⁸ Quality

TACOMA  WATER
TACOMA PUBLIC UTILITIES

Focus

Planning for the future

Thank you for entrusting us to provide you with clean, reliable water now and in the future. We take this responsibility seriously and work hard every day to meet your expectations for quality and service.

This year our primary regulator, the Washington State Department of Health, recognized us with its Bronze Award for meeting filtration treatment standards for three consecutive years. The award is a fantastic achievement. We received it in our inaugural three years of operating the Green River Filtration Facility thanks to the commitment of the team who run and maintain this wonderful asset for you.

In 2018, we completed several plans that work cooperatively. This ensures we account for changing conditions and positions us to continue meeting our community's need for water in the future. You can review these plans at [MyTPU.org/WaterSystemPlan](https://www.mytpu.org/WaterSystemPlan). One highlighted in our 2017 Water Quality Report is our Integrated Resource Plan (IRP). The IRP considers many factors that influence supply and demand due to economic development and changing weather patterns. The IRP shows robust water supplies for the future thanks to our ability to use ground and surface water supplies.

We aim to build upon our final plans of 2018 by updating our Strategic Plan in 2019. The Strategic Plan will guide our work from 2020 to 2025. The future is exciting as we continue evolving to serve you better and position the utility for the future. One project underway you will hear more about in 2019, is our Advanced Meter upgrade. Advanced meters will help you better understand how you use your water and provide us with more details and understanding about our water system.

We look forward to sharing the outcomes of our efforts again next year. In the meantime, we welcome your feedback. Please let us know whether we are doing well and how we can serve you better. Drop us an email at WaterQuality@CityofTacoma.org.

On behalf of Tacoma Water, thank you for letting us serve you.



Scott Dewhirst, Tacoma Water Superintendent

Planning & Strategies

Integrated Resource Plan guides the future of our water supply

We completed our Integrated Resource Plan (IRP) in 2018 with technical support from HDR Engineering, and guidance from a Public Advisory Committee. The plan serves as a tool to assist with making the best use of our water supply resources into the future.

Your water primarily comes from the Green River, which provides water for people and for fish. In some years, natural weather variation requires a careful balance of these two needs. We developed a resource adequacy standard, which identifies the sources of your water and that ensures the water system will meet demands so that mandatory restrictions of water use (curtailments) will not occur more than once in 25 years on average. Occasional reduction of discretionary water uses such as watering your lawn is not failure, but rather a cost-effective way for us to manage the water supply system and supplements our water conservation program.

We currently have adequate water supply to meet our community's needs well into the future. It takes a record drought, such as the one in 2015, to put substantial stress on our water system. In those times, our additional groundwater supplies are critical.

Uncertainties about future climate change, water law, and growth do exist, however. We ran three forward-looking planning scenarios for the future. They consider distinct sets of assumptions that could affect our future water supply. We also developed a computer model to identify which of our water sources could supply adequate water during those scenarios through 2037. Only under the most stressed conditions of the three scenarios would we potentially require more restrictions than our standard without making changes to our water system by 2050.

Several alternatives exist for us to maintain or enhance reliability. We continue to advocate the federal government (U.S. Army Corps of Engineers) for timely development of the fish passage facility at Howard Hanson Dam. Completion of the facility would allow municipal water storage during dry seasons. We are also exploring the potential and cost of enhancing our groundwater facilities to make more use of existing groundwater rights. This effort aligns with related work to upgrade our groundwater treatment systems. The work also improves our water supply system's resiliency to major earthquakes. We also plan to explore long-term aggressive "peak shaving" strategies to help us manage demand and reduce summer water use.

Green River Filtration Facility receives Washington State Department of Health Bronze Award for water treatment

In 2018, the Washington State Department of Health (WSDOH) recognized our Green River Filtration Facility employees for attaining its filtered water turbidity optimization goal and presented a **Bronze Certificate of Achievement** to the Public Utility Board. The WSDOH Office of Drinking Water Northwest Region noted we "produce among the best water in the region."

As caretakers of the Green River Filtration Facility (GRFF), our most significant capital investment, we challenged its Operations and Maintenance team to meet the WSDOH Treatment Optimization Program (TOP) criteria for water quality. To succeed, they needed to produce higher quality drinking water with at least three times less turbidity than DOH regulations require. Turbidity measures the clarity of our water, and the effectiveness of filtration. They met that challenge with skill and dedication in our first three years of operation from 2015 to 2017.

The WSDOH recognizes and rewards utilities with systems that meet TOP optimization goals for resiliency during natural disasters, emergency conditions, and protecting public health. We use TOP goals to set performance standards and grade outcomes as we continuously work to optimize operations at the GRFF. Other activities over the last year include our participation in a performance-based training program statewide and the development of a comprehensive filtration monitoring process.

We will continue to provide you with the highest quality drinking water possible and work toward future achievements.

Visit bit.ly/WARapidRate for information about rapid rate filtration in Washington state and TOP.

Tim Berger Operator, GRFF

"Finished water quality is paramount here at the filtration plant. Our jobs as operators ensure that we meet/exceed water quality standards and all demands. Through optimization, we can look at different plant processes, evaluate them, and experiment to determine whether we can improve our water quality and reduce treatment costs. Quality is a 24/7 job here at the treatment plant."



Brett Cook Mechanic, GRFF

"We commit to provide clean, safe, and reliable drinking water to our utility partners and customers. In order to meet the highest quality standards, properly operating and maintaining equipment is essential. The quality of the water we provide is our top priority as recognized by the Bronze Certificate of Achievement Award presented by the State of Washington."



Jeff Bolam Plant Manager, GRFF

"There really is no trick to high quality drinking water. If there is a challenge, we beat it together. If there is a better way, we find it. Our optimization program includes everyone on the treatment team. We work closely with DOH and network with other plant staff around the state. Not only does our optimized plant produce the best water with lower cost, the process of optimizing gives us the tools, knowledge, and experience should something unexpected happen."



Reporting Chemicals In Your Water

The water quality table at the right shows substances we identified at the water source, treatment plant and distribution system during our most recent sampling. The table does not include the other 59 volatile organic chemicals and 73 synthetic organic chemicals we test for—including many industrial chemicals, herbicides and pesticides—but did not find.

For more information, contact us at 253-502-8215 or waterquality@cityoftacoma.org.

Definitions

(MCL) Maximum Contaminant Level: The highest level of a contaminant that is allowed in drinking water. MCL's are set as close to the MCLG's as feasible using the best available technology.

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

ppm—one part per million.

ppb—one part per billion.

NTU—Nephelometric Turbidity Unit is a standard to measure water clarity.

AL—Action Level is the concentration which, if exceeded, triggers treatment or other requirements which a water system must follow. Action Levels are reported at the 90th percentile for homes at greatest risk.

MRL—Minimum Reporting Level, also known as Method Reporting Limit: The smallest amount of a substance that can be reliably measured and reported in a sample.

ND—Not Detected, result was below the laboratory minimum detection level.

TT—Treatment technique is a required process intended to reduce the level of a contaminant in drinking water.

(MRDL) Maximum Residual Disinfectant Level: Highest level of a disinfectant allowed in drinking water.

(MRDLG) Maximum Residual Disinfectant Level Goal:

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 contaminants.

NA—Not applicable (or not analyzed).

NR—Not Regulated (Not currently subject to EPA drinking water regulations).

pCi/L—picocuries per liter (measure of radioactivity).

(SMCL) Secondary Maximum Contaminant Level: These standards are developed as guidelines to protect the aesthetic qualities of drinking water and are not health based.

Constituent	Highest Level Allowed (MCL)	Highest Level Detected	Ideal Goals (MCLG)	Range of Level Detected or # exceed AL	Regulation Met?	Potential Sources of Contaminant
Arsenic	10 ppb	6 ppb	0	0 - 6 ppb	Yes	Natural erosion
Nitrate	10 ppm	4.6 ppm	10 ppm	0 - 4.6 ppm	Yes	Agricultural uses, septic
Trichloroethylene	5 ppb	0.99 ppb	0	0 - 0.99 ppb	Yes	Industrial contamination

REGULATED AT THE GROUNDWATER SOURCES

UNREGULATED AT THE GROUNDWATER SOURCES

Chloroform	not regulated	0.83 ppb	not regulated	0 - 0.83 ppb Average 0.20 ppb	not regulated	Industrial contamination
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REGULATED AT THE TREATMENT PLANT

Fluoride	4 ppm	0.94 ppm	4 ppm	0.50 - 0.94 ppm	Yes	Treatment additive
Turbidity	1 NTU	0.094 NTU	NA	0.021 - 0.094 NTU	Yes	Soil erosion

REGULATED IN THE DISTRIBUTION SYSTEM

Disinfection byproducts	Highest running annual average allowed	Our running annual average	MCLG	Range of level Detected	Regulation Met?	Potential sources of contaminant
Total Trihalomethane	80 ppb average	9.6 ppb average	NA	5.2 - 26 ppb	Yes	Disinfection interaction
Haloacetic Acid	60 ppb average	6.2 ppb average	NA	3.6 - 13 ppb	Yes	Disinfection interaction
Bromate	10 ppb	0	0	0	Yes	Disinfection interaction
Chlorine Residual	4 ppm	NA	4 ppm (MRDLG)	0.03 - 1.60 ppm	Yes	Treatment additive
Total Coliform	< 5% positive	0.089 %	0	2 of 2255 sites	Yes	Sampling technique

REGULATED AT THE CONSUMERS' TAP

Lead & Copper: sampled in 2016; required once every 3 years	90% of taps sampled must be below action level	90% of taps sampled were at or below this level	MCLG	# of sites above the AL	Regulation Met?	Potential sources of contaminant
Lead	15 ppb AL	2.1 ppb	0	zero of 76 sites	Yes	Household plumbing
Copper	1.3 ppm AL	0.049 ppm	1.3 ppm	zero of 76 sites	Yes	Household plumbing

Identifying substances in your water

Tap water and bottled water sources include rivers, lakes, streams, reservoirs, springs and wells. As water travels over or through the ground, it dissolves naturally occurring minerals and can pick up other substances resulting from the presence of animals or human activity. Those substances may include inorganic material such as salts and metals, synthetic and volatile organic material from industrial processes, storm water runoff and septic systems, and pesticides and herbicides from agriculture and residential uses. To ensure your drinking water is safe, the EPA and the Washington State Department of Health prescribe regulations that limit the amount of certain contaminants in public water systems.

ORGANISMS

Cryptosporidium (KRIP-toe-spo-RID-ee-um)

Cryptosporidium is another microscopic organism commonly found in open surface water sources. Swallowing cryptosporidium can cause diarrhea, fever and other stomach and abdominal symptoms. We tested the Green River for cryptosporidium on a monthly basis from 2015 – 2017. Samples were collected and analyzed using the best available method approved by the EPA. We did not detect cryptosporidium in the untreated Green River during this period. We have had no reported instances of cryptosporidium-related health problems in our service area.

Giardia (GEE-are-DEE-uh)

Giardia lamblia is a microscopic organism commonly found in open-surface waters such as rivers, lakes and streams. Like other water systems that use open surface water sources, federal and state regulations require us to treat Green River water for Giardia. We use filtration and inactivate Giardia effectively with disinfecting chemicals like chlorine and ozone.

GASES

Radon

Radon is a naturally occurring radioactive gas. Breathing radon can cause lung cancer in humans. Ninety-eight percent of detected radon comes from indoor air generally released from soil beneath homes. Radon can release from tap water, but in much smaller quantities—only about 1% of radon exposure comes from drinking water.

We test for radon in our groundwater sources. Federal guidelines require drinking water to contain no more than 4,000 picocuries per liter (a picocurie is a measure of radiation). We took 111 samples and tested them between 1992 and 2016. Findings show an average of 291 picocuries per liter. Our largest single test shows 530 picocuries per liter.

MINERALS

Lead & Copper

Studies cited by the EPA show swallowing lead or copper can cause health problems, especially in pregnant women and young children. Lead and copper found in drinking water usually come from home plumbing. Some homes have higher levels than other homes. Water with a low pH can cause copper to dissolve directly from pipes into water and lead to dissolve from solder used to join copper pipes. Lead-based solder was banned in 1986, but small amounts of lead can still be found in many brass-plumbing fixtures and can slowly dissolve into water after standing in pipes for a long time.

Federal and state drinking water rules establish “action levels” allowable for lead and copper in water samples collected from homes. At least 90% of samples may have no more than 15 parts per billion (ppb) of lead in one liter of water and no more than 1.3 parts per million (ppm) of copper per liter. Once every three years, we sample at least 50 homes for lead and copper. The most recent sampling was completed in 2016. Results show our system met action levels for both lead and copper. Although lead was detected in a few homes, all were at levels below the 15 ppb action level. And although we meet regulatory requirements, we will continue to monitor and adjust pH levels to reduce corrosion in pipes. We will sample again for lead and copper in 2019.

Pregnant women and young children can be more vulnerable to lead in drinking water than the general population. If you have concerns about lead levels in the water at your home, have your water tested. Running water for two minutes after it sits stagnant in the pipe for a few hours can help clean the tap and reduce the amount of lead and or copper in your water.

A change in the temperature of water will also tell you when fresh water arrives.

Information on lead in drinking water, testing methods and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline (800-426-4791) or at www.epa.gov/safewater/lead.

Sand & Silt

Because we take our water from the Green River, which was an unfiltered water source, pipeline shutdowns and fire flows from hydrants can stir up sand and silt that sits in the bottom of water mains throughout the water supply system. Even though this water is treated, turbid events like these can cause water to appear visually unpleasant, but it remains safe.

Treating your water

In addition to filtering the water, in 2018 we treated the Green River supply with chlorine, fluoride, caustic soda and ozone.

Treating water with chemical disinfectants, chlorine and ozone is important to protecting your health when water is drawn from a surface supply like the Green River. Placing disinfecting chemicals in water kills germs and microorganisms, making it safe to drink.

FLUORIDE

Tacoma voters approved fluoride treatment in 1988 and 1989 because of the dental health benefits it provides. The Tacoma City Council then enacted an ordinance directing fluoridation of the water supply. We currently fluoridate at a level of 0.7 ppm.

CAUSTIC SODA

We treat our Green River water supply with caustic soda to raise the pH (a measurement of acidity) of the water, to make it less corrosive on plumbing and reduce the amount of lead and copper that can dissolve into drinking water.

OZONE

We treat the Green River water supply with ozone. Algae and other organic material in the river can create objectionable taste and odor in drinking water. Ozone effectively destroys objectionable taste and odors that can occur in the water and provides disinfection benefits to help ensure water remains safe to drink.

Ozone gas is generated when pure oxygen gas is exposed to electricity in an ozone generator. After ozone gas is created, it is combined with water and injected into pipeline reactors at the Green River Headworks. Ozone only lasts for a few minutes in the water, and is not present in the water supply when it leaves the treatment site.

CHLORINE

Chlorine is our primary disinfection treatment. While it does an excellent job of killing the microorganisms that may be harmful to you, chlorine also reacts with natural organic material commonly found in surface water sources like lakes, rivers and streams. This reaction forms compounds called “disinfection byproducts.” We must meet drinking water standards for two groups of disinfection byproduct compounds. Byproduct levels found in water depend primarily on:

- The amount of natural organic material in the water
- The amount of chlorine used to treat the water
- The amount of time it takes water to reach the customer

Byproduct levels vary throughout the year. Byproducts often increase during the warmest months when the water supply has its highest levels of natural organic material and chemical reactions happen faster. We work to minimize byproduct levels and have adjusted portions of our system operations.

In addition to the preceding table, the table below applies only to the Falling Water subdivision in the Bonney Lake area. The subdivision received water from the Bonney Lake water system for a few days at the end of October, 2018.

Constituent	Highest Level Allowed (MCL)	Highest Level Detected	Ideal Goals (MCLG)	Range of Level Detected or # exceed AL	Regulation Met?	Potential Sources of Contaminant
REGULATED AT THE GROUNDWATER SOURCE						
Nitrate	10 ppm	4.1 ppm	0 - 5 ppm	Less than 0.1 - 4.1 ppm	Yes	Agricultural uses, septic
Hardness	NA	126.8 ppm	NA	0 - 126.8 ppm	Yes	Erosion of Natural Deposits
Sodium	NA	11 ppm	NA	8 - 11 ppm	Yes	Erosion of Natural Deposits

REGULATED IN THE TREATMENT PLANT

Fluoride*	4 ppm	0.94 ppm**	4 ppm	0 - 0.94 ppm**	Yes	Treatment additive
Turbidity	5 NTU	0.052 NTU**	NA	0.01 - 0.052 NTU**	Yes	Soil Erosion, Pipe Sediment

EPA UNREGULATED CONTAMINANT MONITORING (UCMR4)

Manganese	0.05 ppm	22.5*	not regulated (SMCL = 0.050 ppm)	ND - 22.5*	NA	
Anatoxin-a	NA	0.7	not regulated	0.7	NA	
Bromochloroacetic acid	NA	1.1	not regulated	0.5 - 1.1	NA	
Bromodichloroacetic acid	NA	1.1	not regulated	0.5 - 1.1	NA	
Chlorodibromoacetic acid	NA	0.5	not regulated	ND - 0.5	NA	
Tribromoacetic acid	NA	<2	not regulated	ND - <2	NA	

REGULATED IN THE DISTRIBUTION SYSTEM

Chlorine	4 ppm	1.21 ppm*	4 ppm	0.34 - 1.21 ppm*	Yes	Treatment additive
Haloacetic Acids	60 ppb	719 ppb**	NA	0 - 719 ppb**	Yes	Disinfection interaction
Total Trihalomethanes	80 ppb	10.85 ppb**	0 - 24 ppb	0 - 10.85 ppb**	Yes	Disinfection interaction

REGULATED AT THE CONSUMERS' TAP

Constituent	90% of taps sampled must be below action level	90% of taps sampled were at or below this level	MCLG	# of sites above the AL	Regulation Met?	Potential sources of contaminant
Copper***	1.3 ppm	0.92 ppm	1.3 ppm	2 of 38 sites	Yes	Household plumbing
Lead***	0.015 ppm	0.007 ppm	0.015 ppm	1 of 38 sites	Yes	Household plumbing
Total Coliform	< 5% positive	0.089 %	0	zero of 48 sites		Naturally present in Environment

* Tacoma supplied water ** Tacoma sample results *** Lead and Copper results from 2017 monitoring. Required every three years.



An important message from the Environmental Protection Agency

Your drinking water currently meets the EPA's revised drinking water standard for arsenic. However, it does contain low levels of naturally occurring arsenic not associated with known sources of industrial contamination. There is a small chance that some people who drink water containing low levels of arsenic for many years could develop circulatory disease, cancer, or other health problems. Most types of cancer and circulatory diseases are due to factors other than exposure to arsenic. EPA's standard balances the current understanding of arsenic's health effects against the costs of removing arsenic from drinking water.



Delivering your water

Most of your water comes from the Green River in South King County. The Green River Watershed is a 231-square-mile forested area that serves as a collection point for melting snow and seasonal rainfall in an uninhabited area of the Cascade Mountains between Chinook and Snoqualmie Passes. We own land along the river, which is about 11% of the watershed.

Through agreements with other landowners, we limit watershed access and carefully control activities, such as recreation, road maintenance and logging.

We also own and operate seven wells on the North Fork of the Green River and take water from them during periods when Green River water is turbid.

We supplement the Green River supply with groundwater from more than 20 additional wells to meet peak summer demands. Most are in Tacoma city limits.

Keeping you healthy

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 Environmental Protection Agency's Safe Drinking Water Hotline, 1-800-426-4791.

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised 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. Environmental Protection Agency/ Centers for Disease Control guidelines on appropriate means to lessen the risk of infection by cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline, 1-800-426-4791.

Being water smart

Conserving water makes it possible to use existing water supplies more efficiently, provides opportunities to develop our regional water supply and supports our fish enhancement programs. It also helps ensure enough water remains available to meet your needs, the needs of our community, and the needs of wildlife and the environment.

The Washington State Department of Health requires municipal water suppliers to establish a water conservation goal and report on its progress annually. Our water conservation goal is to reduce peak (May – October) per capita water use by 6.65% between Jan. 1, 2018 and Jan. 1, 2028. With this goal, we will focus on the efficient use of water outdoors, by homes, businesses, and other institutions. Please see [MyTPU.org/WaterSmart](https://www.mytpu.org/WaterSmart) to learn ways you can use water more efficiently.

Tacoma Public Utility Board

The Tacoma Public Utility Board is the governing and policy-making body for Tacoma Water. To be involved in water quality decisions, you may participate in public meetings, held on the second and fourth Wednesdays of each month at 6:30 p.m. in the Tacoma Public Utilities Auditorium., 3628 S. 35th St. in Tacoma.

Your water quality report

This report contains information about your drinking water. Congress and the EPA require us to inform you annually about your drinking water and its impacts. Although most content in this report is required, we are pleased to share additional helpful information about your water and the work we do to get it to you. We produced and mailed this report for about 46 cents per customer.

Contact information

Water Quality 253-502-8207	Washington State Department of Health doh.wa.gov/ehp/dw
Conservation 253-502-8723	U.S. Environmental Protection Agency
Cross Connection Control / Backflow Prevention 253-502-8731	Safe Drinking Water Hotline 1-800-426-4791
Rates 253-441-4942	epa.gov/safewater
National Radon Hotline 1-800-55-RADON 1-800-557-2366	

The hotline and EPA website offer information about drinking water contaminants and their potential health effects as well as guidelines from the U.S. Centers for Disease Control about appropriate ways to reduce the risk of infection by cryptosporidium and other microbial contaminants. Both sources also offer information about lead in drinking water, testing methods and steps you can take to minimize exposure.

TACOMA WATER TACOMA PUBLIC UTILITIES

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