Inside:
- The Purpose of this Report ........ 2
- Tigard Water Source Information..... 2
- Tigard Water Service Area Map....... 2
- Information on Detected Substances...............3
- Cryptosporidium ..........................3
- Water Quality Analysis Results .... 4–5
- Lead... Are You at Risk?.......... 6
- Definitions......................................6
- Immuno-Compromised Notice .... 6
- Drinking Water Contaminants .......7
- Conservation Tips ......................7
- Source Water Assessment ............7
- Frequently Asked Questions.........8
- Are You Interested in Learning More about Your Water? ........8
- Backflow Testing Reminder ........ 8
Where Does Tigard’s Water Come From?

SOURCE INFORMATION

Tigard’s main source of drinking water comes from the Clackamas River, one of the highest quality sources in the state.

The Clackamas River begins in Mount Hood National Forest, drawing from a watershed area of 940 square miles. Water is withdrawn from the Clackamas River, pumped through a pipeline buried beneath the Willamette River, and treated at the Lake Oswego-Tigard Water Treatment Plant in West Linn. The water goes through a robust treatment process that includes filtration to remove dirt and organisms, ozone to remove substances that affect how the water tastes and smells, and disinfection to kill organisms and protect the water as it goes through the distribution system.

The Lake-Oswego Water Treatment Plant expansion and the infrastructure that connects the plant to the City of Tigard were completed in 2016. These investments in the water supply system have paid big dividends for Tigard Water Service Area customers — customers have a new, resilient source of supply with excellent water quality.

During periods of high water demand, Tigard supplements its supply with water from two city-owned aquifer storage and recovery (ASR) wells, and a native groundwater well. The ASR wells are filled with water from Lake Oswego-Tigard Water Treatment Plant in the winter when people aren’t using much water, then used as an additional source in the summer when we need more water.
Information on Detected Substances

In 2018, water delivered to the TWSA met or surpassed all regulatory requirements. Tigard’s water was tested for over 200 regulated and unregulated contaminants, including testing throughout the TWSA distribution system. If a known health-related contaminant is not listed in this report, it was not detected in the drinking water.

REGULATED CONTAMINANTS

Federal standards regulate contaminants to protect drinking water quality. These standards limit the levels of contaminants known to occur in water that can adversely affect public health.

Chlorine is added to maintain disinfection throughout the water distribution system, keeping the water safe as it travels to customers’ homes and businesses.

Disinfection Byproducts — Haloacetic Acids (HAA) and Total Trihalomethanes (THM) form through chemical reactions between chlorine and naturally occurring organic matter in the water. Careful control of the disinfection process keeps byproduct levels to a minimum, while maintaining the disinfection we need.

Nitrates and Nitrites form through the erosion of natural deposits, agricultural activity and leaching of septic tanks.

Total Coliform Bacteria are naturally present in the environment and may indicate other potentially harmful bacteria may be present. Chlorine is added to the drinking water supply to kill these bacteria.

Turbidity is a measure of the amount of sediment suspended in the water. This sediment can interfere with disinfection and provide a medium for microbial growth. Large storm events can result in increased turbidity.

UNREGULATED CONTAMINANTS

Water quality standards for unregulated contaminants provide information for development of future regulations and assist public water systems in managing drinking water for aesthetic considerations such as taste, color and odor.

Radon is a naturally occurring, radioactive gas that cannot be seen, tasted or smelled. Radon is not currently regulated and drinking water typically contributes only 1 to 2 percent of a person’s overall radon exposure. Radon has been detected in water from Tigard’s aquifer storage and recovery wells and native groundwater well. At the detected levels, radon is unlikely to contribute to adverse health effects. For more information about radon, call the EPA’s Radon Hotline at 800-SOS-RADON or visit www.epa.gov/radon

Silica, Sodium and Sulfate are formed through the erosion of natural deposits and may be added to water during treatment.

Cryptosporidium is a harmful micro-organism naturally present in surface water supplies throughout the world. Infection can cause nausea, abdominal cramps and diarrhea. Most healthy individuals are able to overcome the disease within a few weeks. However, immuno-compromised people have more difficulty and are at greater risk of developing severe, life threatening illnesses.

Raw, untreated Clackamas River water is tested for Cryptosporidium. In 2016, three samples were collected – one of the 10-liter samples contained a single Cryptosporidium. The detected Cryptosporidium likely came from wildlife that live in the Clackamas River Watershed. In 2017, twelve samples were collected and no Cryptosporidium were detected.

Consistent with results from previous years, these recent test results show a very low level of Cryptosporidium in the “raw” Clackamas River before it’s treated. The water treatment system then protects consumers by filtering out 99.9% of Cryptosporidium in the source water.
# 2018 Water Quality Analysis Results

Federal standards regulate contaminants to protect drinking water quality. Tigard and its water supply partners test for more than 200 regulated and unregulated contaminants.

### Microbiological Contaminants

<table>
<thead>
<tr>
<th>Contaminant</th>
<th>MCL</th>
<th>MCLG</th>
<th>TWSA Results</th>
<th>Violation?</th>
<th>Major Sources of Drinking Water</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fecal coliform and E.coli Bacteria</td>
<td></td>
<td></td>
<td>LOW → Range → HIGH</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A routine sample and a repeat sample are total coliform positive and one is also E. coli positive</td>
<td>0</td>
<td>0% of samples with detectable E. coli or fecal coliform bacteria</td>
<td>No</td>
<td>Human and animal fecal waste</td>
<td></td>
</tr>
<tr>
<td>Total coliform bacteria</td>
<td></td>
<td></td>
<td>LOW → Range → HIGH</td>
<td>No</td>
<td>Naturally present in the environment</td>
</tr>
<tr>
<td>Must not detect coliform bacteria in more than 5% of samples per month</td>
<td>0</td>
<td>0% of samples with detectable total coliform bacteria</td>
<td>No</td>
<td>Erosion of natural deposits</td>
<td></td>
</tr>
<tr>
<td>Turbidity (NTU)</td>
<td></td>
<td></td>
<td>LOW → Range → HIGH</td>
<td>No</td>
<td>Found in natural aquifer deposits; animal waste</td>
</tr>
<tr>
<td>Cannot exceed 5 NTU more than 2 times in 12 months</td>
<td>NA</td>
<td>Highest single measurement: 0.11</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Inorganics

<table>
<thead>
<tr>
<th>Contaminant</th>
<th>MCL</th>
<th>MCLG</th>
<th>TWSA Results</th>
<th>Violation?</th>
<th>Major Sources of Drinking Water</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitrate - Nitrogen (ppm)</td>
<td>10</td>
<td>10</td>
<td>2.1</td>
<td>2.7</td>
<td>No</td>
</tr>
<tr>
<td>Found in natural aquifer deposits; animal waste</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Disinfection Residual and Byproducts

<table>
<thead>
<tr>
<th>Contaminant</th>
<th>MCL</th>
<th>MCLG</th>
<th>TWSA Results</th>
<th>Violation?</th>
<th>Major Sources of Drinking Water</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Chlorine Residual Running Annual Average (ppm)</td>
<td>4</td>
<td>4</td>
<td>0.68</td>
<td>0.81</td>
<td>No</td>
</tr>
<tr>
<td>Additive used to disinfect water</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Chlorine Residual at Any One Site (ppm)</td>
<td>NA</td>
<td>NA</td>
<td>0.17</td>
<td>1.12</td>
<td>No</td>
</tr>
<tr>
<td>Bromate (ppb)</td>
<td>10</td>
<td>0</td>
<td>ND</td>
<td>1.10</td>
<td>No</td>
</tr>
<tr>
<td>Byproduct of drinking water treatment with Ozone</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Disinfection Byproducts – Haloacetic Acids

<table>
<thead>
<tr>
<th>Contaminant</th>
<th>MCL</th>
<th>MCLG</th>
<th>TWSA Results</th>
<th>Violation?</th>
<th>Major Sources of Drinking Water</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haloacetic Acids - Running Annual Average (ppm)</td>
<td>60</td>
<td>NA</td>
<td>0.0044</td>
<td>0.0055</td>
<td>No</td>
</tr>
<tr>
<td>Byproduct of drinking water disinfection</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Haloacetic Acids at Any One Site (ppm)</td>
<td>Not Applicable</td>
<td>NA</td>
<td>0.003</td>
<td>0.0075</td>
<td>No</td>
</tr>
</tbody>
</table>

4 | 2018 Water Quality Report • City of Tigard Water Division
# 2018 Water Quality Analysis Results

Federal standards regulate contaminants to protect drinking water quality. Tigard and its water supply partners test for more than 200 regulated and unregulated contaminants.

## DISINFECTION BYPRODUCTS – TOTAL TRIHALOMETHANES

<table>
<thead>
<tr>
<th>Contaminant</th>
<th>MCL (ppm)</th>
<th>MCLG</th>
<th>TWSA Results</th>
<th>Violation?</th>
<th>Major Sources of Drinking Water</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Trihalomethanes Running Annual Average</td>
<td>80</td>
<td>NA</td>
<td>0.0084 – 0.0121</td>
<td>No</td>
<td>Byproduct of drinking water disinfection</td>
</tr>
<tr>
<td>Total Trihalomethanes at Any One Site (ppb)</td>
<td>NA</td>
<td>NA</td>
<td>0.0062 – 0.0168</td>
<td>No</td>
<td></td>
</tr>
</tbody>
</table>

## UNREGULATED AND SECONDARY (REGULATIONS PROVIDE ADVISORY LIMITS ONLY)

<table>
<thead>
<tr>
<th>Contaminant</th>
<th>MCL</th>
<th>MCLG</th>
<th>TWSA Results</th>
<th>Violation?</th>
<th>Major Sources of Drinking Water</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radon (pCi/L)</td>
<td>No Standard</td>
<td>No Standard</td>
<td>280 – 280</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Silica (ppm)</td>
<td>No Standard</td>
<td>No Standard</td>
<td>27 – 32</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Sodium (ppm)</td>
<td>No Standard</td>
<td>No Standard</td>
<td>5.3 – 5.6</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Sulfate (ppm)</td>
<td>No Standard</td>
<td>No Standard</td>
<td>1.4 – 1.5</td>
<td>No</td>
<td></td>
</tr>
</tbody>
</table>

## Lead and Copper Rule Exceedance

<table>
<thead>
<tr>
<th>Contaminant</th>
<th>90th Percentile</th>
<th>Number of Sites Exceeding the Action Level</th>
<th>MCLG</th>
<th>Lead and Copper Rule Exceedance</th>
<th>Action Level Reached</th>
<th>Typical Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copper (ppm)</td>
<td>0.0</td>
<td>0% of samples (0 out of 66) exceeded the copper action level of 1.3 ppm</td>
<td>1.3</td>
<td>More than 10% of the homes tested have levels above 1.3 ppm</td>
<td>No</td>
<td>Corrosion of household and commercial plumbing</td>
</tr>
<tr>
<td>Lead (ppb)</td>
<td>3.7</td>
<td>3% of samples (2 out of 66) exceeded the lead action level of 15 ppb</td>
<td>0.0</td>
<td>More than 10% of the homes tested have levels above 15 ppb</td>
<td>No</td>
<td></td>
</tr>
</tbody>
</table>

**AL:** action level, **MCL:** maximum contaminant level, **MCLG:** maximum contaminant level goal, **MRDL:** maximum residual disinfectant level, **MRDLG:** maximum residual disinfectant level goal, **MDL:** method detection limit, **ND:** non-detected, **NA:** not applicable, **NTUs:** nephelometric turbidity units, **ppm:** parts per million, **mg/L:** milligrams per liter, **ppb:** parts per billion, **µg/L:** micrograms per liter, **pCi/l:** picocuries per liter. For complete definitions, see page 6.
Lead in the Drinking Water... Are You at Risk?

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 Tigard is responsible for providing high-quality drinking water, but cannot control the variety of materials used in 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 (800-426-4791) or www.epa.gov/safewater/lead.

Definitions

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

**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 using the best available treatment technology.

**Maximum Contaminant Level Goal (MCLG):** The level of 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 of health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contamination.

**Nephelometric Turbidity Units (NTUs):** Turbidity is a measure of how clear the water looks. Turbidity can interfere with disinfection and provide a medium for microbial growth.

**Parts per Million (ppm) or Milligrams per Liter (mg/L):** A unit measurement describing the level of detected contaminants that is one part by weight of analyte to one million parts by weight of the water sample. One part per million corresponds to one penny in $10,000 or approximately one minute in two years. One part per million is equal to 1,000 parts per billion.

**Parts per Billion (ppb) or Micrograms per Liter (µg/L):** A unit measurement describing the level of detected contaminants that is one part by weight of analyte to one billion parts by weight of the water sample. One part per billion corresponds to one penny in $10,000,000 or approximately one minute in 2,000 years.

**Picocurries per Liter (pCi/L):** A standard measurement of radioactivity in water.

SPECIAL NOTICE FOR IMMUNO-COMPROMISED PERSONS

Some people may be more vulnerable to contaminants 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 about drinking water from their health-care providers. Environmental Protection Agency and Centers for Disease Control and Prevention 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).
What the EPA Says about Drinking Water Contaminants

In order to ensure that tap water is safe to drink, the US Environmental Protection Agency (EPA) sets regulatory limits on the amounts of certain contaminants in water provided by public water systems. The Food and Drug Administration (FDA) sets limits on contaminants in bottled water, which must provide the same protection for public health.

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.

Because of this natural part of water’s cycle, drinking water, including bottled water, may contain small amounts of some contaminants. However, the presence of contaminants does not necessarily indicate that the water poses a health risk.

**Contaminants that may be present in source water include:**

- **Microbial contaminants**, such as viruses and bacteria, which may come from wildlife or septic systems.
- **Inorganic contaminants**, such as salts and metals, which can occur naturally or result from urban stormwater runoff, industrial or domestic wastewater discharges or farming.
- **Pesticides and herbicides**, which may come from a variety of sources such as farming, urban stormwater runoff and home or business use.
- **Organic chemical contaminants**, including synthetic and volatile organic chemicals, which are byproducts of industrial processes, and may come from gas stations, urban stormwater runoff and septic systems.
- **Radioactive contaminants**, which can occur naturally.

More information about contaminants and potential health effects is available from the EPA’s Safe Drinking Water Hotline (800-426-4791).

**SOURCE WATER ASSESSMENT**

In 2005, the Oregon Health Authority and the Department of Environmental Quality conducted a source water assessment for the aquifer storage and recovery wells and the native groundwater well serving the Tigard Waster Service Area (TWSA). The purpose of the assessment was to identify potential sources of direct and indirect contamination in areas surrounding these wells. The assessment identified 50 potential contaminant sources (natural and manmade) that could affect the water quality if managed improperly.

To view the assessment, contact Environmental Program Coordinator Jennifer Joe at 503-718-2599 or jennifer@tigard-or.gov.
Is fluoride added to our drinking water?

No. The Lake Oswego-Tigard Treatment Plant does not add fluoride to the water. Fluoride is a naturally occurring trace element in surface and groundwater. You may want to consult with your dentist about fluoride treatment to help prevent tooth decay, especially for young children.

Is our water soft or hard?

Our water is very soft. Most of the year the hardness ranges from 3–8 parts per million (ppm), or approximately ¼ to ½ a grain of hardness per gallon. During the summer, some customers receive a blend of groundwater from our aquifer storage and recovery wells. The water from these wells has a hardness of approximately 80 ppm (about 5 grains per gallon), which is deemed moderately hard.

How can I get my water tested?

Contact Tigard Public Works at 503-718-2591 for information about a free lead-in-water testing kit. For more extensive testing, private laboratories can test your tap water for a fee. Not all labs are accredited to test for all contaminants. For information about accredited labs, call the Oregon Health Authority, Oregon Environmental Laboratory Accreditation Program at 503-693-4122.

MEET OUR STAFF:
Sam Morrison

How long have you worked for the City of Tigard?
I started my career in water works in 1978 with the Tigard Water District before it merged with the City of Tigard, so in total... 40 going on 41 years!

What do you enjoy most about your job?
In my early years, I enjoyed the construction work. I could go home at night and say, “I did that.” Now I really enjoy helping our customers with water issues. Nothing like a big thank you for your help.

What is something unique about working in water?
You would think that after 40 years of service working in water that I would know it all. Totally not the case. Our water system is in a constant state of change and you must learn and adapt. I am always learning.

What is one thing you wish people knew about your job?
I encourage customers to always call the city first with any water related issues. We might not be able to help, but a first look from us is free and we can help troubleshoot.