Report on the City’s Water Quality Relative to Public Health Goals for 2016-2018

Prepared June 2019
Introduction

The City of Poway’s drinking water meets all Federal and State of California drinking water standards to protect public health.

Public water systems, including the City of Poway’s water system, are strictly regulated by the State of California and the federal government. The most stringent regulations are the primary drinking water standards set by the United States Environmental Protection Agency (USEPA) and the California State Water Resources Control Board (SWRCB) Division of Drinking Water. These standards are called Maximum Contaminant Levels (MCL). Tests for these contaminants are run on a required frequency using standard methodologies. Public drinking water systems must ensure compliance with these standards at all times.

In addition, there are two sets of “goals” identified below that apply to contaminants that may be found in drinking water supplies. The goals can be either state or federal goals and are not enforceable.

- **Public Health Goals (PHG)** are non-enforceable goals established by the California Environmental Protection Agency (CalEPA) Office of Environmental Health Hazard Assessment (OEHHA). PHGs are based on public health risk considerations allowing for a margin of extra precaution. PHGs are neither enforceable, nor are public water systems required to achieve them. PHGs are set at a level considered to pose no significant risk of cancer. This is usually defined as a one-in-a-million cancer risk for a lifetime of exposure.

- **Maximum Contaminant Level Goals (MCLG)** are the federal equivalent to PHGs; however, there is a difference in how levels for carcinogens are set at the federal level. The MCLGs for carcinogens are set at zero because the USEPA assumes there is no absolutely safe level of exposure to them.

Determinations of health risk at these low levels are generally theoretical and have not been quantified or proven through scientific experimentation.
The California Health and Safety Code requires that water utilities with more than 10,000 service connections prepare a report every three years on public health goals if any of their water quality measurements exceeded any PHGs. This report covers calendar years 2016, 2017 and 2018. (Health and Safety Code §116470(b)).

The law also requires that where a PHG for a constituent has not been established, the water suppliers are to use the MCLGs adopted by the USEPA. Only constituents which have a California primary drinking water standard and for which either a PHG or an MCLG has been set are to be addressed.

Water quality data collected from the City of Poway water system in 2016, 2017 and 2018 for the purpose of determining compliance with drinking water standards, was used for this report. This data was summarized in Poway’s annual Consumer Confidence Reports for the same years. There were no constituents that exceeded compliance standards in 2016 through 2018; however, there were three constituents, which are discussed in this report, that were detected at least once above the PHG or MCLG limit:

1. Total Coliform Bacteria
2. Radionuclides
3. Arsenic

For each constituent listed above, this report also addresses:

- Numerical public health risk associated with the MCL and the PHG or MCLG,
- Category or type of health risk that could be associated with each constituent, and
- Best treatment technology available to reduce the constituent level.

**Best Available Treatment Technology**

Both the USEPA and SWRCB adopt what are known as “Best Available Technologies” (BAT). These are the best-known methods for reducing contaminant levels to the MCL. These technologies take into account practical risk-management factors, such as analytical detection capability, available treatment technology, benefits and costs. However, since many PHGs and all MCLGs are set much lower than the MCL, it is not always possible to determine what treatment is needed to further reduce contaminant concentrations to the low levels set in the PHG or MCLG. Unfortunately, the analytical tests to determine these very low levels are not always available, or they do not provide reliable results. In some cases, treatment processes that reduce one contaminant to a very low level may adversely affect other aspects of water quality.

**Total Coliform Bacteria**

Each month, the City of Poway collects multiple samples throughout the water distribution system for coliform analysis. Total coliform bacteria are considered an indicator organism. They
are generally not considered harmful, are found everywhere in nature, and are used for sampling because of the ease in monitoring and analysis. Since coliform is only a surrogate indicator of the potential presence of pathogens, it is not possible to state a specific numerical health risk or category for coliform. It is not unusual for a system to have an occasional positive total coliform sample and if a positive sample is found, follow-up sampling is performed to indicate the presence or absence of further risk. If further testing indicates the presence of bacteria, the cause is investigated, the issue is addressed and follow-up testing is performed to ensure bacteria is no longer present.

The MCL for total coliform bacteria is 5 percent positive samples of all distribution system samples collected each month. There is no PHG for coliforms. USEPA established an MCLG of zero coliform bacteria. When a positive sample is detected public water systems must conduct follow up monitoring.

During August 2016, the City of Poway had one month when the coliform results were 1.5 percent positive samples. Repeat tests were completed for all positive samples; all repeat samples were negative. The instances of positive total coliform samples were likely due to debris entering the sample at the sample station.

**Best Available Technologies for Total Coliform Bacteria**

The following have been identified as BAT for microbiological contaminants:

- Maintenance of a disinfectant residual throughout the distribution system,
- Proper maintenance of the distribution system, and
- Filtration and disinfection of surface water.

The City of Poway implements all the above BATs. Additional best practices employed by the City of Poway to minimize the chance of coliform bacteria contamination include:

- An effective cross-connection control program to protect the distribution system from coliform contamination,
- An effective monitoring and surveillance program,
- Training in proper sampling techniques to prevent false positives, and
- Maintenance of positive pressure in the distribution system.

**Radionuclides**

Most drinking water sources have very low levels of radioactive contaminants ("radionuclides"), most of which are naturally occurring. Most radionuclides are at levels that are low enough to not be considered a public health concern.
In 2016, 2017 and 2018, samples for radionuclides in imported water were well below federal and state regulations for MCLs. Therefore, the City of Poway was not required to test for radionuclides in the water distribution system.

Although the levels of radionuclides in the imported water were well below federal and state regulations for MCLs, in some cases, they were greater than the MCLGs and/or the PHGs levels.

Radionuclide levels measured in the imported water are shown below compared to the MCLs and PHGs:

<table>
<thead>
<tr>
<th>Constituent</th>
<th>Units</th>
<th>MCL</th>
<th>MCLG/PHG</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross Beta</td>
<td>pCi/L</td>
<td>50</td>
<td>0</td>
<td>5</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td>Uranium</td>
<td>pCi/L</td>
<td>20</td>
<td>0.43</td>
<td>2</td>
<td>ND</td>
<td>ND</td>
</tr>
</tbody>
</table>

pCi/L = picocuries per liter of water; ND = non-detectable

The constituents identified above come from erosion of natural deposits of certain minerals that are radioactive and may emit a form of radiation known as alpha radiation, photons and beta radiation. At higher levels, long-term exposure to radionuclides in drinking water may increase the risk of cancer.

The Public Health Goal for uranium is 0.43 pCi/L. The numerical health risk for uranium based on the California PHG is one excess cancer case per million population. The health risk category for uranium is carcinogenicity, which means capable of producing cancer. Although OEHHA has not established a PHG for Gross Beta, the MCLG is zero. The numerical health risk for the most potent form of Gross Beta is two in ten thousand population in a lifetime. The health risk category for this is also carcinogenicity.

*Best Available Technologies for Radionuclides*

The BAT processes listed by the EPA Radionuclides Rule to lower uranium levels include:

- Enhanced coagulation followed by filtration,
- Lime softening,
- Ion exchange, or
- Reverse osmosis.

The BAT process listed by the EPA Radionuclides Rule to lower Gross Beta levels is reverse osmosis.

The first technique listed above, enhanced coagulation followed by filtration, is the water filtration method currently used at the City’s Lester J. Berglund Water Treatment Plant; it is a treatment method that is applicable to surface waters, which is appropriate for the City of Poway.
Lime softening cannot be considered in Poway because the City’s Water Treatment Plant was not designed to facilitate softening and the Plant site is too small to add these facilities. The other techniques, ion exchange and reverse osmosis, would require extensive site modification at considerable cost to the ratepayers.

Cost estimating guides from USEPA, Association of California Water Agencies (ACWA), American Water Works Association (AWWA) and American Society of Civil Engineers (ASCE) were used in determining the cost to implement ion exchange and reverse osmosis. Assuming about 14,500 service connections, the estimated cost to install and operate such a treatment system at the Lester J. Berglund Water Treatment Plant would be $13 – $30.5 million/year and result in an increased cost for each customer of approximately $900 - $2,103 per service connection per year for the life of the treatment system. These values were assessed using ACWA’s April 2019 ‘Suggested Guidelines’ for reverse osmosis treatment technology and includes annualized capital and O&M costs. Since Poway’s samples are within the MCL, it is not feasible to add treatment processes that may or may not be effective in meeting the PHG.

**Arsenic**

Arsenic is a naturally occurring element in the earth’s crust and is very widely distributed in the environment. All humans are exposed to microgram quantities of arsenic (inorganic and organic) largely from food (25 to 50 μg/day) and to a lesser degree from drinking water and air. In certain geographical areas, natural mineral deposits may contain large quantities of arsenic and this may result in higher levels of arsenic in water. Waste chemical disposal sites may also be a source of arsenic contamination of water supplies. The main commercial use of arsenic in the U.S. is in pesticides, mostly herbicides and in wood preservatives. Misapplication or accidental spills of these materials could result in contamination of nearby water supplies. Arsenic does not have a tendency to accumulate in the body at low environmental exposure levels.

Studies in humans have shown considerable individual variability in arsenic toxicity. The levels of arsenic that most people ingest in food and water (ca. 25 to 50 μg/day) have not been considered to be of health concern.

The MCL for arsenic is 10 ppb, the PHG and MCLG for arsenic is 0.004 ppb. We have detected arsenic above the PHG Detection Limit for Reporting Purposes in Lake Poway of 2.02 and 2.1 ppb. This occurred in 2017 and 2018, respectively. Additionally, a detection in Imported Water in 2018 had a level of 2.14 ppb.

The health risk associated with arsenic, and the reason that a drinking water standard was adopted for it, is that people who drink water containing Arsenic above the MCL throughout their lifetime could experience an increased risk of getting cancer. The Office of Environmental Health Assessment (part of California Environmental Protection Agency) has set the PHG at 0.004 ppb. The PHG is based on a level that will result in not more than 1 excess cancer in 1 million people who drink 2 liters daily of this water for 70 years. The actual cancer risk may be lower or zero.
Best Available Technologies for Arsenic

The BAT cited in the above-mentioned literature to remove arsenic is reverse osmosis. All costs including capital, land, construction, engineering, planning, environmental, contingency and O&M costs are included but only general assumptions can be made for these items. Cost estimating guides from USEPA, ACWA, AWWA and ASCE were used in determining the cost to implement the BAT. Assuming about 14,500 service connections, the estimated cost to install and operate such a treatment system at the Lester J. Berglund Water Treatment Plant would be $6.5 – $24 million/yr and result in an increased cost for each customer of approximately $450 - $1,650 per service connection per year for the life of the treatment system. These values were assessed using ACWA’s April 2019 ‘Suggested Guidelines’ for reverse osmosis treatment technology and includes annualized capital and O&M costs. Since Poway’s samples are within the MCL, it is not feasible to add treatment processes that may or may not be effective in meeting the PHG.

Conclusion

The City of Poway’s drinking water meets all State of California, SWRCB and USEPA drinking water standards set to protect public health.

To further reduce the levels of the constituents identified in this report, that are already significantly below the established health-based Maximum Contaminant Levels, would involve costly treatment processes. Annually, the City of Poway expends approximately $2.4 million on water treatment, including maintenance and operation of the plant and chemicals for water treatment.

The effectiveness of alternative treatment processes to provide any further reductions in constituent levels from their already low current values is uncertain. The health protection benefits of these further hypothetical reductions are unclear and may not be quantifiable. Calculating the cost of alternative treatment processes is infeasible. Considering site constraints of the City’s current water treatment plant and numerous other variables regarding potential treatment methods to address identified contaminants, even conceptual cost estimates would require extensive engineering analysis. Therefore, since Poway’s drinking water meets all State and Federal standards set to protect public health, no action is proposed.
RESOLUTION NO. 19-047

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF
POWAY, CALIFORNIA, ADOPTING THE REPORT ON THE
CITY’S WATER QUALITY RELATIVE TO PUBLIC HEALTH
GOALS

WHEREAS, the City of Poway’s drinking water meets all State of California and federal standards to protect public health;

WHEREAS, the California Health and Safety Code Section 116470 (Section 116470) requires that water utilities with more than 10,000 service connections prepare a report if any of their water quality measurements exceeded any Public Health Goal in 2016, 2017 or 2018;

WHEREAS, the City of Poway has more than 14,000 service connections and had minor incidents of water quality measurements exceeding Public Health Goals for three substances (total coliform bacteria, radionuclides and arsenic) between 2016 and 2018;

WHEREAS, in compliance with subdivision (b) of Section 116470, a Report on the City’s Water Quality Relative to Public Health Goals has been prepared;

WHEREAS, in compliance with subdivision (c) of Section 116470, the City of Poway must conduct a Public Hearing for the purpose of accepting and responding to public comment prior to the adoption of the Public Health Goal report; and

WHEREAS, on August 6, 2019, at a regular meeting of the Poway City Council, which was duly noticed, and at which a quorum was present, the City Council did conduct a public hearing for the purpose of accepting and responding to public comment related to the Public Health Goal report.

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Poway as follows:

SECTION 1: That the foregoing recitals are true and correct.

SECTION 2: That the City of Poway’s Report on the City’s Water Quality Relative to Public Health Goals, prepared pursuant to and in compliance with Health and Safety Code section 116470, is hereby approved and adopted.
PASSED, ADOPTED AND APPROVED at a Regular Meeting of the City Council of the City of Poway, California on the 6th day of August, 2019 by the following vote, to wit:

AYES: MULLIN, LEONARD, FRANK, GROSCH, VAUS
NOES: NONE
ABSENT: NONE
DISQUALIFIED: NONE

ATTEST:

Faviola Medina, CMC, City Clerk

Steve Vaus, Mayor