



TRIENNIAL REPORT ON WATER QUALITY RELATIVE TO PUBLIC HEALTH GOALS

April 10, 2019

Prepared in Accordance with:

California Health and Safety Code, Section 116470

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City of Antioch – Water Treatment Plant

**401 Putnam Street
Antioch, CA 94509
(925) 779-7024**

SECTION 1: Background Information

History:

The California Health and Safety Code Section 116470 specifies that water utilities serving more than 10,000 connections prepare a brief written report every three years that documents detections of any constituents that exceed a Public Health Goal (PHG) in the preceding three years. PHGs are non-enforceable goals established by the California Office of Environmental Health Hazard Assessment (OEHHA). The law also requires that where OEHHA has not adopted a PHG for a constituent, the water suppliers are to use the Maximum Contaminant Level Goal (MCLG) adopted by the United States Environmental Protection Agency (USEPA). Only constituents that have both a California primary drinking water standard and a PHG or MCLG as of December 31, 2018 are to be addressed in the report.

The City of Antioch prepared the last Triennial PHG Report in 2016. The 2019 Triennial PHG Report, due July 1, 2019, covers constituents detected in the City of Antioch's water supply during calendar years 2016 through 2018 at a level exceeding an applicable PHG or MCLG and provides the required information for each constituent. Included is the numerical public health risk associated with the Maximum Contaminant Level (MCL) and the PHG or MCLG, the category or type of risk to health that could be associated with each constituent, the best technology available that could be used to reduce the constituent level, and an estimate of the cost to install that treatment if it is appropriate and feasible.

What are PHGs:

PHGs are set by the California Environmental Protection Agency's OEHHA and are based solely on public health risk considerations. None of the practical risk-management factors that are considered by the USEPA or the State Water Resources Control Board, Division of Drinking Water (DDW) in setting drinking water standards (MCLs) are considered in setting the PHGs. These factors include analytical detection capability, treatment technology available, benefit and costs. The PHGs are not enforceable and are not required to be met by any public water system. MCLGs are the federal equivalent to PHGs.

Reporting Requirements:

The purpose of this report is to inform consumers of the City's drinking water public health goals that were exceeded during 2016, 2017 and 2018, pursuant to California Health and Safety Code Section 116470(b). In addition, this report provides information about the cost of achieving a water quality level that does not exceed the public health goals.

Water Quality Data Considered:

All of the water quality data that was collected from the City of Antioch's water system during calendar years 2016, 2017 and 2018 for purposes of determining compliance with drinking water standards was reviewed. The data was also summarized in the 2016, 2017, and 2018 Annual Water Quality Reports (AWQRs) that were made available on the City of Antioch's website. Post cards were mailed to all customers with a link to the City of Antioch's website and information on how to request a hard copy of the AWQR, if preferred.

Guidelines Followed:

This report was prepared following a document titled "Health Risk Information for Public Health Goal Exceedance Reports" published on February 7, 2019 by California Environmental Protection Agency's OEHHA.

Best Available Treatment Technology and Cost Estimates:

Both the USEPA and DDW adopt what are known as Best Available Technologies that are the best known methods of reducing contaminant levels to the MCL. Costs can be estimated for such technologies. However, since many PHGs and all MCLGs are set much lower than the MCL, it is not always possible or feasible to determine what treatment is needed to further reduce a constituent downward to or near the PHG or MCLG, many of which are set at zero. Estimating the costs to reduce a constituent to zero is difficult, because it is not possible to verify by analytical means that the level has been lowered to zero.

In some cases, installing treatment to further reduce very low levels of one constituent may have adverse effects on other aspects of water quality.

SECTION 2: Constituents Detected that Exceed a PHG or MCLG

The following is a discussion of constituents that were detected in the City of Antioch's drinking water at levels above the PHG, or if no PHG, above the MCLG.

Radionuclides:

During calendar years 2016 through 2018, Contra Costa Water District (CCWD) was required to collect samples and test for radionuclides from source water locations at least once during the three-year period. This sampling was performed in 2016. Four radiological constituents were found at levels above the PGH or the MCLG. A summary of the results is shown in Table 1.

Table 1: Summary of Radiological Constituents Detected

Constituent	PHG (pCi/L)	MCL (pCi/L)	MCLG (pCi/L)	DLR (pCi/L)	Range (pCi/L)	Average (pCi/L)
Gross Alpha	None	15	0	3	ND-7.5	1.9 or < DLR
Gross Beta	None	50	0	4	ND-5.2	2.79 or < DLR
Tritium	400	20,000	NA	1000	ND-418	41.8 or < DLR
Uranium	0.43	20	0	1	ND-0.94	0.094 or < DLR

pCi/L = picoCuries per liter

NA = Not Applicable

ND = Non-Detect

DLR = Detection Limit for Reporting

Gross Alpha and Gross Beta were found several times at levels above the MCLG. Tritium and Uranium had one detection each above the PHG. A description of the public health risks, categories of health risks and best available treatment technology for each of the detected constituents follows.

Gross Alpha Particle Activity

The DDW has set the drinking water standard for gross alpha at 15 pCi/L. The MCLG is set at zero. The numerical public health risk associated with the MCLG is zero. The numerical public health risk associated with the California MCL is up to 1×10^{-3} , this means 1 cancer case per 1,000 for the isotope polonium 210, which is the most potent alpha emitter.

In 2016, gross alpha was detected at four out of ten source water locations. The range of results was from non-detect to 7.5 pCi/L with an average below the DLR. Per the guidance this is not required to be reported.

Gross alpha in drinking water can occur from natural sources. Gross alpha is defined as the sum total of elemental radium, radon, uranium and thorium. The best available technology for removal of gross alpha is reverse osmosis.

Gross Beta

The DDW has set the drinking water standard for gross beta at 50 pCi/L. The MCLG is set at zero. The numerical public health risk associated with the MCLG is zero. The numerical public health risk associated with the California MCL is up to 2×10^{-3} , this means 2 cancer cases per 1,000 for the isotope lead 210, which is the most potent beta emitter.

In 2016, gross beta was detected at seven out of ten source water locations. The range of results was from non-detect to 5.2 pCi/L with an average below the DLR. Per the guidance this is not required to be reported.

Gross beta in drinking water can occur from natural sources. There are also a number of anthropogenic (man-made) sources such as radioactive materials used in the medical industry. Some people who drink water containing gross beta in excess of the MCL over many years may have an increased risk of getting cancer. The best available technology for removal of gross beta has been identified as ion exchange and reverse osmosis.

Uranium

The DDW has set the drinking water standard for uranium at 20 pCi/L. The PHG is set at 0.43 pCi/L. The numerical public health risk associated with the PHG is 1×10^{-6} , this means 1 cancer case per 1,000,000 population. The numerical public health risk associated with the California MCL is 5×10^{-5} , this means 5 cancer cases per 100,000.

In 2016, uranium was detected at one out of ten source water locations. The range of results was from non-detect to 0.94 pCi/L with an average below the DLR. Per the guidance this is not required to be reported.

The major source of uranium in drinking water is from erosion of natural deposits. Some people who drink water containing uranium in excess of the MCL over many years may have kidney problems or an increased risk of getting cancer. The best available technology for removal of uranium has been identified as ion exchange and reverse osmosis.

Tritium

The DDW has set the drinking water standard for tritium at 20,000 pCi/L. The PHG is set at 400 pCi/L. The numerical public health risk associated with the PHG is 1×10^{-6} , this means 1 cancer case per 1,000,000 population. The numerical public health risk associated with the California MCL is 5×10^{-5} , this means 5 cancer cases per 100,000.

In 2016, tritium was detected at one out of ten source water locations. The range of results was from non-detect to 418 pCi/L with an average below the DLR. Per the guidance this is not required to be reported.

The major source of tritium in drinking water is from decay of natural and man-made deposits. Some people who drink water containing tritium in excess of the MCL over many years may have an increased risk of getting cancer. The best available technology for removal of tritium has been identified as ion exchange and reverse osmosis.

SECTION 3: Recommendations for Further Action

The City of Antioch drinking water quality meets all of the DDW and USEPA drinking water standards set to protect public health. The levels of constituents identified in this report are already significantly below the health-based MCLs established to provide safe drinking water. Further reductions in these levels would require additional costly treatment processes and the ability of these processes to provide significant additional reductions in constituent levels is

uncertain. In addition, the health protection benefits of these possible reductions are not at all clear and may not be quantifiable. Therefore, no action is proposed at this time.

REFERENCES

Health and Safety Code Section 116470

As a condition of its operating permit, every public water system shall annually prepare a consumer confidence report and mail or deliver a copy of that report to each customer, other than an occupant, as defined in Section 799.28 of the Civil Code, of a recreational vehicle park. A public water system in a recreational vehicle park with occupants as defined in Section 799.28 of the Civil Code shall prominently display on a bulletin board at the entrance to or in the office of the park, and make available upon request, a copy of the report.

On or before July 1, 1998, and every three years thereafter, public water systems serving more than 10,000 service connections that detect one or more contaminants in drinking water that exceed the applicable public health goal, shall prepare a brief written report in plain language that does all of the following:

1. Identifies each contaminant detected in drinking water that exceeds the applicable public health goal.
2. Discloses the numerical public health risk, determined by the office, associated with the maximum contaminant level for each contaminant identified in paragraph (1) and the numerical public health risk determined by the office associated with the public health goal for that contaminant.
3. Identifies the category of risk to public health, including, but not limited to, carcinogenic, mutagenic, teratogenic, and acute toxicity, associated with exposure to the contaminant in drinking water, and includes a brief plainly worded description of these terms.
4. Describes the best available technology, if any is then available on a commercial basis, to remove the contaminant or reduce the concentration of the contaminant. The public water system may, solely at its own discretion, briefly describe actions that have been taken on its own, or by other entities, to prevent the introduction of the contaminant into drinking water supplies.
5. Estimates the aggregate cost and the cost per customer of utilizing the technology described in paragraph (4), if any, to reduce the concentration of that contaminant in drinking water to a level at or below the public health goal.
6. Briefly describes what action, if any, the local water purveyor intends to take to reduce the concentration of the contaminant in public drinking water supplies and the basis for that decision.
7. Public water systems required to prepare a report pursuant to subdivision (b) shall hold a public hearing for the purpose of accepting and responding to public comment on the report. Public water systems may hold the public hearing as part of any regularly scheduled meeting.
8. The department shall not require a public water system to take any action to reduce or eliminate any exceedance of a public health goal.

9. Enforcement of this section does not require the department to amend a public water system's operating permit.

10. Pending adoption of a public health goal by the Office of Environmental Health Hazard Assessment pursuant to subdivision (c) of Section 116365, and in lieu thereof, public water systems shall use the national maximum contaminant level goal adopted by the United States Environmental Protection Agency for the corresponding contaminant for purposes of complying with the notice and hearing requirements of this section.