



**2020 BIENNIAL
WATER QUALITY MANAGEMENT PROGRAM (WQMP) REPORT
December 08, 2020**

INTRODUCTION:

This draft biennial report for Zone 7's Water Quality Management Program (WQMP) has been prepared as specified by Zone 7's 2014 Water Quality Policy. It includes a summary of water quality data collected from January 2018 through October 2020 which is compared against applicable water quality targets set forth by the WQMP. It also includes an update of ongoing and emerging potential water quality issues as well as relevant water quality improvement activities and regulatory/technology development since the last WQMP report in December 2018. In addition, this report includes discussion and outcomes from a joint workshop with the Retailers that was conducted on November 10, 2020.

BACKGROUND:

Zone 7 has a **Water Quality Policy for Potable and Non-Potable Water** (see **Attachment A**) that established the WQMP in 2003. The Policy establishes goals to effectively manage various water quality issues and to guide operations and capital improvement planning. The Policy calls for delivered potable water to its M&I Contractors' turnouts to be of a quality that contains no greater than 80% of the applicable State or federal primary Maximum Contaminant Levels (MCLs) and is aesthetically acceptable by meeting all State and federal secondary MCLs. The Policy also calls for Zone 7 to proactively mitigate earthy-musty taste and odor (T&O) events¹ from surface water supplies, optimize its treatment processes to minimize chlorinous odors, and reduce delivered water hardness to "moderately hard", which is defined as 75 to 150 milligrams per liter (mg/L) as calcium carbonate (CaCO₃). As for the non-potable water delivered to Zone 7's untreated water turnouts, it should be of a quality that meets the irrigation needs and does not negatively impact vegetation, crops, or soils.

The goals established in the Policy are further refined with water quality targets for the key parameters of concern. Potable water quality targets were established for "average" conditions; during dry years or emergencies, some targets may not be achieved, but all primary MCLs will be met. Most of the targets are to be met at the turnouts except for a few potable water targets that are based on customer complaints (e.g., appearance and earthy/musty T&O events). Due to operational controls and optimization opportunities, some disinfectant residuals (e.g., total chlorine and free ammonia) and disinfection byproducts (DBPs) are to be met as water leaves the surface water treatment plants (WTPs).

¹ An event is defined as when three or more similar complaints are received in a 7-day period.

Non-potable water quality targets were recommended for irrigated turf and vineyards, for both average conditions and short-term applications. The average targets represent supply sources under average water quality conditions that can be applied on a regular basis. The maximum applied targets represent the maximum tolerance levels that the irrigated turf or vineyards can accept on a short-term basis. This may represent either drought years where the surface water quality is degraded, or different supply sources with lower quality used on a temporary basis, such as with recycled water. Since the non-potable water is delivered via the SWP without any treatment and the SWP is operated and managed by DWR, Zone 7 has no control over the quality of water delivered to its non-potable water customers, the targets are established for information only. It is up to the non-potable water user to decide if and when they need to discontinue the use of water for irrigation due to unacceptable water quality.

Over the years, the water quality targets have been reviewed and adjusted as needed. The potable water quality targets are also incorporated into various operations plans, planning documents, and design criteria as appropriate. The WQMP also has identified operational modifications, studies, and capital facilities to facilitate meeting the potable targets. These projects have been implemented, completed, or incorporated into Zone 7's ongoing Capital Improvement Program (CIP) and Asset Management Program (AMP).

The Water Quality Policy was last revised in April 2014 and directs staff to *"conduct a workshop with the M&I Contractors to develop a Water Quality Management Program Report every two years. The workshop will review emerging water quality issues and relevant regulatory and/or technology developments, review status of key parameters of concern in relation to their water quality targets, review water quality policy and need for updates, and review the status of relevant water quality improvement projects/activities. The Report shall include any recommended revisions to the water quality targets and/or recommended projects/activities to assist in meeting the water quality targets. Optimization of system operations will be recommended, where possible, prior to the identification of the need for capital improvements. The Report recommended capital improvements shall be incorporated into Zone 7's biennial update of the Ten-Year Water System CIP."*

DISCUSSION:

Water Quality Policy: Zone 7's 2014 Water Quality Policy was reviewed and there is no recommended revision to the Policy.

Non-Potable Water Quality And Targets: Zone 7 delivers imported State Water Project (SWP) water from the California Department of Water Resources (DWR) via the South Bay Aqueduct (SBA) directly to its untreated water users without any treatment. Some untreated water users can also receive water from the local Lake Del Valle (LDV) or a blend of LDV and SWP water.

Water quality monitoring data is provided to any interested untreated water users and M&I Contractors on a monthly basis. As indicated in the attached **Table 1**, Zone 7 met all of its non-potable water quality targets during the reporting period.

Potable Water Quality And Targets: Zone 7 supplies mostly treated surface water to its four major retailers and a few direct customers. The four retailers, which provide water for M&I use, are the City of Pleasanton, the City of Livermore, the Dublin San Ramon Services District (DSRSD), and California Water Service Company (CWS). Groundwater supplies are used only to meet peak demands during summertime, for groundwater basin storage management, and when surface water supplies are limited (approximately 15% in 2018 and 26% in 2019). Zone 7 treats its surface water supplies at its Del Valle Water Treatment Plant (DVWTP) and/or Patterson Pass Water Treatment Plant (PPWTP). Groundwater is pumped through any of its ten wells and chloraminated to maintain consistent disinfectant residual in the distribution system. The highest salts and hardness values in Zone 7's groundwater supplies come from its Mocho Wells which can be treated through Zone 7's Mocho Groundwater Demineralization Plant (MGDP).

Zone 7's delivered water quality monitoring data is summarized in its Monthly Delivered Water Quality Reports and Annual Consumer Confidence Reports. Note that Zone 7 continued to meet all of the drinking water standards and, in almost all cases, the quality was significantly better than required. As indicated in the attached **Table 2**, the average delivered water quality data met the potable water quality targets during the reporting period, except for hardness in groundwater supplies and earthy-musty T&O caused by algal blooms in surface water supplies.

Zone 7's groundwater generally contains more salts and minerals and is "harder" than its surface water supplies. The highest chloride levels, total dissolved solids (TDS) and hardness values in Zone 7's groundwater supplies come from Mocho Wells; these levels have been increasing over the past few years (>150 mg/L chloride, >750 mg/L TDS, >400 mg/L hardness, respectively). Zone 7 manages salt loading for the long-term to its groundwater basin via artificial recharge with low TDS surface water, groundwater pumping and demineralization per its Salt Management Program (SMP). Demineralization is also used by Zone 7 to assist in meeting its delivered water salinity and hardness targets. Zone 7's MGDP uses a reverse-osmosis (RO) membrane filtration technology which produces approximately 80 permeate water and 20% reject concentrate. RO permeate is extremely "soft" (less than 10 mg/L) and corrosive, therefore, it is blended with untreated groundwater to ensure that the water is non-corrosive and safe to drink. In general, MGDP is online whenever Mocho wells are online except for repairs/maintenance, when there is need to avoid 20% waste due to drought/surface water emergencies, or when there are requests from PG&E to turn off high power use facilities during potential power shortages. More recently, MGDP was shut down for several months in 2020 to clean out the scale build-up in the RO concentrate pipeline. A second demineralization plant is in Zone 7's long-term plans to provide additional salt removal capability. The implementation schedule for additional groundwater demineralization capacity depends on factors such as growth in the Valley and will be evaluated as part of the ongoing CIP review and update process. The growth in the Valley impacts the overall salt management program needs and funding availability.

Zone 7's surface WTPs historically use Powdered Activated Carbon (PAC) and chlorine to treat algal byproducts; however, the effectiveness of these treatment methods is limited. Ozone is identified by Zone 7 as the best treatment technique for treating algal byproducts as well as reducing DBPs and other potential emerging contaminants. Zone 7 recently completed construction of ozone treatment facilities at DVWTP. One earthy-musty T&O event occurred in

July 2020, before the ozone system startup at DVWTP. Another event occurred in early November 2020, during performance testing of DVWTP's ozone system; Zone 7 immediately took actions to work with DWR to reduce Lake release while increasing the plant's ozone dose. The ozone treatment facilities at PPWTP are currently under construction and should come online in 2022.

Water Quality Issues: A summary of ongoing and emerging potential water quality issues as well as the status of relevant water quality improvement activities and regulatory/technology development since the last WQMP update in December 2018 is provided in the attached **Table 3**.

The water quality issue that is of most concern to Zone 7 is Per- and Polyfluoroalkyl Substances (PFAS) found in the Tri-Valley's groundwater basin since late 2018. To date, Zone 7 has detected seven types of PFAS [(perfluorobutane sulfonic acid (PFBS), perfluoroheptanoic acid (PFHpA), perfluorohexanoic acid (PFHxA), perfluorohexane sulfonic acid (PFHxS), perfluorooctanoic acid (PFOA), perfluorooctanesulfonic acid (PFOS), and perfluorononanoic acid (PFNA)] in eight out of ten Zone 7's production wells (Stoneridge, 3 COL wells, and 4 Mocho wells). Only PFOS and PFOA currently have State guidance levels. Guidance level for PFBS is anticipated to be released in late November 2020 while guidance levels for the other detected PFAS are currently under development. Zone 7 has already implemented operational changes to ensure that any affected wells are treated below the applicable response level prior to entry into the distribution system. In July 2020, Zone 7 completed a study which identified COL wellfield to be most at risk of not being able to comply with future State MCLs for PFAS. In September 2020, Zone 7 Board approved moving forward with the design of the PFAS treatment facility at the COL wellfield, including bench-scale testing of various Granular Activated Carbon (GAC) and specialized Ionic Exchange (IX) resins, in order for the new facility to come online before the anticipated compliance date in early 2024. Zone 7 also recently completed a PFAS Potential Source Investigation Study which includes recommendations for additional sampling near most probable sources (airports, fire stations/fire training sites, land disposal sites, military facilities, and wastewater facilities) and in areas with little data as well as other follow-up work. Zone 7's monitoring data and both draft Study reports are available on Zone 7's website (<https://www.zone7water.com/pfas-information>). Zone 7 will continue its monitoring efforts, proceed with design of the PFAS treatment facility at the COL wellfield, track regulatory development for PFAS, and assess any impact to Zone 7 operations as needed.

CONCLUSIONS:

Based on review of the data and input from the Retailers, no revisions are identified to Zone 7's Water Quality Policy, water quality targets, and ongoing or planned water quality improvement projects/activities.

ATTACHMENTS:

- Table 1 - Status of Non-Potable Water Quality Targets
- Table 2 - Status of Potable Water Quality Targets
- Table 3 - Summary of Water Quality Issues, Status Updates and Recommendations
- Attachment A – 2014 Water Quality Policy for Potable and Non-Potable Water