



Public Health Goals
Escondido Water System
2013

CITY OF ESCONDIDO

REPORT ON THE CITY'S WATER QUALITY RELATIVE TO PUBLIC HEALTH GOALS

2010– 2012

As required by California Health and Safety Code Section 116470(b)

Background

The California Health and Safety Code requires that water utilities with 10,000 or more service connections prepare a report every three years if any water quality measurements detect concentrations of certain constituents that exceed any Public Health Goal, or PHG. The law also requires that if a PHG for a particular constituent has not been established, the water suppliers are to use the Maximum Contaminant Level Goals, or MCLG, adopted by the United States Environmental Protection Agency (USEPA). Only constituents addressed by California primary drinking water standards, which are distinct from PHGs and MCLGs, and for which either a PHG or an MCLG has been set are to be included in the triennial report.

If a constituent was detected in the Escondido water supply in the years 2010 through 2012 at a level exceeding an applicable PHG or MCLG, this report provides information for our customers. Included is the numerical public health risk associated with the Maximum Contaminant Level (MCL, or the enforceable drinking water standard) and the PHG or MCLG, where available. The category or type of risk to health that could be associated with each constituent is also included if such risks have been established.

Goals vs. Standards

Public water supplies are strictly regulated for a host of substances. The enforceable standards are those set by the USEPA and the California Department of Public Health (Cal DPH) in their primary drinking water standards. These standards are called Maximum Contaminant Levels (MCL) and are enforced by the California Department of Public Health. Tests for these contaminants are run at a required frequency using standard methods. Public drinking water systems must ensure compliance with these standards at all times.

In addition to standards, there are two sets of goals that apply to certain substances that are sometimes found in drinking water supplies. The goals can be either state or federal goals. The goals are not enforceable, but they provide guidance concerning contaminant concentrations that water system operators should strive to meet, especially as treatment technologies advance.

Public Health Goals (PHGs) are set by the California Office of Environmental Health Hazard Assessment (OEHHA) which is part of the California Environmental Protection

Agency (Cal-EPA). PHG's are not enforceable and are not required to be met by any public water system. They are set as goals based on public health risk considerations and include a wide "margin of safety".

Maximum Contaminant Level Goals (MCLGs) are similar to PHGs, though set by the federal government. One significant difference between MCLGs and PHGs is the method for setting concentration goals for carcinogens 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. Conversely, PHGs are set at a concentration considered to pose no significant risk of cancer. This is usually denoted as a one-in-a-million cancer risk for a lifetime of exposure to a given concentration of the carcinogen. Determinations of health risk at these low levels are frequently theoretical and have not been quantified or proven through scientific or medical study.

Best Available Treatment Technology

Both the USEPA and the Cal DPH adopt what are known as Best Available Technologies. These technologies take into account factors such as analytical detection capability, available treatment technology, and costs. These are the best known methods for reducing contaminant levels to the MCL. However, since many PHGs and all MCLGs are set much lower than the MCL, it is not always possible to determine which, if any, treatment will 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 and repeatable test results. In some cases, treatment processes that reduce one contaminant to a very low level may have adverse effects on other aspects of water quality.

Water Quality Data Considered

Water quality data collected from the City of Escondido water system in 2010, 2011 and 2012 for purposes of determining compliance with drinking water standards was considered in this report. This data was summarized in the annual Consumer Confidence Reports for the same years and was either mailed to our customers (2010, 2011) or posted to the City's website (2012) with postcard notification of the Report's availability. As stated in the CCR each year, no constituent was detected at concentrations above the MCL, thus Escondido's drinking water met all federal and state standards. However, the constituents discussed below were detected in Escondido's drinking water at concentrations above the PHG or above the MCLG, whichever is applicable.

Coliform Bacteria

The MCL (drinking water standard) for total coliform is 5% of monthly samples and the MCLG (Federal goal) is 0% for monthly samples. The percentage of positive coliform bacteria samples from the distribution system was below the MCL at all times, but at times was over the MCLG.

Each month 140 to 190 samples are collected from the distribution system for analysis of coliform bacteria levels. Occasionally, a sample was found to be positive for coliform bacteria, but repeat samples were negative in all cases. Additional follow-up testing – both upstream and downstream of the original positive test – did not detect coliform bacteria. In any given month, a maximum of 2.0%, or 3 samples, were positive. Over the three-year period, 15 samples out of 5,641 (0.27%), were positive for total coliform. Follow-up samples were negative in all cases.

Monitoring for total coliform bacteria minimizes the possibility of pathogens, or organisms that may cause waterborne disease, in the drinking water. Because coliforms are only a surrogate indicator of the potential presence of pathogens in general, it is not possible to state a specific numerical health risk. While USEPA normally sets MCLGs “at a level where no known or anticipated adverse effects on persons would occur,” they acknowledge that they cannot do so with total coliform bacteria.

Coliform bacteria are found everywhere in nature and are not generally considered harmful. They are used as an indicator because of the ease in monitoring and analysis. If a positive sample is found, it indicates a potential problem that needs to be investigated. It is not at all unusual for a system to have an occasional positive total coliform sample. Follow-up sampling indicates the presence or absence of further risk. As stated previously, all follow-up sampling has been negative.

The City adds chlorine as a disinfectant during the treatment process, and also chloramines prior to distribution, to assure that the water is free of pathogens. The residual levels of the disinfectant are carefully controlled to provide the best health protection without undesirable taste, odor, or byproducts. This careful balance of treatment processes is essential to supplying Escondido’s customers with safe drinking water.

Other equally important measures that have been implemented include: an effective cross-connection control program; maintenance of a disinfectant residual throughout the system; an effective monitoring and surveillance program; and positive pressure in the distribution system.

Copper and Lead

There is no MCL (drinking water standard) for copper or for lead. Instead, the requirement is that 90% of the samples taken from household taps and tested for copper cannot exceed an Action Level or Notification Level of 1.3 mg/L for copper and 0.015 mg/l for lead. The PHG (State goal) for copper is 0.30 mg/L; for lead the PHG is 0.0002 mg/l.

The Federal and State Lead and Copper Rules require sampling once every three years for both lead and copper from household taps. The samples are taken by designated customers from kitchen or lavatory faucets. The sample is taken after the water sits in

the plumbing overnight, without running the water to rinse or flush out contaminants. Customers agreeing to participate by collecting samples are rewarded with a \$25 credit to their water bill. Sampling in the distribution has repeatedly failed to detect either lead or copper; therefore, if a sample has a concentration of lead and/or copper greater than the Action Level or Notification Level, the customer is notified of the source of lead and/or copper in the private plumbing system.

Copper sampling in 2012 indicates that the 90th percentile concentration of copper in samples taken from Escondido household taps was 0.31 mg/L, which is less than the Action Level of 1.3 mg/L but exceeds the PHG of 0.30 mg/L. Approximately 11% of the 66 samples collected in 2012 for copper exceeded the PHG of 0.30 mg/L.

The category of health risk for overexposure to copper is gastrointestinal irritation. Numerical health risk data on copper has not yet been provided by California EPA's Office of Environmental Health Hazard Assessment.

Lead sampling in 2012 indicates that the 90th percentile concentration of lead in samples taken from household taps was less than the Action Level of 0.015 mg/L. In fact, the 90th percentile concentration of lead was less than the detection limit of the test method used (0.005 mg/L). However, the detection limit of the method used exceeds the PHG level of 0.0002 mg/L, so it is not known if the 90th percentile concentration of lead is below the PHG. Further expense for testing with lower detection limits is not merited because the PHG is not an enforceable standard; however, staff must report that the 90th percentile concentration of lead, although less than the Action Level and less than 0.005 mg/L, may be greater than 0.0002 mg/L.

The category of health risk for overexposure to lead is damage to kidneys and the nervous system. Numerical health risk data on lead has not yet been provided by California EPA's Office of Environmental Health Hazard Assessment.

The Escondido water system is in full compliance with the Federal and State Copper and Lead Rule. The concentration of copper and lead falls well below Action Levels or Notification Levels in more than 90% of samples. Therefore, the Escondido water system is deemed by the California Department of Health Services to have "optimized corrosion control" for the system, and it would not be financially or operationally prudent to initiate additional corrosion control treatment. The cost to reduce the copper concentration below the detection limit is not known because the majority of copper and lead contamination comes from piping in individual residences.

Chlorite

Chlorite is a disinfection byproduct produced in the treatment of drinking water with chlorine dioxide. Chlorine dioxide has been used to control tastes and odors associated with algae and decaying vegetation in the raw water supply, as well as to lower the concentration of disinfectant-by-products such as total trihalomethanes (TTHMs) and haloacetic acid (five) (HAA5) in drinking water. Chlorine dioxide was applied seasonally

at the Escondido Water Treatment Plant when Lake Wohlford water was used as part of the raw water supply. The current chlorite MCL (drinking water standard) is 1.0 mg/L and the PHG (State goal) is 0.05 mg/L.

The chlorite levels measured at the entry point to Escondido distribution system when chlorine dioxide was being used during 2010 to 2012 ranged from 0.37 mg/l to 0.75 mg/l.

Several studies reveal that oral exposure to chlorite can result in hematological, endocrine, reproductive, and gastrointestinal effects, as well as changes in neurobehavioral development at levels higher than the MCL (drinking water standard).

Sampling results show the Escondido water system meets the MCL (drinking water standard) for Chlorite, but exceeds the PHG (State goal).

RECOMMENDATIONS FOR FURTHER ACTION:

The City of Escondido drinking water system meets all State of California and USEPA drinking water standards set to protect public health, but concentrations of some constituents do exceed public health goals. To lower the concentration of these constituents, additional costly treatment processes would be required. The benefits of these reductions have not been quantified by the State or Federal governments. Additionally, PHGs (State goals) and MCLGs (Federal goals) are significantly below the health-based MCL (drinking water standard) that have been established to provide “safe drinking water.” The effectiveness of additional treatment processes to provide significant reductions in constituent levels at these already low values is uncertain. The health protection benefits of further reductions are not clear and may not be quantifiable. Therefore, no action is proposed.

Summary of Findings:

Total coliform, copper, lead, and chlorite constituents were detected in our City’s water system at concentrations above the PHGs (State goals) or MCLGs (Federal goals). These goals have been set to identify contaminant concentrations that water agencies should aim to achieve, but these goals are not enforceable. At all times, the Escondido water system served safe drinking water with contaminant concentrations well below recognized and enforceable MCLs (drinking water standards). The drinking water quality of the Escondido water system meets all drinking water standards to protect public health.