



THE CITY OF SAN DIEGO

**Public Utilities Department
Report on Water Quality Relative to Public Health Goals**

June 30, 2010

Background:

Provisions of the California Health and Safety Code specify that the City of San Diego Public Utilities Department, and other water utilities with more than 10,000 service connections, prepare a special report by July 1, 2010, if their water quality measurements exceeded any Public Health Goal (PHG) in calendar years 2007, 2008 and 2009. 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 contaminant, the water suppliers are to use the Maximum Contaminant Level Goals (MCLGs) adopted by the U.S. Environmental Protection Agency (USEPA). Only contaminants that have an existing enforceable mandatory Maximum Contaminant Level (MCL) and have exceeded either a PHG or MCLG are to be addressed in this report. Included in this report is the numerical public health risk associated with the MCL and PHG or MCLG, the category or type of risk to health that could be associated with each contaminant level, and an estimate of the cost to implement specific treatment if it is appropriate and feasible.

PHGs are set by the 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 California Department of Public Health (CDPH) in setting MCLs are considered in setting the PHGs. These factors include analytical detection capabilities, treatment technology availability, benefits and costs. The PHGs are not enforceable and are not required to be met by any public water system. MCLGs are the USEPA's equivalent to PHGs.

Water Quality Data Considered:

All of the water quality data collected by our water system between 2007 and 2009 for purposes of determining compliance with drinking water standards were considered for this report. These data were summarized in our 2007, 2008 and 2009 annual Consumer Confidence Reports, which were mailed to all of our customers in June of each year. Copies of these reports and additional information concerning water quality and the Public Utilities Department may be viewed at www.sandiego.gov/water.

Best Available Treatment Technology and Cost Estimates:

Both the USEPA and CDPH specify best available technologies (BATs), which are the best known methods of reducing contaminant levels, to meet the legally enforceable MCL. Costs can be estimated for such technologies. However, since many PHGs and MCLGs are set much lower than the MCL, it is not always possible, nor feasible, to determine what treatment is needed to further reduce a contaminant to the PHG or MCLG, many of which are set at zero. In some cases, installing treatment to try and further reduce very low levels of one contaminant may have adverse effects on other aspects of water quality. For example, using reverse osmosis will reduce the hardness of the water, but would increase corrosion within the distribution system. The increased corrosion would decrease the life expectancy of the water mains and household plumbing. Corrosion also increases lead and copper dissolving from household plumbing.

Contaminants Detected that Exceed a PHG or a MCLG:

Water delivered in the City of San Diego exceeded one PHG or MCLG during this period: uranium. The detected level for uranium ranged from 2.1 to 2.4 pCi/L (picocuries per liter) well below the 20.0 pCi/L MCL; this does not constitute a violation of drinking water regulations or indicate the water was unsafe to drink. These results could be considered typical for a California water agency. The uranium Public Health Goal is 0.43 pCi/L.

Uranium:

The State of California has a uranium MCL of 20.0 pCi/L based on earlier studies of toxicity to the kidney in rabbits. Cancer risk is stated in terms of excess cancer cases per million (or fewer) population exposed for a lifetime (theoretically 70 years). The numerical health risk at the MCL is 5×10^{-5} . This means five cancer cases per 100,000 population. The numerical health risk at the PHG is 1×10^{-6} . This means one cancer case per 1,000,000 population. The health risk category for uranium is carcinogenicity: chronic toxicity. Carcinogenic risk means capable of producing cancer. Chronic toxicity risk means there may be adverse effects that usually develop gradually from low levels of chemical exposure and that persist for a long time.¹ The primary non-carcinogenic toxic effect is on kidneys.²

Uranium is a naturally occurring radioactive element that is present in the earth's crust. Uranium is found in ground and surface waters due to natural occurrence in geological formation. The average uranium concentration in surface, ground and domestic water are 1, 3 and 2 pCi/L.

¹ *Health Risk Information for Public Health Goal Exceedance Report, Office of Environmental Health Hazard Assessment, Water Toxicology Section, April 2010*

² *Public Health Goals for Chemicals in Drinking Water – Uranium, Office of Environmental Health Hazard Assessment California Environmental Protection Agency, August 2001*

The best available technology (BAT) for uranium to lower the level below the PHG is reverse osmosis. Since the uranium level is already below the MCL, reverse osmosis would be required to attempt to lower the uranium level to below the PHG. Please note that accurate cost estimates are difficult, if not impossible, are highly speculative and theoretical. All costs including annualized capital, construction, engineering, planning, environmental, contingency and O&M are included, but very general assumptions can be made for most of these items. Costs estimating guides from the Association of California Water Agencies guidance report were used in determining the estimated cost to implement the BAT. The City's 2009 treatment capacity is 295 million gallons per day. However, the current expansion of plant capacities will increase capacity to 445 million gallons per day and the cost will increase upon the completion of the expansion projects. The estimated annualized capital and operation and maintenance costs, based on the current capacity of 295 million gallons per day to install and operate a reverse osmosis system at the City's three treatment plants would be between \$147.2 million and \$281.7 million/year for the life of the system. The cost per customer service connection would range from \$537 to \$1,028 per year. There would be additional costs for corrosion control because water treated by reverse osmosis is corrosive and could cause the water to exceed the lead and copper regulations.

Recommendations for Further Action:

The drinking water quality of the City of San Diego meets all state and federal drinking water standards set to protect public health. To further reduce the levels of contaminants identified in this report, which are already significantly below the health-based MCLs to provide "safe drinking water," would require costly treatment processes. The effectiveness of the treatment process to provide significant reductions in contaminant levels at these already low values is uncertain. The health protection benefits of these further hypothetical reductions are not at all clear and may not be quantifiable. In addition, treatment processes to reduce levels of contaminants could result in MCLs, PHGs or MCLGs to be exceeded for other contaminants. Therefore no action is proposed at this time.