Perchlorate Maximum Contaminant Level (MCL) Review

Purpose of the Evaluation:
The primary drinking water standard for perchlorate is the maximum contaminant level (MCL) of 6 micrograms per liter (µg/L). The MCL became effective October 2007. In 2015, the Office of Environmental Health Hazard Assessment revised the public health goal (PHG) for perchlorate from 6 ug/l to 1 ug/l. The revised PHG has prompted the State Water Board to review the perchlorate MCL.

The PHG and Public Health Safety:
The PHG for perchlorate is based on non-carcinogenic health effects, specifically thyroid iodine uptake inhibition. Reduced iodine uptake can lead to inadequate levels of thyroid hormone, which in turn can affect mental and physical development in young children.

Perchlorate is regulated as an acutely toxic substance to reflect concerns about its potential for effects on the developing young. As a result, when a drinking water sample analyzed for perchlorate is found to exceed the MCL, regulations require the laboratory to quickly notify the water system of the findings, and public water systems must perform timely confirmation resampling and analysis. Also expedited is notification to the Division of Drinking Water (DDW) and to the public to help protect public health.

Overall compliance with the current regulation:
Drinking water treatment for perchlorate is in place for approximately 190 wells operated by 57 public water systems. Monitoring results show that treatment to below the detection limit for purposes of reporting (DLR) of 4 µg/L is achieved in over 98% of the total samples.

Limitation of the analysis:
The current DLR of 4 µg/l limits DDW's ability to determine perchlorate in wells at lower concentrations (i.e., between 1 and 4 µg/L) because laboratories typically only report results down to the DLR. The DLR also limits DDW's ability to fully evaluate how various installed treatment technologies perform at removing perchlorate to values below 4 µg/L. This inability to determine sub-4 µg/L performance levels would severely limit DDW during technological and economic analysis as part of lowering the MCL.

Staff recommendation:
DDW recommends first establishing a lower DLR to gather information and then revise the MCL if appropriate.

- The first regulation package would lower the DLR from the current 4-µg/L concentration to a level closer to, equal to, or less than the PHG of 1 µg/L. With a revised DLR, new occurrence data can be gathered to support the development of a revised MCL if appropriate.

- The second regulation package, if supported by new occurrence data, would replace the current 6-µg/L MCL with a new MCL as close to the 1-µg/L PHG as is technologically and economically feasible.

The proposed recommendation of two separate regulation packages would have the advantage of more quickly enabling the consideration of potential MCLs at levels less than 4 ug/L. Developing a regulatory package for only lowering the DLR could be completed faster than developing a regulatory package for both lowering the DLR and considering lower potential MCL values. Under the recommended scenario, state-wide sampling and data collection (using a lowered DLR) would begin substantially sooner. In addition, this approach allows water systems currently treating perchlorate to concentrations lower than 4 µg/L (i.e. not detected) to evaluate various treatment options in order to comply with a new MCL for perchlorate, should one be proposed and adopted.

A review of the current MCL without reliable data at levels below 4 ug/l would have the effect of limiting the review to potential MCL values of between 6 ug/L and 4 ug/L.