



Frequently Asked Questions

Proposed maximum contaminant level (MCL) for hexavalent chromium

Administrative draft released March 2022

What is hexavalent chromium, and how can it affect a person's health?

Chromium is an odorless and tasteless heavy metal that occurs throughout the environment. The "valent form" of chromium refers to the state of the electrons in a chromium atom in terms of the number of electrons involved in or available for chemical bond formation. Atoms can convert between valence states.

The trivalent form, often called chromium-3, is actually an essential nutrient for humans. It is found in a variety of fruits, vegetables, meat, grains and yeast, and it has very low toxicity. The hexavalent form of chromium, or chromium-6, is more toxic. Chronic or long-term exposure to water contaminated with hexavalent chromium may result in liver toxicity, gastrointestinal tumors, and liver cancer.

Where does hexavalent chromium come from?

Much of the hexavalent chromium found in drinking water occurs naturally throughout California from the erosion of chromium deposits. Contamination also can arise from a variety of industrial activities, including the manufacturing of textile dyes, wood preservation, leather tanning, and anticorrosion coatings, where hexavalent chromium contaminated waste has migrated into the groundwater. Hexavalent chromium pollution can occur when an industrial site fails to follow safe waste disposal methods.

Counties with the highest number of sources needing treatment to comply with an MCL are San Bernardino, Los Angeles and Fresno counties.

How is hexavalent chromium currently regulated in California drinking water?

In California, hexavalent chromium in drinking water is currently regulated under the Total chromium state MCL (maximum contaminant level) of 50 parts per billion (ppb). A maximum contaminant level (MCL) is the highest concentration of chemicals permitted in drinking water systems. The total chromium MCL was established in 1977 and regulates both the less-toxic trivalent form and the hexavalent form. California is the only state to have set its own total chromium MCL; other states use the total chromium federal MCL of 100 ppb to regulate chromium. The MCL that the State Water Board will consider in 2022 will regulate hexavalent chromium only.



What happened to the previous MCL for hexavalent chromium that was established in 2014?

In 2014 the California Department of Public Health (CDPH) established an MCL for hexavalent chromium. The same year, the state's drinking water program moved from CDPH to the State Water Board. In a 2017 ruling on a lawsuit brought by the California Manufacturers and Technology Association and the Solano County Taxpayers Association against the State Water Board, the Sacramento Superior Court invalidated the MCL on the grounds that the state "failed to properly consider the economic feasibility of complying with the MCL." The court did not determine whether the MCL established by the CDPH was economically feasible, nor did it conclude whether the MCL was too high or too low. Rather, the court said the regulation did not adequately document how the MCL was economically feasible.

How did State Water Board staff arrive at the MCL now being proposed?

State Water Board staff arrived at the proposed MCL after considering health risks, the technical feasibility of measurement and treatment, and estimated treatment costs, with particular attention to compliance costs for water systems serving fewer than 200 connections. In February 2020, the board released a [white paper](#) on the economic feasibility analysis of a MCL for hexavalent chromium, which noted the challenges in considering economic feasibility during the development of MCLs and concluded there is no simple formula capable of generating an economically feasible MCL. Nonetheless, following rigorous technical analysis and balancing of all factors, staff are proposing an MCL of 10 ppb.

Given that some residents of Hinkley, CA have experienced health impacts linked to hexavalent chromium groundwater contamination in the 50s and 60s, shouldn't any level of hexavalent chromium in drinking water be disallowed?

The illness among residents of Hinkley, California arose from industrial contamination by hexavalent chromium. In 2015, [levels of hexavalent chromium](#) in or near Hinkley were 3600 ppb. The MCL being proposed by the State Water Board is 10 ppb. It is not feasible technically or economically to remove all hexavalent chromium from drinking water.

Why do small water systems have a later timeline for complying with the proposed MCL?

The [State's Safe Drinking Water Plan \(2020\)](#) identified that most of the systems out of compliance with drinking water standards are small community water systems. Analysis of the approximately 2,895 community water systems throughout the state shows that the median community system serves 95 service connections. This means more than

half of these water systems have fewer than 100 households over which to spread the costs of required improvements to comply with new standards.

Many small public water systems already have numerous challenges, from compliance to routine maintenance. Setting the statewide MCL to be affordable for all of them will prevent more protective standards being in place for the 95% of Californians served by water systems with 3,300 or more connections. It is more prudent to set a protective standard for all at once and provide financial and technical assistance to help small systems that are likely to struggle to comply with the new MCL. Therefore, the State Water Board is proposing the following phased approach for complying with the MCL to give smaller systems more time:

- Systems with more than 10,000 service connections would be required to comply with the MCL within two years.
- Systems with 1,000 to 10,000 service connections would be required to comply with the MCL within three years.
- Systems with less than 1,000 service connections would be required to comply with the MCL within four years.

When is the proposed MCL for hexavalent chromium likely to take effect?

Developing, drafting, proposing, revising and adopting an MCL is a lengthy process that provides ample opportunity for public input. The administrative draft MCL was released for public comment on March 10, 2022, and will be followed by public meetings to discuss the drafts on March 22 and 24. Another public meeting over the summer will follow the release of a formal rulemaking, which will define the process for creating a regulation for the proposed MCL, in late spring.

Based on current projections, including addressing public comments where appropriate, and review by the Office of Administrative Law, the MCL, if adopted by the board, would come into effect in early 2024.

What are the anticipated health risks of the proposed MCL?

At a MCL of 10ppb, the health risk is estimated to be a one-in-two-thousand chance of developing cancer during a lifetime (70 years) of exposure.

Why does the proposed MCL for hexavalent chromium result in a health risk greater than the public health goal (PHG)?

Public health goals (PHGs) are developed by the Office of Environmental Health Hazard Assessment (OEHHA) for use by the State Water Board in establishing MCLs. A PHG is a level of a contaminant in drinking water that does not pose a significant health risk. PHGs are not regulatory requirements, but instead represent non-mandatory goals. For cancer-causing chemicals like hexavalent chromium, OEHHA typically establishes the PHG at the “one-in-one million” risk level. At that level, not more than one person in a population of one million people drinking the water daily for 70 years would be expected



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to develop cancer as a result of exposure to that chemical. The PHG for hexavalent chromium is .02 ppb. A PHG for a cancer-causing chemical reflects the risk from long-term exposure to a contaminant and should not be used to estimate risks from short-term or acute exposure.

In contrast to a PHG, a MCL must weigh numerous factors in addition to the overall risks to public health, including the feasibility of achieving the standard on a widespread basis and the costs of water treatment. Given these factors, a MCL of 10ppb has been proposed. At this level, not more than one person in a population of two thousand drinking water daily for 70 years would be expected to develop cancer.

Additional Resources

Public Health Goal: <https://oehha.ca.gov/water/chemicals/chromium-hexavalent>

Rulemaking Status:

https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/SWRCBDDW-21-003_hexavalent_chromium.html

Regulatory Background:

https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/Chromium6.html

Sampling Results:

https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/Chromium6sampling.html