

**Environmental Health Division ♦ Drinking Water Program**

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**Frequently Asked Questions (FAQs)**  
**Hexavalent Chromium (Chromium-6) In Drinking Water**

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The following questions and answers are intended to address issues and concerns surrounding Public Health Goals, Maximum Contaminant Levels, and detections of hexavalent chromium in drinking water, and steps the California Department of Public Health (CDPH) and its regulatory partners are undertaking to ensure public health protection.

**Background:**

California is required by law to adopt drinking water standards that are no less stringent than the United States Environmental Protection Agency (USEPA) federal standards. In the absence of a federal standard, California may establish its own drinking water standards. A drinking water standard, called a maximum contaminant level (MCL), establishes a limit on the concentration of a contaminant in drinking water. MCLs are typically set at concentrations of "parts per million" (ppm) or "parts per billion" (ppb).

Currently, there is no federal or state MCL specific to the hexavalent form of chromium. Hexavalent chromium is regulated in drinking water through the establishment of a total chromium MCL (hexavalent chromium is one of the forms of chromium making up total chromium). In California, the total chromium MCL is 50 ppb, while the federal MCL is 100 ppb. At the time total chromium MCLs were established, ingested hexavalent chromium associated with consumption of drinking water was not considered to pose a cancer risk. Recent studies have now determined that hexavalent chromium in drinking water does pose increased cancer risks over time.

CDPH is required by California law to set an MCL for hexavalent chromium and to set the MCL as close to the public health goal (PHG) as possible, taking into account technical feasibility (e.g., detectability and treatment) and costs. CDPH has been gathering data associated with hexavalent chromium occurrence, treatment, and costs, but adoption of an MCL requires the state Office of Environmental Health Hazard Assessment (OEHHA) to establish a PHG. With OEHHA's 0.02-ppb PHG finalized on July 27, 2011, CDPH will move forward with the process of adopting an MCL for hexavalent chromium.

More information about hexavalent chromium is available on the CDPH website at:

<http://www.cdph.ca.gov/certlic/drinkingwater/Pages/chromium6.aspx>.

**Question: What is hexavalent chromium and why is there a public health concern?**

Answer: Chromium is a heavy metal that occurs throughout the environment. The trivalent form is a required nutrient and has very low toxicity. The hexavalent form, also commonly known as “chromium 6,” is more toxic and has been known to cause cancer when inhaled. In recent scientific studies in laboratory animals, hexavalent chromium has also been linked to cancer when ingested.

**Question: Where does hexavalent chromium come from?**

Answer: Much of the low level hexavalent chromium found in drinking water is naturally occurring, reflecting its presence in geological formations throughout the state. However, there are areas of contamination in California from historic industrial use such as the manufacturing of textile dyes, wood preservation, leather tanning, and anticorrosion coatings, where hexavalent chromium contaminated waste has migrated into the underlying groundwater.

**Question: How is hexavalent chromium currently regulated in drinking water?**

Answer: Hexavalent chromium in drinking water is regulated under the “total chromium” state MCL of 50 ppb, which is more restrictive than the 100 ppb federal MCL. The total chromium MCL was established in 1977 to address the noncancer toxic effects of hexavalent chromium, and also includes the less-toxic trivalent form.

**Question: What is a public health goal (PHG)?**

Answer: A PHG is a level of a contaminant in drinking water that does not pose a significant health risk. A PHG reflects the risk from long-term exposure to a contaminant and should not be used to estimate risks from short-term or acute exposure. PHGs are not regulatory requirements, but instead represent non-mandatory goals. PHGs are developed by the OEHHA for use by CDPH in establishing MCLs.

**Question: What is a State maximum contaminant level (MCL)?**

Answer: State MCLs are health protective drinking water standards to be met by public water systems. MCLs take into account not only health risks from exposure to a chemical, but also factors such as detectability and treatability, as well as costs of treatment to reduce a chemical's presence in drinking water. Health & Safety Code §116365(a) requires CDPH to establish a contaminant's MCL at a level as close to its PHG as is technically and economically feasible, placing primary emphasis on the protection of public health.

**Question: Are there examples of hexavalent chromium contamination in the state's groundwater?**

Answer: Yes. In the late 1980s, USEPA found hexavalent chromium in groundwater at contaminated Superfund sites in the San Fernando Valley. An overview of activities associated with its cleanup, which is important to protect drinking water supplies, is available at <http://www.epa.gov/region9/superfund/chromium/index.html>. In the 1990s, the town of Hinkley in San Bernardino County had findings of hexavalent chromium in groundwater resulting from environmental releases of the chemical in the 1950s and 1960s from a nearby PG&E facility. More information about hexavalent chromium and Hinkley is available at [http://www.swrcb.ca.gov/rwqcb6/water\\_issues/projects/pge/index.shtml](http://www.swrcb.ca.gov/rwqcb6/water_issues/projects/pge/index.shtml).

In addition, after drinking water sources at several locations were sampled and found to contain hexavalent chromium, CDPH required regulated water systems to test their sources for the presence of hexavalent chromium in anticipation of developing a drinking water standard specific for this form of chromium. The sampling results showed that hexavalent chromium occurs at very low levels throughout the state, likely due to its presence in geological formations.

More information about the sampling results including levels reported by specific water systems is available on the CDPH website at:

<http://www.cdph.ca.gov/certlic/drinkingwater/Pages/Chromium6sampling.aspx>.

**Question: Is California working on a standard to specifically address hexavalent chromium in drinking water?**

Answer: Yes. In 2001, CDPH asked the California Environmental Protection Agency's Office of Environmental Health Hazard Assessment (OEHHA) to develop a PHG for hexavalent chromium. A draft PHG was first released in August 2009 and again in 2010, and has gone through a series of revisions based on new research, comments received by the public, and expert scientific peer reviews. In July 2011, OEHHA adopted a final PHG for hexavalent chromium of 0.02 ppb. As a result of OEHHA's adoption of the hexavalent chromium PHG, CDPH has initiated its MCL setting and regulation process in order to have an enforceable standard. It will take approximately 18-24 months to develop an MCL and initiate the formal rulemaking process. Since CDPH is subject to the Administrative Procedures Act requirements and timelines for rulemaking, it may take an additional 12-24 months to complete the formal rulemaking for an MCL. Therefore, the total time may range from 3 to 4 years for MCL development and rulemaking, which would anticipate such rules to be finalized by 2015.

**Question: Why will the MCL for hexavalent chromium be more health protective than the current "total chromium" MCL?**

Answer: Currently, hexavalent chromium in drinking water is regulated under the State's total chromium MCL of 50 ppb which includes both trivalent and hexavalent chromium. The less soluble trivalent form is a required nutrient with very low toxicity, while the more soluble hexavalent form may pose a risk of cancer when ingested. The new MCL will be based on providing public health protection specific to the more toxic hexavalent form of chromium.

**Question: If my drinking water has hexavalent chromium above the PHG, is there a risk to my health?**

Answer: A drinking water sample with a detection of hexavalent chromium above the PHG of 0.02 ppb does not necessarily represent a public health concern. The PHG is set at a health protective level that may result in no more than one case of cancer per million people who drink 2 liters of water with hexavalent chromium at the PHG every day for 70 years. The PHG represents the level of hexavalent chromium at which no adverse health effects would be anticipated over an entire lifetime of exposure. So, a PHG is not a boundary line between a "safe" and "dangerous" level of a chemical, and drinking water is frequently demonstrated as safe to drink even if it contains chemicals at levels exceeding their PHGs. OEHHA provides additional information on potential health risks and its PHG on its website at:

<http://www.oehha.ca.gov/water/phg/pdf/HexChromfacts082009.pdf>.

**Question: Based on the January 2011 guidance from USEPA on enhanced hexavalent chromium monitoring, are water systems required to participate, and what analytical resources are available for those that wish to conduct monitoring?**

Answer: The January 2011 USEPA recommendations are solely guidance at this point. There is no legal requirement for water systems to conduct sampling. However, voluntary enhanced monitoring by water systems can provide useful information for assessing further occurrence of hexavalent chromium in drinking water, as well as for the technical and economic feasibility assessment performed during the MCL review process. For those water systems that wish to participate, CDPH has issued updated guidance and information on its website at: <http://www.cdph.ca.gov/certlic/drinkingwater/Pages/Chromium6.aspx>.