PUBLIC NOTICE

Initiation of Process to Update Public Health Goals in Drinking Water and Request for Relevant Information: Cis-1,2-Dichloroethylene, Trans-1,2-Dichloroethylene, Hexavalent Chromium, and Nickel

Office of Environmental Health Hazard Assessment
California Environmental Protection Agency

October 28, 2016

Public health goals (PHGs) are concentrations of drinking water contaminants that pose no significant acute or chronic health risks. The Office of Environmental Health Hazard Assessment (OEHHA) establishes PHGs, which are used as the health basis for the development of California's primary drinking water standards. OEHHA also reviews and updates existing PHGs. This public notice announces the initiation of update reviews for the following four chemicals:

- Cis-1,2-Dichloroethylene
- Trans-1,2-Dichloroethylene
- Hexavalent Chromium
- Nickel

Updates of existing PHGs for these chemicals are being initiated based on the availability of new data, methodology updates, occurrence in California drinking water supplies, and/or potential public health significance. A brief description of these chemicals is provided below. OEHHA is requesting information on these contaminants that could assist in updating the risk assessments and the potential calculation of revised PHGs.

All information submitted to OEHHA in response to this request is considered public. Please do not submit proprietary information. In order to be considered during the update process, **OEHHA must receive information by 5:00 p.m. on Monday, November 28, 2016. We encourage you to submit information in electronic form, rather than in paper form. Information transmitted by e-mail should be addressed to PHG.Program@oehha.ca.gov with the chemical name in the subject line.** Information submitted in paper form may be mailed or delivered in person to the address below:

Hermelinda Jimenez
PHG Program
Pesticide and Environmental Toxicology Branch
Office of Environmental Health Hazard Assessment
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Oakland, California 94612

If you have any questions, please contact Hermelinda Jimenez at (916) 324-7572 or email PHG.Program@oehha.ca.gov.

All relevant information will be considered in the updating of the PHGs for these chemicals. The State Water Resources Control Board (SWRCB) will use the final risk assessments in considering potential revisions to the existing California regulatory Maximum Contaminant Levels (MCLs) for these chemicals. For more information on this process, go to the SWRCB website at http://www.waterboards.ca.gov/drinkingwater/.

Background on PHG Program

The Calderon-Sher California Safe Drinking Water Act of 1996 (Health and Safety Code section 116365), hereafter referred to as the Act, requires OEHHA to post a notice on its website when it initiates work to develop or update PHGs. PHGs are concentrations of chemicals in drinking water that are not anticipated to produce adverse health effects. OEHHA is required to consider potential adverse effects on members of sensitive subgroups of the population, including infants, children, pregnant women, the elderly, and individuals with a history of serious illness.

PHGs are non-regulatory in nature but are used as the health basis to update the state's primary drinking water standards (MCLs) established by the SWRCB. The Act requires OEHHA to develop PHGs for approximately 90 chemicals for which state or federal MCLs are provided. The Act states that OEHHA shall review these PHGs every five years and update them as appropriate. SWRCB may also ask OEHHA to develop a PHG for a contaminant that it wishes to regulate through adoption of a California MCL.

At the initial posting of a draft document, OEHHA provides a 45-day public comment period. OEHHA also conducts a public workshop to hear public comments and engage in dialogue with interested parties on the draft document. An external scientific peer review is then conducted as required by Health and Safety Code section 57004(b). OEHHA considers all relevant comments in the preparation of the next draft, which is posted for a 30-day public comment period. After consideration of any additional comments, the PHG is finalized and posted on the OEHHA website for public reference and for use by SWRCB in developing California MCLs.

OEHHA has published PHGs for 89 chemicals, and re-evaluations of the original PHG have been completed for 34 of these chemicals. All PHGs and supporting documents are available at http://www.oehha.ca.gov/water/phg/index.html.

PHGs in progress

Listed below are other chemicals for which PHGs are being updated or developed and that have been previously noticed.

- Cyanide
- Diethylhexylphthalate
- 1,1-Dichloroethane
- 1,2-Dibromo-3-chloropropane
- 1,4-Dichlorobenzene
- 1,1-Dichloroethylene
- 1,2-Dichloropropane
- Ethylbenzene
- Fluoride
- Haloacetic acids
- Nitrate/Nitrite
- Radium-226/228
- Strontium-90
- Toxaphene
- Trihalomethanes
- 1,2,4-Trichlorobenzene
- Trichloroethylene

PHGs recently completed

Updated PHGs for antimony, carbofuran, diquat, endrin, picloram, and thiobencarb were finalized on September 23, 2016. The updated PHG for perchlorate was finalized on February 27, 2015.

Descriptions of chemicals or substances subject to this notice

CIS/TRANS-1,2-DICHLOROETHYLENE

1,2-Dichloroethylene (1,2-DCE), a volatile, chlorinated and highly flammable organic compound, exists in two isomeric states, cis-1,2-DCE (Chemical Abstracts Service (CAS) Registry No. 156-59-2) and trans-1,2-DCE (CAS No. 156-60-5). 1,2-DCE has been used primarily as a solvent for waxes and resins, in the extraction of various industrial products such as rubber, and as a refrigerant. Although the trans isomer is used more commonly in industry, both isomers can be found in the environment due to the anaerobic degradation of other commonly found chlorinated solvents such as tricholoroethylene (TCE) and tetrachloroethylene (PCE) (Mattes et al., 2010; US EPA, 2010a). In 2014, US EPA's Toxics Release Inventory (TRI)[1] reported that 33,965 pounds of 1,2-DCE were released to air, 24 pounds to surface water, and 127 pounds to on-site or off-site landfills, underground injection wells or other releases to land. Of the total 34,116 pounds, only 18 pounds were released in California.

In 2006, a PHG of 100 µg/L or 100 parts per billion (ppb), was established for cis-1,2-DCE based on kidney effects in rats, and a PHG of 60 ppb was established for trans-1,2-DCE based on liver effects in mice (OEHHA, 2006). The California Maximum Contaminant Level (MCL) is 6 ppb for cis-1,2-DCE and 10 ppb for trans-1,2-DCE.[2]

[1] Data accessed April 2016 at http://iaspub.epa.gov/triexplorer/tri_release.chemical

[2] Available online at http://www.swrcb.ca.gov/drinking_water/certlic/drinkingwater/MCLsandPHGs.shtml

These levels are lower than the federal MCLs of 70 ppb and 100 ppb for cis-1,2-DCE and trans-1,2-DCE, respectively (US EPA, 2010b).

Both isomers of 1,2-DCE have been detected in California public drinking water supply wells within the last three years.[3] Levels ranging from 0.1 to 22 ppb have been detected for cis-1,2-DCE and levels up to 4.8 ppb for trans-1,2-DCE. Only cis-1,2-DCE has been detected above the current California MCL. The update of the risk assessment for 1,2-DCE will consider the more recent toxicology literature since the publication of the PHG in 2006 and will incorporate the application of updated risk assessment methodologies.

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[3] Data accessed April 2016 with GeoTracker GAMA at http://geotracker.waterboards.ca.gov/gama/

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HEXAVALENT CHROMIUM

Chromium is a metallic element used in a variety of industrial processes, including stainless steel manufacturing, leather tanning, production of pigments, and as an anti-corrosive agent. Chromium occurs naturally in rocks and soil but is also introduced into the environment through improper handling and disposal during industrial uses. The most common valences of chromium are +3 (trivalent chromium or Cr(III)) and +6 (hexavalent chromium or Cr(VI); CAS No. 18540-29-9). The less toxic Cr(III) is a nutrient whereas Cr(VI) is a known carcinogen. From 2006 to 2016, 12,237 active and standby public water wells in California were tested for Cr(VI) and 406 of those wells had levels above the state's MCL of 10 ppb.[4] Chromium (hexavalent compounds) is on the Proposition 65 list as both a carcinogen and developmental toxicant.

OEHHA published a PHG of 0.02 ppb for Cr(VI) in 2011 based on gastrointestinal tumors observed in mice exposed to Cr(VI) in drinking water (NTP, 2008). A health-protective concentration of 2 ppb was also developed for non-cancer effects based on liver toxicity (mild chronic inflammation, fatty changes) in female rats (NTP, 2008). The approach used to develop the PHG was consistent with a mutagenic mode of action for the carcinogenicity of Cr(VI). Since the publication of the 2011 PHG, new toxicity studies have been published, including studies proposing a cytotoxic mode of action for Cr(VI) carcinogenicity (Thompson et al., 2011; Thompson et al., 2012).

The update of the risk assessment for Cr(VI) will include a review of the toxicology literature since the publication of the PHG in 2011 and incorporate the application of updated risk assessment methodologies.

[4] http://www.waterboards.ca.gov/water_issues/programs/gama/docs/coc_hexchromcr6.pdf

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NICKEL

Nickel (CAS No. 7440-02-0) is a naturally occurring element commonly mined and mainly used in the production of nickel alloys. Several nickel compounds such as nickel sulfate, nickel nitrate, nickel chloride and nickel acetate are soluble in water. The California MCL for nickel is 0.1 mg/L or 100 ppb. There is no federal MCL. In the last three years, there have been numerous detections of nickel in California public water supply wells, with levels ranging from 0.888 to 830 ppb.[5]

Nickel and nickel compounds are on the Proposition 65 list as carcinogens and are currently under consideration for causing reproductive toxicity. The PHG of 12 ppb, published in 2001, was based on developmental toxicity in rats (OEHHA, 2001).

Since the publication of the 2001 PHG, a number of animal toxicity studies have been published. The risk assessment update for nickel will consider the recent literature and include application of updated risk assessment methodologies.

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