



REVISED PROPOSED NOTIFICATION AND RESPONSE LEVEL ISSUANCE

Contaminant(s):	Manganese
Revised Proposed Notification Level:	0.05 milligrams per liter (mg/L) [Based on a running annual average (RAA)]*
Revised Proposed Response Level:	0.20 milligrams per liter (mg/L)
Analytical Method:	EPA Methods 200.5, 200.7, and 200.8 Standard Methods 3111B and 3113B
Toxicological Endpoint:	Neurotoxicity in rats
*Running Annual Average: Based on average concentration calculated from four (4) consecutive quarterly samples.	

FINDINGS:

General Background on Notification/Response Levels and Specific Requirements

1. Health and Safety Code sections [116455](#) and [116456](#) authorize the State Water Resources Control Board (State Water Board) to issue or revise notification levels and response levels for contaminants in drinking water delivered for human consumption before maximum contaminant levels (MCL) are adopted. Pursuant to subdivision (k)(2) of section [116271](#) of the Health and Safety Code, the Deputy Director of the Division of Drinking Water (DDW) is delegated through the State Water Board's authority to issue notification and response levels.
2. Health and Safety Code section 116455, subdivision (c)(3), defines notification levels as the concentration level of a contaminant in drinking water delivered for human consumption that has been determined, based on available scientific information, to not pose a significant health risk but which warrants notification to the governing bodies. Notification levels are nonregulatory, health-based advisory levels for contaminants that are established as precautionary measures.
3. Response levels are established in conjunction with notification levels and, consistent with Health and Safety Code 116455, subdivision (c)(4), represent the concentration of a drinking water contaminant at which additional steps, beyond notification to the governing bodies, are recommended to reduce public exposure. As with notification levels, response levels are not drinking water standards. For contaminants with non-cancer health risks, a response level concentration up to 10 times the toxicological endpoint is consistent with an acceptable margin of safety.



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4. The revision of notification levels and response levels does not trigger new monitoring requirements for public water system for the contaminant. However, when a public water system samples for contaminants for which there is a notification level or response level, and the monitoring results indicate either level has been exceeded, then the public water system must comply with Health and Safety Code section 116455, which requires the public water system to notify its governing bodies of the exceedance(s). In addition to the notification requirement, when the response level is exceeded, the State Water Board recommends that additional steps be taken to reduce public exposure to the contaminant.
5. Public water systems subject to recycled water regulations (Cal. Code Regs., tit. 22, div. 4, ch. 3) or direct potable reuse project monitoring requirements (Cal. Code Regs., tit. 22, §64669.65) have additional requirements related to notification and response levels.
6. In addition to the above requirements, DDW recommends that a public water system informs its customers and consumers about the presence of manganese and associated health concerns.

Information on the Contaminant and the Issuance

7. Manganese is an essential nutrient and enzyme cofactor that is naturally present in many foods and available as a dietary supplement, but despite its nutritional benefits, adverse health effects can be caused by over-exposure. There is evidence demonstrating exposure to manganese at high levels can pose a neurotoxic risk. Young children can be particularly susceptible to adverse effects from manganese exposure because they absorb and retain more manganese than adults.
8. Manganese notification level and response level are currently set at 0.5 mg/L and 5 mg/L, respectively, based on neurotoxicity.
9. Manganese has a secondary maximum contaminant level (SMCL) of 0.05 mg/L, based on aesthetic, cosmetic, or technical concerns. Compliance with the manganese SMCL is based on a running annual average of four (4) consecutive quarters and applies to community water systems. Thus, non-community systems, particularly non-transient non-community systems such as schools and workplaces, do not receive the benefits of the secondary standard.
10. In April 2022, DDW staff conducted a literature search for human and animal research that studied adverse health effects from manganese exposures specifically by route of ingestion. This literature review indicated that the current notification level of 0.5 mg/L and response level of 5 mg/L should be revised downward based on the potential risk for manganese-induced neurotoxicological effects to formula-fed infants and young children.
 - DDW staff developed a technical memorandum that derived a health protective



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concentration (HPC) equivalent to 0.02 mg/L, to serve as the basis for future recommended revisions to the current manganese notification and response levels.

11. On April 7, 2022, DDW made a formal request to the Office of Environmental Health Hazard Assessment (OEHHA) to review the technical memorandum and provide comments.
12. On May 3, 2022, OEHHA provided their review, supporting the intermediate approach used to derive the HPC and agreeing with the parameters used in the calculation of the HPC, including use of the Kern et al. (2010) study, the composite uncertainty factor of 1,000, the relative source contribution of 0.2, and the drinking water intake based on infants 0–6 months.
13. In accordance with Health and Safety Code section 116456, on February 16, 2023, DDW provided email notice and posted on its website: (1) proposed revised manganese notification level and response levels of 0.02 mg/L and 0.2 mg/L, respectively, (2) the technical memorandum, and (3) OEHHA's comments on the technical memorandum.
14. On March 21, 2023, DDW presented an informational item on the proposed revised manganese notification level (0.02 mg/L) and response level (0.2 mg/L) during the regularly noticed meeting of the State Water Board.
15. As a result of comments received from the March 21, 2023 State Water Board informational item, the proposed revision to the manganese notification level has been updated to:
 - Align with the public health benefit provided by existing water quality regulations for bottled water. Replacement water, such as bottled water and water from vending stations, is regulated by the California Department of Public Health, Food and Drug Branch (CDPH-FDB), which enforces a manganese concentration limit of 0.05 mg/L.
 - Align with the delivery of manganese exceedance public notices for community water systems which are enforceable through the current manganese SMCL regulation for concentrations more than 0.05 mg/L. Although the proposed health-based notification level is non-enforceable, the State Water Board may include the notification level health advisory language within the public notices that are required for the aesthetic-based manganese SMCL compliance violations.
 - Account for the fluctuation of manganese levels over time. Like the manganese SMCL compliance requirements, exceedance of the proposed notification level for manganese for the purposes of notification will also be based on the running annual average.



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16. While notification levels and response levels are considered non-enforceable, the proposed revised notification level for manganese has direct regulatory implications since it has the same numerical value as the existing manganese SMCL, specifically:
 - Applicability of SMCL compliance waivers in accordance with California Code of Regulations, title 22, division 4, chapter 15, section 64449.2.
 - If a community water system exceeds the manganese SMCL, this would trigger enforceable public notice.
 - Although the SMCL and notification level serve two separate functions, protecting water quality aesthetics and advising of potential adverse health effects, respectively, establishing the SMCL and notification level at the same value allows for simultaneous public notice because the separate concerns are established at the same concentration.
17. In accordance with Health and Safety Code section 116456, on September 4, 2025, DDW provided email notice and posted the proposed revisions to the notification level (0.05 mg/L RAA) and response level (0.20 mg/L) for manganese on its website. Documents related to the development of the notification and response levels described above are available at https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/NotificationLevels.html.
18. To support timely notification, due to the nature of manganese's adverse health effects, DDW recommends public water system request laboratory processing and reporting of manganese analytical results to DDW within the same month during which a sample is collected, but no later than 10 days following the end of the month during which a sample is collected.
19. In accordance with Health and Safety Code section 116455, notice to the governing bodies is required within 30 days after a public water system learns of an exceedance of the notification level based on a running annual average or an exceedance of the response level based on a single sample detection.
20. Exceedance of the manganese SMCL running annual average carries its own public notification requirements in accordance with [Article 16](#) and [Article 18](#) of title 22, division 4, chapter 15 of the California Code of Regulations.
21. When a public water system becomes aware of a manganese result greater than the response level, DDW recommends that the public water system collect a confirmation sample within 48 hours and request the laboratory analyze and report the results to the public water system within 48 hours of receiving the sample. DDW further recommends the public water system do the following:



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- If the average of the initial and confirmation manganese sample results exceeds the response level, report the result to the DDW within 48 hours of receiving the confirmation analytical results and either remove the water source from use or provide public notice to the consumers. If the average of the two samples does not exceed the response level, inform the DDW of the results within seven days from receipt of the confirmation analytical result.
- If a confirmation sample and analysis is not completed as described above, the public water system should contact DDW and either remove the water source from use or provide public notice to the consumers within 48 hours of becoming aware of the initial response level exceedance.

22. In accordance with Health and Safety Code section 116456, on October 7, 2025, DDW proposed a revised notification level of 0.05 mg/L and response level of 0.20 mg/L for manganese as an informational item during the regularly noticed meeting of the State Water Board.

Therefore, the Deputy Director of DDW establishes a revised notification level of 0.05 mg/L (RAA) and response level of 0.20 mg/L (based on a single sample detection) for manganese.

Approved:

Darrin Polhemus, P.E.
Deputy Director, Division of Drinking Water
State Water Resources Control Board

Date