

**MANGANESE IN CALIFORNIA'S
DRINKING WATER
PHASE 1**

COMMUNICATION PLAN

June 2026



TABLE OF CONTENTS

MANGANESE IN CALIFORNIA’S DRINKING WATER PHASE 1	1
TABLE OF CONTENTS.....	2
1. PROJECT MANAGEMENT.....	3
1.1. TITLE SHEET	3
1.2. COMMUNICATION PLAN REVISION HISTORY	3
1.3. PURPOSE AND ORGANIZATION OF DOCUMENT	4
2. PROJECT OVERVIEW.....	4
2.1 PROJECT PARTIES AND ROLES	5
3. KEY PROJECT REPRESENTATIVES AND CONTACT INFORMATION.....	8
3.1 STATE WATER BOARD’S KEY REPRESENTATIVES AND CONTACTS	8
3.2 STATE WATER BOARD’S KEY INTERESTED PARTIES AND CONTACTS	9
4. COMMUNITY PROFILE SUMMARY	9
4.1 INCOME STATUS	10
4.2 RACIAL DEMOGRAPHICS	10
4.3 LANGUAGES SPOKEN	10
4.4 POLLUTION BURDEN	11
4.5 SAFER STATUS.....	11
5. COMMUNICATION AND ENGAGEMENT PLAN.....	12
5.1 ANALYTICAL TESTING RESULTS.....	12
5.2 DELIVERY OF INFORMATION TO PUBLIC WATER SYSTEM CUSTOMERS	14
5.3 DELIVERY OF INFORMATION TO ALL OTHER INTERESTED PARTIES	17
5.4 COMMUNITY ENGAGEMENT	17
APPENDIX A. PROJECT COMMUNITY PROFILE	20
A.1 INTRODUCTION	20
A.2 INCOME DEMOGRAPHICS.....	22
A.3 RACIAL DEMOGRAPHICS	23
A.4 LINGUISTIC DEMOGRAPHICS.....	24
A.5 CALENVIROSCREEN ANALYSIS	25

1. PROJECT MANAGEMENT

1.1. TITLE SHEET

Project Title: Manganese in California’s Drinking Water
Phase 1 (Project)

Lead Organization: California State Water Resources Control Board
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Sacramento, CA 95814

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Division of Drinking Water
State Water Resources Control Board
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Effective Date: JUNE 2026

1.2. COMMUNICATION PLAN REVISION HISTORY

Prepared By	Date of Revision	Description of Change
State Water Board	JUNE 2026	Version 1.0 – NL RL issuance

1.3. PURPOSE AND ORGANIZATION OF DOCUMENT

The purpose of this Communication Plan (Plan) is to:

- Provide information through a centralized communication method
- Standardize messaging for consistency
- Identify project representatives
- Identify engagement opportunities for communities
- Support public awareness and importance of the Project

The intended audience includes State Water Board staff, representatives of agencies directly involved with the Project, public water agencies, and others who may not be directly involved but may be interested in data and results from the Project. The Plan does not include internal contracting and logistical communications between the State Water Board and any consultants or contractors.

The State Water Board adopted the [Racial Equity Resolution](https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2021/rs2021_0050.pdf) (https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2021/rs2021_0050.pdf) in November 2021. This resolution commits the State Water Resources Control Board (State Water Board) and its nine Regional Water Quality Control Boards (collectively known as the Water Boards) to be an organization that incorporates a justice and equity lens in its work. As such, this document includes a community impact analysis and a plan for Tribal outreach and engagement as it relates to the Project. Dependent on the project phase, the analysis may include evaluations of demographic considerations, environmental considerations, human health impacts, as well as potential political and capacity building considerations. More information about this analysis is provided in the Communication and Engagement Plan section and [Appendix A](#) of this document.

2. PROJECT OVERVIEW

In June 2026, the State Water Board's Division of Drinking Water (DDW) lowered its health-based notification and response levels for manganese per Health and Safety Code sections [116455](#) and [116456](#). Manganese is a commonly found trace mineral that is readily absorbed by the bodies of infants and young children but not readily eliminated. Exposure to drinking water manganese levels above the response level of 0.20 milligrams per liter (mg/L) for formula-fed infants may be associated with neurological impacts.

As specified in [Article 16](#) and [Article 18](#) of title 22, division 4, chapter 15 of the California Code of Regulations, community water systems are required to comply with the secondary maximum contaminant level (MCL) for manganese, which includes quarterly monitoring and ongoing quarterly public notification for systems that exceed the secondary MCL. Secondary MCLs are aesthetic based, meaning they address customer concerns like water color, fixture or clothing staining, taste

and odor, rather than health impacts. Many public water systems (PWSs) that have historically monitored for manganese based on aesthetic effects may not be aware of the health concerns of manganese at these revised levels. Additionally, non-community water systems are not held to the secondary MCL requirement, and as a result, may not be monitoring for manganese at all.

The June 2026 revision lowers the notification and response levels of manganese at which health effects are present, which can occur separately from the aesthetic concerns of manganese for which the secondary MCL is meant to address. With these revisions, DDW recommends that water systems not already monitoring for manganese levels begin to do so, and that all water systems develop processes for notifying communities of the health concerns of manganese.

This document is provided to assist DDW staff and water systems in responding to the updated notification and response levels of manganese, including templates to use when notifying their community members.

Manganese in Drinking Water Website:

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

Drinking Water Notification Levels Website:

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

2.1 PROJECT PARTIES AND ROLES

The State Water Board is the lead agency for the Manganese in California's Drinking Water (Project). The primary roles involved with the implementation of the Plan are:

- Project Director - responsible for overseeing the project strategy, project budget, and the implementation of all project activities.
- Project Manager – supports the Project Director in day-to-day project management and coordination of the Project.
- Public Participation Project Coordinator – consults with the Project Director on public-decision making processes, communications, and interactions with stakeholders that could be affected by project actions and decisions.

2.1.2. STATE WATER BOARD OFFICE OF PUBLIC ENGAGEMENT, EQUITY, AND TRIBAL AFFAIRS

Staff within the State Water Board's Office of Public Engagement, Equity, and Tribal Affairs (OPEETA) ensure that public participation policies and procedures are implemented and consistent with principles of the State Water Board. The State Water Board OPEETA also provides general guidance on communication throughout implementation of the Project, especially regarding environmental justice communities.

OPEETA staff assist in the design and implementation of public involvement processes, including meeting facilitation, translation, and other services. Engagement with Tribal governments is deferred through the U.S. Environmental Protection Agency (EPA), however the Tribes are welcomed to bring any issues to the State Water Board for support or guidance.

2.1.3 PUBLIC WATER SYSTEMS

A public water system (PWS) is defined as a system that provides water for human consumption¹ to 15 or more connections or regularly serves 25 or more people daily for at least 60 days out of the year. The Project will include coordination between DDW and PWSs impacted by the revised notification and response levels.

The PWS is responsible for coordinating the order, delivery, and reporting of any sample materials and results with its certified analytical laboratory. The PWS must provide a qualified operator responsible for collecting analytical samples and shipping them to the PWS's laboratory.

Following sample analysis, the PWS is responsible for communicating with the necessary parties (DDW, governing bodies, and/or its customers - especially schools and childcare centers) based on the sample results received, as described in Section 5.2 of the Plan.

What is a Public Water System?

https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/documents/waterpartnerships/what_is_a_public_water_sys.pdf

2.1.4 OTHER CALIFORNIA DEPARTMENTS

Formula-fed infants and young children absorb and retain more manganese than adults, making them particularly susceptible to neurological impacts from manganese exposure. Accordingly, DDW coordinates closely with the Department of Education, which oversees public schools, and the Department of Social Services, which oversees childcare centers.

Since most schools and childcare centers are served by community water systems that must comply with the secondary MCL for manganese, they should be receiving compliant water. The best point of contact for customers served by community water systems, including almost all schools and childcare centers, is their local water system. DDW, the Department of Education, and the Department of Social Services are secondary contacts for community water system customers with manganese concerns. The roughly 400 schools that operate as PWSs should contact the DDW District Office

¹ Human consumption means the use of water for drinking, bathing or showering, hand washing, oral hygiene, or cooking, including but not limited to, preparing food and washing dishes per Section §116275(e) of the Health and Safety Code.

(or local county health department if applicable) with any questions to ensure their customers receive information as outlined in this Plan.

DDW will also coordinate with Departments of Public Health and Health Care Services to support tailored guidance to help care providers protect infants from exposure to high manganese levels in formula and drinking water, especially those not served by community water systems.

TABLE 1. STATE DEPARTMENT KEY PROJECT REPRESENTATIVES

NAME	CONTACT INFORMATION	DIVISION	TITLE
DIANE WATERS	916-327-2884 dwaters@cde.ca.gov	Department of Education	Senior Architect School Facilities and Transportation Services Division - Policy Unit
JUAN MIRELES	916-445-2144 jmireles@cde.ca.gov	Department of Education	School Facilities and Transportation Services Division - Field Unit
CECELIA ASHER-FALK	916-214-8206 Cecelia.Asher-Falk@dss.ca.gov	Department of Social Services	Child Care Policy Bureau Chief
TINA ESPANA	818-400-7045 Tina.Espana@cdph.ca.gov https://www.cdph.ca.gov/Programs/CFH/DWICSN/pages/program-landing1.aspx https://www.cdph.ca.gov/Programs/CFH/DMCAH/Pages/Fiscal/Contract-Liaison-and-Program-Consultant-List.aspx https://www.cdph.ca.gov/Programs/CFH/DMCAH/surveillance/	Department of Public Health	Outreach & Education Supervisor
LOCAL COUNTY	https://www.dhcs.ca.gov/services/ccs/Pages/CountyOffices.aspx https://www.dhcs.ca.gov/services/medical/eligibility/MCAP/Pages/Medi-CalAccessProgram.aspx	Department of Health Care Services	County Offices for California Children's Services & Medi-Cal Access Program

2.1.6. PERSONS RESPONSIBLE FOR UPDATING THE COMMUNICATION PROJECT PLAN

The Project Manager, in collaboration with the Public Participation Project Coordinator, is responsible for maintaining and updating the Plan. All updates will be shared with OPEETA for review to ensure that the Project remains consistent with the State Water Board's Public Participation Policy Guidance.

2.1.7. PROJECT SCHEDULE

Phase 1 of the Project commenced in June 2026, with the issuance of the revised notification and response levels for manganese. The manganese notification level is based on a running annual average of four quarterly manganese samples whereas the response level is based on a single confirmed manganese sample. Accordingly, any required or recommended action based on a single manganese sample exceeding the response level will be effective immediately following the June 2026 revision. Any required or recommended actions resulting from manganese notification level exceedances will be based on a running annual average of quarterly samples following the June 2026 revision.

3. KEY PROJECT REPRESENTATIVES AND CONTACT INFORMATION

This Project includes a variety of project representatives and interested parties. Listed below are the agencies and communities that have been identified as key parties to supply and receive information. Other project representatives and interested parties may be identified in the future as the needs of the Project evolve.

3.1 STATE WATER BOARD'S KEY REPRESENTATIVES AND CONTACTS

- State Water Board Members
- State Water Board management
- Regulatory agency management and staff

The following table provides contact information for key State Water Board individuals that are involved in this project.

TABLE 2. STATE WATER BOARD'S KEY PROJECT REPRESENTATIVES

NAME	CONTACT INFORMATION	DIVISION	ROLE
ROBERT BROWNWOOD	(916) 449-5596 Robert.Brownwood@waterboards.ca.gov	Division of Drinking Water	Project Director
LAWRENCE SANCHEZ	(818) 551-2017 Lawrence.Sanchez@waterboards.ca.gov	Division of Drinking Water	Project Manager
MEGAN KUNG	(916) 327-2037 Megan.Kung@Waterboards.ca.gov	Office of Public Engagement, Equity, and Tribal Affairs	Public Participation Project Coordinator
VANESSA SOTO	(916) 327-8508 Vanessa.Soto@Waterboards.ca.gov	Office of Public Engagement, Equity, and Tribal Affairs	Tribal Engagement Coordinator

DISTRICT ENGINEER	https://www.waterboards.ca.gov/drinking_water/programs/documents/ddwem/DDW_districtofficesmap.pdf	Division of Drinking Water	District Office
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3.2 STATE WATER BOARD’S KEY INTERESTED PARTIES AND CONTACTS

- Federal agencies, such as the U.S. EPA
- Water systems, their consultants and analytical laboratories
- Environmental justice organizations and local community groups
- General members of the public

4. COMMUNITY PROFILE SUMMARY

This section summarizes the estimated income, racial and linguistic demographics, and pollution burden of the communities affected by levels of manganese above the notification and secondary MCL level compared to California’s statewide demographics.

Approximately 600 public water systems had running average annual manganese levels above the secondary MCL over the past five years, between 2021 and 2025. Due to data limitations, only 56% of the communities’ demographics could be analyzed. While demographics were unable to be analyzed for a significant number of systems, the total population in the omitted systems is low, and results are overall representative of the affected population. Detailed analyses and definitions are provided in [Appendix A](#) and summarized below.

The analysis includes system-wide demographics and thus lacks the granularity of household-level details such as families with formula-fed infants – the group most vulnerable to manganese-related neurological impacts. In California about 1.3 million or 3.3 percent of the population is infants, with 50 percent identified as Hispanic.² In terms of the affected water systems, this translates to potentially 150,000 infants annually. There are studies showing increased reliance on infant formulas in various economic and racial demographics. Therefore, research and outreach should target the families and caregivers who use infant formula.

Since demographic data is aggregated system-wide, it is impossible to tell which specific users are affected by manganese within a system that has multiple water sources or water pressure zones. The data aggregates all affected water systems over the last five years, which does not account for variations in water quality over time.

² The State of California’s Babies: <https://stateofbabies.org/state/california/>

4.1 INCOME STATUS

Affected water system populations were analyzed by disadvantaged community status. “Disadvantaged community” is defined in California Water Code Section 79505.5 as a community with an annual median household income less than 80 percent of the statewide annual median household income. Communities with annual median household incomes less than 60 percent of the statewide annual median household income are considered “severely disadvantaged.” There was a higher number (9%) of the affected water system population that were classified as non-disadvantaged and a much lower number (13%) of affected households classified as severely disadvantaged compared to statewide. The percentage of affected households that were classified as disadvantaged was slightly more (4%) than the statewide percentage. This indicates that manganese above the notification level does not appear to have an outsized impact on disadvantaged communities at the population level. A little more than half of the affected systems analyzed were classified as non-disadvantaged. Approximately three quarters of the affected systems are small with less than 1,000 service connections.

However, when comparing the system-wide income status of affected communities there was a higher percentage of water systems classified as disadvantaged and severely disadvantaged when compared to the statewide population income status distribution. This indicates that despite population analysis showing that a minority of people served by disadvantaged communities make up the total affected population there are still a significant number of small, disadvantaged water systems affected by manganese.

4.2 RACIAL DEMOGRAPHICS

The racial demographics analysis indicates the affected population closely mirrored the statewide distribution except for approximately 5% higher level of the Asian population being affected. Research literature has indicated Asian origin as significantly associative with higher blood manganese levels. This highlights an important area for further research and outreach.

4.3 LANGUAGES SPOKEN

California includes a large diversity of races and ethnicities, which results in a diverse set of languages spoken. The predominant language spoken statewide other than English is Spanish.

As determined for the Project, language advisories in the public notice templates or additional language translations of the public notice templates are recommended and may be required beyond Spanish. Translation projections were made based on communities where single languages other than English and Spanish are spoken by more than 5% of population that have limited English proficiency, defined by the U.S. Census Bureau as those who speak English less than “very well.” DDW will provide

language advisories in Chinese (simplified and traditional), Vietnamese, and Punjab in the public notice templates accordingly.

California Code of Regulations, title 22, section [64465](#) outlines the public notice language requirements when a public water system exceeds the manganese secondary MCL. To assist communities in providing a conservative estimate of the potential translation services needed for these important notices the State Water Board has gone beyond the requirements outlined in California Code of Regulations, title 22, section 64465 by identifying and providing additional language advisories especially for public notices for manganese response level exceedances as specified in [Article 18](#) of title 22, division 4, chapter 15 of the California Code of Regulations and Health and Safety Code Section [116450](#).

4.4 POLLUTION BURDEN

CalEnviroScreen pollution burden percentiles vary from low to high, with 0-10 representing low burden and 90-100 being the highest. About two thirds of the affected systems fall into the bottom half or lowest pollution burden percentiles. Analysis of the affected population pollution burden distribution indicates approximately 15% higher amount of the affected population are ranked in the low to mid-range of 30-50 pollution burden percentiles compared to the statewide population burden. As a result, the affected population are equal or less than most other percentiles except for a slightly higher amount of the population in the 10-20 percentile of low population burden communities. This indicates that manganese above the notification level does not outstandingly impact communities with high pollution burdens.

4.5 SAFER STATUS

The State Water Board's SAFER Dashboard³ uses updated results from the latest Drinking Water Needs Assessment Report⁴ to display the current list of public water systems that are Failing or At-Risk of Failing. The SAFER Dashboard identifies Failing and At-Risk PWSs based on multiple risk categories: water quality, accessibility, affordability, and Technical, Managerial, and Financial (TMF) capacity. Of the 3,037 PWSs assessed statewide, approximately 13% were Failing, 19% were At-Risk, 15% were Potentially At-Risk, and 53% were Not At-Risk. This statewide distribution closely matched the distribution of assessed system that met the water quality threshold related to trends towards the secondary MCL (15% Failing, 11% At-Risk, 9% Potentially At-Risk, and 65% Not At-Risk or not assessed).

Based on the 2025 Affordability Assessment, approximately 56% of the affected systems were not assessed or had no affordability burden. Approximately, one third had

³ https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/saferdashboard.html

⁴ https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/documents/needs/2025needsassessment.pdf

a low affordability burden, 9% had medium affordability burden and 1% had high affordability burden. Compared to 2025 affordability assessment distribution, the affected systems represent a smaller percentage of low, medium and high affordability burden systems (45%, 12% and 3%, respectively). The affordability threshold distribution of the affected systems for the three indicators is as follows compared to the 2025 Affordability Assessment distribution (in parenthesis): more water systems exceed the affordability threshold for Household Socioeconomic Burden 36% (51%) than the thresholds for %MHI 12% (17%) or Extreme Water Bill 7% (9%).

5. COMMUNICATION AND ENGAGEMENT PLAN

5.1 ANALYTICAL TESTING RESULTS

Due to the health concerns associated with manganese, it is recommended that samples be analyzed and results reported electronically to the public water system and DDW as soon as practicable but no later than 30 days from the date of sample collection. Furthermore, to improve data accuracy, DDW recommends that water systems request manganese analysis using the lowest available laboratory quantification limit (but no higher than 10 ug/L), provided there are no extra costs or time delays.

A manganese detection means that the testing has found an amount of manganese that is higher than the minimum amount that the laboratory can measure, referred to as the Consumer Confidence Report Detection Level (CCRDL). A confirmed detection means that the average of an initial sample and a timely additional confirmation sample exceed the notification or response level as described in section 5.2.

When a PWS samples for manganese or other contaminants with a notification level or response level, and the results indicate either level has been exceeded, then the public water system must comply with [Health and Safety Code section 116455](#). This code requires public water systems to notify their governing body of the exceedance(s).

TABLE 3. STATE WATER BOARD UPDATED MANGANESE NOTIFICATION AND RESPONSE LEVELS

	CCRDL (MG/L)	NOTIFICATION LEVEL* (MG/L)	RESPONSE LEVEL (MG/L)
MANGANESE	0.010	0.05	0.20

**Manganese's notification level is based on a running annual average (response level is based single confirmed detection) The notification level is the same numerical value as the secondary maximum contaminant level.*

CCRDL = Consumer Confidence Report Detection Level
mg/L = milligrams per liter

In addition to the notification requirement, when a confirmed detection exceeds the response level, DDW may require that additional steps be taken to reduce public exposure to the contaminant:

- Provide public notification, preferably as soon as practicable, but no later than 30 days from the initial detection (pursuant to [Article 18](#) of title 22, division 4, chapter 15 of the California Code of Regulations and Health and Safety Code section [116450](#) for community water systems), or when required by DDW for non-community systems that serve a vulnerable population (formula fed-infants), as determined on a case-by-case basis. Mitigate exposure (remove source from service, provide treatment or provide alternative water for preparation of infant formula).
- Report the detection in the water system's annual consumer confidence report (CCR).

To support PWSs in complying with the updated health-based notification and response levels, including any necessary communications with governing bodies and customers the Plan includes the following documents:

TABLE 4. STATE WATER BOARD MANGANESE RELATED DOCUMENTS

Document (abbreviation)	Description and Document Link	
Issuance Document (ID)	Manganese Notification and Response Level Issuance Document	
Fact Sheet (FAQ)	Manganese Frequently Asked Questions	
Template 1 (T1)	Governing Body Notification Template (> 0.05 mg/L)	Notification templates in accordance with Health and Safety Code section 116455 and 116450
Template 2 (T2)	Public Notice > Response Level Template [> 0.20 mg/L for non-community systems when directed by DDW]	
Template 3 (T3)	SMCL Public Notice ≤ Response Level Template (> 0.05 mg/L ≤ 0.20 mg/L for CWSs)	SMCL public notification templates in accordance with Article 16 & Article 18 of title 22, division 4, chapter 15 of the California Code of Regulations (and 116450 for Template 4)
Template 4 (T4)	SMCL Public Notice > Response Level Template (>0.20 mg/L for CWSs)	
Annual Consumer Confidence Report Language	Consumer confidence report details including detection levels and health language Language available in CCR Reference Manual for Water Suppliers	

5.2 DELIVERY OF INFORMATION TO PUBLIC WATER SYSTEM CUSTOMERS

Test results will be communicated to PWS by PWS's analytical laboratory. Upon receipt of the results, PWS will determine what actions to take. PWS will determine whether they need to contact DDW, and what information needs to be conveyed to their customers. The decision of which actions to take and which materials PWSs send to customers (Table 4) will depend on how the results of the analytical samples compare to the State Water Board's manganese notification level and response level (Table 3) and if the PWS is required to comply with the secondary MCL.

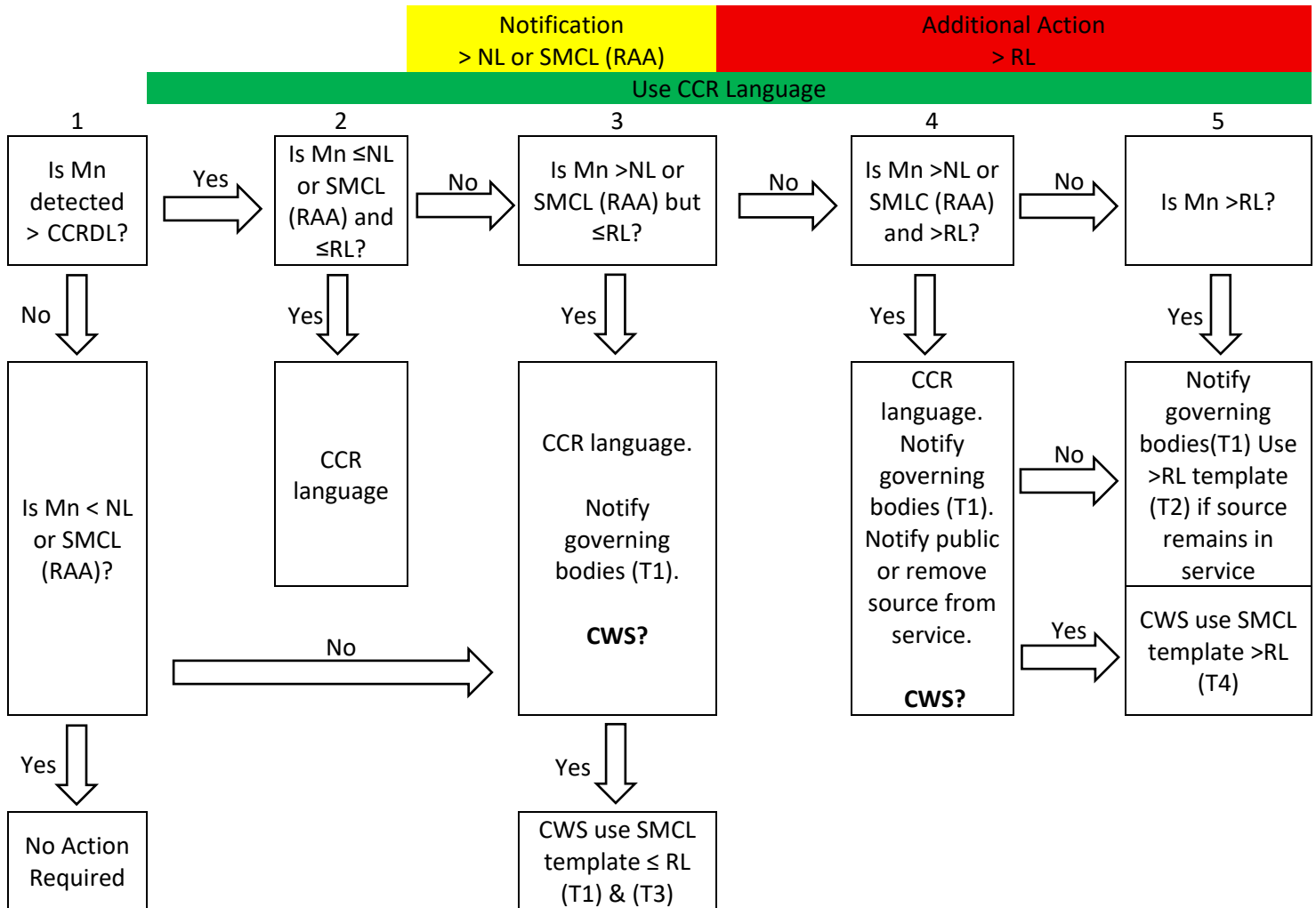
PWS will calculate running annual averages of any related samples to determine if the notification level or secondary MCL running annual average has been exceeded (averages and sample results must be rounded to the same number of significant figures as the level for which compliance is being determined.) The primary governing body and public notification decision points are as follows:

1. Analytical results with manganese below the detection level (i.e. <0.010 mg/L):
 - Community water systems: No notification is required⁵.
 - Non-community water systems: No notification is required⁵.
2. Analytical results with manganese above the detection level but less than the notification level (i.e. < 0.05 mg/L):
 - Community water systems: No notification is required⁵.
 - Non-community water systems: No notification is required⁵.
 - PWS should consider including manganese health-based information in the CCR.
3. Analytical results with manganese above the notification level but less than the response level (i.e. >0.05 mg/L but <0.20 mg/L):
 - Governing body notification is required at a single sample exceedance pursuant to Health and Safety Code section 116455, even if the running annual average is not exceeded.
 - Community water systems: Utilize the [Governing Body Notification Template](#) (T1) when notifying the governing bodies and the [SMCL Public Notice ≤ Response Level Template](#) (T3) for public notification.
 - Non-community water systems: Utilize [Governing Body Notification Template](#) (T1) when notifying the governing bodies.

⁵ Unless exceeding the notification level or secondary MLC RAA (>0.05 mg/L) – see item 3

- PWS should include manganese health-based information in the CCR.
4. Analytical results with manganese above the response level (i.e. >0.20 mg/L):
- PWS should collect and analyze a confirmation sample as soon as practicable but no later than within 30 days of the initial detection. A confirmed detection occurs if no confirmation sample is taken or the average of the initial and confirmation sample is greater than the response level.
 - Governing body notification is required pursuant to Health and Safety Code section 116455 utilizing the [Governing Body Notification Template \(T1\)](#),
 - Community water systems exceeding the secondary MCL are required to issue public notice to customers utilizing the [SMCL Public Notice > Response Level Template \(T4\)](#) and work with DDW on a corrective action plan to mitigate source exposure.
 - When directed by DDW, non-community water systems shall notify the public with the [Public Notice > Response Level Template \(T2\)](#), or (b) remove the water source from service within 30 days of initial sample.
 - PWS should include manganese health-based information in the CCR.

FIGURE 1. DECISION FLOW CHART - INFORMATION PWS SENDS TO CUSTOMERS



CCR = Consumer Confidence Report
 CCRDL = Consumer Confidence Report Detection Level = 0.010 mg/L
 CWS = Community Water System
 NL = Notification Level = 0.05 mg/L
 Mn = Manganese
 mg/L = milligrams per liter
 SMCL = Secondary Maximum Contaminant Level = 0.05 mg/L
 RAA = Running Annual Average
 RL = Response Level = 0.20 mg/L

5.3 DELIVERY OF INFORMATION TO ALL OTHER INTERESTED PARTIES

The primary means of providing information to all other interested parties will be electronically via the DDW's Manganese website:

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

Information provided includes frequently asked questions, pertinent regulations and laws, public notification templates, weblinks to other government agencies, project updates, procedural changes, and reports used to derive health-based values.

Project-related announcements and notifications about new information and website updates will be sent via the govDelivery email subscription service. Interested individuals may sign up for this service by accessing the following link:

https://www.waterboards.ca.gov/resources/email_subscriptions/

- Individuals must enter their email address to sign up. After entering their email address, an additional screen will appear to select informational topics.
 - For this project, open “Drinking Water” and select “Drinking Water Program Announcements”

Information regarding the project will also be available or disseminated through:

- State Water Board informational items
- Water District maps with associated contact information
- Water District webpages

5.4 COMMUNITY ENGAGEMENT

Conducting public outreach and engagement efforts will aid in the analysis of demographic considerations, environmental justice concerns, and human health impacts as they relate to trends in the manganese content of drinking water sources across the state. DDW's District Engineers and staff have relationships with PWSs and will continue to be the liaison for any public outreach, as needed for this Project.

In general, community engagement for the Project by DDW staff and public water systems should be guided by the below principles of transparency, inclusivity, accessibility, environmental justice, and community well-being:

- Transparency
 - Share information with the public and explain how the collected data will be used.
 - Provide educational materials and resources regarding the impact of the laboratory testing results to PWS customers.

- Follow up with interested parties throughout the project process and update the information available online.
- Work with interested parties in assisting with any follow-up that PWS or its customers may request regarding testing results.
- Abide by additional transparency concerns or conditions that may be applicable, such as the Sunshine laws in nine local governments in California (Alameda, Benicia, Contra Costa County, Gilroy, Milpitas, Oakland, Riverside, San Francisco and Vallejo), that require government agencies to maintain transparency and disclose their activities to the public.
- Inclusivity
 - Identify engagement goals and needs.
 - Document engagement efforts and associated perspectives, concerns, and feedback to help inform project decisions.
 - Provide communications to private well owners as appropriate.
 - Recognize Tribal systems and other communities to discuss sampling recommendations with them if requested.
 - If requested, provide PWS materials for any Tribal entities served or on adjacent lands.
 - If requested, consult with Native American Tribes.
 - The sovereignty of Tribal entities is recognized and as such all outreach is deferred to the U.S. EPA.
- Accessibility
 - Use plain language in communications and educational materials.
 - Use collected linguistic data and language access services to translate communications and project updates.
 - Based on the linguistic data for the project counties obtained from the American Community Survey, Spanish is the most prevalent language (other than English) spoken in households in California. As such, materials will be provided in both English and Spanish.
 - It is recommended that, where possible, any public notice is also translated into the most prevalent languages found within the given community.
 - Provide interpreters that accurately reflect the linguistic diversity of a given community in public outreach and engagement efforts, especially when efforts are held in counties where a language other than English is spoken by 5% or more of the population.
 - Keep project webpages updated with the most recent project information.

- Environmental Justice
 - To support the strategic direction of integrating racial equity and measuring impact as part of the 2023-2025 State Water Board Racial Equity Resolution and Action Plan⁶
 - Incorporate contaminant results into the Water Board’s data systems (e.g. GAMA Mapping Tool: https://www.waterboards.ca.gov/gama/online_tools.html) so that the data is transparent to the public and can be viewed against other environmental cleanup sites. This data will assist in the prioritization of those systems for treatment.
 - Incorporate contaminant results data into future DDW Needs Assessment Reports as well as updates to the SAFER Dashboard (https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/saferdashboard.html) showing Failing, At-Risk, Potentially At-Risk, and Not At-Risk PWSs in the state.
- Community Well-being
 - Ensure data collected supports community needs.
 - Address community needs that may come up, such as requests to discuss the sample results or collect extra samples for customers.
 - Let the public know what they can do to reduce manganese exposure and associated health risks. PWS delivering water should have the most accurate information relevant to an individual customer’s water quality concerns, such as the manganese concentrations at a specific school, childcare facility, or residence.
 - Provide a pathway for PWS customers to ask questions
 - DDW’s District Engineers are most familiar with the water system and are available for the public water system’s customers to ask questions and share perspectives. Contact information for the District Engineers is provided at https://www.waterboards.ca.gov/drinking_water/programs/documents/ddwem/DDWdistrictofficesmap.pdf.

Additional information regarding community profile demographics and linguistic data can be found in [Appendix A](#).

⁶ https://www.waterboards.ca.gov/racial_equity/docs/racial-equity-action-plan-final-en.pdf

APPENDIX A. PROJECT COMMUNITY PROFILE

A.1 INTRODUCTION

The most recent American Community Survey (ACS) 5-year data covering 2019-2023⁷ was used to analyze income and racial demographics for the population that would likely be affected by the revised notification level and the existing secondary MCL which are both set at the same value of 0.05 mg/L. The affected population was determined to be those served by approximately 600 systems estimated to have running average annual manganese levels above the secondary MCL over the past five years, between 2021 and 2025. Three quarters of the affected systems are community water systems as opposed to non-community systems like businesses, schools, or restaurants. The general locations of the systems are shown in [Figure 2](#).

Using the Summarize Demographics Geographic Information System (GIS) Tool developed by the OPEETA, total population and population-weighted averages of community level demographics were estimated for each drinking water system by cross referencing ACS GIS data with system boundaries in DDW's System Area Boundary Plus (SABL Plus) GIS layer. Due to data limitations, demographics for 56% of systems were able to be estimated using the GIS tool. Of the 44% of systems omitted, 40% of those had an estimated total population of less than half a percent of the total affected population that was estimated using the GIS tool. The remaining systems for which we have no population data were either not in the SABL Plus layer or they were too small to derive estimates from ACS data.

The GIS tool estimated the affected population to be about 9.2 million people, but this is likely high since it is based on GIS ACS data that may be outside of the service area of the PWSs. For comparison, the total affected population calculated using DDW's PWS database is around 6.5 and 6.7 million. Applying the ratio of 3.3% infants out of the total statewide population, it is estimated that at most 221,000 infants may be affected by manganese levels above the notification level. Accounting for between 1/3 to 2/3 of all infants receive formula about 73,000 to 146,000 infants may be represented in the affected communities depending on the age of the infant and the reliance on formula⁸. The difference is due to the way the GIS tool calculates population whereas the PWS database uses PWS provided estimates. Historically, some public water system population estimates have been calculated by multiplying the total service connections by 3.3.

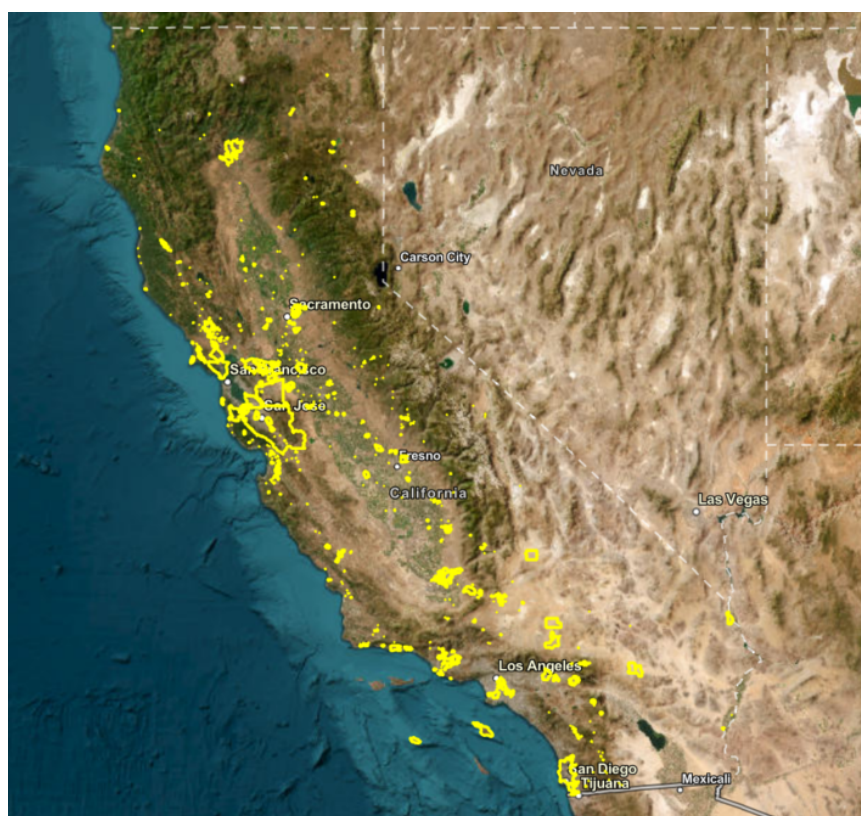
⁷ Available as of the analysis date: December 2025

⁸ In-Hospital Breastfeeding of Newborns: <https://www.kidsdata.org/topic/243/breastfeeding-status/table#fmt=299&loc=2&tf=160&ch=491&sortColumnId=0&sortType=asc> Child Breastfeeding Rates by State (2022): <https://www.cdc.gov/breastfeeding-data/about/rates-by-state.html>

Demographics were unable to be estimated for a significant number of systems resulting in uncertainty in the system level estimates. Nonetheless, since the total population in the omitted systems is low and likely related to the non-community systems, the statistics presented are considered representative of the population affected by manganese levels above notification level. The analysis does not include domestic well users or state small water systems not regulated by DDW.

The analysis includes system-wide demographics and thus lacks the granularity of household-level details such as families with formula-fed infants – the group most vulnerable to manganese-related neurological impacts. In California about 1.3 million or 3.3 percent of the population is infants, with 50 percent identified as Hispanic.⁹ Studies indicate some economic and racial demographics have an increased reliance on infant formulas and thus may be especially at risk.¹⁰ Therefore, research and outreach should target the families and caregivers who use infant formula.

FIGURE 2: PWS LOCATIONS (IN YELLOW) WITH RUNNING ANNUAL AVERAGE MANGANESE LEVELS ABOVE THE NOTIFICATION LEVEL (2019-2025)



⁹ The State of California's Babies: <https://stateofbabies.org/state/california/>

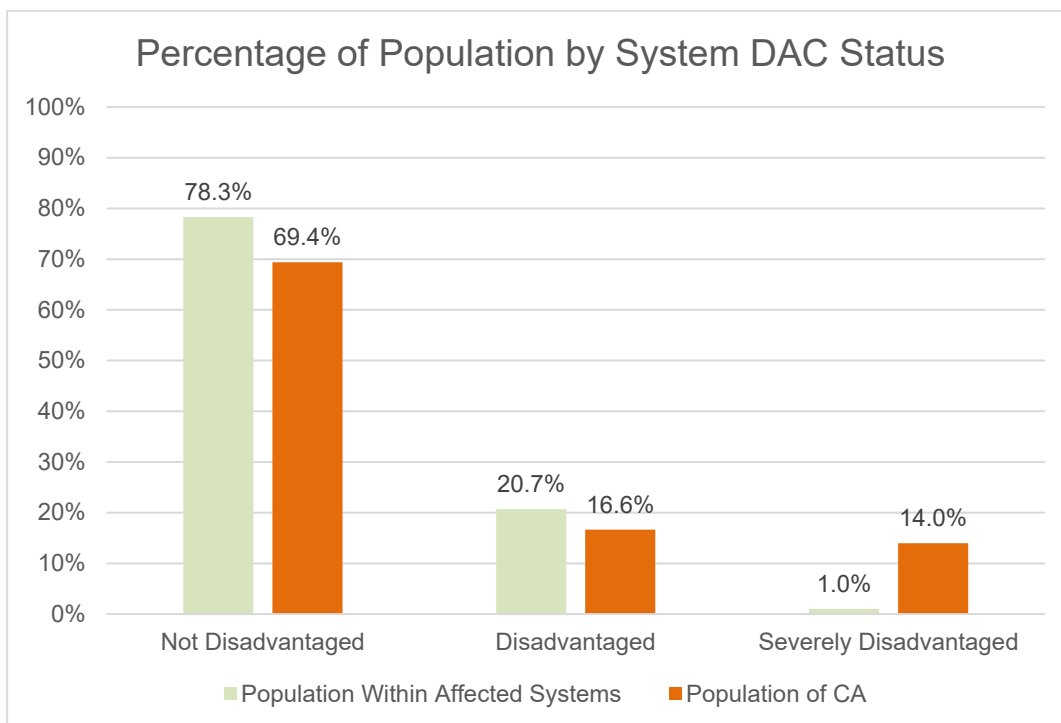
¹⁰ Breastfeeding in the United States: Strategies to Support Families and Achieve National Goals (2025) National Academies of Sciences, Engineering, and Medicine. <https://doi.org/10.17226/12398>

A.2 INCOME DEMOGRAPHICS

Staff analyzed affected system populations Disadvantaged Community (DAC) status relative to the total statewide population by DAC status, which were calculated with ACS block group-level data (ACS 5-year data 2019-2023). Estimates of DAC status percentages for California’s population were calculated only from block groups that had median household income data, which omits approximately 4% of the statewide population. Populations located in affected systems with average household incomes between 60% and 80% of the statewide median household income were classified as disadvantaged, and those where average household incomes were below 60% of statewide median household income were classified as severely disadvantaged.

As shown in [Figure 3](#), the percentage of the population within affected systems considered non-disadvantaged (78.3%) is higher than the statewide population considered non-disadvantaged (69.4%). As for the disadvantaged category, the affected population percentage (20.7%) is higher than the statewide percentage (16.6%). For the severely disadvantaged category, the difference is especially pronounced between the affected population (1.0%) and the statewide percentage (14.0%).

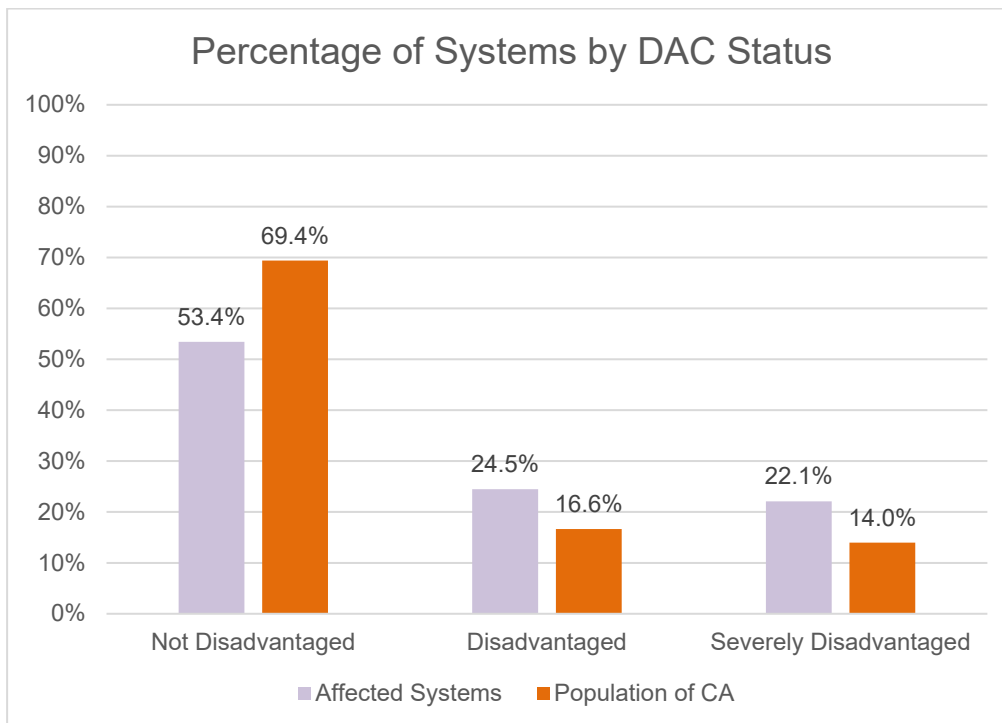
FIGURE 3: DAC STATUS POPULATION PERCENTAGE IN AFFECTED SYSTEMS RELATIVE TO CALIFORNIA POPULATION



Examining affected system DAC status yields different results from the population-level analysis. As shown in [Figure 4](#), the percentage of systems considered severely disadvantaged (22.1%) is higher than the statewide population that falls under the

severely disadvantaged (14.0%) category. Conversely, the percentage of systems considered non-disadvantaged (53.4%) is lower than the statewide population considered non-disadvantaged (69.4%). The systems-level result for the disadvantaged category is like the population-level results, however, with a higher percentage of systems (24.5%) considered disadvantaged relative to California’s population considered disadvantaged (16.6%).

FIGURE 4: DAC STATUS OF AFFECTED SYSTEMS RELATIVE TO CALIFORNIA POPULATION



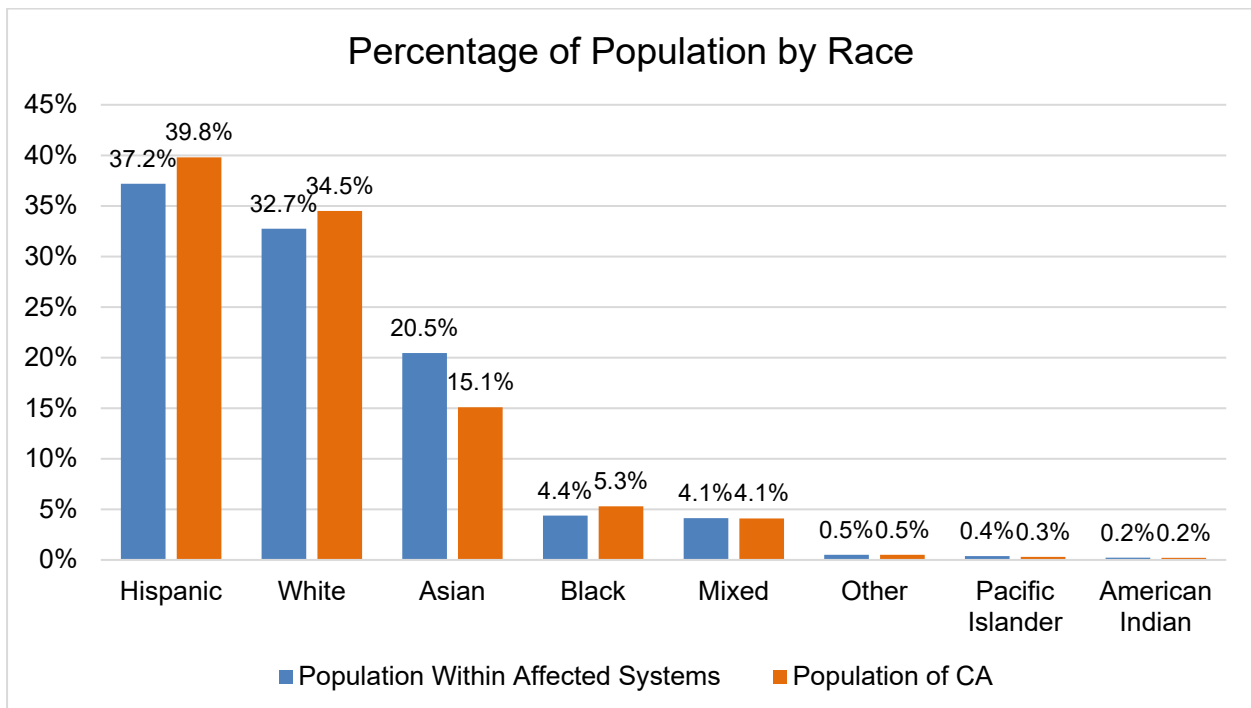
While the system-level DAC status analysis indicates that the percentage of disadvantaged and severely disadvantaged systems are higher than the related California statewide population DAC status, the population-level analysis shows the opposite. This is due to a higher number of smaller sized systems with low population numbers analyzed in the affected systems being considered disadvantaged or severely disadvantaged, while the larger non-disadvantaged systems tend to hold a larger percentage of population. While the number of people in systems that are considered disadvantaged and severely disadvantaged is lower relative to the statewide population, it is especially important that people in these systems are notified about manganese.

A.3 RACIAL DEMOGRAPHICS

In addition, staff examined the racial composition of the population served by affected systems. [Figure 5](#) shows that Asians are the one group that are over-represented relative to the statewide population breakdown by race, with 20.5% of the affected

population identifying as Asian compared to 15.1% of Californians identifying as Asian. Hispanics, whites, and Blacks are slightly underrepresented relative to the statewide population, and mixed race, other race, Pacific Islanders, and American Indians comprise about the same proportion of the affected population as the statewide population. The disproportionate impact on Asians is noteworthy since literature has found statistically significant higher blood manganese levels among Asians in the U.S.¹¹

FIGURE 5: RACIAL COMPOSITION OF POPULATION IN AFFECTED SYSTEMS RELATIVE TO CALIFORNIA POPULATION¹²



A.4 LINGUISTIC DEMOGRAPHICS

California Code of Regulations, title 22, section [64465](#) outlines the language requirements for PWS public notices applicable to their service area when exceeding the manganese secondary MCL. Exceedance of the response level also requires public notice in accordance with [Article 18](#) of title 22, division 4, chapter 15 of the California Code of Regulations for community water systems. DDW will also require public notification when a source cannot be taken offline in accordance with Health and Safety

¹¹ Oulhote Y, Mergler D, Bouchard MF. Sex- and age-differences in blood manganese levels in the U.S. general population: national health and nutrition examination survey 2011-2012. *Environ Health*. 2014 Oct 24;13:87. <https://pubmed.ncbi.nlm.nih.gov/25342305/> doi: 10.1186/1476-069X-13-87. PMID: 25342305; PMCID: PMC4271487.; Ram B. Jain, Y. Sammy Choi, Normal reference ranges for and variability in the levels of blood manganese and selenium by gender, age, and race/ethnicity for general U.S. population, *Journal of Trace Elements in Medicine and Biology*, Volume 30, 2015, Pages 142-152, ISSN 0946-672X, <https://doi.org/10.1016/j.jtemb.2014.12.004>.

¹² California population does not sum to 100% (off by 0.02%) due to decimal rounding.

Code Section [116450](#). To determine the likely languages for which PWS may need to translate communications, such as public notice templates, staff used the results created from OPEETA’s Summarize Demographics GIS Tool, described in Section A.1, which was used to analyze income and racial demographics. The Water Boards’ Language Access Protocol goes beyond the requirements of California Code of Regulations, title 22, section 64465 and recommends translations for languages spoken by at least 5% of the limited English proficiency (LEP) population within the affected community. LEP speakers are defined as those who speak English less than “very well” according to the ACS. Based on this metric, public notice templates meant for PWS customers may be translated into Spanish, Chinese (simplified and traditional), and Vietnamese, as the populations of these LEP language speakers statewide surpass the threshold (shown in [Table 5](#)). DDW has provided language advisories in the public notice templates in these languages. It is of note that the ACS data does not capture all languages spoken, and so staff’s anecdotal experience is also considered. As such, public notice templates may also need to be translated into Punjabi.

TABLE 5: BREAKDOWN OF LIMITED ENGLISH PROFICIENCY (LEP) LANGUAGE SPEAKERS IN AFFECTED SYSTEMS

LANGUAGES	TOTAL LEP LANGUAGE SPEAKERS SERVED	PERCENT OF TOTAL LEP SPEAKERS
Spanish	847,784	53.9%
Chinese	202,203	12.9%
Other Indo-European	120,288	7.7%
Vietnamese	105,446	6.7%
Other Asian Pacific Island	81,294	5.2%
Tagalog including Filipino	75,789	4.8%
Korean	49,976	3.2%
Russian/Polish/Slavic	39,866	2.5%
Other	18,361	1.2%
Arabic	17,451	1.1%
German/West Germanic	7,412	0.5%
French/Haitian/Cajun	5,732	0.4%
Total	1,571,602	100%

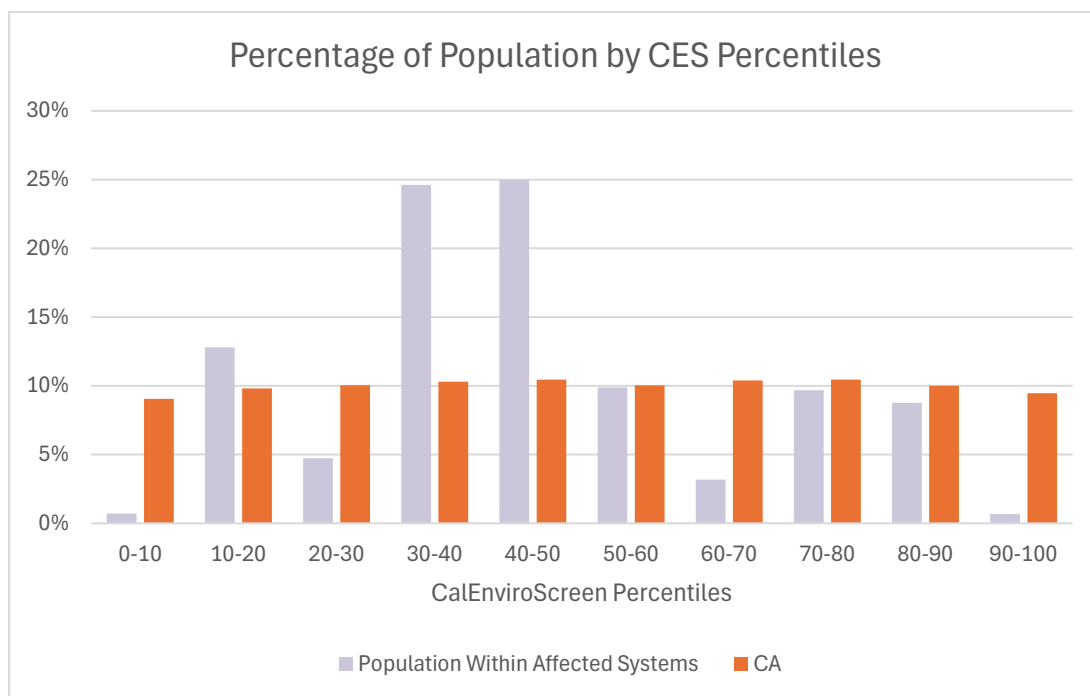
A.5 CALENVIROSCREEN ANALYSIS

CalEnviroScreen (CES) is a tool developed by the Office of Environmental Health Hazard Assessment that combines environmental, health, and socioeconomic information to produce scores for census tracts throughout the state. High scores indicate higher pollution burden than low scores. While CES 4.0 data is not available in

OPEETA's Summarize Demographics GIS Tool, staff used a similar methodology to estimate population-weighted averages for CES percentile scores across affected systems. Using these weighted CES estimates, staff analyzed CES percentiles of system populations affected by notification level exceedances compared to statewide CES percentile scores.

The 50th CES percentile is the median of CES scores, indicating that half of the state has lower CES scores, and half have higher CES scores. As shown in Figure 6, the highest percentages of the affected population are within the 30-50th CES percentile ranges. The percentages of the affected population are equal or less than the percentages of the state's population that fall within the 50-100th CES percentile ranges. This indicates that most of the affected population are in areas that are less burdened relative to the statewide population. While the number of affected people in the highest burdened areas is relatively low, it is especially important that these populations are notified of manganese levels that exceed the secondary MCL, the notification level, or response level due to the high levels of environmental, health, and socioeconomic burdens they already face.

FIGURE 6: DISTRIBUTION OF POPULATION IN AFFECTED SYSTEMS RELATIVE TO STATEWIDE CALENVIROSCREEN POLLUTION BURDEN PERCENTILE SCORES



Staff also analyzed the distribution of affected systems by CES percentiles. Relative to the analysis of population served, there are more systems in lower CES percentile ranges. As shown in Figure 7, the distribution of average CES percentile scores is skewed toward the lower percentiles, indicating that more systems are in lesser polluted areas. From 0-70th CES percentiles, the percentage of affected systems is higher than

the California’s population percentage that fall within those CES percentiles, with the highest percentage in the 10-20th CES percentile range and then declining through higher CES percentiles. The percentage of affected systems within the 70-100th CES percentiles is lower than the percentage of the state population that falls within this range. As noted in Section A.1, because of the significant number of systems that could not be included in the analysis, there is some level of uncertainty in the system-level estimates presented.

FIGURE 7: DISTRIBUTION OF NUMBER OF AFFECTED SYSTEMS ACROSS STATEWIDE CALENVIROSCREEN POLLUTION BURDEN PERCENTILE SCORES

