

# Item 6 - Appendix B

## Staff Report

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SAN FRANCISCO BAY REGIONAL  
WATER QUALITY CONTROL BOARD

CLEAN WATER ACT  
SECTION 303(d)  
2018 Impaired Waters List Updates  
FOR THE SAN FRANCISCO BAY REGION

STAFF REPORT

*March 2019*



CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

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## Introduction

The federal Clean Water Act (CWA) gives states the primary responsibility for protecting and restoring surface water quality. In California, the State Water Resources Control Board (State Water Board) and nine Regional Water Quality Control Boards (Regional Water Boards), collectively referred to as the California Water Boards, serve as the agencies with the primary responsibility for implementing CWA requirements. One such responsibility includes developing and implementing programs to ensure attainment of water quality standards. Water quality standards, pursuant to the CWA, consist of designated beneficial uses of waterbodies and criteria or objectives (numeric and narrative) which are protective of those beneficial uses.

Section 305(b) of the CWA requires each state to report biennially to the United States Environmental Protection Agency (U.S. EPA) on the water quality conditions of its surface waters. U.S. EPA compiles these assessments into their biennial “National Water Quality Inventory Report” to Congress. CWA section 303(d) requires each state to develop, update, and submit to the U.S. EPA for approval, a list of waterbodies not meeting water quality standards. 40 Code of Federal Regulations (CFR) section 130.7(d)(1) requires each state to submit the list biennially. This list is commonly referred to as the “303(d) List” or the “List of Impaired Waters.” Waterbodies placed on the 303(d) list must be addressed through the development of Total Maximum Daily Loads (TMDLs), or an existing regulatory program that is reasonably expected to result in the attainment of the water quality standard within a specified timeframe. The U.S. EPA guidance to the states recommends the two reports be integrated (U.S. EPA, 2005a). For California, this “Integrated Report” is called the California Integrated Report and combines the State Water Board’s section 303(d) and 305(b) reporting requirements. The San Francisco Bay Regional Water Quality Control Board (Regional Water Board) is responsible for developing and adopting the Integrated Report for waters within the San Francisco Bay Region.

As explained below in the section, *Changes to California’s Integrated Report Process*, California submits an Integrated Report to the U.S. EPA every two years, but each of the nine Regional Water Boards only assesses all of its waterbodies every six years. When a Regional Water Board is scheduled to assess all of its waterbodies for the Integrated Report, it is “on-cycle”. The San Francisco Bay Regional Water Board was on-cycle in 2016 (see Table 1 below) and, accordingly, evaluated all water quality data and developed listing and de-listing recommendations for all waters in the region as part of the 2016 Integrated Report.

Regional Water Boards that are “off-cycle” during each two-year Integrated Report cycle have the discretion to assess new “high-priority” data and make new listing/delisting decisions. Following adoption by the off-cycle Regional Water Board, the new listing/delisting decisions will be transmitted to the State Water Board for approval and inclusion with the statewide on-cycle 2018 303(d) List and Integrated Report. Because the San Francisco Bay Region is not on-cycle for the 2018 cycle, it is not preparing a full integrated report but is rather making a small number of changes to the 303(d) List.

This Staff Report provides background information on the following off-cycle decisions constituting the 2018 303(d) List changes for the San Francisco Bay Region.

- A listing decision for temperature in lower Los Gatos Creek and a decision not to list Los Gatos Creek, upper
- Delistings for indicator bacteria for six beaches (Crown Beach, Drake's Estero, Fort Baker's Horseshoe Cove, Keller Beach, Schoonmaker Beach, and Miller Point) that were listed during the 2016 cycle due exclusively to exceedances of the Basin Plan's now-superseded total coliform objective
- Delistings for Napa River and Sonoma Creek for nutrients (already approved by the Regional Water Board in Resolution R2-2014-0006)
- Listing status changes for Suisun Marsh and associated sloughs to make clear that these impairments are addressed by the TMDL for dissolved oxygen and mercury in Suisun Marsh

## Water Quality Assessment

The water quality assessment process begins with the solicitation and evaluation of data collected from the monitoring activities in the region. The data are analyzed to determine if a waterbody is meeting or exceeding water quality standards. Determining whether water quality standards are being met is accomplished by comparing available monitoring data to water quality objectives, criteria, and guidelines (protective limits). This analysis forms the basis of listing and delisting decisions for preparing the 303(d) List. Whether or not these protective limits are exceeded determines the ability of a waterbody to support its assigned beneficial uses and whether to recommend listing, or not listing, the waterbody-pollutant combination on the 303(d) List.

### The Listing Policy

Recommendations to place a waterbody on the 303(d) List are made in conformance with the [Water Quality Control Policy for Developing California's Clean Water Act section 303\(d\) List](#), commonly referred to as the Listing Policy (State Board, 2004). The Listing Policy establishes a standardized approach for developing California's section 303(d) List. The Listing Policy provides the rules for making listing decisions based upon different types of data and establishes a systematic framework for statistical analysis of water quality data. The Listing Policy also establishes requirements for data quality, data quantity, and administration of the listing process. Listing and delisting factors are provided for chemical-specific water quality standards; bacterial water quality standards; health advisories; bioaccumulation of chemicals in aquatic life tissues; nuisance such as trash, odor, and foam; nutrients; water and sediment toxicity; adverse biological response; degradation of aquatic life populations and communities; trends in water quality; and weight of evidence.

The Listing Policy requires the water quality assessments and listing decisions for specific waterbody-pollutant combinations to be documented in waterbody "fact sheets". Fact sheets consist of "lines of evidence" summarizing the applicable standards and the data for a waterbody in relation to a specific beneficial use. The fact sheets also contains the staff "decision" to list or delist a waterbody for a specific pollutant. We then submit these proposed decisions for Regional Water Board consideration and approval. Following adoption by the Regional Water Board, the new listing/delisting decisions will be



transmitted to the State Water Board for approval and inclusion with the statewide 303(d) List and Integrated Report. The fact sheets supporting the recommended changes to the 303(d) List for waters in the San Francisco Bay Region are provided in Appendix B.

### Changes to California’s Integrated Report Process

In 2013, U.S. EPA Region IX, Water Division, management agreed with a State Water Board [management strategy](#) to create a more efficient and timely Integrated Report preparation process. The strategy divides the nine Regional Water Boards into three groups. The Integrated Report is released in cycles with each cycle occurring every two years, on even numbered years. Each Integrated Report cycle consists primarily of assessments from the three Regional Boards that are on-cycle (see Table 1 below). The other six Regional Boards that are off-cycle may also assess new high-priority data and make new listing or delisting decisions. According to this Integrated Report schedule, the San Francisco Bay Regional Water Board would again be on-cycle to develop and approve its next full Integrated Report in 2022. The last time this region prepared 303(d) listing recommendations for the Regional Water Board was for the 2016 Integrated Report (See Resolution [No. R2-2017-0012](#) and associated [Staff Report](#)).

**Table 1: Integrated Report Schedule**

Year	Regional Boards
2016	<b>San Francisco Bay (Region 2)</b> Los Angeles (Region 4) Santa Ana (Region 8)
2018	North Coast (Region 1) Lahontan (Region 6) Colorado Basin (Region 7)
2020	Central Coast (Region 3) Central Valley (Region 5) San Diego (Region 9)
2022	<b>San Francisco Bay (Region 2)</b> Los Angeles (Region 4) Santa Ana (Region 8)

### Data Solicitation for 2018 303(d) List

The State Water Board solicited data from the public with a formal “[Notice of Public Solicitation of Water Quality Data and Information for the California Integrated Report](#)” sent to interested parties subscribed to the [Integrated Report e-mailing list](#). Data used as part of the 2018 Integrated Report were received from November 3, 2016 through May 3, 2017. The majority of these submitted data were collected after the end of the previous cycle’s solicitation period (August 2010) but could have also included data collected prior to previous assessment cycles but not previously submitted for assessment. Data sources include government agencies, municipalities, environmental groups, citizen groups, and receiving water data from the National Pollutant Discharge Elimination System (NPDES) dischargers.

All data and information reviewed in preparing these off-cycle 303(d) List changes will be part of the electronic administrative record compiled after the Regional Water Board public process is completed. Data and information pertaining to specific waterbody-pollutant assessments are provided as hypertext linkages in the fact sheets (Appendix B).

### **Data Processing and Analysis for the San Francisco Bay Region**

As noted previously, Regional Water Boards that are off-cycle during each two-year Integrated Report cycle have the discretion to assess new “high-priority” data and make new listing/delisting decisions. For the 2018 303(d) List, we are exercising this discretion to evaluate only those data necessary to make a limited number of 303(d) List revisions. Specifically, we evaluated indicator bacteria data for the six beaches listed during the 2016 cycle due exclusively to exceedances of the Basin Plan total coliform water quality objective, which is now superseded by *Enterococcus* water quality objectives adopted by the State Water Board in August 2018. We also evaluated an extensive temperature dataset for Los Gatos Creek submitted during the data solicitation period. We determined that the evidence for temperature impairment for the lower portion of the creek was sufficiently compelling that it should also be brought to the Board for consideration for the 2018 303(d) List rather than waiting for the next on-cycle opportunity in 2022. We received no data for other waterbodies in response to the data solicitation.

Fact sheets and overall beneficial use support determinations were developed in the California Water Quality Assessment database (see Appendix B). Lines of evidence summarize monitoring results from the data and provide information pertaining to where and when the water quality monitoring took place, the pollutant sampled, the beneficial use affected, the water quality objective or guideline protective of the beneficial use, the number of samples collected, and how many samples exceeded the objective or guideline. Potential sources are only identified in fact sheets when a specific source analysis has been performed as part of a TMDL or other regulatory process. Otherwise, the potential source was marked “source unknown”.

Data were aggregated by waterbody following the requirements of section 6.1.5.4 of the Listing Policy, and assessments were performed on the individual segments. Waterbodies were segmented to account for hydrologic features. Some waterbodies may have been re-segmented, split into additional segments, or had a modification to the waterbody name since the last 303(d) List was approved. These and other non-substantive modifications (i.e., modifications that did not change a listing status) are summarized in the miscellaneous changes report (Appendix C).

Spatial and temporal representation of data was assessed using the requirements and guidance of the Listing Policy. The available data were used to represent concentrations during the averaging period associated with the pollutant and water quality objective, as required by section 6.1.5.6 of the Listing Policy.

Following data assessment, Regional Water Board staff determined whether the waterbody was attaining relevant water quality standards. Decision recommendations were completed to summarize all relevant lines of evidence for a waterbody-pollutant combination and, based on statistical evaluation described in the Listing Policy, state if the number of exceedances constitutes a 303(d) listing.

## Water Quality Standards Used in the Data Assessment

Beneficial uses for waters in the San Francisco Bay Region are identified in [Table 2-1](#) of the San Francisco Bay Regional Water Quality Control Plan (Basin Plan). Regional Water Board staff assessed attainment of these uses by comparing available data to regulatory limits when available. The most common regulatory limits used include water quality objectives in the Basin Plan or any statewide Water Quality Control Plans applicable to the waterbody, and criteria for toxic chemicals promulgated by the U.S. EPA under the California Toxics Rule (40 C.F.R. §131.27). When numeric regulatory limits were not available, evaluation guidelines were used to interpret narrative water quality objectives. Evaluation guidelines are selected in conformance with section 6.1.3 of the Listing Policy. When evaluating narrative water quality objectives or beneficial use protection, the Regional Water Boards and the State Water Board identify evaluation guidelines that represent standards attainment or beneficial use protection. The guidelines are not water quality objectives and are only used for the purpose of developing the section 303(d) List. When selecting an evaluation guideline to interpret narrative water quality objectives, the Regional Water Board or the State Water Board:

- Identifies the water body, pollutants, and beneficial uses;
- Identifies the narrative water quality objectives or applicable water quality criteria;
- Identifies the appropriate interpretive evaluation guideline that potentially represents water quality objective attainment or protection of beneficial uses.

## Proposed Changes to the Impaired Waters List

We propose the following changes to be incorporated as part of California's 2018 303(d) List. More detail about each change is provided in the sections below.

- A listing decision for temperature in lower Los Gatos Creek and a decision not to list upper Los Gatos Creek for temperature
- Delistings for six beaches for indicator bacteria that were listed during the 2016 cycle due to exceedances of the now-superseded total coliform objective
- Delistings for Napa River and Sonoma Creek for nutrients (already approved by the Regional Water Board in Resolution R2-2014-0006)
- Listing status changes (mercury and organic enrichment/low dissolved oxygen) for Suisun Marsh and three associated sloughs to reflect the TMDL adopted for Suisun Marsh in 2018

### Lower Los Gatos Creek Temperature Listing

High stream temperatures can cause both lethal and chronic impacts to salmonids such as steelhead, a species listed as threatened under the Endangered Species Act. Accordingly, we evaluated an extensive temperature dataset for Los Gatos Creek submitted during the data solicitation period. Steelhead populations can be affected water quality, quantity, or habitat and are, therefore, at risk in Bay Area streams. The Water Board is concerned about protecting existing steelhead populations and the habitat upon which they depend.

Hourly temperature data were collected by the Santa Clara Valley Water District from 2000 through 2012 at 32 monitoring stations along lower Los Gatos Creek (downstream of Lexington Reservoir) and at 5 monitoring stations along upper Los Gatos Creek. These data comprised a data set of nearly two million temperature records. We evaluated these data against the following evaluation guidelines to determine whether or the lower or upper reaches of Los Gatos Creek are impaired due to high temperatures.

- **7DADM:** The 7-day average daily maximum temperature, which is the rolling seven-day average of daily maximum temperature compared to a threshold of 20 °C for the period March 11 through June 15 (steelhead out-migration period) (U.S. EPA, 2003, Shapovalov and Taft, 1954)
- **Lethal:** Days for which the temperature, at any time, exceeded 24 °C from March 1 through October 31 (Carter, 2008; Moyle, 1976; U.S. EPA, 1977), a temperature associated with lethality for steelhead
- **MWAT:** The maximum weekly average temperature (from March 1 through October 31, summer rearing for steelhead) at each station for each year compared to 19.6 °C (Sullivan, 2000)
- **7DAVG:** The rolling seven-day average temperature from March 1 through October 31 (summer rearing for steelhead) compared to a threshold of 17 °C (Sullivan, 2000)

Table 2 below provides a summary of the water quality assessment with respect to these four temperature evaluation guidelines. The values shown in **bold red typeface** indicate circumstances in which the number of exceedances of the evaluation guideline is greater than the critical value (the number required for listing for a given sample size according to Table 3-2 of the Listing Policy, State Board, 2004). For the portion of Los Gatos Creek upstream of Lexington Reservoir, the number of exceedances fell below the critical value for all four evaluation guidelines. For the portion of Los Gatos Creek downstream of the reservoir, the critical value was exceeded for three of the four evaluation guidelines. Therefore, we find that there is sufficient evidence to support placing Los Gatos Creek (lower) on the 303(d) List, but there is not sufficient evidence to recommend listing for Los Gatos Creek (upper).

**Table 2 – Summary of Samples and Exceedances for Los Gatos Temperature**

Evaluation Guideline	Los Gatos Creek, upper		Los Gatos Creek, lower	
	# samples	# exceedances (critical value)	# samples	# exceedances (critical value)
7DADM > 20°C	1867	0 (310)	16427	<b>3053</b> (2727)
Lethal > 24°C	5687	0 (944)	48857	6726 (8110)
MWAT > 19.6°C	37	4 (7)	261	<b>229</b> (44)
7DAVG > 17°C	5444	887 (904)	47179	<b>30499</b> (7830)

### Pathogen Delistings for Six Beaches

As part of the 2016 303(d) List, the San Francisco Bay region placed six beaches on the impaired waters list due to excessive exceedances of the Basin Plan’s total coliform objective (median < 240 MPN/100 ml) to protect direct water contact recreation. These beaches are:

- Crown Beach (Alameda County)
- Drake's Estero (Marin County)
- Fort Baker, Horseshoe Cove (Marin County)
- Keller Beach (Contra Costa County)
- Schoonmaker Beach (Marin County)
- Miller Point (Tomales Bay in Marin County)

On August 7, 2018, the State Board adopted revised bacteria water quality objectives included in the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California. The new water quality objectives to protect contact recreation eliminate the total coliform indicator in favor of a six-week rolling geometric mean enterococci concentration of 30 colony forming units (cfu)/100 ml and a statistical threshold value (STV) of 110 cfu/100ml. These objectives apply in waters where the salinity is greater than 1 part per thousand more than 5 percent of the time. The STV shall not be exceeded more than 10% of the time in any calendar month. If there are a statistically sufficient number of samples to compute the geometric mean, generally not less than five samples equally spaced distributed over a six-week period, the geometric mean alone is used to determine attainment of the water quality standard related to water contact recreation (Section III.E.2).

Total coliform was removed as a bacterial indicator in the revised objectives protecting the contact recreation beneficial use because it is not an accurate indicator of human illness. Accordingly, we re-evaluated all available *Enterococcus* data for the six beaches recently listed due to total coliform exceedances to determine if the new objectives are met. Table 4 is a summary of the water quality assessment for these beaches. When all available data (up to the data solicitation cutoff of May 3, 2017) are re-evaluated for these beaches, all six are eligible for delisting because for all six beaches the number of exceedances of the geometric mean objective did not exceed the critical value required for delisting. The critical values in Table 4 are from Table 4-2 of the listing policy. For beaches where sampling is conducted from April through October, we used critical values from an adjusted version of Table 4-2<sup>1</sup> that accounts for the reduced allowable exceedance frequency for beaches sampled only during April through October. Because we have sufficient data to evaluate the six-week rolling geometric mean for all six beaches, only the geometric mean objective is used to determine the impairment status. Therefore, even though the exceedances of the STV objective are higher than the critical value for some beaches, the STV is not used to determine impairment status.

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<sup>1</sup> A series of binomial tables specific to listing and delisting coastal beaches can be found on the State Water Board's website at: [www.waterboards.ca.gov/water\\_issues/programs/tmdl/docs/303d\\_binomial\\_tables.xls](http://www.waterboards.ca.gov/water_issues/programs/tmdl/docs/303d_binomial_tables.xls).

**Table 4 – Summary of Enterococcus Samples and Exceedances for Beach Delistings**

Beach and sample locations	Metric	# Samples	# Exceedances	Critical value	Notes
Crown Beach (Alameda) Includes: 2001 Shoreline Drive, Bath House, Bird Sanctuary, Sunset Rd., Windsurfer Corner	Geomean	1047	50	173	Data from 2007 – May 2017. Year-round sampling so critical values taken from Table 4-2 of the Listing Policy
	STV	508	108	85	
Drake's Estero (Marin)	Geomean	106	5	10	Data from 2005 – 2012, April through October sampling so critical values taken from Table 4-2 adjusted to account for shorter sampling period
	STV	44	3	4	
Fort Baker Horseshoe Cove (Marin) Includes: Northwest, Southwest, and Northeast beaches combined	Geomean	615	58	60	Data from 2005 – May 2017, April through October sampling so critical values taken from Table 4-2 adjusted to account for shorter sampling period
	STV	190	29	18	
Keller Beach (Contra Costa) Includes: Mid-beach, North, and South combined	Geomean	216	18	35	Data from 2007 – May 2017. Year-round sampling so critical values taken from Table 4-2 of the Listing Policy
	STV	100	25	16	
Schoonmaker Beach (Marin)	Geomean	304	9	29	Data from 2005 – May 2017, April through October sampling so critical values taken from Table 4-2 adjusted to account for shorter sampling period
	STV	87	10	8	
Miller Point (Tomales Bay)	Geomean	290	16	28	Data from 2005 – May 2017, April through October sampling so critical values taken from Table 4-2 adjusted to account for shorter sampling period
	STV	83	11	8	

### Napa River and Sonoma Creek Nutrient Delistings

On February 12, 2014, the Water Board adopted a resolution (R2-2014-0006) delisting Napa River and Sonoma Creek for nutrients. These delistings were not included as part of the 2016 303(d) List because the delisting decisions relied on data collected after the end of the data solicitation period (August 2010) for the 2016 list. For the 2018 303(d) List, we may rely on data collected after August 2010, so we may now make the delistings part of

the statewide 2018 303(d) List so that they can be considered by State Water Board and, ultimately, U.S. EPA. The basis of these two delisting decisions is summarized below, but these decisions are not up for re-consideration as part of this Regional Water Board public process because the Board already approved these delistings in 2014.

Both delistings were based on a weight of evidence approach demonstrating that water quality standards are attained. The evaluation of eutrophic conditions requires the weight of evidence approach because the evaluation process examining a stream's trophic status requires measuring naturally occurring stream organisms (i.e., algae) and determining if the amount of algae present in a stream is affecting recreational beneficial uses or water quality parameters that influence aquatic life (e.g., pH and dissolved oxygen). Such an analysis requires the integration of secondary water quality indicators at sites with high algal biomass because the presence of algae alone does not demonstrate that aquatic impacts have occurred. The datasets used to evaluate nutrient impairment in the non-tidal portions of Napa River and Sonoma Creek are both spatially representative of the watershed and span a decade. We compiled nutrient chemistry data from 2002-2004, 2009, and 2011-2012. We developed benthic algae-based lines of evidence using data collected in 2011 and 2012, which represent current conditions in the watershed.

We used two lines of evidence (i.e., benthic chlorophyll a, benthic percent macroalgae cover) to directly quantify the amount of algae in the stream, in order to determine if the narrative water quality objective for biostimulatory substances (i.e., eutrophication) is currently exceeded. Both metrics show a low proportion of exceedance for both Napa River and Sonoma Creek.

For the four lines of evidence regarding nutrients with direct toxic effects (e.g., un-ionized ammonia, total ammonia, nitrite (Napa River only), and nitrate + nitrite (Napa River only), we used Listing Policy Table 4-1 criteria for toxicants to show that exceedances have been below the maximum number of exceedances allowed to remove a water segment and that municipal (Napa River only), agricultural, and aquatic life beneficial uses were not affected by nutrient toxicity. The nuisance algae indicators showed that Napa River and Sonoma Creek are not impaired for nutrients because they had a low rate of exceedance of the applicable guidelines; for those instances, the secondary indicators were not consistently exceeded.

### **Suisun Marsh and Slough Waterbodies Changes to Listing Status**

In April 2018, the Regional Water Board adopted, and in August 2018, the State Water Board approved a Basin Plan Amendment setting site-specific dissolved oxygen objectives for Suisun Marsh and sloughs, establishing a TMDL for dissolved oxygen in Suisun Marsh, and extending the San Francisco Bay Mercury TMDL to Suisun Marsh. Adoption of this TMDL necessitates updating the listing status of Suisun Marsh and three Suisun Marsh sloughs. These status changes are summarized below in Table 5.

**Table 5 – Listing Status Changes for Suisun Marsh and Associated Sloughs**

<b>Water Body</b>	<b>Pollutant(s)</b>	<b>Listing Status Change</b>	<b>Explanation</b>
Suisun Marsh	Mercury	Impairment being addressed by SF Bay Mercury TMDL	The Suisun Marsh TMDL includes language adding Suisun Marsh to the SF Bay Mercury TMDL
	Organic enrichment, low dissolved oxygen	Impairment being addressed by Suisun Marsh TMDL	
Cordelia Slough Hill Slough Suisun Slough	Mercury	Impairment being addressed by SF Bay Mercury TMDL	The Suisun Marsh TMDL includes language adding Suisun Marsh to the SF Bay Mercury TMDL. These sloughs are part of the Suisun Marsh system and should also be considered addressed by the SF Bay Mercury TMDL.
	Organic enrichment, low dissolved oxygen	Impairment being addressed by Suisun Marsh TMDL	

## **Public Review and Board Approval**

Pursuant to section 6.2 of the Listing Policy, decisions concerning waterbodies listed in Category<sup>2</sup> 4a, 4b, or 5, require public review and approval by the Regional Water Board during a public Board hearing. These decisions are then submitted to the State Water Board for compiling into the California 303(d) List of impaired waters. Once compiled, the California Integrated Report (containing the 303(d) List) is noticed for additional public review and approval by State Water Board Executive Director or the State Water Board, as outlined in section 6.3 of the Listing Policy. The California Category 5 list (i.e., 303(d)-listed waterbodies) will require final approval by the U.S. EPA. If U.S. EPA determines that changes are needed to the submitted report, they will initiate further public review before finalizing and publishing the report.

<sup>2</sup> Category 4a/4b signify that data suggest that at least one designated use is not being supported but that a TMDL is not needed because one has already been approved or established by U.S. EPA (category 4a) or that other required control measures are expected to result in the attainment of an applicable water quality standard in a reasonable period of time (category 4b). Category 5 signifies that at least one designated use is not being supported and that a TMDL is necessary.



## References

Additional references are included as hyperlinks in the Fact Sheets in Appendix B. Fact Sheet references may also be accessed from our [Region's 303\(d\) references page](#).

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## List of Acronyms and Abbreviations

7DADM	Seven Day Average of Daily Maximum Temperature
7DAVG	Seven Day Average Temperature
Basin Plan	Regional Water Quality Control Plan
BPTCP	Bay Protection and Toxic Cleanup Program
BMI	Benthic Macro Invertebrates
CalWQA	California Water Quality Assessment (database)
CCAMP	Central Coast Ambient Monitoring Program
CCC	Criteria Continuous Concentration
CCR	California Code of Regulations
CDPH	California Department of Public Health
CFR	Code of Federal Regulations
Cfu	Colony forming units (measure of bacteria concentration)
CMC	Criteria Maximum Concentration
CTR	California Toxics Rule
CWA	Clean Water Act
°C	degrees Celsius
°F	degrees Fahrenheit
DDE	Dichlorodiphenyldichloroethylene
DDT	Dichlorodiphenyltrichloroethane
DFW	Department of Fish and Wildlife, formerly Department of Fish and Game (DFG)
DO	Dissolved oxygen
dw	dry weight
ERM	Effects Range Median
Geomean	Geometric mean
HCH	Hexachlorocyclohexane
HSA	Hydrologic Sub Area
HU	Hydrologic Unit
IBI	Index of Biological Integrity
ILRP	Irrigated Lands Regulatory Program
IR	Integrated Report
kg	kilogram(s)
Listing Policy	Water Quality Control Policy for Developing California's section 303(d) List
LOE	Line of Evidence
MCL	Maximum Contaminant Level
MDL	Method Detection Limit
mg/kg	milligrams per kilogram (parts per million)
mg/L	milligrams per liter (parts per million)
µg/g	micrograms per gram (parts per million)
µg/L	micrograms per liter (parts per billion)
MTBE	Methyl tertiary-butyl ether
MTRL	Maximum Tissue Residue Level
MWAT	Maximum Weekly Average Temperature
NAS	National Academy of Sciences
ng/g	nanograms per gram (parts per billion)
ng/L	nanograms per liter (parts per trillion)

NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NTU	Nephelometric Turbidity Unit
oc	organic carbon
OEHHA	Office of Environmental Health Hazard Assessment
PAH	Polynuclear aromatic hydrocarbon
PBDE	Polybrominated diphenyl ethers
PCB	Polychlorinated biphenyl
PEL	Probable Effects Level
pg/L	picograms per liter
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
RBI	Relative Benthic Index
RL	Reporting Level
SFEI	San Francisco Estuary Institute
SMWP	State Mussel Watch Program
SQG	Sediment quality guideline
SWAMP	Surface Water Ambient Monitoring Program
STV	Statistical Threshold Value
TDS	Total Dissolved Solids
TIE	Toxicity Identification Evaluation
TMDL	Total Maximum Daily Load
TSMP	Toxic Substance Monitoring Program
TSS	Total Suspended Solids
U.S. EPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey
WDR	Waste Discharge Requirement
WQO	Water quality objective
WQS	Water quality standard
ww	wet weight