CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD

SAN DIEGO REGION

TENTATIVE TIME SCHEDULE ORDER NO. R9-2023-0006

AN ORDER REQUIRING DESIGNATED RESPONSIBLE PERMITTEES TO COMPLY WITH BACTERIA, PROJECT I-TWENTY BEACHES AND CREEKS TMDL REQUIREMENTS PRESCRIBED IN THE REGIONAL MUNICIPAL SEPARATE STORM SEWER SYSTEMS PERMIT FOR THE SAN DIEGO REGION

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) finds:

PART I. BACKGROUND
Part I, Section A. Regulatory Permits and TMDLs

1. **Regional Municipal Separate Storm Sewer System (MS4) Permit.** Order No. R9-2013-0001, *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* was adopted by the San Diego Water Board on May 8, 2013, and amended on February 11, 2015, and November 18, 2015. Order No. R9-2013-0001, as amended (Regional MS4 Permit) regulates discharges of stormwater and non-stormwater from MS4s operated by 39 governmental municipalities named in the Regional MS4 Permit (Copermittees) in a drainage area that encompasses multiple watersheds in portions of San Diego County, Orange County, and Riverside County. The Regional MS4 Permit includes, among other provisions, receiving water limitations requiring that MS4 discharges be controlled to not cause or contribute to exceedances of water quality standards in receiving waters, and other water quality based requirements that require compliance with implementation provisions of approved total maximum daily loads (TMDLs). The Regional MS4 Permit requires the MS4 Copermittees to develop Water Quality Improvement Plans (WQIPs) that include water quality improvement numeric goals, schedules, and strategies to protect, preserve, enhance, and restore the water quality and designated beneficial uses of waters of the state. In particular, the Regional MS4 Permit requires the Copermittees to implement water quality improvement strategies and achieve water quality improvement goals in the Water Quality Improvement Plans.
2. **Bacteria TMDLs.** On February 10, 2010, the San Diego Water Board adopted Resolution No. R9-2010-0001, a *Resolution Amending the Water Quality Control Plan for the San Diego Basin to Incorporate Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)* (Bacteria TMDLs). This Resolution, amending the *Water*

Quality Control Plan for the San Diego Region (Basin Plan)[1] to incorporate the Bacteria TMDLs, was subsequently approved by the State Water Resources Control Board (State Water Board) on December 14, 2010, the Office of Administrative Law on April 4, 2011, and the United States Environmental Protection Agency (USEPA) on June 22, 2011.

3. **Bacteria TMDL Waste Load Allocations.** The Waste Load Allocations (WLAs) for Fecal Indicator Bacteria (FIB) in the Bacteria TMDLs were developed using a reference system and antidegradation approach based on the bacteria water quality objectives for the water contact recreation (REC-1) beneficial use for ocean waters including beaches contained in the Water Quality Control Plan Ocean Waters of California (2005 Ocean Plan), and in the Basin Plan for inland receiving waters. The natural source exclusion approach in current versions of the Basin Plan, the Ocean Plan and the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California (ISWEBE Plan) allows recalculation of bacteria TMDLs and/or adoption of site-specific objectives to include additional exceedance days after all anthropogenic sources of bacteria are identified, quantified, and controlled. TMDL recalculations and site-specific objectives to factor in the natural source exclusion approach must be adopted through a Basin Plan amendment prior to incorporation in the Regional MS4 Permit.
4. **Regional MS4 Permit Implementation Provisions for the Bacteria TMDLs.** Provision II.A.3 of the Regional MS4 Permit requires that each Copermittee comply with applicable WQBELs pursuant to the applicable TMDL compliance schedules. WQBELs include Final Receiving Water Limitations (Final RWLs) and Final Effluent Limitations which are consistent with the WLAs established in the Bacteria TMDLs. Specific Provision 6 in Attachment E of the Regional MS4 Permit (Specific Provision 6) specifies the impaired waterbodies and segments thereof subject to Bacteria TMDL requirements (TMDL waterbodies) and the designated permittees responsible for implementing the TMDL requirements (TMDL Responsible Permittees), WQBELs to implement the TMDL WLAs, and the implementation schedule for compliance with the Bacteria TMDLs. Specific Provision 6 requires the TMDL Responsible Permittees to reduce their waste loads of FIB to comply with final WQBELs for MS4 discharges into specified receiving waters no later than the final compliance dates of April 4, 2021, for dry weather and April 4, 2031, for wet weather.
5. **Prohibitions and Limitations Compliance Option in the Regional MS4 Permit.** Provision II.B.3.c of the Regional MS4 Permit provides Copermittees with an option for implementing the WQIPs accepted by the San Diego Water Board to comply with the Prohibitions and Limitations specified in the Regional MS4 Permit, including applicable water quality based effluent limitations (WQBELs) established for TMDLs in Attachment E to the Regional MS4 Permit. This alternative compliance pathway requires an analysis that must demonstrate that implementation of the water quality improvement strategies in accordance with the schedules and milestones will achieve the final numeric goals by applicable compliance deadlines. The South Orange County Copermittees selected the alternative compliance pathway. The San

[1] Basin Plan, Chapter 4, Page 4-112 available online at the San Diego Water Board website at https://www.waterboards.ca.gov/sandiego/water_issues/programs/basin_plan/docs/R9_Basin_Plan.pdf

Diego Water Board accepted the South Orange Copermittees' WQIP pursuant to Provision II.B.3.c on June 20, 2018. On December 30, 2022, the San Diego Water Board provided formal notification that the WQIP was no longer adequate for deemed compliance with Specific Provision 6 because the compliance deadline had passed, and the analysis lacked the required demonstration.

6. **Regional MS4 Permit Compliance Demonstration Provisions for the Bacteria TMDLs.** Specific Provision 6.b.(3) specifies six compliance pathways the TMDL Responsible Permittees may use to demonstrate compliance with the final WQBELs. The six compliance pathways are summarized in Table 1 below.

Table 1. Final Compliance Pathways Specified in Specific Provision 6.b.(3) in Attachment E to the Regional MS4 Permit.

Specific Provision	Compliance Pathway Measure	Brief Summary of Compliance Pathway
6.b.(3)(a)	No discharge from MS4 outfalls	No discharge from MS4 outfalls to TMDL waterbodies
6.b.(3)(b)	Final Receiving Water Limitations (RWL) in Tables 6.2a and 6.2b	Water quality in TMDL waterbodies meet the Final RWLs
6.b.(3)(c)	Final Effluent Limits (ELs) in Table 6.2c	MS4 discharges to TMDL waterbodies meet the Final ELs
6.b.(3)(d)	Waste Load Reduction (WLR) requirements in Table 6.3	MS4 discharges to TMDL waterbodies meet WLR requirements
6.b.(3)(e)[2]	Extent and Magnitude of Natural Source Contributions	Demonstrate exceedances of Final RWLs in TMDL waterbodies are due to natural sources
6.b.(3)(f)[3]	Water Quality Improvement Plan (WQIP) Implementation Schedules and Milestones consistent with applicable compliance deadlines	Implementation of water quality improvement strategies and methods in accordance with the schedules and milestones in the WQIPs accepted by the San Diego Water Board

[2] The natural source compliance pathway (i.e., Specific Provision 6.b.(3)(e) is contingent upon a Basin Plan amendment that recalculates waste load allocations in accordance with the bacteria water quality objectives and implementation provisions in the California Ocean Plan and/or ISWEBE, as applicable, the TMDL implementation provisions in Chapter Four of the San Diego Water Board's Basin Plan and, if applicable, site-specific objectives in accordance with those requirements.

[3] The WQIP compliance pathway (i.e., Specific Provision 6.b.(3)(f) and the Prohibitions and Limitations Compliance Option discussed in Finding No. 6 must be based on a reasonable assurance demonstration acceptable to the San Diego Water Board where the schedules and milestones will attain the final WQBELs by the final TMDL compliance date.

Part I, Section B. Time Schedule Order Responsible Permittees

7. **Dry Weather Bacteria TMDLs Compliance Determinations.** Most Responsible Permittees elected to demonstrate compliance with the final WQBELs by meeting final dry weather RWLs (Specific Provision 6.b.(3)(b).) The San Diego Water Board reviewed the most recent dry weather receiving water data collected from October 1, 2020, through September 30, 2022, for all waterbodies.[4] The data was collected from the twenty beaches and creeks subject to the WQBELs in the Bacteria TMDL. The data reviewed included receiving water data collected by the TMDL Responsible Permittees and other relevant receiving water data.[5] These data were reviewed to determine whether FIB concentrations in the TMDL waterbodies met the Final RWLs for FIB, as specified in Tables 6.2a and 6.2b of Attachment E to the Regional MS4 Permit (i.e., the RWL compliance pathway), before and after the final dry weather compliance date of April 4, 2021. Using the assessment methodologies specified in Specific Provision 6.d, the San Diego Water Board identified the waterbody segments where the FIB levels do not meet the Final RWLs during dry weather. Table 2 below identifies the waterbody segments that are not meeting the Bacteria TMDL dry weather Final RWLs.

   The Aliso Creek and San Juan Creek Responsible Permittees elected to comply with Specific Provision 6 through the pollutant load reduction pathway (Specific Provision 6.b.(3)(d)). Review of the supporting documentation submitted in the 2020-2021 South Orange County WQIP Annual Report showed that the bacteria load reductions were calculated based on receiving water monitoring data and not outfall monitoring data as required by Specific Provision 6.b.(3)(d)). The Responsible Permittees for the Main Laguna Beach segment of the Pacific Ocean Shoreline in the South Orange County watershed elected to comply with Specific Provision 6 through the no discharge pathway (Specific Provision 6.b.(3)(a)) based on implementation of 42 existing low flow diversions within the South Orange County watershed. However, review of the data from this segment included evidence of dry weather discharges, so the Responsible Permittees discharging into the Main Laguna Beach segment of the Pacific Ocean Shoreline have not demonstrated compliance under Specific Provision 6.b.(3)(a). Therefore, the San Diego Water Board determined compliance with the receiving water pathway (Specific Provision 6.b.(3)(b)) since the Responsible Permittees for these waterbodies had identified the receiving water pathway as an alternative compliance pathway they were pursuing. The City of San Diego elected to comply with Specific Provision 6 through the no discharge pathway (Specific Provision 6.b.(3)(a)) based on implementation of low flow diversions at the Casa Beach (Children's Pool) and Windansea Beach (Palomar Avenue) segments of the Pacific Ocean Shoreline in the Mission Bay watershed. However, review of the data from these segments included evidence of dry weather discharges therefore the City of San Diego discharging into

[4]The San Diego Water Board reviewed data from the 2019-2020 and 2020-2021 monitoring years for the Aliso Creek, Aliso Creek Mouth, San Juan Creek and San Juan Creek Mouth waterbody segments since the 2021-2022 data was not available during compliance determinations in December 2022.

[5] The other relevant receiving water data refer to the FIB data collected by the San Diego County Department of Environmental Health under the AB411 program for relevant beach segments in Table 6.0 of Attachment E, between October 1, 2020, through September 30, 2022. Data are available for download at the Beach Watch Program website hosted by the State Water Board at: https://www.waterboards.ca.gov/water_issues/programs/beaches/search_beach_mon.html

these segments did not demonstrate compliance under Specific Provision 6.b.(3)(a). The San Diego Water Board determined compliance for these segments with the receiving water pathway of Specific Provision 6.b.(3)(b).

8. **TSO Responsible Permittees.** The TMDL Responsible Permittees included in Table 2 below discharge bacteria from their MS4s into the corresponding receiving waterbodies and segments in excess of the final dry weather bacteria WQBELs, therefore causing or contributing to FIB exceedances of water quality objectives in those receiving waters and are violating or threatening to violate the final dry weather bacteria WQBELs in Specific Provision 6 and the receiving water limitation prohibition of Provision A.2.a with respect to bacteria water quality objectives. Therefore, the TMDL Responsible Permittees identified in Table 2 are designated as responsible for compliance with the directives and provisions of this Time Schedule Order (TSO).

Table 2. List of Waterbody Segments or Areas Not Meeting Final RWLs (TSO waterbodies) and Corresponding TSO Responsible Permittees

Watershed Management Area	Waterbody	Segment or Area	TSO Responsible Permittees
South Orange County	Pacific Ocean Shoreline	- Cameo Cove at Irvine Cove Drive – Riviera Way - at Heisler Park – North	City of Laguna Beach County of Orange Orange County Flood Control District
	Pacific Ocean Shoreline	- at Main Laguna Beach - Laguna Beach at Ocean Avenue - Laguna Beach at Cleo Street - Arch Cove at Bluebird Canyon Road - Laguna Beach at Dumond Drive	City of Aliso Viejo City of Laguna Beach City of Laguna Woods County of Orange Orange County Flood Control District
	Aliso Creek	- Entire reach and associated tributaries - At Mouth	City of Aliso Viejo City of Laguna Beach City of Laguna Hills City of Laguna Niguel City of Laguna Woods City of Lake Forest City of Mission Viejo County of Orange Orange County Flood Control District
	Pacific Ocean Shoreline	- Aliso Beach at West Street - Aliso Beach at Table Rock Drive - At Salt Creek (large outlet) at Monarch Beach - Salt Creek Beach at Salt Creek service road	City of Dana Point City of Laguna Beach City of Laguna Niguel County of Orange Orange County Flood Control District
	Pacific Ocean Shoreline	At San Juan Creek	City of Dana Point City of Laguna Hills City of Laguna Niguel City of Mission Viejo City of Rancho Santa Margarita City of San Juan Capistrano County of Orange Orange County Flood Control District

Watershed Management Area	Waterbody	Segment or Area	TSO Responsible Permittees
	San Juan Creek	- Lower One Mile - At Mouth	City of Dana Point City of Laguna Hills City of Laguna Niguel City of Mission Viejo City of Rancho Santa Margarita City of San Juan Capistrano County of Orange Orange County Flood Control District
	Pacific Ocean Shoreline	- Poche Beach - Ole Hanson Beach Club Beach at Pico Drain - San Clemente City Beach at El Portal Street Stairs - San Clemente City Beach at Lifeguard Headquarters - San Clemente Municipal Pier - San Clemente State Beach at Riviera Beach	City of Dana Point City of San Clemente County of Orange Orange County Flood Control District
San Luis Rey River	Pacific Ocean Shoreline	At San Luis Rey River Mouth	City of Oceanside City of Vista County of San Diego
Carlsbad	Pacific Ocean Shoreline	At Moonlight State Beach	City of Carlsbad City of Encinitas City of Escondido City of San Marcos County of San Diego
San Dieguito	Pacific Ocean Shoreline	At San Dieguito Lagoon Mouth	City of Del Mar City of Escondido City of Poway City of San Diego City of Solana Beach County of San Diego
Los Peñasquitos	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	City of Del Mar City of Poway City of San Diego County of San Diego
San Diego River	Forester Creek	Lower 1 mile	City of El Cajon City of Santee County of San Diego
	San Diego River	Lower 6 miles	City of El Cajon City of La Mesa City of Santee City of San Diego County of San Diego
	Pacific Ocean Shoreline	At San Diego River mouth at Dog Beach	
Mission Bay	Pacific Ocean Shoreline	-La Jolla Shores Beach at El Paseo Grande -La Jolla Shores Beach at Vallecitos -La Jolla Shores Beach at Avenida de la Playa - At Casa Beach, Children's Pool -South Casa Beach at Coast Boulevard -Windansea Beach at Playa del Norte	City of San Diego

Watershed Management Area	Waterbody	Segment or Area	TSO Responsible Permittees
		-Windansea Beach at Palomar Avenue -at Tourmaline Surf Park	
	Tecolote Creek	Tecolote Creek Entire Reach and Associated Tributaries	City of San Diego
San Diego Bay	Chollas Creek	Chollas Creek Lower 1.2 miles	City of La Mesa City of Lemon Grove City of San Diego County of San Diego San Diego Unified Port District

Part I, Section C.
United Sates Environmental Protection Agency (USEPA) Water Quality Criteria

9. **USEPA 2012 Recreational Water Quality Criteria.** In 2012, the USEPA released its updated recreational water quality criteria[6] (USEPA 2012 Criteria) recommendations for protecting human health in all coastal and non-coastal waters designated for primary contact recreation use. The USEPA 2012 Criteria provides two sets of recommended criteria for *E.coli* in fresh water and enterococci in both marine and fresh water based on estimated human illness rates of 32 cases of illness per 1000 people and 36 cases of illness per 1000 people. The illness rate of 36 cases per 1000 people corresponds to the *E. coli* and enterococci thresholds previously recommended by USEPA in 1986 for water contact recreation (REC-1) beneficial use.[7] The USEPA concluded in the 2012 Recreation Water Quality Criteria that either 32 cases of illness per 1000 people or 36 cases of illness per 1000 people would protect the designated use of REC-1 activities.
10. **Allowable Quantitative Microbial Risk Assessment Method to Develop Risk-based Thresholds for Alternative Indicators Other than FIB.** The USEPA 2012 Criteria and associated technical documents allow use of the Quantitative Microbial Risk Assessment (QMRA) method to develop risk-based thresholds for alternative indicators other than FIB for water bodies where the predominant sources of fecal contamination are non-human. The development of such thresholds for the alternative indicators must provide at least the same level of public health protection (while swimming) from associated gastrointestinal (GI) illness as the USEPA 2012 Criteria guidelines that recommend an allowable public health risk of no more than an average 32 to 36 cases of GI illness per 1000 people.
11. **Statewide Bacteria Water Quality Objectives (WQOs).** In 2018, the State Water Board amended the FIB WQOs for water contact recreation beneficial use (REC-1) in the Ocean Plan and the ISWEBE Plan. The bacteria WQOs include enterococci as the indictor for pathogens in ocean and brackish water (where salinities are greater than 1 part per thousand), and *E.coli* for inland surface water with the levels of these bacteria indicators corresponding to a public health risk GI illness rate of 32 cases of illness per

[6] USEPA 2012 Recreational Water Quality Criteria Document. Docket Identification Number EPA-HQ-OW-2011-0466, available on the USEPA website at https://www.epa.gov/wqc/2012-recreational-water-quality-criteria

[7] The USEPA published *E. coli* and enterococci bacteriological criteria applicable to waters designated for contact recreation (REC-1) in the Federal Register, Vol. 51, No. 45, Friday, March 7, 1986, 8012-8016.

1000 people. The statewide WQOs supersede the FIB WQOs in the Basin Plan. However, under the terms of the Ocean Plan and the ISWEBE Plan, TMDLs adopted prior to February 4, 2019, which implement numeric water quality objectives for bacteria to support REC-1 remain in effect. TMDLs adopted or recalculated after that date must implement the statewide WQOs.

12. ***E. coli* and Enterococci WQOs in the Basin Plan.** The 1994 Basin Plan includes *E. coli* and enterococci WQOs recommended by USEPA 1986 Criteria for designated REC-1 use. As excerpted in Table 3 below, these 1986 WQOs specify different concentration levels of *E. coli* and enterococci for waterbodies of different REC-1 use intensity:

Table 3. USEPA Bacteriological Criteria For Water Contact Recreation (in colonies per 100 ml)

	Freshwater		Saltwater
	Enterococci	*E. coli*	Enterococci
Steady State			
All Areas	33	126	35
Maximum			
Designated Beach	61	235	104
Moderately or Lightly Used Area	108	406	276
Infrequently Used	151	576	500

Part I, Section D. Development of Human Marker HF183 Thresholds

13. **Genetic Human Markers.** Recent research suggests that viral pathogens associated with human fecal material, such as norovirus and adenovirus, are the primary etiologic agents of swimming associated GI illness in the United States. In recent years, the use of "genetic human markers" has proven valuable in detecting human sources of fecal material in receiving waters. Genetic human markers include gene segments of the bacteria that are mostly associated with human feces, and not other non-human sources. In recent years, the detection of human associated fecal source markers, especially a state-of-the-art genetic marker HF183, has been increasingly used in microbial source tracking studies to identify fecal material of human origin.

14. **Human Marker HF183 Threshold.** Using the QMRA approach, Boehm and Soller[8] have developed risk-based thresholds (RBTs) corresponding to 32 cases of illness per 1000 people, for the human genetic marker HF183 for conditions where raw sewage is the primary source of human waste contamination. The illness rate of 32 cases of illness per 1000 people is consistent with the allowable illness rate recommended by

[8] Boehm and Soller, 2020, Refined ambient water quality thresholds for human-associated fecal indicator HF183 for recreational waters with and without co-occurring gull fecal contamination. Microbial Risk Analysis. Available at https://doi.org/10.1016/j.mran.2020.100139.

USEPA and adopted by the State Water Board for FIB objectives included in the ISWEBE Plan and the Ocean Plan. Further, Boehm and Soller used the same QMRA methodology to estimate the HF183 RBTs for enterococci and *E.coli*, corresponding to the illness rate of 32 cases of illness per 1000 people. Results of the RBT estimates for these FIB are similar to the levels recommended in the USEPA 2012 Criteria, a fact adding credence to the QMRA approach and associated RBT thresholds developed by Boehm and Soller[9] for HF183. After incorporating appropriate margins of safety, the HF183 RBTs developed by Boehm and Soller[10] of 240 copies per 100 ml for inland creeks and streams, and 60 copies per 100 ml for beaches are applicable to the twenty beaches and creeks included in the Bacteria TMDLs, where illicit discharges or sewer leaks may be the primary sources of human waste among anthropogenic sources of fecal contamination. Using a standard deviation of 0.27 for the log transformed HF183 concentrations, the San Diego Water Board calculated the corresponding Statistic Threshold Values of 530 gene copies per 100 ml for inland creeks and streams, and 130 gene copies per 100 ml for beaches. Based on the results published by Boehm and Soller[11], the San Diego Water Board also interpolated the HF183 RBTs corresponding to 36 cases of illness per 1000 people and obtained the Geometric Mean (GM) and STV values of 275 and 609 copies per 100 ml for inland creeks and streams, and 70 and 155 copies per 100 ml for beaches. Attaining these values would achieve an equivalent level of protection as the Bacteria TMDLs and WQBELs if HF183 levels in these waters are below the HF183 RBTs corresponding to 32 or 36 cases of illness per 1000 people.

Part I, Section E. Human Waste Sources and Associated Waste Loads Not Included in the Bacteria TMDL

15. **Additional Human Waste Sources and their Associated Loads Not Considered during Bacteria TMDL Development.** Between 2014 and 2018, the San Diego Water Board conducted an internal review project to determine whether, and to what extent, data support amending the REC-1 WQOs, implementation provisions for applicable TMDLs, or the TMDLs themselves. In support of the review, the Copermittees conducted several investigations, including but not limited to the Surfer Health Study[12] and the Bacteria TMDL Cost Benefit Analysis.[13] Results of the internal review project indicated that other potential sources, such as homeless encampments, sewage collection system contributions, private lateral contributions, septic system contributions, and other illicit discharges, had not been included in the existing Bacteria TMDLs sources and waste load calculations. Based on the results of the internal review project, several short term and long-term regulatory program projects were recommended for

[9] *Ibid.*
[10] *Ibid.*
[11] *Ibid*
[12] Southern California Coastal Water Research Project (SCCWRP), SCCWRP Technical Report 943, The Surfer Health Study, A Three Year Study Examining Illness Rates Associated with Surfing During Wet Weather, September 2016, available at ftp://ftp.sccwrp.org/pub/download/DOCUMENTS/TechnicalReports/943_SurferHealthStudy.pdf .
[13] The report of Cost-Benefit Analysis San Diego Region Bacteria Total Maximum Daily Loads, October 2017, available at https://www.waterboards.ca.gov/sandiego/water_issues/programs/basin_plan/docs/issue3/Final_CBA.pdf

implementation, including but not limited to the issuance of an investigative order for identifying human waste sources in the Lower San Diego River Watershed and revision of the Bacteria TMDLs.

16. **San Diego River Investigative Order.** On June 12, 2019, the San Diego Water Board issued Investigative Order No. R9-2019-0014 (San Diego River IO), to ten public agencies that own and/or operate sewer collection systems or storm drain systems, or both, in the lower San Diego River watershed. The San Diego River IO requires the named Responsible Parties to identify and quantify sources of human fecal waste to receiving waters in the lower San Diego River watershed. The receiving waters covered under the San Diego River IO include two freshwater Bacteria TMDL waterbodies - Forester Creek and the lower San Diego River. The San Diego River IO Responsible Parties have prepared and are in the process of implementing, a work plan to investigate the possible sources of human waste discharged into receiving waters in the lower San Diego River watershed, including sewage overflow and/or exfiltration from public sewer collection systems, spills and/or leakages from private laterals, deposits from homeless encampments, and onsite wastewater treatment systems. Results of these investigations are expected to further inform the San Diego River IO Responsible Parties as well as the San Diego Water Board about the existence and relative contribution of bacteria loads from sources of human wastes to receiving waters, helping to resolve the uncertainties about the "other bacteria sources" and their associated waste loads currently not included in the existing Bacteria TMDL. Results of the lower San Diego River investigation, including the relative contributions of waste loads from each potential source, will be summarized in a final report due to the San Diego Water Board on June 12, 2024.

Part I, Section F. Control Measures Implemented by TMDL Responsible Permittees

17. **Control Measures Implemented for Bacteria TMDLs.** Since the adoption of the Bacteria TMDLs in 2010, TMDL Responsible Permittees have developed and are implementing various strategies to control the discharge of bacteria from MS4s to comply with Specific Provision 6. These strategies involve the implementation of structural and non-structural Best Management Practices (BMPs) in corresponding TMDL watersheds under different stormwater management programs required by the Regional MS4 Permit.[14] Recently, multiple TMDL Responsible Permittees began to implement new strategies that target the control of bacteria and pathogen sources of human origin to comply with Specific Provision 6. Examples of structural and non-structural BMPs that have been implemented to date are provided in Table 4 below:[15]

Table 4. Examples of Structural and Non-Structural BMPs

[14] Examples of stormwater management programs include, but are not limited to, the Illicit Discharge Detection and Elimination (IDDE) Program, the Development Planning Program, the Existing Development Management Program, and the Public Education and Participation Program.

[15] The complete list of strategies and BMP projects the TMDL Responsible Permittees have implemented are available to the public upon request to the San Diego Water Board.

Structural BMPs	• Installation, operation, and maintenance of dry weather flow diversion or UV treatment systems at creek mouths • Channel rehabilitation and wetland restoration projects • Low Impact Development (LID) and green streets • Biofiltering/bioretention BMPs installation at new development and redevelopment projects
Non-Structural BMPs	• Closed-circuit television survey of sewer lines • Cleanup of homeless encampments • Establishment of Septic Pumping Rebate Program • Recreational vehicle illegal discharge surveillance • Water conservation campaign • Annual storm drain cleaning • Street sweeping and catch basin cleaning

PART II. REGULATORY CONSIDERATIONS

18. **Authority to Issue Time Schedule Order (TSO).** California Water Code (Water Code) section 13300 authorizes the San Diego Water Board to issue TSO(s) to establish schedules to prevent or correct violations of waste discharge requirements. TMDL-based final compliance deadlines cannot be extended through schedules in a stormwater management program such as a WQIP. (State Water Board Orders WQ 2015-0075 and WQ 2020-0038; Regional MS4 Permit, section II.B.3.a(1) fn. 7 and Fact Sheet, pp. F-46, F-139-140.) Rather, time schedule orders are an appropriate way to address non-compliance with final TMDL-based effluent limitations and receiving water limitations in the Regional MS4 Permit.

19. **Need for Additional Time to Comply.** Water Code section 13385, subdivisions (h) and (i), requires the San Diego Water Board to impose mandatory minimum penalties upon dischargers that violate "effluent limitations" as defined in Water Code section 13385.1. Water Code section 13385, subdivision (j)(3) exempts violations of effluent limitations from mandatory minimum penalties "where the waste discharge is in compliance with either a cease and desist order issued pursuant to section 13301 or a time schedule order issued pursuant to section 13300, if all of the [specified] requirements are met." In accordance with Water Code section 13385, subdivision (j)(3), the San Diego Water Board finds that

    a. the "effluent limitations" in Specific Provision 6.b.(2)(b) of the Regional MS4 Permit are a new, more stringent or modified regulatory requirement that became applicable to the MS4 waste discharges on April 4, 2021;

    b. the Responsible Permittees need time to conduct additional investigations to identify and quantify additional sources, such as leaking sewers including private laterals, malfunctioning septic systems, and homeless encampments, and their associated loads of human fecal waste that were not considered in the Bacteria TMDLs, and then implement new or modified control measures to comply with these effluent limitations; and

c. the new or modified control measures cannot be designed, installed, and put into operation within 30 calendar days.

20. **Global Economic Considerations.** The COVID-19 pandemic has impacted the economy around the world and has led to reduced revenues for local governments. The Responsible Permittees raised concerns regarding the economic and practical impediments of COVID-19 on their ability to implement the Bacteria TMDL-based WQBELs. Stay-at-home orders and pandemic-related safety measures increased the time needed to complete some tasks. These impacts, which began in approximately March 2020, are recent compared to the now-expired ten-year implementation schedule for dry weather bacteria requirements, as well as U.S. EPA's longstanding illicit discharge detection and elimination (IDDE) requirements,[16] the receiving water limitations prohibition,[17] and the Clean Water Act's prohibition of non-stormwater discharges. However, the San Diego Water Board recognizes this unexpected development may have affected the timelines to attain compliance with dry weather bacteria requirements. The board has also considered the costs of this TSO to ameliorate those effects.

21. **Purpose of TSO.** The purpose of the TSO is to provide the Responsible Permittees more time to attain compliance with the Bacteria TMDL-based permit requirements while protecting human health and avoiding mandatory minimum penalties until bacteria water quality objectives are attained in the receiving waters. A TSO is appropriate to allow the TSO Responsible Permittees the necessary time to resolve the uncertainties associated with the unaccounted human waste sources and pollutant loads[18] in the existing Bacteria TMDLs, and in turn, undertake actions either individually or collectively to reduce the quantity of bacteria discharged from their respective MS4s to the TSO waterbodies covered in the Bacteria TMDLs and Specific Provision 6. The TSO also aims to enhance public health protection during REC-1 activities by allowing the TSO Responsible Permittees to identify and prioritize reduction of human waste sources. Analysis of HF183 data will allow the TSO Responsible Permittees to first direct resources toward the most significant sources of bacteria associated with the highest risk drivers - waste of human origin - to achieve effective protection of public health during water contact activities. As the high-risk waste sources and the dry weather discharge from dairy/Intensive livestock facilities[19] are successfully controlled, the TSO Responsible Permittees must focus on controlling other diffuse anthropogenic FIB sources, such as trash and dog waste, to comply with the final dry weather WQBELs for the TSO waterbodies.

[16] 55 Fed. Reg. 47990 (November 16, 1990)

[17] State Water Board Order WQ 99-05

[18] Such as leaking sewers including sewer mains and private laterals, malfunctioning septic systems, and homeless encampments.

[19] QMRA results indicate that among the farm animals tested, at given level of FIB in a waterbody, the GI illness risks associated with recreational exposure impacted by direct cattle contamination may not be substantially different from those impacted by human sources (Soller et al., 2010, available at https://www.sciencedirect.com/science/article/abs/pii/S0043135410004367?via%3Dihub).

22. **Requests for a TSO.** Between June 16, 2021, and August 13, 2021, certain Responsible Permittees[20] submitted requests to the San Diego Water Board for a TSO meeting the requirements of Water Code section 13385, subdivision (j)(3) to allow more time to comply with the final dry weather WQBELs. The TSO was requested to provide time for implementing additional structural and non-structural BMPs similar to the strategies listed in Table 4 to attain compliance with the final dry weather WQBELs.

23. **TSO Requirements.** Water Code section 13385, subdivision (j)(3)(C)(iii) requires that the TSO specifies interim requirements if the final date by which compliance is required to be achieved exceeds one year from the effective date of the TSO. Since the time schedule for completion of the actions necessary to bring the waste discharge into compliance exceeds one year from the effective date of the TSO, this TSO includes interim limits and dates for their achievement. The interim limits include 1) Interim Effluent Limitations based on the FIB WQOs contained in the Basin Plan or HF183 thresholds, and allowable exceedance rates reasonably achievable for MS4 discharges in dry weather; and 2) Interim Receiving Water Limitations that require attainment of the FIB WQOs contained in the Basin Plan or HF183 thresholds, and allowable exceedance rates reasonably achievable in dry weather.

    In addition to the interim limits, this TSO requires the TSO Responsible Permittees to take specific actions strategically directed first toward control of high risk waste sources and then followed by actions directed toward other diffuse anthropogenic sources to bring their MS4 discharges into compliance with the final WQBELs for FIB. This TSO also requires modifying monitoring station locations to support more accurate receiving water condition assessment needed to determine compliance with final WQBELs for FIB.

24. **Duration of Time Schedule.** The established time schedule is as short as possible, considering the technological, operational, and economic factors that affect the design, development, and implementation of the control measures that are necessary to comply with the final dry weather WQBELs for FIB. Consistent with Water Code section 13385, subdivision (j)(3)(C), the schedule does not exceed five years from the effective date of this Order. The San Diego Water Board may, if appropriate, amend this TSO following a public hearing, to provide up to five additional years if the board finds the TSO Responsible Permittees are making diligent progress toward bringing the waste discharge into compliance and the TSO Responsible Permittees demonstrate that the additional time is necessary to comply.

25. **Pollution Prevention Plan (PPP).** Water Code section 13385, subdivision (j)(3) also requires a discharger to prepare and implement a PPP, either individually or collaboratively, pursuant to Water Code section 13263.3 in order to avoid mandatory minimum penalties. Pursuant to Water Code section 13263.3, subdivisions (d)(1)(D)

[20] The San Diego River Copermittees (City of San Diego, the County of San Diego, the City of Santee, the City of El Cajon, and the City of La Mesa) each submitted a letter requesting a TSO to implement final dry weather WQBELs for FIB. The City of San Diego requested a TSO for all TSO waterbodies for which the City of San Diego is named as a TSO Responsible Permittee in Table 2. The City of La Mesa also requested a TSO for Chollas Creek in the San Diego Bay WMA.

and (d)(2) and section 13300, the San Diego Water Board has determined that a PPP is necessary and appropriate for total coliform, fecal coliform, and enterococci.

26. **Exemption from Mandatory Minimum Penalty.** Pursuant to Water Code section 13385, subdivision(j)(3), full compliance by the TSO Responsible Permittees with requirements in this TSO exempts the TSO Responsible Permittees from mandatory minimum penalties for violations of the final effluent limitations for total coliform, fecal coliform, and enterococci applicable to the MS4 discharges during dry weather to the twenty beaches and creeks subject to the Bacteria TMDLs as set forth in Specific Provision 6.b.(2)(b).

27. **Authority Under Water Code Section 13300.** A TSO that addresses violations of receiving water limitations or requirements to implement best management practices may include the requirements described in paragraphs 22 through 24 but is not required to do so. All TSOs must "include a detailed time schedule of specific actions the discharger shall take in order to correct or prevent a violation of [permit] requirements." A TSO that is consistent with section 13385, subdivision (j)(3) will also satisfy Water Code section 13300. The San Diego Water Board finds the requirements of this Order are necessary and appropriate to ensure compliance with all final WQBELs in Specific Provision 6.

28. **Additional Enforcement Not Planned by the San Diego Water Board.** If the TSO Responsible Permittees are in compliance with their respective applicable requirements in this TSO, then it is not the San Diego Water Board's intention to take enforcement action for violations of the final dry weather bacteria water quality based effluent limitations applicable to the TSO waterbodies as set forth in Specific Provision 6. The San Diego Water Board expects the TSO Responsible Permittees to continue to comply with all other provisions of the Regional MS4 Permit, including all monitoring requirements in Specific Provision 6.d.

29. **Technical Reports**. All technical and monitoring reports required under this TSO are required pursuant to California Water Code section 13383. The San Diego Water Board needs the required information to determine compliance with the San Diego Regional MS4 Permit and this TSO. Section 13383 does not require an evaluation of the costs of monitoring and reporting.

30. **Cost Considerations.** In Order WQ 2021-0005, the State Water Board encouraged, but did not require, the regional water boards to consider a reasonable range of estimated monitoring costs and whether any necessary monitoring and reporting may be accomplished with less expense. The San Diego Water Board has considered these factors. The need for monitoring is addressed above. Estimated costs are as follows:

    a. Directive 2 requires monitoring of flow rates in dry weather-dry season and dry weather-wet season conditions, HF183 and *E.coli* in creeks and streams, and HF183 or FIB (including enterococci and fecal coliform) at beaches. The TSO Responsible Permittees are already implementing weekly sampling for enterococci, fecal coliform, and total coliform at each TMDL compliance station in dry weather-dry season conditions. South Orange County TSO Responsible Permittees have also been sampling beach stations for these FIB on a weekly basis in dry weather-wet season conditions. In the past two years, most TSO Responsible Permittees in

South Orange County and San Diego have also included *E.coli* analysis for creeks and streams. The cost of collectively analyzing total coliform, fecal coliform, and enterococci ranges from $150 - $200 per sample and that for *E.coli* monitoring ranges from $50 - $70 per sample. A range of zero to ten samples, in addition to the existing monitoring activities by TSO Responsible Permittees, are needed for FIB sampling at each station. As a result, the additional cost for FIB monitoring incurred by Directive 2 is expected to be minimal to insignificant (up to about $2,000) for each station. With respect to HF183 analysis, South Orange County TMDL Responsible Permittees have identified HF183 monitoring as a BMP and included such monitoring in their WQIP strategy for complying with the bacteria WQBELs. The HF183 monitoring cost ranges from $200 to $400 per sample. If this compliance determination option is selected, approximately 34 samples would be required to demonstrate human health risks remain acceptable until the TMDL Responsible Permittees attain compliance with the bacteria WQBELs.

b. Directive 4.A (watershed survey) may require installation of one or two continuous flow logger sets per water quality segment listed in Table 2, at a cost of approximately $600/set, plus negligible additional staff time to install and retrieve each logger set during routine monitoring. Because the Responsible Permittees' current monthly sampling frequency may not be adequate during the wet season to demonstrate the complete elimination of MS4 discharges in the dry weather-wet season, installation of the flow monitors at creek compliance stations is necessary to confirm the absence of flow during the dry weather-wet season. Installation of flow monitors and collection of water chemistry at creek compliance stations could cost approximately $1500/site, if long hikes to access the creek is necessary. Easier to reach creek sampling locations could cost less.

c. Directive 4.B (investigate and abate anthropogenic sources) and Directive 3 (comply with final WQBELs) do not add to the requirements of the Regional MS4 Permit. Specific Provision 6.d required the Responsible Copermittees to complete initial source identification and abatement no later than April 4, 2021, and on an ongoing basis thereafter. Investigative Order No. R9-2019-0014 already requires the Cities of El Cajon, La Mesa, Santee and San Diego and the County of San Diego to conduct source identification and associated monitoring and reporting described in Directive 4.B.1.

d. Directive 5 (Pollution Prevention Plan) largely duplicates requirements of the Regional MS4 Permit. Separate reporting is necessary to track compliance with this TSO and progress toward attaining final WQBELs. Any additional reporting costs are expected to be minimal.

e. Directive 6 requires semiannual reporting by the dates listed in Table 8 (July 31st and January 31st of each year following the effective date of the TSO). Depending on the complexity of the watershed, including but not be limited to, hydrology, geology, and different waste sources, the cost to include the specific information in Directive 6.A (TSO compliance reporting) for each watershed may range from $3,000 to $5,000. This reporting is necessary for the San Diego Water Board to track and evaluate the effectiveness of TSO Responsible Permittees' source identification and abatement

actions in controlling the anthropogenic sources of FIB in MS4 discharges and receiving waters, to effectively protect public health during REC-1 activities.

f. The Responsible Permittees already submit WQIP annual reports each year by January 31st as part of the Regional MS4 Permit requirements in Provision F.3.b.(3). The semiannual reporting required in this TSO is necessary for the Responsible Permittees to report progress with meeting the requirements of this TSO and the final WQBELs.

The burden, including costs, of the monitoring and reporting required by this Order bear a reasonable relationship to the need for the reports and the benefits to be obtained from the reports.

31. **CEQA Exemption**. This TSO is being issued to enforce an existing NPDES permit and is therefore exempt from the California Environmental Quality Act (Public Resources Code section 21100 et seq.) (CEQA) in accordance with Water Code section 13389 and section 15301 of Title 14 of the California Code of Regulations. This TSO is being issued for the protection of the environment. Therefore, issuance of this TSO is exempt from the provisions of CEQA in accordance with sections 15308 and 15321(a)(2) of Title 14 of the California Code of Regulations.

32. **Delegation of Authority to Executive Officer**. The San Diego Water Board by prior resolution has delegated all matters that may legally be delegated to its Executive Officer to act on its behalf pursuant to Water Code section 13223. Therefore, the Executive Officer is authorized to act on the San Diego Water Board's behalf on any matter within this TSO, unless such delegation is unlawful under Water Code section 13223, or this Order explicitly states otherwise

33. **Public Notice.** The San Diego Water Board has notified the Responsible Permittees and interested agencies and other persons of its intent to issue this TSO concerning compliance with waste discharge requirements. The San Diego Water Board also provided the public with notice of its intent to adopt this TSO and allowed more than 30 days for public comment.

34. **Consideration of Public Comment.** The San Diego Water Board has considered the written and oral comments received pertaining to the TSO.

PART III.

TIME SCHEDULE ORDER DIRECTIVES

THEREFORE, IT IS HEREBY ORDERED that, pursuant to Water Code sections 13300, 13383, and 13385, in order to meet the requirements of the final dry weather WQBELs in Specific Provision 6 of Attachment E to the Regional MS4 Permit for FIB, the Responsible Permittees listed below must comply with the directives, reporting, and provisions of this TSO.

Table 5. List of TSO Responsible Permittees

San Diego County TSO Responsible Permittees	Orange County TSO Responsible Permittees
City of Carlsbad	City of Aliso Viejo
City of Del Mar	City of Dana Point
City of El Cajon	City of Laguna Beach
City of Encinitas	City of Laguna Hills
City of Escondido	City of Laguna Niguel
City of La Mesa	City of Laguna Woods
City of Lemon Grove	City of Lake Forest
City of Oceanside	City of Mission Viejo
City of Poway	City of Rancho Santa Margarita
City of San Diego	City of San Clemente
City of San Marcos	City of San Juan Capistrano
City of Santee	County of Orange
City of Solana Beach	Orange County Flood Control District
City of Vista	
County of San Diego	
San Diego Unified Port District	

Directive 1. Interim Bacteria Effluent Limitations. On and after the effective date of this TSO, discharges in dry weather from a TSO Responsible Permittee's MS4 outfalls to each corresponding TSO waterbody segment[21] and associated tributaries thereto (TSO watersheds), collectively must not exceed the interim effluent bacteria limitations for each corresponding TMDL waterbody type by **September 30, 2026**, or the deadlines specified in Table 6.a and Table 6.b below. TSO Responsible Permittees must demonstrate compliance with the Interim Effluent Limitations through the method described in Directive 1.A or Directive 1.B below. Compliance must be demonstrated throughout the TSO and reported through semiannual reports required by Directive 6.

[21] See Table 2 of this TSO.

Table 6.a Interim Bacteria Effluent Limitations for MS4 Discharges to TSO Beaches, Saline Waters, and Tributaries Thereto in Dry Weather

Indicators	MS4 Discharge to Beach		MS4 Discharge to Saline Water [1]		MS4 Discharge to Inland Tributaries [2] to Beach [3] and Saline water	
	Single Sample Maximum (SSM) [4]	Allowable Exceedance Frequency (%) [5]	Single Sample Maximum (SSM) [4]	Allowable Exceedance Frequency (%) [5]	Single Sample Maximum (SSM) [4]	Allowable Exceedance Frequency (%) [5]
Enterococci	104 cfu/100 ml	10%	276 cfu/100 ml	20%	Not Applicable	
E.coli	Not Applicable		Not Applicable		406 cfu/100ml	**Compliance Required from TSO Effective Date through Sept 30, 2025** 57% **Compliance Required from Sept 30, 2025 through Sept 30, 2026** 50%
Human Marker HF183 [6]	155 gene copies/100 ml	10%	155 gene copies/100 ml	10%	609 gene copies/100 ml	10%

Notes for Table 6.a

[1] Saline waters refer to lagoons and estuaries where the salinity is greater than 1 part per thousand more than 5 percent of the time.

[2] Inland tributaries do not include the tributaries to Aliso Creek, San Juan Creek, Lower San Diego River, Forrester Creek, Tecolote Creek and Chollas Creek. The Interim Effluent Limits for these creek and stream systems are specified in Table 6.b.

[3] Beach refers to ocean coastal waters.

[4] SSM is a maximum value not to be exceeded in any single sample. *E. coli* SSM value obtained from Table 3.

[5] The Allowable Exceedance Frequency must be applied with values shown in the Table. Tables 3.2 and 4.2 in the State Water Board 303(d) Listing Policy do not apply to this Table. The single sample maximum exceedance frequency must be calculated by dividing the number of dry weather samples that exceed the single sample maximum effluent limitations in the Table by the total number of dry weather samples collected during the monitoring year (October 1 to September 30 of the following year).

[6] Refer to Finding No. 14 for the human marker HF183 thresholds corresponding to 36 cases of illness per 1000 water contact recreators. Commonly used analytical methods for Human Marker HF183 analysis that do not differentiate live vs. dead cells may indicate false positive illness rates in the exposure of water contact recreators to disinfected recycled water or disinfected treated water. HF183 may not be used to demonstrate compliance where the sources of HF183 are disinfected recycled water or disinfected treated wastewater.

Table 6.b Interim Bacteria Effluent Limitations for MS4 Discharges to TSO Creeks and Streams and Tributaries Thereto in Dry Weather

Indicator	MS4 Discharge to TSO Creeks and Streams, Including Tributaries			
	Water Body	Single Sample Maximum (SSM) [1]	Allowable Exceedance Frequency (%) [2]	
			Compliance Required from TSO Effective Date through Sept 30, 2025	Compliance Required from Sept 30, 2025 through Sept 30, 2026
E.coli	Aliso Creek	406 cfu/100ml	57%	50%
	San Juan Creek		80%	50%
	Lower San Diego River (non-Forrester Creek)		68%	50%
	Forrester Creek		80%	50%
	Tecolote Creek		67%	50%
	Chollas Creek		57%	50%
HF183 [3]	Aliso Creek, San Juan Creek, Lower San Diego River, Forrester Creek, Tecolote Creek, Chollas Creek	609 gene copies/100 ml	10%	

Notes for Table 6b

[1] SSM is a maximum value not to be exceeded in any single sample. *E. coli* SSM value obtained from Table 3.

[2] The Allowable Exceedance Frequencies for creeks and streams, including tributaries thereto, are based on existing MS4 outfall discharge conditions in the respective tributaries to the corresponding waterbodies. The single sample maximum exceedance frequency must be calculated by dividing the number of dry weather samples that exceed the single sample maximum effluent limitations in the Table by the total number of dry weather samples collected during the monitoring year (October 1 to September 30 of the following year).

[3] Refer to Finding No. 14 for the human marker HF183 thresholds corresponding to 36 cases of illness per 1000 water contact recreators. Commonly used analytical methods for Human Marker HF183 analysis that do not differentiate live vs. dead cells may indicate false positive illness rates in the exposure of water contact recreators to disinfected recycled water or disinfected treated water. HF183 may not be used to demonstrate compliance where the sources of HF183 are disinfected recycled water or disinfected treated wastewater.

1.A. **Eliminate Effluent Discharge.** Eliminating all direct and indirect dry weather MS4 discharges to the receiving waters listed in Table 2. To show all direct dry weather discharges have been eliminated, a Responsible Permittee must demonstrate that the MS4 outfall or MS4 conveyance system at the point of discharge is dry in dry weather. The compliance demonstration must include weekly MS4 outfall or weekly MS4 conveyance system monitoring to demonstrate continually dry MS4 conditions in dry weather. To show all indirect dry weather discharges have been eliminated, the Responsible Permittee must demonstrate that the receiving water segment between the MS4 discharge point(s) and the corresponding TSO waterbody listed in Table 2 is continually dry in dry weather. This compliance demonstration must include weekly monitoring of the receiving water segment to document with photographic evidence the dry condition, OR

1.B. **Comply with Interim Effluent Limitation.** Conducting dry weather outfall discharge monitoring for FIB or for the human marker HF183. The TSO Responsible Permittees shall collectively or individually conduct weekly dry weather outfall discharge monitoring for the entire monitoring year from MS4 outfalls discharging to the receiving waters listed in Table 2 (TSO outfalls). Each Responsible Permittee must demonstrate that dry weather MS4 discharges from its TSO outfalls to a waterbody collectively do not exceed the applicable allowable exceedance frequencies in Table 6.a and Table 6.b for FIB or HF183 for that waterbody. All Responsible Permittees draining to the same TSO waterbody must agree to monitor the same analyte (FIB or HF183). The demonstration shall be based on monitoring one or more outfalls selected by the Responsible Permittee(s) and approved by the San Diego Water Board, using a scientifically and statistically sound methodology to choose the number and location of outfalls needed to collect data that are representative of all the Responsible Permittee's MS4 discharges to the TSO waterbody in question.

Directive 2. Interim Receiving Water Limitations. Discharges from MS4s owned and operated by a TSO Responsible Permittee must not cause or contribute to gastrointestinal illness rates greater than 36 per 1,000 water contact recreators in corresponding TSO waterbodies. The TSO Responsible Permittees must comply with the Interim Receiving Water Limitations in receiving waters for HF183 or FIB, or no flow conditions, in the shortest time required to achieve full compliance with this requirement, but no later than **September 30, 2026.** The data collection period ends on the last day of the 2026 monitoring year on September 30, 2026, one year prior to the end of this time schedule order. TSO Responsible Permittees must report compliance with the interim receiving water limits in the semiannual reports as required in Directive 6. The TSO Responsible Permittees must demonstrate discharges from their MS4s do not cause or contribute to gastrointestinal illness rates greater than 36 per 1,000 water contact recreators by one or more of the following methods:

2.A. Demonstrate that human source marker HF183 or FIB in TSO waterbodies do not exceed the thresholds listed in Table 7 below.

Table 7. **Thresholds for Demonstrating Compliance with Interim Receiving Water Limitations -** Magnitudes of Human Marker HF183 and FIB that Cause Estimated Illness Rates of 36 per 1000 Contact Water Recreators or Less

Water Quality Indicator Type	Water Quality Indicator Name	Beach and Saline Water[1] Geometric Mean (GM)	Beach and Saline Water[1] Single Sample Maximum (SSM)	Creeks and Streams Geometric Mean (GM)	Creeks and Streams Single Sample Maximum (SSM)	Allowable Exceedance Frequency (%) for GM and SSM[4]
Human Marker	HF183[2][3]	70 gene copies/100mL	155 gene copies/100mL	275 gene copies/100mL	609 gene copies/100mL	10%
Fecal Indicator Bacteria	Enterococci	35 cfu/100 ml	104 cfu/100ml	Not Applicable	Not Applicable	10%
Fecal Indicator Bacteria	Fecal Coliform	200 cfu/100ml	400 cfu/100ml	Not Applicable	Not Applicable	10%
Fecal Indicator Bacteria	*E.coli*	Not Applicable	Not Applicable	126 cfu/100ml	235 cfu/100ml	10%

Notes for Table 7

[1] Magnitudes from the Ocean Plan and the ISWEBE Plan for waters where the salinity is greater than 1 part per thousand more than 5 percent of the time.

[2] Commonly used Human Marker HF183 analytical methods do not differentiate live vs. inactivated cells and may indicate false positive illness rates in the exposure to disinfected recycled water or disinfected treated water. HF183 may not be used to demonstrate compliance where the sources of HF183 are disinfected recycled water or disinfected treated wastewater.

[3] HF183 concentrations must not exceed 90 gene copies/100 mL, if water quality data show gull marker concentrations (i.e., obtained using genetic markers such as CAT or LeeSeagul marker specific to gull feces) in TSO beaches are less than 100 gene copies/100 mL.

[4] The waterbody GM in any six-week interval must be calculated weekly on a rolling basis and must not be exceeded more than 10 percent of the time. The GM value must be applied based on a statistically sufficient number of samples, which is generally not less than five samples distributed over a six-week period. The geometric mean exceedance frequency must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in the Table by the total number of geometric means calculated from dry weather samples collected during the monitoring year (October 1 to September 30 of the following year). However, if a statistically sufficient number of samples is not available to calculate the GM, then attainment of the receiving water limitation shall be determined based only on the SSM. The waterbody SSM must not exceed the applicable SSMs more than 10 percent of the time. The single sample maximum exceedance frequency must be calculated by dividing the number of dry weather samples that exceed the single sample maximum receiving water limitations in the Table by the total number of dry weather samples collected during the monitoring year (October 1 to September 30 of the following year).

2.A.1 **Compliance with Table 7 Interim Receiving Water Limits:** The TSO Responsible Permittees must collect, at a minimum, 34 dry weather samples each monitoring year in the TSO receiving waters at each TMDL compliance station. The TSO Responsible Permittees must assess the data for GM and SSM exceedances of the applicable water quality thresholds in Table 7. The data must be complied and assessed as set forth below. The compliance period ends on the last day of the 2026 monitoring year (**September 30, 2026**). TSO Responsible Permittees must report compliance with the interim receiving water limits in the semiannual reports as required in Directive 6.

a. Measure and report flow rates for each monitoring event in creeks and streams. If a TMDL compliance station in creeks or streams is dry or only contains ponded water, the TSO Responsible Permittees shall examine the flow conditions within 200 meters (upstream and downstream) from the compliance station in the creeks and streams and collect samples if flows are observed within 200 meters from the compliance station. The flows do not need to be sampled if the flows co-locate with other TMDL compliance stations sampled under Specific Provision 6. Report “not sampled (NS)” if the compliance station and the creek or stream bed within 200 meters from the station is dry or ponded. This result must not be included in the assessment for GM or SSM.

b. For creek or stream systems, the 34 samples must be concurrently analyzed for HF183 AND *E.coli*.

c. For beach segments, the 34 samples must be analyzed for HF183 or FIB (both enterococci and fecal coliform).

d. At least 14 of the 30 samples must be collected in consecutive weeks, in dry weather between October 1 of the first year through April 30 of the next year; and

e. At least 20 of the 30 samples must be collected in consecutive weeks, in dry weather between May 1 through September 30.

2.A.2 **No Direct or Indirect Discharge:** Demonstrate that there is no direct or indirect discharge from the TSO Responsible Permittees’ MS4s to the receiving waters and that the segment(s) between the TSO Responsible Permittees’ MS4s and the TSO waterbodies in Table 2 is(are) dry as required in Directive 1.A.; OR

2.A.3 **Other Compliance Method:** Demonstrate, using another method subject to the acceptance by the San Diego Water Board, receiving waters OR discharges from the TSO Responsible Permittee’s MS4s do not cause or contribute to gastrointestinal illness rates greater than 36 per 1,000 water contact recreators. The San Diego Water Board must approve the use of any alternative compliance determination method.

Directive 3. Attain and Demonstrate Compliance with Regional MS4 Permit. No later than **January 31, 2028**, the TSO Responsible Permittees must attain and report compliance with the final dry weather WQBELs for fecal indicator bacteria (FIB) in accordance with Specific Provision 6.b, including future amendments thereof, using data collected through the end of the 2027 monitoring year (**September 30, 2027**).

Directive 4. Required Watershed Control Measures. The TSO Responsible Permittees for the TSO waterbodies in San Juan Creek, Aliso Creek, the lower San Diego River, Forrester Creek, Tecolote Creek, and Chollas Creek must implement and complete the following watershed control measures no later than the compliance date specified for each task below, in accordance with Regional MS4 Permit Provision A (Prohibitions and Limitations), Provision E.2 (Illicit Discharge Detection and Elimination), and the waste load reduction requirements in Specific Provision 6. Directive 4.A below applies only to those TSO Responsible Permittees in the Chollas Creek and Tecolote Creek waterbodies.

4.A **Watershed Survey.** The TSO Responsible Permittees for the Chollas Creek and Tecolote Creek waterbodies must complete a watershed hydrology survey for Chollas Creek and Tecolote Creek in conformance with the directives below, in order to determine whether these waterbodies are ephemeral. Results of the watershed survey must be submitted as part of the Compliance Report due July 31, 2024:

The watershed hydrology survey must be conducted by using continuous flow monitoring devices, performing site monitoring visits at sufficient frequency to identify and delineate the lateral extent of ephemeral segments in the relevant creeks and streams surveyed, and analyzing available existing data since 2015 of comparable quality and frequency. The frequency of monitoring site visits must be at least weekly over a six-month interval that spans from October 1 of the first TSO year through April 30 of the second TSO year.

If perennial or intermittent segments were present in the waterbodies surveyed but historical TMDL compliance station(s) is(are) located within the ephemeral segment, the TSO Responsible Permittees must:

a. Adjust the location of the historical TMDL compliance station(s) to the perennial segment(s), or the intermittent segment(s) if the perennial segments are not available; OR

b. Add at least one additional TMDL compliance station to the perennial segment(s), or the intermittent segment(s) if perennial segments are not available.

The adjusted and newly added station(s) must, at a minimum, be monitored in accordance with the compliance monitoring program required in Directive 2.A.1 above to demonstrate compliance with Directives 2 and 3.

4.B **Investigate and Abate Anthropogenic Sources.** The TSO Responsible Permittees for the TSO waterbodies in San Juan Creek, Aliso Creek, the lower San Diego River, Forrester Creek, Tecolote Creek, and Chollas Creek must, no later than **September 30, 2027**, investigate and abate anthropogenic sources of FIB as follows:

4.B.1 **Source Investigations.** The TSO Responsible Permittees for the TSO waterbodies in San Juan Creek, Aliso Creek, the lower San Diego River, Forrester Creek, Tecolote Creek, and Chollas Creek must conduct source tracking investigations, including necessary monitoring of outfall discharges, and receiving waters of the TSO waterbodies and associated tributaries, to identify the sources of FIB and HF183 exceedances in MS4 discharges or receiving waters. The TSO Responsible Permittees must use analytical methods, with appropriate method of detection limits and

quantification levels for analyzing genetic markers of human and non-human sources. The analytical methods for genetic marker analysis must be accepted by the USEPA, the State Water Board, or the San Diego Water Board.

4.B.1.a **Microbial Source Identification Work Plan.** The TSO Responsible Permittees must, either individually or jointly, submit Microbial Source Identification Work Plans (MSIWPs) for their corresponding TSO waterbodies to the San Diego Water Board. **MSIWPs must be submitted to the San Diego Water Board by July 31, 2023.** A MSIWP previously approved by the San Diego Water Board will be deemed to satisfy this Directive if the MSIWP meets the requirements in this Directive. TSO Responsible Permittees relying on a previously approved MSIWP must so notify the San Diego Water Board by **July 31, 2023**. At a minimum, MSIWPs must include the following information:

1. Summaries of the hydrology and FIB pollution conditions in receiving waters and storm drains in the TSO watersheds.
2. Map(s), including associated Excel tables and GIS files, showing the lateral extents, and associated flowing or non-flowing time periods, of the perennial, intermittent, and ephemeral stream segments in the TSO watersheds;
3. Tabulated summaries (in Excel) of the water quality conditions with respect to FIB and Human Marker HF183 levels, as available, in perennial and intermittent reaches in the past five years;
4. Tabulated summaries (in Excel) of the flow conditions, in terms of continuous, intermittent, or dry, and water quality conditions, in terms of FIB and HF183 levels, of MS4 outfalls that directly or indirectly discharge to the beach segments, or perennial reaches and intermittent reaches in TSO watersheds over the past five years;
5. A summary of the potential high risk FIB sources (in Excel and/or GIS), including but not be limited to, locations and conditions of sewer mains and private laterals, septic systems, transient populations, and as applicable, animal feeding operations in the TSO watersheds;
6. A summary of the potential point discharges and diffuse sources of FIB (in Excel and/or GIS), including and not limited to, horse ranches, outfalls or receiving water segments with high density of trash, and developed communities with high density of dog waste in the TSO watersheds;
7. An evaluation of whether dry weather discharges from outfalls presently monitored pursuant to Provision D.2.b of the Regional MS4 Permit are representative of the FIB levels, from all outfalls owned and operated by the TSO Responsible Permittees in the corresponding TSO watersheds. Further, to achieve the goal of accurately representing FIB waste discharges amongst all MS4 outfalls owned and operated by the TSO Responsible Permittees, the evaluation must include an assessment of whether additional outfalls should be added to the outfalls presently monitored pursuant to Provision D.2.b of the Regional MS4 Permit and/or if the monitoring frequency at the presently monitored outfalls should be increased. These evaluations must consider dry weather outfall monitoring results collected

during monitoring fiscal years 2017-2018, 2018-2019, 2019-2020, 2020-2021, and 2021-2022. All data must be presented in a tabulated Excel summary format and include a GIS map of the outfall locations sampled;

8. An analysis of how to use the dry weather outfall monitoring results from data collected pursuant to Provision D.2.b of the Regional MS4 Permit to assist the source investigation activities required under Directive 4.B.1.a.10 below;
9. A summary of the GPS locations in a GIS map of the TSO outfalls to be monitored under Directive 1.B, if Directive 1.B is selected to demonstrate compliance with the Interim Effluent Limits required in Directive 1, and the rationale and justification that discharges from these TSO outfalls are representative of the MS4 discharges, in terms of FIB levels, from all outfalls owned and operated by the TSO Responsible Permittees in the TSO watersheds in dry weather; and
10. A summary of the source identification strategies, activities, and their associated schedules including milestones throughout the source investigation. Schedules must include but not be limited to, dates for any desktop analysis or estimation of potential source contributions, prioritization criteria for investigative activities, field surveys, and outfall and receiving water sampling, and data analysis.

4.B.2 **Corrective Actions to Abate Anthropogenic Sources**. The TSO Responsible Permittees for the TSO waterbodies in San Juan Creek, Aliso Creek, the lower San Diego River, Forrester Creek, Tecolote Creek, and Chollas Creek must take timely corrective actions to abate anthropogenic sources identified in Directive 4.B.1 above, including but not limited to, human and livestock waste sources, in accordance with Regional MS4 Permit Provisions A (prohibitions and limitations) and Provision E.2 (illicit discharge detection and elimination), and the waste load reduction requirements in Specific Provision 6.

4.B.2.a. **Microbial Source Abatement Work Plans.** The TSO Responsible Permittees must individually or jointly submit Microbial Source Abatement Work Plans (MSAWPs) for their corresponding TSO watersheds to the San Diego Water Board **no later than July 31, 2025.** A MSAWP previously approved by the San Diego Water Board will be deemed to comply with this Directive if the MSAWP meets the requirements in this Directive. TSO Responsible Permittees relying on a previously approved MSAWP must so notify the San Diego Water Board by **July 31, 2025.** The MSAWPs must summarize results of the source investigation activities conducted and the FIB sources (both anthropogenic and natural) identified under Directive 4.B.1. The MSAWPs must propose corrective actions, strategies, activities, and associated schedules and milestones for each high-risk anthropogenic FIB source identified in Directive 4.B.1.a.5 to achieve the following:

1. Abate the human waste sources into TSO Responsible Permittee's MS4s;
2. Abate the non-human anthropogenic sources to ensure that, at a minimum, un-permitted dry-weather flow is not discharged from any livestock or animal feeding operations into MS4 systems or receiving waters; and

3. Comply with the Interim Effluent Limitations in Directive 1, Interim Receiving Water Limitations in Directive 2, and Final WQBELs in Directive 3 for MS4 discharges and TSO waterbodies.

Directive 5. Pollution Prevention Plan. The TSO Responsible Permittees must, pursuant to California Water Code section 13385, subdivision (j)(3)(D) and section 13263.3, subdivisions (d)(1)(D) and (d)(2) and no later than **January 31, 2027**, submit a Pollution Prevention Plan (PPP), either individually or collectively, for human fecal waste indicators and bacteria with a time schedule for implementation. Pursuant to California Water Code section 13263.3, subdivision (d)(2), the PPP must include, without limitation, all information listed below:

5.A A description of the human and non-human anthropogenic sources as well as natural sources of bacteria discharged from the Responsible Permittees' MS4s into the TSO waterbodies, and a comprehensive review of the processes and/or activities that result in the generation and discharge of these bacteria.

5.B An analysis of the TSO Responsible Permittees' existing pollution prevention methods to reduce the level of human waste indicators such as HF183 and fecal indicator bacteria in each of their MS4 discharges to the TSO waterbodies. The analysis must include a statement that existing pollution prevention strategies do not constitute cross media pollution transfers unless clear environmental benefits of such an approach are identified to the San Diego Water Board.

5.C A summary of additional pollution prevention measures, including goal(s) of each measure and priorities for short-term and long-term actions, to ensure effective control of human and non-human anthropogenic sources. The additional measures shall include, but not be limited to, control measures identified based on the results of watershed hydrology surveys, sanitary surveys, and/or other microbial source tracing studies. The summary of additional measures shall include a statement that planned pollution prevention strategies do not constitute cross media pollution transfers unless clear environmental benefits of such an approach are identified to the San Diego Water Board

5.D A detailed description of the tasks and the time schedules required to investigate and implement various elements of pollution prevention measures.

5.E The PPP must also identify operation practices and maintenance frequencies for existing structural BMPs, including low flow diversions, bio-retention filters, and trash excluders (including trash screens installed in catch basins) implemented to achieve the final water quality-based effluent limitations for dry weather MS4 discharges and receiving waters addressed by this TSO. For future structural BMPs implemented to achieve the final water quality-based effluent limitations, operation practices and maintenance frequencies must be developed and submitted to the San Diego Water Board as a component of the Jurisdictional Runoff Management Program Annual Report due to the San Diego Water Board on January 31 each year.

5.F A Monitoring Plan (MP) and associated Quality Assurance Project Plan (QAPP), prepared in accordance with the SWAMP QAPP guidance.[22] The MP and QAPP must include, at a minimum, the following:

1. Monitoring activities to ensure that pollution prevention measures implemented by the TSO Responsible Permittees are effective in controlling human and non-human anthropogenic sources in MS4 discharges and receiving waters;
2. Monitoring activities to demonstrate that the MS4 discharges and receiving waters are compliant with the final WQBELs specified in Directive 3;
3. Triggers to conduct additional source investigation or monitoring activities, as necessary; and
4. Triggers to update the PPP.

5.G An analysis, to the extent feasible, of the relative costs and benefits of the existing and additional pollution prevention activities. A specification of, and rationale for, the technically feasible and economically practicable pollution prevention measures selected by the TSO Responsible Permittee for implementation.

Directive 6. Compliance Reporting Schedule. The TSO Responsible Permittees must prepare and submit, either individually or collaboratively, written semiannual compliance reports as described below.

6.A **Required Information.** Semiannual compliance reports must:

1. Summarize the results of watershed surveys;
2. Describe the human and non-human anthropogenic sources of FIB and sources of HF183;
3. Describe the processes and activities that result in the generation and discharge of FIB and HF183 into the MS4s
4. Describe bacteria source investigations conducted during the previous six months;
5. Summarize source control measures implemented to abate anthropogenic human and non-human bacteria sources;
6. Present all monitoring results collected by the TSO Responsible Permittees to comply with Directive 1, Directive 2, and Directive 3. Data must be submitted in Excel CEDEN format and graphical formats;
7. Describe all data collection and other field activities which are scheduled for the next six months and provide other information relating to the progress of work, including, but not limited to, a graphical depiction of the source identification, investigation, and abatement of bacteria discharges in the TSO watersheds;

[22] Available at https://www.waterboards.ca.gov/water_issues/programs/swamp/qapp/swamp_QAPrP_2017_Final.pdf

8. Describe any modifications to the required TSO work plans that the TSO Responsible Permittees proposed to the San Diego Water Board or that have been approved by San Diego Water Board during the previous six months; and
9. Describe all delays encountered or anticipated that may affect compliance with this TSO;
10. Provide a statement by each TSO Responsible Permittee whether or not they are in compliance with the Directives of this TSO. If noncompliance is being reported, the written submission must contain a description of the noncompliance and its cause, steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance; and the anticipated time the noncompliance is expected to continue.

6.B **Submittal Schedule:** All semiannual compliance reports must be submitted to the San Diego Water Board by the (31st) day of July (for activities conducted in October through April) and the (31st) day of January (for activities conducted in May through September) of each year following the effective date of this TSO. Submission of these compliance reports must continue until the Final Compliance Report is submitted on January 31, 2028.

Table 8. Semiannual Compliance Report Submittal Schedule

Due Date	Reports Due
July 31, 2023	Progress Report 1 & Source ID Work Plan
January 31, 2024	Progress Report 2
July 31, 2024	Progress Report 3 & Watershed Survey Results required pursuant to Directive 4.A
January 31, 2025	Progress Report 4
July 31, 2025	Progress Report 5 & Source Abatement Work Plan
January 31, 2026	Progress Report 6
July 31, 2026	Progress Report 7
January 31, 2027	Progress Report 8 & Pollution Prevention Plan
July 31, 2027	Progress Report 9
January 31, 2028	Progress Report 10 & Final Compliance Report Due

Directive 7. Certification. Any person signing a document submitted under this TSO must make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

PART IV.

MISCELLANEOUS PROVISIONS AND NOTIFICATIONS

1. **TSO Reopener**. The San Diego Water Board or its Executive Officer may reopen this TSO at its discretion or at the request of any of the identified Responsible Permittees, if warranted. Lack of progress towards compliance with the applicable final water quality-based effluent limitations for MS4 discharges and receiving waters addressed by this TSO may be cause to modify the conditions of this TSO. The San Diego Water Board or its Executive Officer will evaluate whether modifications or rescission of this TSO are appropriate upon the reissuance of the Regional MS4 Permit or the effective date of a Basin Plan amendment modifying the calculation or implementation of the Bacteria TMDLs.

2. **Effective Date.** This TSO becomes effective immediately upon issuance by the San Diego Water Board.

3. **Enforcement.** Failure to comply with requirements of this Time Schedule Order may subject the Responsible Permittees to enforcement action, including but not limited to administrative enforcement orders requiring the Responsible Permittees to cease and desist from violations, imposition of administrative civil liability for violations of this Order and/or the Regional MS4 Permit pursuant to Water Code section 13350, not to exceed $5,000 per day or $10 per gallon if imposed administratively ($15,000 per day or $20 per gallon if imposed judicially) for each day in which the violation occurs and section 13385 in an amount not to exceed $10,000 per day and $10 per gallon in excess of 1,000 gallons if imposed administratively ($25,000 per day and $25 per gallon in excess of 1,000 gallons if imposed judicially) for each day in which the violation occurs, and referral to the State Attorney General for injunctive relief.

4. **Petition to State Water Board**. Any person aggrieved by this Time Schedule Order may petition the State Water Board to review the Time Schedule Order in accordance with Water Code section 13320 and the title 23 CCR section 2050 and following. The State Water Board must receive the petition by 5:00 p.m., 30 days following the date of this Time Schedule Order. Copies of the laws and regulations applicable to filing petitions may be found on the State Water Board website at

http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request. For instructions on how to file a petition for review, see the State Water Board website at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality/wqpetition_instr.shtml

I, David W. Gibson, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an order adopted by the California Regional Water Quality Control Board, San Diego Region, on Month XX, 2023.

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David W. Gibson
Executive Officer