Municipal Separate Storm Sewer System (MS4) Outfalls Monitoring Program in San Diego County Watershed Management Areas

Final Workplan

Prepared For:

The County of San Diego and Municipal Stormwater Copermittees

June 25, 2008

Revision 1 (03/17/09)

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Prepared By:

Weston Solutions, Inc.
2433 Impala Drive
Carlsbad, California 92010

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1.0 INTRODUCTION

In January 2007, the Regional Water Quality Control Board, San Diego (RWQCB) issued a National Pollutant Discharge Elimination System (NPDES) Permit Order No. R9-2007-0001 (Permit) for discharges of urban runoff from the municipal separate stormwater sewage systems (MS4s) to the San Diego Municipal Copermittees (Copermittees). The Permit includes an attachment that describes specific mandates for the Receiving Waters and Urban Runoff Monitoring and Reporting Program. This *Monitoring and Reporting Program* was designed to address the following core management questions:

1. Are conditions in receiving waters protective, or likely to be protective, of beneficial uses?
2. What is the extent and magnitude of the current or potential receiving water problems?
3. What is the relative urban runoff contribution to the receiving water problem(s)?
4. What are the sources of urban runoff that contribute to receiving water problem(s)?
5. Are conditions in receiving waters getting better or worse?

A new requirement of the Permit is a MS4 outfall monitoring program. The purpose of the program is to characterize pollutant discharges from MS4 outfalls and to assess whether these discharges contribute to the water quality problems in the receiving waters to address question 3 above. The Permit states:

"*The Copermittees shall collaborate to develop and implement a monitoring program to characterize pollutant discharges from MS4 outfalls in each watershed during wet and dry weather. The program shall include rationale and criteria for selection of outfalls to be monitored. The program shall at a minimum include collection of samples for those pollutants causing or contributing to violations of water quality standards within the watershed. This monitoring program shall be implemented within each watershed and shall begin within the 2007-2008 monitoring year.*"

This report describes the program proposed by the Copermittees to comply with this Permit requirement. The Copermittees through the Regional Monitoring Workgroup collaborated for three meetings during the summer of 2007 to develop the conceptual framework for this program. Additional details were determined during the spring of 2008. The MS4 outfall monitoring program will focus on the assessment of the water quality of discharges from MS4 outfalls and their relative contributions to receiving waters within each defined watershed management area (WMA).

The Permit provides the Copermittees flexibility to develop a workable MS4 outfall monitoring program. Specifically, section II.A.10 of the Permit Fact Sheet states:

"*Since a monitoring program for MS4 discharges is new, the Copermittees are provided significant leeway in the development and implementation of the program. The Copermittees can utilize the flexibility incorporated into the monitoring and reporting program to develop program that is workable for them while providing the necessary information.*"

BACKGROUND

The Southern California Stormwater Monitoring Coalition (SMC) developed the five core management questions identified in the Permit through a consensus building effort that included regulators, municipal copermittees, Heal the Bay and Southern California Coastal Water Research Project (SCCWRP) scientists. A guidance document entitled, "Model Storm Water Monitoring Program for Municipal Separate Storm Water Sewer Systems in Southern California" (Model Monitoring Program) was issued in 1994 (www.sccwrp.org). The Regional Board incorporated much of the Model Monitoring Program in the monitoring requirements of the Permit including MS4 outfall monitoring and a source identification monitoring program.

The Model Monitoring Program provides the following additional background on the nature of the MS4 outfall monitoring studies:

"Once monitoring or other studies demonstrate that there is a current or potential impact to receiving waters (Question 1) and describe the problem's extent and magnitude (Question 2), decisions about any management responses depend on information about the source(s) of the problem. The model monitoring framework breaks this source identification into two parts (Figure 2-1), represented by Questions 3 and 4. The purpose of this two-step process is to prioritize more detailed source identification efforts in Question 4 at only those problems for which urban runoff is a significant contributor. Question 3 begins this process by taking the information from Questions 1 and 2 and beginning to work upstream, both literally and figuratively, to better define the overall contribution of urban runoff to receiving water problems. It is important to clarify that this two-step process involving Questions 3 and 4 is not intended in any way to diminish or replace municipalities' permit requirements to reduce contaminant inputs to the maximum extent practicable. It is rather intended to help determine when additional, more detailed and extensive, upstream source identification efforts should be conducted by a municipality, with the goal of ensuring that the full burden of source identification work not be shifted to the MS4 permittees where action by them would not solve the larger problem.

The model monitoring framework assumes that, if urban runoff contributes only a very small percentage to the receiving water problem, then there would be no need for a municipal permittee to independently carry out substantial source identification efforts in addition to those activities usually carried out under the municipal stormwater permit. For a first-cut estimation, therefore, Question 3 requires only minimal resolution, including at least a rough estimate of the identity and magnitude of the non-urban runoff contributions. In many situations, aggregate estimates of the non-urban runoff contribution, rather than source-by-source estimates, may be adequate and may already be available from previous characterization and/or monitoring studies. Only if urban runoff is found to contribute significantly to receiving water problems would a municipality be required to take the lead on conducting further source identification studies at greater resolution (as described in Question 4)."

"The model monitoring framework for assessing the relative urban runoff contribution to both recreational water quality and habitat problems is primarily a matter of loads estimation at a fixed downstream reference point. Similar loads estimation approaches apply to both recreational water quality and habitat indicators, as described in the following sections, including expert judgment, visual reconnaissance, land use modeling, empirical tributary monitoring, the use of

conservative tracers, and the evaluation of existing data. The actual combination of methods in any particular instance will depend on the quantity and quality of historical data, the nature of the receiving water problem, the number and types of potential sources, and the physical structure and hydrography of the watershed."

1.1 Monitoring Goal

The goal of this monitoring program is to characterize pollutant discharges from MS4 outfalls and their relative contributions to the high priority water quality problems identified in the receiving waters within each WMA.

1.2 Monitoring Objectives

Management Question 3:

"What is the relative urban runoff contribution to the receiving water problem(s)?

The collection and analysis of discharge samples from MS4 outfalls to receiving waters will address management question 3. The MS4 outfall monitoring design is based on a combination of random and targeted samples to be collected during dry weather and wet weather periods. According to the Permit, the dry weather period is from May 1st through September 30th and the wet weather period is from October 1st through April 30th.

Random sampling will be conducted to address the following subquestions:

1. What are the characteristics of the discharges from MS4 outfalls in regard to high priority pollutants?
2. Are constituent loadings changing over time?

The probability-based design in which stations are located randomly provides the ability to draw statistically valid inferences about the region as a whole, rather than just the station itself. In the proposed design the region will be divided into nine strata that are each defined by a WMA. The six samples will be selected randomly within each strata or WMA.

Targeted sampling will be conducted to address the following subquestions:

1. Which of the targeted MS4 outfalls have the greatest pollutant loading?
2. Are the pollutant loadings decreasing over time from these MS4 outfalls?

Targeted sampling will be conducted to assess the relative contribution of a particular constituent discharged from MS4 outfalls to the high priority problems of the receiving waters. The site-specific station design of the targeted program will generate information to support source prioritization in each WMA and will assess constituent trends over time.

2.0 MONITORING DESIGN

The monitoring design is based on a combination of random and targeted sampling of discharges from MS4 outfalls that drain into receiving waters (Table 2-1). Both types of monitoring will be applied to dry weather and wet weather periods.

Table 2-1: Summary of the Proposed MS4 Outfall Monitoring Design

Season	Design Type	Outfall Diameter	Number of Samples
Dry	Random	≥36 inches	54 per year
	Targeted	Any	200 per year
Wet	Random	≥36 inches	54 per year
	Targeted	Any	9 per Permit cycle

2.1 Dry Weather Sampling

2.1.1 Random Sampling Approach

This approach is based on a stratified random study design to characterize the discharges of six MS4 outfalls discharging to receiving waters during dry weather periods in each of the nine WMAs. In this design the region is divided into nine strata that are each defined by a WMA. The six samples are selected randomly within each strata or WMA.

2.1.1.1 Selection of Sampling Locations

Sampling locations are selected by first identifying all outfalls equal or greater than 36 inches in diameter that discharge at the base or the nearest safely accessible upstream location of the MS4s drainage basin or canyon to a receiving water (includes rivers, streams, bays, estuaries, and the Pacific Ocean). To ensure that the selected outfalls are representative of all the outfalls, the entire list of outfalls will be used in the randomized selection process. Only MS4 outfalls that the jurisdictions have access to through easements and where safe access is available on foot will be included. If an outfall is not accessible or safe, the next nearest and safe outfall will be sampled

Samples of the discharges from MS4 outfalls will be collected in the order of the random selection. Outfalls without dry weather flows will be noted and the next outfall on the randomized list will be visited for sampling. Outfalls will be randomly selected each year within each WMA from the most up to date list.

2.1.1.2 Sampling Frequency

Six random sample locations will be collected annually during the dry weather season from each of the nine (9) WMAs. Precision is based on sample size. With six samples collected from each WMA (54 samples total for the region), the precision of the regional estimate of condition will be +- 10% with a 90% confidence. Each site will be sampled during an index period beginning 4 weeks following the last significant rainfall (0.2 inches or greater), but after April 30, and ending

August 1. In addition, no sampling shall occur within 72 hours of any measurable (greater than 0.1 inch) rainfall. Completing the sampling by August 1 will allow the incorporation of the results in the Annual Report and increase the likelihood of wet sites following a year of low rainfall. Without prior knowledge of rainfall, the default dry index period for this program will occur from May 1 to August 1.

2.1.1.3 Laboratory Analyses

Random samples of the discharges from the MS4 outfalls will be analyzed for the following analytes:

- Total Suspended Solids
- Total Phosphorus
- Total Nitrogen
- Total Coliforms
- Fecal Coliform, and
- Enterococcus.

These analytes are typical high priority water quality pollutants identified in the Watershed Urban Runoff Management Plans (Table 2-2). Pollutants analyzed will be the same across all WMAs so that the results will be combined and conditions assessed throughout the region.

Table 2-2: High Priority Water Quality Problems Identified in the Watershed Urban Runoff Management Plans

Watershed Management Area	Hydrologic Area	High Priority Pollutants
Santa Margarita	All	Nutrients, Sediment
San Luis Rey	All	Bacteria, Nutrients
Carlsbad	904.1, 904.2, 904.3, 904.5, 904.6	Bacteria/Pathogens
	904.3, 904.6	Sediment
	904.1, 904.2, 904.6	Nutrients
San Dieguito	All	Bacteria/Pathogens
	906.1	Sediment
Penasquitos	All	Bacteria/Pathogens
	906.1	Sediment
Mission Bay	All	Bacteria/Pathogens, Heavy Metals, Nutrients
San Diego River	All	Bacteria, Phosphorous, Total Dissolved Solids, Low Dissolved Oxygen, Turbidity
San Diego Bay	908.1	Bacteria, Gross Pollutants*, Metals, Oil & Grease, Pesticides
	908.2	Bacteria, Metals, Sediment, Trash, Pesticides
	908.3	Bacteria, Sediment, Trash

Watershed Management Area	Hydrologic Area	High Priority Pollutants
	909.1	Bacteria
	909.2	Pesticides
	910.1	Bacteria, Gross Pollutants*
	910.2	Bacteria
Tijuana River	911.1	Bacteria/Pathogens, Total Suspended Solids, Turbidity, Pesticides, Gross Pollutants*, Metals, Organics
	911.3	Manganese, pH, Color
	911.4	Bacteria/Pathogens, Turbidity, Phosphorus
	911.5	pH, Manganese, Color

2.1.2 Targeted Sampling Approach

The targeted sampling approach focuses monitoring efforts on those MS4 outfalls that are most likely to contribute to receiving water problems (e.g., largest potential pollutant loading). Through a consensus-building workshop process, the Regional Monitoring Workgroup proposes to collect 200 discharge samples from targeted MS4 outfalls in the region. The choice of 200 was based on the realistic number of MS4 outfalls that have water during dry weather and are most likely to contribute to receiving waters problems in the region. To fairly distribute the 200 samples across the region, a formula based on population and land area within a WMA was used. A summary of the estimated number of samples for each jurisdiction by watershed is presented in Appendix A. These are estimates and local conditions may require adjustments.

The Dry Weather Monitoring (DWM) Workgroup was tasked by the Regional Monitoring Workgroup with the following:

(1) Identify preliminary targeted MS4 outfall monitoring locations.
(2) Provide the rationale supporting the selection of the sites, and
(3) Provide a preliminary list of pollutants for chemical analysis for each WMA.

The preliminary program developed by the DWM Workgroup was then provided to the Watershed Urban Runoff Management Workgroup for their review and opportunity to update sample locations and analytes.

2.1.2.1 Selection of Sampling Locations

The DWM Workgroup met three times to develop consensus on the details of the targeted MS4 outfall program for dry weather. A tiered approach (primary and secondary criteria) was used to select the outfall sampling locations.

The primary selection criteria are based on three outfall characteristics presented below. Each of the proposed outfall locations at a minimum met these primary selection criteria. Once the primary selection criteria were met, the secondary criteria were applied to further refine outfall site selection. A list of both primary and secondary criteria is presented below.

Primary Criteria

1. Any size outfall
2. Reported or likely to have dry weather flow
3. Outfall discharges to receiving water

Secondary Criteria

1. Surrounding land-use
2. Concentration of potential source activities
3. Reported exceedances in water quality monitoring
4. Presence of Clean Water Act 303(d) list of impaired waterbodies
5. Flow Rate
6. Best Professional Judgment and Experience

The DWM Workgroup compiled the data submitted by the individual jurisdictions into the attached table (Appendix A). The table contains information related to each outfall including the site name, the jurisdiction responsible for monitoring, coordinates, and proposed analysis. The number of sites varies proportionally by watershed and jurisdiction. The proposed analysis is based on the watershed water quality priorities, and where applicable, the 303(d) listed impairments within the watershed.

The number of MS4 Outfall Monitoring sites is set at approximately 200. The jurisdiction of Del Mar was not able to provide the required number of sampling locations due to the limited number of outfalls within their jurisdiction into receiving water known to have dry weather flow.

Each jurisdiction has also identified potential alternative sites. These alternative sites, not presented in Appendix A, may be used to substitute for the current sites after the first year of full program implementation, if any of the current locations need to be replaced. For example, if flow is eliminated at an outfall. These substitutions will be provided as needed.

2.1.2.2 Sampling Frequency

Beginning in 2008-2009, targeted dry weather sampling will occur once each year at preselected outfalls. The 200 proposed sampling locations are presented in Appendix A. In 2007-2008, one sample will be collected in each watershed to comply with the Permit that indicates the following in section II.B.1 of the Receiving Waters and Urban Runoff Monitoring program of the Permit:

"This monitoring program shall be implemented within each watershed and shall begin within the 2007-2008 monitoring year."

Based on the Permit, the dry season is from May 1 to September 30. Each site will be sampled during an index period beginning 4 weeks following the last significant rainfall (0.2 inches or greater), but after April 30, and ending August 1. In addition, no sampling shall occur within 72 hours of any measurable (greater than 0.1 inch) rainfall. Completing the sampling by August 1 will allow the incorporation of the results into the Annual Report and increase the likelihood of wet sites following a year of low rainfall. Without prior knowledge of rainfall, the default dry index period will occur from May 1 to August 1.

2.1.2.3 Laboratory Analyses

Targeted samples of the discharges from the MS4 outfalls will be analyzed for the analytes detailed in Appendix A. The selection of the analytes was developed through collaboration between the DWM and the WURMP Workgroups. The following factors were considered:

- WMA high priority pollutants
- Baseline long-term effectiveness assessment and the potential identified threats to water quality
- 2006 Clean Water Act 303(d) list of impaired waterbodies
- Total maximum daily loads
- Historical water quality data

2.2 Wet Weather Sampling

2.2.1 Random Sampling Approach

This approach is based on a stratified random study design to characterize the discharges of six MS4 outfalls discharging to receiving waters during wet weather periods in each of the nine WMAs. In this design the region is divided into 9 strata that are each defined by a WMA. The six samples are selected randomly within each strata or WMA.

This approach for MS4 outfall sample selection is analogous with the random sampling approach proposed for dry weather in section 2.1.1. The only difference is that random samples will be conducted throughout the expected wet weather season (October 1st through April 30th). Random wet weather samples will be collected during any part of a storm with at least 0.1 inch of predicted total rainfall. To the extent practical, the first storm events of the wet season will be equally sampled with subsequent storms during the later part of the wet weather season. The purpose will be to collect a distribution of grab samples from the MS4 outfalls in storms that are representative of the entire wet weather season. Sample selection, sample frequency and laboratory analyses will be as proposed for the dry weather random sampling that was presented in section 2.1.1.1, 2.1.1.2 and 2.1.1.3, respectively.

2.2.2 Targeted Sampling Approach

The targeted sampling approach is based on quantifying the relative loading of pollutants from MS4 outfalls that impact receiving waters. This approach focuses monitoring efforts on those MS4 outfalls that are most likely to contribute to receiving water problems (e.g., largest potential pollutant loading).

Only outfalls that discharge directly (or the nearest safely accessible upstream location) to a river, stream, bay, estuary, or the Pacific Ocean will be targeted for sampling. It is anticipated that one wet weather sample (composite or pollutograph sampling event) will be conducted once in each WMA over the 5 year Permit period. During Year 2 of the Permit, details of this program will be developed through a consensus process in the Copermittees' workgroups. Details of the program will be submitted in the Scope of Work due to the RWQCB on September 1, 2009.

3.0 SAMPLING METHODS

For this program the dry weather sampling period is defined as the period from May 1 (but at least 4 weeks after a 0.2 inch or greater rainfall) through August 1 not including any periods less than 72 hours after a rainfall of 0.1 inch or greater. The wet weather sampling period is from October 1st through April 30th during a predicted rainfall event of 0.1-inch or greater.

3.1.1 Sample Collection

3.1.1.1 Dry Weather Samples

Random and targeted dry weather samples will be collected as grab samples. Dry weather flow in the outlet discharging to receiving water will be measured quantitatively using standard USGS protocols (Rantz, 1982). If the discharge flows are too small to measure with instrumentation, the indirect methods described by USGS may be used to estimate flow (e.g., float method, Manning formula).

3.1.1.2 Wet Weather Samples

Random wet weather samples will be collected as grab samples at any point in the hydrograph that is still influenced by urban runoff. Samples are not collected when flows have returned to within 10% of antecedent conditions as this represents baseflow driven primarily by ground water. To the extent practical, wet weather flow in the outlet discharging to the receiving waters will be measured using standard USGS protocols (Rantz, 1982). As previously mentioned above, the targeted wet sampling will be developed during year 2 of the Permit through a consensus process in the Copermittees' workgroups. Details of the program will be submitted in the Scope of Work due to the RWQCB on September 1, 2009.

3.1.2 Sample Handling

All samples collected will be stored in the appropriate container type for the analytical method to be performed. Water quality samples will be labeled with the following information:

- project name
- sample identification number
- site location
- date and time collected
- analyses to be performed
- sample preservation
- samplers initials

Samples will then be stored on ice (4°C) for transfer to the proper analytical laboratory. The sample containers used will be certified as clean and sterile by the laboratory performing the analyses prior to sample collection. Samples will be delivered to the appropriate laboratory and analyses initiated within specified holding times. Sample storage and holding times are summarized in Table 3-1.

3.1.3 Sample Analyses

Analysis of samples should be conducted by a California ELAP certified laboratory. Random wet samples will use the same analytical methods and detection methods used in the San Diego County Municipal Copermittees 2006-2007 Urban Runoff Monitoring Report (Weston Solutions, 2008) and are presented in Table 3-2. Random dry samples will follow the protocols of the jurisdiction's dry weather program or as summarized in Table 3-1.

3.1.4 Chain of Custody

Chain-of-custody forms will be completed for each sample and accompany the samples to the appropriate laboratories.

Samples will be considered to be in custody if they are:

- In the custodian's possession or view,
- Retained in a secured place (under lock) with restricted access, or
- Placed in a container and secured with an official seal such that the sample could not be reached without breaking the seal.

Chain-of-custody procedures will be used for all samples throughout the collection, transport, and analytical process. Chain-of-custody procedures will be initiated during sample collection. A Chain-of-custody record will be provided with each sample or group of samples. Each person who will have custody of the samples will sign the form and ensure the samples will not be left unattended unless properly secured.

Documentation of sample handling and custody includes the following:

- Sample identifier
- Sample collection date and time
- Any special notations on sample characteristics or analysis
- Initials of the person collecting the sample
- Date the sample was sent to the analytical laboratory
- Shipping company and waybill information.

Completed Chain-of-custody forms will be placed in a plastic envelope and kept inside the container containing the samples. Once delivered to the analytical laboratory, the person receiving the samples will sign the Chain-of-custody form. The condition of the samples will be noted and recorded by the receiver. Chain-of-custody records will be included in the final reports prepared by the analytical laboratories and are considered an integral part of the report.

3.1.5 Quality Assurance/Quality Control

Quality assurance and quality control for sampling processes will include proper collection of the samples in order to minimize the possibility of contamination. All samples will be collected in laboratory supplied, laboratory-certified, contaminant-free sample bottles.

Evaluation of sample contamination will be performed by collecting on field blank per every 9 samples of the random samples or 6 blanks each for wet and dry weather annually. The field blank will be used to assess the sample collection, container, and transport of the samples to the analytical laboratory.

Evaluation of sample variability will be performed by collecting one sample duplicate per every 9 samples of the random samples or 6 duplicates each for wet and dry weather annually. The relative percent difference between sample duplicates will be assessed.

The chemistry analyses of the samples will be performed under the guidelines of the quality assurance and quality control programs established by the state-certified laboratory.

The dry weather targeted samples will comply with the quality assurance/ quality control requirements of the dry weather program presented in the Jurisdictional Urban Runoff Management Plan for the jurisdiction that collects the sample.

Table 3-1. Summary of Sample Analytical Methods and Requirements for Methods.

Constituent	Volume Required	Method	Target Reporting Limit	Units	Max Holding Time
General Physical and Inorganic Non-Metals					
Total Dissolved Solids (TDS)	100 ml	SM 2540C	20	mg/l	7D
Total Suspended Solids (TSS)	100 ml	SM2540D	20	mg/l	7D
Turbidity	100 ml	SM 2130A-B	0.1	NTU	48H
Total Hardness	150 ml	SM 2340B	10	mg/l	6M
pH	In field	EPA 150.1	0.1	S.U.	-
Specific Conductance	In field	SM 2510B	1	umhos/cm	-
Temperature	In field	Meter	-	-	-
Dissolved Phosphorus	250 ml	SM 4500PE	0.05	mg/l	48H
Total Phosphorus	250 ml	SM 4500PE	0.05	mg/l	28D
Nitrate as N	200 ml	SM4500NO3E	0.1	mg/l	48H
Nitrite as N	200 ml	SM4500NO2B	0.05	mg/l	48H
Total Nitrogen (sum of TKN, Nitrate as N, and Nitrite as N)	NA	Calculated	NA	NA	NA
Total Kjeldahl Nitrogen (TKN)	500 ml	SM4500C	0.1	mg/l	28D
Ammonia	250 ml	SM 4500NH3D	0.1	mg/l	28D
Chloride	250 ml	SM 4500 Cl C	0.05	mg/l	28D
Sulfate	250 ml	SM 4500 SO4 E	5	mg/l	28D
Biological Oxygen Demand, 5-day (BOD)	1000 ml	SM5210B	2	mg/l	48H
Chemical Oxygen Demand (COD)	25 ml	EPA 410.4	25	mg/l	28D
Organics					
Oil and Grease (O&G)	500 ml	EPA 1664	5	mg/l	14D
Diazinon	1 liter	EPA 625	0.05	ug/l	14D
Chlorpyrifos	1 liter	EPA 625	0.05	ug/l	14D
Malathion	1 liter	EPA 625	0.05	ug/l	14D
Methylene Blue Active Substances (MBAS)	250 ml	SM 5540C	1	mg/l	48H
Metals, Dissolved					
Antimony (Sb)	75 ml	EPA 200.8	0.002	mg/l	6M
Arsenic (As)	75 ml	EPA 200.8	0.001	mg/l	6M
Cadmium (Cd)	75 ml	EPA 200.8	0.001	mg/l	6M
Chromium (Cr)	75 ml	EPA 200.8	0.005	mg/l	6M
Copper (Cu)	75 ml	EPA 200.8	0.001	mg/l	6M
Lead (Pb)	75 ml	EPA 200.8	0.001	mg/l	6M
Nickel (Ni)	75 ml	EPA 200.8	0.002	mg/l	6M
Selenium (Se)	75 ml	EPA 200.8	0.002	mg/l	6M
Zinc (Zn)	75 ml	EPA 200.8	0.02	mg/l	6M
Metals, Total					
Antimony (Sb)	75, ml	EPA 200.8	0.002	mg/l	6M
Arsenic (As)	75, ml	EPA 200.8	0.001	mg/l	6M
Cadmium (Cd)	75, ml	EPA 200.8	0.001	mg/l	6M
Chromium (Cr)	75, ml	EPA 200.8	0.005	mg/l	6M
Copper (Cu)	75, ml	EPA 200.8	0.001	mg/l	6M
Lead (Pb)	75, ml	EPA 200.8	0.001	mg/l	6M
Nickel (Ni)	75, ml	EPA 200.8	0.002	mg/l	6M
Selenium (Se)	75 ml	EPA 200.8	0.002	mg/l	6M
Zinc (Zn)	75, ml	EPA 200.8	0.02	mg/l	6M
Manganese (Mn)	75, ml	EPA 200.8	0.0005	mg/l	6M
Bacteriological					
Total Coliform	200 ml	SM 9221B[1]	*	MPN/100ml	6H
Fecal Coliform	200 ml	SM9221E[1]	*	MPN/100ml	6H
Enterococcus	200 ml	SM 9230[1]	*	MPN/100ml	6H

*** To 6 dilutions for wet weather samples – results will be reported as a number not as a greater than value**
(typical wet weather range is 20-1,600,000 MPN/100ml for Total Coliform, Fecal Coliform and Enterococcus)
(typical dry weather range is 20-1,600,000 MPN/100ml for Total Coliform and 20-160,000 MPN/100ml for Fecal Coliform and Enterococcus)

1. **Membrane filtration techniques SM9222B, SM9222D, SM9230C and other approved wastewater methods for Bacteria are acceptable.**

4.0 ASSESSMENT AND REPORTING

4.1 Assessment

Management Question 3:

"What is the relative urban runoff contribution to the receiving water problem(s)?

The collection and analysis of water samples discharging from MS4 outfalls to receiving waters will be used to address Management Question 3, above. Collection of analytical and flow data from random and targeted sample sites is useful for calculating the contribution, on a load basis, from the MS4. Samples collected during dry and wet weather will be used to estimate the urban runoff contribution of pollutants to receiving waters on a regional basis, and can also be used to target local potential pollutant sources draining to the MS4.

The following sub-questions, organized by random and targeted sampling, will be used to understand the load contribution from the MS4:

Random sampling will be conducted to address the following sub-questions:

1. What are the characteristics of the pollutants discharged from the MS4s?
2. Are pollutant loadings changing over time?

Random sampling is conducted to assess overall water quality of the discharge from the MS4 outfalls. Because stations are randomly selected, the results of analysis can be applied to the region, rather than just the station itself. The region will be divided into nine strata, based on the watershed management areas (WMA) defined in the Permit (Order R9-2007-0001). Six wet and six dry samples will be collected in each WMA each year, resulting in a total of 54 wet samples and 54 dry samples respectively for the region (108 total per year). Over the 5 year period each WMA will have a total of 30 wet and 30 dry samples over the permit cycle.

Targeted sampling will be conducted to address the following sub-questions:

1. Which of the targeted MS4 outfalls have the greatest pollutant loading?
2. Are the pollutant loadings decreasing over time from these MS4 outfalls?

Targeted sampling is conducted to assess the relative contribution of a particular pollutant discharged from MS4 outfalls to the high priority problems of the receiving waters. The site-specific station design of the targeted program will generate information to support source prioritization in each WMA and will assess pollutant trends over time.

Annual presentation of results may include summary data tables and graphs of random and targeted sites, as well as comparison to water quality benchmarks. Although water samples collected from MS4 outfalls may not be required to meet water quality benchmarks, the comparison is useful for interpretation of results.

Further annual assessment will include frequency analysis for the number of water quality benchmark exceedances, descriptive statistics of the central tendency, and distributional qualities of the results. In addition, information from randomly selected outfalls that do not have flow during dry periods will be used to estimate the percent of drains without dry weather nuisance flows in the region. Figure 4-1 gives an example of the proportion of sites above water quality benchmarks.

Long term sampling will provide information on the success of the overall storm water management program. After five years of sampling, the data will be combined and assessed for trends. Additionally, after 5 years, a rolling five-year window can be used to assess trends in spatial extent. After five years, there will be 30 samples in each WMA, which will provide additional assessment at the WMA level (Figure 4-2).

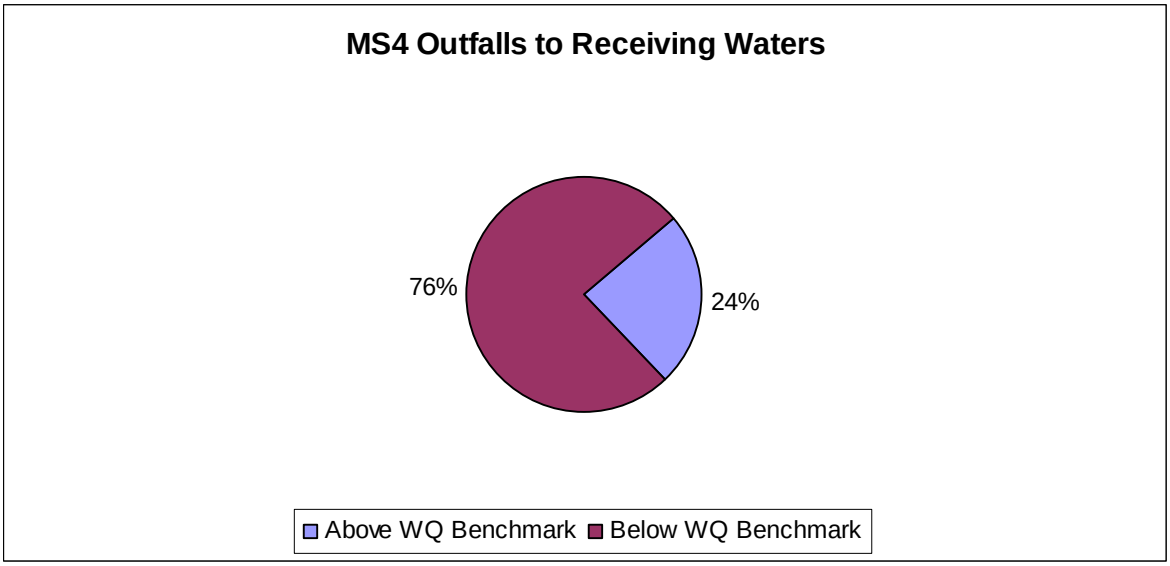

Figure 4-1: Example Graphic of Percent of Outfall Results Compared to Water Quality Benchmarks

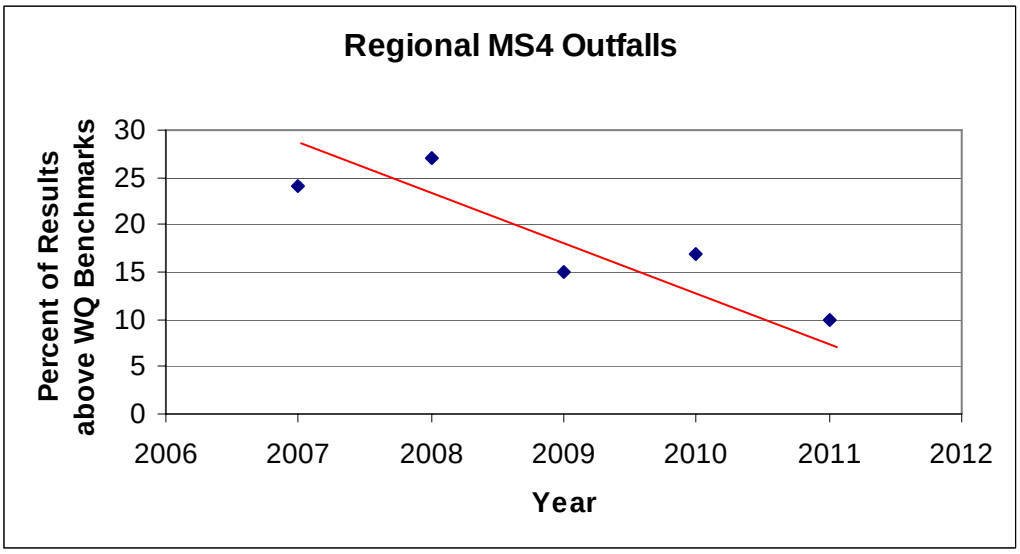

Figure 4-2: Example Graphic of Trend of MS4 Outfall Results Above Water Quality Benchmarks

Targeted outfall monitoring results will be combined and assessed for trends at outfalls that are sampled annually. Concentrations of pollutants will be presented in data tables and displayed graphically on maps showing sampling locations. Two measures of MS4 outfall condition will be reported using data collected in the targeted sampling program: (1) Relative loading from each outfall monitored – normalized by drainage area, and (2) Percent of overall loading from each outfall monitored. The relative loading will be normalized by the size of the drainage are so that results between drainages of different sizes can be compared. Examples of graphics that report these measures are presented below (Figures 4-3 and 4-4).

These data will be considered by jurisdictions and watersheds in prioritizing source identification studies and in planning efforts for Best Management Practices (BMP).

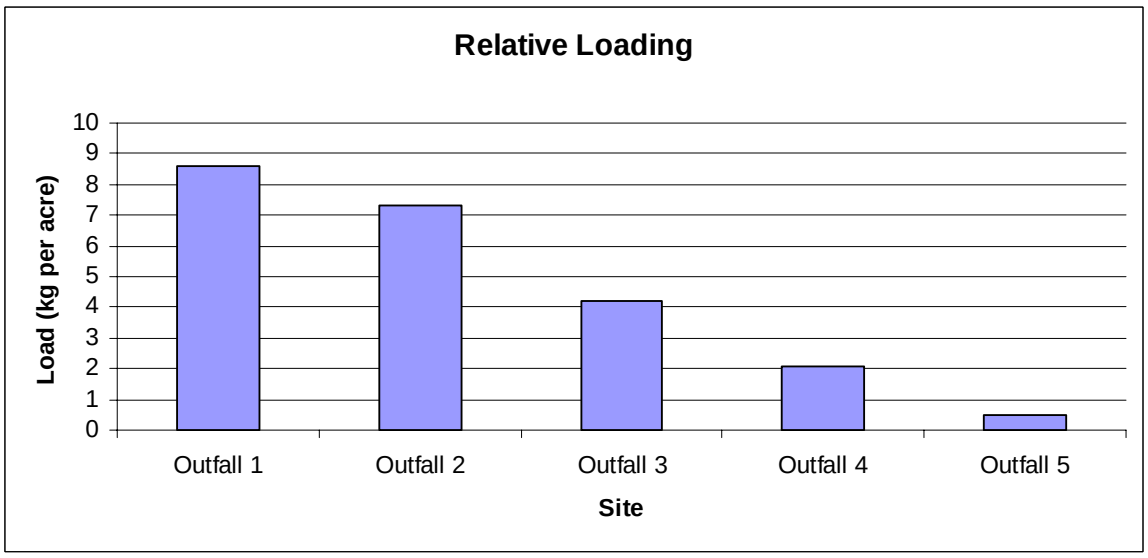

Figure 4-3: Example Graphic of Estimated Pollutant Load from the MS4

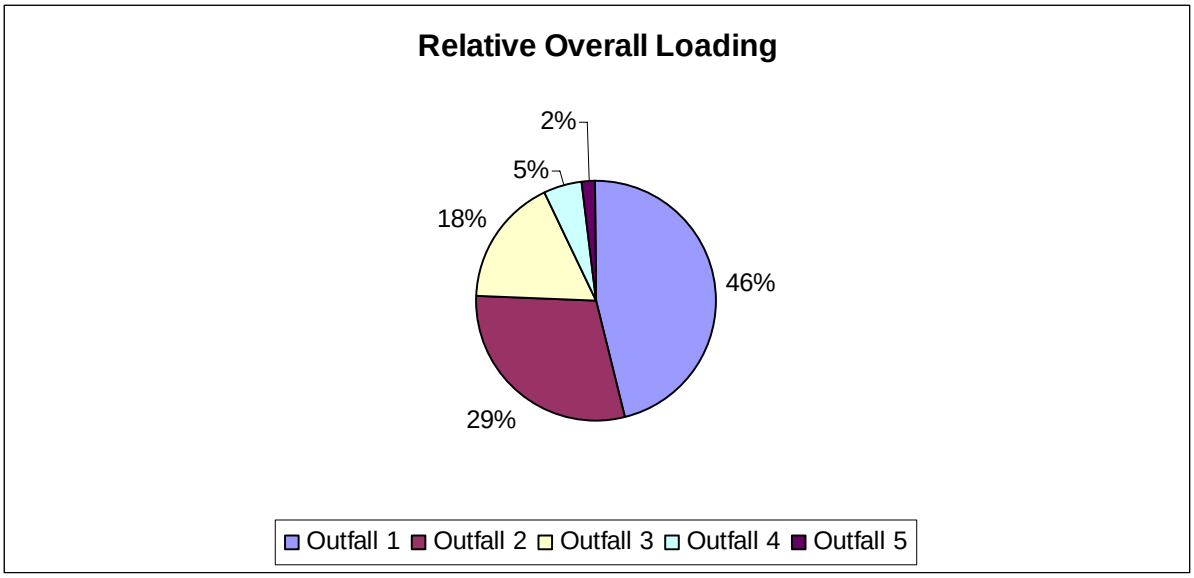

Figure 4-4: Example Graphic of Percent of Overall Loading from MS4 Outfalls Monitored

4.2 Reporting

The MS4 outfall monitoring data and analysis of the data will be included in the San Diego County Municipal Copermittees Urban Runoff Monitoring Annual Report as required by the Permit. When appropriate, these data will be used by the regional group, watershed groups and/or jurisdictions to focus additional source identification studies. The data may also help guide the selection of management actions where appropriate.

4.3 Program Review and Modification

As stated previously in this document, Order 2007-0001 provides the Copermittees flexibility to develop a workable MS4 outfall monitoring program. Specifically, section II.A.10 of the Permit Fact Sheet states:

"*Since a monitoring program for MS4 discharges is new, the Copermittees are provided significant leeway in the development and implementation of the program. The Copermittees can utilize the flexibility incorporated into the monitoring and reporting program to develop program that is workable for them while providing the necessary information.*"

The program described in this document meets the Permit criteria for a MS4 outfall monitoring program. As stated previously in this program, to meet permit compliance in the initial year of the program in 2007-2008, the Copermittees will collect one targeted dry weather sample from each of the nine WMAs. Beginning in 2008-2009 monitoring year, the random wet and dry sample program and the targeted dry weather program will be fully implemented. Beginning in

2009-2010 the targeted wet weather program will be fully implemented. This phased approach of the program allows Copermittees' time to fully develop a comprehensive program.

Because the program is newly developed and has not yet been field tested, it is appropriate to assume that modifications may need to be made after an initial assessment of the data collected. Copermittees intend to evaluate the data and determine where and how program modification will be made. More importantly, Copermittees need to ensure that the data they collect can be directly related to making management decisions (i.e., source investigations, increased BMPs, etc) and to water quality improvements.

5.0 REFERENCES

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APPENDIX A

Appendix A: Targeted MS4 Sample Locations and Target Analytes

Jurisdiction	Name	Lat	Long	Watershed	Suggested Analytes
Carlsbad	1D-21	33.18039	-117.32911	904.21	Bacteria, TSS, Total Nitrogen-N, Total Phosphorus-P
Carlsbad	1D-20	33.18060	-117.32720	904.21	Bacteria, TSS, Total Nitrogen-N, Total Phosphorus-P
Carlsbad	1C-21	33.17903	-117.34093	904.21	Bacteria, TSS, Total Nitrogen-N, Total Phosphorus-P
Carlsbad	16C-61	33.14596	-117.33774	904.31	Bacteria, TSS
Carlsbad	21C-14	33.13670	-117.33414	904.31	Bacteria, TSS, Total Nitrogen-N, Total Phosphorus-P
Carlsbad	19C-1	33.14647	-117.28160	904.31	Bacteria, TDS, TSS, Manganese, Selenium, Sulfates
Chula Vista	TCC-03	32.64726	-116.96885	909.11	Bacteria, TDS, (Cu, Zn, Cd, Pb (dissolved)), Total Hardness
Chula Vista	TCC-04	32.62016	-117.07230	909.11	Bacteria, TDS, (Cu, Zn, Cd, Pb (dissolved)) Total Hardness
Chula Vista	CEN-01	32.62922	-117.09507	909.12	Bacteria, TDS, (Cu, Zn, Cd, Pb (dissolved)) Total Hardness
Chula Vista	RCC-02	32.63830	-117.06551	909.12	Bacteria, TDS, (Cu, Zn, Cd, Pb (dissolved)) Total Hardness
Chula Vista	SUN-06	32.67141	-116.99702	909.12	Bacteria, TDS, (Cu, Zn, Cd, Pb (dissolved)) Total Hardness
Chula Vista	SVS-01	32.64912	-117.06474	909.12	Bacteria, TDS, (Cu, Zn, Cd, Pb (dissolved)) Total Hardness
Chula Vista	BAY-01	32.60820	-117.09235	910.20	Bacteria, (Cu, Zn, Cd, Pb (dissolved)) Total Hardness
Chula Vista	JUD-01	32.59465	-117.06675	910.20	Bacteria, (Cu, Zn, Cd, Pb (dissolved)) Total Hardness
Chula Vista	PRD-02	32.60622	-117.04353	910.20	Bacteria, (Cu, Zn, Cd, Pb (dissolved)) Total Hardness
Chula Vista	SCR-01	32.64567	-116.94713	910.20	Bacteria, (Cu, Zn, Cd, Pb (dissolved)) Total Hardness
City of El Cajon	El Cajon Sampling Site 5	32.82665	-116.98226	907.13	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, Dissolved Oxygen, pH
City of El Cajon	El Cajon Sampling Site 2	32.80363	-116.96548	907.13	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, Dissolved Oxygen, pH
City of El Cajon	El Cajon Sampling Site 41	32.80209	-116.97163	907.13	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, Dissolved Oxygen, pH
City of El Cajon	El Cajon Sampling Site 101	32.81850	-116.97560	907.13	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, Dissolved Oxygen, pH
City of San Diego	DW010	32.99879	-117.09812	905.12	Bacteria, TDS, TSS
City of San Diego	DW336	33.00489	-117.14439	905.12	Bacteria, TDS, TSS

Jurisdiction	Name	Lat	Long	Watershed	Suggested Analytes
City of San Diego	DW006	33.04130	-117.07782	905.21	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, Manganese, pH
City of San Diego	DW002	33.03711	-117.06806	905.22	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, Manganese, pH, Sulfates, Chloride
City of San Diego	DW012	33.01872	-117.06439	905.22	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, Manganese, pH, Sulfates, Chloride
City of San Diego	DW017	32.96954	-117.13830	906.10	Bacteria, TDS, TSS
City of San Diego	DW021	32.90593	-117.08503	906.10	Bacteria, TDS, TSS, Diazinon
City of San Diego	DW025	32.92164	-117.14905	906.10	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, Cu(dissolved), Total Hardness
City of San Diego	DW026	32.90592	-117.15768	906.10	Bacteria, TDS, TSS, Cu(dissolved), Diazinon, MBAS, Total Hardness
City of San Diego	DW027	32.90409	-117.15680	906.10	Bacteria, TDS, TSS
City of San Diego	DW272	32.88494	-117.19715	906.1	Bacteria, TDS, TSS, pH, Total Nitrogen-N, Total Phosphorus-P
City of San Diego	DW289	32.94306	-117.13025	906.10	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P
City of San Diego	DW428	32.89142	-117.15572	906.1	Bacteria, TDS, TSS
City of San Diego	DW018	32.94497	-117.11653	906.20	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P
City of San Diego	DW247	32.96909	-117.09382	906.20	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P
City of San Diego	DW391	32.92347	-117.02618	906.20	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P
City of San Diego	DW151	32.81753	-117.27324	906.30	Bacteria, Total Nitrogen-N, Total Phosphorus-P, (Cu, Zn, Cd, Pb (dissolved)), Total Hardness
City of San Diego	DW152	32.81183	-117.27011	906.30	Bacteria, Total Nitrogen-N, Total Phosphorus-P, (Cu, Zn, Cd, Pb (dissolved)), Total Hardness
City of San Diego	DW153	32.80802	-117.26523	906.30	Bacteria, Total Nitrogen-N, Total Phosphorus-P, (Cu, Zn, Cd, Pb (dissolved)), Total

Jurisdiction	Name	Lat	Long	Watershed	Suggested Analytes
					Hardness
City of San Diego	DW156	32.79984	-117.25853	906.3	Bacteria, Total Nitrogen-N, Total Phosphorus-P, (Cu, Zn, Cd, Pb (dissolved)), Total Hardness
City of San Diego	DW056	32.85413	-117.22855	906.40	Bacteria, TDS, Total Nitrogen-N, Total Phosphorus-P, (Cu, Zn, Cd, Pb (dissolved)), Total Hardness
City of San Diego	DW058	32.86064	-117.20931	906.40	Bacteria, TDS, Total Nitrogen-N, Total Phosphorus-P, (Cu, Zn, Cd, Pb (dissolved)), Total Hardness
City of San Diego	DW104	32.80960	-117.21950	906.40	Bacteria, TDS, Total Nitrogen-N, Total Phosphorus-P, (Cu, Zn, Cd, Pb (dissolved)), Total Hardness
City of San Diego	DW262	32.84254	-117.19169	906.40	Bacteria, TDS, Total Nitrogen-N, Total Phosphorus-P, (Cu, Zn, Cd, Pb (dissolved)), Total Hardness
City of San Diego	DW273	32.81921	-117.22409	906.40	Bacteria, TDS, Total Nitrogen-N, Total Phosphorus-P, (Cu, Zn, Cd, Pb (dissolved)), Total Hardness
City of San Diego	DW106	32.80861	-117.17597	906.50	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, (Cu, Zn, Cd, Pb (dissolved)), Total Hardness
City of San Diego	DW562	32.82125	-117.19226	906.50	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, (Cu, Zn, Cd, Pb (dissolved)), Total Hardness
City of San Diego	DW108	32.81291	-117.17455	906.50	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, (Cu, Zn, Cd, Pb (dissolved)), Total Hardness
City of San Diego	DW165	32.76205	-117.23456	906.50	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, (Cu, Zn, Cd, Pb (dissolved)), Total Hardness
City of San Diego	DW275	32.82403	-117.17834	906.50	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, (Cu, Zn, Cd, Pb (dissolved)), Total Hardness
City of San Diego	DW069	32.83138	-117.08420	907.11	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, Dissolved Oxygen
City of San Diego	DW453	32.78140	-117.05924	907.11	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, Dissolved Oxygen

Jurisdiction	Name	Lat	Long	Watershed	Suggested Analytes
City of San Diego	DW084	32.79052	-117.10449	907.11	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, Dissolved Oxygen, MBAS
City of San Diego	DW088	32.78151	-117.09025	907.11	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, Dissolved Oxygen
City of San Diego	DW089	32.78226	-117.09621	907.11	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, Dissolved Oxygen, Temperature
City of San Diego	DW093	32.78914	-117.11425	907.11	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, Dissolved Oxygen
City of San Diego	DW094	32.80231	-117.08275	907.11	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, Dissolved Oxygen
City of San Diego	DW096	32.81614	-117.06343	907.11	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, Dissolved Oxygen
City of San Diego	DW101	32.79970	-117.01858	907.11	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, Dissolved Oxygen, pH
City of San Diego	DW143	32.75652	-117.23443	907.11	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, Dissolved Oxygen
City of San Diego	DW296	32.80202	-117.13304	907.11	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, Dissolved Oxygen, EC
City of San Diego	DW553	32.73586	-117.16248	908.21	Bacteria, TSS, (Cu, Zn, Cd, Pb (dissolved)), Diazinon, Chlorpyrifos, Malathion, Total Hardness
City of San Diego	DW123	32.74524	-117.11697	908.22	Bacteria, TSS, (Cu, Zn, Cd, Pb (dissolved)), Diazinon, Chlorpyrifos, Malathion, Total Hardness
City of San Diego	DW128	32.73054	-117.14332	908.22	Bacteria, TSS, (Cu, Zn, Cd, Pb (dissolved)), Diazinon, Chlorpyrifos, Malathion, Total Hardness
City of San Diego	DW183	32.70884	-117.04983	908.22	Bacteria, TSS, (Cu, Zn, Cd, Pb (dissolved)), MBAS, Diazinon, Chlorpyrifos, Malathion, Total Hardness
City of San Diego	DW192	32.72608	-117.08429	908.22	Bacteria, TSS, (Cu, Zn, Cd, Pb (dissolved)), Diazinon, Chlorpyrifos, Malathion, Total Hardness

Jurisdiction	Name	Lat	Long	Watershed	Suggested Analytes
City of San Diego	DW196	32.72965	-117.09024	908.22	Bacteria, TSS, (Cu, Zn, Cd, Pb (dissolved)), Diazinon, pH, Chlorpyrifos, Malathion, Total Nitrogen-N, MBAS, Total Hardness
City of San Diego	DW201	32.70093	-117.10104	908.22	Bacteria, TSS, (Cu, Zn, Cd, Pb (dissolved)), Total Nitrogen-N, Total Phosphorus-P, Diazinon, Chlorpyrifos, Malathion, Total Hardness
City of San Diego	DW203	32.69642	-117.12240	908.22	Bacteria, TSS, (Cu, Zn, Cd, Pb (dissolved)), Total Nitrogen-N, Total Phosphorus-P, pH, Diazinon, Chlorpyrifos, Malathion, Total Hardness
City of San Diego	DW207	32.71100	-117.12136	908.22	Bacteria, TSS, (Cu, Zn, Cd, Pb (dissolved)), Total Nitrogen-N, Total Phosphorus-P, pH, Temperature, Diazinon, Chlorpyrifos, Malathion, Total Hardness
City of San Diego	DW312	32.70713	-117.09347	908.22	Bacteria, TSS, (Cu, Zn, Cd, Pb (dissolved)), Diazinon, Chlorpyrifos, Malathion, Total Hardness
City of San Diego	DW325	32.69627	-117.10471	908.22	Bacteria, TSS, (Cu, Zn, Cd, Pb (dissolved)), Diazinon, Chlorpyrifos, Malathion, Total Hardness
City of San Diego	DW330	32.75137	-117.08648	908.22	Bacteria, TSS, (Cu, Zn, Cd, Pb (dissolved)), Diazinon, Chlorpyrifos, Malathion, Total Hardness
City of San Diego	DW461	32.70901	-117.10989	908.22	Bacteria, TSS, (Cu, Zn, Cd, Pb (dissolved)), Diazinon, Chlorpyrifos, Malathion, Total Hardness
City of San Diego	DW188	32.69766	-117.07322	908.31	Bacteria, TSS, Oil and Grease, Total Nitrogen-N
City of San Diego	DW235	32.67071	-117.04612	909.12	Bacteria, TDS, (Cu, Zn, Cd, Pb (dissolved)), Total Hardness
City of San Diego	DW219	32.58908	-117.06097	910.20	Bacteria, (Cu, Zn, Cd, Pb (dissolved)), Total Hardness
City of San Diego	DW468	32.58989	-117.02303	910.20	Bacteria, (Cu, Zn, Cd, Pb (dissolved)), Total Hardness
City of San Diego	DW225	32.57624	-117.08793	910.20	Bacteria, (Cu, Zn, Cd, Pb (dissolved)), Total Hardness

Jurisdiction	Name	Lat	Long	Watershed	Suggested Analytes
City of San Diego	DW227	32.56726	-117.05334	911.11	Bacteria, TSS, Total Nitrogen-N, Total Phosphorus-P, Pesticides, DO, (Cu, Zn, Cd, Pb (dissolved)), Nickel (dissolved), Thallium (dissolved), Total Hardness
City of San Diego	DW322	32.57197	-117.02695	911.11	Bacteria, TSS, Total Nitrogen-N, Total Phosphorus-P, Pesticides, DO, (Cu, Zn, Cd, Pb (dissolved)), Nickel (dissolved), Thallium (dissolved), pH, Total Hardness
City of San Diego	DW303	32.54941	-116.99105	911.12	Bacteria, TSS, Total Nitrogen-N, Total Phosphorus-P, Pesticides, DO, (Cu, Zn, Cd, Pb (dissolved)), Nickel (dissolved), Thallium (dissolved), Total Hardness
City of San Diego	DW304	32.54900	-116.99106	911.12	Bacteria, TSS, Total Nitrogen-N, Total Phosphorus-P, Pesticides, DO, (Cu, Zn, Cd, Pb (dissolved)), Nickel (dissolved), Thallium (dissolved), Total Hardness
Coronado	11	32.68205	-117.18091	910.10	Bacteria, (Cu, Zn, Cd, Pb (dissolved)), Total Hardness
Coronado	35	32.70003	-117.17182	910.10	Bacteria, (Cu, Zn, Cd, Pb (dissolved)), Total Hardness
County	SMG13	33.37100	-117.25819	902.13	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, Diazinon, Chlorpyrifos, Malathion
County	SMG08	33.42184	-117.32179	902.21	Bacteria, Iron, Manganese, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P
County	SMG07	33.41460	-117.24904	902.22	Iron, Manganese, Sulfates, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P
County	SMG11	33.42936	-117.19531	902.22	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P

Jurisdiction	Name	Lat	Long	Watershed	Suggested Analytes
County	SMG12	33.41396	-117.23754	902.22	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P
County	SMG14	33.39892	-117.24979	902.22	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P
County	SLR01	33.28360	-117.21868	903.12	Total Nitrogen-N, Total Phosphorus-P, Bacteria, TDS, Chlorides
County	SLR02	33.26568	-117.23320	903.12	Total Nitrogen-N, Total Phosphorus-P, Bacteria, TDS, Chlorides
County	SLR12	33.33312	-117.23551	903.12	Total Nitrogen-N, Total Phosphorus-P, Bacteria, TDS, Chlorides
County	SLR13	33.34736	-117.24027	903.12	Total Nitrogen-N, Total Phosphorus-P, Bacteria, TDS, Chlorides
County	SLR14	33.29335	-117.22396	903.12	Total Nitrogen-N, Total Phosphorus-P, Bacteria, TDS, Chlorides, Oil & Grease
County	SLR17	33.32363	-117.15744	903.12	Total Nitrogen-N, Total Phosphorus-P, Bacteria, TDS, Chlorides
County	SLR26	33.28959	-117.22525	903.12	Total Nitrogen-N, Total Phosphorus-P, Bacteria, TDS, Chlorides
County	SLR27	33.31514	-117.19418	903.12	Total Nitrogen-N, Total Phosphorus-P, Bacteria, TDS, Chlorides
County	SLR29	33.28808	-117.08333	903.12	Total Nitrogen-N, Total Phosphorus-P, Bacteria, TDS, Chlorides
County	SLR31	33.30205	-117.21691	903.12	Total Nitrogen-N, Total Phosphorus-P, Bacteria, TDS, Chlorides
County	SLR32	33.33138	-117.15067	903.12	Total Nitrogen-N, Total Phosphorus-P, Bacteria, TDS, Chlorides
County	SLR33	33.32901	-117.24475	903.12	Total Nitrogen-N, Total Phosphorus-P, Bacteria, TDS, Chlorides
County	SLR34	33.25872	-117.23931	903.12	Total Nitrogen-N, Total Phosphorus-P, Bacteria, TDS, Chlorides
County	SLR10	33.20494	-117.12968	903.13	Chlorides, TDS, Total Nitrogen-N, Total Phosphorus-P, Bacteria

Jurisdiction	Name	Lat	Long	Watershed	Suggested Analytes
County	SLR15	33.22614	-117.08330	903.21	Chlorides, TDS, Total Nitrogen-N, Total Phosphorus-P, Bacteria
County	SLR30	33.33488	-117.13120	903.21	TDS, Chlorides, Bacteria, Total Nitrogen-N, Total Phosphorus-P
County	CAR05	33.17239	-117.20997	904.32	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, Pesticides, Manganese, Selenium, Sulfates
County	CAR16	33.15629	-117.21513	904.32	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, Pesticides, Manganese, Selenium, Sulfates
County	CAR13	33.12012	-117.20997	904.52	Bacteria, TDS, Total Nitrogen-N, Total Phosphorus-P
County	CAR09	33.01084	-117.23985	904.61	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P
County	CAR02	33.09901	-117.13047	904.62	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, Manganese, Selenium, Sulfates
County	CAR08	33.17810	-117.09193	904.62	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, Manganese, Selenium, Sulfates
County	CAR15	33.17084	-117.10002	904.62	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, Manganese, Selenium, Sulfates
County	SDG07	32.97771	-117.18116	905.11	Bacteria, TDS, TSS
County	SDG08	33.01962	-117.11974	905.11	Bacteria, TDS, TSS
County	SDG13	32.99640	-117.19196	905.11	Bacteria, TDS, TSS
County	SDG14	32.99924	-117.17513	905.11	Bacteria, TDS, TSS
County	SDG15	33.01189	-117.17405	905.12	Bacteria, TDS, TSS
County	SDG09	33.07326	-117.08373	905.23	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, Manganese, pH, Aluminum
County	SDG02	33.02243	-116.89673	905.41	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, Manganese, pH
County	SDG03	33.03379	-116.93608	905.41	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, Manganese, pH

Jurisdiction	Name	Lat	Long	Watershed	Suggested Analytes
County	SDR13	32.86204	-116.94466	907.12	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, Low Dissolved Oxygen, pH, Diazinon, Chlorpyrifos, Malathion
County	SDR15	32.85716	-116.91278	907.12	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, Low Dissolved Oxygen, pH
County	SDR38	32.85972	-116.91877	907.12	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, Low Dissolved Oxygen, pH
County	SDR35	32.82058	-116.96480	907.13	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, Low Dissolved Oxygen, pH
County	SDR37	32.81708	-116.96354	907.13	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, Low Dissolved Oxygen, pH
County	SDR08	32.83599	-116.90040	907.14	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, Low Dissolved Oxygen, pH
County	SDR34	32.85565	-116.93548	907.14	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, Low Dissolved Oxygen, pH, Oil & Grease
County	SDR20	32.99628	-116.84387	907.23	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, Low Dissolved Oxygen, Chloride, Manganese, pH, Sulfates
County	SDR01	32.84127	-116.80540	907.33	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, Low Dissolved Oxygen, Manganese, pH
County	SDR22	32.84232	-116.80839	907.33	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, Low Dissolved Oxygen, Manganese, pH
County	SWT02	32.66558	-117.02409	909.12	Total Nitrogen-N, Total Phosphorus-P, Bacteria, TDS, (Cu, Zn, Cd, Pb (dissolved)), Total Hardness
County	SWT05	32.66692	-117.02325	909.12	Bacteria, TDS, (Cu, Zn, Cd, Pb (dissolved)), Total Hardness
County	SWT07	32.70114	-117.00927	909.12	Total Nitrogen-N, Total Phosphorus-P, Bacteria, TDS, (Cu, Zn, Cd, Pb (dissolved)), Total Hardness
County	SWT26	32.64788	-117.05900	909.12	Bacteria, TDS, (Cu, Zn, Cd, Pb (dissolved)), Total Hardness

Jurisdiction	Name	Lat	Long	Watershed	Suggested Analytes
County	SWT28	32.65228	-117.04958	909.12	Bacteria, TDS, (Cu, Zn, Cd, Pb (dissolved)), Total Hardness
County	SWT29	32.66905	-117.01747	909.12	Bacteria, TDS, (Cu, Zn, Cd, Pb (dissolved)), Total Hardness
County	SWT22	32.71963	-116.88031	909.21	Total Nitrogen-N, Total Phosphorus-P, Bacteria, DO, Diazinon, Chlorpyrifos, Malathion
County	SWT25	32.73968	-116.95245	909.21	Diazinon, Chlorpyrifos, Malathion, DO
County	SWT32	32.71586	-116.97659	909.21	Diazinon, Chlorpyrifos, Malathion, DO
County	SWT10	32.74445	-116.93002	909.22	Bacteria, DO, Total Nitrogen-N, Total Phosphorus-P, Diazinon, Chlorpyrifos, Malathion
County	SWT18	32.81499	-116.83601	909.23	Diazinon, Chlorpyrifos, Malathion, DO
County	SWT20	32.81978	-116.75175	909.26	Diazinon, Chlorpyrifos, Malathion, DO
County	OTY03	32.63624	-116.88456	910.36	Iron, Manganese, Total Nitrogen-N, Total Phosphorus-P, pH, Bacteria
County	TIJ02	32.83776	-116.53725	911.41	Bacteria, Total Nitrogen-N, Total Phosphorus-P, TSS
Encinitas	ENC-10	33.04777	-117.28583	904.51	Bacteria, TDS, Total Nitrogen-N, Total Phosphorus-P
Encinitas	LCS-1	33.05861	-117.26305	904.51	Bacteria, TDS, Total Nitrogen-N, Total Phosphorus-P
Encinitas	CBS-2	33.01666	-117.28138	904.61	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P
Encinitas	ESC-1	33.05389	-117.21639	904.61	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, Manganese, Selenium, Sulfates
Escondido	874.2.0	33.15614	-117.11984	904.52	Bacteria, TDS, Total Nitrogen-N, Total Phosphorus-P
Escondido	813.0.0	33.10271	-117.12315	904.62	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, Manganese, Selenium, Sulfates
Escondido	818.0.0	33.11283	-117.10827	904.62	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, Manganese, Selenium, Sulfates

Jurisdiction	Name	Lat	Long	Watershed	Suggested Analytes
Escondido	825.0.2	33.14073	-117.05329	904.62	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, Manganese, Selenium, Sulfates
Escondido	840.0.0	33.11952	-117.09576	904.62	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, Manganese, Selenium, Sulfates
Escondido	816.1.1	33.10954	-117.11181	904.62	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, Manganese, Selenium, Sulfates
Escondido	862.0.0	33.08482	-117.06175	905.21	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, Manganese, pH
Escondido	861.2.3	33.09985	-117.05087	905.24	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, Manganese, pH
Escondido	818.0.0	33.11278	-117.10833	904.62	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, Manganese, Selenium, Sulfates
Escondido	820.0.1	33.11944	-117.09528	904.62	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, Manganese, Selenium, Sulfates
Escondido	825.0.2	33.14083	-117.05333	904.62	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, Manganese, Selenium, Sulfates
Escondido	826.0.2	33.12306	-117.08611	904.62	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, Manganese, Selenium, Sulfates
Escondido	843.2.0	33.14611	-117.09361	904.62	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, Manganese, Selenium, Sulfates
Escondido	860.1.4	33.06944	-117.07139	905.21	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, Manganese, pH
Escondido	861.1.1	33.08278	-117.07028	905.21	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, Manganese, pH

Jurisdiction	Name	Lat	Long	Watershed	Suggested Analytes
Escondido	863.0.0	33.14750	-117.07083	905.21	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, Manganese, pH
Escondido	818.0.0	33.11278	-117.10833	904.62	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, Manganese, Selenium, Sulfates
Escondido	820.0.1	33.11944	-117.09528	904.62	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, Manganese, Selenium, Sulfates
Imperial Beach	K-2	32.58832	-117.10747	910.20	Bacteria, (Cu, Zn, Cd, Pb (dissolved)), Total Hardness
Imperial Beach	E-1B	32.57292	-117.12313	911.10	Bacteria, TSS, Total Nitrogen-N, Total Phosphorus-P, Pesticides, DO, (Cu, Zn, Cd, Pb (dissolved)), Nickel (dissolved), Thallium (dissolved), Total Hardness
La Mesa	907-ALV-002	32.77414	-117.02287	907.11	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, Dissolved Oxygen, pH
La Mesa	907-ALV-590	32.78180	-117.01328	907.11	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, Dissolved Oxygen, pH
La Mesa	908-UNI-001	32.75473	-117.04813	908.22	Bacteria, TSS, (Cu, Zn, Cd, Pb (dissolved)), Diazinon, Chlorpyrifos, Malathion, Total Hardness
La Mesa	908-UNI-002	32.75516	-117.04584	908.22	Bacteria, TSS, (Cu, Zn, Cd, Pb (dissolved)), Diazinon, Chlorpyrifos, Malathion, Total Hardness
Lemon Grove	DW9	32073259.00000	-117.03357	908.22	Bacteria, TSS, (Cu, Zn, Cd, Pb (dissolved)), Diazinon, Chlorpyrifos, Malathion, Total Hardness
Lemon Grove	31	32.74021	-117.05111	908.22	Bacteria, TSS, (Cu, Zn, Cd, Pb (dissolved)), Diazinon, Chlorpyrifos, Malathion, Total Hardness
National City	45	32.68739	-117.09690	908.31	Bacteria, TSS
National City	13A	32.66942	-117.10326	908.32	Bacteria, TSS
National City	46	32.67584	-117.09539	908.32	Bacteria, TSS
National City	32	32.65887	-117.08274	909.12	Bacteria, TDS, (Cu, Zn, Cd, Pb (dissolved)), Total Hardness
Oceanside	S006	33.20747	-117.38482	903.11	Bacteria, Chlorides, TDS, Total Nitrogen-N, Total Phosphorus-P
Oceanside	S075	33.22234	-117.35305	903.11	Bacteria, Chlorides, TDS, Total Nitrogen-N, Total Phosphorus-P

Jurisdiction	Name	Lat	Long	Watershed	Suggested Analytes
Oceanside	S122	33.22181	-117.35628	903.11	Bacteria, Chlorides, TDS, Total Nitrogen-N, Total Phosphorus-P
Oceanside	S123	33.22710	-117.34289	903.11	Bacteria, Chlorides, TDS, Total Nitrogen-N, Total Phosphorus-P
Oceanside	S119	33.25528	-117.31996	903.11	Bacteria, Chlorides, TDS, Total Nitrogen-N, Total Phosphorus-P
Oceanside	S106	33.26023	-117.26414	903.11	Bacteria, Chlorides, TDS, Total Nitrogen-N, Total Phosphorus-P
Oceanside	S116	33.25568	-117.29310	903.11	Bacteria, Chlorides, TDS, Total Nitrogen-N, Total Phosphorus-P
Oceanside	S107	33.26346	-117.24859	903.11	Bacteria, Chlorides, TDS, Total Nitrogen-N, Total Phosphorus-P
Oceanside	L027	33.20192	-117.33708	904.10	Bacteria, TDS, Total Nitrogen-N, Total Phosphorus-P
Oceanside	L009	33.20590	-117.28512	904.10	Bacteria, TDS, Total Nitrogen-N, Total Phosphorus-P
Oceanside	L054	33.18350	-117.36476	904.10	Bacteria, TDS, Total Nitrogen-N, Total Phosphorus-P
Oceanside	L111	33.20420	-117.30985	904.10	Bacteria, TDS, Total Nitrogen-N, Total Phosphorus-P
Oceanside	B002	33.18073	-117.34243	904.21	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P
Port	Anchorage Lane 145	32.71888	-117.23140	908.10	Bacteria, (Cu, Zn, Cd, Pb (dissolved)), Oil and Grease, Diazinon, Chlorpyrifos, Malathion, Total Hardness
Poway	129	33.00705	-117.05055	905.22	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, Manganese, pH, Sulfates, Chloride
Poway	136	33.01853	-117.04646	905.22	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, Manganese, pH, Sulfates, Chloride
Poway	18A	32.96015	-117.03840	906.20	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P
Poway	19	32.95502	-117.03398	906.20	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P

Jurisdiction	Name	Lat	Long	Watershed	Suggested Analytes
Poway	21	32.95595	-117.02257	906.20	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P
Poway	105	32.94860	-117.06208	906.20	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P
San Marcos	A-10	33.10229	-117.20961	904.51	Bacteria, TDS, Total Nitrogen-N, Total Phosphorus-P
San Marcos	B-02	33.14600	-117.16024	904.52	Bacteria, TDS, Total Nitrogen-N, Total Phosphorus-P
San Marcos	B-04	33.17041	-117.15407	904.52	Bacteria, TDS, Total Nitrogen-N, Total Phosphorus-P
San Marcos	C-05A	33.13962	-117.13943	904.52	Bacteria, TDS, Total Nitrogen-N, Total Phosphorus-P
Santee	O40b	32.84851	-116.96392	907.12	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, Dissolved Oxygen
Santee	G30c	32.84501	-116.99122	907.12	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, Dissolved Oxygen, pH
Santee	S5c	32.84363	-116.98795	907.12	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, Dissolved Oxygen
Santee	U10a	32.83744	-116.99586	907.13	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, Dissolved Oxygen, pH
Solana Beach	Seascape Outfall	32.98552	-117.27330	905.11	Bacteria
Vista	BV-1	33.18273	-117.28393	904.21	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P
Vista	BV-7A	33.19295	-117.25370	904.22	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P
Vista	AH-17	33.14008	-117.24635	904.31	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, Manganese, Selenium, Sulfates
Vista	AH-21	33.13532	-117.24462	904.31	Bacteria, TDS, TSS, Total Nitrogen-N, Total Phosphorus-P, Manganese, Selenium, Sulfates