California Marine Sanctuary Foundation
in partnership with
Monterey Bay National Marine Sanctuary

2020 MRSWMP Dry Run & First Flush Monitoring Report

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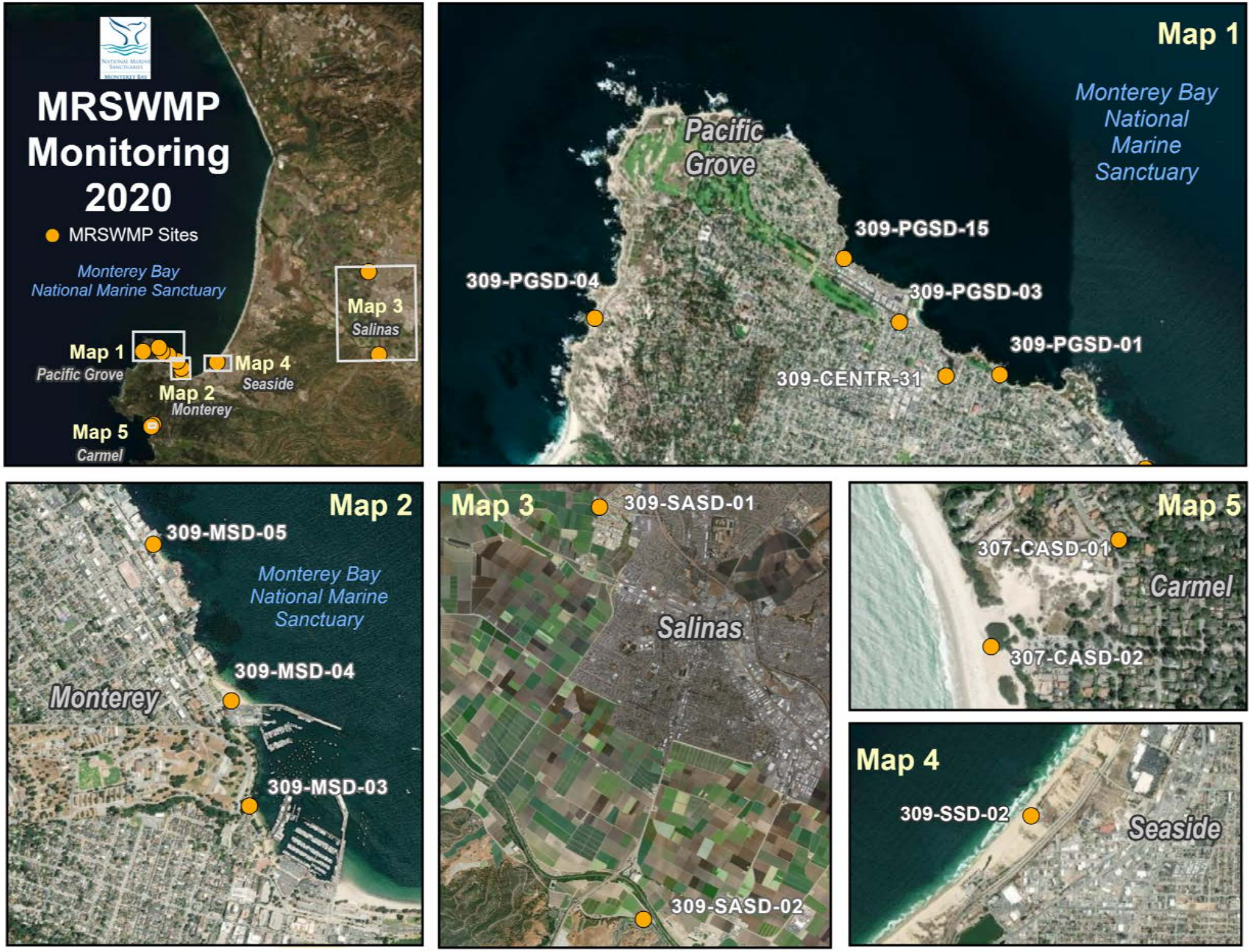
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Introduction

The Monterey Stormwater Education Alliance (Monterey SEA) water quality monitoring program is modeled after Monterey Bay National Marine Sanctuary's (MBNMS) Dry Run-First Flush monitoring program. Dry Run and First Flush volunteers collect water samples from storm drain outfalls prior to the first major rainstorm of the year (Dry Run) and during the first major rainstorm of the winter season (First Flush). Samples are analyzed for common urban pollutants such as detergents, bacteria, metals, sediment and nutrients.

Samples collected during dry weather prior to the first major rainstorm provide information about dry weather flows such as pollutant concentrations, amount of groundwater base flow, or contributions from urban sources such as car washing, pressure washing, irrigation or illicit discharges. Dry weather flows are an important component of water quality monitoring since contaminants can be less diluted and therefore more easily detected and traced to their source. Water samples collected during the first major rainstorm of the winter season provide information on the concentration of contaminants in storm water after months of dry weather accumulation of pollutants on land in urban areas. All runoff from the Monterey region eventually flows into MBNMS except in areas where diversions have been installed that capture some dry and wet weather storm drain system flows and divert it to the sanitary sewer. The cities of Pacific Grove, Salinas and Carmel-by-the-Sea have constructed diversions which facilitate reuse of runoff while minimizing the amount of contaminants flowing to MBNMS. It is hoped that this data collected for MRSWMP's water quality monitoring program provides local cities with information on where to implement best management practices focused on improving water quality.

The MRSWMP water quality monitoring program promotes volunteer participation, stewardship and environmental education while providing important data regarding the quality of water flowing into MBNMS. This monitoring program is designed to meet E.8.ii requirements under the Phase II Storm Water Permit, satisfying public involvement and participation elements of the permit. This monitoring program does not fulfill the E.13 requirements pertaining to ASBS Monitoring, TMDL Monitoring, 303(d) Monitoring or Receiving Water Monitoring which are completed by permittees individually or through regional programs.

Methods

The same protocols and laboratory analyses are used for both of the MRSWMP water quality monitoring events. New Dry Run and First Flush volunteers attend an online training that covers why samples are collected and how. In normal non-COVID years, after training the volunteers then participate in hands-on practice during the Dry Run: a half day event where volunteers demonstrate their skills, visit outfall sites, and collect water samples if flowing water is found. In 2020, due to COVID, the Dry Run was conducted by California Marine Sanctuary Foundation (CMSF) staff. During the Dry Run, field measurements (water temperature, pH, electrical conductivity and transparency) and water samples are collected for lab analysis of nutrients (nitrate, orthophosphate, ammonia and urea), bacteria (*Eschericia coli* and enterococcus), metals (copper, lead and zinc), total suspended solids, color, Methylene Blue Active Substances (MBAS) detergents, hardness (as CaCO3), potassium and turbidity. Volunteers are mobilized for the First Flush when at least 0.10 inches of rain has fallen,

there is sheeting water on roadways and conductivity is at or below 1000 µS. During the First Flush, volunteers take field measurements (water temperature, pH, electrical conductivity and transparency) and collect water samples for lab analysis of nutrients (nitrate, orthophosphate, ammonia and urea), bacteria (*Eschericia coli* and enterococcus), metals (copper, lead and zinc), total suspended solids, color, Methylene Blue Active Substances (MBAS) detergents, hardness (as CaCO3), potassium and turbidity. Samples and field equipment are delivered immediately to the monitoring coordinator once sample collection is complete. Once all of the samples are received, the monitoring coordinator delivers the samples to a certified lab.

Dry Run monitoring entails collecting a single grab sample from each site with flowing water. During the First Flush, two sets of grab samples are collected 30 minutes apart for two time series. In this report, First Flush results reported by *analyte* are averaged between the two time series, and First Flush results reported by *jurisdiction* have individual time series results listed. Samples for urea are only collected during the first time series and are therefore not an average but a single sample result for each event.

During the First Flush, samples are collected from two receiving water sites to better understand pollutant dilution in the ocean compared to end of pipe results. In 2020 these sites were Receiving water sample collection consists of collecting water at the point at which outfall flows reach the receiving water, in this case the ocean, where some mixing has occurred. This location is termed point zero. Samples for this receiving water sampling are collected at point zero as soon as feasible after the outfall samples are collected, in a separate bucket similar to what is used for outfall monitoring. Receiving water samples are tested for the same analytes as outfall samples.

The Cities of Carmel and Pacific Grove operate dry weather storm drain diversions for dry and some wet weather flows in the storm drain system. Two sites in Carmel, 4th Avenue and Ocean Avenue, are within the city's diversion system boundaries, where dry weather storm drain flows are retained and diverted into infiltration trenches. The City of Carmel's diversion is never on during the First Flush. The 4th Avenue (Carmel) site is monitored above the connection point with the diversion system for the Dry Run and First Flush due to access issues at the outfall. Ocean Avenue is sampled at the outfall for both the Dry Run and First Flush events as outfall access is available year-round.

The City of Pacific Grove's diversion collects dry and wet weather storm drain flows and pumps them into the sanitary sewer. Sites monitored in 2020 within the City of Pacific Grove's diversion system boundaries are: 8th Street, Greenwood Park and Lovers. During dry weather, 8th Street and Lovers are sampled at the outfall, which may or may not have flow as any flow is diverted unless the system is blocked by debris and some water is allowed to bypass the diversion. Greenwood Park is always monitored above the diversion system in both dry and wet weather due to safety and access issues at the outfall. If the City of Pacific Grove's diversion remains on during the First Flush, as it was this year, sites are still monitored as follows: Greenwood Park and Lovers are monitored above the diversion system; 8th Street is monitored at the outfall if flow is present, as it was this year. . Water quality data from sites monitored above any dry or wet weather diversions are still valuable as contaminants identified in the runoff may not flow to the ocean.

Most results (lab and field) in this study are compared to receiving water standards established for beneficial uses in a stream, lake, or the ocean (see Table 1). These receiving water quality standards

are not meant for end of pipe monitoring, such as for this MRSWMP water quality monitoring program, except for the analytes that refer to the MS4 General Permit. However, lacking standards for most end-of-pipe monitoring, receiving water standards are used for comparison. MBAS detergents and metal results are compared to the Water Quality Control Plan for the Central Coast Basin (Basin Plan) Water Quality Objectives (WQO) set by the Regional Water Quality Control Board (RWQCB) for the protection of marine or aquatic life. Because there are no numerical water quality objectives in the Basin Plan for *E. coli*, enterococcus, nitrate, orthophosphate, and total suspended solids (TSS), those results are compared with the U.S. Environmental Protection Agency (U.S. EPA) WQOs or Central Coast Ambient Monitoring Program's (CCAMP) Action Levels. The U.S. EPA objectives are for the protection of human health while CCAMP's Action Levels are benchmarks that are set for receiving water concentrations at which pollutants may impact cold-water fish. Action Levels typically represent existing regulatory standards; levels derived from the literature or other agency references; or from data that shows levels are elevated relative to the data distribution for that parameter on the Central Coast. It is important to reiterate that both RWQCB Basin Plan Water Quality Objectives and CCAMP Action Levels are established for receiving waters and not for end of pipe discharges such as is collected for the MRSWMP monitoring. There are no end-of-pipe objectives for most of the monitored analytes of the MRSWMP monitoring program, however, the State Water Resources Control Board's (SWRCB) National Pollution Discharge and Elimination System (NPDES) MS4 General Permit does provide end-of-pipe water quality Action Levels for: ammonia, color, hardness, potassium, and turbidity. For turbidity, the SWRCB NPDES MS4 Action Levels have been supplanted by CCAMP Action Levels that are more protective of water quality.

Grab sample results are reported as concentration, consistent with how the water quality objectives are defined. However, this does not give an indication of the load of pollutants being discharged. To facilitate calculation of instantaneous load, instantaneous flow was measured by filling a container of known volume (a bucket), timing how fast the container filled, and estimating how much of the flow was captured while filling the container. Dry Run instantaneous flow calculations are from a single sample, while the First Flush instantaneous flow calculations are an average of two time series samples. We provide this information to give an indication of the amount of flow at the time of sampling.

Figure 1. First Flush sampling on December 13th after the rain has ended at Ocean Avenue (Carmel). Photo: Lisa Emanuelson.

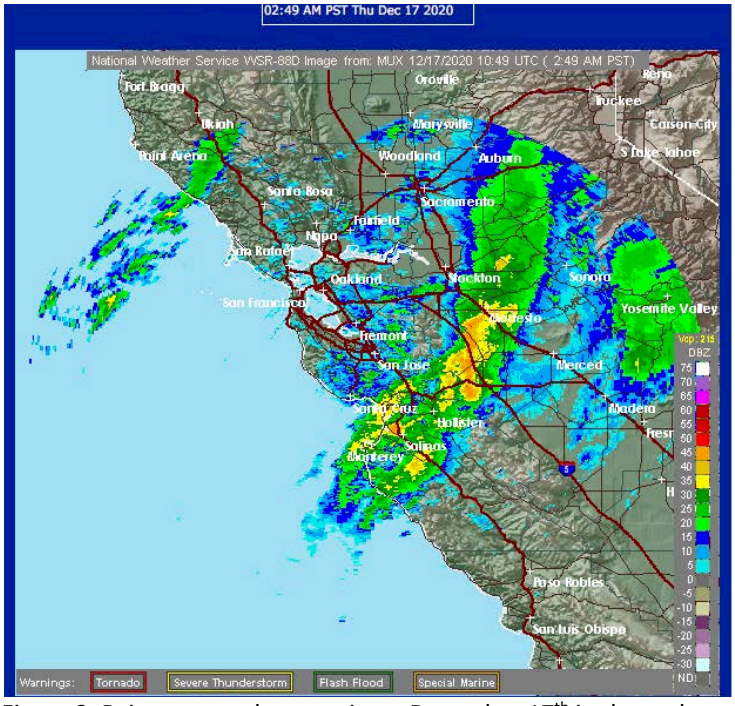

Figure 2. Rain comes ashore again on December 17th in the early hours of the morning. Screen shot from NWS.gov.

Figure 3. Bay Street (Seaside and Sand City) during the First Flush on December 17th, just as the end of the pipe further down the beach becomes unblocked and water is sucked back through the "tower". When the end of the pipe is blocked by sand, water comes out the "tower" and flows down the beach to clear the end of the pipe: a duck-billed flange at the end of a 90" pipe. Photo: Lisa Emanuelson.

Table 1: Receiving Water Quality Objectives

Parameter (reporting units)	Water Quality Objectives	Source of Objective
Ammonia (mg/L)	Not to exceed 50	SWRCB NPDES MS4 General Permit
Color (color units)	Not to exceed 500	SWRCB NPDES MS4 General Permit
Copper (µg/L)	Not to exceed 30[1]	Water Quality Control Plan for the Central Coast- RWQCB
E. coli (MPN/100ml)	Not to exceed 235 [2]	U.S. EPA Ambient Water Quality Criteria
Enterococcus (MPN/100ml)	Not to exceed 104	U.S. EPA Ambient Water Quality Criteria
Hardness as CaCO3 (mg/L)	Not less than or = to 10 or greater than or = to 2,000	SWRCB NPDES MS4 General Permit
Lead (µg/L)	Not to exceed 30 [1]	Water Quality Control Plan for the Central Coast- RWQCB
MBAS Detergents (mg/L)	Not to exceed 0.2	Water Quality Control Plan for the Central Coast- RWQCB
Nitrate as N (mg/L)	Not to exceed 2.25 [3]	Central Coast Ambient Monitoring Program (CCAMP)
Orthophosphate as P (mg/L)	Not to exceed 0.12 [4]	Central Coast Ambient Monitoring Program (CCAMP)
pH (pH units)	Not < 6.5 or > 8.5	Water Quality Control Plan for the Central Coast- RWQCB
Potassium (mg/L)	Not to exceed 20	SWRCB NPDES MS4 General Permit
Total Suspended Solids (TSS) (mg/L)	Not to exceed 500 [5]	Central Coast Ambient Monitoring Program (CCAMP)
Transparency (cm)	Not less than 25 [6]	Central Coast Ambient Monitoring Program (CCAMP)
Turbidity (NTU)	Not to exceed 25	Central Coast Ambient Monitoring Program (CCAMP)
Zinc (µg/L)	Not to exceed 200 [1]	Water Quality Control Plan for the Central Coast- RWQCB

Note: Urea is not listed because it does not have a Water Quality Objective or Action Level.

[1] Water Quality Control Plan for Central Coast Cold Water objective for hard water
[2] Environmental Protection Agency, Updated WQO.
[3] Central Coast Ambient Monitoring Program, Pajaro River Watershed Characterization Report 1998, rev 2003.
[4] Williamson, The Establishment of Nutrient Objectives, Sources, Impacts and Best Management Practices for the Pajaro River and Llagas Creek, 1994.
[5] Central Coast Ambient Monitoring Program, Salinas River Watershed Characterization Report 1999, rev. 2000.
[6] Based upon equivalent guideline value used for 303(d) Listing Guideline Value (Sigler et al., 1985)

Results

Two main monitoring events took place during the 2020 MRSWMP permit year:

- The Dry Run was conducted on Thursday, September 17th, 2020 at 12 sites and on Monday October 5th, 2020 at one site. Only 8 of the 13 sites had enough flowing water to be sampled for the Dry Run 2020. Due to COVID-19 restrictions, no volunteers participated in this monitoring.
- The First Flush and receiving water sampling was conducted on December 13th , 2020 at 10 sites with the help of 28 volunteers. Volunteers were mobilized at 9:45 am on December 13th when the front approached the Monterey Peninsula and dropped 0.11 inches of rain over a 30 minute period just barely enough rain for sampling. This storm event did not create enough flow at 3 sites which were sampled four days later on December 17th, 2020 when a storm dropped 0.25 inches of rain. Sampling this day was conducted with the help of 8 volunteers.

Flow was measured by volunteers at the time of sampling except at sites where low flow during the Dry Run prohibited accurate flow measurements or during the First Flush when an ISCO pump was used to pull sample water from a collection area. At two sites during the Dry Run, Lovers (Pacific Grove) and Pico (Pacific Grove), flow could not be accurately measured due to low flow. ISCOs were used during the First Flush at Las Palmas (Monterey County), Bay Street (Seaside and Sand City) and Lovers (Pacific Grove). All other instantaneous flow estimates are listed in Table 2.

Table 2: Instantaneous flow estimates in **liters per minute (lpm)** per site. NA= data not available due to accessibility to end of pipe because of safety concerns or low flow; NR= Not recorded; NF= No flow.

		Site Description	Site ID	Dry Run	First Flush
Sites by jurisdiction	Carmel	4th Avenue	307-CASD-01	NF	254
		Ocean Avenue	307-CASD-02	NF	405
	Monterey	Twins	309-MSD-03	3	4542*
		San Carlos Beach	309-MSD-04	<1	132
		Steinbeck	309-MSD-05	1	1955
	Monterey County	Boronda	309-SASD-01	NF	59
		Las Palmas	309-SASD-02	NF	NA
	Pacific Grove	8th Street	309-PGSD-01	4	829
		Greenwood Park	309-CENTR-31	60	256
		Lover's	309-PGSD-03	2.0	NA
		Sea Palm	309-PGSD-15	4	123
		Pico	309-PGSD-04	30	484
	Seaside/ Sand City	Bay Street	309-SSD-02	NF	NA

*Flow estimates are based upon one measurement instead of two

Analyte descriptions below are listed alphabetically and include box and whisker graphs that show the data divided into dry weather (DR) and wet weather (FF) results by site. Dry weather monitoring events include Dry Runs and any historical Spring Run and Summer Run events. Wet weather monitoring is inclusive of First Flush and historical Second Flush events. Box and whisker graphs show a distribution of the dataset in a convenient format for making comparisons between sites and the range of concentrations over the years. The box represents the range of 50% of the data above and below the median. The lines above and below the boxes are upper and lower whiskers and represent the remaining upper and lower 25% of the data. The end point of each whisker represents the maximum and minimum average result for that analyte at that location and provides an indication of the best- and worst-case results. Each graph includes a marker for the most recent year's average results for comparison to historical data as well as a marker for receiving water results which are discussed in Appendix 4. A few analytes have graphs that are split along the y-axis to encompass the entire dataset.

Each analyte description includes a reporting of the Minimum Detection Limit (MDL), the lowest concentration that lab equipment can reliably detect an analyte. MDL is a statistical analysis of the confidence of results. Results below the MDL are reported as non-detect since lab equipment cannot reliably determine where the results lay between zero and the MDL.

Ammonia as N

Ammonia, in conjunction with other analytes can assist in identifying a discharge of sewage as well as industrial or commercial liquid wastes. The SWRCB NPDES MS4 General Permit Action Level for ammonia as N is 50 mg/L; the MDL was 0.01 mg/L for the Dry Run and 0.05 for the First Flush. Figure 4 represents all MRSWMP ammonia as N data since 2013. All outfall results are listed in Appendix 2.

- **Dry Run** and **First Flush** results: None of the outfall sites exceeded the Action Level in 2020.

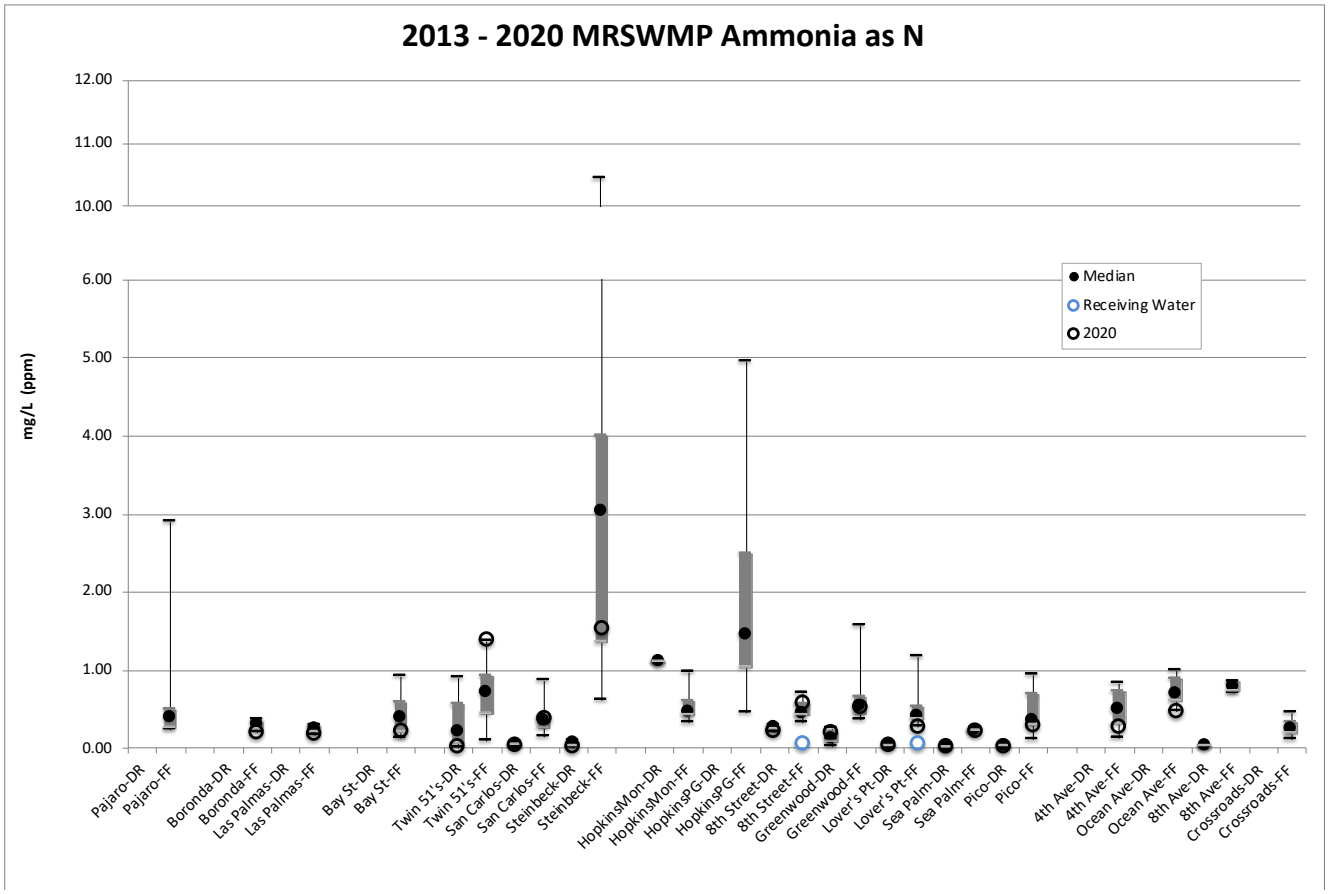

Figure 4. 2013- 2020 MRSWMP ammonia as N results. To better illustrate results, the scale on the graph is split between 6 and 10 mg/L. As a result, First Flush 2014 results from Steinbeck (Monterey) of 10.46 mg/L are in the upper portion of the graph. Non-detects were given the value of half the Minimum Detection Limit (MDL) but their true value lies between the zero and the MDL. Sites are listed north to south.

Color

Color, in conjunction with other analytes, can assist in identifying a discharge of sewage, wash water, as well as industrial or commercial liquid wastes. The SWRCB NPDES MS4 General Permit Action Level for color is 500 units; the MDL for color was 2 color units for the Dry Run and between 2 and 10 color units for the First Flush. Figure 5 represents all MRSWMP color data since 2013. All outfall results are listed in Appendix 2.

- **Dry Run** and **First Flush** results: None of the outfall sites exceeded the Action Level in 2020.

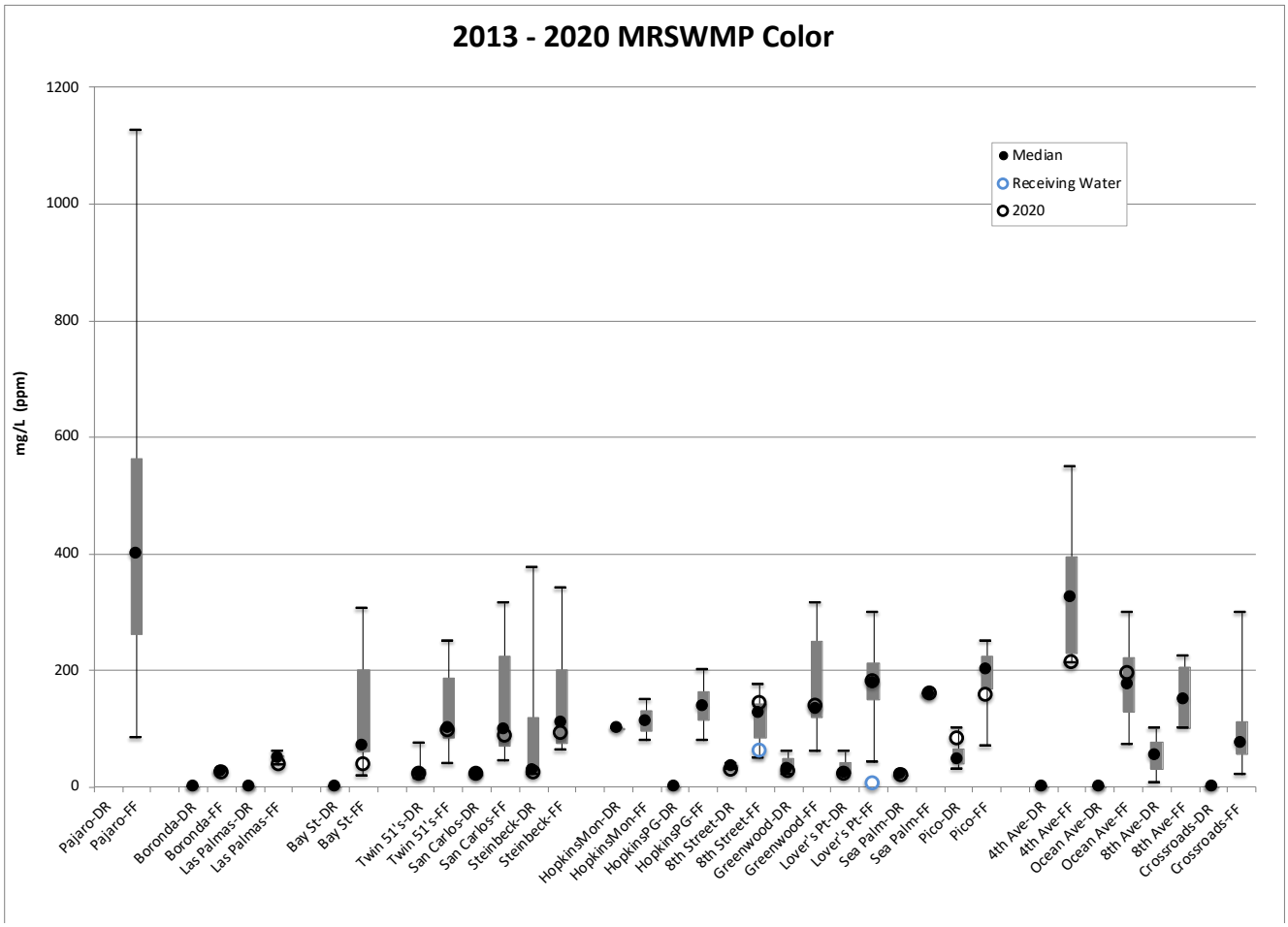

Figure 5. 2013 - 2020 MRSWMP color results. Non-detects were given the value of half the Minimum Detection Limit (MDL) but their true value lies between the zero and the MDL. Sites are listed north to south.

Copper

Copper is toxic to marine organisms and can cause reduced reproduction, developmental deformities, reduced photosynthesis and mortality. Copper and other heavy metal toxicity can be mitigated by the presence of sediment, hardness or other binding compounds that may reduce the metal's bioavailability. Copper is present in some brake pads, pesticides, wood preservatives, roofing materials, and architectural structures such as gutters and downspouts.

The Basin Plan WQO established for total copper is 30 µg/L; the MDL for copper was 5 µg/L for the Dry Run and 7 µg/L for the First Flush. Figure 6 represents all MRSWMP copper data since 2006. All outfall results are listed in Appendix 2.

- **Dry Run** results**:** For 2020 only one site, Steinbeck (Monterey) exceeded the WQO with a result of 58 µg/L.

- **First Flush** results: Average results from nine of the thirteen outfall sites monitored (69%) exceeded the WQO in 2020. The highest average result of 96 µg/L was from 4th Avenue (Carmel).

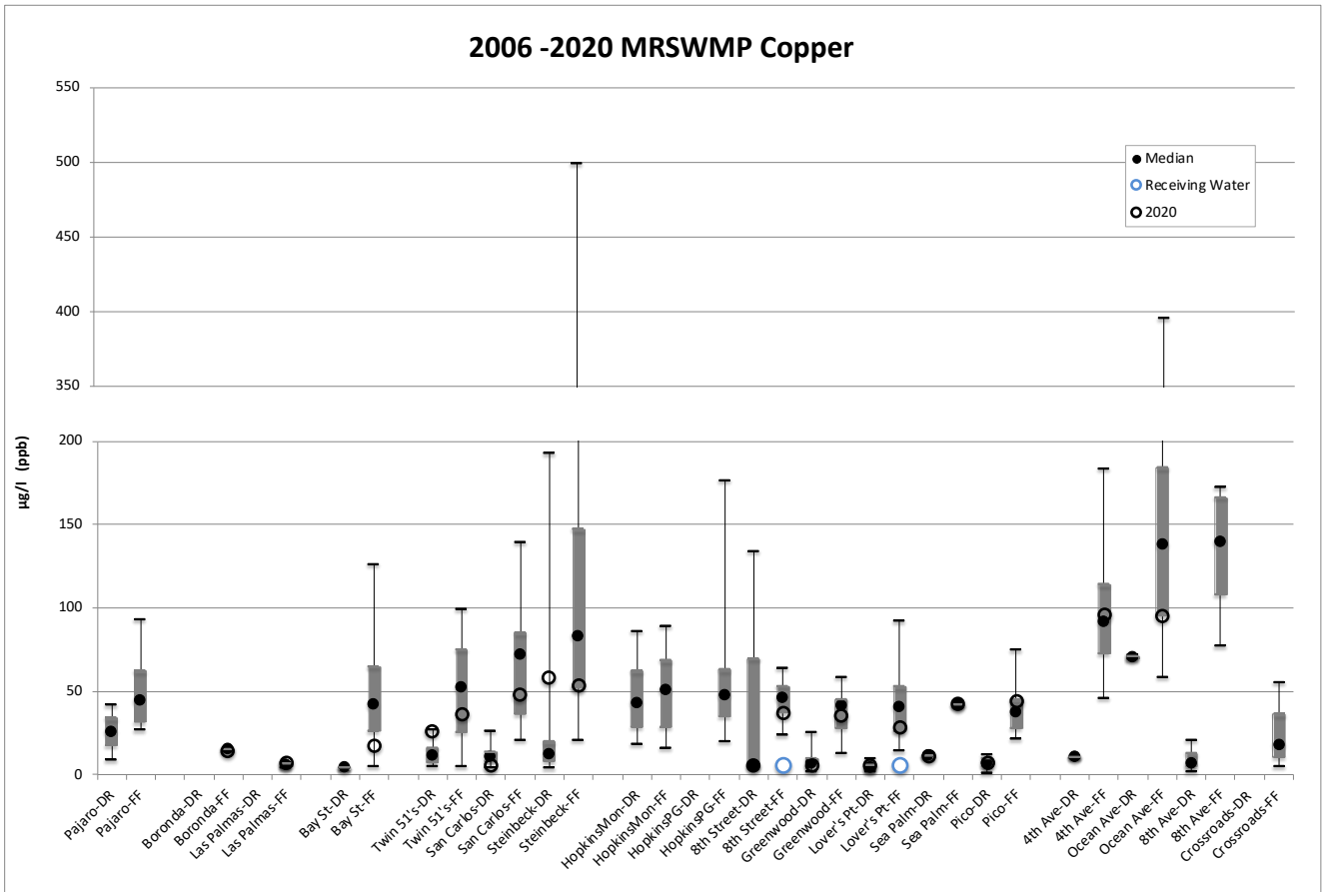

Figure 6. 2006-2020 MRSWMP total copper results. To better illustrate results, the scale on the graph is split between 200 and 350 µg/L. As a result, First Flush 2017 results from Steinbeck (Monterey) of 499 µg/L, and First Flush 2010 results from Ocean Avenue (Carmel) of 395 µg/L are in the upper portion of the graph. Non-detects were given the value of half the Minimum Detection Limit (MDL) but their true value lies between zero and the MDL. Sites are listed north to south.

Escherichia coli (E. coli)

Escherichia coli (*E. coli*) is a type of indicator bacteria found in warm-blooded animals. While *E. coli* does not cause disease in humans, it is a pollutant of concern because its presence indicates the potential presence of pathogens that do cause disease in humans and wildlife.

The U.S. EPA Ambient Water Quality Criteria for *E. coli* is 235 MPN/100 ml. The MDL for *E. coli* was 1 MPN/ 100 ml for the Dry Run and 100 MPN/100 ml for the First Flush. Figure 7 represents all MRSWMP *E. coli* data since 2006. All outfall results are listed in Appendix 2.

- **Dry Run** results: Seven of the eight (88%) outfall sites exceeded the WQO for *E. coli* in 2020. The highest *E. coli* result of >24,196 MPN/100 ml was from Greenwood Park (Pacific Grove). This site is diverted to the sanitary sewer.

- **First Flush** results: All of the outfall sites exceeded the WQO in 2020. The highest average result of 242,000 MPN/100 ml was from 8th Street (Pacific Grove). This site is within the city's diversion system boundary. Wet weather flow from this outfall indicates that either the flow capacity exceeded the diversion system, or debris blocked the diversion conveyance system allowing water to bypass the diversion.

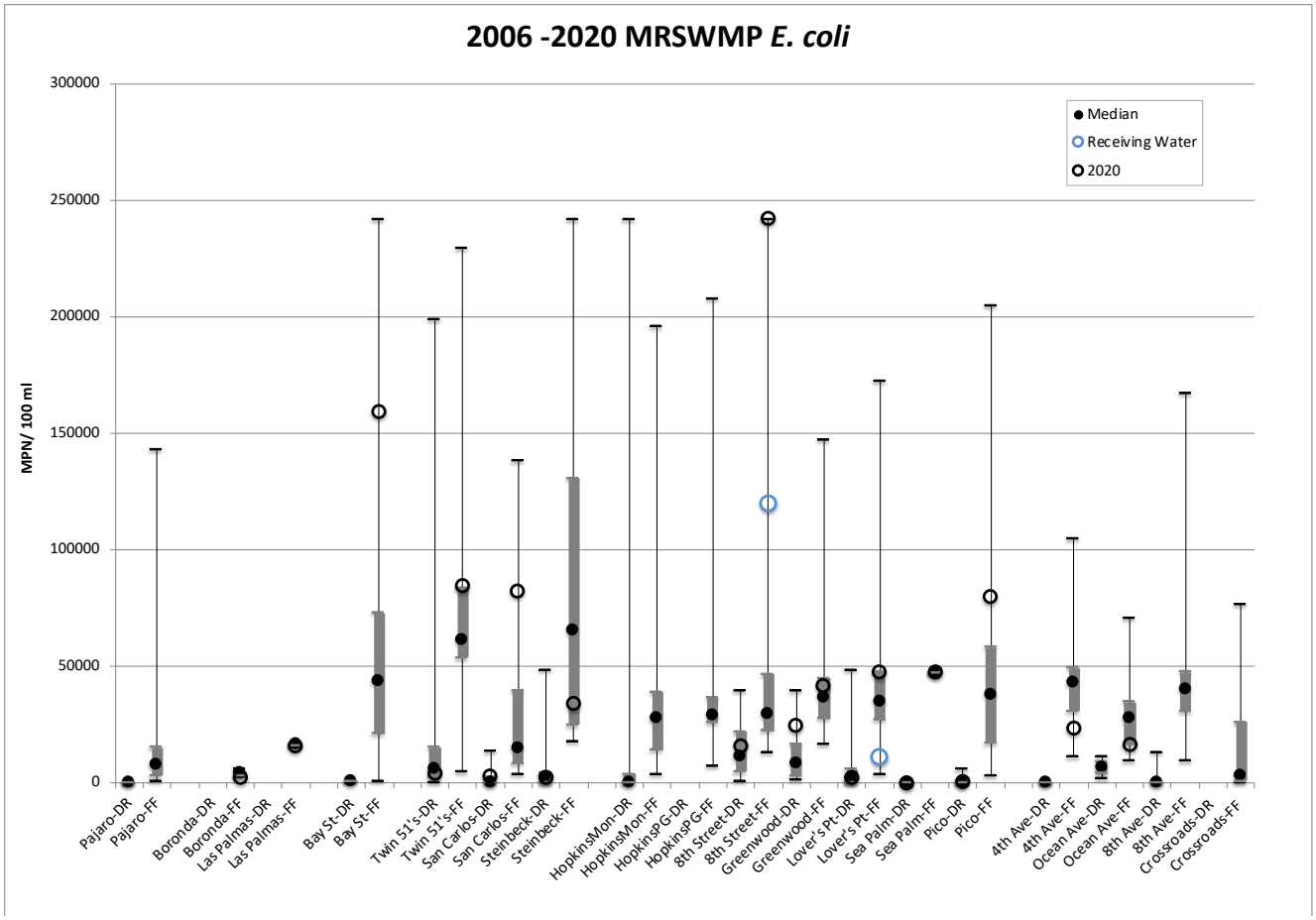

Figure 7. 2006-2020 MRSWMP *E. coli* results. Non-detects were given the value of half the Minimum Detection Limit (MDL) but their true value lies between the zero and the MDL. Sites are listed north to south.

Enterococcus

Enterococcus is another type of indicator bacteria found in warm blooded animals. As described above, it does not cause disease in humans but it is a pollutant of concern because its presence indicates the potential presence of pathogens that do cause disease in humans and wildlife.

The U.S. EPA Ambient Water Quality Criteria for enterococcus is 104 MPN/100 ml. The MDL for enterococcus was 1 MPN/ 100ml for the Dry Run and 100 MPN/100ml for the First Flush. Figure 8 represents all MRSWMP enterococcus data since 2006. All outfall results are listed in Appendix 2.

- **Dry Run** results: Six of the eight outfall sites monitored exceeded the WQO for enterococcus in 2020. The highest enterococcus result of 17,329 MPN/ 100 ml was from Greenwood Park (Pacific Grove), this site is diverted to the sanitary sewer downstream of the collection site.

- **First Flush** results: All outfall sites monitored exceeded the WQO in 2020. The highest average result of 185,959 MPN/100 ml was from Pico (Pacific Grove).

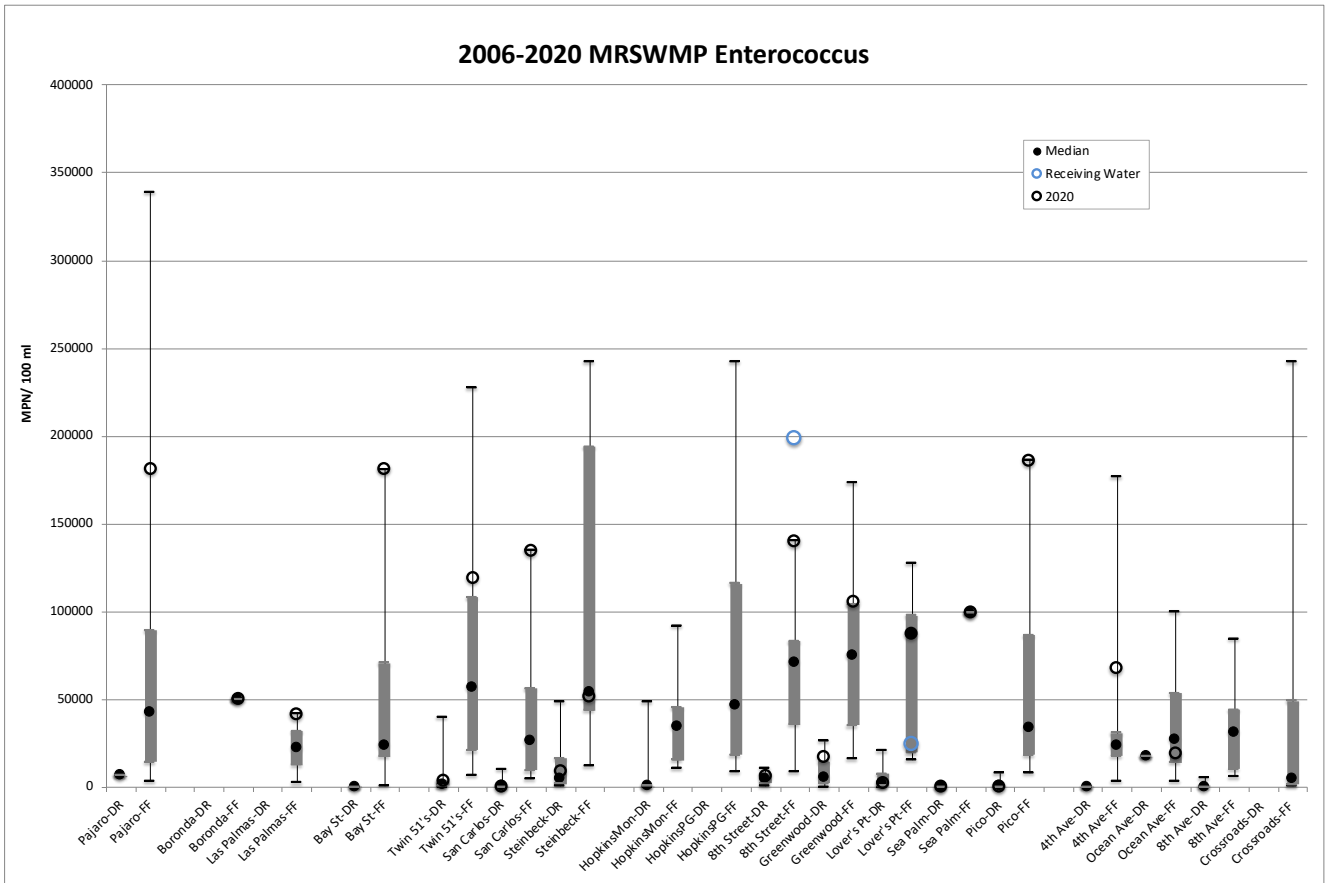

Figure 8. 2006-2020 MRSWMP enterococcus results. Non-detects were given the value of half the Minimum Detection Limit (MDL) but their true value lies between the zero and the MDL. Sites are listed north to south.

Hardness (as $CaCO_3$)

Hardness (as $CaCO_3$) in conjunction with other analytes, can assist in identifying a discharge of sewage, wash water, tap water as well as industrial or commercial liquid wastes. Additionally, when hardness increases, the amount of dissolved metals biologically available to aquatic and marine life decreases resulting in a decrease in the toxicity of the metal.

The SWRCB NPDES MS4 General Permit Action Level for hardness is not less than or equal to 10 mg/L or greater than or equal to 2,000 mg/L; the MDL for hardness (as CaCO3) was 10 mg/L for the Dry Run and 1 and 10 mg/L for the First Flush. Figure 9 represents all MRSWMP hardness data since 2013. All outfall results are listed in Appendix 2.

- **Dry Run** and **First Flush** results: None of the outfall results exceeded the acceptable range in 2020.

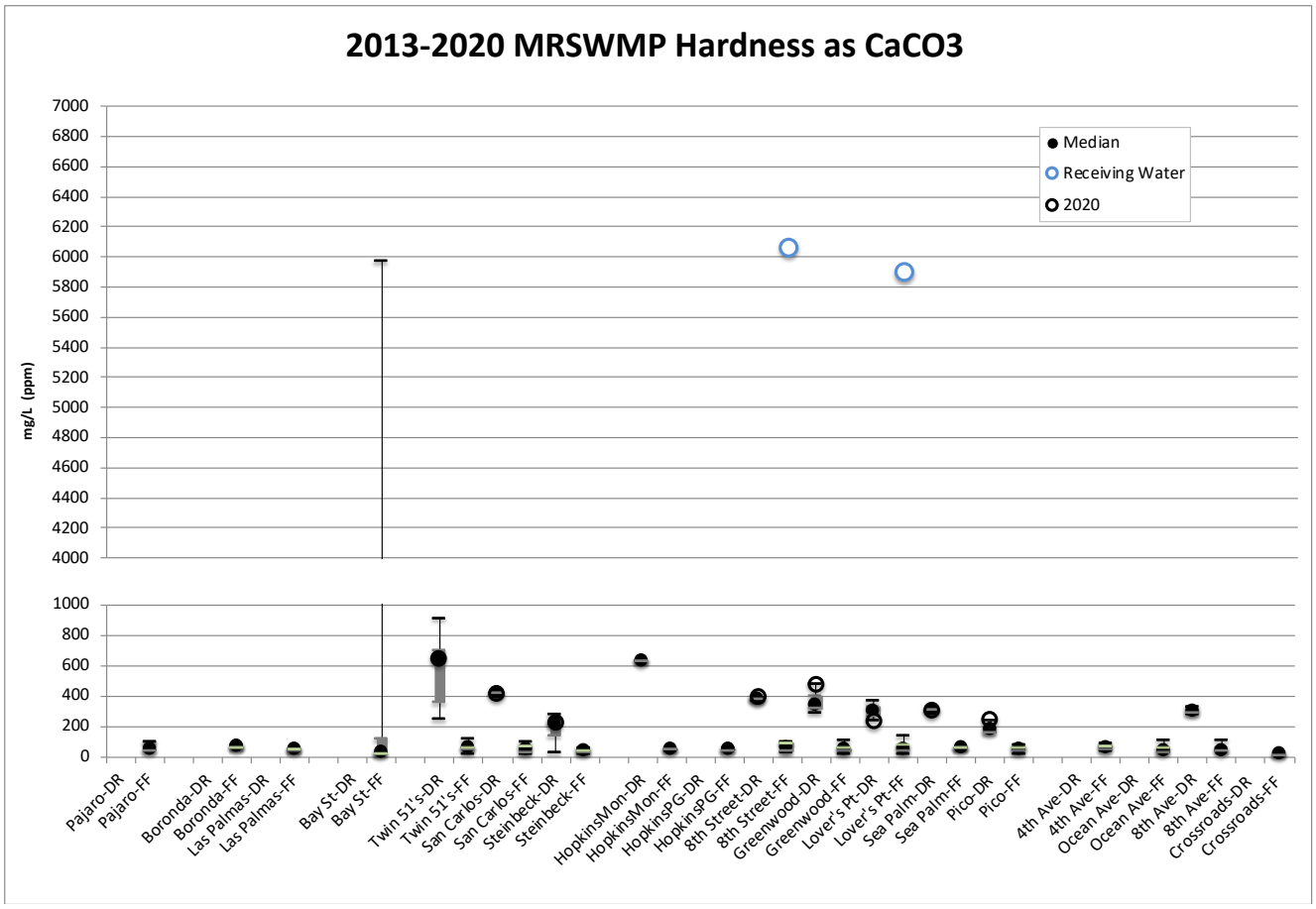

Figure 9. 2013 - 2020 MRSWMP hardness (as CaCO3) results. To better illustrate results, the scale on the graph is split between 1000 and 4000 mg/L. As a result, First Flush 2018 results from Bay Street (Seaside and Sand City) of 5970 mg/L, 8th Street (Pacific Grove) 2020 Receiving Water of 6060 mg/L, and Lovers (Pacific Grove) 2020 Receiving Water of 5900 mg/L, are in the top portion of the graph. Non-detects were given the value of half the Minimum Detection Limit (MDL) but their true value lies between the zero and the MDL. Sites are listed north to south.

Lead

Lead is toxic to marine organisms causing reduced reproduction, developmental deformities, reduced photosynthesis and mortality. Lead and other heavy metal toxicity can be mitigated by the presence of sediment, hardness or other binding compounds that may reduce the metal's bioavailability. Lead is present in some types of paint, water distribution systems, auto emissions and can be passed through the food web via uptake by plants that are grown in lead contaminated soils.

The Basin Plan WQO established for total lead is 30 µg/L; the MDL for lead was 0.1 µg/L for both the Dry Run and First Flush. Figure 10 represents all MRSWMP lead data since 2006. All outfall results are listed in Appendix 2.

- **Dry Run** results: None of the outfall sites exceeded the WQO in 2020. A single non-detect was reported at the Sea Palm (Pacific Grove) outfall site.

- **First Flush** results: None of the outfall sites exceeded the WQO in 2020.

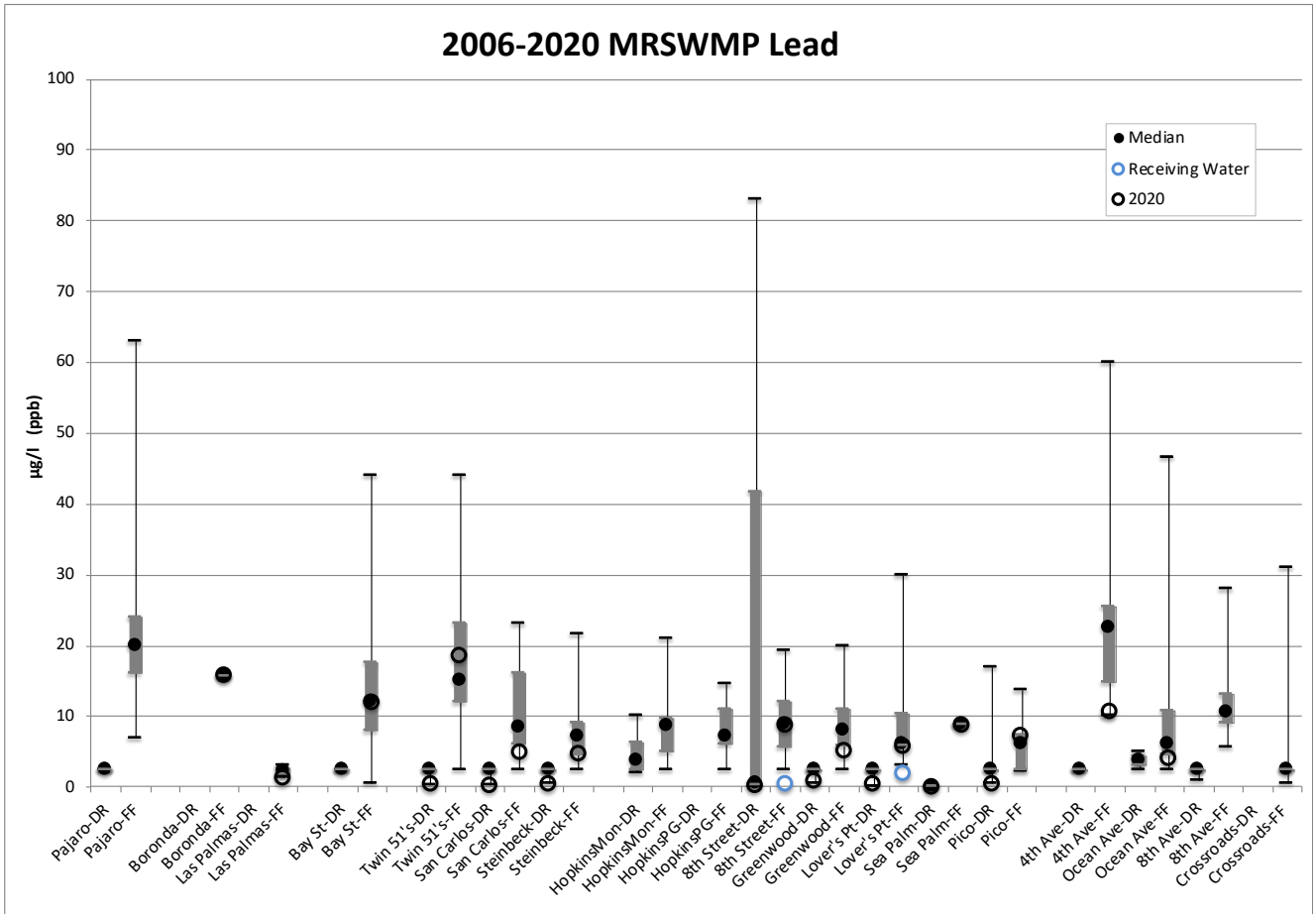

Figure 10. 2006-2020 MRSWMP lead results. Non-detects were given the value of half the Minimum Detection Limit (MDL) but their true value lies between the zero and the MDL. Sites are listed north to south.

MBAS Detergents

MBAS detergents in sample water can indicate a discharge from sewage or wash water, and in conjunction with other analytes, can assist in identifying a discharge of industrial or commercial liquid wastes.

The Basin Plan's WQO established for MBAS detergents is 0.2 mg/L; the MDL for MBAS detergents was 0.02 for the Dry Run and First Flush. Figure 11 represents all MRSWMP MBAS detergent data since 2013. All outfall results are listed in Appendix 2.

- **Dry Run** results: One of the eight sites (13%) was at the WQO for MBAS concentrations in 2020. The highest result of 0.20 mg/L was from Pico (Pacific Grove).

- **First Flush** results: Average results from eleven of the thirteen sites (85%) were above the WQO in 2020. The highest average result of 0.90 mg/L was from 8th Street (Pacific Grove). This site is within the city's diversion system boundary. Wet weather flow from this outfall indicates that either the flow capacity exceeded the diversion system, or debris blocked the diversion conveyance system allowing water to bypass the diversion.

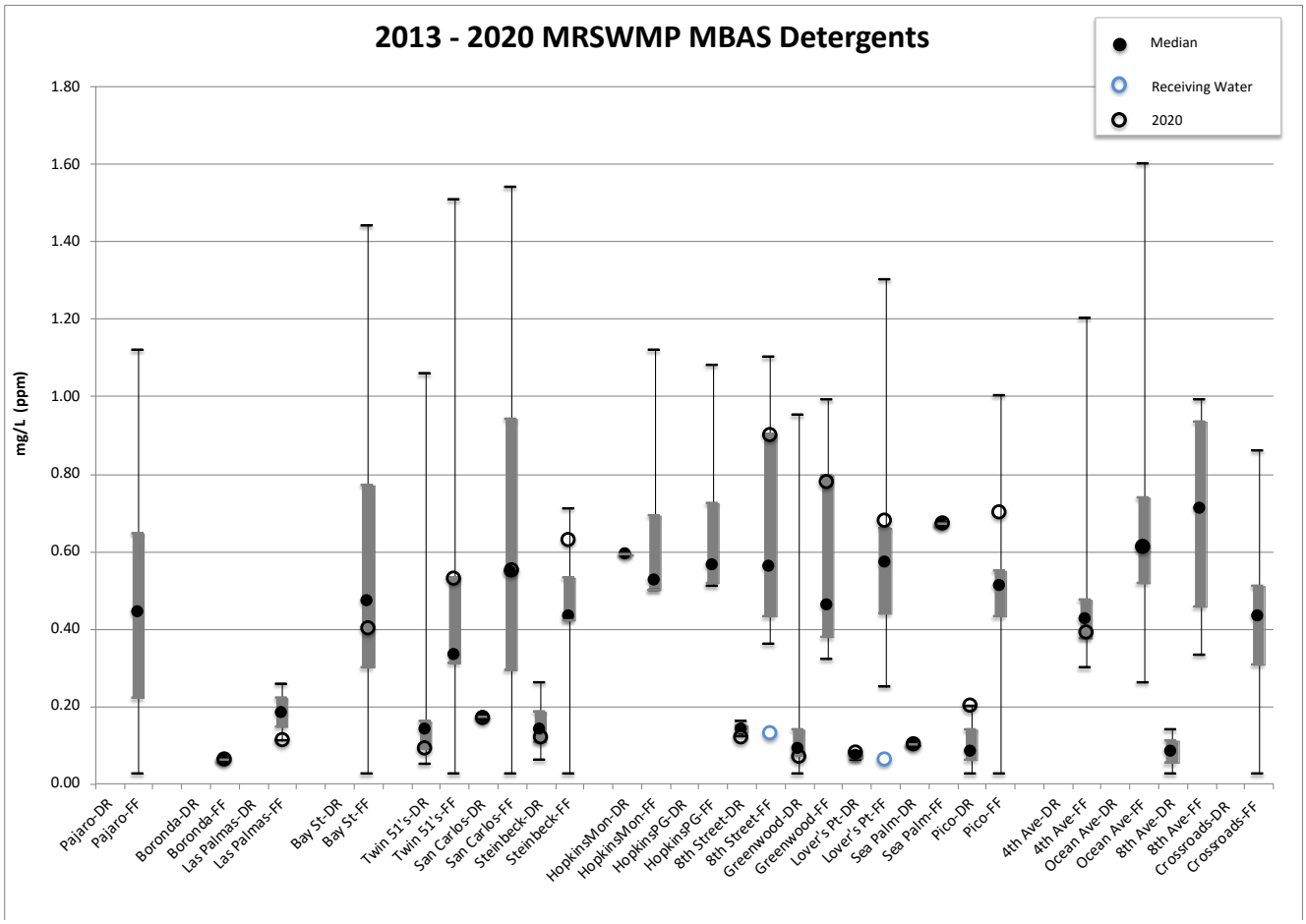

Figure 11. 2013 - 2020 MRSWMP MBAS detergent results. Non-detects were given the value of half the Minimum Detection Limit (MDL) but their true value lies between the zero and the MDL. Sites are listed north to south.

Nitrate as N

Nitrogen is an element needed for plant growth. Primary sources of nitrate in runoff include overwatering of fertilized lawns, agricultural and pasture lands, construction sites, and septic or sewer system leachate. Nitrate in runoff can lead to excessive nitrate in groundwater or increased growth of algal blooms that degrade water quality as algae die off and consume oxygen in their decomposition.

The CCAMP Action Level for nitrate as N (NO_3-N) is 2.25 mg-N/L. The MDL was 0.01 mg-N/L for the Dry Run and First Flush. Figure 12 represents all MRSWMP nitrate as N data since 2006. All outfall results are listed in Appendix 2.

- **Dry Run** results: Two of the eight (25%) monitored sites had results that exceeded the Action Level in 2020. The site with the highest result of 8.6 mg/L was Lovers (Pacific Grove). Dry weather flows from this site were de minimus due to active flow diversion.

- **First Flush** results: No results exceeded the Action Level in 2020.

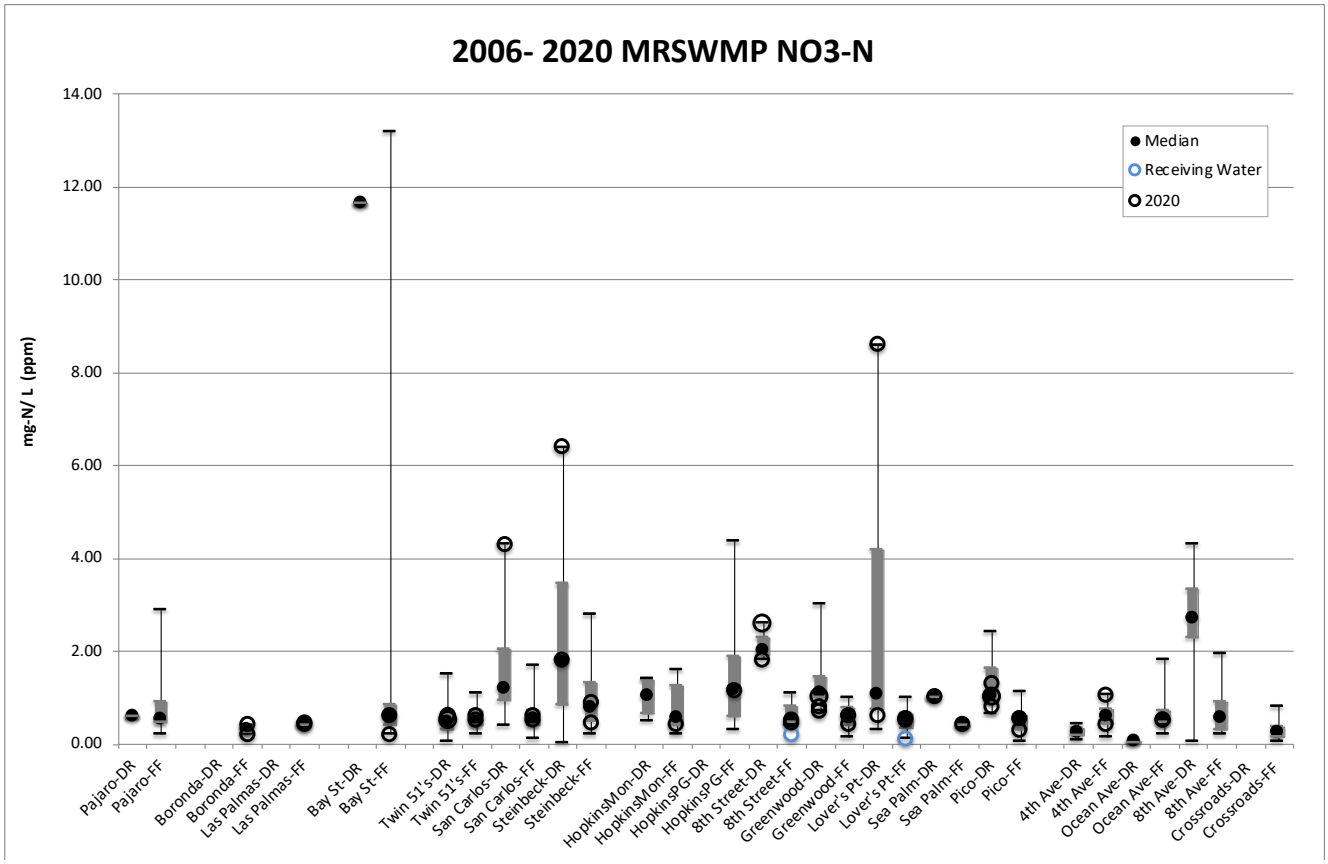

Figure 12. 2006-2020 MRSWMP nitrate as N (NO3-N) results. Non-detects were given the value of half the Minimum Detection Limit (MDL) but their true value lies between the zero and the MDL. Sites are listed north to south.

Orthophosphate as P

Phosphorus is an essential element for plant growth. Orthophosphate is a form of phosphorus commonly found bound to soil particles, in sewage, fertilizers, and in detergents that contain phosphates. In aquatic systems, orthophosphate is rapidly taken up by algae and aquatic plants. When excessive amounts are present, large algal blooms can occur which can lead to degraded water quality conditions toxic to marine or aquatic life.

The CCAMP Action Level for orthophosphate as P (PO_4-P) is 0.12 mg-P/L. The MDL was 0.2 mg-P/L for the Dry Run and First Flush. Figure 13 represents all MRSWMP orthophosphate as P data since 2006. All outfall results are listed in Appendix 2.

- **Dry Run** results: In 2020 four of the eight outfall sites (50%) had results that exceeded the Action Level. The highest result of 0.70 was from Steinbeck (Monterey).

- **First Flush** results: All results exceeded the Action Level in 2020. The highest average result of 1.00 mg-P/ L was from Steinbeck (Monterey).

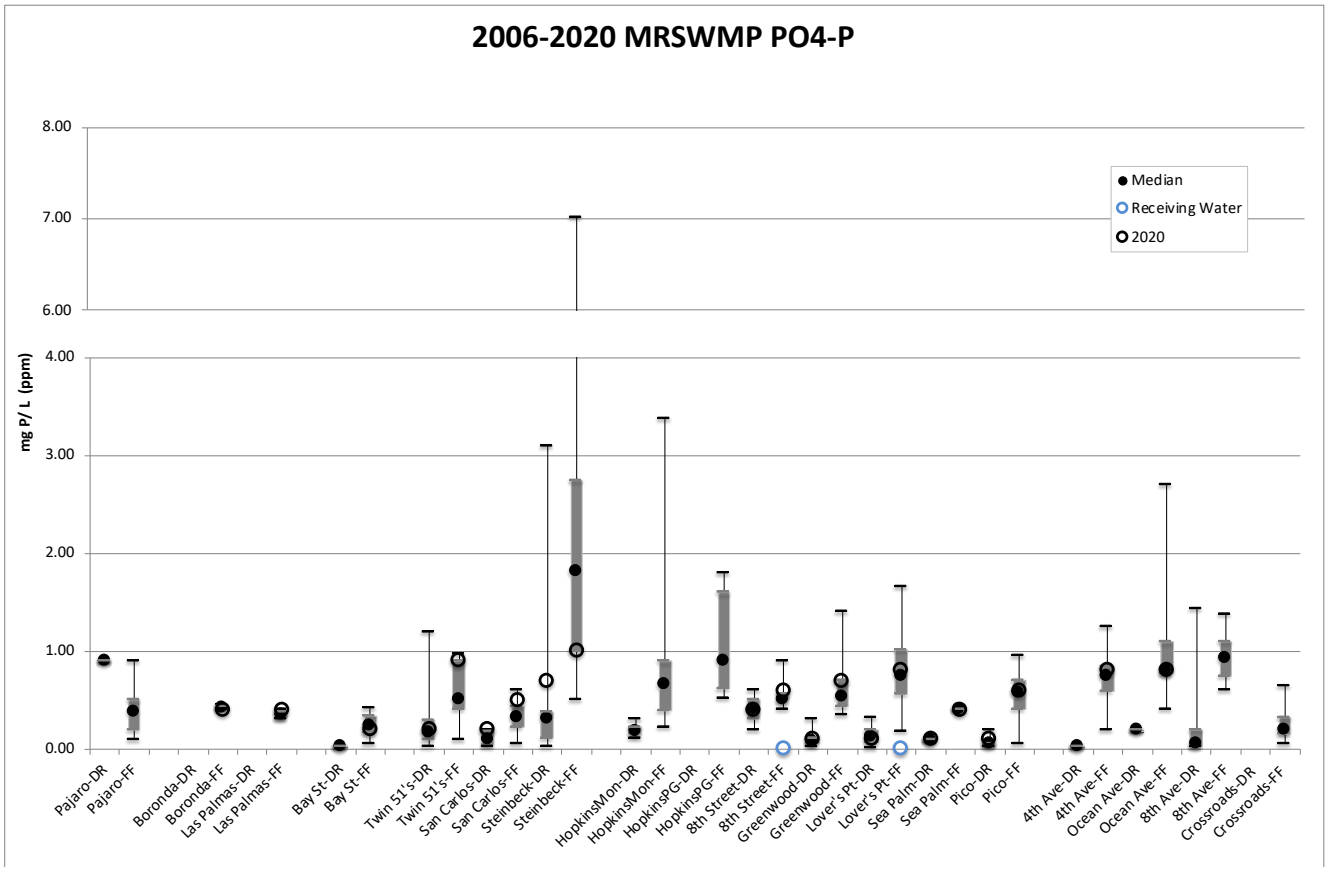

Figure 13. 2006-2020 MRSWMP orthophosphate as P (PO4-P) results. To better illustrate results, the scale on the graph is split between 4.00 and 6.00 mg-P/L. As a result, the First Flush 2010 result of 7.01 mg/L from Steinbeck (Monterey) is in the upper portion of the chart. Non-detects were given the value of half the Minimum Detection Limit (MDL) but their true value lies between the zero and the MDL. Sites are listed north to south.

Potassium

Potassium, in conjunction with other analytes, can assist in identifying a discharge of sewage, industrial, or commercial liquid wastes.

The SWRCB NPDES MS4 General Permit Action Level for potassium is 20 mg/L; the MDL was 0.3 mg/L for both the Dry Run and First Flush. Figure 14 represents all MRSWMP potassium data since 2013. All outfall results are listed in Appendix 2.

- **Dry Run** and **First Flush** results: No sites exceeded the Action Level in 2020.

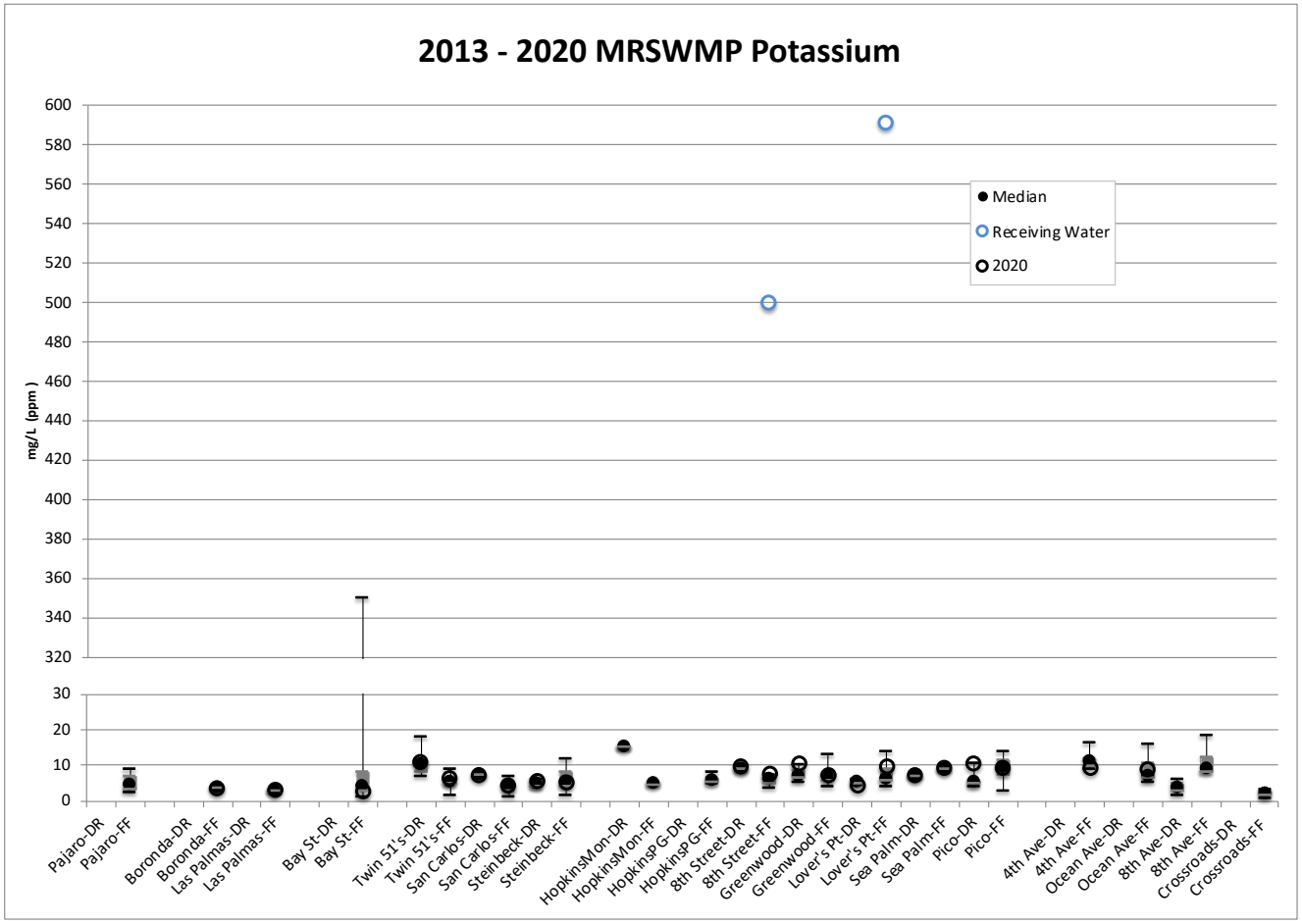

Figure 14. 2013 - 2020 MRSWMP potassium results. To better illustrate results, the scale on the graph is split between 30 and 300 mg/L. As a result, First Flush 2018 result from Bay Street (Seaside and Sand City) of 351 mg/L, 8th Street (Pacific Grove) Receiving Water of 312 mg/L, and Lovers (Pacific Grove) Receiving Water of 336 mg/L are all in the top portion of the graph. Non-detects were given the value of half the Minimum Detection Limit (MDL) but their true value lies between the zero and the MDL. Sites are listed north to south.

Total Suspended Solids

Total suspended solids (TSS) are measured because high amounts of sediment can destroy habitat, suffocate eggs in fresh water systems, limit the food supply, clog gills or impair an organism's vision when feeding. While TSS measures the weight of the solids in the water that contribute to less water clarity, turbidity measures the transparency of water. Both are useful measurements for water clarity but have different methodologies for analysis.

The CCAMP Action Level for TSS is 500 mg/L; the MDL was 2 mg/L for both the Dry Run and First Flush. Figure 15 represents all MRSWMP TSS data since 2006. All outfall results are listed in Appendix 2.

- **Dry Run** results: No sites exceeded the Action Level in 2020. Five of the eight sites monitored, Twins (Monterey), San Carlos (Monterey), 8th Street (Monterey), Lovers (Pacific Grove) and Sea Palm (Pacific Grove) had non-detects. This year flows from Lovers were de minimis due to active flow diversion.
- **First Flush** results: Only one site, Boronda (Monterey County), exceeded the Action Level in 2020 with an average result of 660 mg/L.

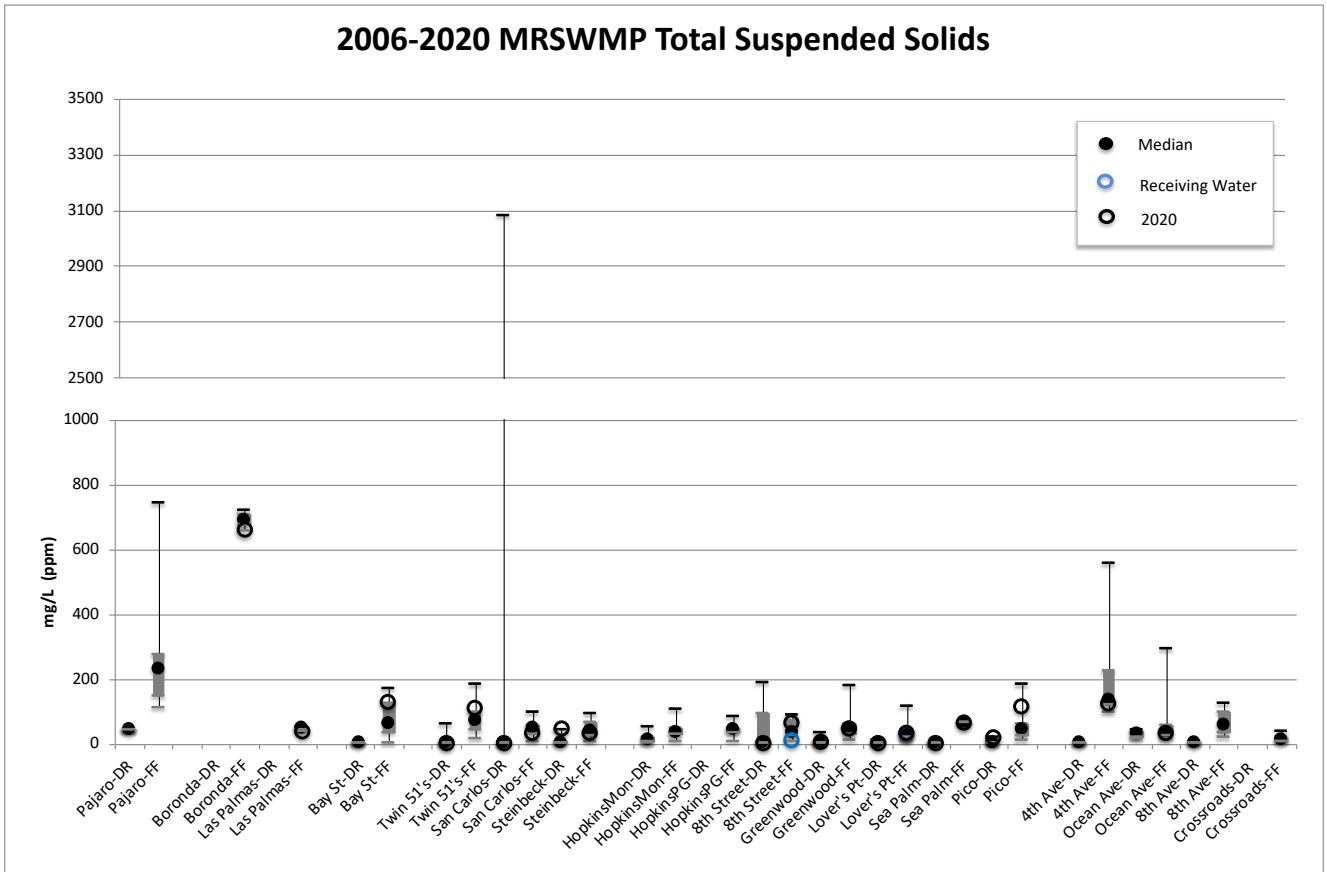

Figure 15. 2006-2020 MRSWMP TSS results. To better illustrate results, the scale on the graph is split between 1000 and 2500 mg/L. As a result, the Dry Run 2007 result of 3080 mg/L from San Carlos (Monterey) is in the top portion of the graph. Non-detects were given the value of half the Minimum Detection Limit (MDL) but their true value lies between the zero and the MDL. Sites are listed north to south.

Turbidity

Turbidity measures the transparency of water while TSS measures the weight of the solids in the water that contribute to less transparency. Both are useful measurements for water clarity but have different methodologies for analysis.

The Action Level for turbidity provided by the State Board in the General Permit is not greater than 1000 NTU. As a comparison CCAMP lists turbidity to be not greater than 25 NTU; the CCAMP Action Level will be used for this set of data as it is more protective of water quality. The MDL was 0.05 NTU for the Dry Run and 0.05 and 0.1 NTU for the First Flush. Figure 16 represents all MRSWMP turbidity data since 2013. All outfall results are listed in Appendix 2.

- **Dry Run** results: No sites exceeded the Action Level in 2020.

- **First Flush** results: Eleven of the thirteen monitored sites (85%) exceeded the Action Level in 2020. The highest average result of 325 NTU was from Boronda (Monterey County).

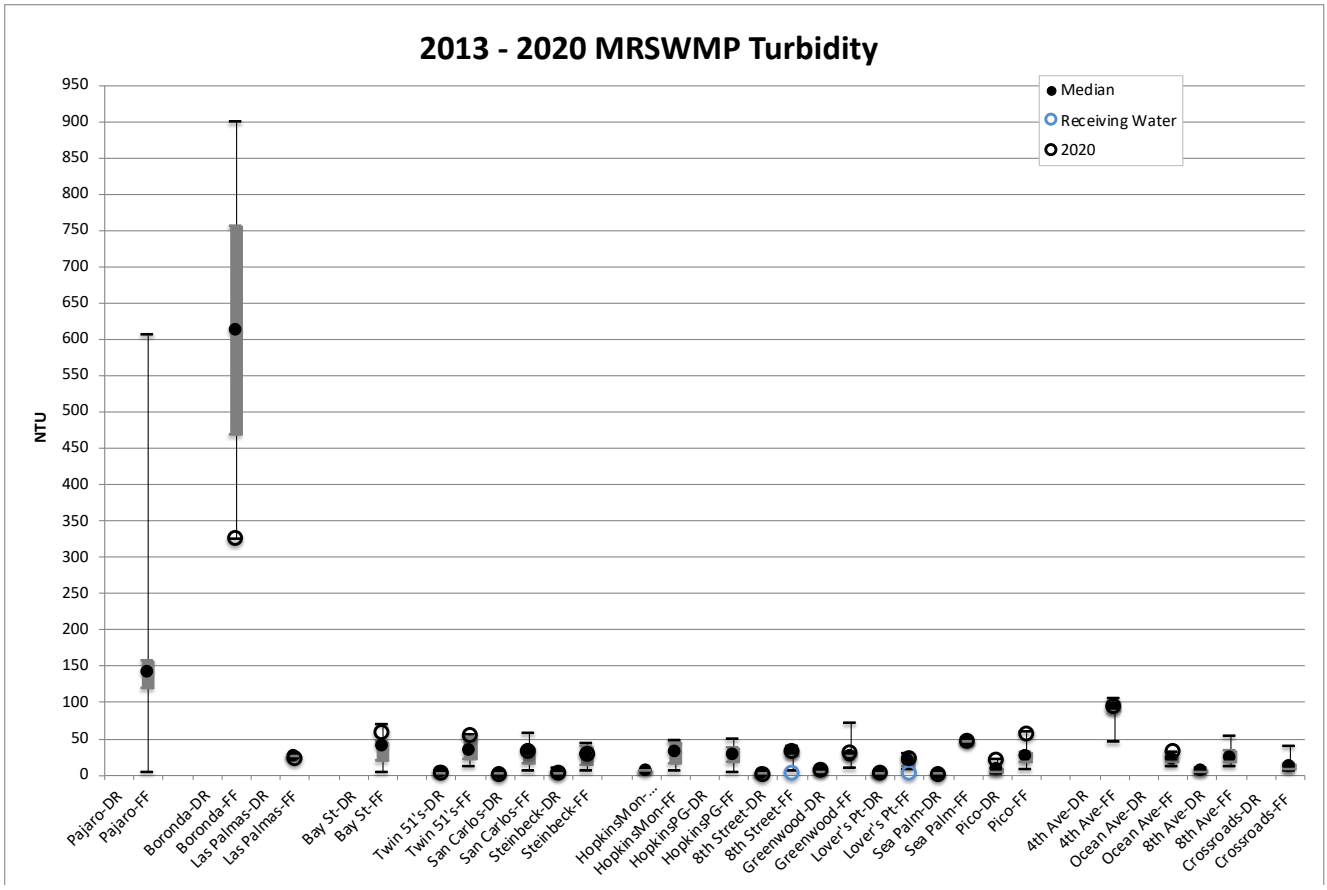

Figure 16. 2013- 2020 MRSWMP turbidity results. Non-detects were given the value of half the Minimum Detection Limit (MDL) but their true value lies between the zero and the MDL. Sites are listed north to south.

Urea

Urea is an organic compound that is often used in agricultural and urban fertilizers. While there is not an established Action Level or WQO, urea concentrations are compared between sites. The MDL for urea was 8 µg/L for the Dry Run and First Flush. Figure 17 represents all MRSWMP urea data since 2006. During the First Flush urea was collected during the first time series only; results shown in Figure 17 are not averaged. All outfall results are listed in Appendix 2.

- **Dry Run** results: In 2020 the highest urea result of 234 µg/L was from 8th Street (Pacific Grove). This site is within the city's diversion system boundary. Dry weather flows from this outfall indicate that debris blocked the diversion conveyance system and allowed some water to bypass the diversion.

- **First Flush** results: In 2020 the highest result of 745 µg/L was from Steinbeck (Monterey).

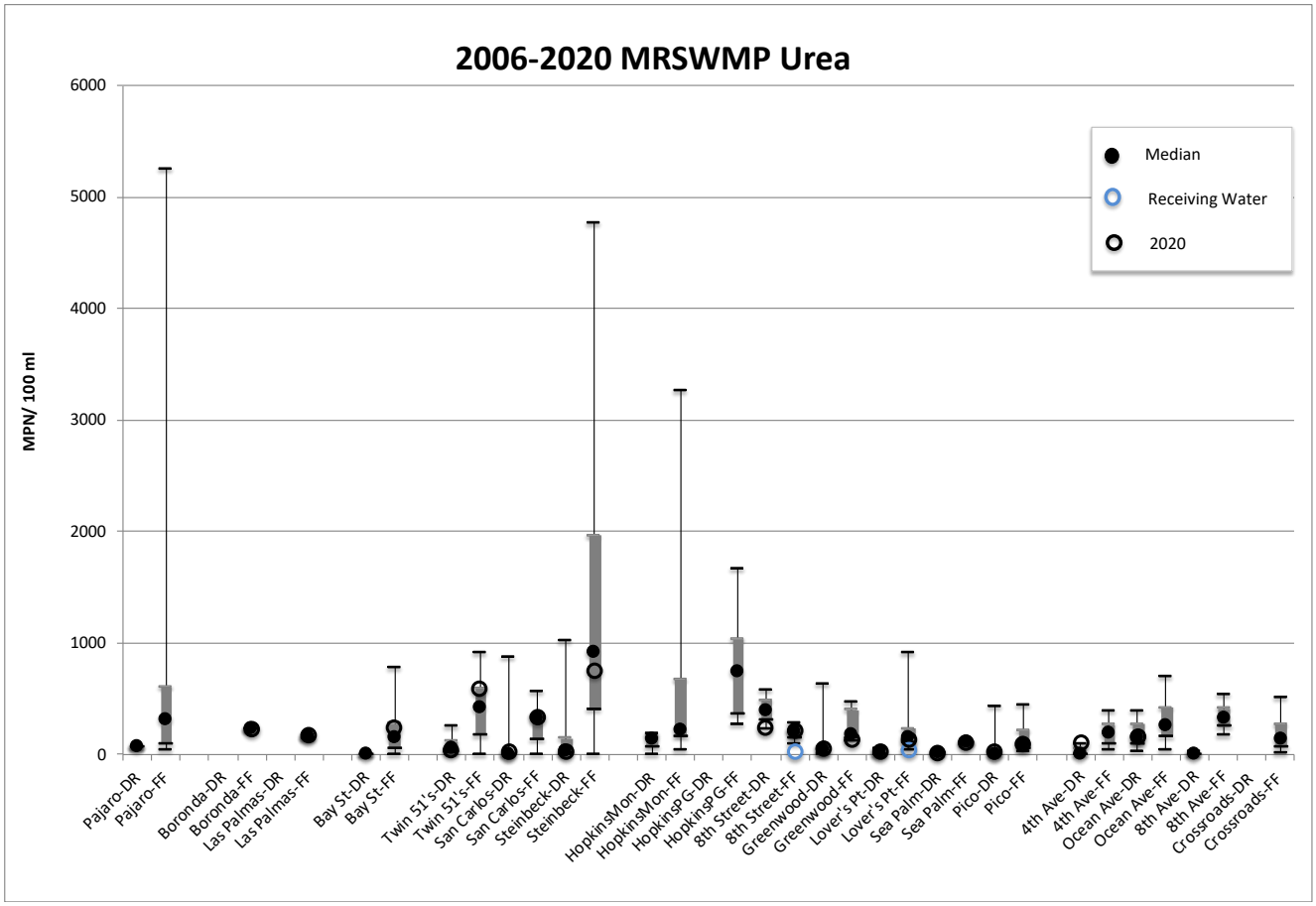

Figure 17. 2006–2020 MRSWMP urea results. Non-detects were given the value of half the Minimum Detection Limit (MDL) but their true value lies between the zero and the MDL. Sites are listed north to south.

Zinc

Zinc is toxic to marine organisms causing reduced reproduction, developmental deformities and mortality. Zinc and other heavy metal toxicity can be mitigated by the presence of sediment or other binding compounds that may reduce the metal's bioavailability. Zinc sources in urban runoff include tires, paint, and outdoor zinc surfaces such as galvanized surfaces.

The Basin Plan WQO for total zinc is 200 µg/L. The zinc MDL was 10 µg/L for the Dry Run and First Flush. Figure 18 represents all MRSWMP zinc data since 2006. All outfall results are listed in Appendix 2.

- **Dry Run** results: No sites exceeded the WQO in 2020. Three outfall sites had a non-detects: Greenwood Park (Pacific Grove), Lovers (Pacific Grove) and Sea Palm (Pacific Grove).). Lovers is within the city's diversion system boundary. Dry weather flows indicate that debris blocked the diversion conveyance system and allowed water to bypass the diversion.

- **First Flush** results: No sites exceeded the WQO in 2020.

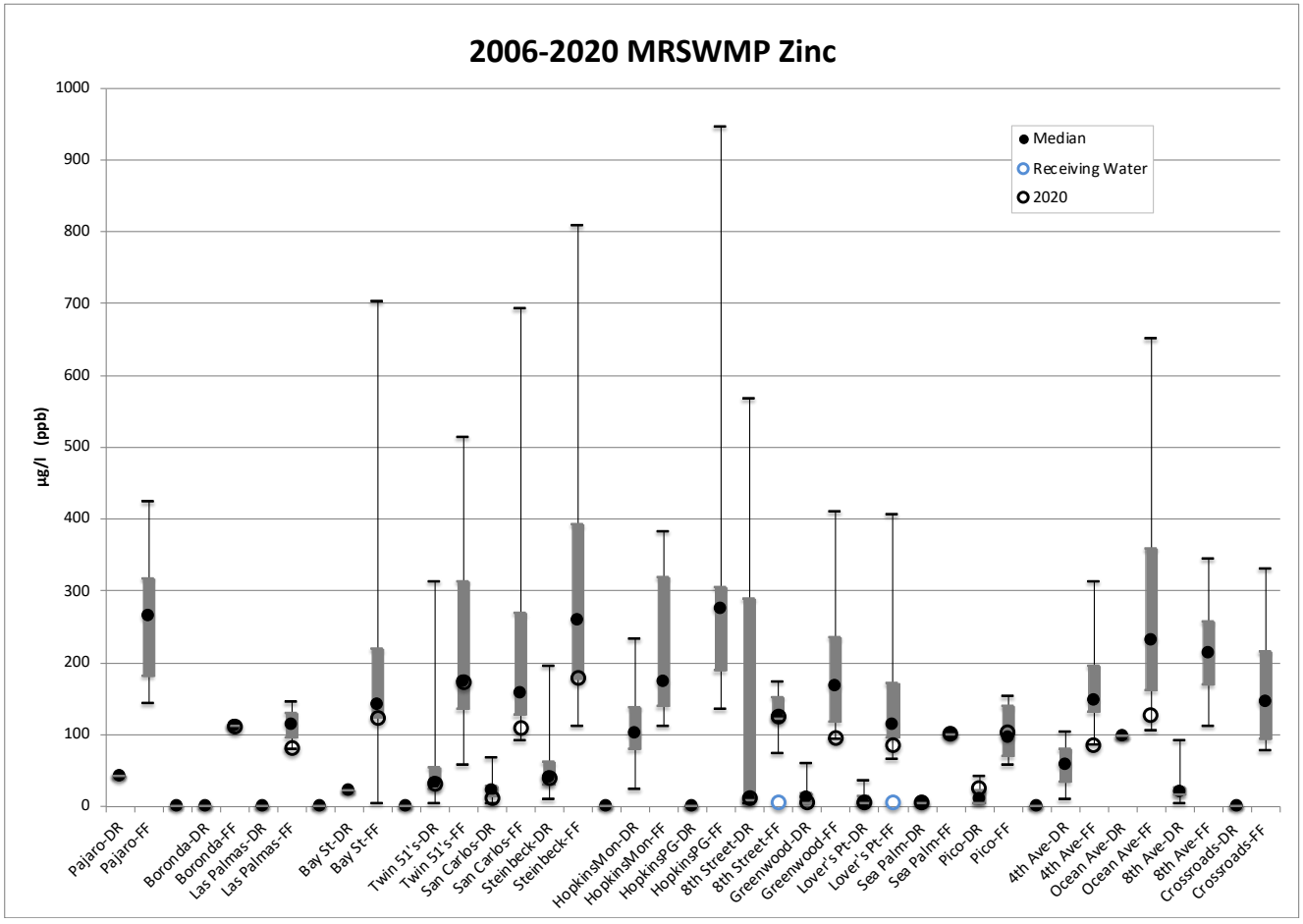

Figure 18. 2006-2020 MRSWMP zinc results. Non-detects were given the value of half the Minimum Detection Limit (MDL) but their true value lies between the zero and the MDL. Sites are listed north to south.

Results by Jurisdiction

The following section is broken out by city or county for this permit year. All 2020 outfall results can be found in Appendix 2 and by jurisdiction in Appendix 3.

Carmel

For the 2020-2021 permit year, two sites were monitored in Carmel: 4th Avenue and Ocean Avenue. There was no flow at either of the sites for the Dry Run.

For the First Flush:

- Copper exceeded the Basin Plan WQO in all samples at both sites. The highest single sample copper result from all 2020 MRSWMP sampled sites of 106 µg/L was from Ocean Avenue during the second time-series sample. The overall highest average of all MRSWMP sites was 4th Avenue with an average of 96 µg/L.
- *E. coli* and enterococcus results exceeded the U.S. EPA WQO in all samples at both sites.
- MBAS surfactant results exceeded the Basin Plan WQO in all samples at both sites.
- Orthophosphate as P results exceeded the CCAMP Action Level in all samples at both sites.
- Turbidity results exceeded the CCAMP Action Level in all samples at both sites.
- Ammonia, color, hardness, lead, nitrate as N, potassium, total suspended solids and zinc results were all below WQOs and Action Levels for both time series samples at both sites.

Monterey

For the 2020-2021 permit year, three sites were monitored: Twins, San Carlos, and Steinbeck. All three Monterey sites had flowing water during the Dry Run.

For the Dry Run:

- Copper results exceeded the WQO and were the highest of all Dry Run sites at Steinbeck with a result of 58 µg/L. Steinbeck was the only site that exceeded the WQO for the Dry Run.
- *E. coli* and enterococcus results exceeded the U.S. EPA WQOs at all sites.
- Nitrate as N results exceeded the CCAMP Action Level at just one site, San Carlos, with a result of 4.3 mg-N/L.
- Orthophosphate as P results exceeded the CCAMP Action Level at all sites, and was the highest of all Dry Run sites at Steinbeck with a result of 0.70 mg-P/L
- Ammonia, color, hardness, lead, MBAS detergents, potassium, total suspended solids, turbidity and zinc results were below WQOs or Action Levels during the Dry Run.

During the First Flush:

- Copper exceeded the Basin Plan WQO in all samples from all sites.
- *E. coli* and enterococcus exceeded the U.S. EPA WQO in all samples at all Monterey sites.
- MBAS detergents exceeded the Basin Plan WQO in all samples at all Monterey sites.

- Orthophosphate exceeded the CCAMP Action Level in all samples at all Monterey sites. The highest single sample result of all 2020 MRSWMP samples of 1.0 mg-P/L was from the second sample at Steinbeck.
- Turbidity exceeded the CCAMP Action Level in all samples from San Carlos and Twins, and the first sample from Steinbeck.
- Ammonia, color, hardness, lead, nitrate as N, potassium, total suspended solids and zinc were all below WQOs and Action Levels for both time series samples at all sites.

Monterey County

For the 2020-2021 permit year, two sites were monitored: Boronda and Las Palmas. There was no flow at either site during the Dry Run.

During the First Flush:

- *E. coli* and enterococcus results exceeded the U.S. EPA WQO in all samples at both Monterey County sites.
- Orthophosphate results exceeded the CCAMP Action Level in all samples at both Monterey County sites.
- Total suspended solids exceeded the CCAMP Action Level in both samples at Boronda and was the highest of all single samples with a result of 768 mg/L in the first time series sample.
- Turbidity results exceeded the CCAMP Action Level only at Boronda which had the highest single sample result of all 2020 MRSWMP samples with a result of 330 mg/L in the second time series sample.
- Ammonia, color, copper, hardness, lead, MBAS surfactants, nitrate as N, potassium and zinc results did not exceed WQOs or Action Levels for any samples during the First Flush.

Pacific Grove

For the 2020-2021 permit year, five sites were monitored: 8th Street, Greenwood Park, Lovers, Sea Palm and Pico. In previous years two sites at Hopkins Marine Station were sampled for First Flush instead of Sea Palm: HopkinsMon and HopkinsPG. Due to COVID in 2020, the Marine Station was closed to the public including First Flush volunteers so these two sites were not sampled and the site at Sea Palm was sampled instead. The 8th Street, Greenwood Park and Lovers sites are included in a dry weather diversion that diverts dry weather urban runoff in the storm drain system to Monterey One Water for treatment from April to October. In recent years, the diversion has been left on throughout the winter season which impacts storm drain flows into the ocean within the diversion area. For the 2020 Dry Run and First Flush the diversion remained in operation. Dry Run samples were collected at the following sites: 8th Street (below the dry weather diversion), Greenwood Park (upstream of the diversion), Lovers (downstream of the diversion, though flow was de minimis)), Sea Palm (outside of the diversion area) and Pico (outside of the diversion area). For First Flush, all sites were sampled: 8th Street (downstream of diversion), Greenwood Park (upstream of the diversion), Lovers (upstream of the diversion), Sea Palm (outside of the diversion area) and Pico (outside of the diversion area). Receiving water samples were collected at 8th Street and Lovers (see Appendix 4).

For the Dry Run:

- *E. coli* was above the U.S. EPA WQO at 8th Street, Greenwood Park, Lovers and Pico. The highest *E. coli* result for all 2020 MRSWMP sites of >24,196 MPN/100 ml was from Greenwood Park.
- Enterococcus was above the U.S. EPA WQO at all sites. The highest result for all 2020 MRSWMP sites of 17,329 MPN/100 ml was from Greenwood Park.
- Nitrate as N exceeded the CCAMP Action Level of 2.25 mg-N/ L and all other Dry Run 2020 samples at Lovers with a result of 8.6 mg-N/L.
- Orthophosphate as P exceeded the CCAMP Action Level at only one site, 8th Street, with a result of 0. 4 mg-P/L.
- Ammonia, color, copper, hardness, lead, MBAS surfactants, potassium, total suspended solids, turbidity and zinc were all below WQOs and Action Levels at all sites.

During the First Flush:

- *E. coli* results exceeded the U.S. EPA WQO in all samples at all sites.
- Enterococcus results exceeded the U.S. EPA WQO in all samples at all sites. Both 8th Street (in the second sample) and Pico (in the first sample) had the highest single sample result of any 2020 MRSWMP sites with a result of 198,629 MPN/100ml.
- Copper results exceeded the Basin Plan Objective of 30 µg/L in all samples from Greenwood Park, 8th Street, Sea Palm and Pico.
- MBAS surfactants results exceeded the RWQCB Basin Plan WQO for all samples at all sites. The first sample at 8th Street had the highest result of any 2020 MRSWMP sites with a result of 1.02 mg/L.
- Orthophosphate results exceeded the CCAMP Action Level in all samples at all sites.
- Turbidity results exceeded the CCAMP Action Level for all samples at Pico and Sea Palm, the first sample at Greenwood Park, and the second sample at 8th Street.
- Ammonia, color, hardness, lead, nitrate as N, potassium, total suspended solids and zinc were all below WQOs and Action Levels for both time series samples at all sites.

Seaside and Sand City

For the 2020-2021 permit year, Bay Street was the only site monitored, and as in past years, this site had no flow for the Dry Run monitoring event.

During the First Flush:

- *E. coli* exceeded the U.S. EPA WQO for both samples.
- Enterococcus exceeded the U.S. EPA WQO for both samples. The highest single sample result for 2020 MRSWMP samples of >242,000 MPN/100 ml was in the first time series sample.
- Hardness exceeded the SWRCB NPDES MS4 General Permit Action Level during the first time series sample with a result of non-detect.
- MBAS surfactant results exceeded the RWQCB Basin Plan WQO in both samples.
- Orthophosphate exceeded the CCAMP Action Level in both samples.
- Turbidity results exceeded the CCAMP Action Level in both samples.

- Ammonia, color, copper, lead, nitrate as N, potassium, total suspended solids and zinc results did not exceed any WQOs or Action Levels for any samples.

All 2020 outfall results can be found in Appendix 2 and by jurisdiction in Appendix 3.

Conclusion

Since 2006, the MRSWMP program has utilized MBNMS' Dry Run and First Flush programs to ascertain what concentrations of pollutants are found in both dry and wet weather flows through storm drains that discharge into surface waters or the ocean. The outfall sites monitored as part of the MRSWMP program are sites that provide a good representation of water quality throughout a jurisdiction and in some cases have been monitored for many years. For the 2020- 2021 permit year, thirteen outfall sites were monitored for the Dry Run and First Flush in six jurisdictions: Monterey County, Seaside-Sand City, Monterey, Pacific Grove and Carmel-by-the-Sea.

In past years, approximately half of the MRSWMP outfall sites did not flow during the dry weather months. This year, eight (62%) of the thirteen storm drain outfalls had flow for the Dry Run: Twins (Monterey), San Carlos (Monterey), Steinbeck (Monterey), 8th Street (Pacific Grove), Greenwood Park (Pacific Grove), Lovers (Pacific Grove), Sea Palm (Pacific Grove) and Pico (Pacific Grove). Dry weather data can be an indicator of the effectiveness of storm water programs. Dry weather monitoring also allows for tracking potential sources of contamination in discharges.

The 2020 First Flush was the latest First Flush in twenty-one years of First Flush sampling. In fact, in each of the past three years, First Flush has been the latest First Flush. The storm that 2020 First Flush volunteers first mobilized for on December 13th was a fairly minor storm with barely enough rain to be considered and at the point of the second sample, many teams were in the dry sunlight. The second storm 2020 First Flush volunteers mobilized for on December 17th was more significant, however also late in the season it is worth noting.

Due to COVID Dry Run sampling was done by a single team or two people and did not provide volunteers with scheduled opportunity to get hands-on practice. For this reason, only volunteers that had participated in First Flush, Snapshot Day or Urban Watch were invited to participate in First Flush this year. First Flush teams were also greatly reduced to teams of two people from the same household if possible. For most teams this restriction was achieved but not for all teams. In addition to requiring team members to wear face masks, all teams were provided with face shields to be used if teams were made up of members not from the same household, and while delivering samples and equipment to program lead, Lisa Emanuelson.

The First Flush event provides an understanding of the types of pollutants flowing into Monterey Bay National Marine Sanctuary after months of dry weather during which contaminants accumulate on streets, roofs, and parking lots. While wet weather samples do indicate the worst-case scenario of high pollutant concentrations discharging into the ocean after months of accumulating on the land, it is important to identify how sub-watersheds compare to each other and if they should be prioritized for follow up investigation during dry weather months. By coupling First Flush with the Dry Run and source tracking within each watershed, a better understanding of each watershed's specific characteristics and problem areas can be achieved, providing needed information for decision making and effective storm water programs.

Appendix 1: MRSWMP Monitoring sites

MRSWMP Monitoring sites- listed from north to south

Jurisdiction	Site ID	Site Name	Drainage Area (acres)	Primary Land Use	MRSWMP Outfall #	Pipe ID (Inches)
Monterey County	SASD-01	Boronda	86	39% Residential 23% Cultivated 19% Industrial	MC-013	24”
Monterey County	SASD-02	Las Palmas	158	3% Commercial 31% Residential 60% Open space	MSP-025	Box culvert
Seaside & Sand City	SSD-02	Bay Street	1200	80% Residential 10% Commercial 10% Public/Other	SC-1	90
Monterey	MSD-03	Twin 51’s	291	63% Residential 15% Commercial 22% Public/Other	M-15	51” (x2)
Monterey	MSD-04	San Carlos	22	12% Commercial 38% Residential 50% Public/Other	M-7	24”
Monterey	MSD-05	Steinbeck	37	66% Commercial 12% Residential 22% Public/Other	M-3	36”
Pacific Grove	PGSD-01	8th Street	35	100% Residential	PG-32	24”
Pacific Grove	CENTR-31	Greenwood Park	238.3	71% Residential 5% Commercial 25% Public/Other	PG-28	36”
Pacific Grove	PGSD-03	Lover’s Point	240	54% Residential 1% Commercial 20% Other	PG-22	54”
Pacific Grove	PGSD-15	Sea Palm	32.2		PG-15	18”
Pacific Grove	PGSD-04	Pico	17.56	60% Residential 40% Public	PG-03	40”
Carmel	CASD-01	4th Avenue	128.0	86% residential 7% Comm/Res 7% Public/Other	C-1	36”x60” Box culvert
Carmel	CASD-02	Ocean Avenue	115.2	22% Commercial 71% Residential 7% Comm/Res	C-2	24”

Appendix 2: Results by Analyte (listed alphabetically)

Ammonia as N

Comparison of ammonia results for MRSWMP monitoring and reported in mg/L. Shaded boxes indicate that the General Permit Action Level of 50 mg/L was exceeded; NA= Not Analyzed; ND= Non-detect; NF= No Flow; NS= Not Sampled; -- = Not included in MRSWMP monitoring for this analyte. Since 2013, sampling has been conducted during dry weather for the Dry Run (DR) and Summer Run (SuR), and during wet weather for the First Flush (FF) and Second Flush (SF).

		Site Name	FF 2020	DR 2020	FF 2019	DR 2019	FF 2018	DR 2018	FF 2017	DR 2017	FF 2016	DR 2016	FF 2015	DR 2015
Sites by Jurisdiction	Carmel	4th Avenue	0.27	NF	0.80	NF	0.45	NF	0.13	NF	0.84	NF	0.53	NF
		Ocean	0.47	NF	0.95	NF	1.00	NF	0.65	NF	0.73	NF	0.59	NF
		8th Avenue	NS	NS	NS	NS	0.85	NF	0.71	ND	0.84	NF	0.73	NF
	Monterey	Twin 51's	1.38	ND	0.48	0.90	0.95	ND	0.92	0.9	0.32	0.44	0.69	0.34
		San Carlos	0.38	0.04	0.34	NF	0.25	NF	0.47	NF	0.26	NF	0.35	NF
		Steinbeck	1.52	ND	0.89	ND	3.30	NF	4.63	NF	2.76	NF	3.79	NF
	Monterey County	Boronda	0.20	NF	0.37*	NF	--	--	--	--	--	--	--	--
		Las Palmas	0.17	NF	0.30	NF	--	--	--	--	--	--	--	--
		Pajaro	NS	NS	NS	NS	0.25	NF	0.51	NF	2.90	NF	0.31	NF
		Crossroads	NS	NS	NS	NS	0.35	NF	0.29	NF	0.18	NF	0.18	NF
	Pacific Grove	HopkinsMon	NS	NS	0.47	NF	0.45	NF	0.98	1.1	0.33	NF	--	--
		HopkinsPG	NS	NS	1.22	NF	4.95	NF	0.45	NF	1.66	NF	--	--
		8th Street	0.57	0.21	0.44	NF	0.70	0.30	0.41	NF	0.32	NF	--	--
		Greenwood	0.52	0.19	0.52	0.10	0.45	0.10	0.41	ND	0.36	0.26	0.78	ND
		Lover's	0.27	0.04	0.55	ND	0.40	NF	0.39	NF	0.33	NF	0.49	NF
		Sea Palm	0.22	ND										
		Pico	0.29	ND	0.70	ND	0.40	ND	0.29	ND	0.29	ND	0.68	ND
	Seaside/ Sand City	Bay St	0.22	NF	0.71	NF	0.15	NF	0.93	NF	0.39	NF	0.53	NF

*Data provided by Monterey County from sampling that occurred one day after First Flush.

Ammonia as N continued

		Site Name	FF 2014	DR 2014	SuR 2014	SF 2014	FF 2013	DR 2013
Sites by Jurisdiction	Carmel	4th Avenue	--	--	NF	NS	NS	NF
		Ocean	--	--	NF	NS	NA	NF
		8th Avenue	--	--	NF	NS	NS	NA
	Monterey	Twin 51's	0.72	0.07	0.06	0.10	NA	NA
		San Carlos	0.86	NF	NF	0.14	NA	NF
		Steinbeck	10.46	0.09	0.08	0.61	NA	NF
	Monterey County	Boronda	--	--	--	--	--	--
		Las Palmas	--	--	--	--	--	--
		Pajaro	0.44	NF	NF	0.23	NA	NF
		Crossroads	0.46	NF	NF	0.12	NA	NF
	Pacific Grove	HopkinsMon	--	--	--	--	--	--
		HopkinsPG	--	--	--	--	--	--
		8th Street	--	--	--	--	--	--
		Greenwood	1.57	0.21	0.11	NS	NA	NA
		Lover's	1.18	NF	NF	NS	NA	NF
		Sea Palm						
		Pico	0.94	ND	ND	0.11	NA	NA
	Seaside/ Sand City	Bay St	0.37	NF	NF	0.13	NA	NF

Color

Comparison of color results for MRSWMP monitoring, reported in Color Units. Shaded boxes indicate that the General Permit action level of 500 color units was exceeded. NA= Not Analyzed; ND= Non-detect; NF= No Flow; NS= Not Sampled; -- = Not included in MRSWMP monitoring of this analyte. Since 2013, sampling has been conducted during dry weather for the Dry Run (DR) and Summer Run (SuR), and during wet weather for the First Flush (FF) and Second Flush (SF).

		Site Name	FF 2020	DR 2020	FF 2019	DR 2019	FF 2018	DR 2018	FF 2017	DR 2017	FF 2016	DR 2016	FF 2015	DR 2015
Sites by Jurisdiction	Carmel	4th Avenue	214	NF	550	NF	275	NF	375	NF	213	NF	400	NF
		Ocean	196	NF	175	NF	175	NF	250	NF	80	NF	73	NF
		8th Avenue	NS	NS	NS	NS	200	NF	225	14	100	NF	100	NF
	Monterey	Twin 51's	96	22	188	75	100	20	250	19	40	24	85	30
		San Carlos	87	22	150	NF	98	NF	250	NF	44	NF	50	NF
		Steinbeck	93	24	125	375	110	NF	200	NF	75	NF	63	NF
	Monterey County	Boronda	25	NF	NA	NA	--	--	--	--	--	--	--	--
		Las Palmas	38	NF	60	NF	--	--	--	--	--	--	--	--
		Pajaro	NS	NS	NS	NS	85	NF	1125	NF	255	NF	400	NF
		Crossroads	NS	NS	NS	NS	125	NF	300	NF	40	NF	20	NF
	Pacific Grove	HopkinsMon	NS	NS	100	NF	125	NF	150	32	80	NF	--	--
		HopkinsPG	NS	NS	150	NF	125	NF	200	NF	80	NF	--	--
		8th Street	143	30	85	NF	125	40	175	NF	50	NF	--	--
		Greenwood	140	26	125	50	125	50	250	10	60	30	100	25
		Lover's	180	21	175	24	200	NF	175	NF	42	NF	75	NF
		Sea Palm	159	20	--	--	--	--	--	--	--	--	--	--
		Pico	157	84	200	100	200	40	225	8	70	60	175	50
	Seaside/ Sand City	Bay St	38	NF	150	NF	18	NF	200	NF	60	NF	65	NF

Color continued

		Site Name	FF 2014	DR 2014	SuR 2014	SF 2014	FF 2013	DR 2013
Sites by Jurisdiction	Carmel	4th Avenue	--	--	NF	NS	NS	NF
		Ocean	--	--	NF	NS	300	NF
		8th Avenue	--	--	NF	NS	NS	7
	Monterey	Twin 51's	185	25	30	50	225	24
		San Carlos	315	NF	NF	70	225	NF
		Steinbeck	340	22	33	70	225	NF
	Monterey County	Boronda	--	--	--	--	--	--
		Las Palmas	--	--	--	--	--	--
		Pajaro	300	NF	NF	500	625	NF
		Crossroads	100	NF	NF	70	75	NF
	Pacific Grove	HopkinsMon	--	--	--	--	--	--
		HopkinsPG	--	--	--	--	--	--
		8th Street	--		--	--	--	--
		Greenwood	315	20	20	NS	250	60
		Lover's	250	NF	NF	NS	300	NF
		Sea Palm	--	--	--	--	--	--
		Pico	225	30	40	167	250	44
	Seaside/ Sand City	Bay St	305	NF	NF	70	250	NF

Copper

Comparison of total copper results for MRSWMP monitoring reported in µg/L. Shaded boxes indicate that the Basin Plan Objective of 30 µg/L was exceeded; ND= Non-detect; NF= No Flow; NS= Not Sampled; -- = Not included in MRSWMP monitoring.
Since 2006, sampling has been conducted during dry weather for the Dry Run (DR), Spring Run (SpR) and Summer Run (SuR), and during wet weather for the First Flush (FF) and Second Flush (SF). The table is broken into sections to facilitate printing.

		Site Name	FF 2020	DR 2020	FF 2019	DR 2019	FF 2018	DR 2018	FF 2017	DR 2017	FF 2016	DR 2016	FF 2015	DR 2015	FF 2014	DR 2014
Sites by Jurisdiction	Carmel	4th Avenue	96	NF	71	NF	163	NF	46	NF	86	NF	73	NF	--	--
		Ocean	95	NF	84	NF	138	NF	111	NF	95	NF	58	NF	--	--
		8th Avenue	NS	NS	NS	NS	139	NF	77	14	108	NF	86	NF	--	--
	Monterey	Twin 51's	36	26	26	23	24	ND	65	19	22	13	27	27	76	11
		San Carlos	48	ND	22	NF	58	NF	72	NF	21	NF	25	NF	121	NF
		Steinbeck	53	58	37	193	59	NF	499	NF	52	NF	39	NF	248	4
	Monterey County	Boronda	14	NF	16*	NF	--	--	--	--	--	--	--	--	--	--
		Las Palmas	7	NF	4	NF	--	--	--	--	--	--	--	--	--	--
		Pajaro	NS	NS	NS	NS	30	NF	79	NF	62	NF	27	NF	32	NF
		Crossroads	NS	NS	NS	NS	30	NF	15	NF	17	NF	10	NF	35	NF
	Pacific Grove	HopkinsMon	NS	NS	16	NF	34	NF	52	32	27	NF	--	--	--	--
		HopkinsPG	NS	NS	20	NF	40	NF	52	NF	32	NF	--	--	--	--
		8th Street	37	ND	24	NF	39	ND	43	NF	26	NF	--	--	--	--
		Greenwood	35	ND	13	6	32	ND	41	10	16	4	22	8	58	ND
		Lover's	28	ND	24	ND	36	NF	47	NF	19	NF	24	NF	68	NF
		Sea Palm	42	11												
		Pico	44	7	22	7	55	ND	27	8	29	5	30	ND	61	ND
	Seaside/ Sand City	Bay St	17	NF	40	NF	ND	NF	81	NF	28	NF	26	NF	106	NF

*Data provided by Monterey County from sampling that occurred one day after First Flush.

Copper continued

		Site Name	SuR 2014	SF 2014	FF 2013	DR 2013	SuR 2013	SF 2013	FF 2012	DR 2012	SuR 2012	SpR 2012	FF 2011	DR 2011	SuR 2011	SpR 2011
Sites by Jurisdiction	Carmel	4th Avenue	NF	NS	NS	NF	NF	NS	86	NF	NF	NF	96	11	NF	10
		Ocean	NF	NS	248	NF	NF	NS	87	NF	72	NF	165	NF	NF	NF
		8th Avenue	NF	NS	NS	6	14	NS	NS	NF	7	21	114	6	4	8
	Monterey	Twin 51's	ND	ND	75	16	13	16	46	10	16	8	52	9	5	11
		San Carlos	NF	24	86	NF	12	--	--	NF	14	13	65	8	4	8
		Steinbeck	ND	21	113	NF	12	37	147	6	31	20	77	9	8	18
	Monterey County	Boronda	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		Las Palmas	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		Pajaro	NF	42	51	NF	NF	32	44	NF	NF	NF	28	NF	NF	NF
		Crossroads	NF	ND	18	NF	NF	7	40	NF	NF	NF	11	NF	NF	NF
	Pacific Grove	HopkinsMon	--	--	--	--	25	NS	NS	NS	22	NS	27	NF	9	16
		HopkinsPG	--	--	--	--	NF	NS	NS	NS	NF	NS	35	NF	NF	NF
		8th Street	--	--	--	--	NF	NS	NS	NF	NF	11	NF	NF	17	13
		Greenwood	ND	NS	52	6	ND	NS	24	ND	8	12	38	10	17	13
		Lover's	NF	NS	92	NF	NF	NS	36	NF	NF	9	40	NF	4	10
		Sea Palm	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		Pico	ND	28	75	6	7	26	28	ND	10	11	43	6	ND	10
	Seaside/ Sand City	Bay St	NF	21	88	NF	NF	48	28	NF	NF	NF	52	NF	NF	4

Copper continued

		Site Name	FF 2010	DR 2010	SuR 2010	SpR 2010	FF 2009	DR 2009	FF 2008	DR 2008	FF 2007	DR 2007	FF 2006	DR 2006
Sites by Jurisdiction	Carmel	Ocean	101	NF	69	NF	184	NF	148	NF	212	NF	--	--
		8th Avenue	395	NF	7	5	166	ND	170	6	148	14	--	--
		4th Avenue	172	5	NF	NF	183	NF	53	NF	152	NF	--	--
	Monterey	Twin 51's	99	12	20	6	78	11	69	7	60	5	92	ND
		San Carlos	124	26	10	7	77	16	84	18	73	11	139	ND
		Steinbeck	352	15	12	10	148	6	126	185	83	17	125	ND
	Monterey County	Boronda	--	--	--	--	--	--	--	--	--	--	--	--
		Las Palmas	--	--	--	--	--	--	--	--	--	--	--	--
		Pajaro	73	NF	NF	NF	44	9	93	NF	--	--	--	--
		Crossroads	55	NF	NF	NF	44	NF	--	--	--	--	--	--
	Pacific Grove	HopkinsMon	72	18	24	25	79	86	49	54	57	NF	89	NF
		HopkinsPG	176	NF	NF	NF	77	NF	63	NF	47	NF	--	--
		8th Street	64	134	NF	NF	59	NF	49	NF	55	NF	49	NF
		Greenwood	56	5	9	25	44	6	44	17	46	3	41	ND
		Lover's	14	5	5	7	54	ND	51	4	48	ND	57	NF
		Sea Palm	--	--	--	--	--	--	--	--	--	--	--	--
		Pico	62	7	11	9	45	5	37	12	44	ND	33	ND
	Seaside/ Sand City	Bay St	65	NF	NF	NF	126	NF	42	NF	50	NF	ND	NF

E. coli

Comparison of *E. coli* results for MRSWMP monitoring reported in MPN/ 100 ml. Shaded boxes indicate that the EPA Water Quality Objective of 235 MPN/ 100 ml was exceeded; NA= Not Analyzed; ND= Non-detect; NF= No Flow; NS= Not Sampled; -- = Not included in MRSWMP monitoring. Since 2006, sampling has been conducted during dry weather for the Dry Run (DR), Spring Run (SpR) and Summer Run (SuR), and during wet weather for the First Flush (FF) and Second Flush (SF). The table is broken into sections to facilitate printing.

		Site Name	FF 2020	DR 2020	FF 2019	DR 2019	FF 2018	DR 2018	FF 2017	DR 2017	FF 2016	DR 2016	FF 2015	DR 2015	FF 2014	DR 2014
Sites by Jurisdiction	Carmel	4th Avenue	23350	NF	33200	NF	40029	NF	49134	NF	38799	NF	46181	NF	--	--
		Ocean	16100	NF	16700	NF	70778	NF	27508	NF	23084	NF	32817	NF	--	--
		8th Avenue	NS	NS	NS	NS	41370	NF	9462	13200	15252	NF	43788	NF	--	--
	Monterey	Twin 51's	84400	4106	59850	8164	56879	1223	9267	1610	42755	141361	53713	198629	60200	6152
		San Carlos	81850	2602	5630	NF	39043	NF	10148	NF	8044	NF	13973	NF	138000	NF
		Steinbeck	33900	2187	17700	3578	17915	NF	20999	NF	27860	NF	25024	NF	65300	3836
	Monterey County	Boronda	2250	NF	5730	NF	--	--	--	--	--	--	--	--	--	--
		Las Palmas	15450	NF	17300	NF	--	--	--	--	--	--	--	--	--	--
		Pajaro	NS	NS	NS	NS	142739	NF	15112	NF	20660	NF	4693	NF	7617	NF
		Crossroads	NS	NS	NS	NS	26180	NF	743	NF	2020	NF	14265	NF	94500	NF
	Pacific Grove	HopkinsMon	NS	NS	12300	NF	36806	NF	25589	242000	12246	NF	--	--	--	--
		HopkinsPG	NS	NS	7305	NF	24422	NF	29093	NF	36606	NF	--	--	--	--
		8th Street	242000	15531	32600	NF	26491	>24196	33673	NF	12885	NF	--	--	--	--
		Greenwood	41300	24196	23400	8664	45590	24196	146841	2920	19105	1153	41922	28272	36590	6152
		Lover's	47600	2098	32750	17407	42692	NF	8712	NF	14634	NF	28761	NF	60200	NF
		Sea Palm	47200	ND	--	--	--	--	--	--	--	--	--	--	--	--
		Pico	79650	158	42400	900	191660	52	7121	880	35076	30	25572	<20	42603	402
	Seaside/ Sand City	Bay St	159450	NF	26950	NF	20679	NF	72839	NF	21026	NF	38969	NF	94500	NF

*Data provided by Monterey County from sampling that occurred one day after First Flush.

E. coli continued

		Site Name	SuR 2014	SF 2014	FF 2013	DR 2013	SuR 2013	SF 2013	FF 2012	DR 2012	SuR 2012	SpR 2012	FF 2011	DR 2011
Sites by Jurisdiction	Carmel	4th Avenue	NF	NS	NS	NF	NF	NS	45645	NF	NF	NF	105013	<20
		Ocean	NF	NS	16250	NF	NF	NS	28322	NF	1918	NF	41525	NF
		8th Avenue	NF	NS	NS	<20	82	NS	NS	NF	<20	20	167021	12263
	Monterey	Twin 51's	3106	9208	67265	4978	2878	4962	72294	296	2289	17329	65081	7746
		San Carlos	NF	4106	3475	NF	5206	NS	NS	NF	20	20	41525	20
		Steinbeck	196	21870	88662	NF	34658	241960	130847	2500	653	218	241960	6511
	Monterey County	Boronda	--	--	--	--	--	--	--	--	--	--	--	--
		Las Palmas	--	--	--	--	--	--	--	--	--	--	--	--
		Pajaro	NF	860	3163	NF	NF	618	8766	NF	NF	NF	16075	NF
		Crossroads	NF	703	1095	NF	NF	296	76395	NF	NF	NF	44059	NF
	Pacific Grove	HopkinsMon	--	--	--	--	3316	NS	NS	NS	169	NS	39726	NF
		HopkinsPG	--	--	--	--	NF	NS	NS	NS	NF	NS	207625	NF
		8th Street	--	--	--	--	NF	NS	NS	NF	NF	456	NF	NF
		Greenwood	5510	NS	19585	39726	1980	NS	35076	31062	6511	1253	116644	6896
		Lover's	NF	NS	30745	NF	NF	NS	42288	NF	NF	5510	48391	NF
		Sea Palm	--	--	--	--	--	--	--	--	--	--	--	--
		Pico	2092	4884	58030	244	40	3214	37769	1720	20	40	32860	2802
	Seaside/ Sand City	Bay St	NF	6488	148335	NF	NF	241960	43518	NF	NF	NF	44059	NF

E. coli continued

		Site Name	SuR 2011	SpR 2011	FF 2010	DR 2010	SuR 2009	SpR 2009	FF 2009	DR 2009	FF 2008	DR 2008	FF 2007	DR 2007	FF 2006	DR 2006
Sites by Jurisdiction	Carmel	4th Avenue	NF	126	22400	NF	NF	NF	73916	NF	11413	NF	49590	NF	--	--
		Ocean	NF	NF	9950	NF	10950	NF	34658	NF	9214	NF	43374	NF	--	--
		8th Avenue	104	20	38450	520	20	20	NA	80	36119	126	59067	82	--	--
	Monterey	Twin 51's	6152	19608	61300	13340	48384	12263	229170	296	83819	6150	165301	25993	185536	50
		San Carlos	40	20	40400	13734	244	149	8770	8212	17484	40	16304	218	14749	798
		Steinbeck	194	126	145400	1974	398	220	90824	4494	112738	48400	40925	9768	158848	2602
	Monterey County	Boronda	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		Las Palmas	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		Pajaro	NF	NF	2050	NF	NF	NF	4681	40	15186	NF	--	--	--	--
		Crossroads	NF	NF	25950	NF	NF	NF	NA	NF	--	--	--	--	--	--
	Pacific Grove	HopkinsMon	20	3912	29650	104	20	3912	19735	48392	3741	312	82782	NF	196179	NF
		HopkinsPG	NF	NF	40300	NF	NF	NF	25994	NF	27742	NF	27742	NF	--	--
		8th Street	NF	456	20976	39726	4283	6511	77979	NF	26485	NF	14636	NF	50978	--
		Greenwood	12976	10950	32700	1814	8212	2966	44059	1976	31528	13000	16767	11588	73322	20529
		Lover's	6152	220	3807	82	82	3870	34659	170	24916	1390	60214	48384	172534	NF
		Sea Palm	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		Pico	80	61	15050	410	40	148	17063	104	204626	3840	155639	5818	43926	606
	Seaside/ Sand City	Bay St	NF	672	64900	NF	NF	NF	34162	NF	20277	NF	46464	NF	856	NF

Enterococcus

Comparison of enterococcus results for MRSWMP monitoring reported in MPN/ 100 ml. Shaded boxes indicate that the EPA Water Quality Objective of 104 MPN/ 100 ml was exceeded; NA= Not Analyzed; ND= Non-detect; NF= No Flow; NS= Not Sampled; -- = Not included in MRSWMP monitoring. Since 2006, sampling has been conducted during dry weather for the Dry Run (DR), Spring Run (SpR) and Summer Run (SuR), and during wet weather for the First Flush (FF) and Second Flush (SF). The table is broken into sections to facilitate printing.

		Site Name	FF 2020	DR 2020	FF 2019	DR 2019	FF 2018	DR 2018	FF 2017	DR 2017	FF 2016	DR 2016	FF 2015	DR 2015
Sites by Jurisdiction	Carmel	4th Avenue	67744	NF	18745	NF	27521	NF	24825	NF	7039	NF	22801	NF
		Ocean	19284	NF	15895	NF	55079	NF	13744	NF	11051	NF	14901	NF
		8th Avenue	NS	NS	NS	NS	44622	NF	11072	5480	7607	NF	25451	NF
	Monterey	Twin 51's	119086	3255	56880	723	20948	697	13590	74	14298	1470	25867	7746
		San Carlos	27777	420	10120	NF	8786	NF	10884	NF	7921	NF	18471	NF
		Steinbeck	51729	9208	15655	2320	54175	NF	43561	NF	13667	NF	56518	NF
	Monterey County	Boronda	50050	NF	NS	NF	--	--	--	--	--	--	--	--
		Las Palmas	41600	NF	2845	NF	--	--	--	--	--	--	--	--
		Pajaro	NS	NS	NS	NS	33127	NF	55711	NF	25545	NF	12311	NF
		Crossroads	NS	NS	NS	NS	37762	NF	4892	NF	2607	NF	8083	NF
	Pacific Grove	HopkinsMon	NS	NS	10460	NF	37138	NF	14088	300	19241	NF	--	--
		HopkinsPG	NS	NS	8560	NF	46308	NF	21426	NF	18168	NF	--	--
		8th St	140135	6131	18215	NF	54750	2755	76523	NF	8704	NF	--	--
		Greenwood	105803	17329	17035	5172	109490	15531	102024	11200	16001	40	40794	20925
		Lover's	87525	2143	15340	20925	46662	NF	17090	NF	18572	NF	119844	NF
		Sea Palm	99316	10	--	--	--	--	--	--	--	--	--	--
		Pico	185959	75	19245	928	169995	31	7980	328	13415	416	29926	<20
	Seaside/ Sand City	Bay St	120300	NF	20050	NF	39564	NF	70697	NF	18458	NF	17265	NF

Enterococcus continued

		Site Name	FF 2014	DR 2014	SuR 2014	SF 2014	FF 2013	DR 2013	SuR 2013	SF 2013	FF 2012	DR 2012	SuR 2012	SpR 2012	FF 2011	DR 2011
Sites by Jurisdiction	Carmel	4th Avenue	--	--	NF	NS	NS	NF	NF	NS	14554	NF	NF	NF	176971	20
		Ocean	--	--	NF	NS	9665	NF	NF	NS	55607	NF	17329	NF	41125	NF
		8th Avenue	--	--	NF	NS	NS	104	974	NS	NS	NF	20	20	84547	4564
	Monterey	Twin 51's	37150	1417	1760	8164	21000	22398	942	6896	79326	492	431	1587	67477	346
		San Carlos	79650	NF	NF	8164	4825	NF	374	NS	NS	NF	20	313	48391	346
		Steinbeck	54200	4962	270	34480	88662	NF	48392	43517	241957	1587	16328	4494	241957	16328
	Monterey County	Boronda	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		Las Palmas	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		Pajaro	20013	NF	NF	7541	3163	NF	NF	6260	92342	NF	NF	NF	80189	NF
		Crossroads	1530	NF	NF	1434	1095	NF	NF	559	241960	NF	NF	NF	116723	NF
	Pacific Grove	HopkinsMon	--	--	--	--	--	--	12976	NS	NS	NS	242	NS	63725	NF
		HopkinsPG	--	--	--	--	--	--	NF	NS	NS	NS	NF	NS	241957	NF
		8th St	--	--	--	--	--	--	NF	NS	NS	NF	NF	218	NF	NF
		Greenwood	41950	4374	2290	NS	20880	8704	1226	NS	81461	14540	25993	1024	173291	8703
		Lover's	20768	NF	NF	NS	127750	NF	NF	NS	95634	NF	NF	1352	116644	NF
		Sea Palm	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		Pico	23118	83	3978	15650	9005	322	746	7308	70697	583	40	61	101332	126
	Seaside/ Sand City	Bay St	126500	NF	NF	17329	23415	NF	NF	12229	82392	NF	NF	NF	47396	NF

Enterococcus continued

		Site Name	SuR 2011	SpR 2011	FF 2010	DR 2010	SuR 2010	SpR 2010	FF 2009	DR 2009	FF 2008	DR 2008	FF 2007	DR 2007	FF 2006	DR 2006
Sites by Jurisdiction	Carmel	4th Avenue	NF	20	21650	NF	NF	NF	40438	NF	25567	NF	3328	NF	--	--
		Ocean	NF	NF	33900	NF	81640	NF	48392	NF	100120	NF	3381	NF	--	--
		8th Avenue	82	187	43700	100	40	40	NA	220	36000	942	6168	436	--	--
	Monterey	Twin 51's	5819	2306	108150	970	498	2669	111501	125	139002	8700	57609	39726	227516	--
		San Carlos	40	146	34450	4196	9768	1918	38751	531	67560	62	25993	20	63487	--
		Steinbeck	2184	393	12100	3232	976	1249	241960	16328	193983	48400	112902	14540	241960	--
	Monterey County	Boronda	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		Las Palmas	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		Pajaro	NF	NF	339000	NF	NF	NF	51797	6339	100612	NF	--	--	--	--
		Crossroads	NF	NF	60200	NF	NF	NF	NA	NF	--	--	--	--	--	--
	Pacific Grove	HopkinsMon	747	700	38000	148	172	917	47619	48291	31828	292	91787	NF	--	--
		HopkinsPG	NF	NF	116000	NF	NF	NF	157330	NF	84778	NF	16523	NF	--	--
		8th St	12976	242	85350	10950	NF	NF	95062	NF	75211	NF	29202	NF	66298	--
		Greenwood	13733	1625	75150	1918	2792	1188	111501	3571	76803	5820	29372	17382	62567	--
		Lover's	3571	521	15372	82	104	10950	88435	104	87231	4130	39739	18416	99442	--
		Sea Palm	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		Pico	20	20	33550	1210	512	220	33310	583	155638	8210	81652	1760	43965	--
	Seaside/ Sand City	Bay St	NF	20	70700	NF	NF	NF	90327	NF	13650	NF	13435	NF	341	--

Hardness

Comparison of hardness results for MRSWMP monitoring reported in mg/L. Shaded boxes indicate that the General Permit Action Level of less than or equal to 10 mg/L or greater than or equal to 2000 mg/L was exceeded; ND= Non-detect; NF= No Flow; NS= Not Sampled; -- = Not included in MRSWMP monitoring. Since 2013, sampling has been conducted during dry weather for the Dry Run (DR) and Summer Run (SuR), and during wet weather for the First Flush (FF) and Second Flush (SF).

		Site Name	FF 2020	DR 2020	FF 2019	DR 2019	FF 2018	DR 2018	FF 2017	DR 2017	FF 2016	DR 2016	FF 2015	DR 2015
Sites by Jurisdiction	Carmel	4th Avenue	67	NF	83	NF	90	NF	36	NF	58	NF	44	NF
		Ocean	55	NF	32	NF	68	NF	36	NF	25	NF	25	NF
		8th Avenue	NS	NS	NS	NS	106	NF	38	326	40	NF	40	NF
	Monterey	Twin 51's	64	639	63	347	57	699	55	429	39	905	53	248
		San Carlos	70	418	27	NF	53	NF	64	NF	32	NF	34	NF
		Steinbeck	40	227	29	142	39	NF	64	NF	33	NF	29	NF
	Monterey County	Boronda	60	NF	76*	NF	--	--	--	--	--	--	--	--
		Las Palmas	51	NF	40	NF	--	--	--	--	--	--	--	--
		Pajaro	NS	NS	NS	NS	40	NF	103	NF	101	NF	41	NF
		Crossroads	NS	NS	NS	NS	29	NF	14	NF	20	NF	9	NF
	Pacific Grove	HopkinsMon	NS	NS	35	NF	53	NF	54	626	51	NF	--	--
		HopkinsPG	NS	NS	51	NF	63	NF	43	NF	42	NF	--	--
		8th Street	92	392	36	NF	57	373	102	NF	31	NF	--	--
		Greenwood	55	475	36	330	55	400	46	456	23	376	35	298
		Lover's	79	239	49	365	66	NF	57	NF	31	NF	20	NF
		Sea Palm	60	308	--	--	--	--	--	--	--	--	--	--
		Pico	57	240	54	172	51	179	39	223	36	179	62	161
	Seaside/ Sand City	Bay St	24	NF	35	NF	5970	NF	922	NF	23	NF	28	NF

*Data provided by Monterey County from sampling that occurred one day after First Flush.

Hardness continued

		Site Name	FF 2014	DR 2014	SuR 2014	SF 2014	FF 2013	DR 2013
Sites by Jurisdiction	Carmel	4th Avenue	--	--	NF	NS	NS	NF
		Ocean	--	--	NF	NS	105	NF
		8th Avenue	--	--	NF	NS	NS	277
	Monterey	Twin 51's	93	910	682	19	119	360
		San Carlos	57	NF	NF	23	100	NF
		Steinbeck	47	224	281	17	52	NF
	Monterey County	Boronda	--	--	--	--	--	--
		Las Palmas	--	--	--	--	--	--
		Pajaro	45	NF	NF	50	102	NF
		Crossroads	18	NF	NF	9	28	NF
	Pacific Grove	HopkinsMon	--	--	--	--	--	--
		HopkinsPG	--	--	--	--	--	--
		8th Street	--	--	--	--	--	--
		Greenwood	45	314	289	NS	114	341
		Lover's	48	NF	NF	NS	135	NF
		Sea Palm	--	--	--	--	--	--
		Pico	60	161	192	18	75	163
	Seaside/ Sand City	Bay St	48	NF	NF	21	120	NF

Lead

Comparison of total lead results for MRSWMP monitoring reported in µg/L. Shaded boxes indicate that the Basin Plan Objective of 30 µg/L was exceeded; NA= Not Analyzed; ND= Non-detect; NF= No Flow; NS= Not Sampled; -- = Not included in MRSWMP. Since 2006, sampling has been conducted during dry weather for the Dry Run (DR), Spring Run (SpR) and Summer Run (SuR), and during wet weather for the First Flush (FF) and Second Flush (SF). The table below is broken into sections to facilitate printing.

		Site Name	FF 2020	DR 2020	FF 2019	DR 2019	FF 2018	DR 2018	FF 2017	DR 2017	FF 2016	DR 2016	FF 2015	DR 2015	FF 2014	DR 2014
Sites by Jurisdiction	Carmel	4th Avenue	10.7	NF	28	NF	15	NF	10	NF	24	NF	32	NF	--	--
		Ocean	4.1	NF	5	NF	5	NF	6	NF	ND	NF	11	NF	--	--
		8th Avenue	NS	NS	NS	NS	11	NF	9	1	9	NF	28	NF	--	--
	Monterey	Twin 51's	18.5	0.3	24	1	12	0.3	15	ND	15	ND	15	ND	12	ND
		San Carlos	4.8	0.2	14	NF	8	NF	8	NF	ND	NF	5	NF	23	NF
		Steinbeck	4.6	0.4	20	2	9	NF	5	NF	ND	NF	ND	NF	15	ND
	Monterey County	Boronda	15.7	NF	NS	NF	--	--	--	--	--	--	--	--	--	--
		Las Palmas	1.3	NF	3	NF	--	--	--	--	--	--	--	--	--	--
		Pajaro	NS	NS	NS	NS	7	NF	32	NF	14	NF	16	NF	14	NF
		Crossroads	NS	NS	NS	NS	ND	NF	1	NF	ND	NF	ND	NF	ND	NF
	Pacific Grove	HopkinsMon	NS	NS	6	NF	5	NF	8	2	ND	NF	--	--	--	--
		HopkinsPG	NS	NS	10	NF	3	NF	6	NF	ND	NF	--	--	--	--
		8th St	8.7	0.1	19	NF	5	0.5	9	NF	ND	NF	--	--	--	--
		Greenwood	5.0	0.9	8	1	7	ND	15	ND	ND	ND	9	ND	11	ND
		Lover's	5.7	0.4	11	ND	4	NF	6	NF	4	NF	6	NF	11	NF
		Sea Palm	8.8	ND	--	--	--	--	--	--	--	--	--	--	--	--
		Pico	7.3	0.4	14	1	2	0.2	6	ND	ND	ND	5	ND	ND	ND
	Seaside/ Sand City	Bay St	12.0	NF	18	NF	ND	NF	11	NF	8	NF	7	NF	44	NF

Lead Continued

Sites by Jurisdiction		Site Name	SuR 2014	SF 2014	FF 2013	DR 2013	SuR 2013	SF 2013	FF 2012	DR 2012	SuR 2012	SpR 2012	FF 2011	DR 2011	SuR 2011	SpR 2011
	Carmel	4th Avenue	NF	NS	NS	NF	NF	NS	23	NF	NF	NF	60	ND	NF	ND
		Ocean	NF	NS	9	NF	NF	NS	11	NF	ND	NF	26	NF	NF	NF
		8th Avenue	NF	NS	NS	ND	ND	NS	NS	NF	ND	ND	19	ND	ND	ND
	Monterey	Twin 51's	ND	ND	31	ND	ND	ND	23	ND	ND	ND	ND	ND	ND	ND
		San Carlos	NF	10	8	NF	ND	NS	NS	NF	ND	ND	22	ND	ND	ND
		Steinbeck	ND	8	ND	NF	ND	ND	7	ND	ND	ND	13	ND	ND	ND
	Monterey County	Boronda	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		Las Palmas	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		Pajaro	NF	24	16	NF	NF	22	20	NF	NF	NF	17	NF	NF	NF
		Crossroads	NF	31	ND	NF	NF	ND	ND	NF	NF	NF	ND	NF	NF	NF
	Pacific Grove	HopkinsMon	--	--	--	--	ND	NS	NS	NA	ND	NS	14	NF	ND	ND
		HopkinsPG	--	--	--	--	NF	NS	NS	NF	NF	NS	13	NF	NF	NF
		8th St	--	--	--	--	NF	NS	NS	NF	NF	ND	NF	NF	6	ND
		Greenwood	ND	NS	8	ND	ND	NS	4	ND	ND	ND	20	ND	ND	ND
		Lover's	NF	NS	6	NF	NF	NS	6	NF	NF	ND	30	NF	ND	ND
		Sea Palm	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		Pico	17	8	6	ND	ND	ND	ND	ND	ND	ND	7	ND	ND	ND
	Seaside/ Sand City	Bay St	NF	10	20	NF	NF	9	8	NF	NF	NF	16	NF	NF	ND

Lead Continued

		Site Name	FF 2010	DR 2010	SuR 2010	SpR 2010	FF 2009	DR 2009	FF 2008	DR 2008	FF 2007	DR 2007	FF 2006	DR 2006
Sites by Jurisdiction	Carmel	4th Avenue	22	NF	NF	NF	25	NF	15	NF	18	NF	--	--
		Ocean	8	NF	5	NF	ND	NF	6	NF	47	NF	--	--
		8th Avenue	11	ND	ND	ND	9	ND	6	5	13	5	--	--
	Monterey	Twin 51's	44	ND	ND	ND	8	ND	17	5	36	5	13	ND
		San Carlos	22	1	ND	ND	6	ND	6	5	18	5	11	ND
		Steinbeck	9	1	ND	ND	7	ND	6	5	22	5	7	ND
	Monterey County	Boronda	--	--	--	--	--	--	--	--	--	--	--	--
		Las Palmas	--	--	--	--	--	--	--	--	--	--	--	--
		Pajaro	34	NF	NF	NF	24	ND	63	NF	--	--	--	--
		Crossroads	ND	NF	NF	NF	ND	--	--	--	--	--	--	--
	Pacific Grove	HopkinsMon	9	ND	ND	ND	21	10	7	5	9	NF	10	NF
		HopkinsPG	11	NF	NF	NF	7	NF	ND	NF	15	NF	--	--
		8th St	8	83	NF	NF	14	NF	ND	NF	12	NF	12	NF
		Greenwood	11	ND	ND	ND	6	ND	6	5	18	5	8	ND
		Lover's	3	ND	ND	ND	10	ND	7	5	16	5	9	NF
		Sea Palm	--	--	--	--	--	--	--	--	--	--	--	--
		Pico	6	ND	ND	ND	ND	ND	8	5	12	5	5	ND
	Seaside/ Sand City	Bay St	28	NF	NF	NF	33	NF	14	NF	15	NF	ND	NF

MBAS Detergents

Comparison of MBAS surfactant results for MRSWMP monitoring reported in mg/L. Shaded boxes indicate that the Basin Plan Water Quality Objective of 0.2 mg/L was exceeded; ND= Non-detect; NF= No Flow; NS= Not Sampled; -- = Not included in MRSWMP monitoring. Since 2013, sampling has been conducted during dry weather for the Dry Run (DR) and Summer Run (SuR), and during wet weather for the First Flush (FF) and Second Flush (SF).

		Site Name	FF 2020	DR 2020	FF 2019	DR 2019	FF 2018	DR 2018	FF 2017	DR 2017	FF 2016	DR 2016	FF 2015	DR 2015
Sites by Jurisdiction	Carmel	4th Avenue	0.39	NF	0.46	NF	0.48	NF	1.20	NF	0.37	NF	0.30	NF
		Ocean	0.61	NF	0.58	NF	0.68	NF	0.80	NF	0.45	NF	0.26	NF
		8th Avenue	NS	NS	NS	NS	0.92	NF	0.99	0.14	0.50	NF	0.33	NF
	Monterey	Twin 51's	0.53	0.09	0.26	0.21	0.42	0.16	1.51	0.16	0.33	0.14	0.33	1.06
		San Carlos	0.55	0.17	0.29	NF	0.55	NF	1.54	NF	0.33	NF	0.29	NF
		Steinbeck	0.63	0.12	0.43	0.26	0.48	NF	0.71	NF	0.43	NF	0.36	NF
	Monterey County	Boronda	0.06	NF	NS	NF	--	--	--	--	--	--	--	--
		Las Palmas	0.11	NF	0.26	NF	--	--	--	--	--	--	--	--
		Pajaro	NS	NS	NS	NS	0.23	NF	0.44	NF	0.77	NF	0.21	NF
		Crossroads	NS	NS	NS	NS	0.86	NF	0.47	NF	0.55	NF	0.22	NF
	Pacific Grove	HopkinsMon	NS	NS	0.50	NF	0.55	NF	1.12	0.59	0.50	NF	--	--
		HopkinsPG	NS	NS	0.52	NF	0.61	NF	1.08	NF	0.51	NF	--	--
		8th Street	0.90	0.12	0.36	NF	0.56	0.16	1.10	NF	0.43	NF	--	--
		Greenwood	0.78	0.07	0.37	0.14	0.40	0.09	0.99	0.09	0.38	0.08	0.32	0.95
		Lover's	0.68	0.08	0.54	0.06	0.46	NF	0.60	NF	0.38	NF	0.25	NF
		Sea Palm	0.67	0.10	--	--	--	--	--	--	--	--	--	--
		Pico	0.70	0.20	0.53	0.15	0.39	0.08	0.51	0.08	0.43	0.08	0.51	0.14
	Seaside/ Sand City	Bay St	0.40	NF	0.47	NF	0.17	NF	1.13	NF	0.51	NF	0.30	NF

MBAS Continued

		Site Name	FF 2014	DR 2014	SuR 2014	SF 2014	FF 2013	DR 2013
Sites by Jurisdiction	Carmel	4th Avenue	--	--	NF	NS	NS	NF
		Ocean	--	--	NF	NS	1.6	NF
		8th Avenue	--	--	NF	NS	NS	ND
	Monterey	Twin 51's	0.55	0.08	0.1	ND	0.31	0.05
		San Carlos	0.94	NF	NF	ND	1.04	NF
		Steinbeck	0.53	0.16	0.06	ND	0.42	NF
	Monterey County	Boronda	--	--	--	--	--	--
		Las Palmas	--	--	--	--	--	--
		Pajaro	0.52	NF	NF	ND	1.12	NF
		Crossroads	0.39	NF	NF	ND	0.43	NF
	Pacific Grove	HopkinsMon	--	--	--	--	--	--
		HopkinsPG	--	--	--	--	--	--
		8th Street	--	--	--	--	--	--
		Greenwood	0.84	0.27	ND	NS	0.52	ND
		Lover's	1.30	NF	NF	NS	0.65	NF
		Sea Palm	--	--	--	--	--	--
		Pico	1.00	ND	0.06	ND	0.55	0.06
	Seaside/ Sand City	Bay St	0.77	NF	NF	ND	1.44	NF

Nitrate as N

Comparison of nitrate as N (NO3-N) results for 2006-2014 MRSWMP monitoring reported in mg-N/ L. Shaded boxes indicate that the CCAMP Action Level of 2.25 mg-N/ L was exceeded; ND= Non-detect; NF= No Flow; NS= Not Sampled; -- = Not included in MRSWMP monitoring. Since 2006, sampling has been conducted during dry weather for the Dry Run (DR), Spring Run (SpR) and Summer Run (SuR), and during wet weather for the First Flush (FF) and Second Flush (SF). The table below is broken into sections to facilitate printing.

		Site Name	FF 2020	DR 2020	FF 2019	DR 2019	FF 2018	DR 2018	FF 2017	DR 2017	FF 2016	DR 2016	FF 2015	DR 2015	FF 2014	DR 2014
Sites by Jurisdiction	Carmel	4th Avenue	0.4	NF	1.05	NF	0.55	NF	0.15	NF	0.5	NF	0.60	NF	--	--
		Ocean	0.5	NF	0.50	NF	0.65	NF	0.66	NF	0.3	NF	0.45	NF	--	--
		8th Avenue	NS	NS	NS	NS	0.55	NF	0.72	ND	0.3	NF	0.55	NF	--	--
	Monterey	Twin 51's	0.5	0.6	0.60	0.60	0.30	0.5	0.66	0.5	0.3	0.40	0.45	1.5	0.7	0.3
		San Carlos	0.6	4.3	0.50	NF	0.50	NF	0.53	NF	0.3	NF	0.30	NF	0.6	NF
		Steinbeck	0.9	1.8	0.45	6.40	0.50	NF	2.78	NF	0.5	1.10	0.55	NF	1.1	0.4
	Monterey County	Boronda	0.4	NF	0.2*	NF	--	--	--	--	--	--	--	--	--	--
		Las Palmas	0.4	NF	0.45	NF	--	--	--	--	--	--	--	--	--	--
		Pajaro	NS	NS	NS	NS	0.45	NF	0.53	NF	0.9	NF	0.35	NF	0.5	NF
		Crossroads	NS	NS	NS	NS	0.15	NF	0.30	NF	0.2	NF	0.20	NF	0.3	NF
	Pacific Grove	HopkinsMon	NS	NS	0.40	NF	0.35	NF	0.59	0.5	0.4	NF	--	--	--	--
		HopkinsPG	NS	NS	1.15	NF	1.45	NF	0.53	NF	0.9	NF	--	--	--	--
		8th St	0.5	1.8	0.45	NF	0.45	2.6	0.41	NF	0.4	NF	--	--	--	--
		Greenwood	0.4	0.8	0.60	0.70	0.35	1.0	0.37	1.1	0.2	NF	0.45	1.4	0.7	0.9
		Lover's	0.5	8.6	0.55	0.60	0.40	NF	0.47	NF	0.2	NF	0.25	NF	0.7	NF
		Sea Palm	0.4	1.0	--	--	--	--	--	--	--	--	--	--	--	--
		Pico	0.3	1.3	0.55	0.80	0.25	1.0	0.39	0.9	0.2	0.90	0.35	0.9	0.7	2.4
	Seaside/ Sand City	Bay St	0.2	NF	0.60	NF	1.15	NF	0.83	NF	0.3	NF	0.45	NF	0.4	NF

*Data provided by Monterey County from sampling that occurred one day after First Flush.

Nitrate as N continued

		Site Name	SuR 2014	SF 2014	FF 2013	DR 2013	SuR 2013	SF 2013	FF 2012	DR 2012	SuR 2012	SpR 2012	FF 2011	DR 2011	SuR 2011	SpR 2011	FF 2010	DR 2010
Sites by Jurisdiction	Carmel	4th Avenue	NF	NS	NS	NF	NF	NS	0.43	NF	NF	NF	0.33	0.08	NF	0.43	1.07	NF
		Ocean	NF	NS	1.8	NF	NF	NS	0.51	NF	ND	NF	0.20	NF	NF	NF	1.58	NF
		8th Avenue	NF	NS	NS	2.2	2.5	NS	NS	NF	4.31	3.36	0.31	3.19	2.73	2.64	1.94	2.92
	Monterey	Twin 51's	0.3	0.2	0.7	0.8	ND	0.2	0.44	0.73	0.39	0.1	0.46	0.7	0.47	0.39	1.1	0.98
		San Carlos	NF	0.2	0.9	NF	1.6	NS	NS	NF	0.8	1.43	0.12	0.83	0.41	1.18	0.81	2.84
		Steinbeck	1.7	0.2	1.3	NF	3.6	0.6	2.67	0.78	2.45	2.97	0.28	ND	2.92	4.81	1.96	1.39
	Monterey County	Boronda	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		Las Palmas	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		Pajaro	NF	0.2	1.2	NF	NF	0.6	0.47	NF	NF	NF	0.39	NF	NF	NF	1.12	NF
		Crossroads	NF	ND	0.5	NF	NF	0.05	0.59	NF	NF	NF	0.11	NF	NF	NF	0.81	NF
	Pacific Grove	HopkinsMon	--	--	--	--	1.2	NS	NS	NS	1.29	NS	0.20	NF	1.25	1.76	1.5	1.35
		HopkinsPG	--	--	--	--	NF	NS	NS	NF	NF	NS	0.31	NF	NF	NF	4.38	NF
		8th St	--	--	--	--	NF	NS	NS	NF	NF	0.95	NF	NF	1.83	1.05	0.87	1.99
		Greenwood	0.8	NS	1.0	1.0	1.4	NS	0.79	2.09	1.01	1.07	0.13	1.54	1.05	0.93	0.9	1.47
		Lover's	NF	NS	1.0	NF	NF	NS	0.59	NF	NF	1.06	0.12	NF	0.31	0.73	0.12	3.54
		Sea Palm	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		Pico	1.9	ND	0.6	2.2	1.7	0.3	1.13	1.91	1.55	1.09	0.1	1.12	0.65	0.92	0.81	0.82
	Seaside/ Sand City	Bay St	NF	0.2	1.4	NF	NF	1.0	0.74	NF	NF	NF	0.22	NF	NF	11.64	0.7	NF

Nitrate as N continued

		Site Name	SuR 2010	SpR 2010	FF 2009	DR 2009	FF 2008	DR 2008	FF 2007	DR 2007	FF 2006	DR 2006
Sites by Jurisdiction	Carmel	4th Avenue	NF	NF	0.60	NF	0.77	NF	0.73	NF	--	--
		Ocean	0.03	NF	0.20	NF	1.07	NF	0.71	NF	--	--
		8th Avenue	3.60	3.63	0.20	2.60	1.40	0.10	0.91	2.17	--	--
	Monterey	Twin 51's	1.30	0.20	0.40	0.40	0.90	0.60	0.99	0.32	0.45	0.16
		San Carlos	1.20	0.64	0.50	1.20	0.87	1.20	0.64	2.17	1.69	3.92
		Steinbeck	1.20	5.15	0.70	ND	1.10	0.10	0.79	1.07	1.72	4.71
	Monterey County	Boronda	--	--	--	--	--	--	--	--	--	--
		Las Palmas	--	--	--	--	--	--	--	--	--	--
		Pajaro	NF	NF	0.60	0.60	2.90	NF	--	--	--	--
		Crossroads	NF	NF	0.30	NF	--	--	--	--	--	--
	Pacific Grove	HopkinsMon	1.30	1.80	0.50	1.40	0.87	0.70	1.59	NF	1.39	NF
		HopkinsPG	NF	NF	2.70	NF	1.87	NF	0.60	NF	--	--
		8th St	NF	NF	0.80	NF	1.10	NF	0.48	NF	0.79	NF
		Greenwood	1.30	1.35	0.60	1.10	0.97	1.90	0.66	3.00	0.78	2.17
		Lover's	2.30	0.74	0.60	4.80	0.87	4.80	0.56	0.86	0.68	NF
		Sea Palm	--	--	--	--	--	--	--	--	--	--
		Pico	0.90	0.76	0.60	1.00	0.83	1.50	0.54	2.04	0.61	1.03
	Seaside/ Sand City	Bay St	NF	NF	0.40	NF	0.60	NF	0.69	NF	13.20	NF

Orthophosphate as P

Comparison of orthophosphate as P results for MRSWMP monitoring reported as mg-P/ L. Shaded boxes indicate that the CCAMP Action Level of 0.12 mg-P/ L was exceeded; ND= Non-detect; NF= No Flow; NS= Not Sampled; -- = Not included in MRSWMP monitoring. Since 2006, sampling has been conducted during dry weather for the Dry Run (DR), Spring Run (SpR) and Summer Run (SuR), and during wet weather for the First Flush (FF) and Second Flush (SF). The table below is broken into sections to facilitate printing.

		Site Name	FF 2020	DR 2020	FF 2019	DR 2019	FF 2018	DR 2018	FF 2017	DR 2017	FF 2016	DR 2016	FF 2015	DR 2015	FF 2014	DR 2014	SuR 2014	SF 2014
Sites by Jurisdiction	Carmel	4th Avenue	0.8	NF	1.00	NF	0.80	NF	0.60	NF	1.0	NF	0.6	NF	--	--	NF	NS
		Ocean	0.8	NF	0.87	NF	0.80	NF	1.15	NF	0.7	NF	0.4	NF	--	--	NF	NS
		8th Avenue	NS	NS	NS	NS	0.90	NF	1.23	0.20	1.1	NF	0.6	NF	--	--	NF	NS
	Monterey	Twin 51's	0.9	0.2	0.48	0.71	0.40	0.10	0.90	0.32	0.4	0.3	0.4	1.2	0.5	ND	ND	0.20
		San Carlos	0.5	0.2	0.32	NF	0.30	NF	0.49	NF	0.3	NF	0.2	NF	0.3	NF	NF	ND
		Steinbeck	1.0	0.7	0.71	0.68	1.50	NF	2.54	NF	1.2	NF	1.4	NF	2.8	0.2	0.10	0.50
	Monterey County	Boronda	0.4	NF	0.45*	NF	--	--	--	--	--	--	--	--	--	--	--	--
		Las Palmas	0.4	NF	0.30	NF	--	--	--	--	--	--	--	--	--	--	--	--
		Pajaro	NS	NS	NS	NS	0.15	NF	0.62	NF	0.9	NF	0.2	NF	0.4	NF	NF	0.20
		Crossroads	NS	NS	NS	NS	0.20	NF	0.38	NF	0.2	NF	0.1	NF	0.3	NF	NF	ND
	Pacific Grove	HopkinsMon	NS	NS	0.56	NF	0.95	NF	0.74	0.16	0.3	NF	--	--	--	--	--	--
		HopkinsPG	NS	NS	0.75	NF	1.15	NF	0.61	NF	0.9	NF	--	--	--	--	--	--
		8th St	0.6	0.4	0.50	NF	0.50	0.20	0.55	NF	0.4	NF	--	--	--	--	--	--
		Greenwood	0.7	0.1	0.52	0.14	0.40	0.10	0.48	ND	0.4	ND	0.7	ND	0.8	ND	ND	NS
		Lover's	0.8	0.1	0.64	ND	0.75	NF	1.66	NF	0.5	NF	0.3	NF	0.8	NF	NF	NS
		Sea Palm	0.4	0.1	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		Pico	0.6	0.1	0.77	0.06	0.40	ND	0.64	ND	0.5	ND	0.7	ND	1.0	ND	ND	0.10
	Seaside/ Sand City	Bay St	0.2	NF	0.43	NF	0.15	NF	0.27	NF	0.4	NF	0.2	NF	0.2	NF	NF	0.10

*Data provided by Monterey County from sampling that occurred one day after First Flush.

Orthophosphate as P continued

		Site Name	FF 2013	DR 2013	SuR 2013	SF 2013	FF 2012	DR 2012	SuR 2012	SpR 2012	FF 2011	DR 2011	SuR 2011	SpR 2011	FF 2010	DR 2010
Sites by Jurisdiction	Carmel	4th Avenue	NS	NF	NF	NS	0.19	NF	NF	NF	0.32	ND	NF	ND	0.54	NF
		Ocean	2.00	NF	NF	NS	0.67	NF	0.19	NF	0.77	NF	NF	NF	1.18	NF
		8th Avenue	NS	ND	ND	NS	NS	NF	ND	0.10	0.65	ND	1.44	ND	0.92	ND
	Monterey	Twin 51's	0.40	ND	0.20	0.10	0.31	0.11	0.13	0.11	0.52	0.09	NF	0.11	0.94	ND
		San Carlos	0.40	NF	ND	NS	NS	NF	ND	0.10	0.19	ND	ND	0.15	0.33	0.17
		Steinbeck	4.20	NF	0.40	0.50	1.82	0.14	0.31	0.15	0.98	ND	ND	0.10	7.01	0.32
	Monterey County	Boronda	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		Las Palmas	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		Pajaro	0.70	NF	NF	0.10	0.46	NF	NF	NF	0.17	NF	NF	NF	0.38	NF
		Crossroads	0.20	NF	NF	ND	0.37	NF	NF	NF	0.16	NF	NF	NF	0.64	NF
	Pacific Grove	HopkinsMon	--	--	ND	NS	NS	NS	ND	NS	0.22	NF	ND	ND	0.60	0.11
		HopkinsPG	--	--	NF	NS	NS	NS	NF	NS	0.54	NF	NF	NF	1.79	NF
		8th St	--	--	NF	NS	NS	NF	NF	0.21	NF	NF	ND	0.12	0.46	0.60
		Greenwood	0.70	ND	0.30	NS	0.37	0.13	ND	0.10	0.35	ND	ND	0.10	0.68	0.08
		Lover's	1.10	NF	NF	NS	0.63	NF	NF	0.13	0.41	NF	ND	0.18	0.18	0.12
		Sea Palm	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		Pico	0.90	ND	ND	ND	0.41	ND	ND	0.10	0.37	ND	ND	ND	0.58	ND
	Seaside/ Sand City	Bay St	0.40	NF	NF	ND	0.23	NF	NF	NF	0.17	NF	NF	ND	0.34	NF

Orthophosphate as P continued

		Site Name	SuR 2010	SpR 2010	FF 2009	DR 2009	FF 2008	DR 2008	FF 2007	DR 2007	FF 2006	DR 2006
Sites by Jurisdiction	Carmel	4th Avenue	NF	NF	0.78	NF	0.70	NF	1.24	NF	--	--
		Ocean	2.70	NF	0.81	NF	0.93	NF	0.77	NF	--	--
		8th Avenue	ND	0.24	0.75	0.20	1.37	0.20	0.99	ND	--	--
	Monterey	Twin 51's	0.20	0.25	0.92	0.30	0.97	0.20	0.72	ND	0.56	0.35
		San Carlos	0.10	0.19	0.18	0.20	0.60	0.20	0.38	ND	0.46	ND
		Steinbeck	0.30	0.35	2.48	0.30	3.77	3.10	2.69	0.09	3.01	0.38
	Monterey County	Boronda	--	--	--	--	--	--	--	--	--	--
		Las Palmas	--	--	--	--	--	--	--	--	--	--
		Pajaro	NF	NF	0.31	0.90	0.50	NF	--	--	--	--
		Crossroads	NF	NF	0.31	NF	--	--	--	--	--	--
	Pacific Grove	HopkinsMon	0.10	0.18	0.34	0.30	0.73	0.20	3.38	NF	2.37	NF
		HopkinsPG	NF	NF	1.60	NF	1.80	NF	0.51	NF	--	--
		8th St	NF	NF	0.56	NF	0.90	NF	0.52	NF	0.49	NF
		Greenwood	0.20	0.18	0.51	0.10	1.40	0.20	0.65	0.07	0.53	ND
		Lover's	0.20	0.32	0.70	0.10	1.30	0.20	0.93	ND	1.38	NF
		Sea Palm	--	--	--	--	--	--	--	--	--	--
		Pico	0.05	0.13	0.40	0.10	0.70	0.20	0.73	ND	0.44	ND
	Seaside/ Sand City	Bay St	NF	NF	0.31	NF	0.40	NF	0.09	NF	0.32	NF

Potassium

Comparison of potassium results for MRSWMP monitoring reported as mg/L. Shaded boxes indicate that the General Permit Action Level of 20 mg/L was exceeded; ND= Non-detect; NF= No Flow; NS= Not Sampled; -- = Not included in MRSWMP monitoring. Since 2013, sampling has been conducted during dry weather for the Dry Run (DR) and Summer Run (SuR), and during wet weather for the First Flush (FF) and Second Flush (SF).

		Site Name	FF 2020	DR 2020	FF 2019	DR 2019	FF 2018	DR 2018	FF 2017	DR 2017	FF 2016	DR 2016
Sites by Jurisdiction	Carmel	4th Ave.	9.1	NF	10.4	NF	16.4	NF	12.0	NF	11.3	NF
		Ocean Ave.	8.7	NF	6.8	NF	12.6	NF	7.0	NF	6.3	NF
		8th Ave	NS	NS	NS	NS	18.6	NF	8.0	6	10.0	NF
	Monterey	Twin 51's	6.1	10.8	5.5	10.2	5.3	6.7	5.0	10	3.5	8.3
		San Carlos	4.3	7.3	2.9	NF	4.1	NF	4.0	NF	2.5	NF
		Steinbeck	5.0	5.5	3.7	5.9	5.1	NF	8.0	NF	4.1	NF
	Monterey County	Boronda	3.4	NF	NS	NS	--	--	--	--	--	--
		Las Palmas	3.0	NF	2.9	NF	--	--	--	--	--	--
		Pajaro	NS	NS	NS	NS	2.60	NF	5.0	NF	8.5	NF
		Crossroads	NS	NS	NS	NS	3.00	NF	2.0	NF	1.9	NF
	Pacific Grove	HopkinsMon	NS	NS	4.7	NF	5.40	NF	5.0	15	4.4	NF
		HopkinsPG	NS	NS	6.2	NF	8.10	NF	5.0	NF	5.4	NF
		8th Street	7.4	9.5	5.0	NF	5.90	8.6	6.0	NF	3.8	NF
		Greenwood	7.1	10.4	5.7	6.5	7.75	8.4	5.0	10	4.0	7.3
		Lover's	9.4	4.4	6.2	6.1	8.75	NF	6.0	NF	4.5	NF
		Sea Palm	9.1	6.9	--	--	--	--	--	--	--	--
		Pico	9.1	10.6	11.5	4.9	9.40	5.1	6.0	6	7.4	4.6
	Seaside/ Sand City	Bay St	2.7	NF	5.2	NF	350.5	NF	55.0	NF	2.8	NF

Potassium continued

		Site Name	FF 2015	DR 2015	FF 2014	DR 2014	SuR 2014	SF 2014	FF 2013	DR 2013
Sites by Jurisdiction	Carmel	4th Ave.	9.5	NF	--	--	NF	NS	NS	NF
		Ocean Ave.	5.1	NF	--	--	NF	NS	16	NF
		8th Ave	8.2	NF	--	--	NF	NS	NS	1.6
	Monterey	Twin 51's	5.2	8	5.4	18.0	11	1.5	9	6.9
		San Carlos	3.0	NF	5.2	NF	NF	1.3	7	NF
		Steinbeck	5.5	NF	8.9	4.2	4.1	1.4	12	NF
	Monterey County	Boronda	--	--	--	--	--	--	--	--
		Las Palmas	--	--	--	--	--	--	--	--
		Pajaro	3.8	NF	4.6	NF	NF	2.5	9	NF
		Crossroads	1.5	NF	2.5	NF	NF	0.8	3	NF
	Pacific Grove	HopkinsMon	--	--	--	--	--	--	--	--
		HopkinsPG	--	--	--	--	--	--	--	--
		8th Street	--	--	--	--	--	--	--	--
		Greenwood	7.5	5.1	6.6	6.7	5.6	NS	13	6.4
		Lover's	4.2	NF	6.2	NF	NF	NS	14	NF
		Sea Palm	--	--	--	--	--	--	--	--
		Pico	14.0	5.2	10.5	5.9	5.5	2.6	12	5.1
	Seaside/ Sand City	Bay St	4.0	NF	3.0	NF	NF	1.3	8	NF

Total Suspended Solids (TSS)

Comparison of Total Suspended Solids (TSS) results for MRSWMP monitoring reported in mg/L. Shaded boxes indicate that the CCAMP Action Level of 500 mg/L was exceeded; NA= Not Analyzed; ND= Non-detect; NF= No Flow; NS= Not Sampled; -- = Not included in MRSWMP monitoring. Since 2006, sampling has been conducted during dry weather for the Dry Run (DR), Spring Run (SpR) and Summer Run (SuR), and during wet weather for the First Flush (FF) and Second Flush (SF). The table below is broken into sections to facilitate printing.

		Site Name	FF 2020	DR 2020	FF 2019	DR 2019	FF 2018	DR 2018	FF 2017	DR 2017	FF 2016	DR 2016	FF 2015	DR 2015	FF 2014	DR 2014	SuR 2014	SF 2014
Sites by Jurisdiction	Carmel	4th Ave.	124	NF	260	NF	162	NF	129	NF	96	NF	312	NF	--	--	NF	NS
		Ocean Ave.	33	NF	24	NF	45	NF	22	NF	18	NF	62	NF	--	--	NF	NS
		8th Ave	NS	NS	NS	NS	127	NF	26	4	36	NF	101	NF	--	--	NF	NS
	Monterey	Twin 51's	108	ND	168	2	47	2	96	4	28	2	59	3	73	ND	ND	14
		San Carlos	31	ND	62	NF	48	NF	54	NF	6	NF	25	NF	91	NF	NF	44
		Steinbeck	32	44	92	6	42	NF	38	NF	7	NF	24	NF	84	ND	ND	34
	Monterey County	Boronda	660	NF	724*	NF	--	--	--	--	--	--	--	--	--	--	--	--
		Las Palmas	37	NF	55	NF	--	--	--	--	--	--	--	--	--	--	--	--
		Pajaro	NS	NS	NS	NS	150	NF	652	NF	111	NF	191	NF	152	NF	NF	244
		Crossroads	NS	NS	NS	NS	41	NF	6	NF	6	NF	20	NF	12	NF	NF	20
	Pacific Grove	HopkinsMon	NS	NS	36	NF	48	NF	46	10	7	NF	--	--	--	--	--	--
		HopkinsPG	NS	NS	33	NF	37	NF	48	NF	9	NF	--	--	--	--	--	--
		8th St	62	ND	89	NF	29	3	71	NF	7	NF	--	--	--	--	--	--
		Greenwood	46	3	47	2	37	7	178	2	12	2	50	6	59	3	8	NS
		Lover's	34	ND	63	ND	24	NF	29	NF	20	NF	20	NF	33	NF	NF	NS
		Sea Palm	64	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		Pico	112	19	183	ND	47	ND	41	ND	14	ND	61	ND	27	ND	ND	68
	Seaside/ Sand City	Bay St	128	NF	129	NF	23	NF	82	NF	32	NF	35	NF	173	NF	NF	33

*Data provided by Monterey County from sampling that occurred one day after First Flush.

Total Suspended Solids (TSS) continued

		Site Name	FF 2013	DR 2013	SuR 2013	SF 2013	FF 2012	DR 2012	SuR 2012	SpR 2012	FF 2011	DR 2011	SuR 2011	SpR 2011	FF 2010	DR 2010	SuR 2010	SpR 2010
Sites by Jurisdiction	Carmel	4th Ave.	NS	NF	NF	NS	139	NF	NF	NF	557	ND	NF	ND	212	NF	NF	NF
		Ocean Ave.	20	NF	NF	NS	57	NF	14	NF	292	NF	NF	NF	42	NF	45	NF
		8th Ave	NS	ND	ND	NS	NS	NF	ND	ND	99	ND	ND	ND	36	3	ND	ND
	Monterey	Twin 51's	69	3	6	19	74	ND	ND	ND	15	ND	ND	ND	183	61	5	ND
		San Carlos	13	NF	3	NS	NS	NF	ND	ND	100	ND	ND	ND	69	3	ND	ND
		Steinbeck	21	NF	4	8	30	7	18	2	88	ND	ND	ND	56	6	ND	ND
	Monterey County	Boronda	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		Las Palmas	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		Pajaro	132	NF	NF	276	140	NF	NF	NF	230	NF	NF	NF	348	NF	NF	NF
		Crossroads	7	NF	NF	5	11	NF	NF	NF	11	NF	NF	NF	15	NF	NF	NF
	Pacific Grove	HopkinsMon	--	--	35	NS	NS	NS	ND	NS	57	NF	8	ND	30	ND	8	7
		HopkinsPG	--	--	NF	NS	NS	NS	NF	NS	75	NF	NF	NF	82	NF	NF	NF
		8th St	--	--	NF	NS	NS	NF	NF	2	NF	NF	20	ND	26	188	NF	NF
		Greenwood	36	4	3	NS	17	2	ND	4	174	ND	ND	7	50	5	6	0
		Lover's	11	NF	NF	NS	21	NF	NF	ND	118	NF	9	12	20	3	ND	ND
		Sea Palm	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		Pico	32	ND	2	12	10	ND	ND	ND	57	ND	ND	ND	36	ND	6	ND
	Seaside/ Sand City	Bay St	66	NF	NF	63	33	NF	NF	NF	59	NF	NF	ND	173	NF	NF	NF

Total Suspended Solids (TSS) continued

		Site Name	FF 2009	DR 2009	FF 2008	DR 2008	FF 2007	DR 2007	FF 2006	DR 2006
Sites by Jurisdiction	Carmel	4th Ave.	121	NF	116	NF	103	NF	--	--
		Ocean Ave.	28	NF	34	NF	59	NF	--	--
		8th Ave	57	ND	20	5	89	4	--	--
	Monterey	Twin 51's	44	6	74	5	137	3	41	2
		San Carlos	22	ND	32	5	47	3080	46	ND
		Steinbeck	68	8	49	8	66	4	14	12
	Monterey County	Boronda	--	--	--	--	--	--	--	--
		Las Palmas	--	--	--	--	--	--	--	--
		Pajaro	270	42	743	NF	--	--	--	--
		Crossroads	21	NF	--	--	--	--	--	--
	Pacific Grove	HopkinsMon	106	51	34	12	36	NF	29	NF
		HopkinsPG	45	NF	25	NF	43	NF	--	--
		8th St	31	NF	15	NF	75	NF	39	
		Greenwood	60	0	19	14	71	3	23	33
		Lover's	52	ND	25	1.9	35	5	24	NF
		Sea Palm	--	--	--	--	--	--	--	--
		Pico	20	ND	45	ND	86	5	40	ND
	Seaside/ Sand City	Bay St	123	NF	66	NF	38	NF	3	NF

Turbidity

Comparison of turbidity results for MRSWMP monitoring reported in NTU. Shaded boxes indicate that the CCRWQCB Action Level of 25 NTU was exceeded; NA= Not Analyzed; ND= Non-detect; NF= No Flow; NS= Not Sampled; -- = Not included in MRSWMP monitoring. Since 2013, sampling has been conducted during dry weather for the Dry Run (DR) and Summer Run (SuR), and during wet weather for the First Flush (FF) and Second Flush (SF).

		Site Name	FF 2020	DR 2020	FF 2019	DR 2019	FF 2018	DR 2018	FF 2017	DR 2017	FF 2016	DR 2016
Sites by Jurisdiction	Carmel	4th Ave.	93	NF	105.0	NF	85	NF	91	NF	44.5	NF
		Ocean Ave.	32	NF	10.5	NF	25	NF	20	NF	21.5	NF
		8th Ave	NS	NS	NS	NS	54	NF	19	10.0	11.0	NF
	Monterey	Twin 51's	55	1.6	51.5	2.9	23	1.4	52	3.8	16.5	6.1
		San Carlos	33	0.5	33.0	NF	38	NF	57	NF	5.2	NF
		Steinbeck	28	2.5	41.5	10.0	43	NF	39	NF	5.0	NF
	Monterey County	Boronda	325	NF	900*	NF	--	--	--	--	--	--
		Las Palmas	23	NF	28.0	NF	--	--	--	--	--	--
		Pajaro	NS	NS	NS	NS	118	NF	606	NF	2.3	NF
		Crossroads	NS	NS	NS	NS	40	NF	19	NF	4.7	NF
	Pacific Grove	HopkinsMon	NS	NS	20.0	NF	48	NF	44	5.3	4.4	NF
		HopkinsPG	NS	NS	21.5	NF	32	NF	50	NF	3.9	NF
		8th St	32	1.1	33.0	NF	25	2.1	40	NF	4.6	NF
		Greenwood	30	5.8	35.5	5.1	27	6.3	71	4.7	10.1	4.5
		Lover's	22	2.0	23.5	0.7	19	NF	30	NF	12.3	NF
		Sea Palm	46	0.4	--	--	--	--	--	--	--	--
		Pico	56	21.0	60.0	15.0	25	4.2	28	6.7	7.9	10.0
	Seaside/ Sand City	Bay St	58	NF	45.5	NF	4	NF	69	NF	12.3	NF

*Data provided by Monterey County from sampling that occurred one day after First Flush.

Turbidity continued

		Site Name	FF 2015	DR 2015	FF 2014	DR 2014	SuR 2014	SF 2014	FF 2013	DR 2013
Sites by Jurisdiction	Carmel	4th Ave.	103.0	NF	--	--	NF	NS	NS	NF
		Ocean Ave.	14.0	NF	--	--	NF	NS	24.0	NF
		8th Ave	26.0	NF	--	--	NF	NS	NS	1.1
	Monterey	Twin 51's	33.0	3.4	21.0	2.0	1.6	12.0	50.0	3.8
		San Carlos	14.0	NF	37.0	NF	NF	16.0	17.3	NF
		Steinbeck	14.0	NF	32.0	0.7	0.7	16.0	13.0	NF
	Monterey County	Boronda	--	--	--	--	--	--	--	--
		Las Palmas	--	--	--	--	--	--	--	--
		Pajaro	140.0	NF	140.0	NF	NF	120.0	175.0	NF
		Crossroads	9.0	NF	12.0	NF	NF	13.0	7.0	NF
	Pacific Grove	HopkinsMon	--	--	--	--	--	--	--	--
		HopkinsPG	--	--	--	--	--	--	--	--
		8th St	--	--	--	--	--	--	--	--
		Greenwood	25.0	5.0	25.0	4.0	2.1	NS	24.0	1.5
		Lover's	10.0	NF	20.0	NF	NF	NS	7.1	NF
		Sea Palm	--	--	--	--	--	--	--	--
		Pico	32.0	3.3	21.0	7.2	2.1	18.0	18.0	3.0
	Seaside/ Sand City	Bay St	19.0	NF	41.0	NF	NF	20.0	40.0	NF

Urea

Comparison of urea results for MRSWMP monitoring reported in µg/L. There is no water quality objective and First Flush results are from a single sample during the first time series; NA= Not Analyzed; ND= Non-detect; NF= No Flow; NS= Not Sampled; -- = Not included in MRSWMP monitoring. Since 2006, sampling has been conducted during dry weather for the Dry Run (DR), Spring Run (SpR) and Summer Run (SuR), and during wet weather for the First Flush (FF) and Second Flush (SF). The table below is broken into sections to facilitate printing.

		Site Name	FF 2020	DR 2020	FF 2019	DR 2019	FF 2018	DR 2018	FF 2017	DR 2017	FF 2016	DR 2016	FF 2015	DR 2015	FF 2014	DR 2014	SuR 2014	SF 2014
Sites by Jurisdiction	Carmel	4th Ave.	104	NF	307	NF	94	NF	109	NF	239	NF	122	NF	--	--	NF	NS
		Ocean Ave.	154	NF	481	NF	169	NF	436	NF	289	NF	187	NF	--	--	NF	NS
		8th Ave	NS	NS	NS	NS	258	NF	269	32	212	NF	173	NF	--	--	NF	NS
	Monterey	Twin 51's	590	31	421	197	117	49	ND	139	186	102	266	254	598	45	22	45
		San Carlos	329	28	277	NF	247	NF	ND	NF	145	NF	118	NF	434	NF	NF	68
		Steinbeck	745	30	156	172	1120	NF	ND	NF	1120	NF	914	NF	4490	24	27	228
	Monterey County	Boronda	230	NF	NS	NF	--	--	--	--	--	--	--	--	--	--	--	--
		Las Palmas	172	NF	149	NF	--	--	--	--	--	--	--	--	--	--	--	--
		Pajaro	NS	NS	NS	NS	140	NF	434	NF	5260	NF	827	NF	313	NF	NF	49
		Crossroads	NS	NS	NS	NS	149	NF	150	NF	129	NF	80	NF	271	NF	NF	56
	Pacific Grove	HopkinsMon	NS	NS	186	NF	249	NF	754	95	168	NF	--	--	--	--	--	--
		HopkinsPG	NS	NS	372	NF	1040	NF	278	NF	740	NF	--	--	--	--	--	--
		8th St	215	234	197	NF	207	587	280	NF	102	NF	--	--	--	--	--	--
		Greenwood	137	51	155	47	154	37	177	124	143	92	180	ND	378	43	17	NS
		Lover's	137	25	221	25	206	NF	249	NF	135	NF	150	NF	914	NF	NF	NS
		Sea Palm	111	16	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		Pico	85	27	224	47	83	ND	140	15	89	ND	451	ND	292	10	435	34
	Seaside/ Sand City	Bay St	230	NF	144	NF	26	NF	ND	NF	205	NF	304	NF	298	NF	NF	57

Urea continued

		Site Name	FF 2013	DR 2013	SuR 2013	SF 2013	FF 2012	DR 2012	SuR 2012	SpR 2012	FF 2011	DR 2011	SuR 2011	SpR 2011	FF 2010	DR 2010
Sites by Jurisdiction	Carmel	4th Ave.	NS	NF	NF	NS	293	NF	NF	NF	46	ND	NF	ND	225	NF
		Ocean Ave.	699	NF	NF	NS	156	NF	31	NF	47	NF	NF	NF	417	NF
		8th Ave	NS	ND	ND	NS	NS	NF	ND	5	547	ND	10	ND	426	ND
	Monterey	Twin 51's	595	131	93	55	193	32	87	61	179	35	53	16	520	21
		San Carlos	572	NF	ND	NS	NS	NF	ND	5	73	ND	10	ND	326	878
		Steinbeck	2075	NF	938	405	478	29	127	5	393	30	42	ND	2234	11
	Monterey County	Boronda	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		Las Palmas	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		Pajaro	838	NF	NF	98	312	NF	NF	NF	44	NF	NF	NF	609	NF
		Crossroads	114	NF	NF	20	289	NF	NF	NF	52	NF	NF	NF	519	NF
	Pacific Grove	HopkinsMon	--	--	ND	NS	NS	NS	ND	NS	55	NF	30	ND	160	ND
		HopkinsPG	--	--	NF	NS	NS	NS	NF	NS	378	NF	NF	NF	1628	NF
		8th St	--	--	NF	NS	NS	NF	NF	1861	NF	NF	83	ND	192	389
		Greenwood	446	11	56	NS	423	11	11	5	168	12	44	70	280	5
		Lover's	450	NF	NF	NS	98	NF	NF	57	97	NF	12	ND	54	5
		Sea Palm	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		Pico	225	ND	42	63	63	ND	ND	5	25	ND	10	20	96	5
	Seaside/ Sand City	Bay St	787	NF	NF	349	158	NF	NF	NF	143	NF	NF	ND	284	NF

Urea continued

		Site Name	SuR 2010	SpR 2010	FF 2009	DR 2009	FF 2008	DR 2008	FF 2007	DR 2007	FF 2006	DR 2006
Sites by Jurisdiction	Carmel	4th Ave.		NF	393	NF	84	NF	195	NF	--	--
		Ocean Ave.	400	NF	105	NF	250	NF	280	NF	--	--
		8th Ave	ND	ND	419	ND	331	10	345	10	--	--
	Monterey	Twin 51's	16	258	920	250	753	45	560	116	724	53
		San Carlos	15	10	331	ND	336	15	440	35	370	13
		Steinbeck	10	213	1547	11	740	1	1965	1028	4777	152
	Monterey County	Boronda	--	--	--	--	--	--	--	--	--	--
		Las Palmas	--	--	--	--	--	--	--	--	--	--
		Pajaro	NF	NF	241	74	98	NF	--	--	--	--
		Crossroads	NF	NF	321	NF	--	--	--	--	--	--
	Pacific Grove	HopkinsMon	ND	36	456	193	38	173	2495	NF	3263	NF
		HopkinsPG	NF	NF	1671	NF	840	NF	275	NF	--	--
		8th St	NF	NF	141	NF	267	NF	210	NF	139	NF
		Greenwood	636	31	120	14	470	71	455	428	348	485
		Lover's	ND	13	118	20	41	57	320	23	217	NF
		Sea Palm	--	--	--	--	--	--	--	--	--	--
		Pico	24	13	35	15	104	69	240	10	150	ND
	Seaside/ Sand City	Bay St	NF	NF	62	NF	108	NF	205	NF	60	NF

Zinc

Comparison of total zinc results for MRSWMP monitoring reported in µg/L. Shaded boxes indicate that the Basin Plan Objective of 200 µg/L was exceeded; NA= Not Analyzed; ND= Non-detect; NF= No Flow; NS= Not Sampled; -- = Not included in MRSWMP monitoring. Since 2006, sampling has been conducted during dry weather for the Dry Run (DR), Spring Run (SpR) and Summer Run (SuR), and during wet weather for the First Flush (FF) and Second Flush (SF). The table below is broken into sections to facilitate printing.

		Site Name	FF 2020	DR 2020	FF 2019	DR 2019	FF 2018	DR 2018	FF 2017	DR 2017	FF 2016	DR 2016	FF 2015	DR 2015	FF 2014	DR 2014
Sites by Jurisdiction	Carmel	4th Avenue	85	NF	131	NF	141	NF	198	NF	133	NF	148	NF	--	--
		Ocean	127	NF	152	NF	238	NF	194	NF	144	NF	106	NF	--	--
		8th Avenue	NS	NS	NS	NS	201	NF	111	71	125	NF	169	NF	--	--
	Monterey	Twin 51's	173	32	136	95	99	74	220	17	93	56	167	114	513	313
		San Carlos	109	12	139	NF	150	NF	157	NF	92	NF	118	NF	692	NF
		Steinbeck	178	39	233	119	222	NF	249	NF	149	NF	170	NF	764	53
	Monterey County	Boronda	111	NF	NS	NF	--	--	--	--	--	--	--	--	--	--
		Las Palmas	80	NF	146	NF	--	--	--	--	--	--	--	--	--	--
		Pajaro	NS	NS	NS	NS	143	NF	424	NF	317	NF	167	NF	231	NF
		Crossroads	NS	NS	NS	NS	156	NF	130	NF	134	NF	78	NF	229	NF
	Pacific Grove	HopkinsMon	NS	NS	119	NF	152	NF	142	106	112	NF	--	--	--	--
		HopkinsPG	NS	NS	286	NF	275	NF	136	NF	189	NF	--	--	--	--
		8th St	125	11	122	NF	101	ND	121	NF	74	NF	--	--	--	--
		Greenwood	94	ND	106	13	135	ND	180	13	93	ND	129	ND	410	60
		Lover's Pt	85	ND	105	ND	112	NF	107	NF	80	NF	87	NF	406	NF
		Sea Palm	100	ND												
		Pico	103	25	113	41	68	ND	92	ND	68	23	150	ND	144	39
	Seaside/ Sand City	Bay St	123	NF	210	NF	ND	NF	136	NF	138	NF	141	NF	703	NF

Zinc continued

		Site Name	SuR 2014	SF 2014	FF 2013	DR 2013	SuR 2013	SF 2013	FF 2012	DR 2012	SuR 2012	SpR 2012	FF 2011	DR 2011	SuR 2011	SpR 2011	FF 2010	DR 2010
Sites by Jurisdiction	Carmel	4th Avenue	NF	NS	NS	NF	NF	NS	145	NF	NF	NF	312	11	NF	104	195	NF
		Ocean	NF	NS	395	NF	NF	NS	203	NF	98	NF	354	NF	NF	NF	650	NF
		8th Avenue	NF	NS	NS	24	92	NS	NS	NF	ND	26	214	20	19	ND	344	15
	Monterey	Twin 51's	48	58	504	93	46	70	147	28	ND	40	142	20	25	25	385	46
		San Carlos	NF	96	269	NF	36	NS	NS	NF	ND	43	264	17	29	67	351	28
		Steinbeck	25	112	293	NF	43	158	392	38	21	60	258	19	31	62	808	31
	Monterey County	Boronda	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		Las Palmas	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		Pajaro	NF	264	297	NF	NF	182	198	NF	NF	NF	170	NF	NF	NF	351	NF
		Crossroads	NF	81	185	NF	NF	79	211	NF	NF	NF	97	NF	NF	NF	330	NF
	Pacific Grove	HopkinsMon	--	--	--	--	60	NS	NS	NS	ND	NS	138	NF	36	24	322	24
		HopkinsPG	--	--	--	--	NF	NS	NS	NS	NF	NS	166	NF	NF	NF	945	NF
		8th St	--	--	--	--	NF	NS	NS	NF	NF	22	NF	NF	88	15	156	567
		Greenwood	48	NS	263	20	14	NS	102	ND	ND	21	300	ND	16	12	232	5
		Lover's Pt	NF	NS	204	NF	NF	NS	114	NF	NF	14	182	NF	16	36	65	5
		Sea Palm	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		Pico	ND	63	129	37	ND	70	58	21	ND	12	86	ND	11	34	139	17
	Seaside/ Sand City	Bay St	NF	119	402	NF	NF	187	94	NF	NF	NF	219	NF	NF	22	272	NF

Zinc continued

		Site Name	SuR 2010	SpR 2010	FF 2009	DR 2009	FF 2008	DR 2008	FF 2007	DR 2007	FF 2006	DR 2006
Sites by Jurisdiction	Carmel	4th Avenue	NF	NF	226	NF	116	NF	170	NF	--	--
		Ocean	439	NF	288	NF	225	NF	361	NF	--	--
		8th Avenue	14	17	256	19	237	20	303	61	--	--
	Monterey	Twin 51's	52	20	313	29	273	28	330	25	295	ND
		San Carlos	28	25	213	19	157	18	269	10	342	ND
		Steinbeck	29	40	400	196	347	110	384	130	411	ND
	Monterey County	Boronda	--	--	--	--	--	--	--	--	--	--
		Las Palmas	--	--	--	--	--	--	--	--	--	--
		Pajaro	NF	NF	273	41	368	NF	--	--	--	--
		Crossroads	NF	NF	303	NF	--	--	--	--	--	--
	Pacific Grove	HopkinsMon	22	35	341	234	194	99	382	NF	307	NF
		HopkinsPG	NF	NF	477	NF	305	NF	231	NF	--	--
		8th St	NF	NF	147	NF	121	NF	173	NF	153	--
		Greenwood	ND	14	167	ND	156	35	236	11	180	27
		Lover's Pt	ND	14	166	ND	123	10	175	13	158	NF
		Sea Palm	--	--	--	--	--	--	--	--	--	--
		Pico	16	11	87	ND	96	12	154	10	142	ND
	Seaside/ Sand City	Bay St	NF	NF	345	NF	124	NF	185	NF	33	NF

Appendix 3: Results by Jurisdiction (listed alphabetically)

Carmel 2020 MRSWMP monitoring results.

Table results include the Dry Run (DR), First Flush time series (FF-A and FF-B) and FF results averaged for the two time series (FF-Avg). Shaded boxes indicate that a Water Quality Objective (WQO) or Action Level was exceeded. ND= Non-detect; NF= No Flow; -- = Not included in MRSWMP.

Analytes	WQO or Action Level	4th Avenue				Ocean Avenue			
		DR	FF- A	FF - B	FF Avg	DR	FF- A	FF - B	FF Avg
Ammonia (mg/L)	50 mg/L	NF	0.27	0.26	0.27	NF	0.50	0.44	0.47
Color (Color Units)	500 color units	NF	203	224	214	NF	180	212	196
Copper (ug/L)	30 ug/L	NF	92	99	96	NF	83	106	95
E. coli (MPN/ 100 ml)	235 MPN/ 100 ml	NF	26100	20600	23350	NF	16800	15400	16100
Enterococcus (MPN/ 100 ml)	104 MPN/ 100 ml	NF	48844	86644	67744	NF	21872	16695	19284
Hardness mg/L	<10 and >2000 mg/L	NF	64	69	67	NF	54	56	55
Lead (ug/L)	30 ug/L	NF	11.8	9.5	10.7	NF	4.6	3.6	4.1
MBAS Surfactants	0.2 mg/L	NF	0.35	0.43	0.39	NF	0.61	0.60	0.61
NO3-N (mg-N/ L)	2.25 mg-N/ L	NF	0.4	0.4	0.4	NF	0.4	0.5	0.5
PO4-P (mg-P/ L)	0.12 mg-P/ L	NF	0.8	0.8	0.8	NF	0.8	0.7	0.8
Potassium (mg/L)	20 mg/ L	NF	8.9	9.2	9.1	NF	7.8	9.6	8.7
TSS (mg/L)	500 mg/L	NF	135	113	124	NF	41	25	33
Turbidity (NTU)	25 NTU	NF	100	85	93	NF	32	31	32
Urea (ug/L)	None currently	NF	104	--	--	NF	154	--	--
Zinc (ug/L)	200 ug/L	NF	89	81	85	NF	132	122	127

Monterey 2020 MRSWMP monitoring results.

Table results include the Dry Run (DR), First Flush time series (FF-A and FF-B) and FF results averaged for the two time series (FF-Avg). Shaded boxes indicate that a Water Quality Objective (WQO) or Action Level was exceeded. ND= Non-detect; NF= No Flow; -- = Not included in MRSWMP monitoring.

	WQO or Action Level	Twins				San Carlos				Steinbeck			
Analytes		DR	FF- A	FF - B	FF Avg	DR	FF- A	FF - B	FF Avg	DR	FF- A	FF - B	FF Avg
Ammonia (mg/L)	50 mg/L	ND	1.40	1.36	1.38	0.04	0.39	0.36	0.38	ND	1.22	1.82	1.52
Color (Color Units)	500 color units	22	88	104	96	22	85	88	87	24	83	102	93
Copper (ug/L)	30 ug/L	26	38	34	36	ND	49	47	48	58	37	69	53
E. coli (MPN/100 ml)	235 MPN/ 100 ml	4106	48800	120000	84400	2602	112000	51700	81850	2187	36500	31300	33900
Enterococcus (MPN/100 ml)	104 MPN/ 100 ml	3255	64882	173289	119086	420	>241960	27777	134869	9208	30759	72699	51729
Hardness mg/L	<10 and >2000 mg/L	639	47	80	64	418	48	91	70	227	32	47	40
Lead (ug/L)	30 ug/L	0.3	10.9	26.0	18.5	0.2	5.6	3.9	4.8	0.4	5.6	3.6	4.6
MBAS Surfactants	0.2 mg/L	0.09	0.54	0.52	0.53	0.17	0.54	0.56	0.55	0.12	0.54	0.71	0.63
NO3-N (mg-N/ L)	2.25 mg-N/ L	0.6	0.4	0.5	0.5	4.3	0.4	0.8	0.6	1.8	0.6	1.2	0.9
PO4-P (mg-P/ L)	0.12 mg-P/ L	0.2	0.8	0.9	0.9	0.2	0.5	0.5	0.5	0.7	0.9	1.0	1.0
Potassium (mg/L)	20 mg/ L	10.8	4.9	7.3	6.1	7.3	3.8	4.8	4.3	5.5	4.3	5.7	5.0
TSS (mg/L)	500 mg/L	ND	70	145	108	ND	40	22	31	44	42	22	32
Turbidity (NTU)	25 NTU	1.6	40	70	55	0.45	32	33	33	2.5	35	20	28
Urea (ug/L)	None currently	31	590	--	--	28	329	--	--	30	745	--	--
Zinc (ug/L)	200 ug/L	32	181	614	173	12	116	101	109	39	162	193	178

Monterey County 2020 MRSWMP monitoring results.

Table results include the Dry Run (DR), First Flush time series (FF-A and FF-B) and FF results averaged for the two time series (FF-Avg). Shaded boxes indicate that a Water Quality Objective (WQO) or Action Level was exceeded. ND= Non-detect; NF= No Flow, -- = Not included in MRSWMP monitoring; *Data provided by Monterey County from sampling that occurred one day after First Flush.

		Boronda				Las Palmas			
Analytes	**WQO or Action Level**	DR	FF- A	FF- B	FF-Avg	DR	FF- A	FF- B	FF-Avg
Ammonia (mg/L)	50 mg/L	NF	0.21	0.18	0.20	NF	0.19	0.15	0.17
Color (Color Units)	500 color units	NF	30	20	25	NF	36	40	38
Copper (ug/L)	30 ug/L	NF	20	8	14	NF	ND	ND	ND
E. coli (MPN/ 100 ml)	235 MPN/ 100 ml	NF	2700	1800	2250	NF	14200	16700	15450
Enterococcus (MPN/ 100 ml)	104 MPN/ 100 ml	NF	72100	28000	50050	NF	43500	39700	41600
Hardness mg/L	<10 and >2000 mg/L	NF	57	62	60	NF	38	63	51
Lead (ug/L)	30 ug/L	NF	18.0	13.4	15.7	NF	1.5	1.1	1.3
MBAS Surfactants (mg/L)	0.2 mg/L	NF	0.06	0.05	0.06	NF	0.08	0.14	0.11
NO3-N (mg-N/ L)	2.25 mg-N/ L	NF	0.3	0.5	0.4	NF	0.3	0.5	0.4
PO4-P (mg-P/ L)	0.12 mg-P/ L	NF	0.4	0.3	0.4	NF	0.3	0.4	0.4
Potassium (mg/L)	20 mg/ L	NF	3.5	3.3	3.4	NF	2.7	3.2	3.0
TSS (mg/L)	500 mg/L	NF	768	552	660	NF	46	27	37
Turbidity (NTU)	25 NTU	NF	320	330	325	NF	29	17	23
Urea (ug/L)	None currently	NF	230	--	--	NF	172	--	--
Zinc (ug/L)	200 ug/L	NF	132	89	111	NF	86	74	80

Pacific Grove 2020 MRSWMP Monitoring results.

Table results include the Dry Run (DR), First Flush time series (FF-A and FF-B) and FF results averaged for the two time series (FF-Avg). Shaded boxes indicate that a Water Quality Objective (WQO) or Action Level was exceeded. ND= Non-detect; NF= No Flow; -- = Not included in MRSWMP monitoring.

	WQO or Action Level	8th Street				Greenwood Park				Lovers			
Analytes		DR	FF- A	FF - B	FF Ave	DR	FF- A	FF - B	FF Ave	DR	FF- A	FF - B	FF Ave
Ammonia (mg/L)	50 mg/L	0.21	0.51	0.62	0.57	0.19	0.46	0.58	0.52	0.04	0.28	0.25	0.27
Color (Color Units)	500 color units	30	162	124	143	26	130	150	140	21	166	193	180
Copper (ug/L)	30 ug/L	ND	38	36	37	ND	35	34	35	ND	28	28	28
E. coli (MPN/100 ml)	235 MPN/ 100 ml	15531	242000	242000	242000	>24196	46100	36500	41300	2098	43500	51700	47600
Enterococcus (MPN/100 ml)	104 MPN/ 100 ml	6131	81641	198629	143135	17329	81641	129965	105803	2143	77010	98039	87525
Hardness mg/L	<10 and >2000 mg/L	392	118	66	92	475	47	63	55	239	60	98	79
Lead (ug/L)	30 ug/L	0.1	5.9	11.5	8.7	0.9	6.2	3.7	5.0	0.4	6.4	4.9	5.7
MBAS Surfactants	0.20 mg/L	0.12	1.02	0.77	0.90	0.07	0.78	0.78	0.78	0.08	0.74	0.61	0.68
NO3-N (mg-N/ L)	2.25 mg-N/ L	1.8	0.5	0.4	0.5	0.8	0.3	0.4	04	8.6	0.4	0.5	0.5
PO4-P (mg-P/ L)	0.12 mg-P/ L	0.40	0.70	0.50	0.60	0.10	0.50	0.80	0.70	0.1	0.8	0.8	0.8
Potassium (mg/L)	20 mg/ L	9.5	8.5	6.3	7.4	10.4	6.5	7.6	7.1	4.4	8.9	9.9	9.4
TSS (mg/L)	500 mg/L	ND	25	98	62	3	60	31	46	ND	40	28	34
Turbidity (NTU)	25 NTU	1.1	23	40	32	5.8	36	24	30	2.0	23	20	22
Urea (ug/L)	None currently	234	215	--	--	51	137	--	--	25	137	--	--
Zinc (ug/L)	200 ug/L	11	81	168	125	ND	100	88	94	ND	89	80	85

Pacific Grove 2020 MRSWMP Monitoring results continued

Analytes	WQO or Action Level	Sea Palm				Pico			
		DR	FF- A	FF - B	FF Ave	DR	FF- A	FF - B	FF Ave
Ammonia (mg/L)	50 mg/L	ND	0.22	0.22	0.22	ND	0.25	0.32	0.29
Color (Color Units)	500 color units	20	156	161	159	84	141	173	157
Copper (ug/L)	30 ug/L	11	45	39	42	7	50	38	44
E. coli (MPN/100 ml)	235 MPN/ 100 ml	<10	57900	36500	47200	158	86600	72700	79650
Enterococcus (MPN/100 ml)	104 MPN/ 100 ml	10	86644	111987	99316	75	198629	173289	185959
Hardness mg/L	<10 and >2000 mg/L	308	60	60	60	240	51	63	57
Lead (ug/L)	30 ug/L	ND	10.1	7.4	8.8	0.4	10.1	4.5	7.3
MBAS Surfactants	0.20 mg/L	0.10	0.62	0.71	0.67	0.20	0.70	0.70	0.70
NO3-N (mg-N/ L)	2.25 mg-N/ L	1.0	0.7	ND	0.4	1.3	0.3	0.3	0.3
PO4-P (mg-P/ L)	0.12 mg-P/ L	0.10	0.50	0.30	0.40	0.10	0.60	0.50	0.60
Potassium (mg/L)	20 mg/ L	6.9	8.9	9.2	9.1	10.6	7.7	10.5	9.1
TSS (mg/L)	500 mg/L	ND	90	37	64	19	162	61	112
Turbidity (NTU)	25 NTU	0.4	60	32	46	21.0	80	31	56
Urea (ug/L)	None currently	16	111	--	--	27	85	--	--
Zinc (ug/L)	200 ug/L	ND	100	99	100	25	139	67	103

Seaside and Sand City 2020 MRSWMP Monitoring results.

Table results include the Dry Run (DR), First Flush time series (FF-A and FF-B) and FF results averaged for the two time series. Shaded boxes indicate that a Water Quality Objective (WQO) or Action Level was exceeded. ND= Non-detect; NF= No Flow; -- = Not included in MRSWMP monitoring.

Analytes	**WQO or Action Level**	**Bay Street**			
		Dry Run	First Flush-A	First Flush-B	FF Average
Ammonia (mg/L)	50 mg/L	NF	0.25	0.19	0.22
Color (Color Units)	500 color units	NF	39	37	38
Copper (ug/L)	30 ug/L	NF	20	14	17
E. coli (MPN/ 100 ml)	235 MPN/ 100 ml	NF	198600	120300	159450
Enterococcus (MPN/ 100 ml)	104 MPN/ 100 ml	NF	>242000	120300	181150
Hardness mg/L	<10 and >2000 mg/L	NF	ND	24	17
Lead (ug/L)	30 ug/L	NF	14.0	9.9	12.0
MBAS Surfactants (mg/L)	0.2 mg/L	NF	0.43	0.37	0.40
NO3-N (mg-N/ L)	2.25 mg-N/ L	NF	0.2	0.2	0.2
PO4-P (mg-P/ L)	0.12 mg-P/ L	NF	0.2	0.2	0.2
Potassium (mg/L)	20 mg/ L	NF	3.0	2.3	2.7
TSS (mg/L)	500 mg/L	NF	167	88	128
Turbidity (NTU)	25 NTU	NF	74	42	58
Urea (ug/L)	None currently	NF	240	--	--
Zinc (ug/L)	200 ug/L	NF	165	81	123

Appendix 4: Receiving Water Sampling

Appendix 4. Receiving Water Monitoring

Introduction

Collecting paired receiving water samples and discharge samples can provide a more complete understanding of the fate of common urban pollutants once they flow into the ocean during a major rainstorm. The 2016-2017 MRSWMP monitoring program added collection and analysis of receiving water samples from two sites in Pacific Grove during the First Flush which was continued into the 2018-2019, 2019-2020 and now the 2020-2021 programs. Receiving water sites were selected based upon ease of sample collection and to compliment previous Areas of Special Biological Significance (ASBS) monitoring that was done at end of pipe and in receiving water in Pacific Grove. Two receiving water sites, 8th Street and Lovers, were monitored during the 2020-2021 winter season. Pacific Grove maintains and operates a dry weather diversion system that remained operational throughout the fall and winter season leading up to the First Flush.

Methods

Sample collection protocols were the same as those used for all of the MRSWMP water quality monitoring events. Receiving water grab samples were collected using a 2-gallon bucket in ankle deep water at the location where outfall water flowed into the ocean. No field measurements were collected. All receiving water samples were analyzed for the same analytes as those for the MRSWMP outfall monitoring: nutrients (nitrate, orthophosphate, ammonia and urea), bacteria (*Eschericia coli* and enterococcus), metals (copper, lead and zinc) and total suspended solids, color, Methylene Blue Active Substances (MBAS) detergents, hardness (as CaCO3), potassium and turbidity.

All results from this receiving water study are compared to actual receiving water standards established for beneficial uses in the ocean. All Water Quality Objectives and Action Levels and their accompanying sources are listed in Table A4.1. In cases where the Ocean Plan provides more protection of receiving water quality than those water quality objectives used for end of pipe monitoring, then the Ocean Plan Water Quality Objectives are used and noted.

Results

Receiving Water samples were collected on December 13, 2020 at the same time the outfalls were sampled. The dry weather diversion was operational at Lovers and 8th Street at the time of sampling however there was flow from the outfalls that reached the receiving water. Flow from the end of pipe to the ocean was good at 8th Street while only minimal from Lovers. End of pipe samples were collected using the same protocols as for First Flush, with one exception: only one sample was collected. Receiving water results are presented for each site in the graphs for each analyte.

Table A4.1: Receiving Water Quality Objectives

Parameter (reporting units)	Water Quality Objectives	Source of Objective
Ammonia (mg/L)	Not to exceed 50	SWRCB NPDES MS4 General Permit
Color (color units)	Not to exceed 500	SWRCB NPDES MS4 General Permit
Copper (µg/L)	Not to exceed 30	California Ocean Plan 2015
E. coli (MPN/100ml)	Not to exceed 235 [1]	EPA Ambient Water Quality Criteria
Enterococcus (MPN/100ml)	Not to exceed 104	EPA Ambient Water Quality Criteria
Hardness as CaCO3 (mg/L)	Not less than or = to10 or greater than or = to 2,000	SWRCB NPDES MS4 General Permit
Lead (µg/L)	Not to exceed 20	California Ocean Plan 2015
MBAS Detergents (mg/L)	Not to exceed 0.2	Water Quality Control Plan for the Central Coast
Nitrate as N (mg/L)	Not to exceed 2.25 [2]	Central Coast Ambient Monitoring Program (CCAMP)
Orthophosphate as P (mg/L)	Not to exceed 0.12 [3]	Central Coast Ambient Monitoring Program (CCAMP)
Potassium (mg/L)	Not to exceed 20	SWRCB NPDES MS4 General Permit
Total Suspended Solids (TSS) (mg/L)	Not to exceed 500 [4]	Central Coast Ambient Monitoring Program (CCAMP)
Turbidity (NTU)	Not to exceed 225	California Ocean Plan 2015
Zinc (µg/L)	Not to exceed 200 [1]	California Ocean Plan 2015

Note: Urea is not listed because it does not have a Water Quality Objective or Action Level.

[1] Environmental Protection Agency, Updated WQO.
[2] Central Coast Ambient Monitoring Program, Pajaro River Watershed Characterization Report 1998, rev 2003.
[3] Williamson, The Establishment of Nutrient Objectives, Sources, Impacts and Best Management Practices for the Pajaro River and Llagas Creek, 1994.
[4] Central Coast Ambient Monitoring Program, Salinas River Watershed Characterization Report 1999, rev. 2000.

8th Street Outfall and Receiving Water Monitoring

The 8th Street outfall empties directly on to a small boulder-strewn pocket beach that is seasonally used by newborn harbor seal pups and their mothers. The 8th Street outfall has a drainage area of 35 acres that is 100% residential. The 2020 First Flush 8th Street outfall average and single grab sample receiving water results are listed in Table A4.2.

Overall, constituent concentrations decreased in seawater except for hardness and potassium which were above the Action Levels in 8th Street receiving water. However, the ocean contains quite a bit of calcium carbonate and potassium, so much so that calcium and potassium are within the top six constituents in seawater. Orthophosphate results were above the Action Level for the end of pipe sample only. *E. coli*, enterococcus and MBAS detergents were over the Water Quality Objectives (WQO) for both end of pipe and receiving water samples.

Table A4.2. 8th Street outfall and receiving water results for First Flush on December 13, 2020 . Shaded boxes represent an exceedance of a Water Quality Objective or Action Level.

Parameter	Units	Outfall Monitoring		Receiving Water Monitoring	
		FF Result	MDL	Result	MDL
Ammonia (mg/L)	50 mg/L	0.57	0.05	ND	0.05
Color (color units)	500 color units	143	5*	63	5*
Copper- total (µg/L)	30 µg/L	37	7	ND	70*
Escherichia coli (E. coli) (MPN/100ml)	235 MPN/100 ml	242,000	1	120,000	1
Enterococcus (MPN/100 ml)	104 MPN/100 ml	140,135	100*	198,639	100*
Hardness (mg/L)	10 to 2,000 mg/L	92	1	6060	1
Lead- total (µg/L)	20 µg/L	8.7	0.1	0.4	0.1
MBAS Detergents (mg/L)	0.2 mg/L	0.90	0.02	0.13	0.02
Nitrate as N (mg/L)	2.25 mg/L	0.50	0.04*	0.20	0.1*
Orthophosphate as P (mg/L)	0.12 mg/L	0.60	0.08*	ND	0.2*
Potassium (mg/L)	20 mg/L	7.4	0.3	500	3.0*
Total Suspended Solids (mg/L)	500 mg/L	62	2	7	2
Turbidity (NTU)	25 NTU	32	0.5*	3	0.05
Urea (µg/L)	No WQO	215	8	20	8
Zinc- total (µg/L)	200 µg/L	125	10	ND	100*

*Samples were diluted

Lovers Outfall and Receiving Water Monitoring

The Lovers watershed is one of the largest watersheds in Pacific Grove at 240 acres and consists of a mix of residential (54%), commercial (1%), and some public lands or other uses (20%). The Lovers outfall empties right on to one of the most used beaches in Pacific Grove. The 2020 First Flush Lovers outfall average and single grab sample receiving water results are listed in Table A4.3.

As with 8th Street, overall constituent concentrations decreased in seawater except hardness and potassium which were above the Action Levels in Lovers receiving water. However, the ocean contains quite a bit of calcium carbonate and potassium, so much so that calcium and potassium are within the top six constituents in seawater. Orthophosphate results were above the Action Level for the end of pipe sample only. *E. coli*, enterococcus and MBAS detergents results were over the Water Quality Objectives for both end of pipe and receiving water samples.

Table A4.3. Lovers outfall and receiving water results for First Flush on December 13, 2020. Shaded boxes represent an exceedance of a Water Quality Objective or Action Level.

		Outfall Monitoring		Receiving Water Monitoring	
Parameter (units)	**WQO**	**FF Result**	**MDL**	**Result**	**MDL**
Ammonia (mg/L)	50 mg/L	0.27	0.05	ND	0.05
Color (color units)	500 color units	180	5*	5	1
Copper- total (µg/L)	30 µg/L	28	7	ND	70*
Escherichia coli (E. coli) (MPN/100ml)	235 MPN/100 ml	47,600	100*	11,200	10*
Enterococcus (MPN/100 ml)	104 MPN/100 ml	87,525	100*	24,196	10*
Hardness (mg/L)	10 to 2,000 mg/L	79	1	5900	1
Lead- total (µg/L)	20 µg/L	5.7	0.1	1.9	0.1
MBAS Detergents (mg/L)	0.2 mg/L	0.68	0.02	0.06	0.02
Nitrate as N (mg/L)	2.25 mg/L	0.50	0.04*	0.10	0.1*
Orthophosphate as P (mg/L)	0.12 mg/L	0.80	0.08*	ND	0.2*
Potassium (mg/L)	20 mg/L	9.4	0.3	591	0.3
Total Suspended Solids (mg/L)	500 mg/L	34	2	28	2
Turbidity (NTU)	25 NTU	22	0.5*	2	0.05
Urea (µg/L)	No WQO	137	8	32	8
Zinc- total (µg/L)	200 µg/L	85	10	ND	100*

*Samples were diluted

Conclusion

Receiving water samples provide information on the fate and dilution of urban watershed pollutants in the ocean. By pairing receiving water with end of pipe samples, initial concentrations can provide insight into the level of pollutants coming off urban areas. This year's receiving water samples, showed levels above the Water Quality Objectives for *E. coli* and enterococcus in both end of pipe and receiving water samples. Only receiving water samples had results that exceeded the Water Quality Objectives for hardness and potassium. End of pipe concentrations that exceeded Water Quality Objectives and Action Levels for MBAS detergents, orthophosphate as P and turbidity (8th Street (Pacific Grove) only) did not lead to exceedances in the receiving water.