Prepared for

County of San Luis Obispo
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TMDL Wasteload Allocation Attainment Plan

For Morro Bay, San Luis Obispo Creek, and Nipomo Watersheds

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Revision 3: July 13, 2016

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1. Introduction

The California NPDES Phase II Small MS4 General Permit (Permit) (SWRCB, 2013) requires that the County of San Luis Obispo (County) develop a Wasteload Allocation Attainment Plan (WAAP) to address Total Maximum Daily Loads (TMDLs) in its watersheds, where the County's Municipal Separate Storm Sewer System (MS4) is identified as a responsible discharger. This WAAP addresses discharges from County MS4 Permit areas, which are typically urban developed land uses. Agriculture, grazing, and open space land uses are not within the County's jurisdictional control with respect to TMDL wasteload allocation attainment.

As a guide to the implementation of activities that will achieve TMDL wasteload allocations, this WAAP addresses: development of an implementation and assessment strategy; source identification and prioritization; best management practice (BMP) identification, prioritization, implementation, analysis, and assessment; monitoring program development and implementation; coordination with stakeholders; and other pertinent factors. Implementation of this plan and the BMPs described herein is designed to attain the appropriate wasteload allocations.

The five TMDLs[1] addressed in this WAAP are:

1. the San Luis Obispo Creek pathogen TMDL (R3-2004-0142), effective July 25th, 2005;

2. the Morro Bay pathogen TMDL (R3-2003-0060), effective November 19th, 2003;

3. the Morro Bay sediment TMDL (R3-2002-0051), effective December 3rd, 2003;

4. the Santa Maria River fecal indicator bacteria TMDL (R3-2012-0002), effective February 21st, 2013; and

[1] The County is also identified in the San Luis Obispo Creek nutrient TMDL and Santa Maria River pesticide TMDL; however there are WAAP requirements in for the County San Luis Obispo Creek nutrient TMDL and no Waste Load Allocations assigned to the County Santa Maria River pesticide TMDL.

5. the Santa Maria River nitrogen compounds and orthophosphate TMDL (R3-2013-0013), effective May 22nd, 2014.

The interim and final target dates for achieving the TMDL Waste Load Allocations (WLAs) for all the TMDL pollutants in each watershed are shown in Table 1.

Table 1. Interim target and WLA target dates

Watershed	TMDL WLA	Interim Target Date	WLA Target Date
San Luis Obispo Creek	Fecal Coliform (pathogen)	Not applicable	7/25/2015
Morro Bay	Fecal Coliform (pathogen)	Not applicable	11/19/2013
	Sediment	12/3/2028 (50%)[2]	12/3/2053
Nipomo Creek[1]	Fecal Coliform and E. Coli	2/21/2018 (20%) and 2/21/2023 (50%)[2]	2/21/2028
	Nitrate as N	5/22/2034 (Wet Season)[3]	5/22/2044
	Unionized Ammonia as N	5/22/2026	5/22/2044

1. Nipomo Creek is the only waterbody in the Santa Maria River watershed that has WLAs assigned to the County.
2. Values listed in () represent the progress toward the WLA that should be achieved by the listed interim target date.
3. No interim targets are listed for the dry season.

Following a 2011 Program Compliance Audit by the Regional Board, it was determined that a previous version of this WAAP (April 2010 version) did not adequately incorporate the minimum principle components required by the Board. In particular, the July 2011 audit assessment stated that:

- "The County's WAAP does not include additional BMPs beyond the baseline BMPs described in the County's 2010 SWMP;
- The County does not conduct analytical monitoring to determine whether the WAAP BMPs will meet its wasteload allocations (WLAs); and
- The County's approach to effectiveness assessment does not demonstrate that its WLAs will be met."

In light of these findings by the Regional Board, this WAAP was amended in an effort to more effectively incorporate the minimum principle components required. The first revision to the WAAP, which focused on the Morro Bay

Pathogen TMDL and resulting BMPs, monitoring plan, and program effectiveness, was completed and submitted in June 2012. The second revision focused on updates for the San Luis Obispo Creek Pathogen TMDL portion of the WAAP and included quantitative assessments of County BMPs for the Morro Bay Pathogen TMDL and San Luis Obispo Creek Pathogen TMDL. The second revision was completed and submitted in August 2012.

The WAAP is being revised a third time to address new TMDL requirements found in Draft Attachment G[2] of the Permit (SWRCB, 2015), which includes the addition of bacteria and nutrient TMDL requirements for the Santa Maria River watershed. This revision also includes changes reflected in the San Luis Obispo County Phase II Storm Water Guidance Document (County of San Luis Obispo, 2013) and the County of San Luis Obispo Amended and Approved Guidance Document for April 2010 SWMP (Stormwater Management Program) (County of San Luis Obispo, 2014).

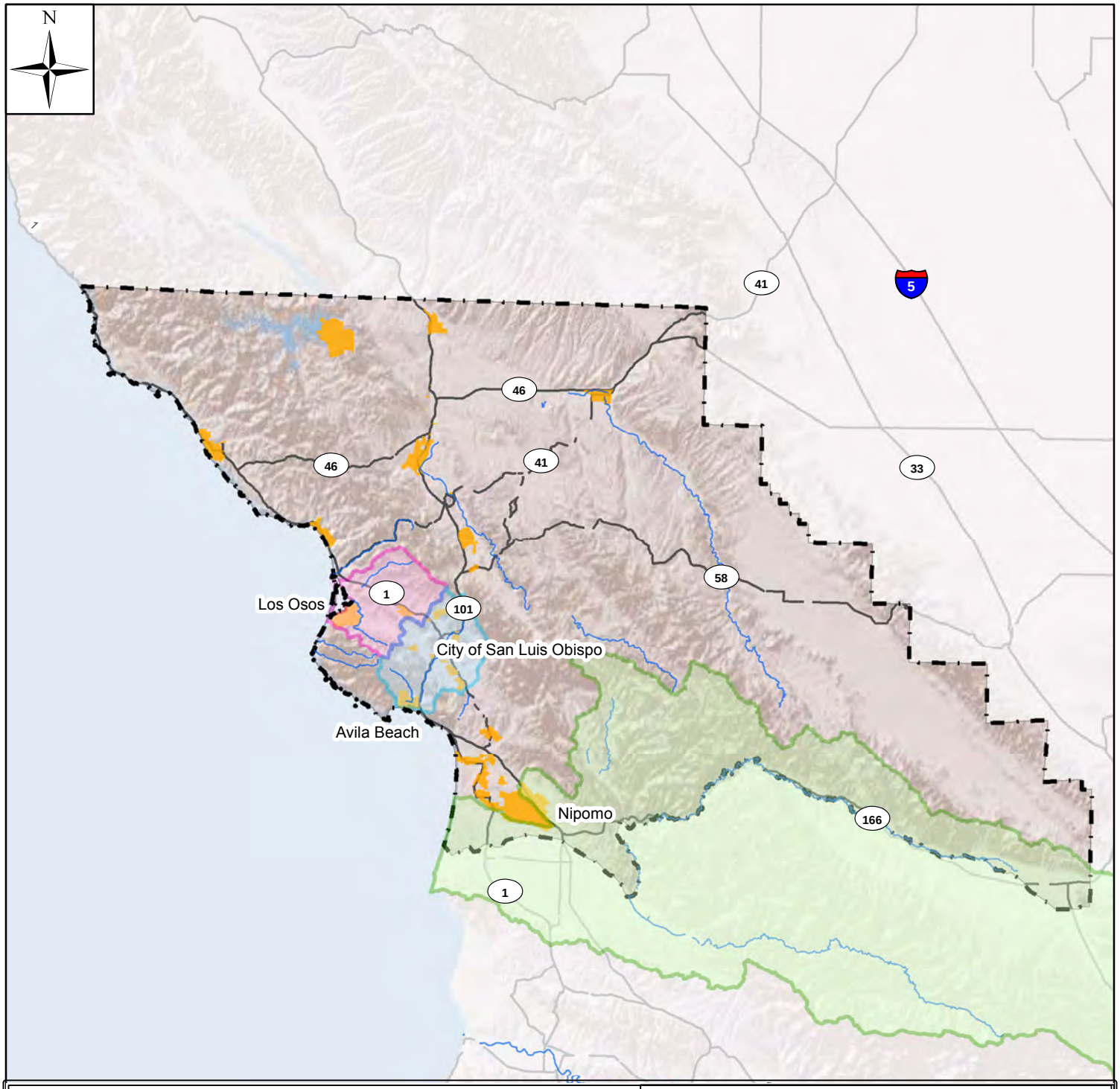
2. Implementation Strategy

The County relies on education and outreach, public involvement and participation, illicit discharge detection and elimination, construction site runoff control, post construction runoff controls, and pollution prevention / good housekeeping programs (provisions E.7 through E.12 of the Permit) to prevent pollution at the source. The County's Stormwater Guidance Document seeks to coordinate stormwater runoff pollution prevention efforts throughout the County by identifying cost effective BMPs to achieve the objectives of the Permit. The County's Permit compliance strategy, outlined in the Guidance Document, relies on a balanced approach of implementing and assessing source control BMPs and leveraging existing practices to the maximum extent practicable (MEP). Through adaptive management, new BMPs will be added and existing BMPs enhanced to better target TMDL pollutants specific to the watersheds addressed in this WAAP. As necessary to achieve TMDL WLAs, further BMP enhancements may be implemented based on monitoring results.

[2] An informal Draft of Proposed Revisions of Attachment G was circulated June 19, 2015 and comments were requested for submission by July 31, 2015.

3. Source Identification and Prioritization

For each TMDL, sources of applicable pollutants of concern were identified through review of existing data and in-field observations. These evaluations were aimed at targeting the leading causes, magnitudes, and locations of respective pollutant loadings. Data considered included water quality, flow, land use, and other information. Relative pollutant source loads and best professional judgment were then used to prioritize the sources based on relative contribution to the receiving water impairment and anticipated controllability. A summary of each TMDL source evaluation is provided below, including discussion that is more focused on County MS4 sources specifically. Additional source evaluation details can be found in the TMDL staff reports or the referenced studies. For reference, a map of the County unincorporated coverage areas (per the Permit) is shown in Figure 1. Additionally, specific land uses under the County's jurisdiction are shown for the San Luis Obispo Creek (Figure 2), Morro Bay (Figure 3 & Figure 4), and Nipomo Creek (Figure 5) watersheds. The only urbanized County areas within the San Luis Obispo Creek watershed are some varied land uses scattered around the City of San Luis Obispo, and Avila Beach and its surrounding vicinity. Within the Morro Bay watershed, the County has jurisdiction over the community of Los Osos-Baywood Park (Figure 4) and a public facility/recreation area near the top of the watershed. Within the Santa Maria River watershed, the County has jurisdiction over the community of Nipomo (Figure 5). The County MS4's relative pollutant load contribution to each watershed is minimal compared to other sources (e.g. stormwater discharges from open spaces, irrigated agriculture, ranching, and other MS4s), as indicated by stormwater pollutant loading calculations described in Section 9.1.



Legend

GIS data provided by County of San Luis Obispo

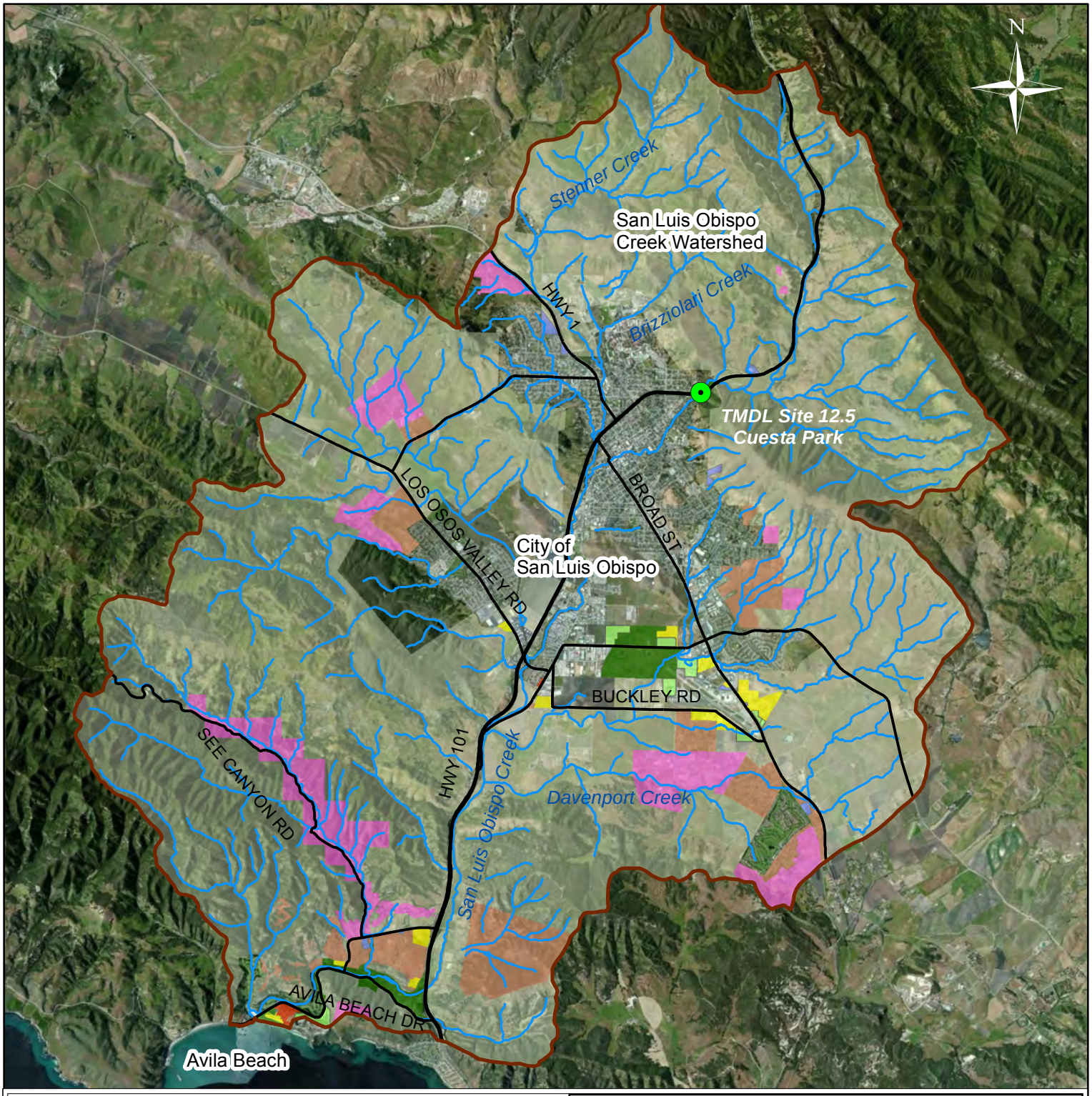
- Santa Maria River Watershed
- San Luis Obispo Creek Watershed
- Morro Bay Watershed
- County Unincorporated Area
- County Boundary
- Streams
- Major Roads

0 5 10 20 30 Miles

Geosyntec consultants

LA0350
September 2015

Figure 1.
Map of County Unincorporated Coverage Areas



Legend

GIS data provided by County of San Luis Obispo

County Land Uses

- Public Facility
- Recreation
- SF Residential
- MF Residential
- Rural Residential
- Commercial
- Industrial
- Undeveloped County

- TMDL Monitoring Site 12.5
- *Streams*
- MAJORS ROADS
- Watershed Boundary

0 0.5 1 2 3 4 Miles

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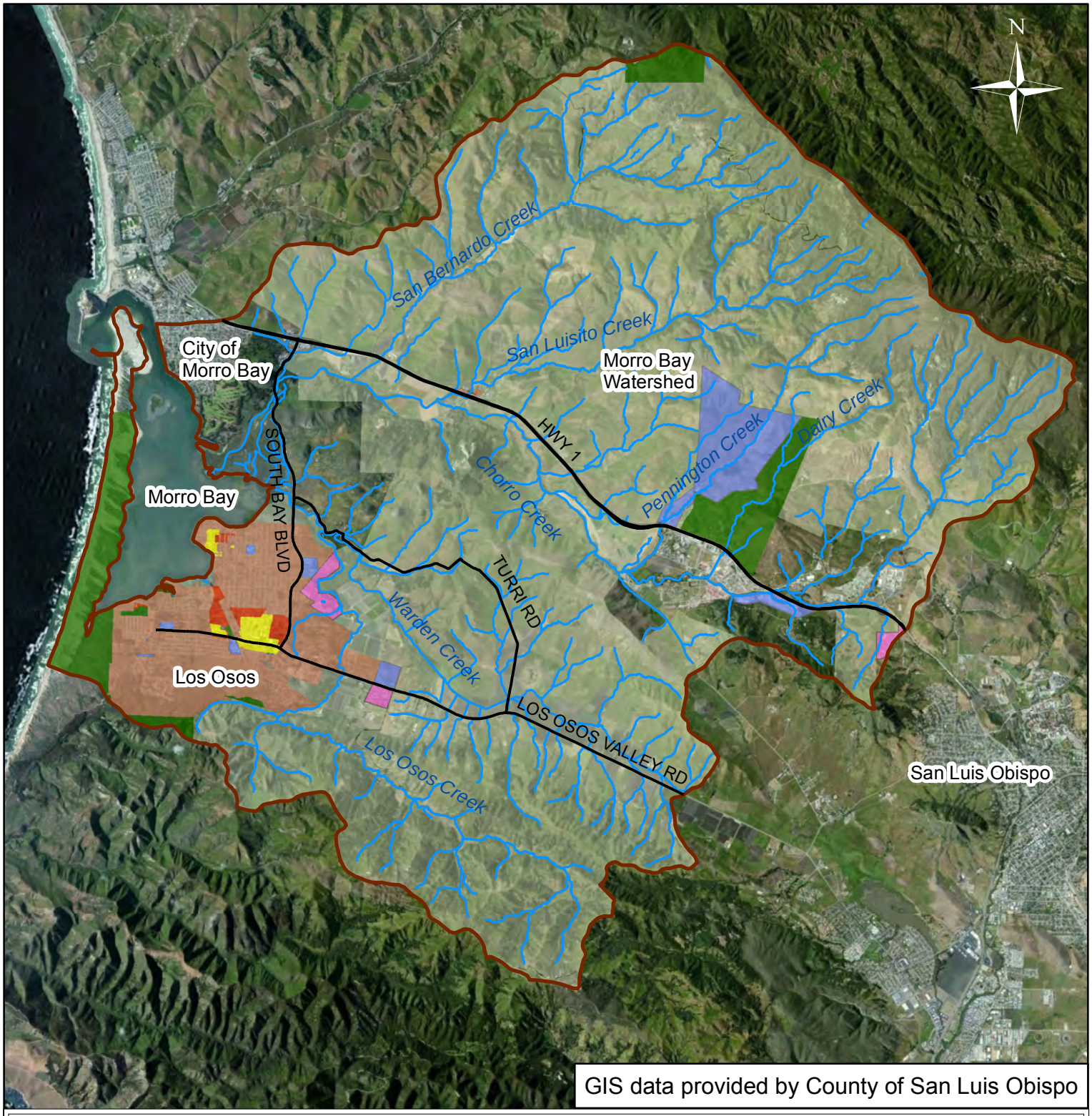
LA0251
August 2012

Figure 2.
Land Use within SLO Creek Watershed



Legend

- Public Facility
- Recreation
- SF Residential
- MF Residential
- Rural Residential
- Commercial
- Undeveloped County
- *Streams*
- MAJOR ROADS
- Watershed Boundary

0 0.5 1 2 3 4 Miles

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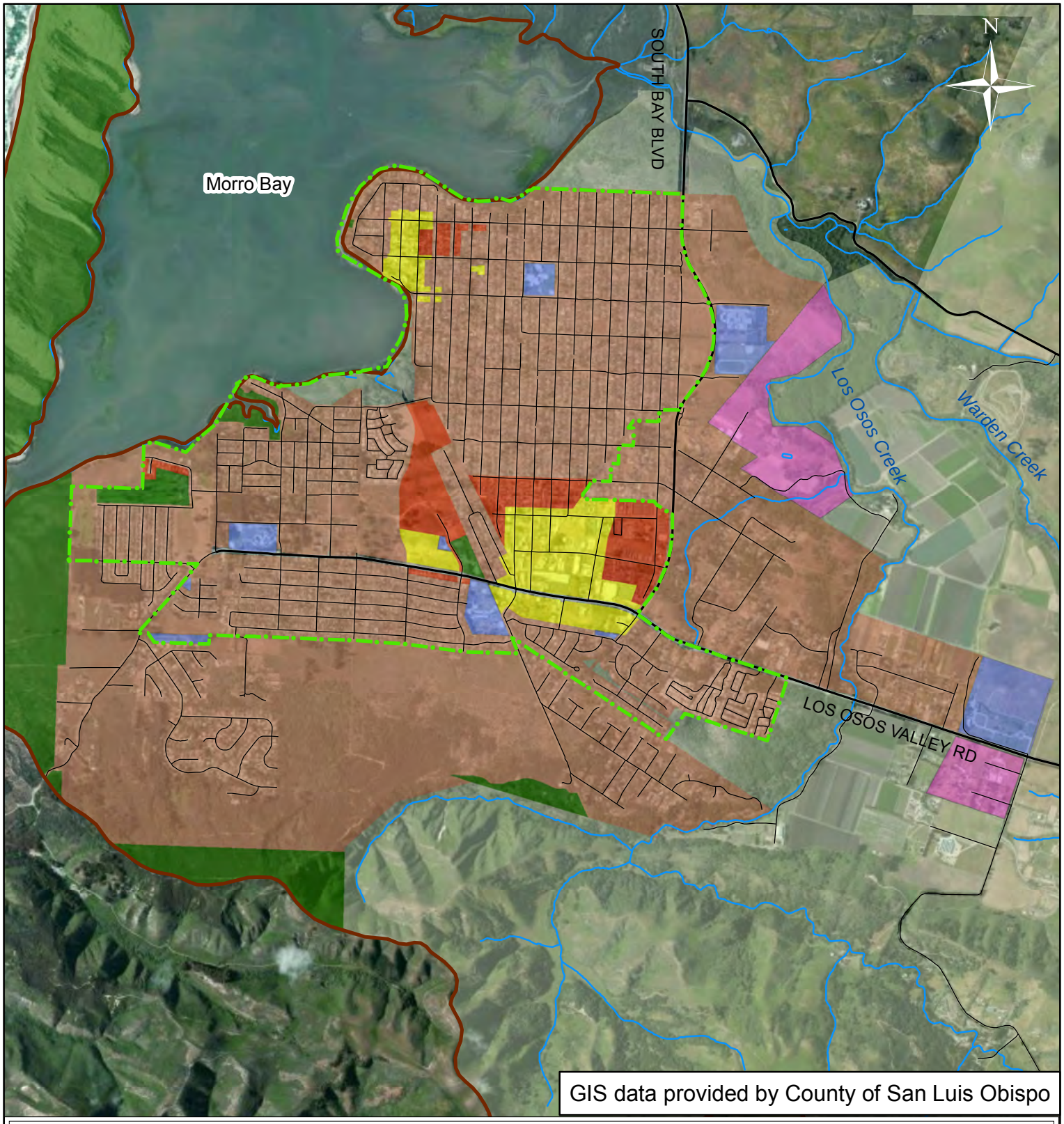
LA0251
June 2012

Figure 3.
Land Use within Morro Bay Watershed



Legend

- Public Facility
- Recreation
- SF Residential
- MF Residential
- Rural Residential
- Commercial
- Undeveloped County
- LOWCS Service Area
- Morro Bay Watershed
- *Streams*
- ROADS

0 0.15 0.3 0.6 0.9 1.2 Miles

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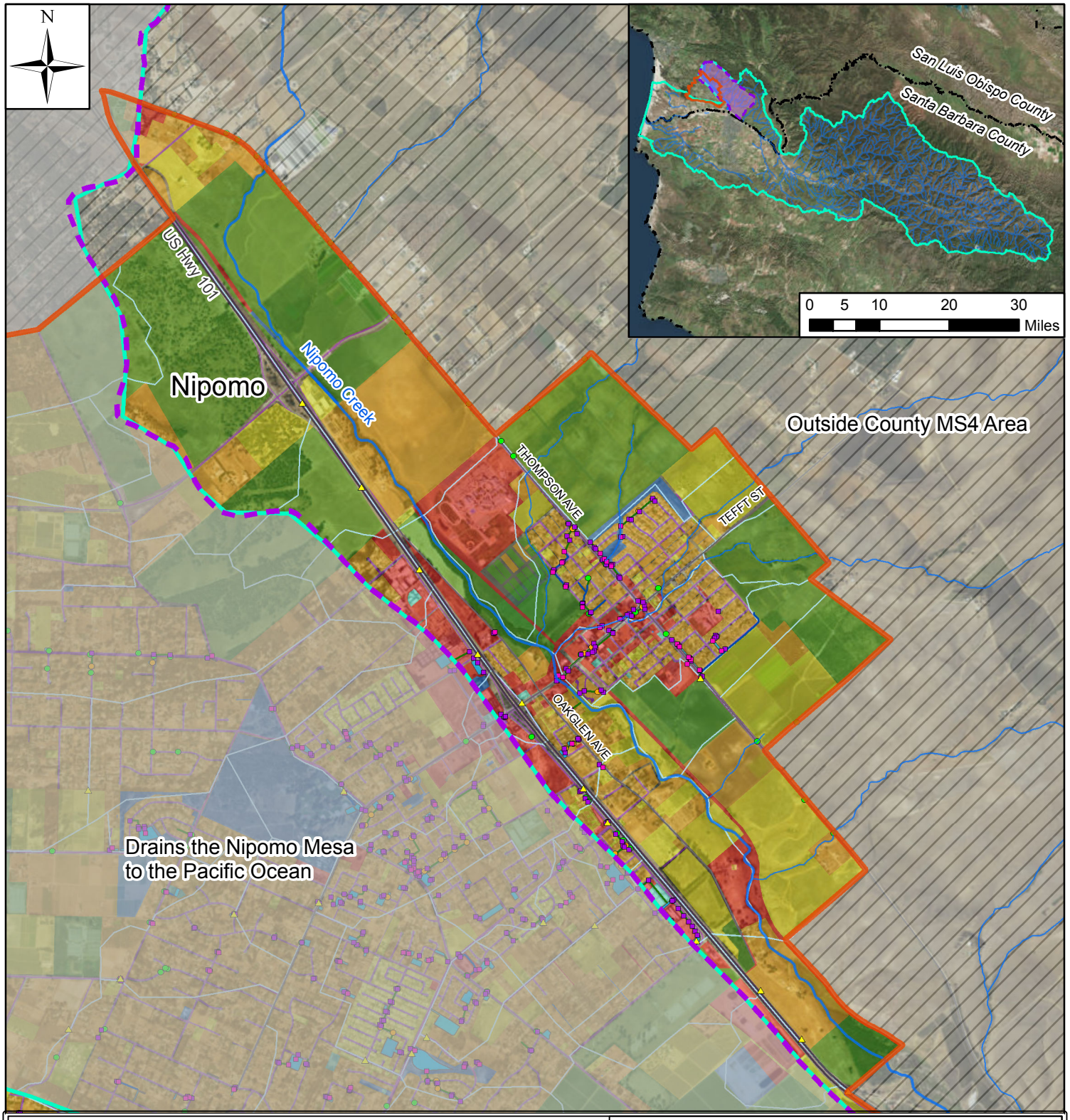
June 2012

Figure 4.
Land Use within Los Osos - Baywood Park



Legend

GIS data provided by County of San Luis Obispo

- County MS4 Area
- Nipomo Creek Subwatershed
- Santa Maria Watershed
- Drains Nipomo Mesa to Ocean
- Outside County MS4 Area
- Outfalls
- Outlet
- Inlet
- Manhole
- Culverts
- Drainage Basin
- Roadside Drainage
- Culvert Pipe
- Catchments
- Counties
- Streams

Land Use

- Single-Family Residential
- Multi-Family Residential
- Transportation/Other
- Commercial
- Cultivated
- Industrial
- Other
- Roads

0 0.2 0.4 0.8 1.2 Miles

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July 2016

Figure 5.
Land Use within Nipomo Creek Subwatershed

3.1 San Luis Obispo Creek Pathogen TMDL

Regional Board staff began collecting total and fecal coliform data throughout the San Luis Obispo Creek watershed beginning in March 2001. Sampling continued until April 2003, resulting in 394 samples collected from 21 sites throughout the Creek main stem and tributaries. The TMDL Project report made no distinction as to whether these samples were collected during dry or wet weather flows. Figure 6 and Figure 7 present two sets of telling results from this monitoring effort.

Overall, results show fecal coliform concentrations to be highest in the downtown area of the City (represented by Sites 10 and 10.3 in Figure 6 and Figure 7), particularly downstream of the 1200 foot long tunnel that runs under the downtown area. Immediately downstream of this tunnel, disinfected effluent from the nearby water reclamation facility (WRF) was found to lower fecal coliform concentrations in the creek. Upstream of the downtown area, the Stenner Creek watershed was determined to contribute only a small load of fecal coliform to the Creek; downstream of the WRF confluence, bacteria levels were consistently below the TMDL numeric target (log mean of 200MPN/100mL fecal coliform for any 30-day period based on a minimum of not less than five samples). Therefore, the downtown tunnel was determined to be the main contributor of fecal coliform to the creek.

According to the TMDL Basin Plan Amendment, the County's focus is to be on areas upstream of sampling site 12.5, which only includes a small portion of the San Luis Obispo Creek watershed urban area (CCRWQCB, 2004b). Consistent with Figure 6 and Figure 7 below, which show mean fecal coliform levels below the TMDL numeric target at sampling site 12.5 and significantly greater bacteria concentrations within the City, the TMDL Staff Report states that the County is not responsible for monitoring "because data indicate low fecal coliform levels, relative to areas draining City and Cal Poly lands" (CCRWQB, 2004c). However, the County still plans to implement measures to address urban bacteria sources within the County's MS4. TMDL WLAs assigned to the County for pathogens in San Luis Obispo Creek are shown in Table 2.

Table 2. San Luis Obispo Creek Pathogen TMDL WLAs

	Fecal Coliform[1] (MPN/100ml)	
	Log Mean[2]	Not more than 10% of samples
WLA[3]	200	400
1. *E. coli* may be used as a surrogate for fecal coliform. 2. Five samples taken over a 30 day period. 3. Final compliance within 10 years of TMDL effective date (7/25/2015). Interim targets are not applicable since the final compliance date has already past.		

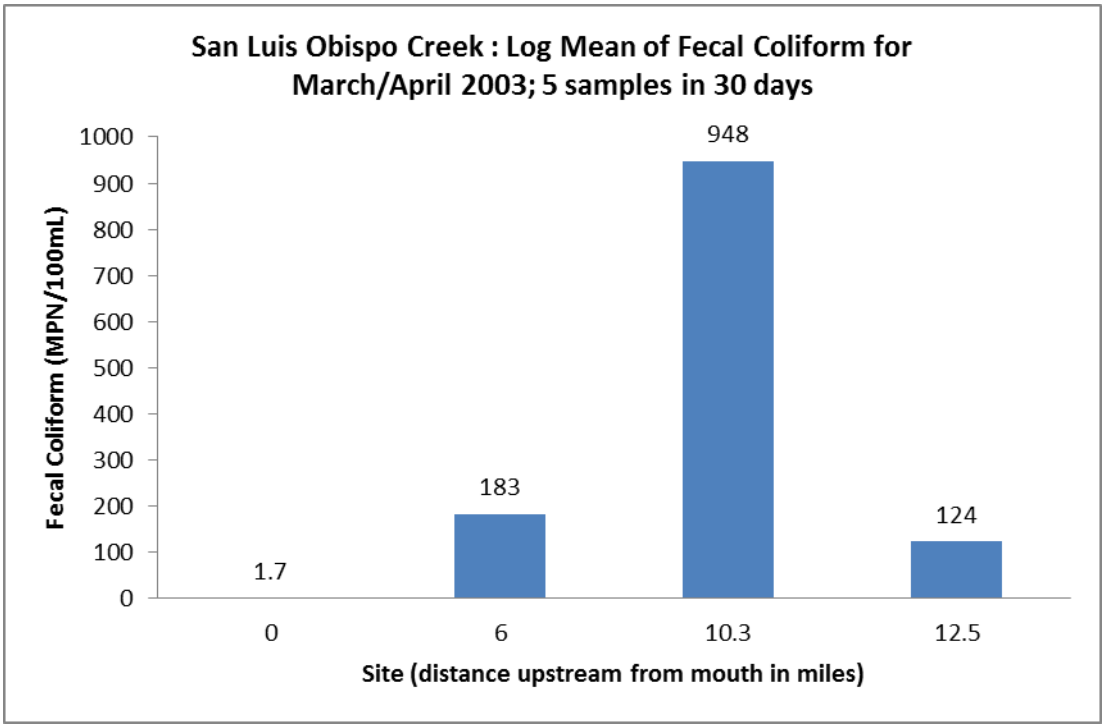


Figure 6. March/April 2003 Sampling Results (CCCRWQCB, 2004c)

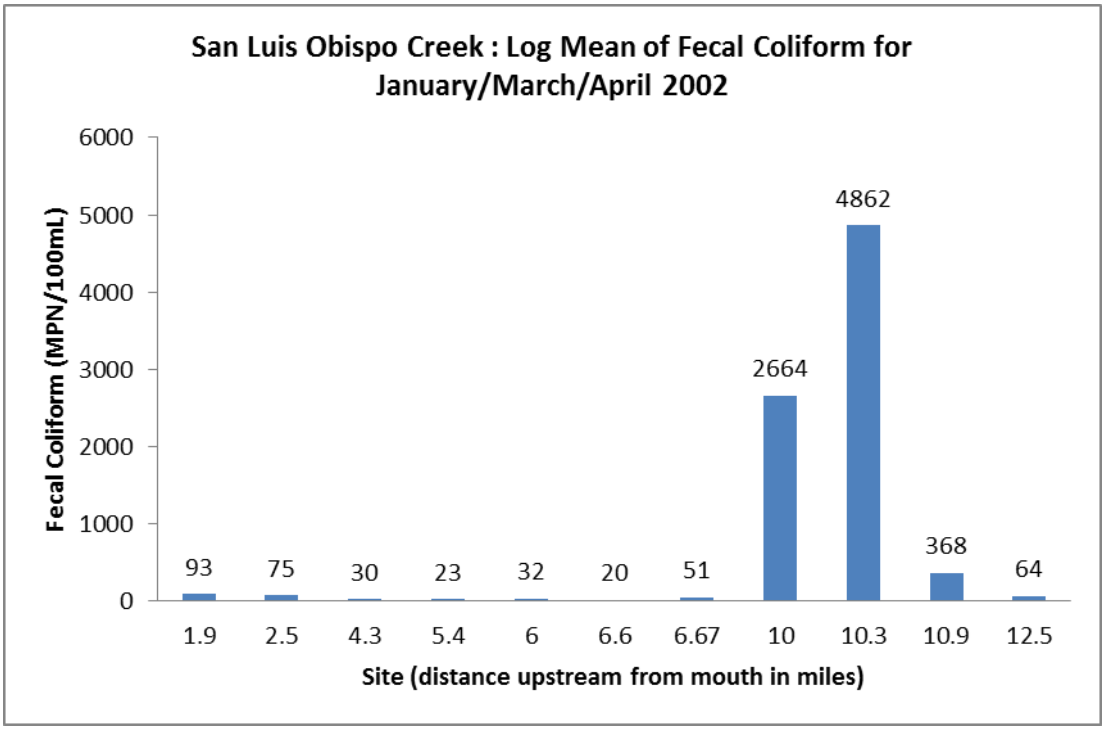


Figure 7. January/March/April 2002 Sampling Results (CCCRWQCB, 2004c)

3.1.1 DNA Fingerprinting

In June of 2002, DNA fingerprinting analysis using a ribotyping method[3] was used to identify sources of fecal coliform within the watershed (CCRWQCB, 2004c). Twenty-seven samples were taken at 3 locations along the main stem of the Creek near the tunnel. Combining these results with water quality data, flow data, and land use information, source contributions were estimated. The estimated relative source contributions are summarized in Table 3.

[3] This is no longer considered a state-of-the-art source tracking method and so results should be viewed as a very rough approximation of source allocation. Newer, more reliable source tracking methods are now available.

Table 3. San Luis Obispo Creek Pathogen Contributing Sources

Source	Relative Fecal Coliform Contribution (%)
Urban (dogs, cats, nonpoint source human)	46
Human (leaking sewer laterals, illicit connections, or other point sources)	27
Tunnel Birds & Bats (TBB)	14
Livestock	7
Background	6

Source: CCRWQCB, 2004c

The three primary sources of fecal coliform loading to the Creek are urban, human, and tunnel bird and bat (TBB) sources, particularly in and upstream of the downtown tunnel. The urban source refers to sources originating in urban areas, including sources conveyed through storm drain conduits. This category includes coliform originating from pets (e.g., dogs and cats), as well as human waste not originating from point sources (referred to as a Combined Sewer Overflow [CSO] source despite CSOs not being utilized in San Luis Obispo). The human source category refers to fecal coliform originating from potentially leaking private sewer lateral lines, illicit connections, or any other human source potentially entering the creek as a point source. The TBB fraction is a source category specific to San Luis Obispo Creek. This category refers to fecal contamination from animals that have populated an area in unusually high density. Specifically, this category refers to the tunnel area, where birds and bats are provided roosting habitat resulting in high population densities. The TMDL Project Report indicates that the major contributing sources within the "Upper and Reservoir" and "Upper City" subwatersheds, both above the downtown tunnel, are background and urban sources. The background source contribution within the watershed is assumed to be from forested lands and was estimated to be 81 MPN/100 mL on average (CCRWQCB, 2004c), a value that is often higher than fecal coliform sample results at sample site 12.5 (County's TMDL focus area). The background fraction was developed based on samples from relatively undisturbed reference sites in the watershed, although the TMDL Project Report made no distinction as to whether this background value was determined based on dry or wet weather flows. Although these results acknowledge the significance of natural sources of indicator bacteria consistent with findings from other recent reference watershed studies (Southern California Coastal Water Research Project, 2008), the TMDL WLAs do not account for natural sources in the form of allowed exceedance days (or concentrations/loads above the REC-1 water quality objective) that are based on background contributions.

Consistent with findings from the TMDL, the County will prioritize control measures that address anthropogenic urban sources (e.g., human, pet wastes) within the County MS4 areas upstream of the City in the San Luis Obispo Creek watershed. The County will also seek to implement nonstructural BMPs throughout the entirety of the San Luis Obispo Creek watershed in an effort to limit MS4 bacteria contributions from their jurisdiction.

3.1.2 In Field Investigation

A field investigation by Geosyntec staff was conducted on July 30, 2012 in an attempt to better understand potential County sources of bacteria within the watershed. Areas of interest within the County's jurisdiction were visited and observations were made regarding potential bacteria sources, pathways to watercourses, and potentially applicable BMPs. Areas of interest included Cuesta Park, Avila Beach, See Canyon Creek and the Bob Jones Bike Trail, commercial areas adjacent to the airport, and residential areas along Davenport Creek. Field logs and photographs from the field visit can be found in Appendix B. Throughout the urban areas observed it was noted that the County of San Luis Obispo has minimal MS4 infrastructure. Thus, the following items are divided into observations pertaining to MS4 and non-MS4 sources of bacteria.

Non-MS4 sources:

- Downstream of Cuesta Park, dogs were observed swimming in San Luis Obispo Creek. While two dispensers of dog waste collection bags were observed throughout Cuesta Park, the ability for dogs to access the creek without restriction is a potential issue to address. Dog waste was not observed on the ground at Cuesta Park; however, dog waste remains a potential fecal source of bacteria to this reach of the creek within the County unincorporated area.
- Adjacent to and immediately downstream of Cuesta Park, the San Luis Obispo Creek acts as a recreational area to visitors of the park. During the field investigation, two children were observed playing in the creek, with water almost to their waist. Bather shedding is a potential source of human fecal bacteria within the Creek since it is a recreational water body.
- In general, trash receptacles appear to be well kept within the County urban areas of the watershed. In Cuesta Park, there are several picnic areas with BBQ pits and trash cans located along San Luis Obispo

Creek. The main group picnic site contained two wash areas with faucets adjacent to the creek. During the field investigation, all picnic areas were clean and well kept, with clean trash bags in all the trash cans. Two large dumpsters were observed in the park parking lot. These dumpsters were clean and no signs of trash were seen on the ground in the surrounding area. Two dumpsters were also located in the commercial area surrounding the airport and although the lids were not closed, they were clean and the trash was contained. There were no stains observed around all trash areas, indicating that leakage is not occurring. Runoff from trash areas may be a potential urban source of bacteria within the County area; however, no storm drain outfalls were present in these areas.

- Signs of homeless encampments were observed under a bridge downstream of the City. These areas are potential sources of bacteria and debris within the County area and may be further investigated if problems develop to determine the extent of any contamination present.

- Along the Bob Jones Bike Trail near the Avila Bay Club, dry weather flow was observed and assumed to be irrigation runoff from the adjacent field.

- Many dogs were observed near or in the creek near the Bob Jones Bike Trail. Only one dispenser of dog waste collection bags was located throughout the Bike Trail and this dispenser was empty. Dog waste was not observed on the ground areas along the trail.

- In the areas surrounding a tributary creek in See Canyon, horses were observed grazing on private ranches. The horses were not observed in the creek; however, no apparent restriction was observed, which would limit their access to the waterway. Waste from the horses can reach the waterway via surface overland transport or direct access from the animals.

Potential MS4 sources:

- In Avila Beach, a significant amount of dry weather flow was observed. While the source of these flows was untraceable, curb-cut outlets in mixed commercial/residential areas were observed discharging to the street. Additionally, dry weather flows were observed along streets in the commercial area surrounding the airport. These flows are potential dry

weather bacteria sources to the County MS4; even if such flows may be sterile potable water, they may mobilize bacteria in street gutters, catchbasins, or storm drains prior to discharging via the MS4 outfall (SCCWRP, 2012).

- A full grease trap structure was observed behind a restaurant in a commercial area in Avila Beach. The structure was full of water (potentially wastewater and/or stormwater, which can flow into the structure through the top grate) and could potentially overflow onto the surrounding impervious area and drain towards a nearby storm drain inlet. This is a potential bacteria source to the County MS4. The observed trash storage areas within the commercial areas of Avila Beach were clean.

3.1.3 Source Assessment Conclusions

Both the TMDL and subsequent water quality monitoring (from the City of San Luis Obispo) suggest low bacteria levels at monitoring location 12.5, located near the City/County boundary. The in-field observations described above, particularly those upstream of monitoring location 12.5, identify potential bacteria sources in unincorporated County areas; however, most of these are not occurring within or conveyed by MS4 pipes, channels, or other drainage infrastructure. In general, given the very low density of development and active land uses, bacteria concentrations in dry and wet weather stream samples from County unincorporated areas, represented by monitoring location 12.5, are comparable to open space background levels (SCCWRP, 2008).

3.2 Morro Bay Pathogen TMDL

Ten years of fecal coliform data were collected through the National Monitoring Program (1993-2001) and the California Polytechnic State University of San Luis Obispo (Cal Poly, 2002). Results indicate portions of Chorro Creek and Los Osos Creek, which both drain to Morro Bay, have fecal coliform concentrations above the single sample body contact recreation (REC-1) objective of 400 MPN/100 ml at least half the time, with higher concentrations observed during wet-weather. Partly as a consequence, Morro Bay fecal coliform values were found to regularly exceed the monthly geometric mean shellfish harvesting (SHELL) objective of 14 MPN/100 ml. Recent analyses by Southern California Coastal Water Research Project (SCCWRP) researchers (SCCWRP, 2009) have shown that frequent SHELL objective exceedances are not uncommon for coastal waters throughout California, even at reference

beach sites at the outlet of undisturbed watersheds, given the very low SHELL objective value relative to natural coastal bacteria levels.

Besides Chorro and Los Osos Creeks, another constant input to the Bay is surfacing groundwater sites (seeps) on the Bay shoreline of the community of Los Osos. Sampling from these seeps indicates high concentrations of fecal coliform almost always above REC-1 objectives during periods of both wet- and dry- weather (Cal Poly, 2002).

The major sources of bacteria in the Morro Bay watershed were suspected to be (1) background, which includes bird, wild animals and sea mammals; (2) non-point sources, which include humans, septic systems, agricultural runoff, cattle and other farm animals, and domestic pets; and (3) point sources, which include MS4s and sanitary sewer overflows (from the City of Morro Bay or the California Men's Colony wastewater treatment plants). Although the TMDL source assessment does acknowledge the significance of natural sources of indicator bacteria consistent with findings from other recent reference watershed studies (SCCWRP, 2008), the TMDL WLAs do not account for natural sources in the form of allowed exceedance days (or concentrations/loads above the REC-1 water quality objective) that are based on background contributions.

Additional data from Cal Poly's DNA Fingerprinting study and the 2002-2011 Data Summary from the Morro Bay National Estuary Program (MBNEP), along with in-field observations performed during a 2012 field visit, all provide further insight into possible controllable sources within the County's jurisdiction. TMDL WLAs assigned to the County for pathogens in Morro Bay are shown in Table 4.

Table 4. Morro Bay Pathogen TMDL WLAs

	Fecal Coliform[1] (MPN/100ml)	
WLA[2]	Geometric Mean[3]	Not more than 10% of samples
Los Osos and Chorro Creeks and tributaries	200	400
Morro Bay	14	43

1. *E. coli* may be used as a surrogate for fecal coliform.
2. Final compliance within 10 years of TMDL effective date (11/19/2013). Interim targets are not applicable since the final compliance date has already past.
3. Based on not less than five samples over a period of 30 days.

3.2.1 DNA Fingerprinting

DNA fingerprinting of *E. coli* (a subset of fecal coliform) was conducted by Cal Poly and University of Washington researchers from 1999 through 2001 (California Polytechnic State University, et al., 2002) using a ribotyping method[4]. When results were summed over the entire study the largest fractions of *E. coli* in the Morro Bay watershed (including marine waters, Bayshore seeps, and tributary creeks) came from four sources: bird (22%), human (17%), bovine (14%) and dog (9%). Of the 333 *E. coli* samples taken from Los Osos Creek, birds were found to be the largest source of *E. coli* in the creek. In Chorro Creek, a total of 301 *E. coli* samples were taken, showing bovine sources to be the largest contributor of bacteria to the creek. Although more accurate source identification techniques have been developed since the time of this study, results provide the best quantitative source assessment known to be available as of May 2012. A summary of the source assessment results for Los Osos Creek and Chorro Creek is presented in Table 5.

Table 5. Los Osos and Chorro Creek Pathogen Contributing Sources

Waterbody	Relative *E. coli* Contributions (%)		
	Human or Domestic Animals	Birds, Livestock, or Wild Animals	Unrecognizable
Los Osos Creek	36	42	22
Chorro Creek	24	58	18

Source: Cal Poly San Luis Obispo, 2002

In addition to the DNA source tracking aspect of the study, samples were collected from various locations throughout Chorro and Los Osos Creeks and analyzed for total and fecal coliform. In total, three wet days and two dry days were sampled in 2000 and 2001. Results were reviewed to assess meaningful trends for MS4 bacteria load reduction planning purposes. Data were split by weather (wet or dry[5]) and plotted by site (see Appendix A). Nearest sampling locations downstream of County MS4 outfalls include the SYB site on Los Osos Creek (downstream of eastern Los Osos community) and the CAN site on

[4] This is no longer considered a state-of-the-art source tracking method and so results should be viewed as a very rough approximation of source allocation. Newer, more reliable source tracking methods are now available.

[5] Wet days were defined by rain events with at least 0.4 inches of rainfall within a 24 hour period. Each wet sampling event consisted of two sampling days: the first and third day of the shellfish harvesting area closure, based on rainfall. Dry-weather sampling was conducted during June and August.

Chorro Creek (downstream of County golf course, Chorro Regional Park, and the County Service Yard at Kansas Avenue). Other important upstream contributors to these locations include cattle rangeland[6], the California Men's Colony Waste Water Treatment Plant, and Cuesta College.

During wet-weather, the highest concentrations of fecal coliform were observed along Dairy Creek (DAM site) above County MS4 areas, and every site except PEN and CVC (upper Chorro Creek downstream of County contributions on Chorro Creek) exceeded the 400 MPN/100 ml fecal coliform single sample limit in at least 25% of the samples. Comparing the two creeks, lower Los Osos Creek had higher fecal coliform concentrations than lower Chorro Creek. Median concentrations at all sites range from 300-1,700 MPN/100 ml, excluding DAM. In the Los Osos Creek subwatershed, highest concentrations were observed at Warden Creek, outside of the County's MS4 area. Based on this collective dataset, it is not possible to determine whether or where MS4 outfall discharges were a significant contributor to the observed exceedances in downstream creek samples during wet-weather.

During dry-weather, the highest concentrations of fecal coliform were observed on lower Dairy Creek and Pennington Creek in the Chorro Creek subwatershed, and along Warden Creek in the Los Osos Creek subwatershed. Frequent exceedances of the 400 MPN/100 ml fecal coliform single sample limit only occurred at these three sites. Comparing the two creeks at their lowermost monitoring locations, fecal coliform concentrations were similar. Median concentrations at all sites range from 10-800 MPN/100 ml, well below wet-weather ranges. Sites downstream of County MS4 outfalls, SYB, CVC, and CAN, exceed the 400 MPN/100 ml limit up to 33% of the time. Based on this collective dataset, it is not possible to determine whether or where MS4 outfall discharges (which likely were minimal or non-existent during dry-weather) were significant contributors to the observed exceedances in downstream creek samples during dry-weather.

3.2.2 MBNEP Data Summary

Additional in-stream water quality data from many of the same locations sampled in the DNA study has been summarized in MBNEP's 2011 and 2014 Data Summary Reports (MBNEP, 2011 and 2014). Among other constituents,

[6] Sampling results reflect conditions prior to more recent exclusion fencing projects (to prevent cattle access to creek beds) along northern tributaries to Chorro Creek.

fecal indicator bacteria were sampled on a monthly basis from June 2002 through May 2011 and are summarized in the 2011 report. Results for samples taken from January 2008 to June 2014 are summarized in the 2014 report. These datasets are more recent, more robust (i.e., greater number of samples), and more informative from a USEPA REC criteria perspective (given the inclusion of *E. coli* and Enterococcus results) than the Cal Poly dataset that was discussed above. However, MBNEP does not distinguish between dry and wet-weather results, therefore weather related conclusions cannot be made.

A brief summary of the monitoring results from these reports for both the creek and Bay sites follows. Consistent with USEPA REC criteria, *E. coli* is discussed for the freshwater sampling sites and Enterococcus is discussed for the marine sites.

Creek sites – *E. coli* rolling geometric mean values and single sample exceedance frequencies[7] were generally comparable between (a) nearest sites downstream of County MS4 areas (UCR in upper Chorro Creek below the California Men's Colony, and SYB in lower Los Osos Creek near the Los Osos community) and (b) the remaining watershed monitoring sites, in the 2011 report. In the 2014 report, UCR exceedance frequencies were lower, but were above other sites monitored in Chorro Creek. No bacterial data is reported for site SYB in the 2014 report. The average single sample exceedance frequencies (based on the 235 MPN/100 ml USEPA REC1 freshwater criteria[8]) from 2003-2011 were 28% and 20%[9] for UCR and SYB sites, respectively, compared with average Southern California undeveloped reference stream exceedance rates of 2% and 19% during dry and wet-weather, respectively (Los Angeles Regional Water Quality Control Board, 2010). Single sample exceedance frequencies from 2008-2014 were 15% for UCR. This represents a decrease in exceedance frequency compared to the 2011 report, which is expected based on the change of single sample exceedance criteria to 410 MPN/100mL[10]. MBNEP creek samples were collected monthly regardless of

[7] Sample days which had no flow at respective sample locations were not included in these calculations. The exceedance percentage is therefore a percentage of grab samples that exceeded the criterion, not the percent of time that the criterion was exceeded.
[8] Because USEPA REC criteria are based on *E. coli* and enterococcus, MBNEP's 2011 Data Summary uses the *E. coli* freshwater single sample criteria of 235 MPN/100 ml set forth in EPA's 1986 guidance document *Ambient Water Quality Criteria for Bacteria*.
[9] Years with 5 or fewer samples were excluded from the averaging calculation.
[10] The single sample exceedance criteria for E. coli was changed to 410 MPN/100mL in the USEPA's 2012 recreation water quality criteria.

weather. These UCR and SYB datasets are therefore believed to be inclusive of both dry and wet-weather samples. These UCR and SYB exceedance rates are both above the USEPA allowed 10% exceedance rate (or Statistical Threshold Value, STV) based on 2012 REC criteria. Rolling geometric mean values[11] (not reported in 2014) at these sites were generally in the 100-200 MPN/100 ml range, compared with the USEPA *E. coli* geometric mean REC1 criteria of 126 MPN/100 ml. Cattle ranching is discussed in the 2011 report with respect to potentially causing or contributing to bacteria impacts throughout the watershed. The water quality impacts of the 2007 improvements to the California Men's Colony Wastewater Treatment Plant - to increase nitrate removal and reduce occurrence of Sanitary Sewer Overflows - were also evaluated in the report. While county MS4 bacteria contributions were not discussed, the 2014 report does describe stormwater runoff as a source of pollution and the positive benefits of the stormwater management efforts described in this WAAP are briefly described. Based on this data review, the County will add representative MS4 outfall and creek sampling locations along lower Los Osos Creek and upper Chorro Creek (see monitoring section of this WAAP for further detail), and will target BMPs to address the potential MS4 bacteria sources that were observed in these drainage areas.

Bay sites – Enterococcus rolling geometric mean values and single sample exceedance frequencies in both the 2011 and 2014 reports were highest at the two north Los Osos sites along Morro Bay, or Pasadena Point (PAS) and Baywood Pier (BAY) sites, which are both in the LOWCS service area. Therefore, the septic tank to sewer system conversions are expected to improve bacteria levels at these Bay sites. A total of eight sites were sampled by MBNEP along Morro Bay, four near the City of Morro Bay and four near the community of Los Osos-Baywood Park. The number of samples per site ranged from 47 to 92, with data spanning 2005 to 2014 in the two reports. It is not clear whether any of these samples reflect wet-weather. Average single sample exceedance rates (of 104 and 130 MPN/100ml in the 2011 and 2014 reports, respectively) were 17% and 24% at PAS and BAY sites in the 2011 report, respectively and 14% and 21% in the 2014 report. These exceedance rates are above the USEPA 2012 REC criteria allowed exceedance rate (10%), but are comparable with average Southern California enclosed reference beach exceedance rates of 5%, 13%, and 30% during summer-dry, winter-dry and wet-weather, respectively (Los Angeles Regional Water Quality Control Board,

[11] Averaging period and non-detect substitution assumptions not stated in the MBNEP report.

2010). Rolling geometric mean values for PAS and BAY sites are both generally in the 10-100 MPN/100ml range in the 2011 report, in comparison with the USEPA Enterococcus geometric mean REC1 criteria of 35 MPN/100ml. In the 2014 report, only site BAY was above the 35 MPN/100ml geometric mean criteria at 39 MPN/100mL. The MBNEP reports do not specifically mention impacts associated with County MS4 discharges to the Bay. However, first-flush monitoring conducted by MBNEP on an annual basis between 2005 and 2007 showed elevated levels of *E. coli* at all MS4 sampling locations throughout the Bay. Though sampling was limited, *E. coli* results from these storm events were highest near Baywood Pier (MBNEP, 2007), in a large County culvert (site BPR). Based on this data review, the County will add a representative MS4 outfall sampling location along this area of the Bay shoreline (see monitoring section of this WAAP for further detail), and will target their BMPs to mitigate potential MS4 bacteria sources in this high priority drainage area.

Although the MBNEP Data Summary Report cannot be used to directly assess MS4 TMDL compliance within the Morro Bay watershed creeks, the exceedance percentages throughout the watershed suggest that the TMDL wasteload allocations are not being met in the majority of creeks and Bay monitoring sites. The consistently high bacteria concentrations in areas that are not urbanized (i.e. agriculture, grazing, and open space land uses) suggests that these "undeveloped" areas are the greatest contributors to bacteria loading in the watershed.

3.2.3 In Field Investigation

In addition to these monitoring data analyses, a field investigation by Geosyntec and County staff was conducted on March 29, 2012 in an attempt to better understand potential County sources of bacteria within the watershed. Developed areas within the County's jurisdiction were visited and observations were made regarding potential bacteria sources, pathways to watercourses, and potentially applicable BMPs. Areas of interest included the public facility yard located at Kansas Avenue, the County-jurisdictional areas within the Dairy Creek and Pennington Creek subwatersheds, and the community of Los Osos-Baywood Park. Field logs and photographs from the field visit can be found in Appendix B. General findings from the field investigation are divided into potential MS4 and non-MS4 sources.

Non-MS4 sources:

- Chorro Regional Park, located at the downstream end of Dairy Creek, contains numerous public access areas and a dog park. The dog park, located between MBNEP sample locations DAM and DAL, may be a contributor of bacteria loads to the creek. During the field investigation, dogs were seen bathing in a wash area immediately adjacent to the creek, with overflow leading directly to the creek. Excrement was also noticed in the park. Runoff from the adjacent golf course may also contribute bacteria to the creek, depending on fertilizer applications. A campground is located on the west side of Dairy Creek. This campground is equipped with full hook-ups, with waste being pumped to the California Men's Colony for treatment. The campground does not appear to be a significant contributor to bacteria loads in the creek.
- Three large ponds are present on the southern end of Dairy Creek Golf Course. These ponds receive runoff from the golf course. The southernmost pond also receives tertiary-treated effluent from the California Men's Colony treatment facility. This pond has a spillway on its southern side and discharges to a channel immediately north of Highway 1. Water was observed percolating from the southern berm of the pond. Pond discharge eventually flows to Chorro Creek.
- Seeps were observed along the sandy beach shoreline west of 3rd Street, near MBNEP's BAY sampling site and the outfall locations discussed above. These observations were consistent with observations from the DNA study, which found high bacteria concentrations present in seep samples.
- Horse excrement was observed in noticeable quantities at the horse stables located along Solano Street, in the road along both Solano St. and Butte Dr., and along the hiking trail that runs along the southwest boundary of the bay. Multiple equestrian riders were seen along this trail, with no signs of waste pickup present.
- No homeless encampments or individuals were observed along the urban creek corridors.

Potential MS4 sources:

- The San Luis Obispo Animal Services facility and the County Sheriff's Honor Farm, located on Oklahoma Avenue on the eastern side of the Kansas Avenue Public Services Yard, may be contributing bacteria loads to Chorro Creek. A dog wash area on the southern side of the animal

services facility appeared to discharge washout from dog cages directly to a storm drain pipe. Additionally, fertilizers may be used at the community service garden located directly upstream of Chorro Creek. These are controllable sources within the County's jurisdiction. No dog waste was observed at the animal services facility. Volunteer dog walkers were well trained in the importance of picking up litter, and no excrement was observed on any of the outdoor facilities for the dogs.

- Minor storm drain facilities are present throughout the Los Osos-Baywood Park community, with catchbasins and some small detention basins located at various points throughout the community. Trace dry-weather runoff was observed at a few locations, although no measurable flows were observed entering any storm drain catchbasins. This implies that over-irrigation is not a significant source of dry-weather flows within the community. Many catchbasins had sediment, decaying organic matter, and/or biofilm buildup present.
- Two pipes were observed discharging water to the Bay near 3rd Street and El Morro Avenue, though the upstream source could not be identified in either case (see Photos 437 and 444 in Appendix B). These discharge locations are adjacent to MBNEP's BAY sampling site. One pipe (Photo 437) was steadily flowing at a rate of approximately 0.5-1 gpm; the second pipe (Photo 444) was producing a steady trickle. Both pipes were observed at approximately 12:30 p.m. The presence of pipe flow without the presence of surface water runoff suggests that groundwater inflow/infiltration or illicit connections may be present within this network of the Los Osos MS4. These outfall locations are within the planned service area for the new Los Osos Wastewater Collection System. As residents cease the use of septics, groundwater levels may drop, causing infiltration into the MS4 system to cease.
- The major commercial area of Los Osos, along Los Osos Valley Road between 9th Street and S. Bay Blvd, was observed to be in very good condition. In fact, of the 7 trash storage areas observed, only one had trash outside of the dumpster. This location also contained food waste and uncovered grease barrels.

3.2.4 Source Assessment Conclusions

Primary contributing sources – including agriculture and rangeland runoff, sanitary sewer overflows from local wastewater treatment plants, and natural sources such as birds, wildlife and marine mammals – are not under the County's jurisdiction. The observations described above identify potential

bacteria sources in unincorporated County areas; however, most of these are not occurring within or conveyed by MS4 infrastructure.

The primary contributing sources of human waste derived fecal coliform within the County's jurisdiction appear to be failing/leaking septics and groundwater seeps in the community of Los Osos-Baywood Park. Though wet-weather data are limited, results from MBNEP's outfall monitoring program (MBNEP, 2007) suggest that MS4 discharges from urbanized areas with land uses similar to the Los Osos-Baywood Park community likely contribute bacteria at concentrations above the TMDL numeric targets, although many other significant sources of bacteria are present in the watershed (e.g., groundwater seeps and cattle ranching), which makes it difficult to determine the significance of MS4 discharges based on MBNEP creek and Bay monitoring results. In the Chorro Creek watershed, specific County MS4 sources may include the Kansas Avenue Service Yard, El Chorro Regional Park, and the Dairy Creek Golf Course. Implementation of the Los Osos Wastewater Collection System (LOWCS) is expected to significantly reduce bacteria loading from groundwater to the Bay. The LOWCS has been designed to consist of a collection system, treatment facility, recycled water reuse program, and conservation program. The new system will serve approximately 12,500 citizens out of the total population of 14,300 in the area, thus significantly reducing the number of actively used septic systems that remain in the Los Osos-Baywood Park community. The service area for the new system is shown on Figure 4. The project draft EIR was released in November 2008, and the final EIR was adopted by the County Board of Supervisors on September 29, 2009. Construction of the system began in July 2012, and is planned to be finished in 2016. Once the project is complete, all landowners within the service area will have 180 days to establish a connection to the new system.

Consistent with findings from the TMDL, along with addressing septics in the community of Los Osos-Baywood Park through the implementation of the new LOWCS, the County will prioritize BMPs that address pet waste, runoff, and illicit discharges within the County's MS4 areas in these watersheds.

3.3 Morro Bay Sediment TMDL

Source analysis was conducted to characterize types, magnitudes, and locations of sources of sediment loading to Morro Bay and to Chorro and Los

Osos Creeks according to land use categories, erosion categories, and subwatersheds. Rough RUSLE[12]-based sediment yield estimates were made by Tetra Tech (1998) and the Soil Conservation Service (SCS, 1989).

The Tetra Tech estimate found that contributing land uses include rangeland, brush land, woodland, cropland, and urban, due to grazing, row crop and land development activities (e.g., roads, construction). Erosion categories included sheet and rill, stream banks, roads, and gullies. Sheet and rill contributed the most sediment by erosion category. The Chorro and Los Osos Creeks subwatersheds were estimated to deliver an average of approximately 70,000 tons per year of sediment to the estuary. The Chorro Creek watershed was estimated to contribute 86 percent of the total sediment produced in the Morro Bay watershed. These subwatersheds contain the vast majority of the upland areas of the Morro Bay watershed. Areas of steepest slope and highest rainfall intensity within these watersheds were noted to be the most significant sources of sediment loading to Morro Bay.

The TMDL staff report describes the vast majority of sediment loading in the watersheds to derive from non-point sources. County MS4 sources, such as roads, contribute sediment to a lesser degree. The County will therefore prioritize road maintenance and construction BMPs for addressing these sources. TMDL WLAs assigned to the County for sediment in Morro Bay are shown in Table 6.

Table 6. Morro Bay Sediment TMDL WLAs

	Sediment (tons/year)	% Reduction[1]
WLA[2]	5,137	50
1. Compared to 2003 levels. 2. Final compliance within 50 years of the effective date (12/3/2053). Interim targets (as proposed in Section 7.4) are 50% progress within 25 years of TMDL approval.		

3.4 Santa Maria River Bacteria TMDL

For this TMDL, the County is only responsible for bacteria from urban stormwater in Nipomo Creek. The bacteria TMDL concentration-based WLAs

[12] RUSLE is the Revised Universal Soil Loss Equation, an equation used to estimate the soil loss from a given area of land.

assigned to the County for Nipomo Creek are summarized in Table 7. The fecal coliform bacteria WLAs are based on the objectives for the beneficial use of water contact recreation found in the Water Quality Control Plan for the Central Coast Basin (Basin Plan), while *E. coli* WLAs are based on the USEPA recommended criteria.

Table 7. Nipomo Creek Bacteria TMDL WLAs

	Fecal coliform (MPN/100mL)		E. coli (MPN/100mL)	
	Log mean[1]	Not more than 10% of samples[1]	Geometric mean[1]	Single sample
WLA[2]	200	400	126	409

1. Calculated from not less than five samples equally spaced over a 30-day period.
2. Final compliance within 15 years of TMDL approval (2/21/2028). Interim targets (as stated in the TMDL) are 20% progress within 5 years of approval (2/21/2018) and 50% within 10 years (2/21/2023). Alternative interim targets are proposed within this WAAP (Section 7.4)

3.4.1 TMDL Identified Sources

The TMDL identified the following sources of fecal coliform bacteria to runoff in the Nipomo Creek watershed, with each source's estimated relative percentage contribution in parentheses: urban stormwater (16%), domestic animal runoff (29%), background runoff (2%), in-stream domestic animals (38%), and in-stream wildlife (15%) (CCRWQCB, 2012). Wastewater treatment plant (WWTP) collection systems and on-site disposal systems (OSDS) were identified as sources in other areas of the Santa Maria River watershed, but were not identified as (or observed to be, based on field inspections) contributors in the Nipomo Creek watershed.

3.4.2 Other Common Sources Based on Literature Review

Discharges from MS4s typically carry bacteria concentrations in excess of recreational water quality objectives. Anthropogenic sources of bacteria in municipal stormwater can include pet waste, leachate from dumpsters, illegal connections, untreated sewage from spills, septic discharges from recreational vehicles, and reclaimed water. Other sources of bacteria may include wildlife, biofilms/regrowth in MS4 infrastructure, and natural sources. A nationwide study of runoff from urban surfaces showed that bacteria concentrations varied by land use, but even open space land uses were above recreation standards (Pitt et al., 2004). Another Southern California study found that low-density residential areas were the most significant land use based source of urban wet weather bacteria loads in a particular urban watershed (Weston, 2009).

Recent studies have investigated the bacterial contributions of pet waste, irrigation runoff, and leaking dumpsters and grease traps. A survey of Chesapeake Bay residents indicated that about 60 percent of dog owners pick up after their pets; and a survey in Washington indicated that about 70 percent of dog owners pick up pet waste (Schueler, 2000). Pooling of dry weather flows from irrigation runoff was found to foster in-situ bacterial growth in gutters, catchbasins, storm drains, and receiving waters (Geosyntec, 2010). A source tracking study performed in San Diego found that approximately 20% of all dumpsters or grease traps had evidence of liquid leaks. These leaking containers are of especially high importance due to high bacteria concentrations in the liquid (geometric mean fecal coliform concentrations of 2,860 MPN/100mL) (Weston, 2009). In phase 2 of the study it was found that cleaning of catchbasins didn't significantly affect the dry weather runoff bacteria concentrations downstream; however the data are limited. A survey conducted as part of this San Diego source study also found that 46% of commercial catchbasins had moderate buildup and 34% had ponded water and that commercial catchbasin sediments had higher bacteria concentrations than residential catchbasin sediments. Signs of wash down and food scraps were associated with catchbasins near restaurants (Weston, 2009), which may contribute to elevated bacteria concentrations. In some less urban areas, livestock, such as horses and cattle may also be sources, particularly when animals are free to enter creeks and streams or if pens are nearby and drain to receiving waters.

3.4.3 In Field Investigation

A field investigation by Geosyntec and County staff was conducted on August 26th, 2015 to better understand potential County MS4 sources of bacteria to Nipomo Creek. Several potential sources of bacteria were identified along tributaries and storm drains in the urban areas along the upper Nipomo Creek watershed. MS4 sources included human feces in a culvert, pet waste near curbs and gutters that had not been properly disposed of, signs of agriculture runoff flowing into storm drains, and accumulation of street sediment. Equestrian areas near the creek were observed, although these would not contribute to County MS4s. Irrigation overspray was also observed, which may be mobilizing bacteria into the MS4. Appendix B provides a summary of the field investigation observations and photos.

3.4.4 Source Assessment Conclusions

Controllable sources of bacteria from urban runoff that are targeted by the County in this WAAP include: human waste and domestic animals (waste from pets such as dogs, as well as equestrian waste), as well as flows from over-irrigation which may be mobilizing bacteria. This WAAP will enhance and focus existing BMPs from the County's stormwater Guidance Document to better target sources of this TMDL pollutant in the Nipomo Creek watershed.

3.5 Santa Maria River Nutrient TMDL

The nutrient TMDL concentration-based WLAs assigned to the County for Nipomo Creek are summarized in Table 8. The WLA for nitrate is based on the Basin Plan's numeric water quality objective for protection of drinking water (MUN) and groundwater recharge (GWR) beneficial uses. The WLA for unionized ammonia is based on the Basin Plan's numeric water quality objective to protect against toxicity in surface waters.

Table 8. Nipomo Creek Nutrient TMDL WLAs

	Nitrate as N (mg/L)	Unionized Ammonia as N (mg/L)
WLA[1]	10	0.025
1. Final compliance within 30 years of TMDL approval (5/22/2044). Interim targets are to achieve the WLA within 12 years of the effective date (5/22/2026).		

3.5.1 TMDL Identified Sources

Source analysis completed as part of the TMDL (CCRWQCB, 2013) estimated that 96% of the nitrogen inputs to the lower Santa Maria River were from croplands, grazing lands, and groundwater. Urban sources were estimated to be 3% for nitrogen and 10% for phosphorous. Croplands (7,620 acres) and grazing lands (4,674 acres) make up 92% of the Nipomo Creek watershed area, while urban areas (578 acres) account for only 4% and forested and undeveloped land makes up the remaining 4% (CCRWQCB, 2013). Specific sources of nutrients were not identified for the Nipomo Creek watershed in the TMDL. However, data analyzed from the central coast region show that nitrate concentrations in urban runoff rarely exceed the 10 mg/L Nitrate-N water quality objective (CCRWQCB, 2013).

3.5.2 Other Common Sources Based on Literature Review

In residential areas, potential sources of nutrients in stormwater and urban runoff may include: fertilizers, green waste, trash, and pet waste, which may be mobilized to the MS4 by irrigation runoff. Common sources of nutrients outside the MS4 area include fertilizers from croplands and waste from livestock on grazing lands. Atmospheric deposition and groundwater may also be sources of nutrients to both urban and non-urban lands. Non-MS4 sources are not addressed in this WAAP.

3.5.3 In Field Investigation

A field investigation by Geosyntec and County staff was conducted on August 26th, 2015 to better understand potential County MS4 sources of nutrients to Nipomo Creek. Several potential sources of nutrients were identified along tributaries and storm drains of the upstream Nipomo Creek watershed. These sources included domestic animal waste from dogs and horses, organic debris and trash accumulation in storm drain catchbasins, exposed bags of potting soil at a nursery, sediment buildup along storm drain channels, and runoff from over irrigation of residential lawns. Appendix B provides a summary of the field investigation observations and photos.

3.5.4 Source Assessment Conclusions

Controllable sources of nutrients that are targeted by the County in this WAAP include: domestic animal waste, nurseries, organic debris and trash accumulation, sediment buildup, and residential irrigation runoff.

Monitoring data collected by the Regional Board through the Central Coast Ambient Monitoring Program (CCAMP) for Nipomo Creek monitoring locations downstream of the County's MS4 Permit area show that geometric mean nitrate and unionized ammonia concentrations in the receiving waters are below WLAs (see Appendix C), and these pollutants are not expected to be above WLAs in MS4 discharges based on Southern California studies of typical urban stormwater (Robinson, 2005 and Stein, 2007).

4. BMP Identification

In order to reduce stormwater pollutants in receiving waters to the MEP, Best Management Practices (BMPs) are required. According to the Permit, these BMPs must be developed and implemented based on six Minimum Control Measures: 1) Public Education and Outreach; 2) Public Participation and

Involvement; 3) Illicit Discharge Detection and Elimination; 4) Construction Site Runoff Control; 5) Post-Construction Stormwater Management; and 6) Pollution Prevention/Good Housekeeping for Municipal Operations.

4.1 Guidance Document BMPs

In its Guidance Document, the County has identified the following existing BMPs which pertain directly to the reduction of the pollutants of concern addressed in the TMDLs. Applicable BMPs that are actively being implemented are shown in Table 9. A description of each BMP is available in the County's Guidance Document (County of San Luis Obispo, 2014).

Table 9. Guidance Document BMPs Identified for each TMDL

San Luis Obispo Creek Pathogen TMDL		
Program	**Description**	**BMP[1]**
Public Education and Outreach	"Educate the public regarding sources of fecal coliform and associated health risks of fecal coliforms in surface waters. Educate the public regarding actions that individuals can take to reduce loading."	PE5 Materials targeting residential audiences PE10 Educational Programs for School Age Children PE11 College Students PE12 Tourists PE17 Citizen Reporting Hotline PE18 Pet Waste Management program
Pet Waste Management	"Develop and implement enforceable means (e.g. an ordinance) of reducing/eliminating fecal coliform loading from pet waste."	IL1 IDDE Ordinance PE18 Pet Waste Management program
Illicit Discharge Detection and Elimination	"Develop and implement strategies to detect and eliminate discharges (whether mistaken or deliberate) of sewage to the Creek."	IL1 IDDE Ordinance IL4 Illicit connections/discharge inspections IL6 Sanitary Sewer Overflow Prevention and Spill Response Program IL7 Septic system management program
Post-Construction Stormwater Management in New Development and Redevelopment	"Develop and implement strategies to reduce/eliminate fecal coliform loading from streets, parking lots, sidewalks, and other urban areas potentially collecting and discharging fecal coliform to the creeks."	PC4 On-site inspections and self-certification requirements PC13 LID and hydromodification control
Pollution Prevention and Good Housekeeping	"Develop and implement strategies to reduce/eliminate fecal coliform loading from streets, parking lots, sidewalks, and other urban areas potentially collecting and discharging fecal coliform to the Creek."	MO2 Street sweeping program MO3 Storm drain cleaning and inspection MO6 Facility inspection program

Morro Bay Pathogen TMDL		
Program	**Description**	**BMP[1]**
Pet Waste Management	"Create an off leash dog park, provide supplies to pick up pet waste, ordinance."	IL1 IDDE Ordinance PE18 Pet Waste Management program
Septic system maintenance	"Inspect and maintain all septic systems throughout the watershed."	PE17 Citizen Reporting Hotline IL1 IDDE Ordinance IL4 Illicit connections/discharge inspections IL6 Sanitary Sewer Overflow Prevention and Spill Response Program IL7 Septic system management program

Post-Construction Stormwater Management in New Development and Redevelopment	"Develop and implement strategies to reduce/ eliminate bacteria loading from MS4 areas potentially collecting or discharging bacteria to the Bay."	PC4 On-site inspections and self-certification requirements PC13 LID and hydromodification control
Spay/neuter pets	"Educate the public to promote spaying and neutering pets."	PE18 Pet Waste Management program
Reduce the number of feral dogs/cats	"Reduce the number of feral dogs/cats"	PE18 Pet Waste Management program
Pollution Prevention and Good Housekeeping	"Develop and implement strategies to reduce/ eliminate bacteria loading from MS4 areas potentially collecting and discharging bacteria to the Creeks."	MO2 Street sweeping program MO3 Storm drain cleaning and inspection MO6 Facility inspection program

Morro Bay Sediment TMDL		
Program	**Description**	**BMP[1]**
Road Maintenance	"Increase the use of management measures for road maintenance and construction."	MO3 Storm drain inspection and maintenance MO5 County road and bridge maintenance procedures
Stormwater Sediment Controls on Roads	"Include specific road sediment control measures in County stormwater management plan."	MO2 Street sweeping program MO5 County road and bridge maintenance procedures CON1 County grading ordinance
Construction Projects	"Increase the use of management measures for road maintenance and construction."	CON1 County grading ordinance CON3 Construction site inspections and runoff control requirements CON4/PE8 Public education and outreach for construction runoff controls
Post-Construction Stormwater Management in New Development and Redevelopment	"Develop and implement strategies to reduce/eliminate sediment loading from streets, parking lots, sidewalks, and other urban areas potentially collecting and discharging sediment to the Bay."	PC1 Adoption and enforcement of revisions to the County Land Use Ordinances (Titles 22 and 23) PC4 On-site inspections and self-certification requirements PC13 LID and hydromodification control

Nipomo Creek Bacteria TMDL		
Program	**Description**	**BMP[1]**
Public Education and Outreach	"Educate the public regarding sources of fecal coliform and associated health risks of fecal coliforms in surface waters. Educate the public regarding actions that individuals can take to reduce loading."	PE5 Materials targeting residential audiences PE10 Educational Programs for School Age Children PE17 Citizen Reporting Hotline PE18 Pet Waste Management program
Pet Waste Management	"Develop and implement enforceable means (e.g. an ordinance) of reducing/eliminating fecal coliform loading from pet waste."	IL1 IDDE Ordinance PE18 Pet Waste Management program
Illicit Discharge Detection and Elimination	"Develop and implement strategies to detect and eliminate discharges (whether mistaken or deliberate) of sewage to the Creek."	IL1 IDDE Ordinance IL4 Illicit connections/discharge inspections IL6 Sanitary Sewer Overflow Prevention and Spill Response Program IL7 Septic system management program
Post-Construction Stormwater Management in New Development and Redevelopment	"Develop and implement strategies to reduce/eliminate fecal coliform loading from streets, parking lots, sidewalks, and other urban areas to the Creek."	PC4 On-site inspections and self-certification requirements PC13 LID and hydromodification control
Good Housekeeping and Pollution Prevention for Municipal Operations	"Develop and implement strategies to reduce/eliminate fecal coliform loading from streets, parking lots, sidewalks, and other urban areas to the Creek."	MO2 Street sweeping program MO3 Storm drain cleaning and inspection MO6 Facility inspection program

Nipomo Creek Nutrient TMDL		
Program	**Description**	**BMP[1]**
Public Education and Outreach	"Educate the public regarding sources of nutrients in surface waters. Educate the public regarding actions that individuals can take to reduce loading."	PE5 Materials targeting residential audiences PE6 Restaurants, automobile services, mobile cleaners, contractors, landscapers and property managers PE10 Educational Programs for School Age Children PE17 Citizen Reporting Hotline
Illicit Discharge Detection and Elimination	"Develop and implement strategies to detect and eliminate discharges (whether mistaken or deliberate) of sewage to the Creek."	IL1 IDDE Ordinance IL4 Illicit connections/discharge inspections IL6 Sanitary Sewer Overflow Prevention and Spill Response Program IL7 Septic system management program
Post-Construction Stormwater Management in New Development and Redevelopment	"Develop and implement strategies to reduce/eliminate nutrient loading from streets, parking lots, sidewalks, and other urban areas to the Creek."	PC4 On-site inspections and self-certification requirements PC13 LID and hydromodification control
Good Housekeeping and Pollution Prevention for Municipal Operations	"Develop and implement strategies to reduce/eliminate nutrient loading from streets, parking lots, sidewalks, and other urban areas to the Creek."	MO2 Street sweeping program MO3 Storm drain cleaning and inspection MO6 Facility inspection program MO11 Landscape and lawn care procedures

[1] BMP numbers correspond to identifiers in the County's Guidance Document (County of San Luis Obispo, 2014).

4.2 Additional BMPs

In addition to the BMPs currently in place in the County's Guidance Document, supplementary BMPs have been suggested for implementation in the Morro Bay, San Luis Obispo Creek, and Nipomo Creek watersheds to specifically address bacteria impairments[13] in receiving waters. These BMPs have been selected based on the source assessments presented in Sections 3.1 through 3.5, knowledge of effective bacteria BMPs from various Southern California studies, and Geosyntec and County staff experience.

Note that these additional BMPs were originally proposed in the 2012 version of this WAAP. These BMPs have already been implemented in the San Luis Obispo Creek and Morro Bay watersheds and are incorporated in the County's updated 2014 Guidance Document. To comply with the addition of the Santa Maria River watershed bacteria TMDL, these programs will be expanded to

[13] As stated in Section 3.3, additional BMPs (beyond what is currently implemented in the Guidance Document) are not necessary to address sediment loadings in the Morro Bay watershed, since the vast majority of the load is from non-point sources. Also as stated in Section 3.5, additional BMPs (beyond what is currently implemented in the Guidance Document) are not necessary for nutrients in the Nipomo Creek watershed since typical urban runoff rarely exceeds the WLAs and historic monitoring data demonstrates that the receiving waters are in compliance.

include the Nipomo Creek watershed. While selected to reduce bacterial loads, these BMPs are also expected to reduce nutrient loads from County MS4s in these watersheds.

4.2.1 Animal Facilities Management

Animal facilities for large and small animals can be sources of bacteria, along with nutrients and sediment, in both wet and dry-weather. An effective source control program would begin with an inventory of animal facilities within the County MS4 area (e.g. horse stables, dog parks, animal care centers, etc.) and development of outreach tools for the community. Outreach tools would include education materials that stress manure and wash-water management, watershed awareness, and exclusion fencing around watercourses. Therefore, an additional BMP to create and distribute educational materials to animal facilities was incorporated in the 2014 Guidance Document as BMP PE18.

In addition, policies for manure management may be introduced, requiring large animal users to clean up manure for compost or storage prior to proper disposal. This BMP would also require soil bedding and manure to be removed from stalls frequently and stored in seepage-free containers prior to disposal.

Within the Morro Bay watershed, the San Luis Obispo Animal Services Facility, the County dog park at Chorro Regional Park, and horse stables observed in Los Osos, will be targeted for appropriate pet waste disposal practices. Signage referencing the Storm Water Pollution Prevention and Discharge Control Ordinance will be placed around these facilities, and pamphlets will be delivered to these facilities describing measures that can be implemented to reduce pollutant loading. Facility operators will be educated on the importance of proper waste disposal and the effect animal waste has on water quality in the bay. Follow-up inspections will occur to ensure that facilities are being managed properly.

Within the San Luis Obispo Creek watershed, the Cuesta Park Animal Hospital and the private animal facilities within See Canyon will be targeted for appropriate pet waste disposal practices. The Cuesta Park Animal Hospital, located within Cuesta Park adjacent to the main stem of the creek, is not believed to be a significant source of bacteria in the creek. The hospital's wash facilities were observed to be well maintained and were not connected to the County MS4 system. Animal waste appeared to be handled in an appropriate manner as well, with no waste observed in the vicinity of the hospital. The County, through continued education and inspection, will encourage the animal

hospital to continue their efforts to minimize bacteria contribution to the watershed. Additionally, signage or brochures referencing the aforementioned Pollution Prevention Ordinance will be given to this facility.

In See Canyon and Nipomo Creek watershed, the County will target educational outreach to private animal facilities and ranch owners with horses and other animals that graze in the vicinity of the tributary creek. Outreach may include brochures or other materials designed to make the public aware of the linkage between equestrian/animal waste and stormwater quality. Although the County cannot require exclusion fencing to be installed around the tributary creek in See Canyon, these fences will be recommended to prevent grazing from occurring in or directly adjacent to water courses.

4.2.2 Commercial/Industrial Targeted Inspections

Requiring targeted inspections involves establishing and enforcing ordinances for commercial (particularly restaurants, grocery stores, and other food processing facilities) and industrial facilities. Programs that address wet-weather load reductions include increased inspection and enforcement of grease traps for restaurants, monitoring trash enclosures for proper waste disposal, and annual cleaning of private catchbasins and drain inlets. Dry-weather controls can also include discouraging vehicle washing, power washing, and other wash down activities that produce nuisance flows to MS4s.

A source tracking study performed in the San Diego River watershed found that approximately 20% of all dumpsters or grease traps had evidence of liquid leaks. These leaking containers are of especially high importance as a result of the significant pollutant loading in the liquid (Weston 2009).

Catchbasins and drain inlets play an important role in the prevention of trash and other sediment from entering the storm drain system. However, many commercial areas have no regulation mandating the cleanliness of these systems and they are often neglected. A survey conducted as part of the San Diego River source study found that 46% of commercial catchbasins had moderate buildup and 34% had ponded water. Often signs of washdown and food scraps were associated with catchbasins near restaurants (Weston 2009).

The County's Public Health Department carries out inspections within its MS4 jurisdiction for illicit discharges, drum storage, and hazardous material storage, but it did not routinely inspect grease traps or review grease trap records. The County has addressed this by revising the inspection checklist to include grease

trap inspections for commercial restaurant and industrial food processing facilities[14] and ordering inadequate facilities to update and clean grease traps immediately. If necessary, the County will pursue an ordinance to enforce the inspection notices, including fines, for any non-compliant facilities.

Enhanced inspection and enforcement of commercial and industrial wash down areas, catchbasins/inlets, or waste storage areas can be carried out on a facility and adjacent property if supporting authority exists or is successfully developed. This would include requiring private catchbasin cleaning prior to the wet season, especially for restaurants and other food outlets to reduce MS4 bacteria loads. An ordinance requiring covered trash enclosures and frequent cleaning of dumpsters and dumpster enclosures would also be expected to reduce bacteria loads from dumpsters. The County intends to incorporate these requirements into an ordinance. Commercial and industrial areas within the County's jurisdiction are offered free dumpsters and dumpster enclosure cleaning.

4.2.3 Fertilizer Management

Fertilizers provide a beneficial environment for fecal bacteria to survive and multiply. A recent study showed a strong correlation between *E. coli* concentrations and total phosphorus concentrations, finding that *E. coli* survival is strongly dependent on the concentration of phosphorus in water (Surbeck, et al. 2010). Such findings highlight the importance of fertilizer control and the effect fertilizers may have on bacteria concentrations. Irrigation water or stormwater provides the necessary mechanism to transport these pollutants to downstream receiving waters. Education and outreach to homeowners and landscape contractors is recommended to reduce the use of fertilizers, pesticides, and herbicides, and to prevent overwatering which transports pollutants to storm drains. Outreach should include the use of bilingual brochures and should be designed to raise public awareness about the linkages between fertilizer use and nutrient and bacteria pollution.

Golf courses typically use large amounts of fertilizers, which contain high amounts of nitrogen, phosphorus, and other pollutants. Two golf courses are located within the County's jurisdiction in the Morro Bay watershed- Dairy Creek

[14] A sample checklist can be found from the City of Rancho Palos Verdes Clean Bay Restaurant program, created as part of the Santa Monica Bay Clean Bay Restaurant Certification Program (City of Rancho Palos Verdes, 2012).

Golf Course, located off of Dairy Creek Road and Highway 1, and Sea Pines Golf Resort, located near the southern shore of Morro Bay off Solano Street in Los Osos. It is important that appropriate steps be taken to ensure that golf courses are in compliance with their water quality management plans. The County will aim outreach efforts toward golf course management to ensure that water is conserved to the MEP and the application of fertilizers is limited to periods when no rain is immediately forecasted. In addition, the County will inform golf course managers that fertilizers should not be applied directly adjacent to surface waters, as vegetated buffers absorb and filter pollutants before reaching surface waters.

Two golf courses exist within the San Luis Obispo Creek watershed- San Luis Obispo Golf and Country Club and Avila Beach Golf Resort. San Luis Obispo Golf and Country Club is located near the headwaters of Davenport Creek and has not been observed to contribute dry weather flows to San Luis Obispo Creek. Avila Beach Golf Resort is located adjacent to the Bob Jones bike trail near the creek outlet at San Luis Obispo Bay. Both of these courses are privately owned and are therefore outside of the County's jurisdiction. However, the County will attempt to provide outreach for these two golf courses, stressing the importance of water conservation and fertilizer application care to golf course management.

4.2.4 Enhanced Pet Waste Control and Pickup

BMP PE18 was updated in the County's Guidance Document to reflect the additional BMPs identified below for the Morro Bay and San Luis Obispo Creek watersheds. Additionally, the County has chosen pet waste as its pollutant of concern for the Community Based Social Marketing program mandated by the RWQCB. As such, different locations in the Morro Bay, San Luis Obispo Creek and Nipomo Creek watersheds have been sites of educational events/displays, and signage.

Although the County currently has a pet waste control program (see BMP PE18), pet waste remains a potentially significant source of bacteria during wet-weather to the Morro Bay watershed. BMPs for pet waste pick-up and disposal could include both educational outreach and enforcement to encourage residents and pet owners to clean up after their pets. A survey of Chesapeake Bay residents indicated that about 60 percent of dog owners pick up after their pets; and a survey in Washington indicated that about 70 percent of dog owners pick up pet waste (Schueler, 2000).

Options to control pet waste include park signage, receptacles for pet waste, waste bag distribution stations, designated dog parks, strict ordinances to regulate pet waste clean-up, and educational outreach at pet stores, animal shelters, veterinary offices, and other sites frequented by pet owners. A potential mechanism to fund and maintain this program is a stormwater charge on animal licenses. If funding through animal licenses is not a Proposition 218 fee, the County could pursue it. If it does fall under Proposition 218, its complexity most likely would make it infeasible to pursue. While most commonly applied in parks, recreation areas, and open spaces, pet waste pickup and education programs in residential areas could also be effective.

The DNA Study found that 17% and 11% of *E. coli* contributions within Los Osos Creek and Chorro Creek, respectively, were due to domestic animals. To reduce these numbers, the County has installed pet waste bag dispensers and educational signage within park facilities in the Morro Bay watershed. To improve pet waste management, additional pet waste stations (including bags and waste containers) will be installed at strategic locations throughout the Los Osos-Baywood Park community. The City of San Diego found that such stations resulted in a 37% reduction in the total amount of pet waste in city parks (City of San Diego, 2011a). Additionally, an educational campaign seeking to inform pet owners about the importance of picking up pet waste will be implemented. By offering to provide educational pamphlets at various facilities often visited by pet owners (e.g., pet stores, shelters, and veterinary offices), the County hopes to increase awareness regarding proper pet waste disposal. As demonstrated by the City of Austin, educational programs of this nature may result in a 9% or more improvement in the number of pet owners who claim to regularly pick up waste (City of Austin, 2008).

In San Luis Obispo Creek watershed, pet waste bag dispensers exist in some strategic locations. However, in an effort to target high pet-traffic areas, the County will add pet waste stations along the beach walk in Avila Beach and along the bike path near Avila Beach Drive. The County will also strive to maintain these pet waste dispensers with sufficient bags. Additionally, appropriate signage will be added around Cuesta Park and Avila Beach referencing the Pet Waste Disposal Ordinance (once passed). Similar to efforts in the Morro Bay watershed, the County will also attempt to increase awareness regarding proper pet waste disposal through various educational outreach strategies, as specified in BMP PE18.

In the Nipomo Creek watershed, pet waste bag dispensers exist in strategic locations. However, in an effort to target high pet-traffic areas, the County will

add pet waste stations along the most popular dog walking areas that are near creeks or outfalls. The County will also maintain these dispensers with sufficient bags, as possible. Similar to efforts in the Morro Bay watershed, the County will also increase awareness regarding proper pet waste disposal through various educational outreach strategies, as specified in BMP PE18.

4.2.5 Water Conservation Inspections

Over-irrigation is a leading cause of runoff in MS4 areas, serving as a key source of dry-weather flow to urban storm drains and mobilizing bacteria and nutrients from other sources such as gutters, catchbasins, and storm drain sediments. To assess over-irrigation contributions within the Los Osos-Baywood Park, Avila Beach, and Nipomo communities, the County's roving field inspector and road maintenance crews will be directed to inspect the communities for such flows and report observations to the enforcement unit. The County will continue to support existing community-based programs that offer free outdoor water use audits and guidance, and other elements such as the distribution of smart irrigation controllers. This effort will be aimed at reducing dry-weather flows from irrigation practices and encouraging the use of drought-resistant landscaping to reduce the amount of water necessary for irrigation. Additionally, residents found to contribute nuisance flows to the County right-of-way may be fined up to $350 per day per Division 1, Chapter 6 of the Streets and Highways Code.

4.2.6 Dry-weather MS4 Inspection Program

Along with water conservation inspections, the County will begin an inspection program targeting MS4 outfalls within the Morro Bay, San Luis Obispo Creek and Nipomo Creek watersheds. As a first step, the County will continue to update their GIS database of all County-owned storm drains in the MS4 permit areas. Once finalized, the County will annually inspect these outfalls to observe when, where, and approximately how much flow is occurring in the MS4 system. Where flow is observed to occur, flows will be traced upstream in an attempt to establish the source of such dry-weather flows. Visually tracking the flow, fluorescent dye, closed-circuit television (CCTV), and/or Microbial Source Tracking markers may then be used in storm drains to identify leaks and/or illicit connections per methods described in available guidance (e.g. City of Santa Barbara, 2012, UWRRC, 2014). If surface flows are not observed upstream of the MS4 outfall but flows are continually present, further investigations will evaluate whether groundwater is the source of such flows. If this is the case, groundwater inflows will be sampled (if not already captured through proposed

outfall monitoring) and if found to have elevated bacteria levels, steps will be taken to reduce groundwater flows into the County MS4 system. Where surface flows are observed to be the source, the property owner who is responsible for the contributions will be informed of the need to eliminate such flows as authorized in Division 1, Chapter 6 of the Streets and Highways Code.

4.2.7 Homeless Reduction/Encampment Management

Encampments of homeless and transient persons within the watershed can be a source of waste and other materials during wet weather. Homeless waste management activities may include: enhancing programs to reduce the number of homeless people living in outdoor encampments and enforcing new and existing laws which can decrease the negative impact on water quality.

Within the San Luis Obispo Creek watershed, actions will focus on areas of homeless encampment in the upper watershed near Cuesta Park and immediately downstream of San Luis Obispo's city limits, and will initially consist of a visual inspection of the area to observe the presence of any waste. The County will then develop site-specific measures to be implemented in impacted areas.

Within the Nipomo Creek watershed, actions will focus on areas of homeless encampment in Nipomo Creek near the town center, and will initially consist of a visual inspection of the area to observe the presence of any waste, and to provide outreach to dwellers. The County will then develop site-specific measures to be implemented in impacted areas. When feasible and practical, the County will organize community cleaning days to remove trash from these areas.

4.2.8 Culvert Exclusion Fencing

With the cooperation of the property owners, grant money will be pursued to design, purchase, and install exclusion fencing to address the significant amount of waste (human feces and trash) in the culvert under Thompson Avenue between Tefft Street and Dana Street. Although cleaning of the culvert previously performed by the County temporarily removed the waste, after only a short period the area was again full of waste. The fencing will extend far enough to prohibit public access to the culvert and will therefore eliminate the future depositing of waste in the culvert.

5. BMP Prioritization

As a first step for the County's BMP prioritization for this WAAP, the Guidance Document BMPs were screened down to only those which addressed the TMDL pollutants of concern. Next, best professional judgment was applied to select those BMPs that were expected to be most effective (in term of long term pollutant reduction) and comprehensive (in terms of covering a range of MS4 sources). These prioritized BMPs included any that directly addressed the prioritized County pollutant sources discussed earlier in Section 3. Where gaps were identified between the prioritized BMP suite and the prioritized sources, BMPs were added to address these sources and the Guidance Document will be revised accordingly.

6. BMP Implementation

The BMPs described in this WAAP are part of the County's broader efforts to meet the requirements of the Permit. The proposed BMPs were selected because they are specific to the needs of the communities in the County, they protect and improve water quality, they are feasible based on the County's resources, and they are flexible to allow for continuous improvement over the course of the Permit term.

Implementation of these BMPs requires that the County expend resources and staff time. Where possible, the County will take advantage of existing water quality activities related to stormwater, particularly by partnering with community volunteer groups, County departments, and a coalition of other agencies to implement BMPs. By building upon the combined effects of these activities, the County will be able to implement these practices more effectively and efficiently.

6.1 Existing BMP Implementation

Table 10, condensed from the Guidance Document, identifies the implementation schedule for each BMP, milestones and measureable goals that will be used by the County to track and assess implementation efforts, and responsible departments within the County.

Table 10. Guidance Document BMP Implementation

	BMP ID	Measurable Goals and Outcomes	Implementation Timetable					County Implementers
			Permit Year					
			1	2	3	4	5	
Public Education	PE 5	PE5A: Incorporate residential households located in the Permit coverage area in the County community based social		X	X	X	X	Public Works

	BMP ID	Measurable Goals and Outcomes	Implementation Timetable					County Implementers
			Permit Year					
			1	2	3	4	5	
		marketing (CBSM) strategy. PE5B: Post water pollution and water quality information. on the Public Works website for MS4 Permit areas with TMDL WLAs where quality sampling has occurred, including Illicit Discharge Detection and Elimination information.			X	X	X	
	PE 6	PE6A: Incorporate restaurants, automobile services, mobile cleaners, contractors, and landscape and property management operations located in the Permit coverage areas in the County CBSM strategy, as appropriate. PE6B: Post water pollution and water quality information relative to the CBSM strategy on County website.	X X	X X	X X	X X	X X	Public Works
	PE 8	PE8A: Distribute stormwater pollution prevention educational materials, including Illicit Discharge Detection and Elimination information, targeting the development community and construction industry including construction site owners and operators and contractors to every applicant for projects one acre or more in size in the Permit coverage areas. PE8B: Post storm water pollution education information, including Illicit Discharge Detection and Elimination information and construction and post construction requirements for projects on the County website.	X	X X	X X	X X	X X	Department of Planning and Building Public Works
	PE 10	PE10A: Continue education effort through the in-classroom presentation program that follows the California Science Curriculum and Common Core requirements. PE10B: Provide Sammy the Steelhead appearances to events focused on children as personnel is available to inhabit the costume.	X X	X X	X X	X X	X X	Public Works
	PE 12	PE12: Incorporate hotels and tourist attractions located in the coverage area in the CBSM strategy as appropriate.	X	X	X	X	X	Public Works
	PE 17	PE17A: Provide a Stormwater Pollution Prevention Telephone Information Line for the public to get more information and a Pollution Reporting Hotline to report storm water pollution problems. PE17B: Include telephone numbers in published Stormwater information and website.	X X	X X	X X	X X	X X	Public Works Planning and Building Departments Environmental Health Division of the County Health Agency
	PE 18	PE18A: Provide educational materials and mutt mitt stations in all County Parks in the Permit coverage areas.	X	X	X	X	X	County Parks, Central Services

	BMP ID	Measurable Goals and Outcomes	Implementation Timetable					County Implementers
			Permit Year					
			1	2	3	4	5	
		PE 18B: Continue enforcement of the Storm Water Discharge Ordinance, including violations of proper pet waste management.	X	X	X	X	X	Animal Services Division of the County Health Agency Public Works
		PE18C: Provide pet waste management reminders including website addresses, to pet owners via license renewals or other contacts	X	X	X	X	X	
		PE18E: Provide education materials to animal shelters, pet stores, veterinarian offices and farm supply stores in Permit coverage areas, including the San Luis Obispo County Animal Services Facility.	X	X	X	X	X	
		PE18F: Update pet waste management public education information as available on the County website.	X	X	X	X	X	
		PE18G: Incorporate information as available and appropriate about organizations and programs that promote pet health and recreation.	X	X	X	X	X	
Illicit Discharge Detection and Elimination	IL 1	IL1: Enforce the "County of San Luis Obispo Stormwater Pollution Prevention and Discharge Control Ordinance" (County Health and Safety Code Section 8.68).	X	X	X	X	X	Public Works, Storm Water Coordinator Planning and Building Department Environmental Health Division of the County Health Agency
	IL 4	IL4A: Continue enforcement and penalties for illicit connections and discharges	X	X	X	X	X	Public Works, Road Operations Superintendent Public Health, Environmental Health Services Division, Supervising Environmental Health Specialist,and Hazardous Materials Section
		IL4B: Inspect for illicit connections and discharges during storm drain and cross-connection inspections. See MO3	X	X	X	X	X	
		IL4C: Biennially train restaurant health inspectors in illicit discharge detection and elimination. Inspect 100% of restaurants annually. Assess need for additional preventive and/or corrective actions	X	X	X	X	X	
		IL4D: Continue to train Certified Unified Program Agency (CUPA) inspectors in illicit discharge detection and elimination	X	X	X	X	X	
		IL4E: Establish a system of tracking enforcement and penalties for illicit connections and discharges.	X	X	X	X	X	
	IL 6	IL6: Audit the adequacy of the operations and maintenance programs for County-operated wastewater treatment systems to ensure that these systems are properly operated and maintained to prevent sanitary sewer overflows and spills into the storm sewer system	X	X	X	X	X	Public Works, Utilities Division
	IL 7	IL7A: Identify and map Permit coverage area served by septic systems including County operated systems.	X	X	X	X	X	Department of Planning and Building Chief Building Official

	BMP ID	Measurable Goals and Outcomes	Implementation Timetable					County Implementers
			Permit Year					
			1	2	3	4	5	
		IL7B: Establish inspection/monitoring criteria for priority areas.	X	X	X	X	X	Public Works for County-owned septic systems
		IL7C: Inspect 25% of the County-owned septic systems and septic systems in key areas per year.	X	X	X	X	X	
		IL7D: Achieve 100% removal of septic system discharges in areas of Los Osos subject to the Regional Water Quality Control Board discharge prohibition.	X	X	X	X	X	
Municipal Operations	MO 2	MO2A: Sweep County roads with storm drains, curbs, and gutters in the Permit coverage area on quarterly basis or more frequently in heavily soiled areas.	X	X	X	X	X	Public Works, Road Operations Superintendent
		MO2B: Review sweeping data to assess need for schedule changes.	X	X	X	X	X	
	MO 3	MO3: Implement Storm Sewer Inspection and Maintenance Procedures and Schedules	X	X	X	X	X	Public Works, Road Operations Superintendent
	MO 5	MO5A: Maintain the County road and bridge inventory.	X	X	X	X	X	Public Works, Road Operations Superintendent
		MO5B: Implement the road and bridge maintenance procedure manual.	X	X	X	X	X	
		MO5C: Train road and bridge maintenance employees to the manual.	X	X	X	X	X	
	MO 6	MO6A: Use a self-inspection checklist to inspect County facilities (Golf Courses, Parks, Pools, Operations, Buildings, Vehicle and Equipment service and Fueling stations, construction sites, water and wastewater facilities and fleet and corporation/road yards in the Permit areas) for stormwater pollution prevention practices and procedures.	X	X	X	X	X	County Parks, Central Services Public Works
		MO6B: Inspect facilities annually at a minimum to ensure ongoing compliance.	X	X	X	X	X	
	MO 11	MO11A: Audit County landscape and lawn care procedures and practices in permit coverage areas for stormwater pollution prevention including, but not limited to: the use of appropriate less toxic alternative products for pesticide and herbicide use, use of fertilizers, green waste disposal, irrigation practices, trash management and recycling practices, storage and maintenance of equipment, riparian corridor protection, and sustainable landscape design.	X	X	X	X	X	Parks and Recreation Department
		MO11B: Revise procedures and retrain employees based on audit findings.	X	X	X	X	X	
		MO11C: Inspect for compliance during facility inspections described in BMP MO6.	X	X	X	X	X	
Construction	CON 1	CON1: Enforce Grading Ordinance for projects that disturb one acre or more of land to comply with the Permit and Construction Stormwater General Permit requirements.	X	X	X	X	X	Department of Planning and Building, Chief Enforcement Official
	CON 3	CON3: Inspect construction sites >1 acre for stormwater BMPs to ensure that they are being implemented and properly maintained.	X	X	X	X	X	Department of Planning and Building

	BMP ID	Measurable Goals and Outcomes	Implementation Timetable					County Implementers
			Permit Year					
			1	2	3	4	5	
	CON 4	CON4: Provide construction site education and outreach information with 100% of all construction Permit applications for projects with one acre or more of land disturbance in permit overage areas.	X	X	X	X	X	Department of Planning and Building Public Works, Development Services
Post-Construction	PC 1	PC1: Adopt and enforce CCRWQCB 2013 Post Construction Requirements (PCRs) in County Land Use Ordinance	X	X	X	X	X	Department of Planning and Building
	PC 4	PC4: Inspect project sites ≥1 acre for compliance with post-construction requirements defined in Section 22.52.110 of County Land Use Ordinance or in Section 23.02.040 of the Coastal Zone Land Use Ordinance. Inspections must include a check to verify that the post-construction runoff controls have been implemented and are being maintained in order to be compliant. Include post-construction stormwater management in site inspections and ongoing storm sewer system inspections. Include self-certification to ensure long-term maintenance of post-construction stormwater management controls.	X	X	X	X	X	Department of Planning and Building
	PC 13	PC13: Enact a strategy for implementing LID and hydromodification control for new and redevelopment projects. Provide appropriate education and outreach for all applicable target audiences. Provide specific guidance for LID BMP design and compliance with hydromodification control criteria. Apply LID principles and features to new and redevelopment projects.	X	X	X	X	X	Planning and Building Staff

6.2 Additional BMP Implementation

Implementation actions for the additional BMPs specified in Section 4.2 are listed below (Table 11). In some cases, implementation actions of the additional BMPs overlap with current Guidance Document BMPs. These cases, which are indicated below by reference to existing BMP identifiers, will enhance or build upon the existing implementation actions. In instances where this is not the case, new implementation actions are proposed below, but may require future changes to reflect in-field conditions. As stated in Section 4.2, these BMPs are for implementation within the County MS4 area in the Morro Bay, San Luis Obispo Creek and Nipomo Creek watersheds.

Table 11. Additional BMP Implementation

Additional BMP	County Implementation Actions	Implementation Schedule
Animal Facilities Management	Along with implementation actions for PE18, educational outreach shall target the San Luis Obispo Animal Services facility, and the County dog park at Chorro Regional Park. In San Luis Obispo Creek watershed, outreach will target the Cuesta Park Animal Hospital and the animal facilities within See Canyon. In the Nipomo Creek watershed, outreach will target animal facilities along the creek and tributaries. Pet waste disposal education, including pamphlets and training, will take place at each of these locations.	Beginning 2012 in Morro Bay and San Luis Obispo Creek watersheds Beginning 2016 in Nipomo Creek watershed
Commercial/Industrial Targeted Inspections	Expand MO6 to include routine inspections for all commercial/industrial facilities within the Los Osos-Baywood Park, Avila Beach, and Nipomo communities. Update inspection checklist to include grease trap and illicit discharge inspections as part of BMP IL4D. Continue educating restaurant and food outlet owners about the importance of proper food waste disposal. Develop educational pamphlets for commercial/industrial facility managers. Draft ordinance requiring trash enclosures to be cleaned annually and covered.	Beginning 2013 in Morro Bay and San Luis Obispo Creek watershed Beginning 2016 in Nipomo Creek watershed
Fertilizer Management	Update PE5B to include fertilizer management. Target both of the County golf courses in the Morro Bay watershed, the private golf courses in the San Luis Obispo Creek watershed (as feasible), and gardening/landscape services. As necessary, create bilingual pamphlets to hand out.	Beginning 2012 in Morro Bay and San Luis Obispo Creek watersheds Beginning 2016 in Nipomo Creek watershed
Enhanced Pet Waste Control	Expand PE18 to include the installation of mutt-mitt stations at targeted locations throughout the Los Osos-Baywood Park community and at select locations near Avila Beach, the Bob Jones bike trail, and	Beginning 2012 in Morro Bay and San Luis Obispo Creek watersheds

Additional BMP	County Implementation Actions	Implementation Schedule
	appropriate areas in the Nipomo Creek watershed. Add signage or brochures referencing the Pet Waste Disposal Ordinance to strategic areas throughout the watersheds. Maintain pet waste dispensers.	Beginning 2016 in Nipomo Creek watershed
Water Conservation Inspections	Enforce over-irrigation observations within the Morro Bay, San Luis Obispo Creek, and Nipomo Creek watersheds by requiring roving field inspectors and road crews to initiate inspections. If violators are observed, enforce Section 1487 of the Streets and Highways Code with appropriate fines. Continue support of existing community-based programs to reduce dry-weather flows.	Beginning 2012 in Morro Bay and San Luis Obispo Creek watersheds Beginning 2016 in Nipomo Creek watershed
Dry-weather MS4 Inspection Program	Update GIS database showing all County MS4 facilities (storm drains and outfalls). Create a checklist to be used for annual MS4 outfall inspections. Perform annual inspections of County outfalls. Utilize source investigation technics to: (1) identify unknown flow sources, (2) abate human and/or pet waste sources, and (3) confirm absence of human and/or pet waste in discharges. If feasible, begin a community outreach program aimed at detecting dry-weather flows.	Beginning 2012 in Morro Bay and San Luis Obispo Creek watersheds Beginning 2016 in Nipomo Creek watershed
Homeless Reduction/ Encampment Management	Conduct a fecal waste generation visual assessment of homeless encampments adjacent to waterways. Develop and implement an education strategy for encampment dwellers. Work with law enforcement on clean-up days for encampments.	Beginning 2012 in Morro Bay and San Luis Obispo Creek watersheds Beginning 2016 in Nipomo Creek watershed
Culvert Exclusion Fencing	Submit a grant application to install exclusion fencing around the culvert under Thompson Avenue between Tefft Street and Dana Street. The fencing will extend far	Beginning 2016 in Nipomo Creek watershed

Additional BMP	County Implementation Actions	Implementation Schedule
	enough to prohibit public access to the culvert and therefore eliminate future waste in the culvert.	

7. Wasteload Allocation Attainment

7.1 Demonstration of Bacteria WLA Compliance

The TMDL WLAs for bacteria are concentration-based metrics that are used for MS4 permit compliance assessment. However, as stated in the Santa Maria River Bacteria TMDL Basin Plan Amendment[15], a natural source demonstration may also be used (CRWQCB, 2012). Therefore, this WAAP proposes alternate WLA language for Santa Maria River Bacteria TMDL for Regional Board consideration. The proposed language allows multiple optional pathways to achieve and demonstrate compliance, thus allowing MS4 dischargers flexibility in their compliance implementation pathway (or multiple lines of evidence to demonstrate compliance). This language is based in part on the bacteria TMDL compliance language in the 2013 San Diego Regional Phase I MS4 Permit (SDRWQCB, 2013).

Compliance may be demonstrated by any one of the following pathways:

1. demonstration of zero discharge from MS4 outfalls during the reporting period (primarily applicable to dry weather);
2. outfall compliance monitoring locations meet the REC 1 Basin Plan Objectives;
3. receiving water compliance monitoring locations meet the REC 1 Basin Plan Objectives;
4. outfall monitoring demonstrates compliance with the WAAP-based target load reductions (TLR) (applicable to wet weather only);

[15] "Responsible parties may also demonstrate that although water quality objectives are not being achieved in receiving waters, controllable sources of pathogens are not contributing to the exceedance. If this is the case, the Central Coast Water Board may re-evaluate the numeric target and allocations. For example, the Central Coast Water Board may pursue and approve a site-specific objective. The site-specific objective would be based on evidence that natural or background sources alone were the cause of exceedances of the Basin Plan water quality objective for fecal coliform or the USEPA recommended criteria for E. coli."

5. representative outfall samples for MST markers demonstrate absence of anthropogenic waste (i.e., no human or pet waste markers in MS4 discharge); or
6. implementation of an approved WAAP according to the milestones and schedule established therein.

Based on this proposed language, Table 12 summarizes how the County is demonstrating compliance with the Santa Maria River Bacteria TMDL, and if this language can be incorporated into the other applicable bacteria TMDLs, how the County is demonstrating compliance with these other bacteria TMDLs. The compliance demonstration approaches listed here may be expanded at a future date after recent outfall and receiving water monitoring data are reviewed, future special studies are performed, and/or other activities are performed to monitor the various proposed compliance pathways. Furthermore, it is anticipated that if a robust dry weather MS4 outfall inspection program is implemented (as described in the new/additional BMP section of this WAAP), abatement of human fecal sources will be successful, and thus proposed compliance pathway #5 will be met.

Table 12. Approaches Being Used by the County to Demonstrate Compliance with Applicable Bacteria TMDL WLAs

TMDL	WLA Compliance Date	Compliance Demonstration Approach
San Luis Obispo Creek Bacteria	7/25/2015	Implement strategies discussed in this WAAP, including BMPs and monitoring according the milestones and schedule (Proposed Compliance Pathway #6).[16]
Morro Bay Bacteria	11/19/2013	Implement strategies discussed in this WAAP, including BMPs and monitoring according the milestones and schedule (Proposed Compliance Pathway #6).
Santa Maria River Bacteria	2/21/2028	Implement strategies discussed in this WAAP, including BMPs and monitoring according the milestones and schedule (Proposed Compliance Pathway #6).

7.2 Demonstration of Sediment WLA Compliance

According to the Morro Bay Sediment TMDL[17], the continued implementation of the County's sediment control BMPs, identified in the TMDL table "Trackable Implementation Actions" (and this WAAP, Section 4 and Section 6), demonstrates compliance unless the Regional Board monitoring program indicates that BMPs are failing to reduce sediment loads. At this point the Regional Board has not indicated that the County BMPs were insufficient or that the sampling results reveal insufficient loading reductions, therefore the County is demonstrating compliance with the Morro Bay Sediment TMDL.

7.3 Demonstration of Nutrient WLA Compliance

Historic receiving water concentrations (from 2000 to 2013) at CCAMP sites in Nipomo Creek are below the WLA (Appendix C). Furthermore, County MS4s are not expected to contribute concentrations above the WLA values based on

[16] The County may also be able to use proposed compliance pathway #3 if recent receiving water monitoring results (post TMDL compliance date) are consistent with historic receiving water concentrations, which are below the WLA (as shown in Figure 6 and Figure 7 of this WAAP). These sampling locations include where San Luis Obispo Creek leaves the County unincorporated area upstream of the City of San Luis Obispo and throughout the creek downstream of the City of San Luis Obispo (Compliance Pathway 3).

[17] This language was not incorporated into the draft Permit TMDL provision, and therefore may not be effective.

MS4 outfall monitoring data collected elsewhere in Southern California (Section 3.5), therefore the County is demonstrating compliance with Nipomo Creek Nutrient TMDL.

7.4 Proposed Interim Targets

Interim targets are goals that provide a basis for assessing progress towards the WLAs assigned in each TMDL. The Santa Maria River bacteria TMDL specifies that "implementing parties may develop and propose interim targets as part of their WAAP as demonstration of progress" (CCRWQCB, 2012). Thus, new County-specific interim targets pertaining to the bacteria in MS4 outfalls in Nipomo Creek have been developed and are shown in Table 13. Nutrient interim targets for Nipomo Creek remain the same as outlined in the TMDL and are also shown in Table 13. These interim targets will be applied to the County's discharge (for bacteria) or receiving water (nutrients) sampling locations identified in the Nipomo Creek watershed. If the interim targets for bacteria have not been achieved by the wet weather target date, then the County may consider conducting a study to investigate background levels of bacteria within the Nipomo Creek watershed. A similar study may also be conducted for nutrients if their interim targets are not achieved. Additionally, WAAP requirements for each of the TMDLs in Attachment G of the Permit include "If the approved TMDL does not explicitly include interim targets, the MS4 shall establish interim targets (and dates when stormwater discharge conditions will be evaluated)". The bacteria TMDLs for Morro Bay and San Luis Obispo creek have already passed the final effective date and therefore interim targets are not applicable. Since the Morro Bay sediment TMDL does not have interim targets explicitly stated in the TMDL, interim targets and the interim target dates have been included in Table 13.

Table 13. Proposed TMDL Interim Targets

WLA		Proposed Interim Targets[1]	Target Dates[2]
Morro Bay Sediment	Wet Weather	Achieve a fifty percent reduction in the wasteload allocated to the County (2,567 tones/year)	Dec. 3rd, 2028 (25 years from effective date)
Nipomo Bacteria	Dry Weather	Flow based target: Establish baseline MS4 discharge volume and number of locations with intermittent and/or persistent dry weather discharge based on a minimum of 3 dry weather monitoring events during year 1 (2016), then reduce flow volume or occurrence by 50%.	Feb. 21st, 2018 (5 years from effective TMDL date)
	Wet Weather	Concentration based target: Establish existing MS4 discharge concentrations based on a minimum of 3 wet weather sample events performed during year 1 (2016), reduce the concentration by 50%.	Feb. 21st, 2023 (10 years from effective TMDL date)
Nipomo Nutrients	Year-Round	Achieve interim WLA for unionized ammonia.	May 22nd, 2026 (12 years from the TMDL effective date)
		Achieve interim WLA for nitrate.	

1. Bacteria interim targets are *proposed* (i.e., alternative to the default language stated in the existing TMDL Basin Plan Amendment) and assume 50 percent progress by the compliance midpoint. Nutrient interim targets are taken directly from the TMDL.
2. See Section 1 for the effective dates

8. Monitoring Program

A common quantitative means of assessing the overall effectiveness of BMPs is through water quality monitoring. Though the County was not required to perform water quality monitoring under the previous MS4 Permit, multiple local groups monitor water quality in the County watersheds. The most effective means of monitoring water quality improvements in multiple watersheds is through coordination with this existing monitoring network.

The County will monitor the individual BMPs discussed in this WAAP. In addition to water quality sampling, monitoring of individual BMPs will include receiving public comments, keeping track of activities, and collecting any other information that may assist the County in evaluating the BMPs. The effectiveness of individual BMPs will be assessed on an annual basis in terms of progress made toward achieving the measurable goals as described in the

County's Guidance Document and Program Effectiveness Assessment and Improvement Plan (PEAIP).

In addition, the individual TMDLs address monitoring issues specific to their respective pollutants of concern and watersheds. These monitoring requirements are summarized below, along with any supplemental TMDL monitoring that the County will perform.

8.1 San Luis Obispo Creek Pathogen TMDL

The City of San Luis Obispo will continue to sample four (4) locations and Cal Poly will continue to sample two (2) locations in the San Luis Obispo Creek watershed. Sampling events occur quarterly, each consisting of five (5) samples drawn in a 30-day time period within the sampling period.

As previously discussed in Section 3, the observed fecal coliform concentrations were highest in and downstream of the downtown tunnel-areas that are not the County's responsibility. The sampling results show that the fecal coliform concentrations at Site 12.5 are very low in comparison. As a result, the TMDL Staff Report states that, "The County will not be required to sample because data indicate low fecal coliform levels, relative to areas draining City and Cal Poly lands" (CCCRWQCB, 2004a). Furthermore, very few MS4 outfalls to the creek were observed based on a field visit to the County unincorporated urban areas. Due to the low observed fecal coliform concentrations at Site 12.5 and this specific recommendation from the TMDL Staff Report, the County proposes no new bacteria sampling in the San Luis Obispo Creek watershed at this time, but will reevaluate this decision in the future based on new information.

8.2 Morro Bay Pathogen TMDL

Water quality sampling was initially planned in coordination with the Morro Bay National Estuary Program (MBNEP) and the Friends of the Estuary Volunteer Monitoring Program, to complement existing sampling performed by the California Department of Health Services (DHS). This proposed sampling includes 6 sites within Morro Bay and 13 sites in the creeks and tributaries of the Morro Bay watershed, with samples to be analyzed for bacteria. Sampling through these existing programs is the responsibility of the Regional Board, the MBNEP Volunteer Program, and the DHS.

In addition, implementation actions are tracked by the Regional Board with voluntary assistance from the County along with the MBNEP, California Men's Colony Wastewater Treatment Facility (CMC), City of Morro Bay, Community of Los Osos, and the DHS. As stated in the TMDL, Regional Board and MBNEP staff will review the progress of implementation activities annually and will assess compliance every three years. When informed of this compliance status through Regional Board progress reports to the TMDL stakeholders, the County may adjust the bacteria BMPs in the Morro Bay watershed accordingly. It is assumed that the Regional Board will consider information provided in the County's MS4 Permit annual reports as part of this compliance assessment process.

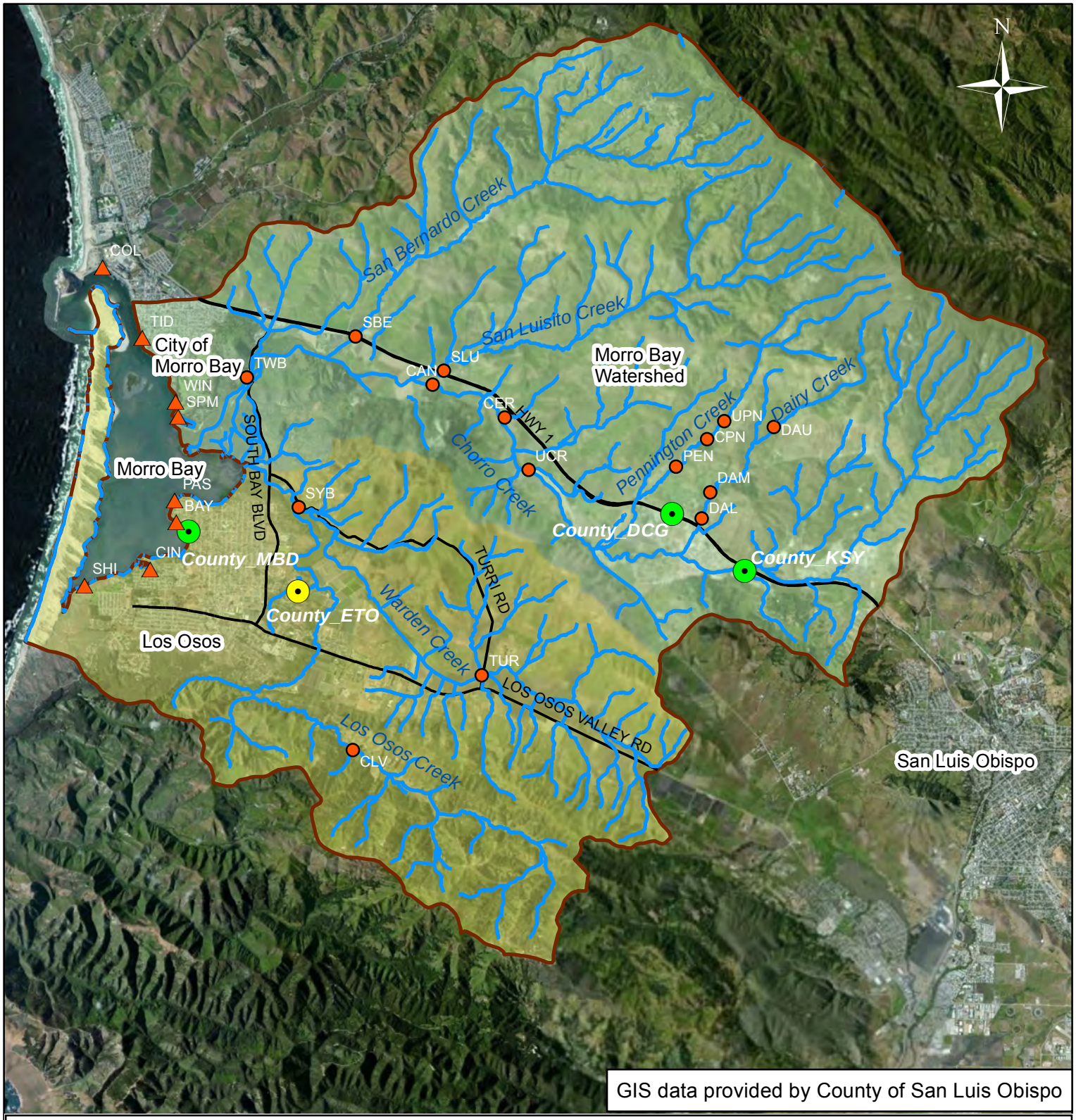
Furthermore, in response to the 2011 Program Compliance Audit by the Regional Board, the County has added new water quality sampling within the Morro Bay watershed, beginning in 2013. This is described below.

8.2.1 County Bacteria Sampling – Morro Bay Watershed

The County sampling program will consist of four sites sampled on a monthly basis. This will be in addition to other monitoring efforts conducted by MBNEP, the DHS, and other groups performing water quality sampling in the watershed, most of which focus on receiving waters (as opposed to MS4 discharges). County sampling locations have been selected based on possible County MS4 source areas and BMP locations to help determine if WLAs are being met. These sampling locations include three outfall locations and one receiving water location that is downstream of a MS4 urban area. County MS4 outfall sampling will occur above MBNEP creek sites UCR and SYB and at one outfall location near Bay sites PAS and BAY, providing a representative cross-section of County MS4-served land uses. Results from outfall locations are intended to further inform the County regarding potential sources within their MS4 jurisdiction. The single receiving water location was selected because the tributary catchment area is entirely within the Los Osos community, and drains a variety of land uses, including a significant portion of the commercial area in Los Osos. This stream flows to Eto Lake before discharging to Los Osos Creek. Table 14 summarizes the sampling locations, which are shown on Figure 8.

Table 14. County Bacteria Sampling Locations in the Morro Bay Watershed

Sub watershed	Location ID	Location Type	Location Description	Lat/Long
Chorro Creek	County_KSY	MS4 outfall	Downstream of SLO Animal Services Facility at Kansas Yard, at MS4 discharge location on Kansas Ave. near the Juvenile Detention Center.	35.19279, -120.43235
	County_DCG	MS4 outfall	Discharge location for the southern-most pond at Dairy Creek Golf Course, adjacent to Highway 1	35.33173, -120.73652
Los Osos Creek	County_ETO	Receiving water (creek)	Los Osos Creek tributary, immediately upstream of Eto Lake, near Hollister Lane Crossing	35.18908, -120.49243
Coastal Outfall to Bay	County_MBD	MS4 outfall	MS4 pipe discharge to Morro Bay, approximately 100 ft west of the intersection of El Morro Ave and 3rd Street	35.32616, -120.84031



Legend

MBNEP Sampling Stations

- Creek Sampling
- Bay Sampling

County Sampling Stations

- Outfall Sampling
- Receiving Water Sampling

- *Watershed Streams*
- WATERSHED ROADS
- Morro Bay Watershed

0 0.5 1 2 3 4 Miles

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June 2012

Figure 8.
Morro Bay Watershed
Sampling Locations

Each sample shall be recorded with observations of site conditions, which should include, at a minimum, sample ID, collection date and time, weather conditions (including prior and day-of precipitation measurements and future forecasts), sampler's name, and observed site and flow conditions (including observed sources of potential bacteria contributions, turbidity, color, odor, nearby discharging outfalls and seeps, and presence of foam, sheen trash, organic litter, etc.). If flow is inadequate for sampling, field logs will reflect that flow conditions do not permit sampling. Though not required, photos of each sample point are encouraged during sampling. The safety of the sample collector will be a top priority, and thus safety issues may prohibit sampling. If site conditions are not safe, notes should reflect this and a follow-up sample should be taken once conditions are improved.

At all sample sites, samples shall be taken at the middle of the creek or storm drain outfall discharge whenever possible, or as near to the middle of flow as is safely accessible. A pole sampler may be used to access hard to reach locations. If the sample collector must enter the water to take the sample, samples must always be taken upstream of the collector.

The MS4 outfall at sample location County_MBD is not believed to be tidally influenced. If observations determine that Bay waters do in fact enter the outfall due to rising tide, samples shall be taken at low tide when no tidal influence is present. After several sampling events at this location, the location was deemed unsafe due to poor accessibility and lighting. Comparable locations are currently being considered.

County bacteria sampling will be conducted on a monthly basis. Additionally, 3 wet-weather samples[18] will be taken each year, for a total of 15 sample events per year. Samples will be analyzed at the County's lab of choice, and will be analyzed for fecal coliform bacteria or *E. coli*. Necessary dilutions or aliquot volumes shall be processed to insure that reportable values can be determined. Bacterial results are reported as organism type per 100 ml of sample.

[18] Although the TMDL does not specifically define or address wet-weather days, data suggests that bacteria concentrations in the creeks are higher during wet-weather. For the sake of wet-weather monitoring, the County will take advantage of their existing, real-time precipitation gauge network to distinguish between wet and dry days. Specifically, gauges 727 (Los Osos Landfill), 747 (Canet Road), and 713 (Camp SLO) will be used to inform the County if rain has fallen in the watershed. A wet-weather sample event will be defined as a day on which at least 0.4 inches of rain has fallen within a 24 hour period; samples will be taken within 24 hours of this threshold being met.

All laboratories performing analysis for the County shall maintain Environmental Laboratory Accreditation Program certification (ELAP administered by California Department of Health Services) for specified methods from ELAP's "Field of Testing 126: Microbiology of Recreational Water". Each analytical method used for the bacteria analyses shall be an approved EPA or Standard Methods for the Examination of Water and Wastewater, 18th-22cnd edition (1992-2012).

Per standard methods, bacteria analyses have a 6-hour hold time. As a result, the County will coordinate appropriately with their lab to ensure that samples are taken, transported, and analyzed within this time, as feasible.

The selected laboratory must employ a program that associates quality assurance with the laboratory facility, staff, instrumentation and equipment, materials and methods, media and reagents, and data validation. The appropriate quality assurance/quality control (QA/QC) measures will be included in sample result receipts. The County will retain all sample results in a comprehensive spreadsheet to allow for the tracking of water quality over time. A summary of annual sampling results will be submitted with the County's Annual Report.

8.3 Morro Bay Sediment TMDL

Sediment monitoring programs in the Morro Bay watershed have been developed in coordination with MBNEP and the Friends of the Estuary Volunteer Monitoring Program. The TMDL monitoring plan identifies 10 sites within the Morro Bay watershed that will be monitored for TMDL target compliance. These monitoring activities are the responsibility of the Regional Board and the MBNEP Volunteer Program. Monitoring will include 10 year rolling averages of residual pool volume, median diameter, percent of fine fines, percent of coarse fines, and tidal prism volume.

TMDL monitoring conducted by the Regional Board will include the tracking of implementation actions. The County will cooperatively participate with the Regional Board through the Annual Report process described in this WAAP.

8.4 Santa Maria River Bacteria and Nutrient TMDLs

Water quality sampling data from CCAMP, which were used in the development of the Santa Maria River watershed TMDLs have been collected at two Nipomo Creek sampling locations since the year 2000. A summary of these results for TMDL bacteria and nutrients is shown in Appendix C. Median *E. coli*

concentrations increase from below the 200 MPN/100mL geometric mean WLA at upstream location 312NIT to above the WLA at downstream location 312NIP. Samples also frequently exceed the 409 MPN/100mL single sample target for *E. coli* at both sites (27% at NIT and 50% at NIP). Median fecal coliform concentrations were similar at the two sites and both single sample and log mean WLAs were exceeded.

Although an increase in *E. coli* concentrations was observed from upstream to downstream in the Nipomo Creek watershed, it cannot be determined if this is due to bacterial loads from Nipomo MS4 discharges. The upstream sampling location is within the town of Nipomo and is influenced by runoff originating from the upstream areas of this community, while the downstream location is beyond the County's MS4-served area and is likely influenced by dry weather and stormwater discharges from agricultural and grazing lands.

Available CCAMP data for nutrients suggest that nutrient concentrations in receiving waters are not frequently exceeding final TMDL WLAs in Nipomo Creek. Since 2001, nitrate has only exceeded the 10 mg/L (as N) WLA concentration in 2 of 46 samples and unionized ammonia has only exceeded the 0.025 mg/L (as N) WLA concentration in 1 of 41 samples (see Appendix C). The median concentration for nitrate and unionized ammonia are below their respective WLAs at both sampling locations. Furthermore, County MS4 discharges are not expected to exceed these WLA concentrations based on Southern California water quality sampling studies of MS4 stormwater discharges (Robinson, 2005 and Stein, 2007).

8.4.1 County Sampling – Nipomo Creek Watershed

All pollutants with WLAs assigned to the County will be sampled in MS4 discharge and receiving waters, including: Fecal Coliform, *E. Coli*, Nitrate as N, and Unionized Ammonia as N. Receiving water sites are located at the upstream and downstream boundaries of the County's MS4 Permit area to identify potential changes as a result of the County MS4 discharges. Representative outfall sampling includes a County MS4 outfall that drains a residential area, with the purpose being to evaluate the water quality of this predominant land use type. Water quality sampling locations are shown in Figure 9 and are described in more detail in Table 15.

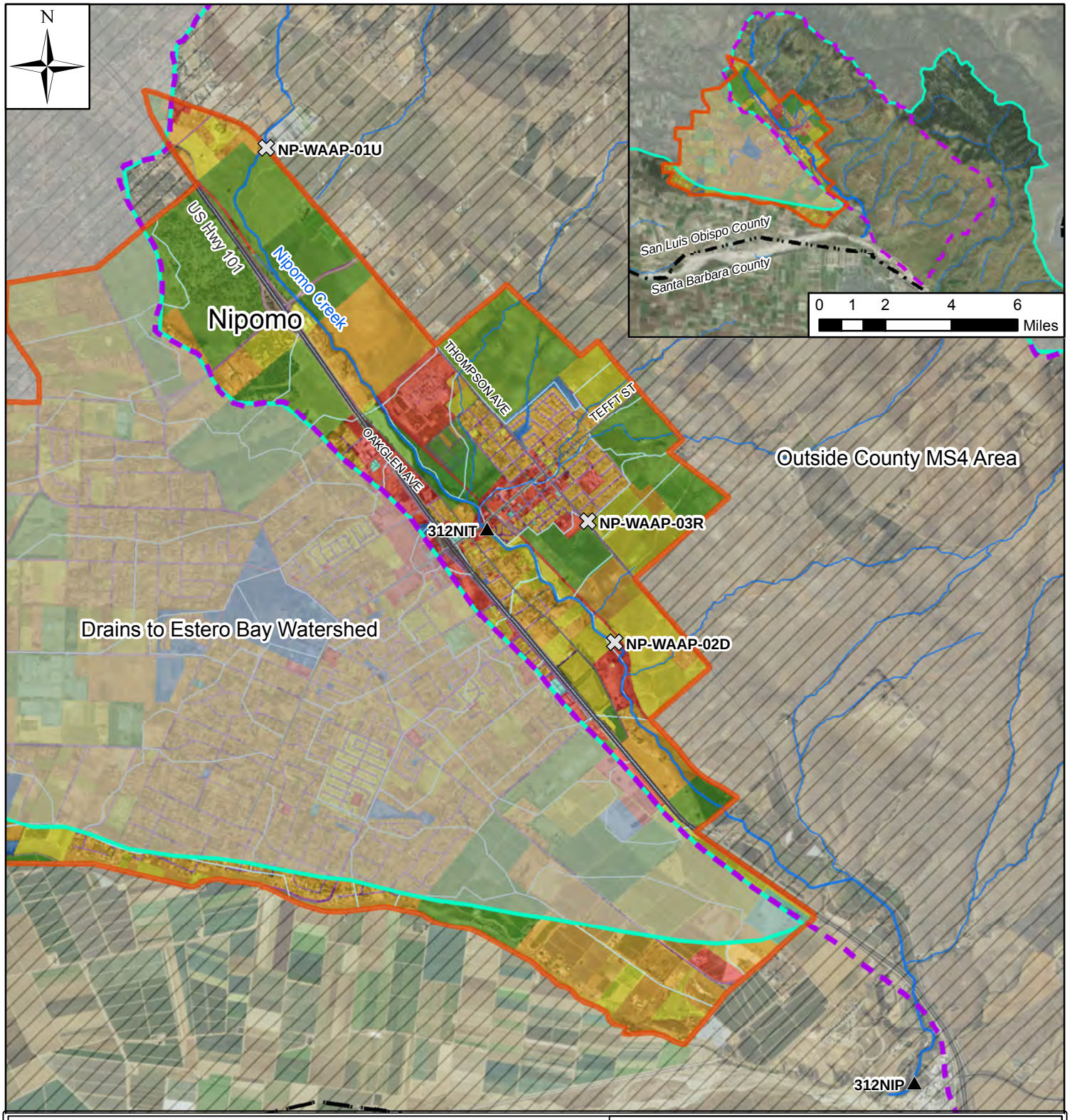
Flow will be measured during sampling at each location to estimate pollutant loads. Instantaneous flow will be calculated using velocity measurements and stream/outfall dimension at the beginning and end of the sample collection

window, or using a continuous flow meter. Manual 2 hour composite samples (collected at 15 minute intervals) will be collected at these locations annually during three wet weather and two dry weather events. Wet weather events will be defined as 0.2" or greater of rainfall over a period of 24 hours. Sampling will be conducted if rain is forecast with a minimum 75% probability of 0.2" or greater over a period of 24 hours following a period of dry weather. If the forecast is incorrect, and less than 0.2" of rain has occurred by the time of sampling, this sampling event will be cancelled. Dry weather sampling will not occur within 72 hours of a wet weather event.

The sampling program will commence winter of 2016-17.

Table 15. County Sampling Locations in the Nipomo Creek Watershed

Location ID	Location Type	Location Description	Lat/Long
NP-WAAP-01U	Receiving Water	Nipomo Creek upstream of the County MS4 Permit area, on the west side of Thompson Avenue where it cross Nipomo creek	35.067846, -120.503213
NP-WAAP-02D	Receiving Water	Nipomo Creek downstream of the County MS4 Permit area, accessed from the rear of the Dana Adobe Estate	35.029726, -120.468813
NP-WAAP-03R	MS4 Outfall	Nipomo Creek residential area of the County MS4 Permit area, outfall at Knotts Street and Thompson Avenue.	35.039172, -120.471655



Legend

GIS data provided by County of San Luis Obispo

- CCAMP Monitoring Locations
- Monitoring Locations
- County MS4 Area
- Nipomo Creek Subwatershed
- Santa Maria Watershed
- Drains to Estero Bay Watershed
- Outside County MS4 Area
- Catchments
- Counties
- Roads
- Streams

Land Use

- Single-Family Residential
- Multi-Family Residential
- Transportation/Other
- Commercial
- Cultivated
- Industrial
- Other

0 0.25 0.5 1 1.5 Miles

Geosyntec consultants

LA0350
September 2015

Figure 9.
Nipomo Creek Sampling Locations

9. Effectiveness Assessment

Control measures and BMPs are aimed at achieving outcome levels 1, 2 and 3 in accordance with the California Stormwater Quality Association's (CASQA's) Municipal Stormwater Program Effectiveness Assessment Guide (CASQA, 2007). These outcome levels highlight the desired results of effective program implementation including documenting activities, raising awareness, and changing behavior to control pollution at the source. Specific assessment methods that will be implemented to track the effectiveness of BMPs include:

- Confirmation of BMP implementation/completion
- Tabulation of actions, participants, or items associated with each BMP
- Representative surveys of a population used to understand the attitudes, beliefs, or knowledge of that group
- Inspections/Direct Observations, particularly for construction sites, industrial facilities, etc.
- Monitoring of water quality

Outcome levels 1-3 are inherently less quantifiable than the other outcome levels described in the CASQA manual. As the County's stormwater program matures, assessments will begin to shift to higher outcome levels that require more data and discernible changes in loading and receiving water quality. It is recognized that the County's understanding of individual BMP effectiveness will, in turn, enable more accurate and meaningful measurable goals to be set in the future. Table 16 summarizes the specific effectiveness measures for each BMP.

Table 16. Effectiveness Measures of Guidance Document BMPs

	BMP ID	Effectiveness Measures
Public Education	PE 5	PE5A: Once developed, use the CBSM strategic plan to determine goal and effectiveness measure. PE5B: Information posted on the County website.
	PE 6	PE6A: Continue to provide educational materials to 100% of the restaurants, automobile service, mobile cleaning, contractor, landscape service and property management companies in the Permit coverage area. PE6B: Continue to post Business appropriate stormwater information on the County website (Y/N)
	PE 8	PE8A: Number of building permit applications for projects one acre or more in size receiving storm water information. PE8B: Stormwater information is posted on the County website (Y/N) PE8C: Advertise stormwater information to all contractors, builders and developers via P& B newsletters, website and other media as appropriate.

	BMP ID	Effectiveness Measures
	PE 10	PE10A: Number of presentations made to # of school children in # of schools. Include a list of school locations PE10B: Number of events Sammy attends.
	PE 12	PE12: Once developed, use the CBSM strategic plan to determine effectiveness measures; continue to post information of the web.
	PE 17	PE17A: Record the number of Information line calls received. Track the types of inquiries. PE17B: Record the number of Hotline calls received. Track the types of reports and inquiries and how they were resolved. PE17C: Track and record the Hotline response times for each type of violation.
	PE 18	PE18A: Number of Mutt Mitts provided throughout the year. PE 18B: Number of citations regarding pet waste violations of Ordinance. PE18C: Number of license renewals with pet waste management information and websites PE18D: Number of pet waste management pledges received or other result as defined by CBSM strategy. PE18E: Number of brochures provided to pet related outlets in the coverage areas and the number of calls received from outlets for more brochures. PE18F: Number of hits on pet waste management portion of website. PE18G: List organizations and programs promoted.
Illicit Discharge Detection and Elimination	IL 1	IL1A: Number of total Enforcement Actions, Number of Verbal Warnings, Number of Written Notices, Number and type of Escalated Enforcement Actions IL1B: Annually assess adequacy of ordinance in enforcing pet waste disposal requirements. (Y/N) IL1C: Track and trend annual enforcement reports. Violation types evaluated to measure effectiveness over time (Y/N)
	IL 4	IL4A: Number and type of violations. Track and record corrective actions (Y/N)
		IL4B: Number of inspections conducted and number of illicit connections and/or discharges detected. IL4C: Year, date, number and percentage of health inspectors trained to detect and report illicit discharges. Annual number and type of violations, corrective action taken and average response time; Preventive or corrective action needed. (Y/N) IL4D: Number and percentage of CUPA inspectors trained to detect and report illicit discharges. Number and type of violations, corrective action taken and average response time. IL4E: Enforcement and penalty system exists. (Y/N) Percentage of violations with follow up completed.
	IL 6	IL6A: Annually audit County facilities (Y/N) IL6B: Number of overflow events.
	IL 7	IL7A: Map completed and updated annually (Y/N) IL7B: Inspection and monitoring criteria are established. (Y/N) IL7C: Inspected 25% of County owned septic systems annually (Yes/No) IL7D: Summarize Los Osos Sewer Project status.
Municipal Operations	MO 2	MO2A: Amount of material collected and miles of streets swept. MO2B: Review data annually and record any schedule changes.
	MO 3	MO3A: Implement routine inspection and cleaning procedures and schedules for storm drain catchbasins and other components of the storm sewer system that require cleaning at least twice per year on an ongoing basis. MO3B: Number of storm drains cleaned per year, and amount of debris collected.
	MO 5	MO5A: Road and bridge Inventory is up to date. (Y/N) MO5B: Manual is being implemented. (Y/N) MO5C: Number and percentage of employees trained M05D: Number of pollutant discharges occurring during maintenance operations.
	MO 6	MO6A: Self inspection checklist created (Y/N) MO6B: Track number and percentage of County facilities inspected. MO6C: Track number and type of noncompliance conditions and the corrective actions.
	MO 11	MO11A: Track number of County audits per year and number of noncompliance conditions. MO11B: Number of revised procedures. MO11C: Annual compliance inspection conducted (Y/N)
Construction	CON 1	CON1A: Number and percentage of inspection and enforcement staff trained annually. CON1B: Number of construction sites subject to the Construction General Permit, compared to the number inspected
	CON 3	CON3A: Number of storm water inspections and complaints
	CON 4	CON4A: Information provided to each construction applicant. (Y/N)

	BMP ID	Effectiveness Measures
Post-Construction	PC 1	PC1A: Number of projects with PCRs
	PC 4	PC4A: Number of post-construction inspections verifying the run-off controls are being implemented and maintained PC4B: Percentage of sites PCR compliant. PC4C: Number/Percentage of sites self-certified for perpetual maintenance of storm water facilities
	PC 13	PC13A: Specific guidance on how to achieve and demonstrate compliance with the hydromodification control criteria and LID requirements has been made available to redevelopment and new project applicants. (Y/N) PC13B: Tracking Report indicating municipality's accomplishments in education and outreach supporting implementation of LID and hydromodification control for new and redevelopment projects. PC13C: Conduct education and outreach per the goals, schedules, and target audiences developed in support of enforceable mechanisms, hydromodification control criteria, applicability thresholds, LID BMP design, and compliance with LID and hydromodification control criteria.

Effectiveness measures for the additional BMPs specified in Section 4.2 are listed in Table 17. These measures, in addition to water quality sampling, will assist the County in assessing the effectiveness of these new BMPs.

Table 17. Effectiveness Measures of Additional WAAP BMPs Countywide

Additional BMP	Effectiveness Measures
Animal Facilities Management	Number of pamphlets distributed to targeted animal centers Countywide Number of on-site trainings provided by the County at targeted facilities within the County's MS4 jurisdiction
Commercial/Industrial Good Housekeeping Practices	Number of facilities inspected annually Number of violations recorded Number of dumpster enclosures covered
Fertilizer Management	Number of bilingual pamphlets distributed targeting fertilizer management Number of outreaches conducted at golf courses
Enhanced Pet Waste Control	Number of mutt-mitt stations installed at targeted locations each year Number of times mutt-mitt stations re-supplied annually
Water Conservation Inspections	Number of semi-annual inspections conducted in addition to roving inspections by field inspectors and road crews Locations/frequency of over-irrigation runoff Number of outdoor water use audits conducted Total violation notifications distributed for nuisance flows
Dry-weather MS4 Inspection Program	Update of GIS database showing all County MS4 facilities (storm drains and outfalls)

Additional BMP	Effectiveness Measures
	Observation log template to be used for annual MS4 outfall inspections created (Yes/No) Annual inspections conducted Number of MS4 outfalls discharging
Homeless Reduction/ Encampment Management	Annual inspection of homeless encampments conducted Records of type and volume trash in encampment areas Number/type of control measures to be implemented in encampment areas
Culvert Exclusion Fencing	Fencing installed around culvert (Yes/No) Semi-annual inspection of culvert Pounds of fecal material and trash removed

9.1 Quantification of BMP Bacteria Load Reductions

In addition to the approaches described above to measure the effectiveness of the additional BMPs, quantitative, modeling-based estimates of load reductions were developed for fecal coliform for each watershed. The reported values are approximate estimates of a range of BMP load reductions based on simplifying assumptions, limited available data, best professional judgment, and the current state of the practice for TMDL implementation planning quantification for urban stormwater dischargers. These reductions are reported as total annual load (e.g., MPN/year) and percent of "baseline" (or pre-BMP) County MS4 load for an average annual rain (for the period of record at each rain gage, See Appendix D). This was done for both dry and wet weather.

The watershed-wide and County MS4 Permit area existing (baseline) pollutant loads were estimated for bacteria using the rational method and land use-based pollutant concentrations. The wet weather baseline load was established using the average annual precipitation, land use specific runoff coefficients, and land use specific event mean concentrations for fecal coliform. The dry weather MS4 baseline load was calculated from land use-specific dry weather flow rates and bacteria concentrations; however, watershed-wide dry weather baseline loads were not estimated due to limited dry weather flow rate information. Appendix D describes the watershed-wide and MS4 Permit area bacteria baseline load estimates, assumptions, and methods (Appendices D-1 for San Luis Obispo Creek, D-2 for Morro Bay and D-3 for the Nipomo Creek).

The load reduction quantification approach for the additional suite of BMPs included in this WAAP is illustrated in

Figure 10. The first step was to calculate the load generated by the targeted bacteria source that the BMP will address. For many of the BMPs, the targeted bacteria source load was a percentage of the total bacteria baseline load (either wet or dry, depending on what the specific BMP is expected to address), which was established based on urban source tracking studies. If studies establishing a percentage of the total bacteria load from a targeted source were not available, an alternate approach to calculate the targeted bacteria source load was applied based on the amount of bacteria found in targeted source materials and the total quantity of targeted source materials present.

Once the targeted bacteria source load was calculated, the potential load reduction benefit was calculated using the estimated effectiveness of the selected BMP. These values were based on literature when available, otherwise they were based on best professional judgment. In both cases, predicted levels of uncertainty are high, though they represent the state of the practice based on recent Southern California MS4 bacteria TMDL implementation plans and watershed management plans. The following sections provide a brief description of the specific quantification approach for each additional BMP, along with relevant assumptions and explanations. Load reductions for some BMPs are not as readily quantifiable due to limited data. For example, there is a lack of knowledge about the extent of pollutant loading from homeless sources, animal facilities, and fertilizer use. In such instances, the BMPs addressing these sources were not quantified but may provide additional load reduction benefit beyond the estimates reported here. The MS4 bacteria load reduction estimates, assumptions, and methods for the additional BMPs included in this WAAP are described in Appendix E (Appendices E-1 for San Luis Obispo Creek, and E-2 for Morro Bay and E-3 for the Nipomo Creek).

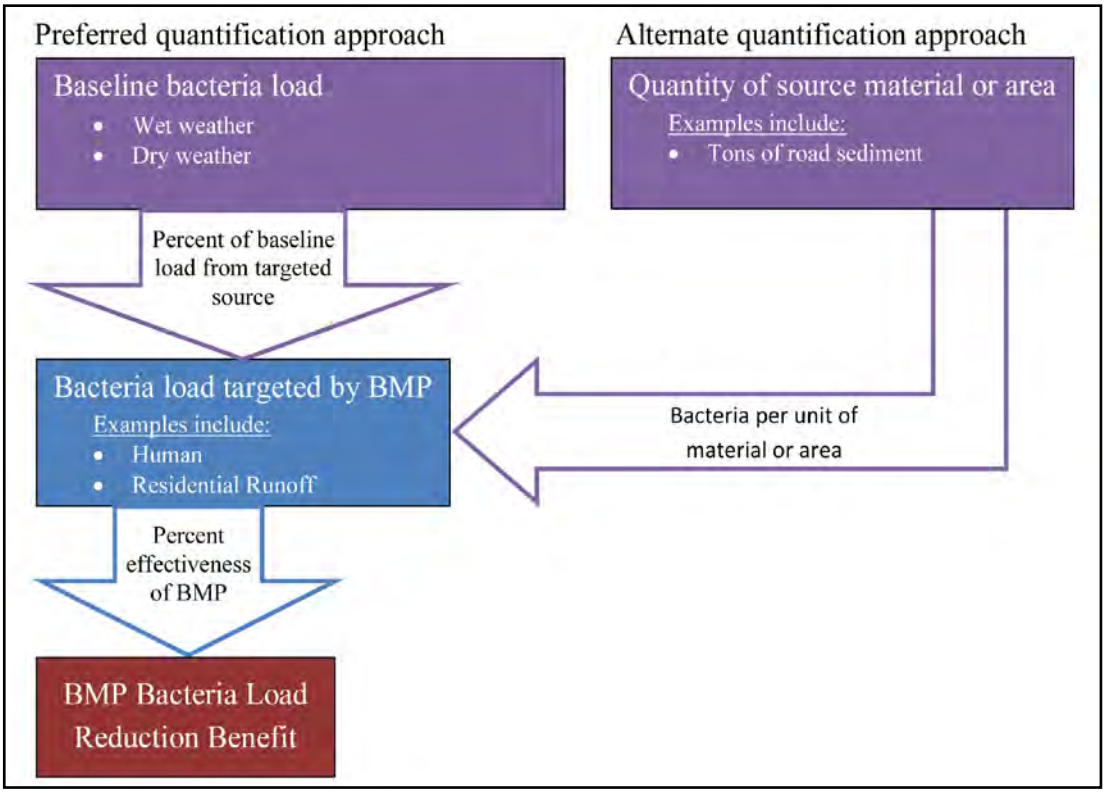


Figure 10. BMP Quantification Approach

9.1.1 Commercial/Industrial Targeted Inspections

The portion of the County dry weather fecal coliform load attributed to runoff from commercial areas was estimated using best professional judgment. A San Diego River study (Weston 2009) found that 15-27 percent of dry weather commercial flows are from commercial activities such as dumpster leaks and wash-down (i.e. not from irrigation runoff). The reduction achieved through inspections was based on the rate of inspection coverage, and the effectiveness of inspections found in the San Diego County Jurisdictional Urban Runoff Management Program annual report (County of San Diego 2011).

9.1.2 Enhanced Pet Waste Control and Pickup

To estimate reduction due to the pet waste program, the County's fecal coliform wet weather baseline load was reduced by the percent of bacteria having canine sources, as describe in section 4.2.4. Studies in Austin, TX and San Diego, CA (also described in section 4.2.4) present an estimated behavior change based on the implementation of this BMP.

9.1.3 Water Conservation Inspections

The dry weather loading of fecal coliform from irrigation runoff was determined using the same approach as for commercial activities runoff. The percent of bacteria loading from commercial and residential runoff was estimated using land use specific bacteria concentrations and flow rates, along with best professional judgment. Based on findings from the San Diego River source tracking study (Weston 2009), 59-80 percent of commercial and residential runoff is from irrigation. The implementation of this inspection-based BMP is estimated to reduce irrigation runoff from commercial and residential areas by 10 to 20 percent as found by IRWD (2004) in a study in Orange County.

9.1.4 Dry-weather MS4 Inspection Program

This BMP is based on the identification and control of sewer inputs and human wastes into the MS4 during dry weather. The quantification of the County's baseline dry weather load from human sources was divided into two periods: winter dry weather and summer dry weather. This distinction resulted from the findings of the Lower San Luis Rey Microbial Source Tracking Study (City of Oceanside, 2011). The Draft San Luis Rey Comprehensive Load Reduction Plan (Geosyntec Consultants, 2012) suggests that the percent of fecal bacteria having human sources was 5 to 20 percent during winter dry weather and 1 to 10 percent during summer dry weather. Although human source contributions were estimated for the Morro Bay watershed (36% for Los Osos Creek and 24% for Chorro Creek) and San Luis Obispo Creek watershed (27%) in each watershed's respective TMDL, these source tracking studies were not used because they do not specifically distinguish between wet and dry weather sources. Though it is believed that the source tracking results reflect dry weather, the uncertainty of the sample dates (wet vs. dry), locations (only within the downtown tunnel for San Luis Obispo Creek), and method (see Footnote 1 regarding DNA methodology), the more conservative human source percentages from previous findings in San Diego were used in this WAAPs calculations. Based on findings from the San Diego County Source Prioritization process (Ruby, 2011), it is estimated that 50-75% of the human bacteria load is contained within the pollutant generating activities addressed by this BMP. Best professional judgment was then used to estimate a reduction in sewage discharge based on implemented controls. This reduction rate was then applied to the annual estimated human sewage bacteria load to calculate a total reduction of the County's MS4 bacteria baseline load.

Another recent source tracking study in San Diego found that between 30-35% of outfalls were flowing during dry weather investigations (Geosyntec Consultants, 2014). Approximately 20-25% of the flowing outfalls test positive for a human marker. The outfalls that were positive for human markers were investigated and potential sources were identified.

9.2 Load Reduction Summary for Modeled BMPs

The County has judiciously chosen BMPs that are believed to be the most effective and efficient source control strategies to reduce pollutant loading and meet the TMDL WLAs, as feasible. The BMP selection and prioritization processes, which were described previously, were also based on an understanding of prioritized pollutant sources within the County MS4 area. Given the fact that many of these BMPs are source control-type BMPs for which little performance monitoring data are published, it is difficult to quantitatively estimate expected performance (e.g., load reductions resulting from source control implementation). However, in an effort to quantitatively estimate the impact of the County BMP program on bacteria loading in the targeted watersheds, a quantitative assessment was carried out, as described in detail in Section 9 with the watershed-wide results summarized in Table 18. This assessment was based on published estimates of nonstructural BMP performance. Detailed results can be found in Appendices D and E.

Table 18. Summary of MS4 Load Reductions

Watershed	Percent of Watershed Load from County's MS4[1]	Average Annual Wet Weather MS4 Load Reduction		Average Annual Dry Weather MS4 Load Reduction	
		Fecal Coliform Per Year (10^12 MPN)	Percent Reduction of County's MS4 Load	Fecal Coliform Per Year (10^12 MPN)	Percent Reduction of County's MS4 Load
San Luis Obispo Creek	12%	4.9 - 73	0.5 to 7%	0.030 - 0.18	3.3% to 20%
Morro Bay	11%	5.5 - 82	0.5% to 7%	0.026 - 0.15	3.3% to 19%
Nipomo Creek	9%	1.1 - 17	0.4% to 7%	0.01 - 0.04	3% to 19%

1. The percent of the watershed areas within the County MS4 areas are about the same as the percent of the watershed load from the County's MS4 load.

10. Adaptive Management

The WAAP adaptive management approach for the County MS4 Permit area is designed to address the WAAP planning process and the relationship between monitoring, scheduling, and BMP planning. The adaptive management process outlines how the WAAP will be modified in response to monitoring results, special studies, and lessons learned from BMP implementation. It is designed to accomplish three goals:

1. Clarify the short-term and long-term commitments of the County within the WAAP.
2. Provide a structured decision-making process for modifications to the WAAP based on the results of monitoring data.
3. Propose a structure for evaluating compliance with water-quality based Permit requirements within an adaptive structure.

As described in Section 7, the BMPs identified in this WAAP have been designed around meeting the interim and final WLAs through one or multiple of the proposed compliance pathways. While the WAAP identifies actions that will lead to compliance with the final TMDL WLAs, the specific actions taken will be

informed by monitoring data collected under the monitoring program, special studies that may be conducted during implementation, and any applicable regulatory changes that could influence the remaining interim and final milestones and schedule. For example, bacteria is prevalent throughout these watersheds including numerous natural, non-anthropogenic, non-MS4 sources. Therefore, the County may consider options to perform special studies to evaluate the bacteria WLAs. Through the adaptive management process, the WAAP may be reevaluated after any changes to the statewide objectives, TMDL WLAs, and/or Permit limits.

Monitoring data will be utilized to measure progress towards achieving WLAs. An evaluation of monitoring data will be carried out on an annual basis to determine if modifications to the WAAP are necessary. Modifications that are warranted because final WLAs are achieved more quickly than anticipated can be made at any time (i.e. no more actions are needed if fewer control measures result in meeting WLAs). Modifications that are warranted because insufficient progress is being made will be addressed in the annual report and a schedule for additional BMP implementation will be provided.

If at any point during the implementation period the Permit conditions are modified in response to a regulatory action, TMDL modification, or local studies, the receiving water and outfall sampling data will be compared to the new water quality objectives. The same procedure will be followed for evaluating the data and adapting the WAAP, but the new objectives will be used for the analysis.

This adaptive management process applies during the implementation period for this WAAP. At the end of the implementation period, if the final WLAs are not being met, either the TMDL must be modified to adjust the schedule or the County will need to apply for a Time Schedule Order or other mechanism to get an extension of the compliance deadlines. This WAAP will then be modified accordingly.

11. Reporting

The County must submit annual reports to the Regional Board by October 15th of each year as directed under the Permit. This report will summarize the activities performed for the reporting period (currently July 1 – June 30). Each report will include:

- The status of compliance with Permit conditions;

- An assessment of the appropriateness and effectiveness of the identified BMPs, including new BMPs identified in this WAAP;
- The status of all identified measurable goals;
- The results of information collected and analyzed, including monitoring data, if any, during the reporting period;
- A summary of the stormwater activities the Permittee plans to undertake during the next reporting cycle, and;
- A summary of any meetings or other correspondence that the County has had with Regional Board staff and other stakeholders regarding progress on the TMDLs.

12. Coordination

The County will continue its cooperation with Federal, State, and local agencies and non-profit organizations to implement this WAAP. Monitoring efforts, which are an extensive part of the WAAP, will be carried out by the County, the City of San Luis Obispo, Cal Poly and the Regional Board through CCAMP, along with agencies such as the Morro Bay Shellfish Technical Advisory Committee, MBNEP, and DHS. The County will collaborate with these agencies to gather monitoring data in an efficient matter so as to track the effectiveness of each BMP in attaining TMDL objectives. As necessary, meetings will be held with agencies, stakeholders, and the public to ensure that progress is being made toward WAAP objectives.

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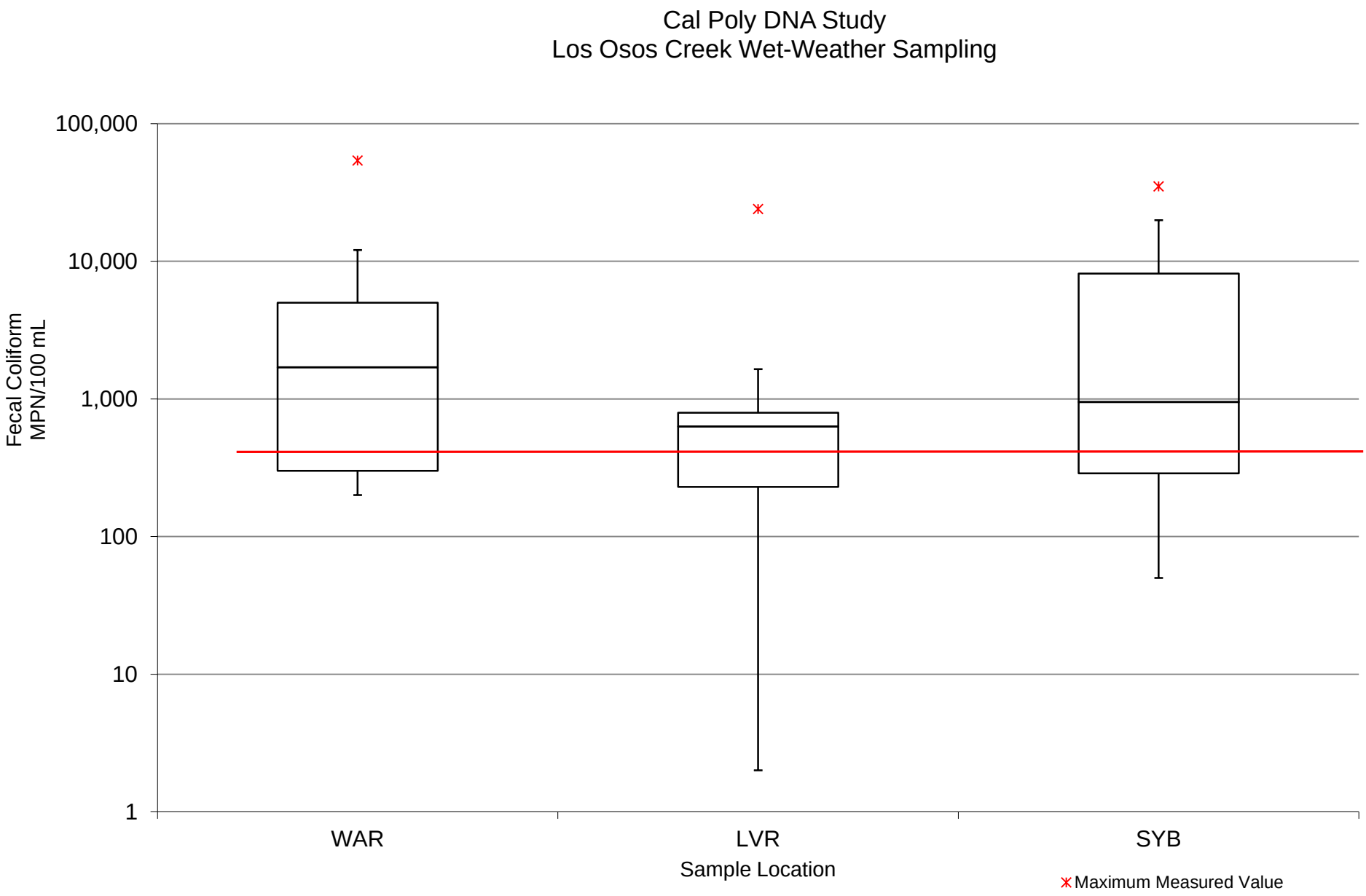
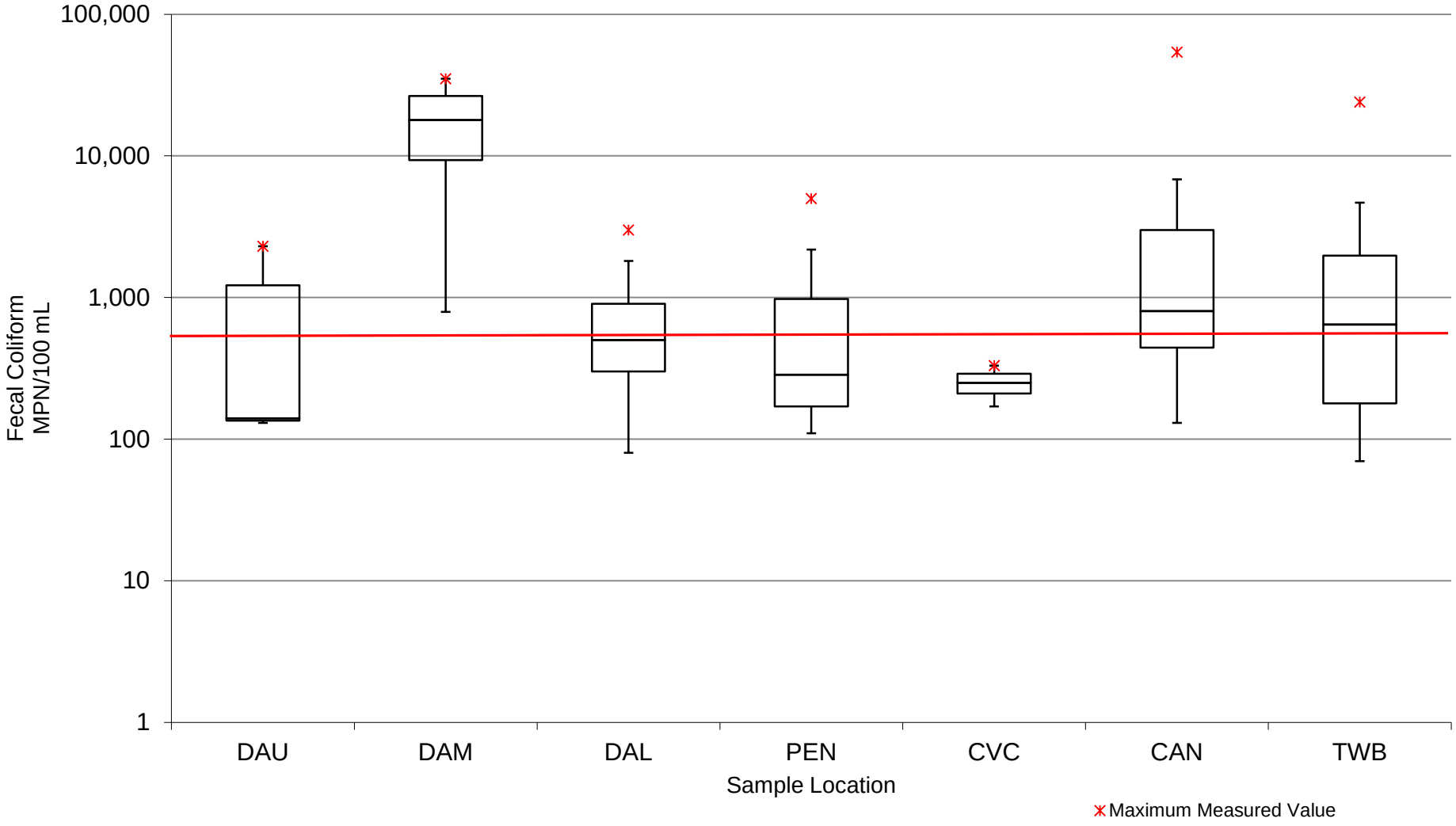
Appendix A

Box Plots for Fecal Coliform Bacteria from DNA Study



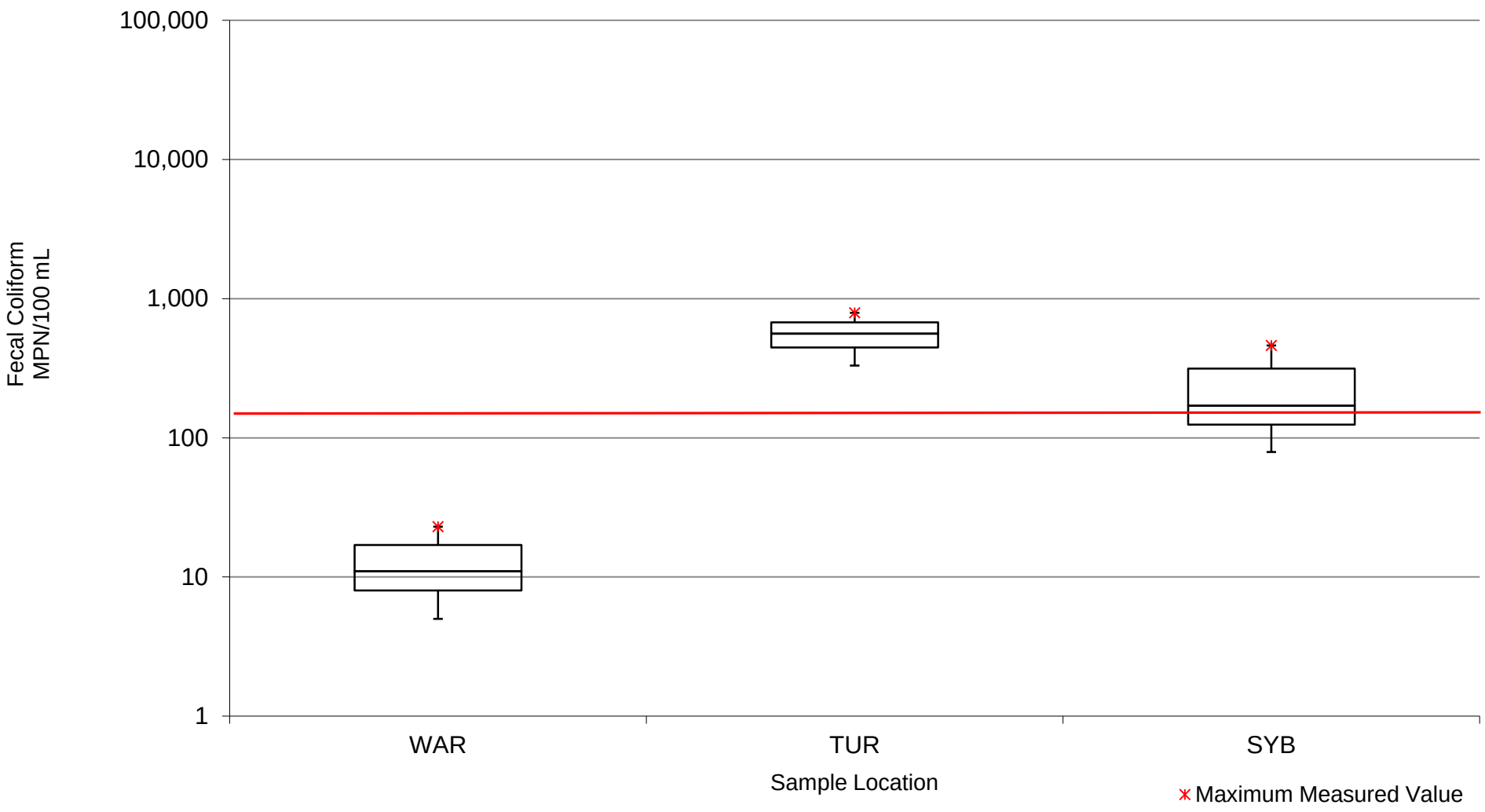
- Boxes indicate the median or 50th percentile value (middle horizontal line), the upper quartile or 75th percentile value (top horizontal line), and the lower quartile or 25th percentile value (bottom horizontal line). Whiskers indicate 1.5 times the interquartile range (e.g., lower whisker reflects 1.5 times the difference between the 25th and 50th percentile values).
- Number of samples varies between 7 and 13 samples at each site.

Cal Poly DNA Study
Chorro Creek Wet-Weather Sampling

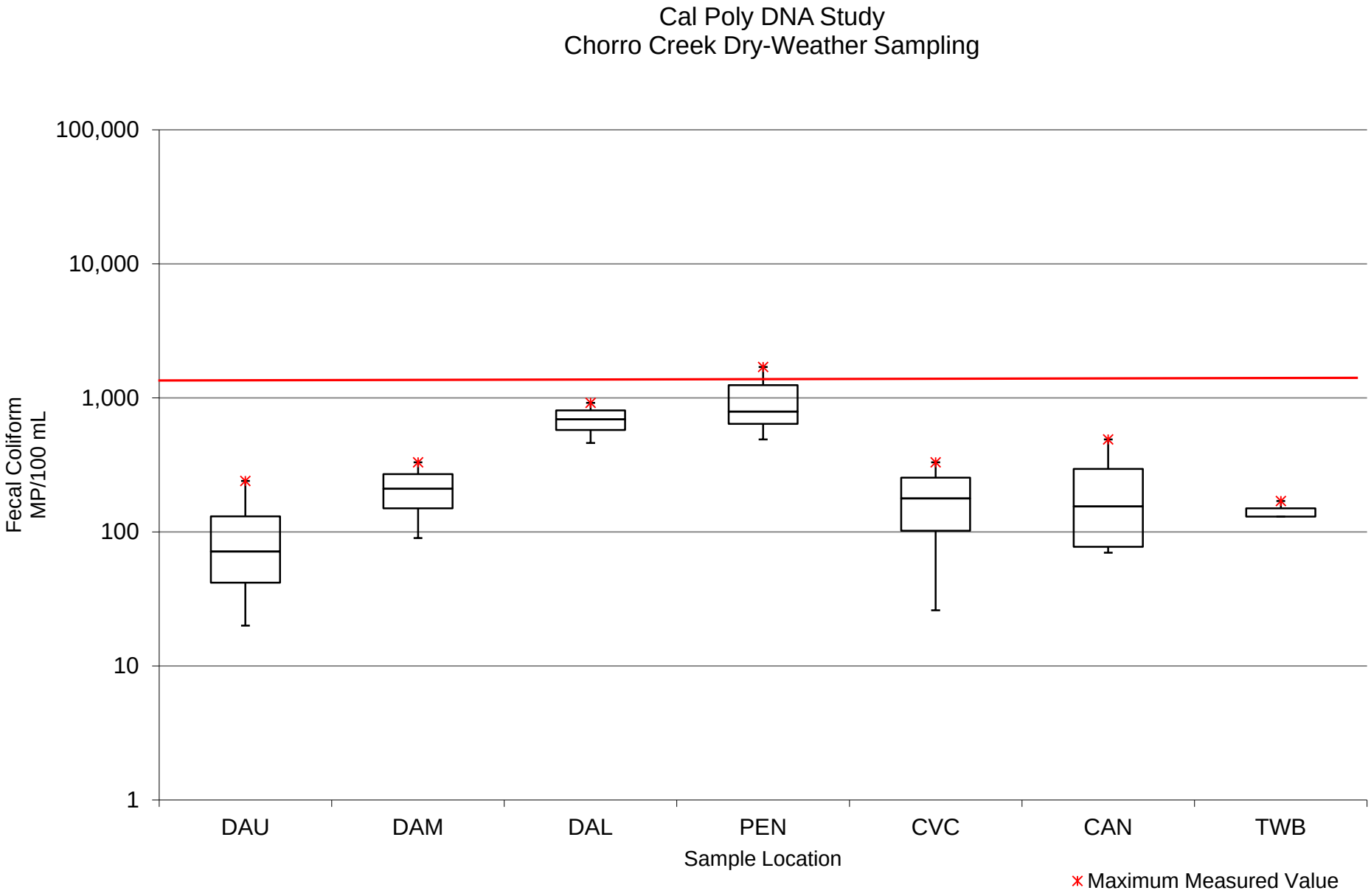


- Boxes indicate the median or 50th percentile value (middle horizontal line), the upper quartile or 75th percentile value (top horizontal line), and the lower quartile or 25th percentile value (bottom horizontal line). Whiskers indicate 1.5 times the interquartile range (e.g., lower whisker reflects 1.5 times the difference between the 25th and 50th percentile values).
- Number of samples varies between 2 and 14 samples at each site.

Cal Poly DNA Study
Los Osos Creek Dry-Weather Sampling



- Boxes indicate the median or 50th percentile value (middle horizontal line), the upper quartile or 75th percentile value (top horizontal line), and the lower quartile or 25th percentile value (bottom horizontal line). Whiskers indicate 1.5 times the interquartile range (e.g., lower whisker reflects 1.5 times the difference between the 25th and 50th percentile values).
- Number of samples varies between 2 and 3 samples at each site.



- Boxes indicate the median or 50th percentile value (middle horizontal line), the upper quartile or 75th percentile value (top horizontal line), and the lower quartile or 25th percentile value (bottom horizontal line). Whiskers indicate 1.5 times the interquartile range (e.g., lower whisker reflects 1.5 times the difference between the 25th and 50th percentile values).
- Number of samples varies between 2 and 4 samples at each site.

Appendix B

Field Observation Logs

Appendix B-1

Field Observation Logs

San Luis Obispo Creek Watershed Field Visit

July 30, 2012

LA0251: San Luis Obispo TMDL Support - Field Log

Location Cuesta Park

Date 7/30/2012 Weather: Sunny and clear

Arrival Time 11:30 AM Other Observations:

Staff Present Avery Blackwell (Geosyntec)

Photo Log

Photo Number	Time Taken	Description
Cuesta Park (1)	11:38 AM	SLO Creek downstream of Cuesta Park just before tunnel under Highway 101
Cuesta Park (2)	11:32 AM	Cuesta Park entrance to Highway 101 tunnel
Cuesta Park (3)	11:35 AM	San Luis Drive exit to Highway 101 tunnel
Cuesta Park (4)	11:34 AM	Storm drain from Highway 101 to SLO Creek after tunnel
Cuesta Park (5)	11:40 AM	Storm drain from Highway 101 to SLO Creek in Cuesta Park
Cuesta Park (6)	11:46 AM	Water faucet in picnic areas, draining to creek
Cuesta Park (7)	11:47 AM	2nd water faucet in picnic areas, draining to creek
Cuesta Park (8)	11:47 AM	Group picnic area
Cuesta Park (9)	11:50 AM	Upper group picnic area
Cuesta Park (10)	11:56 AM	Dumpsters in parking lot
Cuesta Park (11)	11:28 AM	Dog bag dispenser
Cuesta Park (12)	11:33 AM	Bird nest in Highway 101 tunnel
Cuesta Park (13)	11:49 AM	Kids playing the creek

Field Observations

Flows Present (Y/N)? None

Seeps Present (Y/N)? None

Noticeable Odors (Y/N)? None

Debris Accumulation (Y/N)? None

Following Observed:

Dumpsters? All clean and in place

Washouts?

Inlets?

Outlets?

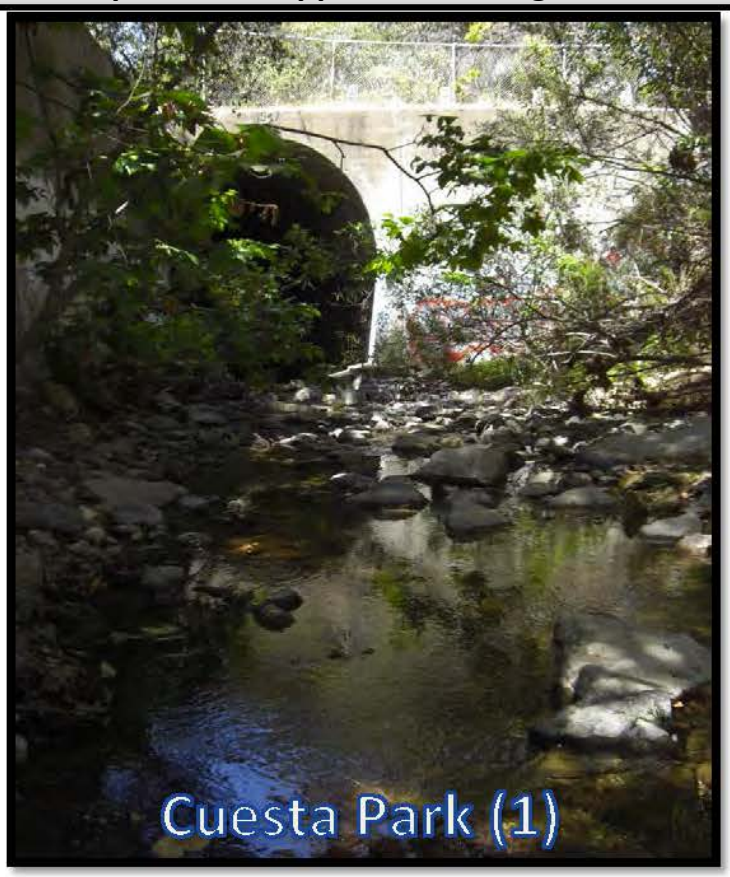
Animals? Dogs playing in the creek, two nests in downstream tunnel

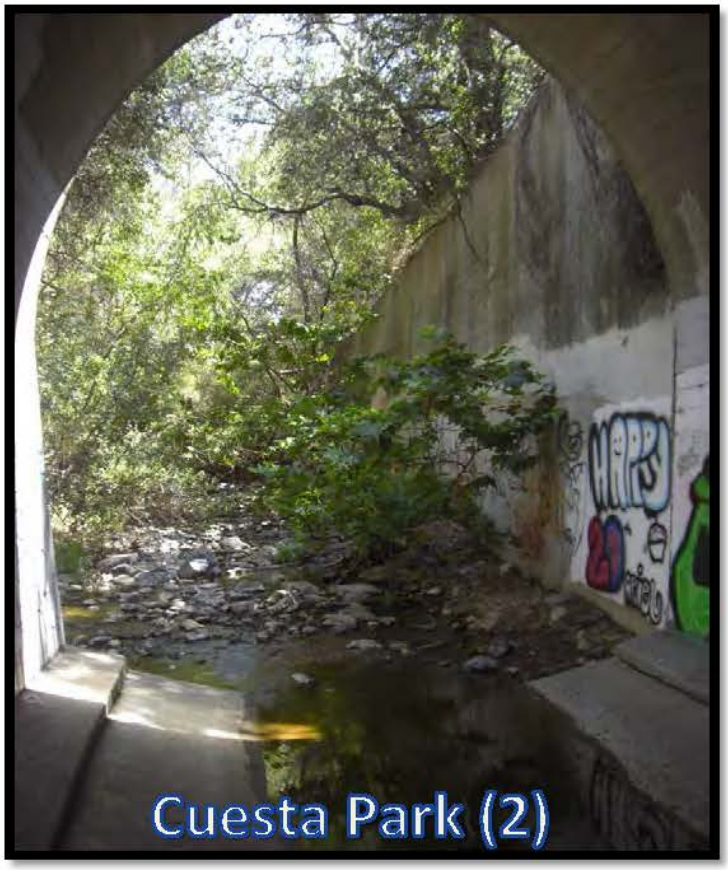
Notes

All picnic areas were thoroughly clean and well maintained

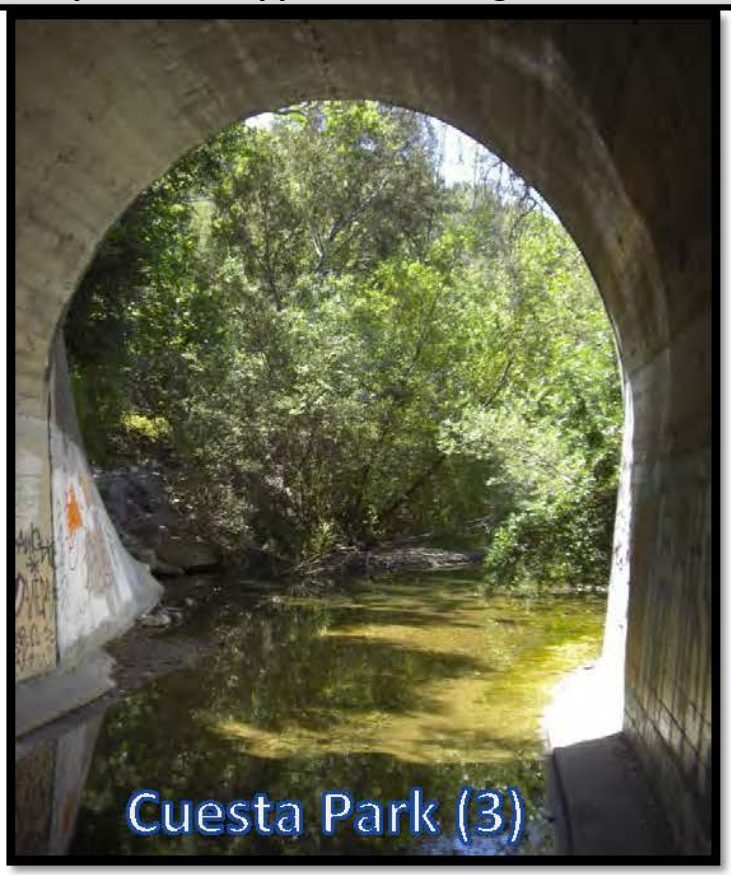
Two dog bag dispensers

LA0251: San Luis Obispo TMDL Support - Field Log Photos





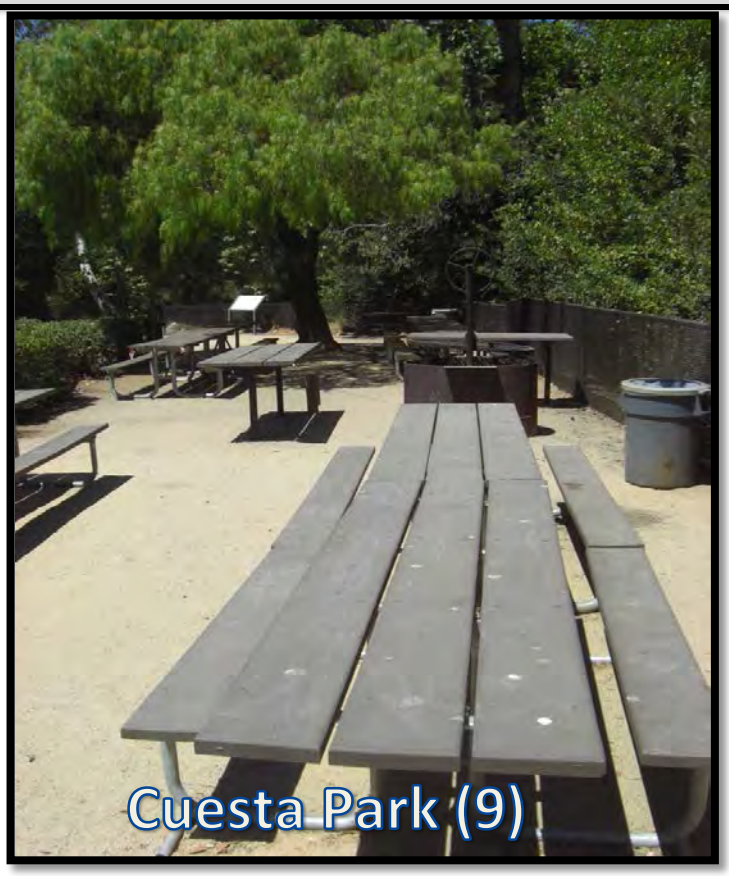
LA0251: San Luis Obispo TMDL Support - Field Log Photos



LA0251: San Luis Obispo TMDL Support - Field Log Photos

LA0251: San Luis Obispo TMDL Support - Field Log Photos

LA0251: San Luis Obispo TMDL Support - Field Log Photos



LA0251: San Luis Obispo TMDL Support - Field Log Photos

Cuesta Park (11)

Cuesta Park (12)

LA0251: San Luis Obispo TMDL Support - Field Log Photos

LA0251: San Luis Obispo TMDL Support - Field Log

Location Airport Commercial Areas

Date 7/30/2012 Weather: Sunny and clear

Arrival Time 12:30 AM Other Observations:

Staff Present Avery Blackwell (Geosyntec)

Photo Log

Photo Number	Time Taken	Description
Commercial (1)	12:35 PM	Commercial storm drain
Commercial (2)	12:42 PM	Sign of dry weather flow in parking area
Commercial (3)	12:43 PM	Dumpsters in commercial parking area
Commercial (4)	12:44 PM	Storage pond behind commercial area
Commercial (5)	12:44 PM	Algae floating in storage pond
Commercial (6)	12:45 PM	Dry creek downstream of storage area
Commercial (7)	12:45 PM	Outlet from storage pond
Commercial (8)	12:46 PM	Commercial area car wash down area, looks to be linked to sewer
Commercial (9)	12:53 PM	Sign of dry weather flow in parking area
Commercial (10)	12:53 PM	Irrigation runoff
Commercial (11)	12:54 PM	Sign of dry weather flow in parking area

.

Field Observations

Flows Present (Y/N)? Yes and
Significant signs of dry weather flows in the parking areas

Seeps Present (Y/N)? None

Noticeable Odors (Y/N)? None

Debris Accumulation (Y/N)? None

Following Observed:

Dumpsters? Most clean, in place, with lids closed

Washouts? 1 well maintained

Inlets?

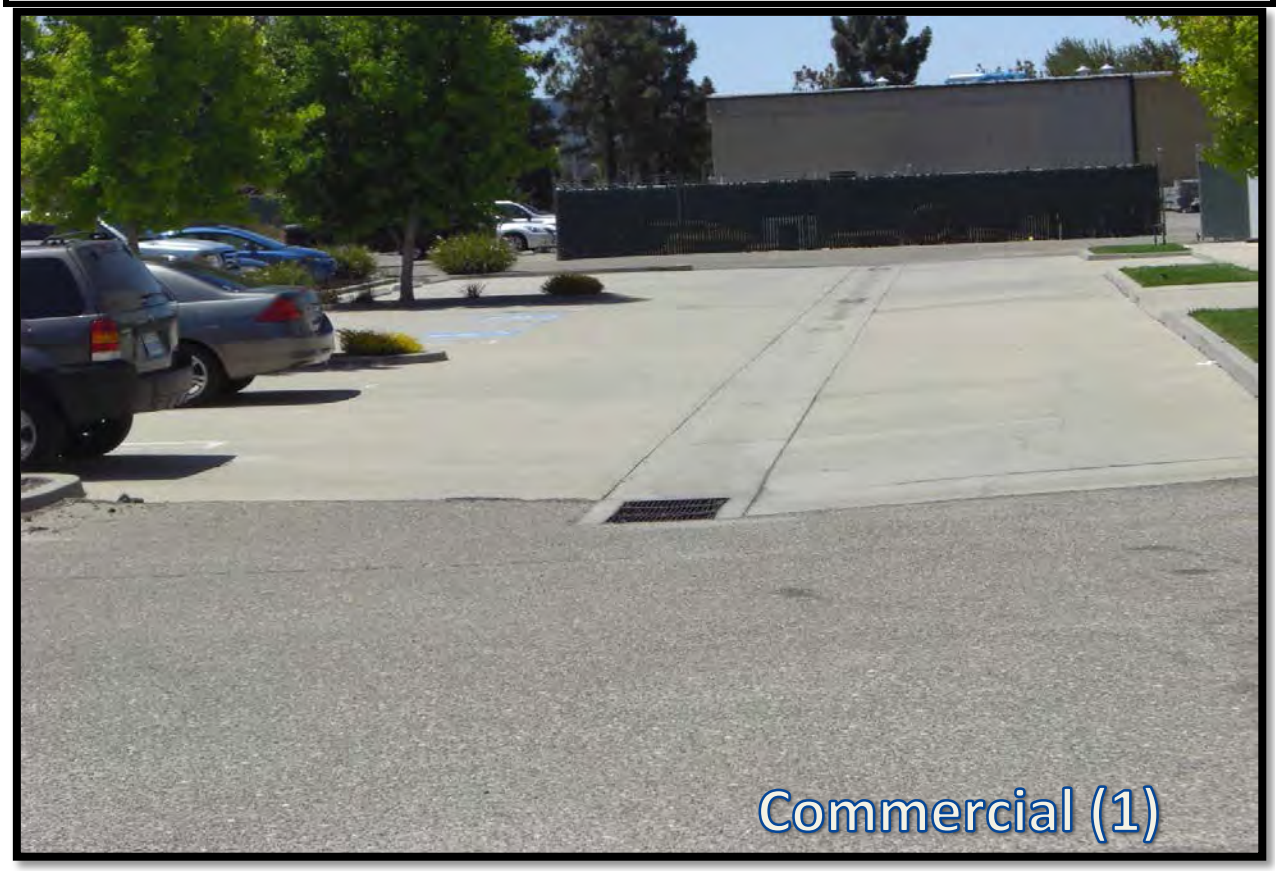
Outlets?

Animals?

Notes

The creek was dry behind most of the commercial areas at time of visit

LA0251: San Luis Obispo TMDL Support - Field Log Photos



LA0251: San Luis Obispo TMDL Support - Field Log Photos

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LA0251: San Luis Obispo TMDL Support - Field Log Photos

LA0251: San Luis Obispo TMDL Support - Field Log

Location See Canyon and Bob Jones Bike Trail

Date 7/30/2012 Weather: Sunny and clear

Arrival Time 3:45 PM Other Observations:

Staff Present Avery Blackwell (Geosyntec)

Photo Log

Photo Number	Time Taken	Description
See Canyon (1)	3:45 PM	See Canyon Creek at San Luis Bay Drive
Bike Trail (1)	3:51 PM	Storm drain outlet at San Luis Bay Drive and Avila Beach Drive
Bike Trail (2)	3:51 PM	San Luis Bay Drive over SLO Creek
Bike Trail (3)	3:54 PM	Dog bag dispenser on Bob Jones Bike Trail
Bike Trail (4)	3:58 PM	Storm drain with dry weather flows into SLO Creek
Bike Trail (5)	4:00 PM	Dry weather flow assumed from irrigation runoff
Bike Trail (6)	4:01 PM	Algae covering SLO creek

.

Field Observations

Flows Present (Y/N)? Yes

1 storm drain flowing into creek

Seeps Present (Y/N)? None

Noticeable Odors (Y/N)? None

Debris Accumulation (Y/N)? None

Following Observed:

Dumpsters?

Washouts?

Inlets?

Outlets?

Animals? Horses, cows, chickens observed roaming free along side creek in See Canyon

Lots of dogs walking on trail

Notes

Many orchards and livestock lining creek in See Canyon

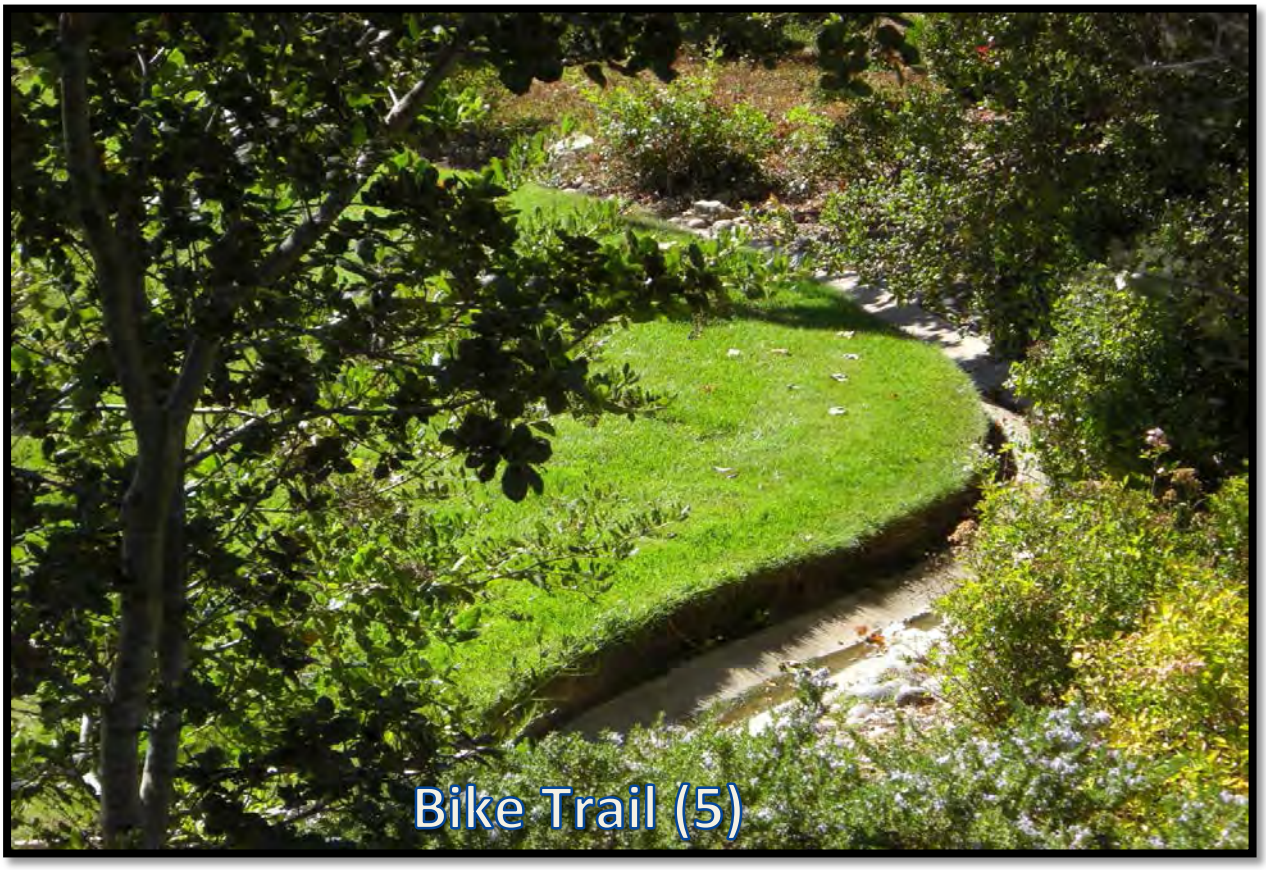
Dog Bag dispenser empty on Bike Trail

Lots of algae growing in the creek along the Bike Trail

LA0251: San Luis Obispo TMDL Support - Field Log Photos

LA0251: San Luis Obispo TMDL Support - Field Log Photos

LA0251: San Luis Obispo TMDL Support - Field Log Photos



LA0251: San Luis Obispo TMDL Support - Field Log Photos

LA0251: San Luis Obispo TMDL Support - Field Log

Location Avila Beach

Date 7/30/2012 Weather: Sunny and clear

Arrival Time 4:15 PM Other Observations:

Staff Present Avery Blackwell (Geosyntec)

Photo Log

Photo Number	Time Taken	Description
Avila Beach (1)	4:23 PM	Main storm drain outlet into SLO Creek
Avila Beach (2)	4:18 PM	Storm drain inlet on Avila Beach Drive
Avila Beach (3)	4:56 PM	Dry weather flow in gutter
Avila Beach (4)	4:47 PM	Additional dry weather flows
Avila Beach (5)	4:45 PM	Storm drain flows
Avila Beach (6)	4:45 PM	Storm drain heading towards SLO Creek
Avila Beach (7)	4:52 PM	Back of a restaurant
Avila Beach (8)	4:51 PM	Signs of grease/other debris on driveway
Avila Beach (9)	4:51 PM	BBQ parked over storm drain
Avila Beach (10)	4:50 PM	Storm drain filled with grease
Avila Beach (11)	4:24 PM	Creek water with black film
Avila Beach (12)	4:37 PM	Interface of SLO creek (right) and the ocean (left)

Field Observations

Flows Present (Y/N)? Yes,
Lots of water flowing into gutters and to storm drains

Seeps Present (Y/N)? Yes

Noticeable Odors (Y/N)? None

Debris Accumulation (Y/N)? Inlets contained screens that had a fair amount of debris and sand

Following Observed:

Dumpsters? All clean and in place

Washouts?

Inlets? Screen coverings

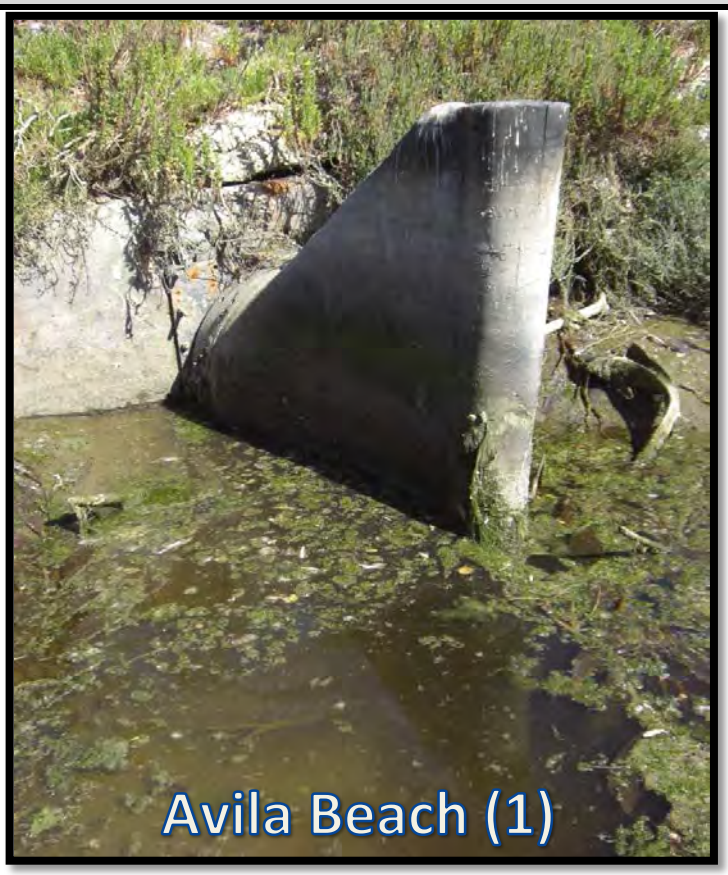
Outlets? No storm drain outlets along the beach

Animals?

Notes

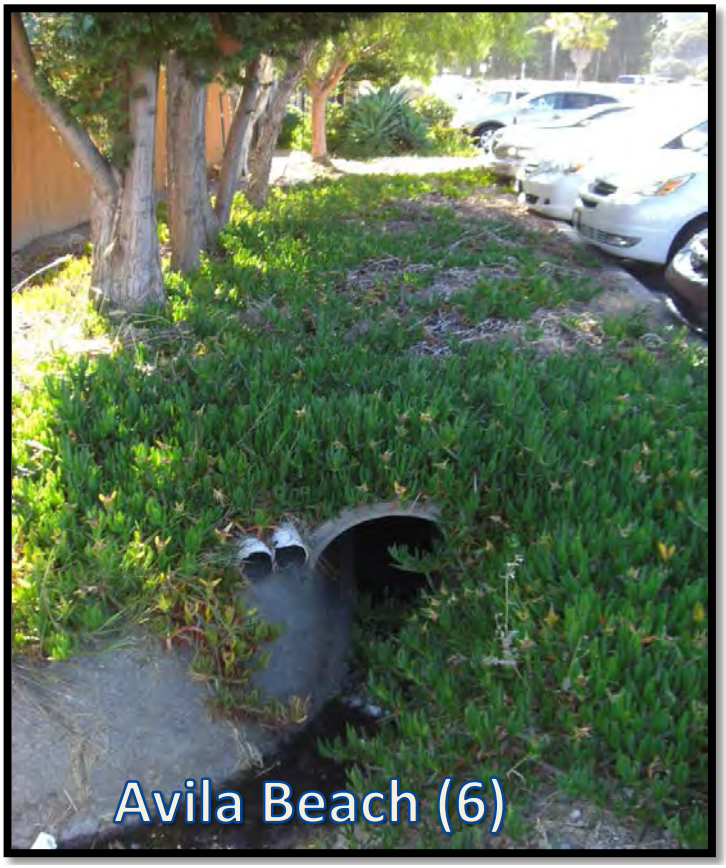
The main storm drain outlet for Avila Beach had water flow from it

LA0251: San Luis Obispo TMDL Support - Field Log Photos

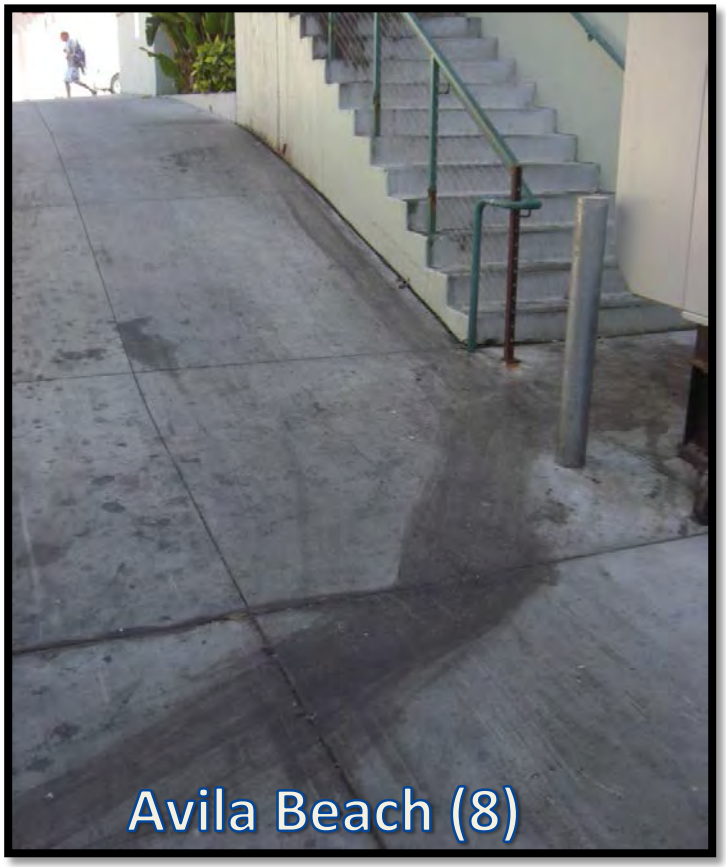


LA0251: San Luis Obispo TMDL Support - Field Log Photos

LA0251: San Luis Obispo TMDL Support - Field Log Photos



LA0251: San Luis Obispo TMDL Support - Field Log Photos



LA0251: San Luis Obispo TMDL Support - Field Log Photos

LA0251: San Luis Obispo TMDL Support - Field Log Photos

LA0251: San Luis Obispo TMDL Support - Field Log

Location Davenport Creek and Downstream of the City of SLO

Date 7/30/2012 Weather: Sunny and clear

Arrival Time 5:45 PM Other Observations:

Staff Present Avery Blackwell (Geosyntec)

Photo Log

Photo Number	Time Taken	Description
Davenport (1)	5:45 PM	Storm drain inlet (1) for upper Davenport Creek neighborhood
Davenport (2)	5:45 PM	Davenport Creek below storm drain (1)
Davenport (3)	5:48 PM	Storm drain outlet (2) for upper Davenport Creek neighborhood
Davenport (4)	5:48 PM	Storm drain inlet (2) for upper Davenport Creek neighborhood
DS of City (1)	6:04 PM	Trash under South Higuera Bridge of SLO Creek
DS of City (2)	6:04 PM	SLO Creek under South Higuera Bridge
DS of City (3)	6:05 PM	Signs of homeless under South Higuera Bridge

Field Observations

Flows Present (Y/N)? No

Seeps Present (Y/N)? No

Noticeable Odors (Y/N)? None

Debris Accumulation (Y/N)? No

Following Observed:

Dumpsters?

Washouts?

Inlets?

Outlets?

Animals?

Notes

Davenport creek dry between upper neighborhood and SLO creek

Trash and homeless observed under South Higuera Bridge

LA0251: San Luis Obispo TMDL Support - Field Log Photos

LA0251: San Luis Obispo TMDL Support - Field Log Photos

LA0251: San Luis Obispo TMDL Support - Field Log Photos

LA0251: San Luis Obispo TMDL Support - Field Log Photos

Appendix B-2

Field Observation Logs

Morro Bay Watershed Field Visit

March 29, 2012

LA0251: San Luis Obispo TMDL Support - Field Log

Location	Private Animal Facility		
Date	3/29/2012	Weather:	Sunny
Arrival Time	12:45 PM/2:50 PM	Other Observations:	
Staff Present	Chris Wessel (Geosyntec)	Mark Davis (County)	
	Avery Blackwell (Geosyntec)		
	Mary Whittlesey (County)		

Photo Log

Photo Number	Time Taken	Description
DSC 0473	2:53 PM	Horse corrals on Solano St.
DSC 0451	12:45 PM	Unloading horses in parking lot
DSC 0494	3:06 PM	Horse wash down area
DSC 0493	3:06 PM	Horse feces on edge of wash down area
DSC 0491	3:06 PM	Horse feces on edge of wash down area

Field Observations

Flows Present (Y/N)?	None
Seeps Present (Y/N)?	None
Noticeable Odors (Y/N)?	Yes
Debris Accumulation (Y/N)?	Yes - Horse feces in corrals, wash down area, and on the street
Following Observed:	
Dumpsters?	
Washouts?	
Inlets?	Immediately downstream of stables
Outlets?	
Animals?	Horses - In corrals, unloading in parking lot, and on the street

Notes

Horese excrement observed along Salano St. and Butte Dr, and also along the hiking trail due west of Butte Drive.

Mutliple riders were seen along the streets; although waste was seen, there was no sign of proper disposal of waste

No sign of excrement cleanup in stables; no BMPs preventing off-site tracking or run-on/run-off controls

LA0251: San Luis Obispo TMDL Support - Field Log


DSC 0494


DSC 0493


DSC 0491

LA0251: San Luis Obispo TMDL Support - Field Log

Location	El Chorro Regional Park and Dairy Creek Golf Course		
Date	3/29/2012	Weather:	Sunny
Arrival Time	11:45 AM	Other Observations:	
Staff Present	Chris Wessel (Geosyntec)	Mark Davis (County)	
	Avery Blackwell (Geosyntec)		
	Mary Whittlesey (County)		

Photo Log

Photo Number	Time Taken	Description
DSC 0404	11:51 AM	Dog wash area adjacent to Dairy Creek
DSC 0411	12:00 PM	Dairy Creek leaving Chorro Park
DSC 0413	12:05 PM	Golf course "Zero Waste" compost facility
DSC 0421	12:06 PM	Golf course/Men's colony WWTP recycled water pond
DSC 0426	12:07 PM	Recycled water pond overflow outlet

Field Observations

Flows Present (Y/N)?	Dairy creek was running
	Recycled water pond overflow outlet was discharging
Seeps Present (Y/N)?	Significant seeps draining from recycled water pond into a storm drain
Noticeable Odors (Y/N)?	None
Debris Accumulation (Y/N)?	None
Following Observed:	
Dumpsters?	Clean and in place
Washouts?	
Inlets?	
Outlets?	
Animals?	Dog wash area (where dogs bathe in small bath tubs) is approximately 10-15 feet upslope from the creek
	Ducks swimming in recycled water pond

Notes

There was a small amount of algae and sludge on the banks of the recycled water pond.

There is a campsite next to the golf course, but all sites have direct hookups to the septic system, which is pumped to the Men's Colony WWTP.

The dog park is equipped with signs to pickup after your dog, doggie bags, and trash cans, but dog feces were still observed on the ground.

The dog park is directly adjacent to dairy creek. The dog wash area may cause direct discharges to the creek

LA0251: San Luis Obispo TMDL Support - Field Log Photos

LA0251: San Luis Obispo TMDL Support - Field Log Photos

LA0251: San Luis Obispo TMDL Support - Field Log Photos

LA0251: San Luis Obispo TMDL Support - Field Log

Location Los Osos Commercial Areas

Date 3/29/2012 Weather: Sunny

Arrival Time 3:00 PM Other Observations:

Staff Present Chris Wessel (Geosyntec)

Avery Blackwell (Geosyntec)

Photo Log

Photo Number	Time Taken	Description
DSC 502	3:23 PM	Trash area with grease bins and burned out stove
DSC 504	3:31 PM	Grease bins in a trash area
DSC 505	3:31 PM	Leaking dumpster
DSC 507	3:32 PM	Storm drain with trash enclosure of leaking dumpster in the background
DSC 513	3:51 PM	Typical trash enclosure area
DSC 514	3:53 PM	Dumpsters not enclosed

Field Observations

Flows Present (Y/N)? Observed from one dumpster area

Seeps Present (Y/N)? None

Noticeable Odors (Y/N)? Yes- in trash receptacle area with waste drums (see photos 504 and 505)

Debris Accumulation (Y/N)? Some around trash cans (see photos)

Following Observed:

Dumpsters? Mostly clean and in place; mostly covered; two dumpsters had trash outside the dumpster

Washouts?

Inlets? Clean

Outlets?

Animals?

Notes

Most dumpsters appeared to be in excellent shape in the commercial vicinity of Los Osos. Most were covered

One dumpster location (NE corner of Los Osos Valley Parkway and Fairchild Way) contained two full, open food waste bins; these are a likely source for bacteria (see photo 504). This dumpster facility also had trash overflowing the dumpsters, and water leaking from the dumpster (see photo 505)

A second dumpster area (located at 905 Los Osos Valley Road) contained two grease bins, though these were empty and covered

LA0251: San Luis Obispo TMDL Support - Field Log Photos

LA0251: San Luis Obispo TMDL Support - Field Log Photos

LA0251: San Luis Obispo TMDL Support - Field Log Photos

LA0251: San Luis Obispo TMDL Support - Field Log

Location	SLO County Juvenile and Animal Services, Kansas Yard		
Date	3/29/2012	Weather:	Sunny
Arrival Time	10:30 AM	Other Observations:	
Staff Present	Chris Wessel (Geosyntec)	Mark Davis (County)	
	Avery Blackwell (Geosyntec)		
	Mary Whittlesey (County)		

Photo Log

Photo Number	Time Taken	Description
DSC 0365	10:45 AM	Sludge and water in a storm drain
DSC 0363	10:45 AM	Growing grounds of Juvenile facilities
DSC 0381	11:09 AM	County fleet car wash
DSC 0385	11:11 AM	Creek running through site
DSC 0392	11:22 AM	Animal Services truck and carrier washout area
DSC 0396	11:23 AM	Storm drain in Animal Services washout area
DSC 0398	11:26 AM	Humane society storm channel flowing onto street
DSC 0399	11:26 AM	Debris build up from the humane society
DSC 0390	11:21 AM	Doggie bags and trash cans

Field Observations

Flows Present (Y/N)?	Car wash flows in parking lot
	Creek flowing through site
Seeps Present (Y/N)?	No
Noticeable Odors (Y/N)?	No
Debris Accumulation (Y/N)?	Sludge in several of the storm drains
	Build up from humane society runoff
Following Observed:	
Dumpsters?	Clean
Washouts?	
Inlets?	Debris often found
Outlets?	
Animals?	

Notes

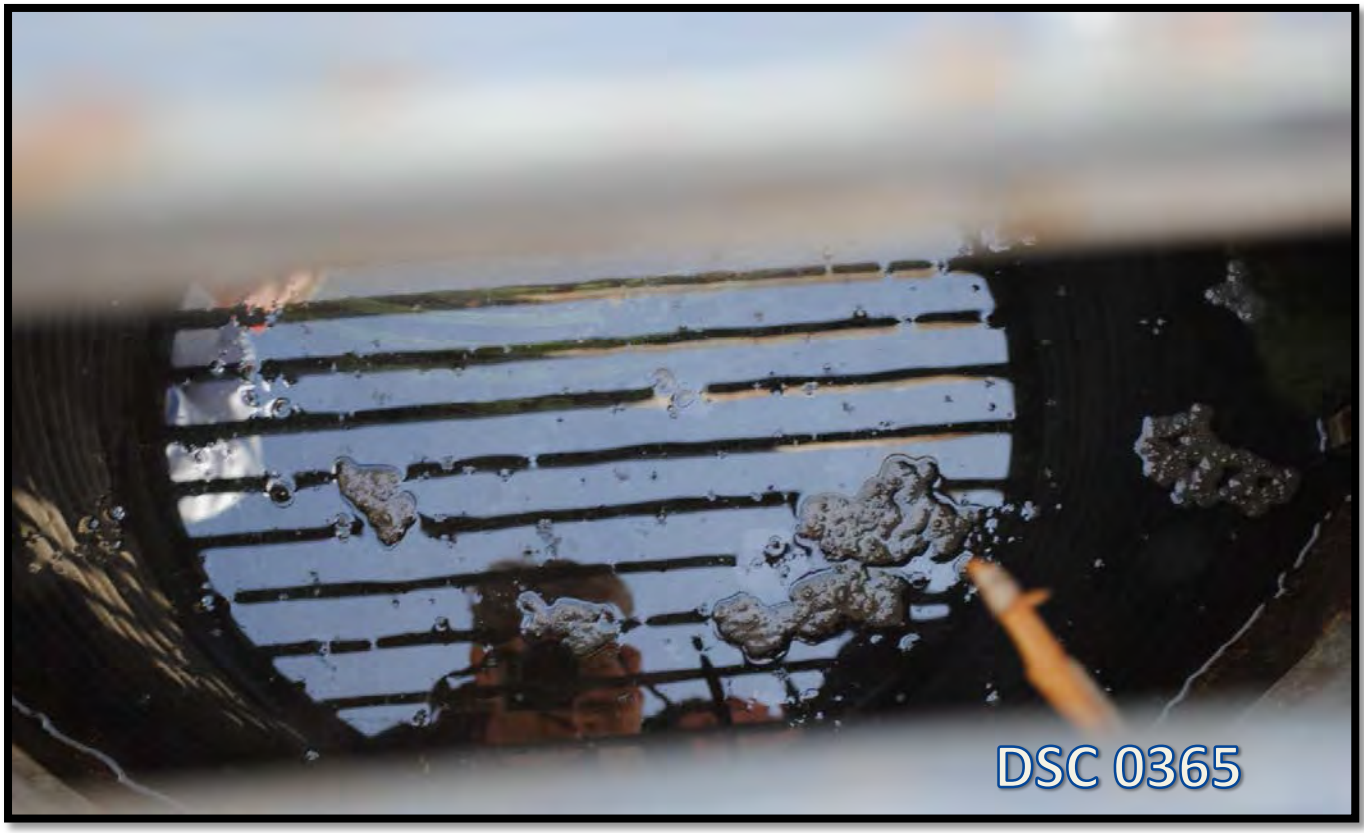
The waste pickup procedures at the dog pound seem good and thorough
all dog walkers we saw were picking up after the dogs; didn't see any feces on the ground

Both the pound and the community center sheet flow to various collection basins,
and flow via a small pipe network directly to the creek approximately 100-200 yards downstream.

Behind the animal facilities building, near the SW corner, a washout area exists. This area is used to washout trucks and
dog cages after animals have been picked up. It is highly likely that excrement is washed out of this area (see photos 0392 and 0396)

The community service rehab center contains a garden that discharges to the creek

LA0251: San Luis Obispo TMDL Support - Field Log Photos



LA0251: San Luis Obispo TMDL Support - Field Log Photos

LA0251: San Luis Obispo TMDL Support - Field Log Photos

LA0251: San Luis Obispo TMDL Support - Field Log Photos

LA0251: San Luis Obispo TMDL Support - Field Log Photos

LA0251: San Luis Obispo TMDL Support - Field Log

Location	Los Osos Municipal Areas		
Date	3/29/2012	Weather:	Sunny
Arrival Time	12:00 PM	Other Observations:	
Staff Present	Chris Wessel (Geosyntec)	Mark Davis (County)	
	Avery Blackwell (Geosyntec)		
	Mary Whittlesey (County)		

Photo Log

Photo Number	Time Taken	Description
DSC 432	12:09 PM	Storm drain discharging into the Bay
DSC 431	12:09 PM	Storm drain effluent with Algae
DSC 437	12:30 PM	Storm drain discharging into the Bay
DSC 444	12:32 PM	Storm drain discharging into the Bay
DSC 435	12:29 PM	Inlet with flow in the storm drain
DSC 462	2:43 PM	Inlet with decomposing organic matter in the storm drain
DSC 495	3:09 PM	Dry weather flow from school lawn
DSC 508	3:35 PM	Dry weather flow
DSC 447	12:43 PM	Septic pump truck
DSC 479	2:57 PM	Horses walking down street from Sand Spit
DSC 480	2:58 PM	Horse feces (new and old) on the street
DSC 490	3:03 PM	Horse feces in open lot next to the street

Field Observations

Flows Present (Y/N)?	In gutter from school lawn runoff
	In storm drains at several locations
	In storm drains into the bay, source unknown
Seeps Present (Y/N)?	Yes, significant amounts along Bay
Noticeable Odors (Y/N)?	None
Debris Accumulation (Y/N)?	Minimal, mostly decomposing organic matter
Following Observed:	
Dumpsters?	
Washouts?	
Inlets?	Some accumulation of debris
Outlets?	Flowing into the Bay
Animals?	Horse walking on the street

Notes

A few discharge pipes were located off of 2nd and 3rd street leading to the Bay. Two were observed to be discharging (though very little water- see photo 437 and 444). We could not track down an inlet source for these pipes.

Minor amounts of dry weather flow were observed in the community; no large discharges observed

Most catch basins appeared to have biofilm/sludge buildup

All storm drain inlets appeared to be labeled "No Dumping" or "Drains to Ocean"

LA0251: San Luis Obispo TMDL Support - Field Log Photos

LA0251: San Luis Obispo TMDL Support - Field Log Photos

LA0251: San Luis Obispo TMDL Support - Field Log Photos

LA0251: San Luis Obispo TMDL Support - Field Log Photos

LA0251: San Luis Obispo TMDL Support - Field Log Photos

LA0251: San Luis Obispo TMDL Support - Field Log Photos

Appendix B-3

Field Observation Logs

Nipomo Creek Subwatershed Field Visit

August 26, 2015

GEOSYNTEC CONSULTANTS
Photographic Record

Geosyntec consultants

Client: San Luis Obispo County	**Project Number: LA0350**
Site Name: Nipomo Creek	**Site Location: Nipomo, CA**

UpstreamMonitoring 1 **Date: 8/26/2015 8:38 AM** **Direction:** **Comments: Creek dry exiting the culvert under Thompson Ave. Upstream monitoring location**	
UpstreamMonitoring 2 **Date: 8/26/2015 8:38 AM** **Direction:** **Comments: Looking upstream through culvert under Thompson Ave**	

GEOSYNTEC CONSULTANTS
Photographic Record

Geosyntec consultants

Client: San Luis Obispo County	**Project Number: LA0350**
Site Name: Nipomo Creek	**Site Location: Nipomo, CA**

UpstreamMonitoring 3	
Date: 8/26/2015 8:39 AM	
Direction:	
Comments: Looking down at creek exiting culver under Thompson Ave	

UpstreamMonitoring 4	
Date:	
Direction:	
Comments: Street view of creek culvert, monitoring location access on the right (west) by the trees	

GEOSYNTEC CONSULTANTS
Photographic Record

Geosyntec consultants

Client: San Luis Obispo County	**Project Number: LA0350**
Site Name: Nipomo Creek	**Site Location: Nipomo, CA**

NipomoCreek_WillowRd 1	
Date: 8/26/2015 9:08 AM	
Direction:	
Comments: North side of Willow Rd bridge. Heavy green vegetation indicating frequent water. Creek dry upstream of bridge	

NipomoCreek_WillowRd 2	
Date: 8/26/2015 9:09 AM	
Direction:	
Comments: South side of Willow Rd bridge. Heavy green vegetation indicating frequent water. Creek dry downstream of bridge	

GEOSYNTEC CONSULTANTS
Photographic Record

Geosyntec consultants

Client: San Luis Obispo County	**Project Number: LA0350**
Site Name: Nipomo Creek	**Site Location: Nipomo, CA**

NipomoCreek_WillowRd 3	
Date: 8/26/2015 9:10 AM	
Direction:	
Comments: Algae growing in pool on the south side of Willow Rd bridge indicating frequent water	

NipomoCreek_WillowRd 4	
Date: 8/26/2015 9:11 AM	
Direction:	
Comments: Algae growing in pool on the north side of Willow Rd bridge indicating frequent water	

GEOSYNTEC CONSULTANTS Photographic Record	
Client: San Luis Obispo County	**Project Number: LA0350**
Site Name: Nipomo Creek	**Site Location: Nipomo, CA**

NipomoCreek_WillowRd 5 **Date: 8/26/2015 9:13 AM** **Direction:** **Comments: Outfall from Willow Rd. Heavy green vegetation indicating frequent water**	
NipomoCreek_WillowRd 6 **Date: 8/26/2015 9:13 AM** **Direction:** **Comments: Flow from Willow Rd outfall**	

GEOSYNTEC CONSULTANTS
Photographic Record

Client: San Luis Obispo County	**Project Number: LA0350**
Site Name: Nipomo Creek	**Site Location: Nipomo, CA**

NipomoCreek_WillowRd 7 **Date: 8/26/2015 9:17 AM** **Direction:** **Comments: Flow in stormdrain at first manhole on Willow Rd west of Nipomo Creek**	
NipomoCreek_Tefft **Date: 8/26/2015 10:40 AM** **Direction:** **Comments: Creek dry at Tefft St**	

GEOSYNTEC CONSULTANTS
Photographic Record

Geosyntec consultants

Client: San Luis Obispo County	**Project Number: LA0350**
Site Name: Nipomo Creek	**Site Location: Nipomo, CA**

DownstreamMonitoring 1	
Date: 8/26/2015 1:06 PM	
Direction:	
Comments: Deer observed near the potential downstream monitoring location	

DownstreamMonitoring 2	
Date: 8/26/2015 1:11 PM	
Direction:	
Comments: Potential downstream monitoring location is dry. White sandbags referencing where to collect sample	

GEOSYNTEC CONSULTANTS
Photographic Record

Geosyntec consultants

Client: San Luis Obispo County	**Project Number: LA0350**
Site Name: Nipomo Creek	**Site Location: Nipomo, CA**

DownstreamMonitoring 3	
Date: 8/26/2015 1:17 PM	
Direction:	
Comments: Access to the downstream monitoring location from the Dana Adobe (parcel owned by the County)	

NipomoHS 1	
Date: 8/26/2015 9:52 AM	
Direction:	
Comments: Large detention basin at back of the high school behind the track	

GEOSYNTEC CONSULTANTS Photographic Record	
Client: San Luis Obispo County	**Project Number: LA0350**
Site Name: Nipomo Creek	**Site Location: Nipomo, CA**

NipomoHS 2	
Date: 8/26/2015 9:56 AM	
Direction:	
Comments: Animal barn at Nipomo High School behind track (currently no animals)	

NipomoHS 3	
Date: 8/26/2015 9:56 AM	
Direction:	
Comments: Outside animal pens at Nipomo HS next to animal barn (currently no animals)	

GEOSYNTEC CONSULTANTS Photographic Record	
Client: San Luis Obispo County	**Project Number: LA0350**
Site Name: Nipomo Creek	**Site Location: Nipomo, CA**

Residential 1	
Date: 8/26/2015 10:12 AM	
Direction:	
Comments: Open channels collect runoff in residential neighborhoods NW of Tefft and Thompson. No runoff or pollutant sources observed	

Residential 2	
Date: 8/26/2015 10:12 AM	
Direction:	
Comments: Dry outfall from residential neighborhood NW of Tefft and Thompson.	

GEOSYNTEC CONSULTANTS Photographic Record	
Client: San Luis Obispo County	**Project Number: LA0350**
Site Name: Nipomo Creek	**Site Location: Nipomo, CA**

Residential 3	
Date: 8/26/2015 10:18 AM	
Direction:	
Comments: Large dry detention basin downstream of the residential neighborhood NE of Tefft and Thompson	

Residential 4	
Date: 8/26/2015 10:19 AM	
Direction:	
Comments: Catch basin filled with debris need detention basin	

GEOSYNTEC CONSULTANTS Photographic Record	
Client: San Luis Obispo County	**Project Number: LA0350**
Site Name: Nipomo Creek	**Site Location: Nipomo, CA**

Residential 5	
Date: 8/26/2015 10:23 AM	
Direction:	
Comments: Irrigation runoff and runoff staining observed in multiple locations in the residential neighborhood NE of Tefft and Thompson	

Residential 6	
Date: 8/26/2015 11:18 AM	
Direction:	
Comments: Potential residential monitoring location at Knotts and Thompson	

GEOSYNTEC CONSULTANTS Photographic Record	
Client: San Luis Obispo County	**Project Number: LA0350**
Site Name: Nipomo Creek	**Site Location: Nipomo, CA**

Residential 7	
Date: 8/26/2015 11:18 AM	
Direction:	
Comments: Sewer manhole with marker indicating that sewer does not cross the storm drain in Thompson Ave south of Knotts St	

Residential 8	
Date: 8/26/2015 11:08 AM	
Direction:	
Comments: Outfall just south of Knotts and Thompson with agriculture and residential land use areas upstream	

GEOSYNTEC CONSULTANTS
Photographic Record

Geosyntec consultants

Client: San Luis Obispo County	**Project Number: LA0350**
Site Name: Nipomo Creek	**Site Location: Nipomo, CA**

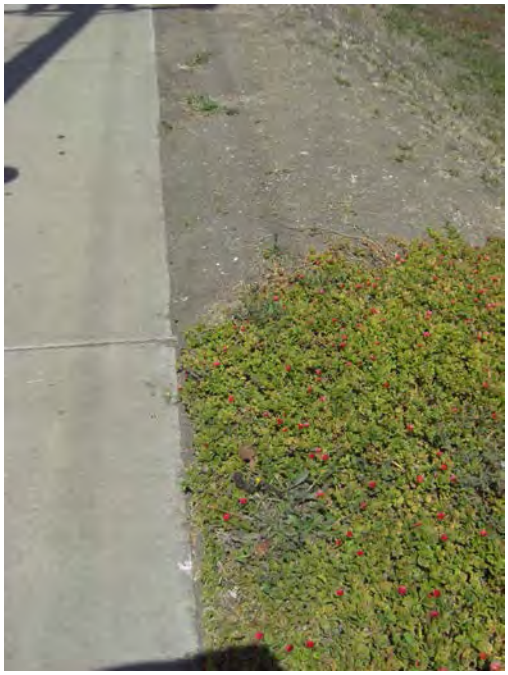
Residential 9	
Date: 8/26/2015 11:10 AM	
Direction:	
Comments: Growing vegetation from an ag field drain to culvert indicating frequent flow	

Residential 10	
Date: 8/26/2015 11:11 AM	
Direction:	
Comments: Open channel that collects runoff from residential neighborhood NE of Knotts and Thompson	

GEOSYNTEC CONSULTANTS
Photographic Record

Client: San Luis Obispo County	**Project Number: LA0350**
Site Name: Nipomo Creek	**Site Location: Nipomo, CA**

Residential 11	
Date: 8/26/2015 11:12 AM	
Direction:	
Comments: Infiltration basin at Knotts and Thompson	

Residential 12	
Date: 8/26/2015 11:13 AM	
Direction:	
Comments: Dog feces on the edge of the infiltration basin at Knotts and Thompson	

GEOSYNTEC CONSULTANTS Photographic Record	
Client: San Luis Obispo County	**Project Number: LA0350**
Site Name: Nipomo Creek	**Site Location: Nipomo, CA**

Residential 13	
Date: 8/26/2015 11:15 AM	
Direction:	
Comments: Open channel upstream of the potential monitoring location at Knotts and Thompson. May provide easier access for monitoring	

Residential 14	
Date: 8/26/2015 11:15 AM	
Direction:	
Comments: Culvert under Knotts damp	

GEOSYNTEC CONSULTANTS Photographic Record	
Client: San Luis Obispo County	**Project Number: LA0350**
Site Name: Nipomo Creek	**Site Location: Nipomo, CA**

Residential 15	
Date: 8/26/2015 11:16 AM	
Direction:	
Comments: Vegetated swale upstream of culvert under Knotts	

Residential 16	
Date: 8/26/2015 11:17 AM	
Direction:	
Comments: Dog feces near potential residential outfall monitoring location	

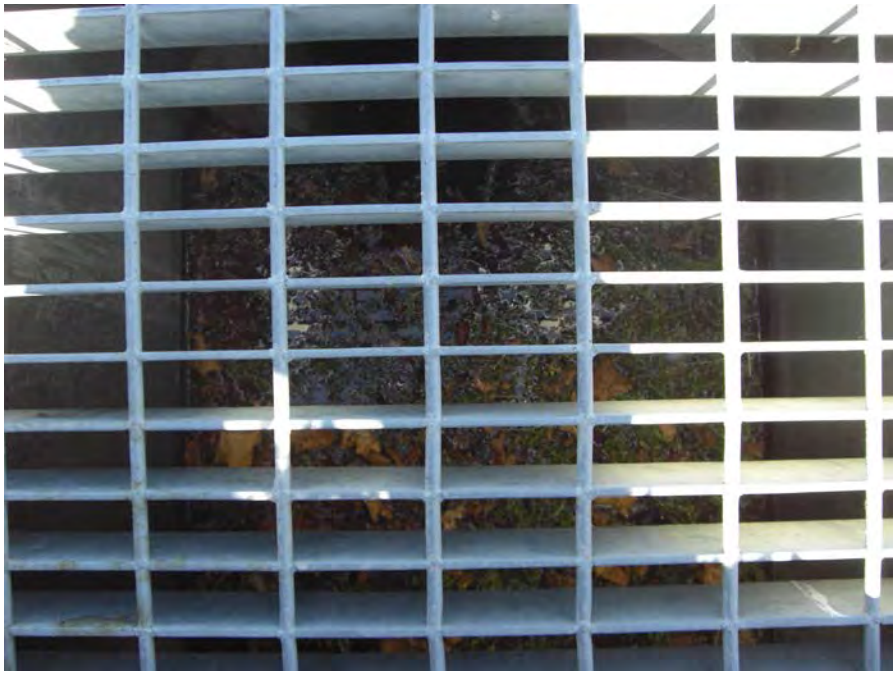
GEOSYNTEC CONSULTANTS Photographic Record	
Client: San Luis Obispo County	**Project Number: LA0350**
Site Name: Nipomo Creek	**Site Location: Nipomo, CA**

Residential 17	
Date: 8/26/2015 1:24 PM	
Direction:	
Comments: FloGuard catchbasin insert on Oakglen ave	

Residential 18	
Date: 8/26/2015 1:32 PM	
Direction:	
Comments: Vortechnic water quality device, appears to be clogged with trash and pooled water	

GEOSYNTEC CONSULTANTS Photographic Record	
Client: San Luis Obispo County	**Project Number: LA0350**
Site Name: Nipomo Creek	**Site Location: Nipomo, CA**

Residential 19	
Date: 8/26/2015 1:33 PM	
Direction:	
Comments: Manhole cover of the Vortechnic device	

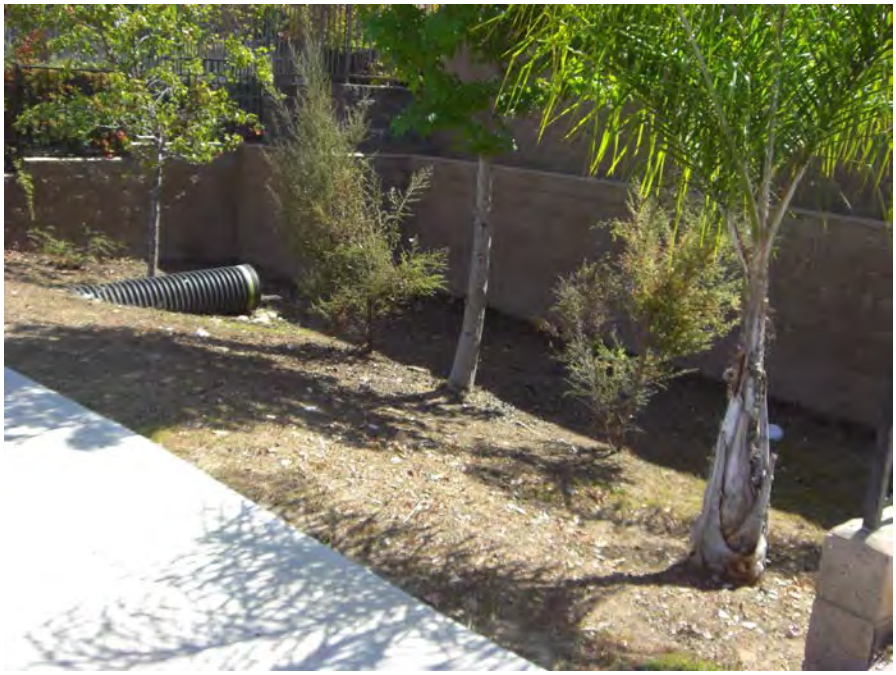
Residential 20	
Date: 8/26/2015 1:42 PM	
Direction:	
Comments: Ponded water inlet at the corner of frontage rd and division st	

GEOSYNTEC CONSULTANTS
Photographic Record

Geosyntec consultants

Client: San Luis Obispo County	**Project Number: LA0350**
Site Name: Nipomo Creek	**Site Location: Nipomo, CA**

Residential 21	
Date: 8/26/2015 1:43 PM	
Direction:	
Comments: Damp stormdrain downstream of ponded inlet prior to going under Hwy 101	

Residential 22	
Date: 8/26/2015 2:03 PM	
Direction:	
Comments: Infiltration basin on Frontage rd between Grande and Division	

GEOSYNTEC CONSULTANTS Photographic Record	
Client: San Luis Obispo County	**Project Number: LA0350**
Site Name: Nipomo Creek	**Site Location: Nipomo, CA**

Commercial 1	
Date: 8/26/2015 10:35 AM	
Direction:	
Comments: Example of dumpster. Most observations were clean with the lid closed. No observations of leaks	

Commercial 2	
Date: 8/26/2015 10:36 AM	
Direction:	
Comments: Example of behind commercial areas. Most were clean with no staining. Here cardboard boxes need to be recycled	

GEOSYNTEC CONSULTANTS
Photographic Record

Geosyntec consultants

Client: San Luis Obispo County	**Project Number: LA0350**
Site Name: Nipomo Creek	**Site Location: Nipomo, CA**

Commercial 3	
Date: 8/26/2015 10:38 AM	
Direction:	
Comments: Back of nursery on corner of Tefft and Carrillo. Stacks of bags of soil elevated off the ground, but not covered. Nipomo creek is in the background	

Commercial 4	
Date: 8/26/2015 10:39 AM	
Direction:	
Comments: Piles of mulch next to the nursery and along the creek bank	

GEOSYNTEC CONSULTANTS Photographic Record	
Client: San Luis Obispo County	**Project Number: LA0350**
Site Name: Nipomo Creek	**Site Location: Nipomo, CA**

Commercial 5	
Date: 8/26/2015 10:53 AM	
Direction:	
Comments: Trash filling the north culvert under Thompson Rd between Tefft and Dana	

Commercial 6	
Date: 8/26/2015 10:54 AM	
Direction:	
Comments: Toilet paper and human feces filling the south culvert under Thompson Rd between Tefft and Dana	

GEOSYNTEC CONSULTANTS
Photographic Record

Geosyntec consultants

Client: San Luis Obispo County	**Project Number: LA0350**
Site Name: Nipomo Creek	**Site Location: Nipomo, CA**

Commercial 7 **Date: 8/26/2015 1:54 PM** **Direction:** **Comments: Dry culvert from the corner of Frontage rd and Southland under Hwy 101**	
Commercial 8 **Date: 8/26/2015 1:56 PM** **Direction:** **Comments: Ponded water in inlet at the corner of Frontage Rd and Southland. Stormdrain goes into infiltration basin at the corner of Frontage Rd and Southland**	

GEOSYNTEC CONSULTANTS Photographic Record	
Client: San Luis Obispo County	**Project Number: LA0350**
Site Name: Nipomo Creek	**Site Location: Nipomo, CA**

Commercial 9	
Date: 8/26/2015 1:57 PM	
Direction:	
Comments: Dry inlet near the corner of Frontage Rd and Southland. Stormdrain goes into infiltration basin at the corner of Frontage Rd and Southland	

Commercial 10	
Date: 8/26/2015 1:57 PM	
Direction:	
Comments: Infiltration basin at the corner of Frontage Rd and Southland	

GEOSYNTEC CONSULTANTS
Photographic Record

Geosyntec consultants

Client: San Luis Obispo County	**Project Number: LA0350**
Site Name: Nipomo Creek	**Site Location: Nipomo, CA**

Agriculture 1	
Date: 8/26/2015 8:40 AM	
Direction:	
Comments: Animal stables on the west side of Thompson	

Agriculture 2	
Date: 8/26/2015 9:00 AM	
Direction:	
Comments: Nursery area of Speedling Inc	

GEOSYNTEC CONSULTANTS
Photographic Record

Geosyntec consultants

Client: San Luis Obispo County	**Project Number: LA0350**
Site Name: Nipomo Creek	**Site Location: Nipomo, CA**

Agriculture 3	
Date: 8/26/2015 9:03 AM	
Direction:	
Comments: Growers Transplanting Inc nursery area. Some runoff occurring but does not appear to be reaching the creek	

Agriculture 4	
Date: 8/26/2015 9:03 AM	
Direction:	
Comments: Growers Transplanting Inc nursery area. Some runoff occurring but does not appear to be reaching the creek	

GEOSYNTEC CONSULTANTS
Photographic Record

Geosyntec consultants

Client: San Luis Obispo County	**Project Number: LA0350**
Site Name: Nipomo Creek	**Site Location: Nipomo, CA**

Agriculture 5	
Date: 8/26/2015 9:04 AM	
Direction:	
Comments: Growers Transplanting Inc nursery area. Row crops are also being grown	

Agriculture 6	
Date: 8/26/2015 9:08 AM	
Direction:	
Comments: Growers Transplanting Inc nursery area. Row crops are also being grown	

GEOSYNTEC CONSULTANTS
Photographic Record

Geosyntec consultants

Client: San Luis Obispo County	**Project Number: LA0350**
Site Name: Nipomo Creek	**Site Location: Nipomo, CA**

Agriculture 7	
Date: 8/26/2015 9:35 AM	
Direction:	
Comments: Equestrian facilities located on the corner of Willow Rd and Thompson	

Agriculture 8	
Date: 8/26/2015 9:36 AM	
Direction:	
Comments: Horses grazing in fields along Nipomo Creek	

GEOSYNTEC CONSULTANTS
Photographic Record

Geosyntec consultants

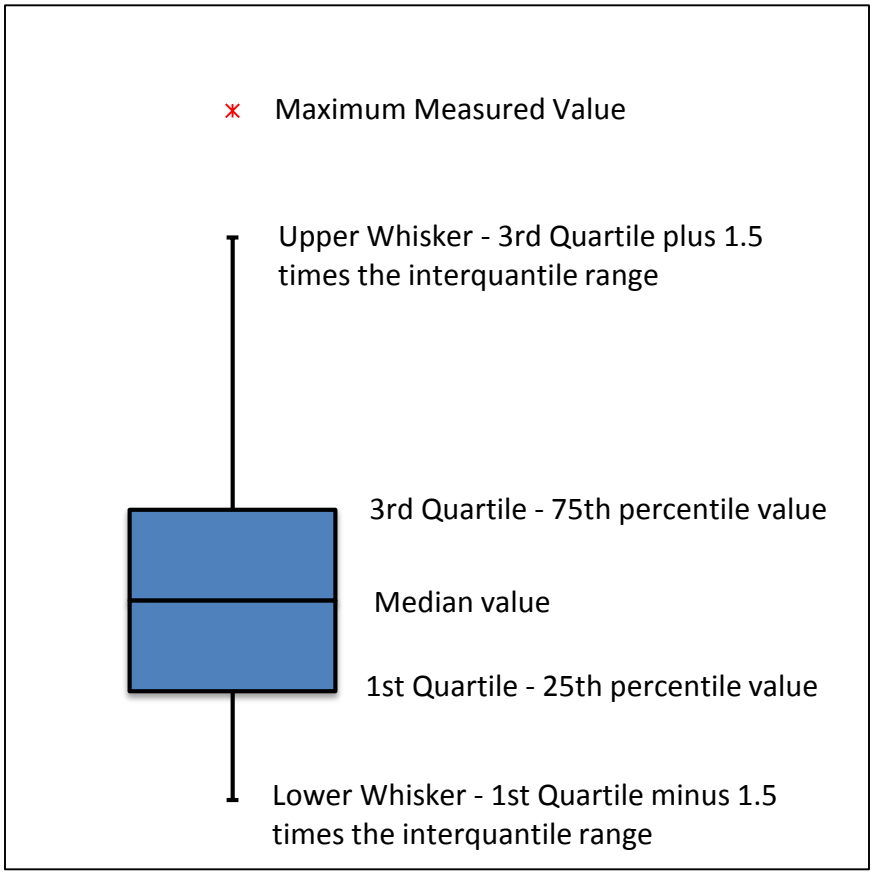
Client: San Luis Obispo County	**Project Number: LA0350**
Site Name: Nipomo Creek	**Site Location: Nipomo, CA**

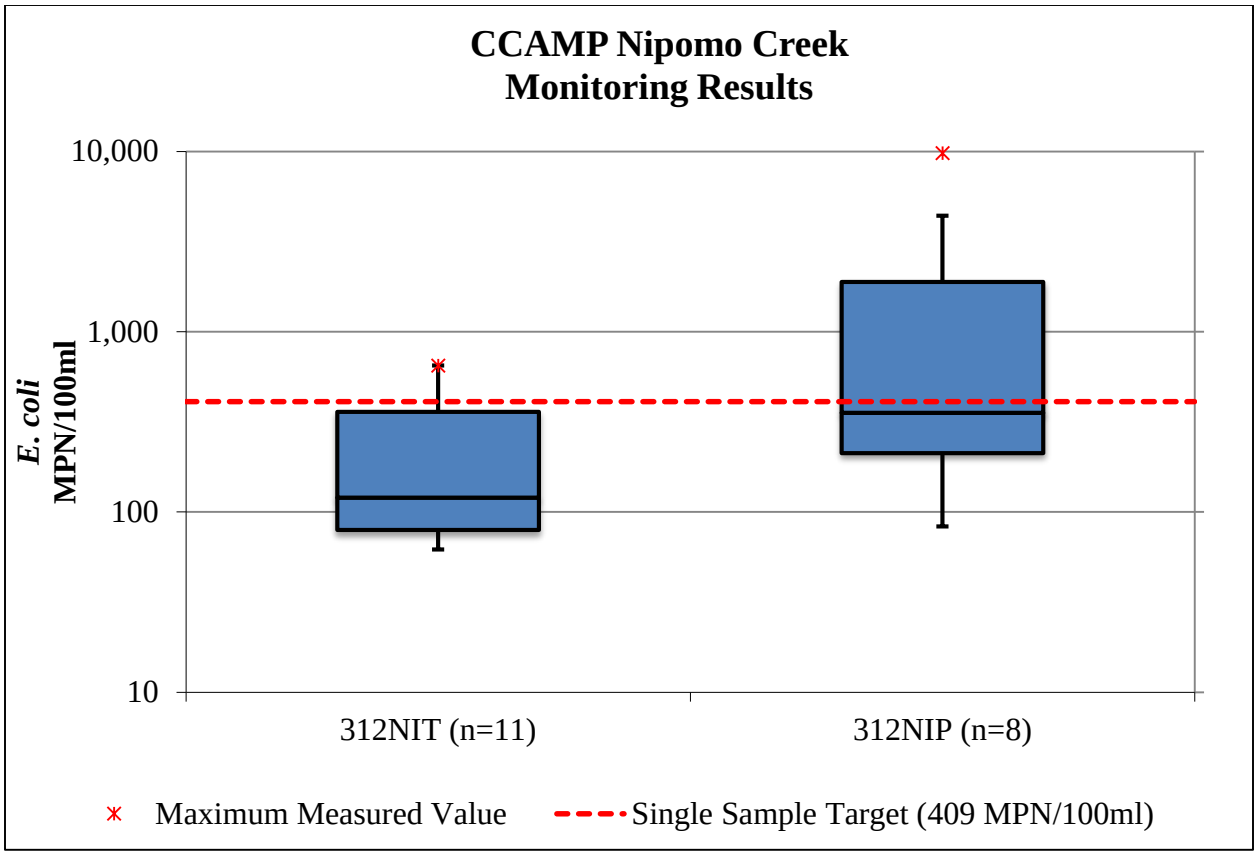
Agriculture 9 **Date: 8/26/2015 11:07 AM** **Direction:** **Comments: Large piles of vegetated material along a tributary to Nipomo creek, near Knotts and Thompson**	
Agriculture 10 **Date: 8/26/2015 10:27 AM** **Direction:** **Comments: Orange orchards at the East end of Tefft road**	

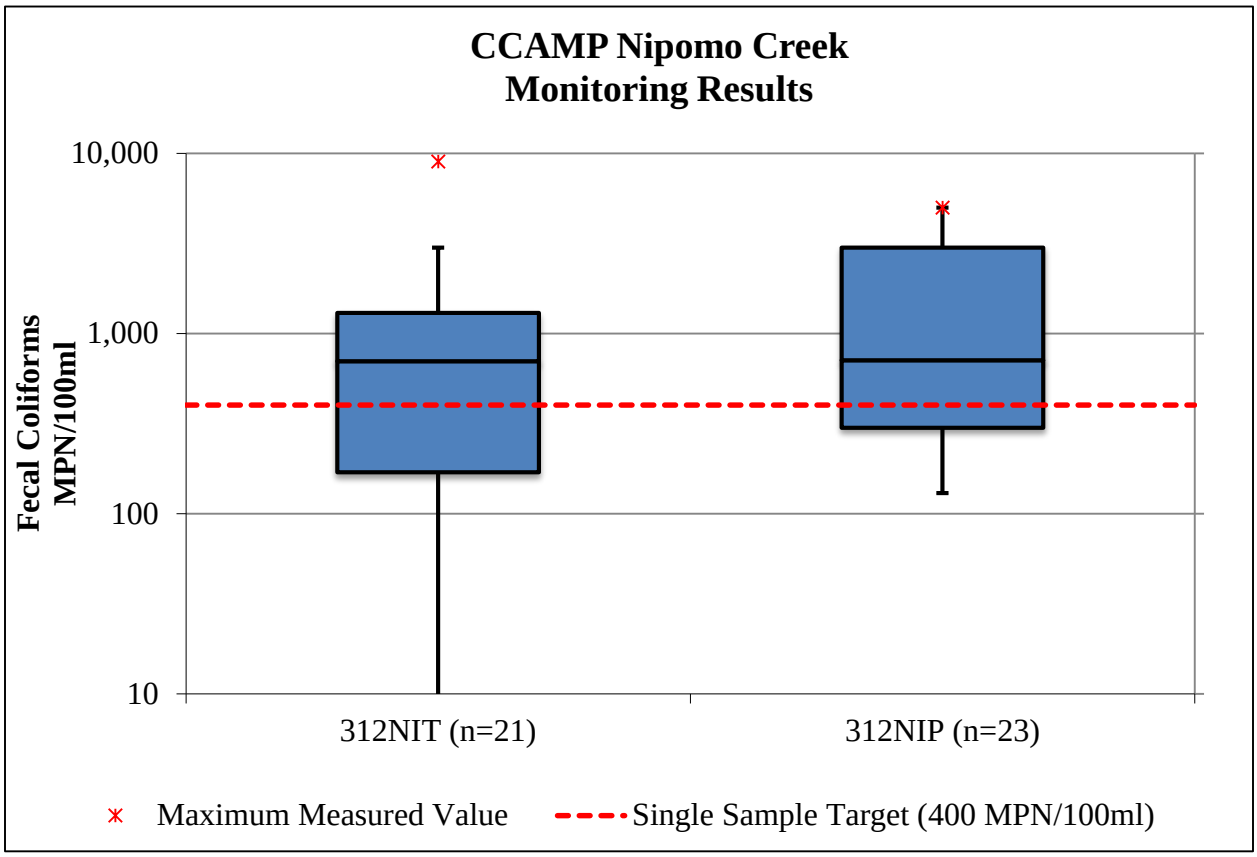
Appendix C

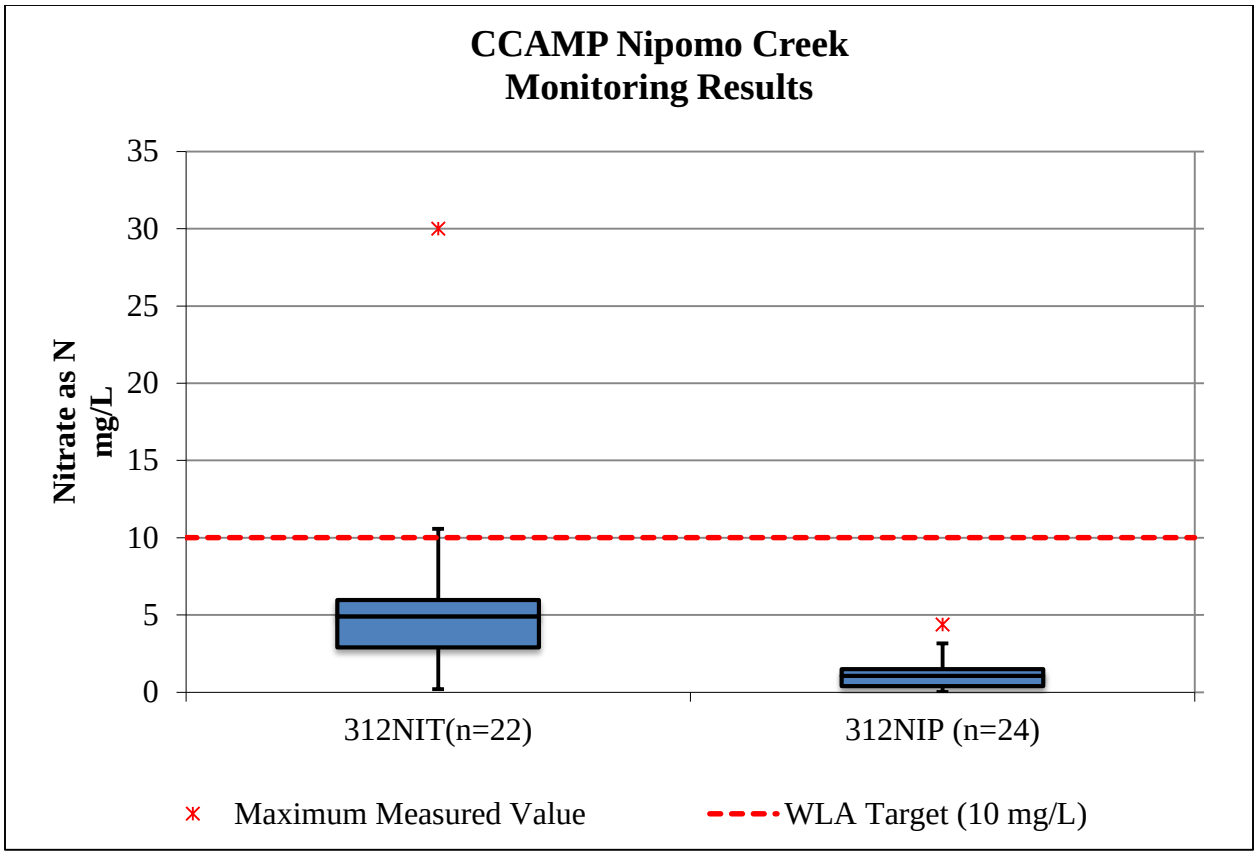
CCAMP Monitoring Data Plots

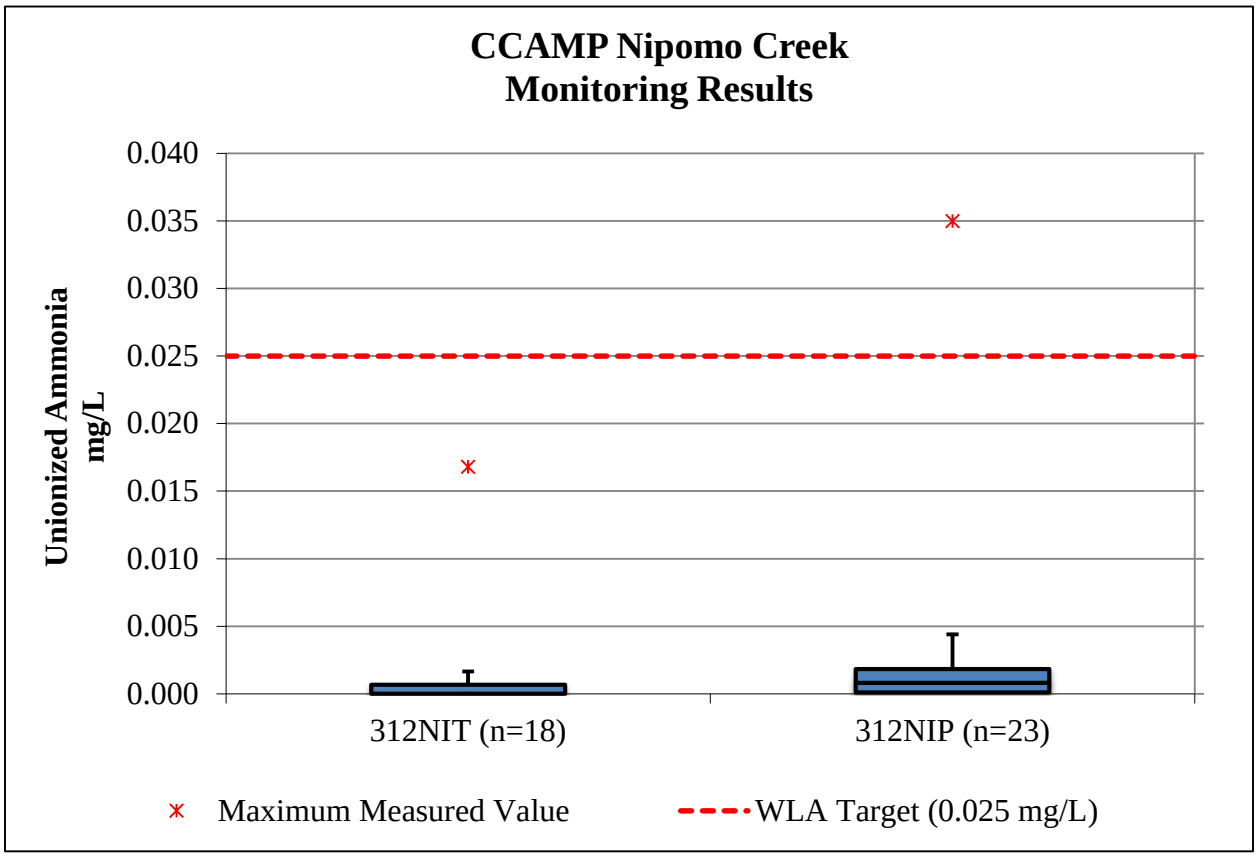
Box and Whisker Template




CCAMP Nipomo Creek
Monitoring Results
10,000
1,000
100
10
E. coli
MPN/100ml
312NIT (n=11)
312NIP (n=8)
Maximum Measured Value
Single Sample Target (409 MPN/100ml)


CCAMP Nipomo Creek
Monitoring Results
10,000
1,000
100
10
Fecal Coliforms
MPN/100ml
312NIT (n=21)
312NIP (n=23)
Maximum Measured Value
Single Sample Target (400 MPN/100ml)


CCAMP Nipomo Creek
Monitoring Results
Nitrate as N
mg/L
35
30
25
20
15
10
5
0
312NIT(n=22)
312NIP (n=24)
Maximum Measured Value
WLA Target (10 mg/L)


CCAMP Nipomo Creek
Monitoring Results
Unionized Ammonia
mg/L
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
312NIT (n=18)
312NIP (n=23)
Maximum Measured Value
WLA Target (0.025 mg/L)

Appendix D

Baseline Load Quantification Tables

Appendix D-1

Bacteria Baseline Loads

San Luis Obispo Creek Watershed

Wet Weather Watershed Baseline Load

Annual Precipitation (inch)[1]	21.8
Conversion from acre-in to 100ml	1027900
Convert to 10^12	1.00E+12

Land Use Name	Area[2] (acres)	% of Total Area	Runoff Coefficient[3]	Average Annual Runoff (100 ml)	Wet Weather EMC[4] (mpn/100ml)	Average Annual Load (10^12 MPN Fecal Coliform)	% of Total Load
Agriculture	26351	55.7%	20%	118,221,681,276	60,300	7129	81%
Commercial	391	0.8%	75%	6,578,362,130	791	5	0.1%
Industrial	151	0.3%	85%	2,874,880,974	26,703	77	1%
MF Residential	74	0.2%	70%	1,169,283,709	11,800	14	0%
Open Space	13306	28.1%	20%	59,694,955,508	6,310	377	4%
Public Facility	823	1.7%	75%	13,845,840,754	2,148	30	0.3%
Recreation	989	2.1%	20%	4,436,874,347	6,310	28	0.3%
Rural Residential	2379	5.0%	45%	24,009,989,077	6,684	160	2%
SF Residential	2310	4.9%	50%	25,911,267,539	35,557	921	11%
Transportation	525	1.1%	87%	10,248,267,661	1,680	17	0.2%
Total Area	**47298**				**Total Load**	**8758**	

Wet Weather MS4 Baseline Load

Annual Precipitation (inch)[1]	21.8
Conversion from acre-in to 100ml	1027900
Convert to 10^12	1.00E+12

Land Use Name	Area[2] (acres)	% of Total Area	Runoff Coefficient[3]	Average Annual Runoff (100 ml)	Wet Weather EMC[4] (mpn/100ml)	Average Annual Load (10^12 MPN Fecal Coliform)	% of Total Load
Commercial	241	4.0%	75%	4,059,212,599	791	3.2	0.3%
Industrial	151	2.5%	85%	2,874,880,974	26,703	76.8	7%
MF Residential	29	0.5%	70%	460,631,353	11,800	5.4	0.5%
Public Facility	83	1.4%	75%	1,403,801,227	2,148	3.0	0.3%
Recreation	509	8.5%	20%	2,285,512,934	6,310	14.4	1%
Rural Residential	2378	39.9%	45%	24,006,286,857	6,684	160.5	15%
SF Residential	2041	34.3%	50%	22,892,427,778	35,557	814.0	74%
Transportation	525	8.8%	87%	10,248,267,661	1,680	17.2	2%
Total Area	**5959**				**Total Load**	**1095**	

Dry Weather MS4 Baseline Load

Dry Weather Days[1]	325
Conversion from cf to 100ml	283.2
Convert to 10^12	1.00E+12

Land Use Name	Area[2] (acres)	% of Total Area	cf/day per developed acre[5]	Average Annual Runoff (100 ml)	Dry Weather EMC[6] (mpn/100ml)	Average Annual Load (10^12 MPN Fecal Coliform)	% of Total Load
Commercial	241	4.0%	11.3	250,961,687	106	0.03	3%
Industrial	151	2.5%	11.3	156,829,527	20	0.00	0.3%
MF Residential	29	0.5%	11.3	30,512,820	150	0.00	1%
Public Facility	83	1.4%	11.3	86,790,311	106	0.01	1%
Recreation	509	8.5%	11.3	529,883,722	129	0.07	8%
Rural Residential	2378	39.9%	11.3	2,473,656,363	167	0.41	46%
SF Residential	2041	34.3%	11.3	2,122,993,863	167	0.35	39%
Transportation	525	8.8%	11.3	546,208,051	41	0.02	2%
Total Area	**5959**				**Total Load**	**0.90**	

References

1. San Luis Obispo County Water Resources, Rain Gauge Station - SLO Airport # 205.4
2. San Luis Obispo County GIS Land Use information
3. County of San Luis Obispo, San Luis Obispo Creek Waterway Management Plan Vol. 3 Drainage Design Manual, February 2003.
4. Braun, C., Steets, B., Susilo, K., and Tesfamichael, A. 2011. Draft San Luis Rey Comprehensive Load Reduction Plan EMC memo. November 14, 2011.
5. IRWD and Orange County Metropolitan Water District (OCMWD). 2004. Residential Runoff Reduction Study. Irvine Ranch Water District and Municipal Water District of Orange County. July 2004.
6. Weston Solutions. 2009a. San Diego River Source Tracking Investigation – Phase I, Final Report Revision 1. Prepared for City of San Diego Storm Water Department. San Diego, CA. 132 pp.

Appendix D-2

Bacteria Baseline Loads

Morro Bay Watershed

Wet Weather Watershed Baseline Load

Annual Precipitation (inch)[1]	22.4
Conversion from acre-in to 100ml	1027900
Convert to 10^12	1.00E+12

Land Use Name	Area[2] (acres)	% of Total Area	Runoff Coefficient[3]	Average Annual Runoff (100 ml)	Wet Weather EMC[4] (mpn/100ml)	Average Annual Load (10^12 MPN Fecal Coliform)	% of Total Load
Agriculture	31868	64.4%	20%	146,753,626,359	60,300	8849	83%
Commercial	240	0.5%	75%	4,151,694,764	791	3	0.03%
Industrial	0	0.0%	85%	0	26,703	0	0%
MF Residential	147	0.3%	70%	2,369,542,616	11,800	28	0.3%
Open Space	6604	13.4%	20%	30,409,795,072	6,310	192	2%
Public Facility	3403	6.9%	75%	58,764,300,233	2,148	126	1%
Recreation	1893	3.8%	20%	8,715,091,460	6,310	55	1%
Rural Residential	1838	3.7%	45%	19,039,721,015	6,684	127	1%
SF Residential	3139	6.3%	50%	36,139,869,419	35,557	1285	12%
Transportation	334	0.7%	87%	6,687,134,153	1,680	11	0.1%
Total Area	**49466**				**Total Load**	**10677**	

Wet Weather MS4 Baseline Load

Annual Precipitation (inch)[1]	22.4
Conversion from acre-in to 100ml	1027900
Convert to 10^12	1.00E+12

Land Use Name	Area[2] (acres)	% of Total Area	Runoff Coefficient[3]	Average Annual Runoff (100 ml)	Wet Weather EMC[4] (mpn/100ml)	Average Annual Load (10^12 MPN Fecal Coliform)	% of Total Load
Commercial	142	2.7%	75%	2,459,624,995	791	1.9	0.2%
Industrial	0	0.0%	85%	0	26,703	0.0	0%
MF Residential	128	2.4%	70%	2,064,648,822	11,800	24.4	2%
Public Facility	995	18.8%	75%	17,190,044,546	2,148	36.9	3%
Recreation	1029	19.4%	20%	4,738,949,142	6,310	29.9	2%
Rural Residential	189	3.6%	45%	1,960,531,570	6,684	13.1	1%
SF Residential	2730	51.5%	50%	31,423,646,307	35,557	1117.3	91%
Transportation	90	1.7%	87%	1,803,852,752	1,680	3.0	0.2%
Total Area	**5304**				**Total Load**	**1227**	

Dry Weather MS4 Baseline Load

Dry Weather Days[1]	328
Conversion from cf to 100ml	283.2
Convert to 10^12	1.00E+12

Land Use Name	Area[2] (acres)	% of Total Area	cf/day per developed acre[5]	Average Annual Runoff (100 ml)	Dry Weather EMC[6] (mpn/100ml)	Average Annual Load (10^12 MPN Fecal Coliform)	% of Total Load
Commercial	142	2.7%	11.3	149,439,392	106	0.02	2%
Industrial	0	0.0%	11.3	0	20	0.00	0%
MF Residential	128	2.4%	11.3	134,401,963	150	0.02	3%
Public Facility	995	18.8%	11.3	1,044,415,231	106	0.11	14%
Recreation	1029	19.4%	11.3	1,079,715,933	129	0.14	17%
Rural Residential	189	3.6%	11.3	198,526,636	167	0.03	4%
SF Residential	2730	51.5%	11.3	2,863,808,881	167	0.48	60%
Transportation	90	1.7%	11.3	94,479,870	41	0.00	0.5%
Total Area	**5304**				**Total Load**	**0.80**	

References

1. San Luis Obispo County Water Resources, Rain Gauge Station - Comm Shop # 224
2. San Luis Obispo County GIS Land Use information
3. County of San Luis Obispo, San Luis Obispo Creek Waterway Management Plan Vol. 3 Drainage Design Manual, February 2003.
4. Braun, C., Steets, B., Susilo, K., and Tesfamichael, A. 2011. Draft San Luis Rey Comprehensive Load Reduction Plan EMC memo. November 14, 2011.
5. IRWD and Orange County Metropolitan Water District (OCMWD). 2004. Residential Runoff Reduction Study. Irvine Ranch Water District and Municipal Water District of Orange County. July 2004.
6. Weston Solutions. 2009a. San Diego River Source Tracking Investigation – Phase I, Final Report Revision 1. Prepared for City of San Diego Storm Water Department. San Diego, CA. 132 pp.

Appendix D-3

Bacteria Baseline Loads

Nipomo Creek Subwatershed

Wet Weather Watershed Baseline Load

Annual Precipitation (inch)[1]	15.4
Conversion from acre-in to 100ml	1027900
Convert to 10^12	1.00E+12

Land Use Name	Area[2] (acres)	% of Total Area	Runoff Coefficient[3]	Average Annual Runoff (100 ml)	Wet Weather EMC[4] (mpn/100ml)	Average Annual Load (10^12 MPN Fecal Coliform)	% of Total Load
Agriculture	14,395	78%	20%	45,492,431,692	60,300	2743	89%
Commercial	318	1.7%	75%	3,769,785,382	791	3	0.1%
Industrial	14	0.1%	85%	183,416,184	26,703	5	0%
MF Residential	459	2.5%	70%	5,081,245,185	11,800	60	2%
Open Space	941	5.1%	20%	2,973,396,358	6,310	19	1%
Public Facility	0	0.0%	75%	0	2,148	0	0.0%
Recreation	3	0.0%	20%	10,831,681	6,310	0	0.0%
Rural Residential	1,250	6.8%	45%	8,889,095,117	6,684	59	2%
SF Residential	647	3.5%	50%	5,109,306,999	35,557	182	6%
Transportation	431	2.3%	87%	5,919,782,134	1,680	10	0.3%
Total Area	**18,458**				**Total Load**	**3,081**	

Wet Weather MS4 Baseline Load

Annual Precipitation (inch)[1]	15.4
Conversion from acre-in to 100ml	1027900
Convert to 10^12	1.00E+12

Land Use Name	Area[2] (acres)	% of Total Area	Runoff Coefficient[3]	Average Annual Runoff (100 ml)	Wet Weather EMC[4] (mpn/100ml)	Average Annual Load (10^12 MPN Fecal Coliform)	% of Total Load
Commercial	312	19.8%	75%	3,693,236,875	791	2.9	1.2%
Industrial	14	0.9%	85%	183,416,184	26,703	4.9	2%
MF Residential	460	29.2%	70%	5,085,314,146	11,800	60.0	23.9%
SF Residential	642	40.7%	50%	5,071,155,800	35,557	180.3	72%
Transportation	149	9.5%	87%	2,047,192,763	1,680	3.4	1%
Total Area	**1,576**				**Total Load**	**252**	

Dry Weather MS4 Baseline Load

Dry Weather Days[1]	329
Conversion from cf to 100ml	283.2
Convert to 10^12	1.00E+12

Land Use Name	Area[2] (acres)	% of Total Area	cf/day per developed acre[5]	Average Annual Runoff (100 ml)	Dry Weather EMC[6] (mpn/100ml)	Average Annual Load (10^12 MPN Fecal Coliform)	% of Total Load
Commercial	312	19.8%	11.3	328,170,174	106	0.03	15%
Industrial	14	0.9%	11.3	14,380,432	20	0.00	0.1%
MF Residential	460	29.2%	11.3	484,142,217	150	0.07	32%
SF Residential	642	40.7%	11.3	675,912,001	167	0.11	50%
Transportation	149	9.5%	11.3	156,816,838	41	0.01	3%
Total Area	**1,576**				**Total Load**	**0.23**	

References

1. San Luis Obispo County Water Resources, Rain Gauge Station - CDF Nipomo # 151.1
2. San Luis Obispo County GIS Land Use information
3. County of San Luis Obispo, San Luis Obispo Creek Waterway Management Plan Vol. 3 Drainage Design Manual, February 2003.
4. Braun, C., Steets, B., Susilo, K., and Tesfamichael, A. 2011. Draft San Luis Rey Comprehensive Load Reduction Plan EMC memo. November 14, 2011.
5. IRWD and Orange County Metropolitan Water District (OCMWD). 2004. Residential Runoff Reduction Study. Irvine Ranch Water District and Municipal Water District of Orange County. July 2004.
6. Weston Solutions. 2009. San Diego River Source Tracking Investigation – Phase I, Final Report Revision 1. Prepared for City of San Diego Storm Water Department. San Diego, CA. 132 pp.

Appendix E

BMP Quantification Assessment Tables

Appendix E-1

BMP Bacteria Load Reduction Quantification

San Luis Obispo Creek Watershed

BMP Name	Wet or Dry Weather	Land Use Targeted	Pollutant Generating Activity	Quantification Assumptions			Quantification Method	Expected Annual Reduction of MS4 Baseline Load (10^12 MPN Fecal Coliform)	
				Load Assumption	Units	Citation/Assumptions		Low Range	High Range
Additional BMPs									
Animal Facilities Management (Inspection, Enforcement, Education and Outreach)	Primarily Wet Weather	Commercial and Rural Residential	Livestock, manure	Not sufficient data to quantify at this time					
Commercial/Industrial Targeted Inspections (Inspection, enforcement, outreach)	Dry Weather	Commercial	Dumpsters, outdoor garbage areas, garbage trucks, grease bins, outdoor dining/fast food, wash water	0.90	10 ^12 Average MS4 FIB-FC dry-weather load in watershed	Calculated based on dry weather flow and land use concentrations	(bacteria load) * (percent bacteria from runoff) * (percent of runoff from commercial activities) * (increase in inspection) * (expected behavior change)	**0.0013**	**0.012**
				5-10%	Percent of MS4 dry-weather flows (and fecal bacteria loads) from commercial runoff	Best Professional Judgment			
				15-27%	Percent of commercial runoff load generated from commercial activities	San Diego River Source ID study, 2009			
				25-50%	Percent of commercial area covered by increased inspection	Best Professional Judgment			
				75-100%	Percent reduction in bacteria loads from enhanced inspections	San Diego County JURMP			
Fertilizer Management (Education and Outreach)	Primarily Wet Weather	Commercial and Residential	Golf courses, landscaping	Not sufficient data to quantify at this time					
Enhanced Pet Waste Control and Pickup (Signage, mutt mitts, outreach, etc.)	Wet Weather	Primarily Parks, Recreational Areas and Residential	Pets	1,095	10 ^12 Average MS4 FIB-FC wet-weather load in watershed	Calculated by annual precipitation, land use runoff coefficients and land use FIB concentrations	(annual bacteria load) * (percent bacteria from canine sources) * (expected behavior change) * (percent of contributing area)	**4.9**	**73**
				10-20%	Percent of indicator bacteria having canine sources	Morro Bay DNA study			
				9 - 37%	Estimated behavior change	City of Austin, 2008; City of San Diego, 2010			
				50-90%	Percent of contributing area covered by program enhancements	Best Professional Judgment			
Water Conservation Inspections (Outreach and education)	Dry Weather	Residential, Commercial, and Public Facilities	Irrigation runoff, fertilizers/compost, soil and decaying plant matter, green waste	0.90	10 ^12 Average MS4 FIB-FC dry-weather load in watershed	Calculated based on dry weather flow and land use concentrations	(bacteria load) * (percent bacteria from runoff) * (percent of runoff from irrigation) * (expected behavior change)	**0.027**	**0.12**
				50-80%	Percent of MS4 dry-weather flows (and fecal bacteria loads) from commercial and residential runoff	Best Professional Judgment			
				59-80%	Percent of commercial and residential runoff load generated residential and commercial from irrigation	San Diego River Source ID study, 2009			
				10-20%	Percent reduction in irrigation runoff from irrigation control incentives	Orange County irrigation runoff study, 2004			

BMP Name	Wet or Dry Weather	Land Use Targeted	Pollutant Generating Activity	Quantification Assumptions			Quantification Method	Expected Annual Reduction of MS4 Baseline Load (10^12 MPN Fecal Coliform)	
				Load Assumption	Units	Citation/Assumptions		Low Range	High Range
Additional BMPs									
Dry-weather MS4 Inspection Program (Inspections, enforcements, outreach)	Primarily Winter Dry Weather	MS4 Conveyance System	Leaking sewers, illegal discharges, illicit connections, illegal dumping, RVs	0.90	10 ^12 Average MS4 FIB-FC dry-weather load in watershed	Calculated based on dry weather flow and land use concentrations	(bacteria load) * (months of winter dry weather) / 12 * (percent bacteria from human sources) * (percent human contribution assumed from Illicit discharge sources) * (expected behavior change)	0.001	0.028
				5	Months during Winter dry weather				
				5-20%	Percent of dry-weather fecal bacteria having human sources	Estimate based on analysis of data for source tracking study in Oceanside, CA			
				50-75%	Percent human contribution from sewer discharge to MS4	Estimated based on the San Diego County Bacteria Source Prioritization Process			
				10-50%	Percent expected reduction from sewer discharge controls	Best Professional Judgment			
	Primarily Summer Dry Weather	MS4 Conveyance System	Leaking sewers, illegal discharges, illicit connections, illegal dumping, RVs	0.90	10 ^12 Average MS4 FIB-FC dry-weather load in watershed	Calculated based on dry weather flow and land use concentrations	(bacteria load) * (months of summer dry weather) / 12 * (percent bacteria from human sources) * (percent human contribution assumed from Illicit discharge sources) * (expected behavior change)	0.00026	0.02
				7	Months during Summer dry weather				
				1-10%	Percent of dry-weather fecal bacteria having human sources	Estimate based on analysis of data for source tracking study in Oceanside, CA			
				50-75%	Percent human contribution from sewer discharge to MS4	Estimated based on the San Diego County Bacteria Source Prioritization Process			
				10-50%	Percent expected reduction from sewer discharge controls	Best Professional Judgment			
Wet Weather Total							**Total expected load reduction**	**4.9**	**73**
							% of average MS4 total load	**0.5%**	**7%**
Dry Weather Total							**Total expected load reduction**	**0.030**	**0.18**
							% of average MS4 total load	**3.3%**	**20%**
Total								**5**	**73**

Appendix E-2

BMP Bacteria Load Reduction Quantification

Morro Bay Watershed

BMP Name	Wet or Dry Weather	Land Use Targeted	Pollutant Generating Activity	Quantification Assumptions			Quantification Method	Expected Annual Reduction of MS4 Baseline Load (10^12 MPN Fecal Coliform)	
				Load Assumption	Units	Citation/Assumptions		Low Range	High Range
Additional BMPs									
Animal Facilities Management (Inspection, Enforcement, Education and Outreach)	Primarily Wet Weather	Commercial and Rural Residential	Livestock, manure	Not sufficient data to quantify at this time					
Commercial/Industrial Targeted Inspections (Inspection, enforcement, outreach)	Dry Weather	Commercial	Dumpsters, outdoor garbage areas, garbage trucks, grease bins, outdoor dining/fast food, wash water	0.80	10 ^12 Average MS4 FIB-FC dry-weather load in watershed	Calculated based on dry weather flow and land use concentrations	(bacteria load) * (percent bacteria from runoff) * (percent of runoff from commercial activities) * (increase in inspection) * (expected behavior change)	**0.0011**	**0.011**
				5-10%	Percent of MS4 dry-weather flows (and fecal bacteria loads) from commercial runoff	Best Professional Judgment			
				15-27%	Percent of commercial runoff load generated from commercial activities	San Diego River Source ID study, 2009			
				25-50%	Percent of commercial area covered by increased inspection	Best Professional Judgment			
				75-100%	Percent reduction in bacteria loads from enhanced inspections	San Diego County JURMP			
Fertilizer Management (Education and Outreach)	Primarily Wet Weather	Commercial and Residential	Golf courses, landscaping	Not sufficient data to quantify at this time					
Enhanced Pet Waste Control and Pickup (Signage, mutt mitts, outreach, etc.)	Wet Weather	Primarily Parks, Recreational Areas and Residential	Pets	1,227	10 ^12 Average MS4 FIB-FC wet-weather load in watershed	Calculated by annual precipitation, land use runoff coefficients and land use FIB concentrations	(annual bacteria load) * (percent bacteria from canine sources) * (expected behavior change) * (percent of contributing area)	**5.5**	**82**
				10-20%	Percent of indicator bacteria having canine sources	Morro Bay DNA study			
				9 - 37%	Estimated behavior change	City of Austin, 2008; City of San Diego, 2010			
				50-90%	Percent of contributing area covered by program enhancements	Best Professional Judgment			
Water Conservation Inspections (Outreach and education)	Dry Weather	Residential, Commercial, and Public Facilities	Irrigation runoff, fertilizers/compost, soil and decaying plant matter, green waste	0.80	10 ^12 Average MS4 FIB-FC dry-weather load in watershed	Calculated based on dry weather flow and land use concentrations	(bacteria load) * (percent bacteria from runoff) * (percent of runoff from irrigation) * (expected behavior change)	**0.024**	**0.1**
				50-80%	Percent of MS4 dry-weather flows (and fecal bacteria loads) from commercial and residential runoff	Best Professional Judgment			
				59-80%	Percent of commercial and residential runoff load generated residential and commercial from irrigation	San Diego River Source ID study, 2009			
				10-20%	Percent reduction in irrigation runoff from irrigation control incentives	Orange County irrigation runoff study, 2004			

BMP Name	Wet or Dry Weather	Land Use Targeted	Pollutant Generating Activity	Quantification Assumptions			Quantification Method	Expected Annual Reduction of MS4 Baseline Load (10^12 MPN Fecal Coliform)	
				Load Assumption	Units	Citation/Assumptions		Low Range	High Range
Additional BMPs									
Dry-weather MS4 Inspection Program (Inspections, enforcements, outreach)	Primarily Winter Dry Weather	MS4 Conveyance System	Leaking sewers, illegal discharges, illicit connections, illegal dumping, RVs	0.80	10 ^12 Average MS4 FIB-FC dry-weather load in watershed	Calculated based on dry weather flow and land use concentrations	(bacteria load) * (months of winter dry weather) / 12 * (percent bacteria from human sources) * (percent human contribution assumed from Illicit discharge sources) * (expected behavior change)	**0.001**	**0.025**
				5	Months during Winter dry weather				
				5-20%	Percent of dry-weather fecal bacteria having human sources	Estimate based on analysis of data for source tracking study in Oceanside, CA			
				50-75%	Percent human contribution from sewer discharge to MS4	Estimated based on the San Diego County Bacteria Source Prioritization Process			
				10-50%	Percent expected reduction from sewer discharge controls	Best Professional Judgment			
	Primarily Summer Dry Weather	MS4 Conveyance System	Leaking sewers, illegal discharges, illicit connections, illegal dumping, RVs	0.80	10 ^12 Average MS4 FIB-FC dry-weather load in watershed	Calculated based on dry weather flow and land use concentrations	(bacteria load) * (months of summer dry weather) / 12 * (percent bacteria from human sources) * (percent human contribution assumed from Illicit discharge sources) * (expected behavior change)	**0.00023**	**0.018**
				7	Months during Summer dry weather				
				1-10%	Percent of dry-weather fecal bacteria having human sources	Estimate based on analysis of data for source tracking study in Oceanside, CA			
				50-75%	Percent human contribution from sewer discharge to MS4	Estimated based on the San Diego County Bacteria Source Prioritization Process			
				10-50%	Percent expected reduction from sewer discharge controls	Best Professional Judgment			
Wet Weather Total							**Total expected load reduction**	**5.5**	**82**
							% of average MS4 total load	**0.5%**	**7%**
Dry Weather Total							**Total expected load reduction**	**0.026**	**0.15**
							% of average MS4 total load	**3.3%**	**19%**
Total								**6**	**82**

Appendix E-3

BMP Bacteria Load Reduction Quantification

Nipomo Creek Subwatershed

BMP Name	Wet or Dry Weather	Land Use Targeted	Pollutant Generating Activity	Quantification Assumptions			Quantification Method	Expected Annual Reduction of MS4 Baseline Load (10^12 MPN Fecal Coliform)	
				Load Assumption	Units	Citation/Assumptions		Low Range	High Range
Additional BMPs									
Animal Facilities Management (Inspection, Enforcement, Education and Outreach)	Primarily Wet Weather	Commercial and Rural Residential	Livestock, manure	Not sufficient data to quantify at this time					
Commercial/Industrial Targeted Inspections (Inspection, enforcement, outreach)	Dry Weather	Commercial	Dumpsters, outdoor garbage areas, garbage trucks, grease bins, outdoor dining/fast food, wash water	0.23	10 ^12 Average MS4 FIB-FC dry-weather load in watershed	Calculated based on dry weather flow and land use concentrations	(bacteria load) * (percent bacteria from runoff) * (percent of runoff from commercial activities) * (increase in inspection) * (expected behavior change)	**0.00032**	**0.0031**
				5-10%	Percent of MS4 dry-weather flows (and fecal bacteria loads) from commercial runoff	Best Professional Judgment			
				15-27%	Percent of commercial runoff load generated from commercial activities	San Diego River Source ID study, 2009			
				25-50%	Percent of commercial area covered by increased inspection	Best Professional Judgment			
				75-100%	Percent reduction in bacteria loads from enhanced inspections	San Diego County JURMP			
Fertilizer Management (Education and Outreach)	Primarily Wet Weather	Commercial and Residential	Golf courses, landscaping	Not sufficient data to quantify at this time					
Enhanced Pet Waste Control and Pickup (Signage, mutt mitts, outreach, etc.)	Wet Weather	Primarily Parks, Recreational Areas and Residential	Pets	252	10 ^12 Average MS4 FIB-FC wet-weather load in watershed	Calculated by annual precipitation, land use runoff coefficients and land use FIB concentrations	(annual bacteria load) * (percent bacteria from canine sources) * (expected behavior change) * (percent of contributing area)	**1.1**	**17**
				10-20%	Percent of indicator bacteria having canine sources	Morro Bay DNA study			
				9 - 37%	Estimated behavior change	City of Austin, 2008; City of San Diego, 2010			
				50-90%	Percent of contributing area covered by program enhancements	Best Professional Judgment			
Water Conservation Inspections (Outreach and education)	Dry Weather	Residential, Commercial, and Public Facilities	Irrigation runoff, fertilizers/compost, soil and decaying plant matter, green waste	0.23	10 ^12 Average MS4 FIB-FC dry-weather load in watershed	Calculated based on dry weather flow and land use concentrations	(bacteria load) * (percent bacteria from runoff) * (percent of runoff from irrigation) * (expected behavior change)	**0.007**	**0.029**
				50-80%	Percent of MS4 dry-weather flows (and fecal bacteria loads) from commercial and residential runoff	Best Professional Judgment			
				59-80%	Percent of commercial and residential runoff load generated residential and commercial from irrigation	San Diego River Source ID study, 2009			
				10-20%	Percent reduction in irrigation runoff from irrigation control incentives	Orange County irrigation runoff study, 2004			

BMP Name	Wet or Dry Weather	Land Use Targeted	Pollutant Generating Activity	Quantification Assumptions			Quantification Method	Expected Annual Reduction of MS4 Baseline Load (10^12 MPN Fecal Coliform)	
				Load Assumption	Units	Citation/Assumptions		Low Range	High Range
Additional BMPs									
Dry-weather MS4 Inspection Program (Inspections, enforcements, outreach)	Primarily Winter Dry Weather	MS4 Conveyance System	Leaking sewers, illegal discharges, illicit connections, illegal dumping, RVs	0.23	10 ^12 Average MS4 FIB-FC dry-weather load in watershed	Calculated based on dry weather flow and land use concentrations	(bacteria load) * (months of winter dry weather) / 12 * (percent bacteria from human sources) * (percent human contribution assumed from Illicit discharge sources) * (expected behavior change)	**0.00024**	**0.0071**
				5	Months during Winter dry weather				
				5-20%	Percent of dry-weather fecal bacteria having human sources	Estimate based on analysis of data for source tracking study in Oceanside, CA			
				50-75%	Percent human contribution from sewer discharge to MS4	Estimated based on the San Diego County Bacteria Source Prioritization Process			
				10-50%	Percent expected reduction from sewer discharge controls	Best Professional Judgment			
	Primarily Summer Dry Weather	MS4 Conveyance System	Leaking sewers, illegal discharges, illicit connections, illegal dumping, RVs	0.23	10 ^12 Average MS4 FIB-FC dry-weather load in watershed	Calculated based on dry weather flow and land use concentrations	(bacteria load) * (months of summer dry weather) / 12 * (percent bacteria from human sources) * (percent human contribution assumed from Illicit discharge sources) * (expected behavior change)	**0.000066**	**0.0050**
				7	Months during Summer dry weather				
				1-10%	Percent of dry-weather fecal bacteria having human sources	Estimate based on analysis of data for source tracking study in Oceanside, CA			
				50-75%	Percent human contribution from sewer discharge to MS4	Estimated based on the San Diego County Bacteria Source Prioritization Process			
				10-50%	Percent expected reduction from sewer discharge controls	Best Professional Judgment			
Homeless Reduction / Encampment Management (Inspection, Outreach, Community Cleaning)	Wet and Dry Weather	Commercial and Residential	Human waste and trash	Not sufficient data to quantify at this time					
Culvert Exclusion Fencing	Wet and Dry Weather	Commercial	Human waste and trash	Not sufficient data to quantify at this time					
Wet Weather Total							**Total expected load reduction**	**1.1**	**17**
							% of average MS4 total load	**0.44%**	**6.8%**
Dry Weather Total							**Total expected load reduction**	**0.0073**	**0.044**
							% of average MS4 total load	**3.2%**	**19%**
Total								**1.1**	**17**

Appendix F

Applicable Excerpts from the Draft Phase II Small MS4 General Permit - Attachment G

ATTACHMENT G – Region Specific Requirements

Regional Water Board Approved TMDLs where urban runoff is listed as a source

TMDL Effective Date/BPA/Res. No.	Municipality	Impaired Water Body	Deliverables/Actions Required/Waste Load Allocations
Region 3: Central Coast Regional Water Board			
TMDL and Implementation Plan for Pathogens for Morro Bay and Chorro and Los Osos Creeks Effective Date: 11/19/2003 BPA: Chapter 4 Resolution No. R3-2003-0060	City of Morro Bay County of San Luis Obispo	Morro Bay Chorro Creek Los Osos Creek Pennington Creek San Bernardo Creek San Luisito Creek Walters Creek Warden Creek	**Purpose of Provisions** The purpose of these provisions is to implement the requirements of the Morro Bay (Chorro and Los Osos Creeks) Pathogen TMDL. **TMDL Wasteload Allocations** The City of Morro Bay and County of San Luis Obispo are assigned the following wasteload allocations: 1) for discharges to Los Osos Creek, Chorro Creek, and their tributaries, the fecal coliform geometric mean concentration shall not exceed 200 MPN/100 mL over a 30-day period nor shall 10% of the samples exceed 400 MPN/100 mL over any 30-day period. 2) For discharges to Morro Bay, the fecal coliform geometric mean concentration of 14 MPN/100 mL must be achieved and no more than 10% of the samples may be over 43 MPN/100 mL. [1] **Provisions for Implementing TMDL** ~~Within one year of adoption of this Order~~By June 30, 2015, the City of Morro Bay and County of San Luis Obispo shall each develop, submit, and begin implementation of a Wasteload Allocation Attainment Program that identifies the actions they will take to attain their wasteload allocations. The Wasteload Allocation Attainment Programs shall include: 1. A detailed description of the strategy the MS4 will use to guide BMP selection, assessment, and implementation, to ensure that BMPs implemented will be effective at abating pollutant sources, reducing pollutant discharges, and achieving wasteload allocations according to the TMDL schedule 2. Identification of sources of the impairment within the MS4's jurisdiction, including specific information on various source locations and their magnitude within the jurisdiction. 3. Prioritization of sources within the MS4's jurisdiction, based on suspected contribution to the impairment, ability to control the source, and other pertinent factors. 4. Identification of BMPs that will address the sources of impairing pollutants and reduce the discharge of impairing pollutants. 5. Prioritization of BMPs, based on suspected effectiveness at abating sources and reducing impairing pollutant discharges, as well as other pertinent factors. 6. Identification of BMPs the MS4 will implement, including a detailed implementation schedule. For each BMP, identify milestones the MS4 will use for tracking implementation, measurable goals the MS4 will use to assess implementation efforts, and measures and targets the MS4 will use to assess effectiveness. MS4s shall include expected BMP implementation for future implementation years, with the understanding that future BMP implementation plans may change as new information is obtained. ~~7.~~ A quantifiable numeric analysis demonstrating the BMPs selected for implementation will likely achieve, based on modeling, published BMP pollutant removal performance estimates, best professional judgment, and/or other available tools, the MS4's wasteload allocation according to the
TMDL and Implementation Plan			

[1] For all Central Coast Water Board fecal indicator bacteria and pathogens TMDLs, E. coli concentrations may be used as a surrogate for fecal coliform concentrations.

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TMDL Effective Date/BPA/Res. No.	Municipality	Impaired Water Body	Deliverables/Actions Required/Waste Load Allocations
Region 3: Central Coast Regional Water Board			

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Regional Water Board Approved TMDLs where urban runoff is listed as a source

TMDL Effective Date/BPA/Res. No.	Municipality	Impaired Water Body	Deliverables/Actions Required/Waste Load Allocations
Region 3: Central Coast Regional Water Board			
Morro Bay TMDL for Sediment (including Chorro Creek, Los Osos Creek, and the Morro Bay Estuary) Effective Date: 12/3/2003 BPA: Chapter 4 Resolution No. R3-2002-0051	County of San Luis Obispo	Morro Bay Los Osos Creek Chorro Creek Dairy Creek Pennington Creek San Luisito Creek San Bernardo Creek Warden Creek	**Purpose of Provisions** The purpose of these provisions is to implement the requirements of the Morro Bay TMDL for sediment. **TMDL Wasteload and Load Allocations** The County of San Luis Obispo is assigned a wasteload allocation of 5,137 tones/year of sediment. This allocation represents a 50% reduction in sediment loading relative to 2003 levels. The aggregated sediment discharge from all storm water outfalls into Morro Bay, or any tributary that has the potential to discharge sediment to Morro Bay, shall not exceed the allocation. **Provisions for Implementing the TMDL** The County of San Luis Obispo shall implement practices that will assure their allocation is achieved, including identifying and implementing specific road sediment control measures. ~~Within one year of adoption of this Order~~By June 30, 2015, the County of San Luis Obispo shall develop, submit, and begin implementation of a Wasteload Allocation Attainment Program that identifies the actions it will take to attain its wasteload allocation. The Wasteload Allocation Attainment Program shall include: 1. A detailed description of the strategy the MS4 will use to guide BMP selection, assessment, and implementation, to ensure that BMPs implemented will be effective at abating pollutant sources, reducing pollutant discharges, and achieving wasteload allocations according to the TMDL schedule. 2. Identification of sources of the impairment within the MS4's jurisdiction, including specific information on various source locations and their magnitude within the jurisdiction. 3. Prioritization of sources within the MS4's jurisdiction, based on suspected contribution to the impairment, ability to control the source, and other pertinent factors. 4. Identification of BMPs that will address the sources of impairing pollutants and reduce the discharge of impairing pollutants. 5. Prioritization of BMPs, based on suspected effectiveness at abating sources and reducing impairing pollutant discharges, as well as other pertinent factors. 6. Identification of BMPs the MS4 will implement, including a detailed implementation schedule. For each BMP, identify milestones the MS4 will use for tracking implementation, measurable goals the MS4 will use to assess implementation efforts, and measures and targets the MS4 will use to assess effectiveness. MS4s shall include expected BMP implementation for future implementation years, with the understanding that future BMP implementation plans may change as new information is obtained. 7. A quantifiable numeric analysis demonstrating the BMPs selected for implementation will likely achieve, based on modeling, published BMP pollutant removal performance estimates, best

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Regional Water Board Approved TMDLs where urban runoff is listed as a source

TMDL Effective Date/BPA/Res. No.	Municipality	Impaired Water Body	Deliverables/Actions Required/Waste Load Allocations
Region 3: Central Coast Regional Water Board			
Morro Bay TMDL for Sediment (including Chorro Creek, Los Osos Creek, and the Morro Bay Estuary) (continued)			professional judgment, and/or other available tools, the MS4's wasteload allocation according to the schedule identified in the TMDL. This analysis will most likely incorporate modeling efforts. The MS4 shall conduct repeat numeric analyses as the BMP implementation plans evolve and information on BMP effectiveness is generated. Once the MS4 has water quality data from its monitoring program, the MS4 shall incorporate water quality data into the numeric analyses to validate BMP implementation plans. 8. A detailed description, including a schedule, of a monitoring program the MS4 will implement to assess discharge and receiving water quality, BMP effectiveness, and progress towards any interim targets and ultimate attainment of the MS4s' wasteload allocation. The monitoring program shall be designed to validate BMP implementation efforts and quantitatively demonstrate attainment of interim targets and wasteload allocations. The monitoring program may be based on and use monitoring approaches and designs resulting from the Central Coast Water Board's efforts to develop a region-wide Phase II municipal stormwater monitoring strategy. 8.9. If the approved TMDL does not explicitly include interim targets, the MS4 shall establish interim targets (and dates when stormwater discharge conditions will be evaluated) that are equally spaced in time over the TMDL compliance schedule and represent measurable, continually decreasing MS4 discharge concentrations or other appropriate interim measures of pollution reduction and progress towards the wasteload allocation. At least one interim target and date must occur during the five-year term of this Order. The MS4 shall achieve its interim targets by the date it specifies in the Wasteload Allocation Attainment Program. If the MS4 does not achieve its interim target by the date specified, the MS4 shall develop and implement more effective BMPs that it can quantitatively demonstrate will achieve the next interim target. 9.10. A detailed description of how the MS4 will assess BMP and program effectiveness. The description shall incorporate the assessment methods described in the CASQA Municipal Storm water Program Effectiveness Assessment Guide. 10.11. A detailed description of how the MS4 will modify the program to improve upon BMPs determined to be ineffective during the effectiveness assessment. 11.12. A detailed description of information the MS4 will include in annual reports to demonstrate adequate progress towards attainment of wasteload allocations according to the TMDL schedule. 12.13. A detailed description of how the MS4 will collaborate with other agencies, stakeholders, and the public to develop and implement the Wasteload Allocation Attainment Program. 13.14. Any other items identified by Integrated Report fact sheets, TMDL Project Reports, TMDL Resolutions, or that are currently being implemented by the MS4 to control its contribution to the impairment. The allocations shall be achieved by December 3, 2053.

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TMDL Effective Date/BPA/Res. No.	Municipality	Impaired Water Body	Deliverables/Actions Required/Waste Load Allocations
Region 3: Central Coast Regional Water Board			
San Luis Obispo Creek Total Maximum Daily Load and Implementation Plan for Pathogens Effective Date: 7/25/2005 BPA: Chapter 4 Resolution No. R3-2004-0142	City of San Luis Obispo County of San Luis Obispo Cal Poly State University	San Luis Obispo Creek Stenner Creek Brizziolari Creek	**Purpose of Provisions** The purpose of these provisions is to implement the requirements of the San Luis Obispo Creek TMDL for Pathogens. **TMDL Wasteload Allocations** The City of San Luis Obispo, the County of San Luis Obispo, and Cal Poly State University-San Luis Obispo, are assigned a concentration based wasteload allocation for fecal coliform equal to 200 MPN/100mL, measured as a log mean of five samples taken in a 30-day period from impaired water body receiving waters, nor shall more than 10% of the total samples during any 30-day period exceed 400 MPN per 100mL in receiving waters; storm water discharge cannot cause or contribute to exceedance of the allocations. The City of San Luis Obispo is assigned these allocations in the following water bodies: San Luis Obispo Creek, Stenner Creek. The County of San Luis Obispo is assigned these allocations in the following water bodies: San Luis Obispo Creek. Cal Poly State University-San Luis Obispo is assigned these allocations in the following water bodies: Stenner Creek, Brizziola **Provisions for Implementing the TMDL** The City of San Luis Obispo, County of San Luis Obispo, and Cal Poly State University are required to implement best management practices specifically targeting fecal coliform loading. Required actions include development and implementation of: public education regarding fecal coliform sources and associated health risk, enforceable means of addressing pet waste and wild animals that are attracted to storm water infrastructure, elimination of illicit discharges. ~~Within one year of adoption of this Order~~By June 30, 2015, the City of San Luis Obispo, County of San Luis Obispo, and Cal Poly State University shall each develop, submit, and begin implementation of a Wasteload Allocation Attainment Program that identifies the actions they will take to attain their wasteload allocations. The Wasteload Allocation Attainment Programs shall include: 1. A detailed description of the strategy the MS4 will use to guide BMP selection, assessment, and implementation, to ensure that BMPs implemented will be effective at abating pollutant sources, reducing pollutant discharges, and achieving wasteload allocations according to the TMDL schedule. 2. Identification of sources of the impairment within the MS4's jurisdiction, including specific information on various source locations and their magnitude within the jurisdiction.

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Regional Water Board Approved TMDLs where urban runoff is listed as a source

TMDL Effective Date/BPA/Res. No.	Municipality	Impaired Water Body	Deliverables/Actions Required/Waste Load Allocations
Region 3: Central Coast Regional Water Board			
San Luis Obispo Creek Total Maximum Daily Load and Implementation Plan for Pathogens (continued) 2013-0001-DWQ ~~2013~~			3. Prioritization of sources within the MS4's jurisdiction, based on suspected contribution to the impairment, ability to control the source, and other pertinent factors. 4. Identification of BMPs that will address the sources of impairing pollutants and reduce the discharge of impairing pollutants. 5. Prioritization of BMPs, based on suspected effectiveness at abating sources and reducing impairing pollutant discharges, as well as other pertinent factors. 6. Identification of BMPs the MS4 will implement, including a detailed implementation schedule. For each BMP, identify milestones the MS4 will use for tracking implementation, measurable goals the MS4 will use to assess implementation efforts, and measures and targets the MS4 will use to assess effectiveness. MS4s shall include expected BMP implementation for future implementation years, with the understanding that future BMP implementation plans may change as new information is obtained. 7. A quantifiable numeric analysis demonstrating the BMPs selected for implementation will likely achieve, based on modeling, published BMP pollutant removal performance estimates, best professional judgment, and/or other available tools, the MS4's wasteload allocation according to the schedule identified in the TMDL. This analysis will most likely incorporate modeling efforts. The MS4 shall conduct repeat numeric analyses as the BMP implementation plans evolve and information on BMP effectiveness is generated. Once the MS4 has water quality data from its monitoring program, the MS4 shall incorporate water quality data into the numeric analyses to validate BMP implementation plans. 8. A detailed description, including a schedule, of a monitoring program the MS4 will implement to assess discharge and receiving water quality, BMP effectiveness, and progress towards any interim targets and ultimate attainment of the MS4s' wasteload allocation. The monitoring program shall be designed to validate BMP implementation efforts and quantitatively demonstrate attainment of interim targets and wasteload allocations. ~~8.~~9. If the approved TMDL does not explicitly include interim targets, the MS4 shall establish interim targets (and dates when stormwater discharge conditions will be evaluated) that are equally spaced in time over the TMDL compliance schedule and represent measurable, continually decreasing MS4 discharge concentrations or other appropriate interim measures of pollution reduction and progress towards the wasteload allocation. At least one interim target and date must occur during the five-year term of this Order. The MS4 shall achieve its interim targets by the date it specifies in the Wasteload Allocation Attainment Program. If the MS4 does not achieve its interim target by the date specified, the MS4 shall develop and implement more effective BMPs that it can quantitatively demonstrate will achieve the next interim target. ~~9.~~10. A detailed description of how the MS4 will assess BMP and program effectiveness. The description shall incorporate the assessment methods described in the CASQA Municipal Storm water Program Effectiveness Assessment Guide. ~~10.~~11. A detailed description of how the MS4 will modify the program to improve upon BMPs determined

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Regional Water Board Approved TMDLs where urban runoff is listed as a source

TMDL Effective Date/BPA/Res. No.	Municipality	Impaired Water Body	Deliverables/Actions Required/Waste Load Allocations
Region 3: Central Coast Regional Water Board			
San Luis Obispo Creek Total Maximum Daily Load and Implementation Plan for Pathogens (continued)			to be ineffective during the effectiveness assessment. ~~11.~~12. A detailed description of information the MS4 will include in annual reports to demonstrate adequate progress towards attainment of wasteload allocations according to the TMDL Schedule. ~~12.~~13. A detailed description of how the MS4 will collaborate with other agencies, stakeholders, and the public to develop and implement the Wasteload Allocation Attainment Program. ~~13.~~14. Any other items identified by Integrated Report fact sheets, TMDL Project Reports, TMDL Resolutions, or that are currently being implemented by the MS4 to control its contribution to the impairment. All allocations shall be achieved no later than July 25, 2015.

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Regional Water Board Approved TMDLs where urban runoff is listed as a source

TMDL Effective Date/BPA/Res. No.	Municipality	Impaired Water Body	Deliverables/Actions Required/Waste Load Allocations
Region 3: Central Coast Regional Water Board			
San Luis Obispo Creek TMDL and Implementation Plan for Nitrate-Nitrogen Effective Date: 8/04/2006 BPA: Chapter 4 Resolution No. R3-2005-0106	City of San Luis Obispo County of San Luis Obispo Cal Poly State University	San Luis Obispo Creek	**Purpose of Provisions** The purpose of these provisions is to implement the requirements of the San Luis Obispo Creek TMDL for Nitrate. **TMDL Wasteload Allocations** Urban storm water from the City of San Luis Obispo, County of San Luis Obispo, and Cal Poly State University shall not cause an increase in receiving water nitrate concentration greater than the increase in nitrate concentration resulting from their discharge in 2006 (when the TMDL became effective). In 2006, the nitrate concentration of storm water discharge was 0.3 mg/L-N. The City of San Luis Obispo, County of San Luis Obispo, and Cal Poly State University were achieving their allocations at the time the TMDL became effective; these municipalities shall implement measures to assure continued compliance with their allocations. **Provisions for Implementing the TMDL** The City of San Luis Obispo, County of San Luis Obispo, and Cal Poly State University shall implement best management practices that specifically address the reduction or elimination of nutrient loading. The City of San Luis Obispo, County of San Luis Obispo, and Cal Poly State University shall submit reports required by their storm water permits and in those reports outline best management practices implemented to assure ongoing compliance with their allocations.

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Regional Water Board Approved TMDLs where urban runoff is listed as a source

TMDL Effective Date/BPA/Res. No.	Municipality	Impaired Water Body	Deliverables/Actions Required/Waste Load Allocations
Region 3: Central Coast Regional Water Board			
Total Maximum Daily Loads for Fecal Indicator Bacteria in the Santa Maria River Watershed Effective Date: 2/21/2013 BPA: Chapter 4 Resolution No. R3-2012-0055	City of Santa Maria County of Santa Barbara County of San Luis Obispo City of Guadalupe Santa Maria Fairpark	Water Bodies in the Santa Maria River Watershed (including: Alamo Creek Blosser Channel Bradley Canyon Creek Bradley Channel Cuyama River La Brea Creek Little Oso Flaco Creek Main Street Canal Nipomo Creek Orcutt Creek Oso Flaco Creek Oso Flaco Lake Santa Maria River Estuary Santa Maria	**Purpose of Provisions** The purpose of these provisions is to implement the requirements of the Santa Maria River Watershed Fecal Indicator Bacteria TMDL. **TMDL Wasteload Allocations** The City of Santa Maria, County of Santa Barbara, County of San Luis Obispo, City of Guadalupe, and Santa Maria Fairpark are assigned the following concentration based wasteload allocation: (1) Fecal coliform concentration, based on a minimum of five samples for any 30-day period, shall not exceed a log mean of 200 MPN per 100mL, nor shall more than ten percent of total samples collected during any 30-day period exceed 400 MPN per 100mL; (2) Based on a statistically sufficient number of samples (generally not less than five samples equally spaced over a 30-day period), the geometric mean of E. coli densities shall not exceed 126 per 100mL, and no sample shall exceed a one-sided confidence limit (C.L.) calculated using the following as guidance: lightly used for contact recreation (90% C.L.) = 409 per 100mL. These wasteload allocations are receiving water allocations that must be attained by February 21, 2028 in accordance with a Wasteload Allocation Attainment Plan or other integrated plan. The City of Santa Maria is assigned allocations in the following water bodies: Santa Maria River, Main Street Canal, Blosser Channel, and Bradley Channel. The County of Santa Barbara is assigned allocation in the following water body: Orcutt Creek. The County of San Luis Obispo is assigned allocation in the following water body: Nipomo Creek. The City of Guadalupe is assigned allocation in the following water body: Santa Maria River. The Santa Maria Fairpark is assigned allocation in the following water body: Main Street Canal. **Provisions for Implementing the TMDL** By June 30, 2015, the County of Santa Barbara, County of San Luis Obispo, City of Santa Maria, City of Guadalupe, and the Santa Maria Fairpark shall each develop, submit, and begin implementation of a Wasteload Allocation Attainment Program, or an integrated plan, that identifies the actions they will take to attain their wasteload allocations. The Wasteload Allocation Attainment Programs or integrated plans shall include:

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Regional Water Board Approved TMDLs where urban runoff is listed as a source

TMDL Effective Date/BPA/Res. No.		Municipality	Impaired Water Body	Deliverables/Actions Required/Waste Load Allocations
Region 3: Central Coast Regional Water Board				
Total Maximum Daily Loads for Fecal Indicator Bacteria in the Santa Maria River Watershed (Continued)			River)	1. A detailed description of the strategy the MS4 will use to guide BMP selection, assessment, and implementation, to ensure that BMPs implemented will be effective at abating pollutant sources, reducing pollutant discharges, and achieving wasteload allocations according to the TMDL schedule. 2. Identification of sources of the impairment within the MS4's jurisdiction, including specific information on various source locations and their magnitude within the jurisdiction. 3. Prioritization of sources within the MS4's jurisdiction, based on suspected contribution to the impairment, ability to control the source, and other pertinent factors. 4. Identification of BMPs that will address the sources of impairing pollutants and reduce the discharge of impairing pollutants. 5. Prioritization of BMPs, based on suspected effectiveness at abating sources and reducing impairing pollutant discharges, as well as other pertinent factors. 6. Identification of BMPs the MS4 will implement, including a detailed implementation schedule. For each BMP, identify milestones the MS4 will use for tracking implementation, measurable goals the MS4 will use to assess implementation efforts, and measures and targets the MS4 will use to assess effectiveness. MS4s shall include expected BMP implementation for future implementation years, with the understanding that future BMP implementation plans may change as new information is obtained. 7. A quantifiable numeric analysis demonstrating the BMPs selected for implementation will likely achieve, based on modeling, published BMP pollutant removal performance estimates, best professional judgment, and/or other available tools, the MS4's wasteload allocations according to the schedule identified in the TMDL. This analysis will most likely incorporate modeling efforts. The MS4 shall conduct repeat numeric analyses as the BMP implementation plans evolve and information on BMP effectiveness is generated. Once the MS4 has water quality data from its monitoring program, the MS4 shall incorporate water quality data into the numeric analyses to validate BMP implementation plans. 8. A detailed description, including a schedule, of a monitoring program the MS4 will implement to assess discharge and receiving water quality, BMP effectiveness, and progress towards any interim targets and ultimate attainment of the MS4s' wasteload allocations. The monitoring program shall be designed to validate BMP implementation efforts and quantitatively demonstrate attainment of interim targets and wasteload allocations. 9. The MS4 shall establish interim targets (and dates when stormwater discharge conditions will be evaluated) that are equally spaced in time over the TMDL compliance schedule and represent measurable, continually decreasing MS4 discharge concentrations or other appropriate interim measures of pollution reduction and progress towards the wasteload allocation. At least one interim target and date must occur during the five-year term of this Order. The MS4 shall achieve its interim targets by the date it specifies in the Wasteload Allocation Attainment Program. If the MS4 does not specify interim targets as described above in its Wasteload Allocation Attainment Program, the interim targets identified in the TMDL apply. If the MS4 does not achieve any interim target by the date specified, the MS4 shall develop and implement more effective BMPs that it can quantitatively

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Regional Water Board Approved TMDLs where urban runoff is listed as a source

TMDL Effective Date/BPA/Res. No.		Municipality	Impaired Water Body	Deliverables/Actions Required/Waste Load Allocations
Region 3: Central Coast Regional Water Board				
Total Maximum Daily Loads for Fecal Indicator Bacteria in the Santa Maria River Watershed (Continued)				demonstrate will achieve the next interim target. 10. A detailed description of how the MS4 will assess BMP and program effectiveness. The description shall incorporate the assessment methods described in the CASQA Municipal Storm water Program Effectiveness Assessment Guide. 11. A detailed description of how the MS4 proposes to assess its compliance with interim targets and the final wasteload allocation. 12. A detailed description of how the MS4 will modify the program to improve upon BMPs determined to be ineffective during the effectiveness assessment. 13. A detailed description of information the MS4 will include in annual reports to demonstrate adequate progress towards attainment of wasteload allocations according to the TMDL schedule. 14. A detailed description of how the MS4 will collaborate with other agencies, stakeholders, and the public to develop and implement the Wasteload Allocation Attainment Program or integrated plan. 15. Any other items identified by Integrated Report fact sheets, TMDL Project Reports, TMDL Resolutions, or that are currently being implemented by the MS4 to control its contribution to the impairment, including public education and participation items identified above. All wasteload allocations shall be achieved by February 21, 2028.

ATTACHMENT G – Region Specific Requirements

Regional Water Board Approved TMDLs where urban runoff is listed as a source

<table>
<tr><th>TMDL
Effective Date/BPA/Res. No.</th><th>Municipality</th><th>Impaired Water Body</th><th>Deliverables/Actions Required/Waste Load Allocations</th></tr>
<tr><td colspan="4">Region 3: Central Coast Regional Water Board</td></tr>
<tr><td>Total Maximum Daily Loads for Nitrogen Compounds and Orthophosphate for the Lower Santa Maria River Watershed and Tributaries to Oso Flaco Lake

Effective Date: 5/22/2014

BPA: Chapter 4

Resolution No. R3-2013-0013

Total Maximum Daily Loads for Nitrogen Compounds and Orthophosphate for the Lower Santa Maria River Watershed and Tributaries to Oso Flaco Lake
(Continued)</td><td>City of Santa Maria

County of Santa Barbara

County of San Luis Obispo

City of Guadalupe</td><td>Water Bodies in the Lower Santa Maria River Watershed and Tributaries to Oso Flaco Lake (including:

Blosser Channel

Bradley Canyon Creek

Bradley Channel

Greene Valley Creek

Main Street Canal

North Main Street Channel

Orcutt Creek

Oso Flaco Creek

Little Oso Flaco Creek

Oso Flaco Lake

Santa Maria River

Santa Maria River Estuary)</td><td>Purpose of Provisions
The purpose of these provisions is to implement the requirements of the Lower Santa Maria River Watershed and Tributaries to Oso Flaco Lake Nitrogen Compounds and Orthophosphate TMDL.

TMDL Wasteload Allocations
The City of Santa Maria, County of Santa Barbara, County of San Luis Obispo, and City of Guadalupe are assigned the following concentration based wasteload allocations:

<table>
<tr><th colspan="5">FINAL WASTE LOAD ALLOCATIONS (WLAs)</th></tr>
<tr><th>Waterbody the Responsible Party is Discharging to [1, 2]</th><th>Party Responsible for Allocation & NPDES/WDR number</th><th>Receiving Water Nitrate as N WLA (mg/L)</th><th>Receiving Water Orthophosphate as P WLA (mg/L)</th><th>Receiving Water Unionized Ammonia as N WLA (mg/L)</th></tr>
<tr><td>Santa Maria River (upstream from Highway 1), Blosser Channel, Bradley Channel, Main Street Canal, North Main Street Channel</td><td>City of Santa Maria (Storm drain discharges to MS4s) NPDES No. CAS000004

City of Guadalupe (Storm drain discharges to MS4s) (NPDES No. CAS000004)</td><td>Allocation-4 (see descriptions of allocations at bottom of this table)</td><td>Not Applicable</td><td>Allocation-3</td></tr>
<tr><td>Santa Maria River (downstream from Highway 1)</td><td>City of Guadalupe (Storm drain discharges to MS4s) (NPDES No. CAS000004)</td><td>Allocation-1</td><td>Allocation-2</td><td>Allocation-3</td></tr>
<tr><td>Nipomo Creek</td><td>County of San Luis Obispo (Storm drain discharges to MS4s) (NPDES No. CAS000004)</td><td>Allocation-4</td><td>Not Applicable</td><td>Allocation-3</td></tr>
</table>
</td></tr>
</table>

ATTACHMENT G – Region Specific Requirements

Regional Water Board Approved TMDLs where urban runoff is listed as a source

<table>
<tr><th>TMDL
Effective Date/BPA/Res. No.</th><th>Municipality</th><th>Impaired Water Body</th><th>Deliverables/Actions Required/Waste Load Allocations</th></tr>
<tr><td colspan="4">Region 3: Central Coast Regional Water Board</td></tr>
<tr><td>Total Maximum Daily Loads for Nitrogen Compounds and Orthophosphate for the Lower Santa Maria River Watershed and Tributaries to Oso Flaco Lake
(Continued)</td><td></td><td></td><td>
<table>
<tr><td>Orcutt Creek</td><td>County of Santa Barbara (Storm drain discharges to MS4s) (NPDES No. CAS000004)</td><td>Allocation-1</td><td>Allocation-2</td><td>Allocation-3</td></tr>
</table>
Description of allocations:
<table>
<tr><th>Allocation [A]</th><th>Compound</th><th>Concentration (mg/L) [B]</th></tr>
<tr><td>Allocation 1</td><td>Nitrate as N</td><td>Dry Season (May 1-Oct. 31): 4.3
Wet Season (Nov. 1-Apr. 30): 8.0</td></tr>
<tr><td>Allocation 2</td><td>Orthophosphate as P</td><td>Dry Season (May 1-Oct. 31): 0.19
Wet Season (Nov. 1-Apr. 30): 0.3</td></tr>
<tr><td>Allocation 3</td><td>Unionized Ammonia as N</td><td>Year-round: 0.025</td></tr>
<tr><td>Allocation 4</td><td>Nitrate as N</td><td>Year-round: 10</td></tr>
</table>
[A] Federal and State anti-degradation requirements apply to all waste load and load allocations.
[B] Achievement of final waste load and load allocations to be determined on the basis of the number of measured exceedances and/or other criteria set forth in Section 4 of the Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List (Listing Policy - State Water Resources Control Board, Resolution No. 2004-0063, adopted September 2004) or as consistent with any relevant revisions of the Listing Policy promulgated in the future.
[1] Responsible parties shall meet allocations in all receiving surface waterbodies of the responsible parties' discharges.
[2] All reaches and tributaries unless otherwise noted.

These wasteload allocations are receiving water allocations that must be attained by the dates set forth in the TMDL in accordance with a Wasteload Allocation Attainment Plan or other integrated plan.

Provisions for Implementing the TMDL
By June 30, 2015, the County of Santa Barbara, County of San Luis Obispo, City of Santa Maria, and City of Guadalupe shall each develop, submit, and begin implementation of a Wasteload Allocation Attainment</td></tr>
</table>

ATTACHMENT G – Region Specific Requirements

Regional Water Board Approved TMDLs where urban runoff is listed as a source

TMDL Effective Date/BPA/Res. No.	Municipality	Impaired Water Body	Deliverables/Actions Required/Waste Load Allocations
Region 3: Central Coast Regional Water Board			
Total Maximum Daily Loads for Nitrogen Compounds and Orthophosphate for the Lower Santa Maria River Watershed and Tributaries to Oso Flaco Lake (Continued)			Program, or an integrated plan, that identifies the actions they will take to attain their wasteload allocations. The Wasteload Allocation Attainment Programs or integrated plans shall include: 1. A detailed description of the strategy the MS4 will use to guide BMP selection, assessment, and implementation, to ensure that BMPs implemented will be effective at abating pollutant sources, reducing pollutant discharges, and achieving wasteload allocations according to the TMDL schedule. 2. Identification of sources of the impairment within the MS4's jurisdiction, including specific information on various source locations and their magnitude within the jurisdiction. 3. Prioritization of sources within the MS4's jurisdiction, based on suspected contribution to the impairment, ability to control the source, and other pertinent factors. 4. Identification of BMPs that will address the sources of impairing pollutants and reduce the discharge of impairing pollutants. 5. Prioritization of BMPs, based on suspected effectiveness at abating sources and reducing impairing pollutant discharges, as well as other pertinent factors. 6. Identification of BMPs the MS4 will implement, including a detailed implementation schedule. For each BMP, identify milestones the MS4 will use for tracking implementation, measurable goals the MS4 will use to assess implementation efforts, and measures and targets the MS4 will use to assess effectiveness. MS4s shall include expected BMP implementation for future implementation years, with the understanding that future BMP implementation plans may change as new information is obtained. 7. A quantifiable numeric analysis demonstrating the BMPs selected for implementation will likely achieve, based on modeling, published BMP pollutant removal performance estimates, best professional judgment, and/or other available tools, the MS4's wasteload allocations according to the schedule identified in the TMDL. This analysis will most likely incorporate modeling efforts. The MS4 shall conduct repeat numeric analyses as the BMP implementation plans evolve and information on BMP effectiveness is generated. Once the MS4 has water quality data from its monitoring program, the MS4 shall incorporate water quality data into the numeric analyses to validate BMP implementation plans. 8. A detailed description, including a schedule, of a monitoring program the MS4 will implement to assess discharge and receiving water quality, BMP effectiveness, and progress towards any interim targets and ultimate attainment of the MS4s' wasteload allocations. The monitoring program shall be designed to validate BMP implementation efforts and quantitatively demonstrate attainment of interim and final wasteload allocations. 9. A detailed description of how the MS4 will assess BMP and program effectiveness. The description shall incorporate the assessment methods described in the CASQA Municipal Storm water Program Effectiveness Assessment Guide. 10. A detailed description of how the MS4 proposes to assess its compliance with interim targets and the final wasteload allocation. 11. A detailed description of how the MS4 will modify the program to improve upon BMPs determined to be ineffective during the effectiveness assessment.

ATTACHMENT G – Region Specific Requirements

Regional Water Board Approved TMDLs where urban runoff is listed as a source

TMDL Effective Date/BPA/Res. No.	Municipality	Impaired Water Body	Deliverables/Actions Required/Waste Load Allocations
Region 3: Central Coast Regional Water Board			
			12. A detailed description of information the MS4 will include in annual reports to demonstrate adequate progress towards attainment of wasteload allocations according to the TMDL schedule. 13. A detailed description of how the MS4 will collaborate with other agencies, stakeholders, and the public to develop and implement the Wasteload Allocation Attainment Program or integrated plan. 14. Any other items identified by Integrated Report fact sheets, TMDL Project Reports, TMDL Resolutions, or that are currently being implemented by the MS4 to control its contribution to the impairment, including public education and participation items identified above. The MS4 shall achieve its interim wasteload allocations as specified in the TMDL. If the MS4 does not achieve any interim wasteload allocation by the date specified, the MS4 shall develop and implement more effective BMPs that it can quantitatively demonstrate will achieve the next interim or final wasteload allocations. All wasteload allocations shall be achieved within 30 years of approval of the TMDL by the Office of Administrative Law.

ATTACHMENT G – Region Specific Requirements

Regional Water Board Approved TMDLs where urban runoff is listed as a source

<table>
<tr><th>TMDL
Effective Date/BPA/Res. No.</th><th>Municipality</th><th>Impaired Water Body</th><th>Deliverables/Actions Required/Waste Load Allocations</th></tr>
<tr><td colspan="4">Region 3: Central Coast Regional Water Board</td></tr>
<tr><td>Total Maximum Daily Loads for Toxicity and Pesticides in the Santa Maria River Watershed

Effective Date: 10/29/2014

BPA: Chapter 4

Resolution No. R3-2014-0009</td><td>City of Santa Maria

County of Santa Barbara

County of San Luis Obispo

City of Guadalupe</td><td>Blosser Channel

Bradley Canyon Creek

Bradley Channel

Greene Valley Creek

Little Oso Flaco Creek

Main Street Canal, Orcutt Creek

Oso Flaco Creek

Oso Flaco Lake

Santa Maria River</td><td>
Purpose of Provisions
The purpose of these provisions is to implement the requirements of the Santa Maria River Watershed Toxicity and Pesticides TMDL.

TMDL Wasteload Allocations
The City of Santa Maria, County of Santa Barbara, and City of Guadalupe are assigned the following wasteload allocations:

<table>
<tr><th colspan="3">Waste Load Allocations</th></tr>
<tr><th>Responsible Party</th><th>Source</th><th>Allocation</th></tr>
<tr><td>City of Santa Maria – NPDES No. CAS000004</td><td>Urban Stormwater</td><td>3, 4 & 5</td></tr>
<tr><td>County of Santa Barbara – NPDES No. CAS000004</td><td>Urban Stormwater</td><td>3, 4 & 5</td></tr>
<tr><td>City of Guadalupe</td><td>Urban Stormwater</td><td>3, 4 & 5</td></tr>
</table>
Allocation-3: Additive Toxicity TMDL for Pyrethroid Pesticides:
The pyrethroid pesticides have additive toxicity in aquatic sediments. Since the TMDL is linked to toxicity and concentrations, additive toxicity must be considered in the TMDL as a numeric target.

The numeric target for additive toxicity for pyrethroid pesticides is:

$$\frac{C\ (Pyrethroid\ 1)}{NLC(Pyrethroid\ 1)} + \frac{C\ (Pyrethroid\ 2)}{NLC\ (Pyrethroid\ 2)} = S;\ where\ S\ \leq 1$$

Where:
C = the concentration of a pesticide measured in sediment.
NLC = the numeric LC50 for each pesticide present (Table 3).
S = the sum; a sum exceeding one (1.0) indicates that beneficial uses may be adversely affected.

The additive toxicity numeric target formula shall be applied when pyrethroid pesticides are present in the
</td></tr>
</table>

ATTACHMENT G – Region Specific Requirements

Regional Water Board Approved TMDLs where urban runoff is listed as a source

TMDL Effective Date/BPA/Res. No.	Municipality	Impaired Water Body	Deliverables/Actions Required/Waste Load Allocations
Region 3: Central Coast Regional Water Board			
Total Maximum Daily Loads for Toxicity and Pesticides in the Santa Maria River Watershed (Continued)			sediment. Table 1 Pyrethroid Sediment LC50s **Chemical** / **LC50 ng/g ppb)** / **LC50 µg/g OC*(ppm)** Bifenthrin 12.9 0.52 Cyfluthrin 13.7 1.08 Cypermethrin 14.87 0.38 Esfenvalerate 41.8 1.54 Lambda-Cyhalothrin 5.6 0.45 Permethrin 200.7 10.83 *Median lethal concentration (LC50) for amphipods (Hyalella azteca) organic carbon normalized concentrations (ug/g OC) Allocation-4: Aquatic Toxicity TMDLs (refer to Table 5) Table 2 Standard Aquatic Toxicity Tests **Parameter** / **Test** / **Biological Endpoint Assessed** Water Column Toxicity / Water Flea – *Ceriodaphnia (6-8 day chronic)* / Survival and reproduction Sediment Toxicity / Hyalella azteca (10-day chronic) / Survival Allocation-5: Organochlorine Pesticide TMDLs (refer to Tables 8, 9, and 10) Table 3 DDT Sediment Chemistry TMDLs Waterbodies Assigned TMDLs[1] / TMDL DDD, 4,4- (p,p-DDD) o.c.[2] µg/kg / DDE, 4,4- (p,p-DDE) o.c.[2] µg/kg / DDT, 4,4- (p,p-DDT) o.c.[2] µg/kg / Total DDT o.c.[2] µg/kg Blosser Channel 9.1 5.5 6.5 10 Bradley Channel 9.1 5.5 6.5 10 Greene Valley Creek 9.1 5.5 6.5 10

ATTACHMENT G – Region Specific Requirements

Regional Water Board Approved TMDLs where urban runoff is listed as a source

TMDL Effective Date/BPA/Res. No.	Municipality	Impaired Water Body	Deliverables/Actions Required/Waste Load Allocations
Region 3: Central Coast Regional Water Board			
Total Maximum Daily Loads for Toxicity and Pesticides in the Santa Maria River Watershed (Continued)			

Little Oso Flaco Creek	9.1	5.5	6.5	10
Main Street Canal	9.1	5.5	6.5	10
Orcutt Creek	9.1	5.5	6.5	10
Oso Flaco Creek	9.1	5.5	6.5	10
Oso Flaco Lake	9.1	5.5	6.5	10
Santa Maria River	9.1	5.5	6.5	10

[1] All reaches of all surface waters in the Santa Maria River watershed, including those listed.
[2] o.c.: organic carbon normalized concentrations.

Table 4 Additional Organochlorine Pesticide Sediment Chemistry TMDLs

Waterbodies Assigned TMDLs[1]	TMDL			
	Chlordane o.c.[2]	Dieldrin o.c.[2]	Endrin o.c.[2]	Toxaphene o.c.[2]
	µg/kg	µg/kg	µg/kg	µg/kg
Oso Flaco Lake	1.7	0.14	550[3]	20[3]
Santa Maria River	1.7	0.14	550	20
Orcutt Creek	1.7[3]	0.14	550[3]	20[3]

[1] All reaches of all surface waters in the Santa Maria River watershed, including those listed.
[2] o.c.: organic carbon normalized concentrations.
[3] Waterbody is currently achieving the TMDL.

Table 5 Fish Tissue TMDLs for Organochlorine Pesticides

Waterbodiess Assigned TMDLs	Fish Tissue TMDL			
	Chlordane	DDTs	Dieldrin	Toxaphene
	ng/g* (ppb)	ng/g* (ppb)	ng/g* (ppb)	ng/g* (ppb)
Oso Flaco Lake	5.6	21	--	--
Oso Flaco Creek	5.6	21		
Santa Maria River	5.6	21	0.46	6.1
Orcutt Creek	5.6	21	0.46	6.1

*ng/g: i.e. nanograms of pollutant per grams of fish tissue (e.g. a fillet)

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Regional Water Board Approved TMDLs where urban runoff is listed as a source

TMDL Effective Date/BPA/Res. No.		Municipality	Impaired Water Body	Deliverables/Actions Required/Waste Load Allocations
Region 3: Central Coast Regional Water Board				
Total Maximum Daily Loads for Toxicity and Pesticides in the Santa Maria River Watershed	(Continued)			These wasteload allocations are receiving water allocations that must be attained by the dates set forth in the TMDL in accordance with a Wasteload Allocation Attainment Plan or other integrated plan. **Provisions for Implementing the TMDL** By June 30, 2015, the County of Santa Barbara, City of Santa Maria, and City of Guadalupe shall each develop, submit, and begin implementation of a Wasteload Allocation Attainment Program, or an integrated plan, that identifies the actions they will take to attain their wasteload allocations. The Wasteload Allocation Attainment Programs or integrated plans shall include: 1. A detailed description of the strategy the MS4 will use to guide BMP selection, assessment, and implementation, to ensure that BMPs implemented will be effective at abating pollutant sources, reducing pollutant discharges, and achieving wasteload allocations according to the TMDL schedule. 2. Identification of sources of the impairment within the MS4's jurisdiction, including specific information on various source locations and their magnitude within the jurisdiction. 3. Prioritization of sources within the MS4's jurisdiction, based on suspected contribution to the impairment, ability to control the source, and other pertinent factors. 4. Identification of BMPs that will address the sources of impairing pollutants and reduce the discharge of impairing pollutants. 5. Prioritization of BMPs, based on suspected effectiveness at abating sources and reducing impairing pollutant discharges, as well as other pertinent factors. 6. Identification of BMPs the MS4 will implement, including a detailed implementation schedule. For each BMP, identify milestones the MS4 will use for tracking implementation, measurable goals the MS4 will use to assess implementation efforts, and measures and targets the MS4 will use to assess effectiveness. MS4s shall include expected BMP implementation for future implementation years, with the understanding that future BMP implementation plans may change as new information is obtained. 7. A quantifiable numeric analysis demonstrating the BMPs selected for implementation will likely achieve, based on modeling, published BMP pollutant removal performance estimates, best professional judgment, and/or other available tools, the MS4's wasteload allocations according to the schedule identified in the TMDL. This analysis will most likely incorporate modeling efforts. The MS4 shall conduct repeat numeric analyses as the BMP implementation plans evolve and information on BMP effectiveness is generated. Once the MS4 has water quality data from its monitoring program, the MS4 shall incorporate water quality data into the numeric analyses to validate BMP implementation plans. 8. A detailed description, including a schedule, of a monitoring program the MS4 will implement to

ATTACHMENT G – Region Specific Requirements

Regional Water Board Approved TMDLs where urban runoff is listed as a source

TMDL Effective Date/BPA/Res. No.	Municipality	Impaired Water Body	Deliverables/Actions Required/Waste Load Allocations
Region 3: Central Coast Regional Water Board			
Total Maximum Daily Loads for Toxicity and Pesticides in the Santa Maria River Watershed (Continued)			assess discharge and receiving water quality, BMP effectiveness, and progress towards any interim targets and ultimate attainment of the MS4s' wasteload allocations. The monitoring program shall be designed to validate BMP implementation efforts and quantitatively demonstrate attainment of interim and final wasteload allocations. 9. A detailed description of how the MS4 will assess BMP and program effectiveness. The description shall incorporate the assessment methods described in the CASQA Municipal Storm water Program Effectiveness Assessment Guide. 10. A detailed description of how the MS4 proposes to assess its compliance with interim targets and the final wasteload allocation. 11. A detailed description of how the MS4 will modify the program to improve upon BMPs determined to be ineffective during the effectiveness assessment. 12. A detailed description of information the MS4 will include in annual reports to demonstrate adequate progress towards attainment of wasteload allocations according to the TMDL schedule. 13. A detailed description of how the MS4 will collaborate with other agencies, stakeholders, and the public to develop and implement the Wasteload Allocation Attainment Program or integrated plan. 14. Any other items identified by Integrated Report fact sheets, TMDL Project Reports, TMDL Resolutions, or that are currently being implemented by the MS4 to control its contribution to the impairment, including public education and participation items identified above. Waste load allocations will be achieved through implementation of management practices and strategies to reduce pesticide loading, and wasteload allocation attainment will be demonstrated through water quality monitoring. Implementation can be conducted by MS4s specifically and/or through statewide programs addressing urban pesticide water pollution. The target date to achieve the TMDLs for pyrethroids is 15 years after approval of the TMDL by the Office of Administrative Law. This estimate is based on the widespread availability of pyrethroids, including consumer usage, and current limited regulatory oversight. The target date to achieve the TMDLs for organochlorine pesticides (DDT, DDD, DDE, chlordane, eldrin, toxaphene, dieldrin) is 30 years after approval of the TMDL by the Office of Administrative Law.