

C-12.0 WATERSHED PLANNING

C-12.1 Introduction

Watershed management is the term used for the approach to water quality planning that places an emphasis on the watershed (the area draining into a river system, ocean or other body of water through a single outlet) as the planning area and looks to multi-jurisdictional solutions to problems that cut across programs and jurisdictional boundaries.

The Permits have, with varying degrees of specificity, required the Permittees to develop and implement a watershed-based aspect to urban stormwater management to complement the established jurisdictional-based approaches. In the area of the County under the jurisdiction of the San Diego Regional Board, initial Watershed Workplans will now be foundational to the Water Quality Improvement Plan under the 5th Term Permit. In the Santa Ana Regional Board area of the County, the Permittees initial progress with watershed master planning will now be foundational to the Watershed Management Plans that will be developed under the impending fifth term permit.

The approach taken to master planning, recognizes that the jurisdictional DAMP/ LIPs and watershed planning efforts represent the principal policy and program documents for two separate, but nonetheless similar and highly interdependent, water quality planning processes targeting the control of pollutants in urban runoff (see **Section 3.0, 2003 DAMP**). There is also recognition that these efforts are, in many watersheds in Orange County, supportive of additional planning processes focused on achieving broader objectives such as watershed habitat restoration and connectivity rather than specific water quality outcomes.

There are five distinct watersheds within the Santa Ana Regional Board area which are identified below in **Table 12.1.** and are the focus of watershed planning.

Table 12.1: Santa Ana Region Watersheds

Watershed Planning Area	Major Watercourses
San Gabriel River/Coyote Creek	Coyote, Carbon, Fullerton, and Brea Creeks
Anaheim Bay/Huntington Harbour	East Garden Grove Wintersburg Channel, Bolsa Chica Channel
Santa Ana River (within Orange County)	Talbert Channel, Santiago Creek and Santa Ana River
Newport Bay	San Diego Creek, Santa Ana Delhi Channel
Newport Coastal Streams (Often combined with Newport Bay)	Buck Gully, Los Trancos Canyon Creek, Muddy Canyon Creek

C-12.2 Accomplishments

C-12.2.1 Watershed Management/Planning Initiatives

- **Watershed Master Planning**

Order R8-2009-0030 requires the Permittees to prepare master plans, termed Watershed Infiltration and Hydromodification Management Plans (WIHMPS), for the Coyote Creek-San Gabriel River, Anaheim Bay-Huntington Harbor, Santa Ana River, and Newport Bay-Newport Coast watersheds. These plans shall include the following principal components:

- Maps to identify areas susceptible to hydromodification including downstream erosion, impacts on physical structure, impacts on riparian and aquatic habitats and areas where stormwater and urban runoff infiltration is possible and appropriate.
- A hydromodification model to make available as a tool to enable proponents of land development projects to readily select storm water preventive and mitigative site BMP measures.

Draft WIHMPS were completed in the reporting period..

- **Watershed Management Areas**

Recognizing the need for a coordinated approach to resource management and capital improvement planning, leveraging partnerships with regional stakeholders and developed programs and plans (such as TMDLs and consolidated grants) the governance for water quality programs has been organized around three geographic sub-areas, or watershed management areas (WMAs) (**Figure C-12.2**). The San Gabriel River/Coyote Creek, Anaheim Bay/Huntington Harbour, and Santa Ana River (within Orange County) watersheds comprise the North Orange County WMA; the Newport Bay and Newport Coastal Streams watersheds comprise the Central Orange County WMA; and the Aliso Creek, San Juan Creek, Laguna Coastal Streams, Dana Point Coastal Streams, San Clemente Coastal Streams and San Mateo Creek (within Orange County) watersheds comprise the South Orange County WMA which falls wholly under the jurisdiction of the San Diego Regional Board.

The governance structure of each WMA is different. Participants may include cities, water and wastewater agencies, private and public interests, academia, State and Federal agencies, and non-governmental organizations with various missions, including, but not limited to, ecosystem restoration and open space and coastal protection. Involvement of diverse stakeholders promotes integration and maximizes potential benefits through increased communication and collaboration.

The State of California has been promoting Integrated Regional Water Management (IRWM) planning, as a means of achieving more sustainable water use. IRWM is intended to be a more efficient and effective way to manage water resources. It

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allows for regional prioritization of important watershed issues and for consensus to be reached on how to address those issues. Also, IRWM planning fosters development of holistic solutions to problems, addresses problems at the source, and integrates projects and programs throughout the region that have logical overlaps. Ultimately, IRWM planning promotes sustainable resource management.

Whereas watershed planning for stormwater management is focused on enhanced BMP implementation targeting specific constituents of concern within a watershed, an IRWM Plan is an integrated plan for all water resources projects, including water supply, wastewater, flood management, stormwater and urban runoff, aquatic habitat, and recreation.

The Central Orange County IRWM Plan incorporates goals, objectives, research, strategies, and projects that have been identified and received stakeholder support. Some of these efforts are driven by regulations and others are the result of regional vision and goals for the quality and function of the Newport Bay and Newport Coast Watersheds.

During 2008-09, the Central Orange County WMA joined with the Santa Ana Watershed Project Authority (SAWPA) as part of one region for the Department of Water Resources' Proposition 84 IRWM grant program.

The purpose of the North Orange County WMA IRWM Plan is intended to maximize the utilization of local water resources by providing for more effective collaboration through the application of multiple water management strategies by implementing multi-purpose projects that will fulfill the needs of the region. The North Orange County WMA IRWM Plan was completed in March 2011 with an updated project list for the region. There were no updates to this IRWM Plan in the reporting period.

Watershed Permittees along with the County of Orange submitted grant applications for the Proposition 84 IRWM grant program. As a result of this effort ten projects were selected from the north and central WMAs to receive Proposition 84 IRWM grant funding totaling more than \$20 million.

C-12.2.2 Environmental Restoration Efforts

- **Santa Ana River:** Fairview Park Wetlands and Riparian Habitat Project

The City of Costa Mesa's Fairview Park Wetlands and Riparian Habitat Project includes the restoration of approximately 30 acres containing the following four major design elements:

- 17-acre riparian habitat area;
- 6-acre area of water treatment ponds for water quality improvement and percolation;
- 13-acre area of CSS, native grasslands, and an oak woodland; and

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- Water delivery system to the ponds and riparian area from a modified pump station along the Greenville-Banning Channel.

The City of Costa Mesa continues to look for funding to provide amenities such as interpretive centers, picnic tables and other educational features for the park.

C-12.2.3 Watershed-Based Water Quality Planning Efforts

- **San Gabriel River/Coyote Creek:** San Gabriel River Regional Monitoring Program

The Sanitation Districts of Los Angeles County are required, as a condition of their NPDES Permit, to work with all agencies and interested parties in developing a watershed-wide monitoring program for the San Gabriel River Watershed. The County, as Principal Permittee, is participating in this workgroup which is facilitated by Aquatic Bioassay & Consulting, Inc. The Principal Permittee provided sample collection and analysis for up to three random sites in Orange County per year since the beginning of the monitoring program. The data are presented in annual reports available through Aquatic Bioassay & Consulting.

For 2015-16, one trend site and one random site were sampled on Fullerton Creek. Results of this monitoring effort can be found in **Section C-11.0**.

- **San Gabriel River/Coyote Creek:** Coyote Creek Metals TMDL

The San Gabriel River and Impaired Tributaries TMDLs (Coyote Creek Metals TMDL) established mass-based WLAs for total copper, total lead, and total zinc in wet weather and total copper in dry weather. The TMDLs were established by the Los Angeles Region since most of the San Gabriel River watershed lies within that region, but 54% of the Coyote Creek watershed lies in Orange County within the jurisdictional boundary of the Santa Ana Regional Board. While the Los Angeles Regional Board has no jurisdiction over portions of Coyote Creek within Orange County, the Santa Ana Regional Board deferred to the findings of Los Angeles Regional Board and incorporated some TMDL requirements into the Orange County MS4 Permit, particularly the development of a Source Control Plan and Monitoring Program (SCP).

In 2009, the County initiated SCP development. A Work Group was convened, consisting of the County and the cities of Anaheim, Brea, Buena Park, Cypress, Fullerton, La Habra, La Palma, Los Alamitos, Placentia, and Seal Beach (watershed cities), to help guide SCP development. The SCP was finalized and approved by the Work Group in June 2010. In July 2010, the County initiated monitoring activities under the SCP on behalf of the watershed cities. Since then, a total of six sites have been monitored monthly for total and dissolved metals, hardness, and other parameters. These sites will continue to be monitored to establish baseline water quality conditions in the watershed and to track progress in attaining TMDL goals.

- **San Gabriel River/Coyote Creek:** Coyote Creek Bacteria TMDL

On June 10, 2015, the Los Angeles Regional Water Quality Control Board (Los Angeles Regional Board) adopted Resolution No. R15-005 to establish a TMDL for Indicator Bacteria in the San Gabriel River, Estuary and Tributaries to restore REC-1 beneficial use of these waters. The target indicator for the TMDL is E. coli. The State Water Resources Control Board (State Water Board) has not yet approved the TMDL.

Coyote Creek, as tributary to the San Gabriel River, is subject to the TMDL. However, the Orange County portion of the watershed lies within the jurisdiction of the Santa Ana Regional Board. State Water Board action on the TMDL may not occur before the Santa Ana Regional Board adopts the new Orange County Stormwater Permit.

No historical data on E. coli exist for the Coyote Creek watershed. Therefore, monthly monitoring of six sites began in July 2015 to provide baseline E.coli data at the confluences of major tributaries in the watershed.

- **Santa Ana River:** Talbert Channel and Lower Santa Ana River Water Quality Diversions and Investigation

On October 15, 1999, the Santa Ana Regional Board issued a Section 13267 Directive to the County of Orange and five cities concerning bacteriological water quality impairments in the Talbert and Lower Santa Ana River watersheds that may be affecting surfzone water quality. In response to the Regional Board's Directive, the County of Orange constructed dry weather urban runoff diversion projects in four flood control facilities [Huntington Beach Pump Station (D01PS1), Talbert Channel (D03), Santa Ana River (E01); and Greenville Banning Channel (D03)] for the diversion of dry weather urban runoff, an area of 16,575 acres. Runoff is diverted to the sanitary sewer collection system for conveyance to OCSD, where it is treated prior to offshore ocean outfall discharge. Similar diversion actions were taken by the City of Huntington Beach at a number of pump stations. The project goals were to divert all dry weather urban runoff from the watershed year-round and reduce the number of beach postings and closures due to high bacteria counts at the Huntington Beach State Beach.

Greenville Banning Channel and Huntington Beach pump station diversion facilities have been continuously operational, excepting periods of rainfall and subsequent storm runoff. The Santa Ana River diversion was generally operated only during the dry season (May - October) due to operational issues during the rainy season. As a result of these diversion programs, there has been no re-occurrence of the extensive beach closures of 1999.

- **Newport Bay:** Trash Management Plan

In December 2012 the County was awarded a grant from the CIAP, administered by the US Fish & Wildlife Service, to implement a project that would offer Orange County municipalities with a substantially improved ability to manage trash in the environment. The goals of the project are to 1) develop and implement tools needed to understand and remediate trash, and 2) apply these tools towards developing a trash management plan for the Newport Bay Watershed. Progress in the reporting period is discussed in **Section C-3.0.** and in **Exhibit 27 - County Of Orange/OCFCD PEA.**

- **Newport Bay:** Nitrogen and Selenium Management Program

The NSMP was created in 2004 in response to a general NPDES permit (Order No. R8-2004-0021, which was replaced by R8-2007-0041 and subsequently amended by R8-2009-0045). The permits establish waste discharge requirements for certain groundwater-related discharges and regulate *de minimus* discharges in the Newport Bay Watershed. The NSMP is a collaborative effort of up to 20 stakeholders, including various State, county, and local agencies, environmental groups, and private entities with the goal of developing management strategies and treatment technologies for both selenium and nitrogen for the watershed. The Principal Permittee is the Chair of the NSMP, providing program leadership and ensuring implementation of the work plan and consequential compliance with the terms of the permit. A work plan was developed by the NSMP and approved by the Santa Ana Regional Water Quality Control Board in 2005. The work plan focused on development of treatment technologies and BMPs; development of an offset, trading or mitigation program; and development of a tissue-based site-specific water quality objective. Participation in the NSMP and implementation of the approved Work Plan constituted compliance with the permit. Since permit expiration in December 2009, Time Schedule Orders (TSO) R8-2009-0069 (amended by R8-2013-0060 and R8-2014-0025) and R8-2009-0070 (amended by R8-2013-0061 and R8-2014-0026) have been in place to provide interim coverage for groundwater-dewatering discharges of the NSMP stakeholders.

Since issuance of the TSO, the efforts of the NSMP have focused on development of a BMP Strategic Plan, which outlines a phased, adaptive approach to achieving applicable selenium water quality standards. On December 5, 2013, the BMP Strategic Plan was approved by the Regional Board. Currently, the NSMP members are implementing the tasks specified in the Plan. The cornerstone of the BMP Strategic Plan is two dry weather diversion pipeline projects, located at Peters Canyon Channel and Santa Ana-Delhi Channels respectively, which will intercept and divert dry weather flows to OCSA for treatment and/or reuse. It is expected that these projects will achieve significant selenium and nitrogen reductions in the watershed. The Peters Canyon Channel Project was completed in September 2016. The Santa Ana-Delhi Channel project has completed the final design and is expected to begin construction in early 2017.

The Big Canyon Wash watershed, located within the City of Newport Beach, drains directly to the Upper Newport Bay. The City has developed a comprehensive selenium management program including groundwater-surface water investigations, water conservation, diversion, and other projects that will lower the selenium loadings as well as limit bioavailability of selenium to the biota within the habitat areas, which include the lakes in the Big Canyon Golf Course and in the Big Canyon Nature Park. During the 2015-16 reporting year, water conservation efforts and a diversion project in the upper watershed resulted in significant reduction in selenium loading.

The NSMP has assisted the Regional Board with the development of a revised selenium TMDL and will also support development of site-specific water quality objectives, which are expected to be adopted after the TMDL adoption. In December 2015, the draft revised Selenium TMDL was submitted to the Regional Board for final review and subsequent adoption, which is anticipated to be in early 2017.

Since 2010, the NSMP has carried out selenium-related watershed monitoring including fish and bird egg tissue sampling and special studies. In spring 2016, a special study on selenium speciation and cycling in the lower Newport Bay watershed was carried out jointly by the Regional Board and County staff.

In June 2013, the OCSD Board of Directors approved an increase of the effective cap of the Urban Runoff Diversion Program from 4 million gallons a day (MGD) to 10 MGD. This increase enabled the two NSMP diversions to be built as well as other future projects when treatment or other BMPs are not available or feasible. A special discharge permit has been issued by OCSD to the Peters Canyon Channel Project.

- **Newport Bay:** Newport Bay Watershed Nutrient TMDL

The nutrient TMDL establishes mass-based WLAs to reduce the annual loading of nitrogen and phosphorus to Newport Bay by 50% in order to attain the numeric and narrative water quality objectives by 2012. To achieve these WLAs, the TMDL established a number of interim targets requiring a 30% and 50% reduction in nutrients in summer flows by 2002 and 2007, respectively, and a 50% reduction in non-storm winter flows by 2012.

In February 2000, the Principal Permittee on behalf of the Watershed Permittees, initiated the Regional Nutrient Monitoring Program (RMP) for the Newport Bay watershed pursuant to requirements established by the Santa Ana Regional Board (Resolution 99-77). Data analysis reports to document watershed nutrient concentrations and loadings, algal biomass, and bay nutrient concentrations. Reporting frequency was increased to quarterly from 2006-2014. Annual reporting resumed in 2015 and the first annual report was submitted to the Regional Board on December 15, 2015 covering data from April 2014 - June 2015.

Current analysis of the RMP watershed and Bay data indicate the overall TMDL is being met for the majority of seasons. Nutrient levels at Santa Ana-Delhi Channel

and San Diego Creek Reach 2 are influenced by rising groundwater, which has been documented as a significant source of nitrogen. As rising groundwater has a separate load allocation under the TMDL, revisions of the TMDL have been recommended to the Santa Ana Regional Board to address this issue. For phosphorus, the current allocation would require sustained drought conditions (<5 inches of rain per year) to meet the urban runoff target since phosphorus loads are highly correlated with rainfall. The total phosphorus load to Newport Bay has recently been in attainment of the overall TMDL as shown in the *2014-15 Annual Data Report for the Newport Bay Watershed Nutrient TMDL*. Revisions to the TMDL have been recommended in the annual data report to address this issue.

- **Newport Bay:** Newport Bay Watershed Sediment (TMDL)

In April 1999, the Regional Board approved a sediment TMDL for the Newport Bay watershed to address water quality impairment due to excessive sedimentation. It requires implementation and maintenance of sediment control measures aimed at ensuring that existing habitat acreages of Upper Newport Bay are not significantly changed and that sediment discharges in the watershed are reduced by 50% within 10 years. The load allocations for sediment discharges to Newport Bay from urban areas shall not exceed 2,500 tons per year, implemented as a 10-year running annual average. The long term goal of the sediment TMDL is to reduce the frequency of dredging Upper Newport Bay to once every 20 to 30 years.

To comply with the sediment TMDL, an annual basin report is to be submitted to the Santa Ana Regional Board by November 15 of each year verifying that the foothill and in-channel retarding basins in the watershed have at least 50% available capacity. Additionally, an annual compilation of sediment monitoring data and TMDL compliance analysis is required by February 27 of each year. Analysis of the past 16 years of monitoring data indicates that sediment loads in the San Diego Creek/Newport Bay Watershed have been reduced significantly from rates recorded in the pre-TMDL period and that compliance with the 50% reduction (62,500 tons per year) is being achieved. Compliance is evaluated as 10 year running average of the suspended sediment load measured at San Diego Creek at Campus Drive which is approximately 26,250 tons per year. The estimated load from urban sources to Newport Bay calculated over the 2004-05 to 2013-14 water years is approximately 700 tons (Northwest Hydraulic Consultants, Sediment TMDL review May 2016).

In February 2014, the Santa Ana Regional Board approved requested modifications to the Monitoring and Reporting Program for the Sediment TMDL. The revisions were based on the extensive monitoring data collected to date and reflect the changing nature of the watershed in response to sediment control initiatives and efforts put in place over the past 30 years. The revised Monitoring Program allows resources to be appropriately applied.

- **Newport Bay:** Fecal Coliform TMDL

The fecal coliform TMDL for Newport Bay was adopted in 1999 to improve bacterial quality, reduce public health risks, and improve water contact recreational activities. Based on an evaluation of trends in data since 2001 from Newport Bay sites, average fecal coliform concentrations have decreased substantially. The TMDL requires an updated TMDL report based upon findings from a Source Identification Project and recommendations in the Source Management Plan. During the reporting period County staff worked on development of this report and continued monitoring of Bay bacteria concentrations. A report entitled *Newport Bay Fecal Coliform 2016 Summary of Management Activities* was finalized during the reporting period. The report summarizes the substantial BMP efforts in the Newport Bay watershed that are likely to help reduce bacteria levels.

- **Newport Bay:** Newport Bay Watershed Toxics TMDL

On June 14, 2002, EPA Region 9 established the Toxics TMDL for the Newport Bay Watershed. The Santa Ana Regional Board is currently splitting the EPA promulgated Toxics TMDL into five separate constituent and geographically specific TMDLs. The five resulting TMDLs will include (1) diazinon and chlorpyrifos, (2) organochlorine compounds, (3) selenium, (4) metals, and (5) Rhine Channel. Each of these individual TMDLs must proceed through the full approval process before they are officially adopted and effective. To date, the Santa Ana Regional Board has adopted two of the five TMDLs. The development status of these separate TMDLs is as follows:

- **Organophosphate Pesticides:** A Basin Plan Amendment (BPA) was adopted by the Regional Board in 2003 and the associated WLAs were incorporated into the existing MS4 Permit.
- **Organochlorines:** At the time the existing MS4 permit was issued in 2009, the Regional Board had adopted a BPA for the Organochlorines TMDL in the San Diego Creek and Newport Bay watershed. The BPA had not yet been approved by the State Water Resources Control Board (State Board), the Office of Administrative Law (OAL), or USEPA and therefore was not yet effective. The TMDL received final approval from USEPA in 2013. Therefore, this TMDL will be incorporated for the first time in the reissued North Orange County MS4 Permit. A draft work plan for implementation of the Organochlorines TMDL was prepared and submitted to the Regional Board. Currently the work plan is being evaluated by the Permittees.
- **Selenium:** The revised Selenium TMDL was submitted to the Regional in December 2015 for review and approval (See prior section on Nitrogen and Selenium Management Program above for detailed information).
- **Metals:** A California Environmental Quality Act (CEQA) public scoping meeting was held on July 23, 2015 for the proposed BPA that would establish revised metals TMDLs and replace those promulgated by EPA. Further action is expected in 2016-17.
- **Rhine Channel (Mercury and Chromium):** No new TMDL is expected at this time.

- **Newport Coastal Streams:** City of Newport Beach Initiatives

The Newport Coast Watershed area covers about 10 square miles and eight coastal canyons; it extends south of Corona Del Mar in Newport Beach to El Morro Canyon in Crystal Cove State Park. Two of the canyons are 303(d) listed and the entire watershed drains to one of two Areas of Special Biological Significance (ASBS's) (the Newport Beach Marine Life Refuge and/or the Irvine Coast Marine Life Refuge). In addition to the DAMP/LIP BMPs, the following actions are under way by the City of Newport Beach to address canyon degradation, ASBS concerns and the 303(d) listing:

- Continued catch basin screening program and street sweeping program;
- Sanitary System Overflow (SSO) prevention plan;
- Continued production of Water Wise program;
- Continued to create numerous water conservation and water quality PSA's;
- "Zero Trash Newport" program for trash and debris removal on many of the ocean and bay beaches;
- Residential Water Quality letter and fact sheets;
- Buck Gully Resource Management Plan;
- Harbor Area Management Plan (HAMP); and
- Program converting traditional landscaping to California-friendly and drought tolerant planting.

C-12.3 Assessment

The Permittees' environmental restoration efforts focused on ecological outcomes are, in the main, broad stakeholder initiatives rather than permit compliance driven planning processes. In contrast, the Permittees' watershed-based water quality planning efforts are focused on water quality standard attainment; involve the Permittees and other regulated entities, and principally represents cooperative compliance efforts to address TMDLs. The focus on specific pollutant-waterbody combinations will continue to define watershed-based water quality planning in the Fifth Term Permit. However, a shift in the Countywide program toward addressing the priority water quality constituents of concern, the possible introduction of new WMP or WQIP requirements, and the burgeoning interest in integrated water resource management as a consequence of ongoing drought conditions, will likely combine to ensure that watershed-based planning becomes a more defining characteristic of stormwater management and water quality planning and protection.

2016-17 Program Focus

- Complete WQIP for the San Juan Hydrologic Unit;
- Use foundational elements of the WQIP-equivalent watershed-based planning in the watersheds of north Orange County after fifth term permit approval, and

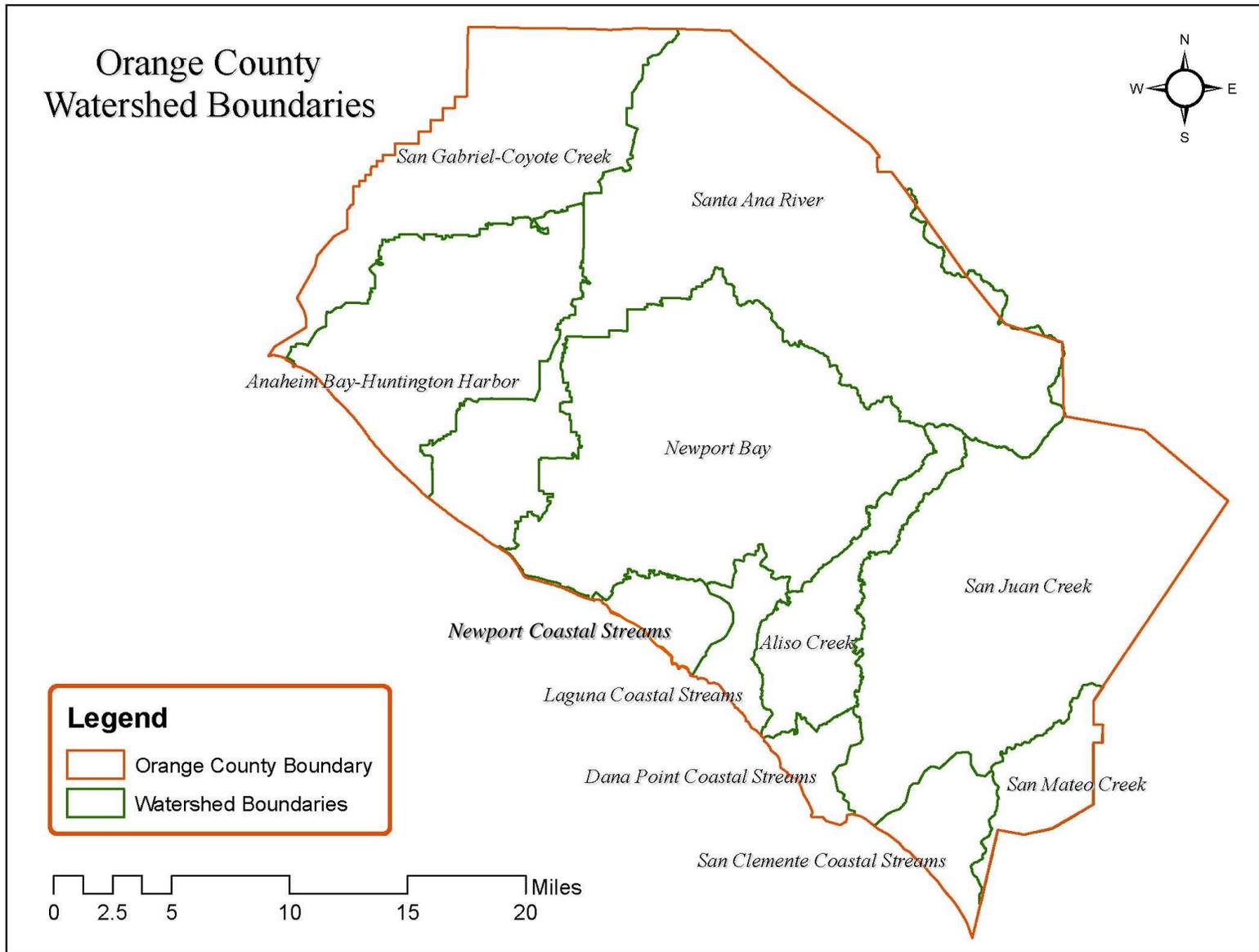
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- Direct DAMP/LIP and WQIP planning processes toward addressing Nutrients and Pesticides, in addition to Fecal Indicator Bacteria.

C-12.4 Summary

The Permittees' watershed-based water quality planning efforts are principally focused on water quality standard attainment; involve the Permittees and other regulated entities, and represent collective and cooperative compliance efforts. The further development of the watershed planning approach will enable water quality, watershed restoration and current integrated water resource management imperatives to be more synergistically addressed and will be a focus of further plan development in the Fifth Term Permit period.

Figure C-12.1: Orange County Watershed Boundaries



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Figure C-12.2: Watershed Management Areas

