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Attorneys for Petitioner City of Goleta

BEFORE THE

CALIFORNIA STATE WATER RESOURCES CONTROL BOARD

In the Matter of the Petition of the City of Goleta for Review of Action and Failure to Act by the Central Coast Regional Water Quality Control Board.	SWRCB/OCC File _____ **CITY OF GOLETA'S PETITION FOR REVIEW; STATEMENT OF POINTS AND AUTHORITIES IN SUPPORT THEREOF** [Wat. Code, § 13320]

The City of Goleta (City or Petitioner) submits this Petition for Review and Statement of Points and Authorities (Petition) to the State Water Resources Control Board (State Water Board) in accordance with Water Code section 13320. The City respectfully requests that the State Water Board review the Central Coast Regional Water Quality Control Board's (Central Coast Water Board) actions and inactions related to its July 12, 2013, adoption of Resolution No. R3-2013-0032, *Approving Post-Construction Stormwater Management Requirements for Development Projects in the Central Coast Region* (Resolution No. R3-2013-0032). (A final copy of Resolution No. R3-2013-0032 and its attachments are attached hereto as Exhibit A.)

The stated purpose of Resolution No. R3-2013-0032 is to maintain and restore watershed processes to protect water quality and beneficial uses. Resolution No. R3-2013-0032 establishes specific requirements that were adopted to serve as the minimum post-construction criteria that the City must apply to applicable new development and redevelopment projects. These requirements are found in Attachment 1 to Resolution No. R3-2013-0032 (Attachment 1) and at times are referred to in this Petition as "Post-Construction Requirements." Included in the Post-Construction Requirements is Performance Requirement No. 3, which is a key provision of concern to the City, and the primary provision at issue in this Petition.

This Petition satisfies the requirements of California Code of Regulations, title 23, section 2050. The City requests the opportunity to file supplemental points and authorities in support of this Petition once the administrative record becomes available. The City also reserves the right to submit additional arguments and evidence in reply to the Central Coast Water Board's or other interested parties' responses to this Petition.

1. NAME, ADDRESS, TELEPHONE NUMBER, AND EMAIL ADDRESS OF THE PETITIONER

Petitioner is the City of Goleta, California, which operates and maintains the City's Municipal Separate Storm Sewer System. Petitioner's address is as follows:

City of Goleta
Steve Wagner
Public Works Director
130 Cremona Drive, Suite B
Goleta, CA 93117
Phone: (805) 961-7500
Email: swagner@cityofgoleta.org

In addition, the City requests that all materials in connection with this Petition and administrative record be provided to the City's counsel and special counsel as follows:

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2. THE SPECIFIC ACTION OR INACTION OF THE CENTRAL COAST WATER BOARD WHICH THE PETITIONER REQUESTS THE STATE WATER BOARD TO REVIEW

The City requests that the State Water Board review the Central Coast Water Board's adoption of Resolution No. R3-2013-0032 and other actions and inactions related thereto. The specific actions and inactions are described more fully in the Statement of Points and Authorities beginning on page 6 of this Petition and include:

- Adoption of Post-Construction Requirements that regulate watershed processes and flow—not pollutants;
- Adoption of Performance Requirement No. 3 that will result in over-sized stormwater control measures under certain soil conditions;
- Adoption of Performance Requirement No. 3 that is inconsistent with the maximum extent practicable (MEP) standard established under the National Pollutant Discharge Elimination System (NPDES) program of the Clean Water Act (CWA), and other applicable law and guidance;
- The Central Coast Water Board's failure in adopting Resolution No. R3-2013-0032 to comply with applicable legal procedures, including: (1) making findings based on evidence in the record that bridge the analytic gap between the evidence and the ultimate determinations and what is being required; (2) ensuring the evidence supports the findings; and (3) considering the factors of Water Code sections 13263(a) and 13241; and
- Adoption of Performance Requirement No. 3 that puts the City at considerable risk with respect to potential takings claims from private project proponents that will need to dedicate disproportionate amounts of land to stormwater retention controls, pay in-lieu fees for off-site mitigation, or suffer deprivation of the economic benefits of their property.

3. THE DATE ON WHICH THE CENTRAL COAST WATER BOARD ACTED OR REFUSED TO ACT

The Central Coast Water Board adopted Resolution No. R3-2013-0032 on July 12, 2013.

4. A STATEMENT OF THE REASONS THE ACTION OR FAILURE TO ACT IS INAPPROPRIATE OR IMPROPER

A full and complete statement of the reasons why the Central Coast Water Board's actions were inappropriate or improper is provided in the Statement of Points and Authorities of this Petition, which begin on page 6.

5. THE MANNER IN WHICH PETITIONER IS AGGRIEVED

The City is aggrieved by the actions or inactions of the Central Coast Water Board described in this Petition because Resolution No. R3-2013-0032 will have severe economic and environmental consequences on the City and its citizens. The Post-Construction Requirements, and in particular Performance Requirement No. 3, will require developers to spend money and dedicate land resources in amounts that exceed the purported environmental benefits associated with the Post-Construction Requirements. As a result, the new requirements will hinder development and redevelopment within the City, which will cost residents and businesses the benefits of tax revenue, jobs, and other economic opportunities.

Further, implementation of Performance Requirement No. 3 may subject the City to takings claims by developers. Imposition of Performance Requirement No. 3 may constitute a governmental regulation that deprives project proponents of the economic benefit of their property, which may result in a regulatory taking. Specifically, it may result in stormwater retention facilities that are 26-40% larger than necessary to achieve the Central Coast Water Board's goal of having stormwater retained on-site that would otherwise occur in the site's undeveloped state. By requiring a developer to use more land than necessary and depriving the developer of its investment-backed expectation, the City may be subject to such takings claim. Also, under recent Supreme Court precedent, the requirement to pay in-lieu fees to fund the use or construction of off-site retention facilities may constitute a per se taking. In any case, if a takings

claim occurs, the City would at the very least be forced to defend itself, and could be forced to provide just compensation under the Fifth Amendment of the United States Constitution.

6. THE SPECIFIC ACTION REQUESTED BY PETITIONER

The City requests that the State Water Board adopt an order vacating Performance Requirement No. 3, which is Provision 4(c)(i) of Resolution No. R3-2013-0032. At the very least, the City requests that the order either amend Provision 4(c)(i)(1) or direct the Central Coast Water Board to amend Provision 4(c)(i)(1) to allow the use of locally/regionally calibrated simulation models to determine the amount of stormwater that should be retained on-site as compared to the undeveloped condition.

7. A STATEMENT OF POINTS AND AUTHORITIES IN SUPPORT OF LEGAL ISSUES RAISED IN THIS PETITION

As required by California Code of Regulations, title 23, section 2050(a)(7), this Petition includes a Statement of Points and Authorities.

8. A STATEMENT THAT THIS PETITION WAS SENT TO THE CENTRAL COAST WATER BOARD

A true and correct copy of this Petition was mailed by First Class mail to the Central Coast Water Board. The address to which the City mailed the copy to the Central Coast Water Board is:

Kenneth A. Harris, Jr.
Executive Officer
Central Coast Regional Water Quality Control Board
895 Aerovista Place, Suite 101
San Luis Obispo, CA 93401-7906

The City is the Petitioner and discharger. Therefore, the City did not mail a separate copy of this Petition to the discharger.

9. A STATEMENT AS TO WHETHER THE PETITIONER RAISED THE ISSUES OR OBJECTIONS IN THE PETITION TO THE CENTRAL COAST WATER BOARD

The City timely raised the substantive issues and objections in this Petition before the Central Coast Water Board in written comments, testimony, and other materials provided before the adoption of Resolution No. R3-2013-0032. The City additionally submits that neither the

Water Code nor any other applicable law precludes the State Water Board's consideration of these issues in this Petition.

10. STAY OF CHALLENGED REQUIREMENTS

The Water Code and State Water Board regulations provide for the issuance of stays of regional water quality control board (Regional Water Board) orders in connection with a petition for review. At this time, the City believes that a stay will not be necessary. However, the City may subsequently request a stay of one or more provisions of the Post-Construction Requirements in accordance with State Water Board regulations.

SOMACH SIMMONS & DUNN

DATED: August 12, 2013

By _____
Theresa A. Dunham
Attorneys for Petitioner CITY OF GOLETA

STATEMENT OF POINTS AND AUTHORITIES

The City files this Statement of Points and Authorities in support of its Petition pursuant to California Code of Regulations, title 23, section 2050(a). The City reserves the opportunity to file a supplemental or reply memorandum after receipt of the administrative record and any response by the Central Coast Water Board or other interested parties. The City incorporates by reference all comments, testimony, and evidence in the record supporting its Petition. Further, the City incorporates by reference the record associated with the State Water Board's adoption of Order No. 2013-0001-DWQ, *General Permit for Waste Discharge Requirements (WDRs) for Storm Water Discharges from Small Municipal Separate Storm Sewer Systems (MS4s)* (Phase II General Permit) as it is relevant to the Central Coast Water Board's adoption of the Post-Construction Requirements.

I. INTRODUCTION

On July 12, 2013, the Central Coast Water Board adopted Resolution No. R3-2013-0032, establishing new post-construction stormwater management requirements (Post-Construction Requirements). The Post-Construction Requirements include, inter alia, the minimum

hydromodification criteria that the City must apply to certain new development and redevelopment projects. If left in place as is, the Post-Construction Requirements could have severe economic consequences for the City. Future development and redevelopment within the City under the Post-Construction Requirements could require expenditures of money and dedication of other resources to retain a level of stormwater on-site that exceeds the amount of stormwater that would otherwise be retained on-site in the undeveloped condition.[1] This could substantially hinder development and redevelopment within the City, costing its residents and businesses tax revenue, jobs, and other economic opportunities.

In addition to the economic consequences, the Post-Construction Requirements represent a major change in how stormwater runoff would be regulated on the Central Coast for the Phase II municipal separate storm sewer systems (MS4s), and is a significant departure from how other Phase II communities are being regulated throughout the rest of California. Specifically, the Post-Construction Requirements (and in particular Performance Requirement No. 3) are intended to address hydromodification concerns and are looking to ensure that new development and redevelopment projects are built in a manner to protect "watershed processes." The primary goal is to retain stormwater on-site that would otherwise have occurred in the site's undeveloped condition. To achieve this intended goal, the Post-Construction Requirements mandate retention of stormwater based on a "proxy" condition. To comply, project proponents will need to incorporate management measures into the site design that retain the amount of stormwater pursuant to the "proxy" condition. Such an objective, while admirable, is not feasible or appropriate in many circumstances because it may make the project in question economically infeasible, and use of the proxy condition may result in over-sized facilities.

Further, the requirements presented here put the Phase II Central Coast communities at a significant disadvantage as compared to most others in California. While most of California's municipalities are being required to apply low impact development standards (i.e., retain runoff equal to volume from 85th percentile 24-hour storm event) to development and redevelopment

[1] The term "undeveloped condition" is intended to mean the condition of a site that would exist in its natural state as compared to the "pre-development" condition, which could include pre-existing impervious surfaces.

projects, Performance Requirement No. 3 at issue in this Petition seeks to retain runoff for events up to the 95th percentile 24-hour rainfall event for certain watershed management zones (WMZs). The City finds this major policy shift to be problematic for both technical and legal reasons. Thus, for the reasons stated in this Petition, the City respectfully requests that at the very least the State Water Board adopt an order that amends Performance Requirement No. 3.

Further, in adopting Resolution No. R3-2013-0032, the Central Coast Water Board failed to: (1) make findings, based on evidence, that bridge the analytic gap between the evidence and the ultimate determination including what is being required; and (2) consider the factors of Water Code sections 13263(a) and 13241. Accordingly, Resolution No. R3-2013-0032 is invalid in its entirety. Moreover, Performance Requirement No. 3 is inconsistent with state and federal substantive law, including the MEP standard of the CWA, the Phase II General Permit, and other requirements for small MS4s. Finally, requiring the City to apply Performance Requirement No. 3 to development and redevelopment projects may require developers to dedicate lands for retention purposes that are disproportionate to the purported benefit, and may also deprive project proponents of the economic benefits of their property. Either result could subject the City to takings claims and the requirement to pay just compensation.

II. BACKGROUND

A. The 2003 Phase II General Permit

Currently, the City is subject to the Phase II General Permit adopted by the State Water Board on February 5, 2013, to regulate stormwater discharges from small MS4s in accordance with the federal NPDES program. Previously, small MS4s were regulated under State Water Board Order No. 2003-0005 DWQ (2003 Phase II General Permit). Similar to the current Phase II General Permit, the 2003 Phase II General Permit required permittees to implement Best Management Practices (BMPs) to reduce the discharge of pollutants in stormwater to the MEP. (2003 Phase II General Permit, p. 8.) To achieve the technology-based MEP standard, permittees were required to develop and implement a Storm Water Management Plan (SWMP) that "serve[d] as a framework for identification, assignment, and implementation of control measures/BMPs." (2003 Phase II General Permit, p. 8.) Coverage under the 2003 Phase II

General Permit required a SWMP be approved by the applicable Regional Water Board—which, in the City's case, is the Central Coast Water Board. (2003 Phase II General Permit, p. 7.)

B. The 2008 Resolution and Preceding Central Coast Water Board Actions

In early 2003, the City submitted a SWMP to the Central Coast Water Board for approval. The initial draft of the SWMP was developed in consultation with the County of Santa Barbara because the City at that time was newly incorporated and the county was providing stormwater management services under contract with the City. The SWMP underwent extensive review by the public through City held public workshops and City Council meetings. In February 2005, the City received a comment letter from the Central Coast Water Board with respect to the City's 2003 submittal. In response to those comments, the City submitted a revised SWMP to the Central Coast Water Board in November 2005. In February 2008, Central Coast Water Board staff issued a letter informing small MS4s within the region of a new, unprecedented region-wide process to enroll under the Phase II General Permit. (Letter from Roger W. Briggs, Executive Officer, Central Coast Water Board (Feb. 15, 2008), Notification to Traditional, Small MS4s on Process for Enrolling under the State's General NPDES Permit for Storm Water Discharges (February Letter).)

The February Letter described new substantive elements that SWMPs must include for small MS4s to be covered by the Phase II General Permit. The February Letter stated that SWMPs must include BMPs that maximize the infiltration of clean stormwater, minimize runoff volume and rate, and minimize pollutant loading. (February Letter, p. 4.) The February Letter prescribed how SWMPs must address these conditions. For example, to maximize the infiltration of clean stormwater and minimize runoff volume and rate, SWMPs needed to include post-construction hydromodification control criteria. (February Letter, p. 4.) To minimize pollutant loading, SWMPs needed to include volume- and/or flow-based treatment criteria. (February Letter, p. 5.) The City revised its SWMP as a result of the new region-wide Central Coast Water Board's direction for SWMPs described in the February Letter, including the hydromodification BMPs.

In April 2009, the Central Coast Water Board provided the City with a notice of enrollment approving the City's SWMP subject to certain revisions. (Notice of Enrollment – NPDES Small Municipal Separate Storm Sewer Systems General Permit; City of Goleta, Santa Barbara County, WDID #34ZMS03022 (April 3, 2009) (hereafter, Notice of Enrollment Letter), Final Table of Required Revisions.) Some of these required revisions directed the City to develop hydromodification control criteria. (Notice of Enrollment Letter, Final Table of Required Revisions.) For example, the City was directed to: (1) have adequate development review and permitting procedures to impose conditions of approval or other enforceable mechanisms to implement numeric criteria for hydromodification control; and (2) develop long-term hydromodification criteria and control measures that result in numeric criteria for runoff rate, and volume control. Based on this approval, the City moved forward to implement its SWMP accordingly.

C. The "Joint Effort" for Development of Post-Construction Hydromodification Criteria and Resolution No. R3-2012-0025

In 2009, the Central Coast Water Board Executive Officer notified small MS4s of the option to participate in the Central Coast Joint Effort for developing post-construction hydromodification control criteria or "Joint Effort." The Joint Effort commenced in September 2010. The purpose of the Joint Effort was to meet the hydromodification control criteria development, adoption, and implementation required in the City's SWMP. The City agreed to participate in the Joint Effort.

On May 14, 2012, Central Coast Water Board staff issued a draft resolution, draft post-construction requirements, and draft technical support document (collectively, Draft Resolution) for public review and comment prior to consideration for adoption. Attachment 1 to the Draft Resolution consisted of proposed post-construction hydromodification requirements developed based on ten WMZs. According to the Draft Resolution, the WMZs were created during the Joint Effort to reflect "common key watershed processes and receiving water type (creek, marine nearshore waters, lake, etc.)." (Draft Resolution, Attachment 1, p. 1.) Among other things, the Draft Resolution included provisions requiring small MS4s to: (1) apply post-construction

requirements to ministerial projects; (2) prevent off-site discharge from events up to the 95th percentile 24-hour rainfall event (as defined) under specified conditions; (3) impose on regulated projects runoff retention performance requirements using certain low impact development (LID) standards; and (4) apply certain design strategies to regulated projects, including single-family homes, that create and/or replace 2,500 square feet or more of impervious surface over the entire project site. (Draft Resolution, Attachment 1, pp. 3-4, 6-10, 13.) The deadline to submit written comments on the Draft Resolution was July 6, 2012. The City timely submitted its comments on July 5, 2012, addressing these issues and overarching concerns with the Draft Resolution.

The Central Coast Water Board adopted Resolution No. R3-2012-0025 on September 6, 2012, which established minimum Post-Construction Requirements related to LID and hydromodification control to fulfill BMP requirements in the SWMPs of the Joint Effort MS4s. Under Resolution No. R3-2012-0025, the Joint Effort MS4s were required to amend their SWMPs to include the adopted requirements. Under Resolution No. R3-2012-0025, the Joint Effort MS4s were required to apply the requirements to all regulated development and redevelopment projects within their jurisdictions by September 6, 2013. On October 8, 2012, the City petitioned the State Water Board to review Resolution No. R3-2012-0025. On July 10, 2013, the State Water Board dismissed the City's petition on grounds of mootness.

D. Phase II General Permit

On February 5, 2013, the State Water Board adopted the Phase II General Permit, which replaced the 2003 Phase II General Permit. The Phase II General Permit requires "Renewal Permittees" to implement a number of specific tasks related to the required stormwater program elements, including requirements with respect to the Post-Construction Storm Water Management Program. (Phase II General Permit, pp.48-62.) Under the Phase II General Permit, Renewal Permittees are required to implement LID standards that are designed to meet certain numeric sizing criteria for stormwater retention and treatment. (Phase II General Permit, p. 52.) Specifically, the LID sizing criteria include several volumetric and flow based options. (Phase II General Permit, p. 53.) Concurrently, Site Design Measures are to be implemented based on the

objective of achieving infiltration, evapotranspiration, and/or harvesting/reuse of the 85th percentile 24-hour storm runoff event. (Phase II General Permit, p. 54.)

Alternatively, Renewal Permittees are required to comply with the Phase II Post-Construction Storm Water Program requirements:

> . . . based on a watershed-process approach developed by the Regional Water Board that include the following:
>
> - Completion of a comprehensive assessment of dominant watershed processes affected by urban storm water
> - LID site design and runoff reduction measures, numeric runoff treatment and retention controls, and hydromodification controls that will maintain watershed processes and protect water quality and beneficial uses
> - A process by which Regional Board staff will actively engage Permitees to adaptively manage requirements as determined by the assessment of watershed processes
> - An annual reporting program that involves Regional Board staff and State Board staff to inform statewide watershed process based criteria
>
> The regional watershed-process based approach must be approved by the Regional Water Board following a public process. (Phase II General Permit, p. 62.)

The language in question here was subject to considerable testimony and discussion by State Water Board members and the public. In fact, prior to introduction and adoption of this alternative language, a tentative version of the Phase II General Permit proposed to include the specific requirements as originally adopted by the Central Coast Water Board in Resolution No. R3-2012-0025.[2] (See November 16, 2012 Draft of Phase II General Permit.) In the tentative version, the Central Coast Water Board's Post-Construction Requirements were identified as Attachment J and applied specifically to Phase II permittees in the Central Coast. However, as indicated in the Phase II General Permit Fact Sheet, the State Water Board ultimately rejected Attachment J because of concerns raised during the public comment period. The State Water Board stated that "[a]fter receiving extensive public comment on Attachment J, the State Water Board determined that, while the Board continues to support a watershed process-based approach to hydromodification requirements, the Joint Effort process should be allowed to evolve and proceed, without incorporation into this Order, to address several unresolved issues acknowledged

[2] Because Resolution No. R3-2012-0025 was adopted in accordance with and to implement the 2003 Phase II General Permit, it needed to be incorporated into or recognized by the Phase II General Permit to be valid.

by the parties to that process, including the Regional Water Board." (Phase II General Permit, Fact Sheet, p. 36.) Accordingly, rather than incorporating the specific provisions of Resolution No. R3-2012-0025, the State Water Board adopted the alternative provision (E.12.k), which required the Central Coast Water Board to re-adopt its post-construction provisions if they wanted them to apply in-lieu of the Phase II General Permit's post-construction requirements.

E. Resolution No. R3-2013-0032

To that end, Central Coast Water Board staff relied on section E.12.k of the Phase II General Permit as the basis for re-adopting the Post-Construction Requirements that are at issue in this Petition. Specifically, the Post-Construction Requirements adopted by the Central Coast Water Board include a runoff retention standard titled "Performance Requirement No. 3: Runoff Retention" (Performance Requirement No. 3). It states in relevant part:

> a) The Permittee shall require Regulated Projects, except detached single-family homes, that create and/or replace ≥ 15,000 square feet of impervious surface (collectively over the entire project site), and detached single-family homes ≥ 15,000 square feet of Net Impervious Area, in WMZs 1, 2, 5, 6, 8 and 9, and those portions of WMZs 4, 7, and 10 that overlie designated Groundwater Basins (Attachment B) to meet the Runoff Retention Performance Requirements in Sections B.4.b and B.4.c using the LID Development Standards in Section B.4.d for optimal management of watershed processes.
>
> b) Adjustments to the Runoff Retention Performance Requirements for Redevelopment – Where the Regulated Project includes replaced impervious surface, the below adjustments apply. These adjustments are accounted for in the Retention Tributary Area calculation in Attachment D.
>
> i. Redevelopment Projects outside an approved Urban Sustainability Area, as described in Section C.3. – The total amount of replaced impervious surface shall be multiplied by 0.5 when calculating the volume of runoff subject to Runoff Retention Performance Requirements.
>
> ii. Redevelopment Projects located within an approved Urban Sustainability Area (Section C.3.) – The total amount of runoff volume to be retained from replaced impervious surfaces shall be equivalent to the pre-project runoff volume retained.
>
> c) The Permittee shall require Regulated Projects, subject to the Runoff Retention Performance Requirements, to meet the following Performance Requirements:
>
> i. Watershed Management Zone 1 and portions of Watershed Management Zones 4, 7 and 10 which overlie designated Groundwater Basins:
>
> 1. Retain 95th Percentile Rainfall Event – Prevent offsite discharge from events up to the 95th percentile 24-hour rainfall event as determined from local rainfall data.
>
> 2. Compliance must be achieved by optimizing infiltration. Compliance for retention of the remaining volume must be

> achieved via storage, rainwater harvesting and/or evaportranspiration. (Resolution No. R3-2013-0032, Attachment 1, pp. 5-6.)

All of the City is considered to be in WMZ 1. The primary objective for Performance Requirement No. 3 is to "retain stormwater runoff to protect watershed processes so that beneficial uses of receiving waters are maintained and, where applicable restored." (Resolution No. R3-2013-0032, Attachment 2, p. 22.)

On April 8, 2013, Central Coast Water Board staff notified the public that the Central Coast Water Board would consider re-adopting the Post-Construction Requirements and provided a draft for review. (See Resolution No. R3-2013-0032, p. 7, ¶ 37.) The notice required comments to be submitted by May 10, 2013. (*Ibid.*)

The City timely submitted extensive comments and evidence on a number of issues, and in particular challenged the efficacy of Performance Requirement No. 3 as it applies to the City. On June 3, 2013, the Central Coast Water Board released a Staff Report for the Central Coast Water Board's July 12, 2013 meeting (July 12, 2013 Staff Report), which included a response to comments received between April 8 and May 10, 2013. (July 12, 2013 Staff Report, Attachment 4.) With some changes being made based on public comment and testimony, the Central Coast Water Board adopted Resolution No. R3-2013-0032 at its July 12, 2013 public hearing, including Performance Requirement No. 3. Considering the impact of Performance Requirement No. 3 to the City, the City finds it necessary to challenge the Central Coast Water Board's action on several grounds, which are presented here.

III. ARGUMENT

A. The Post-Construction Requirements Impermissibly Regulate Flow—Not Pollutants

As a preliminary matter, the Post-Construction Requirements, and Performance Requirement No. 3 in particular, are not proper NPDES permit requirements for municipal stormwater. Fundamentally, NPDES permits allow for the discharge of pollutants. (33 U.S.C. § 1342(a)(1).) For municipal dischargers, such permits are required to include:

> [C]ontrols to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or State

> determines appropriate for the control of such pollutants. (33 U.S.C. § 1342(p)(3)(B)(iii).)

As indicated in a recent district court decision, the term "pollutant" has a precise statutory definition, and stormwater runoff is not a pollutant. (*Virginia Dept. of Transportation, et al. v. U.S. EPA, et al.* (E.D. Va., Jan. 3, 2013, Civil Action No. 1:12-CV-775) 2013 U.S. Dist. LEXIS 981, *12, *15 (*Virginia*).) In other words, when incorporating municipal stormwater permit provisions that are intended to implement the technology-based MEP standard into NPDES permits, such controls must be specifically designed or related to the reduction of pollutants. According to Resolution No. R3-2013-0032, the Post-Construction Requirements are the minimum criteria applicable to ". . . new development and redevelopment projects in order to protect water quality and comply with the MEP standard . . . ." (Resolution No. R3-2013-0032, p. 8.) Thus, to the extent that the Post-Construction Requirements are intended to implement MEP, such requirements must be directly related to reducing and controlling the discharge of pollutants. However, as indicated in Resolution No. R3-2013-0032 and its Technical Support Document (Attachment 2 to Resolution No. R3-2013-0032), the requirements extend well beyond reducing and controlling pollutants. First, Resolution No. R3-2013-0032 includes several findings with respect to maintaining and restoring watershed processes (e.g., Finding 17, p. 4), and states specifically:

> [t]he Post-Construction Requirements' emphasis on protecting and, where degraded, restoring key watershed processes is necessary to create and sustain linkages between hydrology, channel geomorphology, and biological health necessary for healthy watersheds. These linkages cannot be created by find-tuning any particular flow attribute (e.g., peak, duration) or reconstructing a desired geomorphic feature alone. Instead, these critical linkages only occur where key watershed processes are intact. (Resolution No. R3-2013-0032, p. 5.)

Second, the Technical Support Document for the Post-Construction Requirements provides further evidence of the Central Coast Water Board's intent to regulate flow and not pollutants. For example, it states as follows:

> The Performance Requirements rely on four important strategies that are critical to recognize for a full understanding of how the requirements, taken together, will result in protection of watershed processes and the beneficial uses they support: 1) a reliance on LID to the extent feasible to achieve protection of the broadest suite of watershed processes not effectively targeted by structural controls; 2) the use of Stormwater Control Plans to ensure project applicants have followed due

> diligence in selecting SCMs and have optimized LID; *3) the combination of retention and peak management requirements on larger sites to achieve a broad spectrum of watershed process protection while also protecting stream channels from hydromodification impacts*; and 4) the additive application of Performance Requirements as projects trigger each size threshold (e.g., the largest sites must meet Performance Requirements applying to smaller sites). Elements of these strategies are integrated into the Performance Requirements to support successful implementation. (Resolution R3-2013-0032, Attachment 2, p. 18, emphasis added.)

The findings and Technical Support Document collectively indicate that the Post-Construction Requirements are about watershed processes and controlling stormwater runoff generally and less about controlling specific pollutants.

With respect to Performance Requirement No. 3, the requirements are directly tied to watershed processes and have the stated goal of retaining "100 percent of the volume of water from storms less than or equal to the indicated percentile event (85th or 95th), over the footprint of the project, ..." (Resolution No. R3-2013-0032, Attachment 2, p. 22.) The stated purposes for such a requirement include, "reducing overland flow, infiltration, interflow, and groundwater recharge, and achieves reductions in urban pollutant loading of receiving waters that are non-existent under natural conditions." (*Ibid.*) In other words, controlling stormwater flow in this manner acts as a surrogate for controlling pollutants. Under the plain language of the CWA, use of a surrogate when the language clearly uses the term "pollutant" is impermissible. (*Virginia*, *supra*, 2013 U.S. Dist. LEXIS 981, *15.)

To the extent that the Central Coast Water Board argues that the Post-Construction Requirements are intended to implement water quality standards and are "such other provisions" as determined appropriate, such arguments fail for the same reasons provided above. The term "such other provisions" is also tied directly to the control of pollutants. (33 U.S.C. § 1342(p)(3)(B)(iii).) Thus, requirements to implement water quality standards must also be associated with controlling pollutants in the first instance and not controlling stormwater flow as a surrogate for pollutants.

B. Performance Requirement No. 3 Results in Oversized BMPs for Certain Soils

Application of criteria in Performance Requirement No. 3 varies based on the identified WMZ for the area in question. As indicated previously, all of the City is considered to be in WMZ 1. For WMZ 1, the runoff retention requirement is as follows: "Retain 95th Percentile Rainfall Event—Prevent offsite discharge from events up to the 95th percentile 24-hour rainfall event as determined from local rainfall data." This is referred to as the "proxy" condition. The goal of Performance Requirement No. 3 is that ". . . 100 percent of the volume of water from storms less than or equal to the indicated percentile event (85th or 95th), over the footprint of the project, will not discharge to surface waters." (Resolution No. R3-2013-0032, Attachment 2, p. 22.) Considering this goal, the City assessed the proposed Post-Construction Requirements by comparing the stormwater control measure size necessary to retain the 95th percentile 24-hour storm event pursuant to Performance Requirement No. 3 to the stormwater control measure size necessary to match undeveloped runoff from a site. These comparisons are best made by accounting for site-specific factors, such as soil type. For example, 64% of soils within the City's jurisdiction are Hydrologic Soil Group (HSG) D soils (Type D soils). HSG D soils are "very slow" infiltrative soils. (See Memorandum to Everett King and Steve Wagner, City of Goleta from Lisa Austin, et al., Geosyntec Consultants, *Review of Post-Construction Stormwater Management Requirements for Development Projects in the Central Coast Region* (May 9, 2013) (Geosyntec Memorandum), p. 2.)

Based on the analysis conducted by Geosyntec Consultants, Performance Requirement No. 3 for Type D soils results in oversized stormwater control measures. Specifically, when the retention basin size required to match undeveloped discharge on Type D soils is compared to the retention basin size necessary to retain the 95th percentile 24-hour event using the "Simple Method," the size of the retention facility would be about 26% larger than necessary. (Geosyntec Memorandum, p. 5.) Also, when the BMP size for the undeveloped condition on Type D soils is compared to the size of the retention facility necessary for the "Routing Method" on Type D soils, the retention facility would be about 40% larger than necessary. (*Ibid.*)

As such, Performance Requirement No. 3, especially as applied to Type D soils, results in post-development standards that require retention of stormwater at a level that exceeds the undeveloped condition. Accordingly, Performance Requirement No. 3 is inappropriate as applied to Type D soils. Because of this impractical application, the City recommended to the Central Coast Water Board in its written comments that, at the very least, Performance Requirement No. 3 needed to be revised to specifically exclude application to Type D soils. Or, as requested by the City at the July 12, 2013 hearing, Performance Requirement No. 3 could be revised to allow for the use of a locally/regionally calibrated continuous simulation model to calculate the amount of off-site discharge in the undeveloped condition that would occur to determine the appropriate size of the structural control measure.

In response to the City's comments, Central Coast Water Board staff's position, which was subsequently endorsed by the Central Coast Water Board in its adoption of the Post-Construction Requirements, is that the oversizing of retention facilities would be infrequent and that the requirements allow for various adjustments based on site conditions. (Staff Report for Resolution No. R3-2013-0032, Attachment 4, Public Comments Received on April 8, 2013 Draft Resolution No. R3-2013-0032 and Central Coast Water Board Staff Response (Staff Response to Comments), pp. 16-18.) Further, staff argued that continuous simulation modeling at an individual site is not a satisfactory substitute for the proxy condition (i.e., retain 95th percentile 24-hour rain event) because a "consistent and well calibrated application of continuous simulation modeling is virtually impossible to ensure at this time." (*Id.*, p. 17.) Based on Central Coast Water Board staff's recommendation, the Board adopted Performance Requirement No. 3 without either of these suggested changes as put forward by the City in its written comments and public testimony.

As a practical matter for the City, the "various adjustments" may not be feasible, and oversizing in the City is likely to not be just occasional. With respect to the "various adjustments" that are purportedly available to prevent over-sizing, there are four. Each one, and the City's concerns, is discussed briefly here.

1. Redevelopment Projects Outside an Approved Urban Sustainability Area

Redevelopment is defined to mean, [o]n a site that has already been developed, construction or installation of a building or other structure subject to the Permittee's planning and building authority: . . . ." (Resolution No. R3-2013-0032, Attachment 1, p. 25.) In other words, it is new or replaced facilities on a site that was previously developed. For redevelopment projects subject to this provision, the amount of replaced impervious surface is to be multiplied by 0.5 "when calculating the volume of runoff subject to Runoff Retention Performance Requirements." (*Id.*, p 6.) Although this provision provides for a generous adjustment, its applicability to the City is limited. Most of the development projects in the City are "in-fill" development—not redevelopment. Thus, this adjustment does not apply.

2. Redevelopment Projects Located Within an Approved Urban Sustainability Area

As previously indicated, most of the development projects in the City are in-fill and not redevelopment. Further, the term "Urban Sustainability Area" is likely to have limited application to the City.

3. Dedication of No Less Than 10% of Project's Equivalent Impervious Surface Area to Retention-Based Stormwater Control Measures

Under this provision, where technical infeasibility limits on-site compliance (e.g., soil types that significantly limit infiltration), Performance Requirement No. 3 can be satisfied if at least 10% of the site's equivalent impervious surface area is dedicated to retention-based structural stormwater control measures. (Resolution No. R3-2013-0032, Attachment 2, p. 22.) The practicality of using this "adjustment" will be limited based on the size of the site. For small sites and/or high denisity in-fill projects, this type of adjustment will be difficult to implement and it may prevent the project from being economically viable.

4. Alternative Compliance (Off-Site Compliance)

Off-site compliance may be allowed to comply with Performance Requirement No. 3 if there is technical infeasibility or with an approved watershed or regional plan. (Resolution No. R3-2013-0032, Attachment 1, pp. 12-15.) While this may provide an alternative path to

compliance, it does not address the fundamental issue with respect to Performance Requirement No. 3 and its potential to require over-sized structural control measures. Rather than requiring the over-sized structural control measure to be built on-site, it allows the project proponent to mitigate impacts off-site to meet the 95th percentile 24-hour retention standard. It still means that under certain soil conditions, like those in the City, that a project proponent is being required to mitigate project impacts beyond those that would otherwise occur in the undeveloped condition.

In sum, the various adjustments may provide for a path to compliance but do not address the City's fundamental concern, which is a requirement that may result in project mitigation that exceeds its actual impact. Conversely, the revisions requested by the City, especially the use of continuous simulation modeling to determine the amount of discharge that would otherwise be retained in the undeveloped condition, would ensure that structural control measures were right-sized to meet the Central Coast Water Board's intent with respect to Performance Requirement No. 3.

C. Performance Requirement No. 3 Exceeds the Federal MEP Standard

Further, the Central Coast Water Board's action to adopt Performance Requirement No. 3 leaves in place a Post-Construction Requirement that exceeds the federal MEP standard.

As indicated above, all MS4 permits must require controls to reduce the discharge of pollutants to the MEP. Federal regulations and the Phase II General Permit require MS4 permittees to develop, implement, and enforce BMPs to reduce discharges of pollutants to the MEP. MS4s must develop and implement BMPs and associated measurable goals to fulfill requirements associated with the following six minimum control measures: (1) public education and outreach on storm water impacts; (2) public involvement and participation in the development and implementation activities related to the program; (3) illicit discharge detection and elimination; (4) construction and site storm water runoff control; (5) post-construction storm water management in new development and redevelopment; and (6) pollution prevention and good housekeeping for municipal operations.

The MEP standard is met by implementing BMPs. The federal regulations describe BMPs as "generally the most appropriate form of effluent limitations when designed to satisfy technology requirements (including reduction of pollutants to the maximum extent practicable) and to protect water quality." (40 C.F.R. § 122.34(a).) The MEP standard entails an iterative process whereby the permittee reviews and improves BMPs over time. (See, e.g., *Building Industry Assn. v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 889.)

The applicable legal authority and guidance emphasize the need to consider site-specific factors (including cost) when determining what constitutes MEP. Immediately following is a more detailed discussion of the MEP standard in this regard and argument as to why Performance Requirement No. 3 impermissibly conflicts with the MEP standard.

1. The MEP Standard Is Flexible, Continually Evolves, and Requires the Consideration of Site-Specific Factors

Applicable legal authority and other guidance make clear that MEP is a flexible, evolving, and site-specific standard that involves the consideration of various factors. Such factors include public acceptance, cost versus benefits, and technical and economic feasibility. Technical feasibility may depend on local environmental conditions (e.g., soils, geography, parcel size), while economic feasibility may depend on local economic conditions.

U.S. Environmental Protection Agency (USEPA) guidance states that the MEP standard "allow[s] the permitting authority and regulated MS4s maximum flexibility in their interpretation of it as appropriate." (Storm Water Phase II Compliance Assistance Guide, USEPA 833-R-00-002 (Mar. 2000), pp. 4-17.) USEPA guidance emphasizes the importance of applying MEP in a flexible, site-specific manner as part of an iterative process. (See, e.g., 64 Fed. Reg. 68722, 68732, 68755 (Dec. 8, 1999); MS4 Program Evaluation Guidance, USEPA 833-R-07-003 (Jan. 2000), p. 2; Stormwater Phase II Final Rule, USEPA 833-F-00-009 (Jan. 2000), p. 1.) For example, USEPA guidance for small MS4s states:

> This final rule requires the permittee to choose appropriate best management practices (BMPs) for each minimum control measure. In other words, EPA expects Phase II permittees to develop and update their stormwater management plans and their BMPs to fit the particular characteristics and needs of the permittee and the area served by its MS4. Therefore the Federal or State operator of a

> regulated storm sewer system can take advantage of the flexibility provided by the rule to utilize the most suitable minimum control measures for its MS4. (Stormwater Phase II Final Rule, Federal and State-Operated MS4s: Program Implementation, EPA 833-F-00-012 (Dec. 2005), p. 2.)

Additional USEPA guidance for small MS4s states: "Because redevelopment projects may have site constraints not found on new development sites, the Phase II Final Rule provides flexibility for implementing post-construction controls on redevelopment sites that consider these constraints." (Stormwater Phase II Final Rule, Post-Construction Runoff Minimum Control Measure, USEPA 833-F-00-012 (Dec. 2005), p. 2.) Further, "[i]t is important to recognize that many BMPs are climate-specific, and not all BMPs are appropriate in every geographic area." (*Ibid.*) Other USEPA guidance for new development and redevelopment states: "EPA recommends that the BMPs chosen: be appropriate for the local community; minimize water quality impacts; and attempt to maintain pre-development runoff conditions." (See 40 C.F.R. § 122.34(b)(5)(iii).)

Moreover, the Phase II General Permit describes MEP as "an ever-evolving, flexible, and advancing concept, which considers technical and economic feasibility." (Phase II General Permit, p. 10, ¶ 36.) The Phase II General Permit emphasizes the need for such flexibility and an iterative MEP process as follows:

> BMP development is a dynamic process and may require changes over time as the Permittees gain experience and/or the state of the science and art progresses. To do this, the Permittees must conduct and document evaluation and assessment of each relevant element of its program, and their program as a whole, and revise activities, control measures/ BMPs, and measurable goals, as necessary to meet MEP. (Phase II General Permit, p. 10, ¶ 36.)

A 1993 Memorandum from the State Water Board's Office of Chief Counsel recommends considering the following site-specific factors to determine whether a municipality would achieve MEP in a given instance:

1. Effectiveness: Will the BMP address a pollutant of concern?
2. Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?
3. Public acceptance: Does the BMP have public support?
4. Cost: Will the cost of implementing the BMP have a reasonable relationship to the pollution control benefits to be achieved?
5. Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc.? (Memorandum to Archie Matthews,

Division of Water Quality, from Elizabeth Miller Jennings, Office of Chief Counsel, State Water Resources Control Board, Subject Definition of "Maximum Extent Practicable" (Feb. 11, 1993), pp. 4-5.)

Thus, although MEP is not specifically defined, there is considerable guidance to follow to determine if a certain stormwater permit requirement exceeds the MEP standard.

2. Performance Requirement No. 3 Impermissibly Conflicts With the MEP Standard

As an initial matter, nothing in the Phase II General Permit or federal regulations requires the City to implement the specific Post-Construction Requirements mandated by Resolution No. R3-2013-0032. Nor do the federal regulations or Phase II General Permit identify hydromodification criteria as necessary or appropriate to fulfill any of the six minimum control measures that a stormwater program must include.

Further, as described above, the MEP standard is site-specific and a flexible concept whereby permittees review and refine BMPs over time. In this case, the Central Coast Water Board has passingly acknowledged the MEP standard, but has proposed very prescriptive requirements (i.e., Performance Requirement No. 3) that apply across specified WMZs without proper regard for local economic and environmental conditions, or technical feasibility. Although the Central Coast Water Board claims that there are various adjustments to Performance Requirement No. 3 to take into consideration site-specific conditions, in reality the requirements are rigid and incorporate limited options to address site-specific conditions.

For the reasons provided below, Performance Requirement No. 3 exceeds the MEP standard because it: is not designed to address a pollutant or combination of pollutants (see section III.A above); is technically infeasible in certain conditions; will have costs that surpass their economic benefits and/or will be economically infeasible; and is generally and overwhelmingly unaccepted by the public.

a. Performance Requirement No. 3 Is Technically Infeasible

Performance Requirement No. 3 exceeds MEP because it is technically infeasible. For the City, and presumably for other municipalities, Performance Requirement No. 3 is infeasible and troubling because for WMZ 1 it requires the retention of runoff through primarily infiltration for

storms up to the 95th percentile 24-hour rainfall event. Resolution No. R3-2013-0032 acknowledges, "in some circumstances, site conditions (e.g., historical soil contamination) and the type of development (i.e., urban infill) can limit the feasibility of retaining, infiltrating, and reusing stormwater at sites." (Resolution No. R3-2013-0032, p. 5, ¶ 20.) This is particularly true with regard to the City. The City's Type D soils do not allow infiltration at a rate conducive to these retention/infiltration requirements. Compounding the problem is that the City primarily has only infill properties available within the City's sphere of influence. Based on these environmental conditions, much of the City would be incapable of infiltrating or retaining the 95th percentile 24-hour rainfall event.

Technical Guidance of the USEPA for section 438 of the federal Energy Independence and Security Act (EISA) is the purported basis for the 95th percentile requirement. The EISA guidance includes a 95th percentile retention requirement for federal facilities creating or replacing more than 5,000 square feet. (*Method and Findings of the Joint Effort for Hydromodification Control in the Central Coast Region of California,* prepared for the Central Coast Water Board by Stillwater Sciences and Tetra Tech (June 14, 2012), p. 46; see also Resolution No. R3-2013-0032, Attachment 2, pp. 23-24, 27.) There is no basis to conclude (or findings in the record supporting) that this standard for federal facilities, which is backed by the resources of the federal government, is technically or economically feasible for the City.

Moreover, Performance Requirement No. 3 does not incorporate the full text of the Section 438 Technical Guidance, which lists an alternative option for compliance to perform a site-specific hydrologic analysis and provide the appropriate site-specific compliance. (*Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects Under Section 438 of the Energy Independence and Security Act*, USEPA 841-B-09-001 (Dec. 2009), p. 12; see also California Stormwater Quality Association comment letter to Mr. Dominic Roques (July 6, 2012) (CASQA July 2012 Comment Letter), pp. 3-4.) Further, the Section 438 Technical Guidance provides for other options when retention of the 95th percentile storm event is not feasible. Other options include: the use of evapotranspiration and harvesting and reuse, rather than just infiltration; specific conditions that can be used to justify a determination that it is not

technically feasible to implement fully the criteria, and rainwater harvesting and use is not practical; and, when a determination of technical infeasibility is made, projects can be approved based on a maximum extent technically feasible versus requiring off-site compliance, regardless if off-site compliance is feasible. (CASQA July 2012 Comment Letter, p. 4.)

To comply with Performance Requirement No. 3, the proponent of a regulated project may undertake alternative compliance measures (Ten Percent Adjustment or off-site compliance) if the infiltration requirements cannot be met due to infeasibility. Alternative compliance refers to achieving the retention requirement off-site through mechanisms such as developer fee-in-lieu arrangements and/or use of regional facilities. However, this alternative means of compliance is also infeasible. For example, off-site compliance must occur in the same watershed. For the City, existing development restrictions and environmental and economic constraints make this unworkable for many projects. Specifically, the City's General Plan includes many designated Environmentally Sensitive Habitat Areas (ESHAs), which preclude the use of these areas for off-site mitigation. The Post-Construction Requirements allow the Central Coast Water Board Executive Officer to approve off-site compliance projects outside the watershed, but the approval is discretionary, there are no criteria for when this approval should be given, and there is no certainty that suitable alternative lands exist or that it will be technically and economically feasible to implement a project on them.

b. The Costs of Implementing Performance Requirement No. 3 Would Surpass Its Economic and Environmental Benefit and/or Performance Requirement No. 3 Is Economically Infeasible

The costs of implementing Performance Requirement No. 3 would arguably exceed its benefits, and in some cases, the costs may make it economically infeasible to implement. For example, substantial additional costs will be incurred for designing structural control measures that can retain all stormwater up to the 95th percentile 24-hour storm event. More importantly, to comply with Performance Requirement No. 3 on small lots, businesses may need to modify their development plans in a manner that no longer makes the project feasible (e.g., eliminate parking lots or office areas), which may ultimately be considered a regulatory taking. (See section III. F, below.)

As a result of the additional costs associated with implementing Performance Requirement No. 3, the City expects that it will have increased difficulty attracting new businesses and retaining profitable businesses; lose revenue from planning and building development fees; and lose revenue from property and sales tax. Lack of job creation from the loss of development is expected to have tremendous long-term effects for the City. Further, affordable housing may become unattainable as the cost of development consistent with meeting Performance Requirement No. 3 may rise beyond that which is economically feasible, especially for a community like the City.

Moreover, to implement Performance Requirement No. 3, the City will, among other things, have to revise its Storm Water Management Ordinance, planning application forms and handouts, building application forms and handouts, environmental guidelines, and improvement standards; train staff in requirements; undertake additional building and grading plan review and inspections; perform additional planning stormwater review for discretionary projects, concept plans, improvement plans, and stormwater control plan requirements; and comply with detailed verification and reporting requirements. Those actions, and the implementation and oversight of the new ordinance, would require significant staff time and additional expenses.

Accordingly, costs for meeting Performance Requirement No. 3 to retain runoff from storm events up to the 95th percentile 24-hour storm exceed the environmental and economic benefit to be gained. Such a requirement exceeds MEP.

c. The Post-Construction Requirements Far Exceed Hydromodification Requirements in the Phase II General Permit

The federal regulatory scheme establishes separate requirements for MS4 permits and applications based on whether the discharger is a large, medium, or small MS4. (See 40 C.F.R. § 122.26.) The Phase I regulations govern the issuance of stormwater permits for large and medium MS4s, which by definition serve incorporated areas with populations of 100,000 or more. (See 40 C.F.R. §§ 122.26(b)(4), (7); 55 Fed. Reg. 47990 (Nov. 16, 1990).) The Phase II regulations govern the issuance of stormwater permits for small MS4s, which serve populations of less than 100,000. (40 C.F.R. §§ 122.26(b)(16), 122.30-122.37.)

As mentioned, MS4s must implement BMPs, including six specific minimum control measures, and compliance with the BMPs equates to compliance with the MEP standard. (40 C.F.R. § 122.34.) USEPA has stated that small MS4s should not be required to implement BMPs that go beyond the six minimum control measures. For example, USEPA guidance "strongly recommends" that:

> [N]o additional requirements beyond the minimum control measures be imposed on regulated small MS4s without the agreement of the operator of the affected small MS4, except where an approved TMDL [total maximum daily load] or equivalent analysis provides adequate information to develop more specific measures to protect water quality. (40 C.F.R. § 122.34(e)(2).)

Although development and redevelopment standards are one of the six specific minimum control measures, the specific Post-Construction Requirements here, and in particular Performance Requirement No. 3, exceed the level of BMPs associated with development and redevelopment standards for Phase II communities.

Specifically, and as discussed previously, with Performance Requirement No. 3, the Central Coast Water Board staff is purportedly proposing hydromodification requirements based on watershed processes. This means that they are looking to ensure that the project site post-development mimics the undeveloped state of the site. This approach to application of Post-Construction Requirements far exceeds the hydromodification approach being required of all other Phase II communities that are otherwise subject to section E.12 of the Phase II General Permit. (Phase II General Permit, p. 56.) In the Phase II General Permit, hydromodification management basically requires that post-project runoff cannot exceed estimated pre-project flow rate for certain specified flow rates, which are much lower than the retention standards in Performance Requirement No. 3. Considering that the Central Coast Water Board is clearly moving down a path that departs from current practice and policy, such diversion as compared to what is being applied to other Phase II communities exceeds MEP.

d. There Is an Overall Lack of Public Acceptance of Performance Requirement No. 3

Public comments and testimony related to the adoption of Resolution No. R3-2012-0025, and the Central Coast specific post-construction requirements included in the November 16, 2012

draft of the Phase II General Permit, provide overwhelming evidence of an overall lack of public acceptance for applying Performance Requirement No. 3 to small MS4s. Despite the critical public comments, the Central Coast Water Board included the 95th percentile 24-hour storm event volume retention requirement (i.e., Performance Requirement No. 3) in Resolution No. R3-2013-0032.

Further evidence of public unwillingness to automatically accept Performance Requirement No. 3 as contained in Resolution No. R3-2013-0032 is that, in response to extensive public comment, the State Water Board chose to remove "Attachment J" from its November 16, 2012 draft of the Phase II General Permit. "Attachment J" contained Performance Requirement No. 3. The State Water Board pulled Attachment J because of "several unresolved issues acknowledged by the parties" to the Joint Effort, "including the Regional Water Board." Although re-adopted at a public hearing, there are still many unresolved issues amongst the parties.

In light of the highly critical public response to Performance Requirement No. 3, it is clear that such requirements exceed the MEP standard, and should either be rejected, or modified as suggested by the City.

D. Adoption of Resolution No. R3-2013-0032 Violates Water Code Sections 13263(a) and 13241 By Failing to Consider Certain Requirements Before Adopting the Resolution

Water Code section 13263(a) requires the Central Coast Water Board to consider the factors of Water Code section 13241 when adopting permit-based requirements more restrictive than those mandated by federal law. (*Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 626-627 (*Burbank*).) The factors listed in Water Code section 13241 include:

(a) Past, present, and probable future beneficial uses of water.
(b) Environmental characteristics of the hydrographic unit under consideration, including the quality of water available thereto.
(c) Water quality conditions that could reasonably be achieved through the coordinated control of all factors which affect water quality in the area.
(d) Economic considerations.
(e) The need for developing housing within the region.
(f) The need to develop and use recycled water.

As explained by the Supreme Court in *Burbank*, "economic considerations" include the cost the permit holder will incur to comply with the adopted numeric pollutant restrictions. (*Burbank, supra*, 35 Cal.4th at p. 627.) Guidance from the State Water Board's Chief Counsel reaffirms that the Central Coast Water Board has an affirmative duty to consider economics and must engage in a balancing of public interest factors. (Memorandum to Regional Water Board Executive Officers and Regional Water Board Attorneys, from William R. Attwater, Chief Counsel, State Water Board, Re: Guidance on the Consideration of Economics in the Adoption of Water Quality Objectives (Jan. 4, 1994) (Attwater Memorandum).) The Central Coast Water Board must address the Water Code section 13241 factors in the permit findings where such requirements exceed federal requirements. (*In the Matter of the Review on Own Motion of Waste Discharge Requirements Order No. 5-01-044 for Vacaville's Easterly Wastewater Treatment Plant*, State Water Board Order WQO 2002-0015 (Oct. 3, 2002), p. 35.)

The objective of the Post-Construction Requirements, including Performance Requirement No. 3, is supposedly "to ensure that the permittee is reducing pollutant discharges to the Maximum Extent Practicable and preventing stormwater discharges from causing or contributing to a violation of receiving water quality standards in all applicable development projects . . . ." (Resolution No. R3-2013-0032, Attachment 1, p. 1.) Further, the Resolution claims that maintenance and restoration of watershed processes . . . is necessary to protect water quality and beneficial uses." (*Id.*, p. 4, ¶ 17.) Based on these findings, the Post-Construction Requirements are intended to maintain and restore watershed processes, which the Central Coast Water Board finds is necessary to implement water quality standards. Based on the Central Coast Water Board findings, such requirements are arguably water quality-based and therefore extend beyond the mandated MEP standard.

As recognized in previous court decisions, MEP is the minimum standard and states have the discretion, but are not required, to impose more stringent requirements. (See, e.g. *Building Industry Assn. v. State Water Resources Control Bd.*, 124 Cal.App.4th at p. 883; see also *Defenders of Wildlife, et al. v. Carol M. Browner* (9th Cir. 1999) 191 F.3d 1159, 1166-1167.) Because MEP is the federal mandated requirement, and because water quality-based controls are

imposed using discretionary authority, application of water quality-based controls exceed the requirements of federal law, and are therefore subject to Water Code section 13623, and its incorporation of Water Code section 13241.

As such, the Central Coast Water Board is required to consider economics and the other public interest factors in Water Code section 13241. (Wat. Code, § 13263; *Burbank, supra,* 35 Cal.4th at p. 627.) The findings and record in this matter are devoid of evidence that the Central Coast Water Board has adequately and properly considered the factors of Water Code section 13241 in its adoption of the Post-Construction Requirements, including Performance Requirement No. 3. Accordingly, the Central Coast Water Board's adoption of the Post-Construction Requirements violates the law and is thus arbitrary.

E. The Central Coast Water Board Has Failed to Make Findings Based on Evidence That Bridge the Analytic Gap Between the Evidence and the Requirements

Resolution No. R3-2013-0032 states that the Post-Construction Requirements are "the minimum post-construction criteria that Central Coast Traditional MS4s . . . must apply to applicable development and redevelopment projects in order to protect water quality and comply with the MEP standard and Phase II Municipal General Permit section E.12.k." (Resolution No. R3-2013-0032, pp. 7-8, ¶ 2.) Resolution No. R3-2013-0032 includes hydromodification requirements that run afoul of state and federal law. For the reasons explained below, the State Water Board should reject the proposed Post-Construction Requirements, or at the very least, modify Performance Requirement No. 3 as requested by the City.

The Central Coast Water Board has characterized Resolution No. R3-2013-0032 as constituting waste discharge requirements (WDRs), and the City agrees. The adoption of WDRs, is of course, a quasi-adjudicatory act. (*California Assn. of Sanitation Agencies v. State Water Resources Control Bd.* (2012) 208 Cal.App.4th 1438, 1462, fn. 22.) The Post-Construction Requirements are enforceable post-construction hydromodification criteria that purportedly serve to implement the Phase II General Permit. If the City fails to comply with such requirements, it would be subject to enforcement action for violation of the Phase II General Permit. (See Phase II General Permit, p. 12.)

When adopting permit requirements, the Central Coast Water Board has a duty to "set forth findings to bridge the analytic gap between the raw evidence and the ultimate decision or order." (*Topanga Assn. For a Scenic Community v. County of Los Angeles* (1994) 11 Cal.3d 506, 515 (*Topanga).*) This serves to "conduce the administrative body to draw legally relevant sub-conclusions supportive of its ultimate decision" and "facilitate orderly analysis and minimize the likelihood that the agency will randomly leap from evidence to conclusions." (*Id.* at p. 516.) As the California Supreme Court explained, clear articulation of "the relationships between evidence and findings and between findings and ultimate action" discloses "the analytic route the administrative agency traveled from evidence to action." (*Id.* at p. 515.) The Legislature "contemplated that the agency would reveal this route" in the findings. Findings revealing the analytic route traveled by the agency must be supported by evidence in the record. (*Id.* at pp. 514-515.)

The Central Coast Water Board has failed to satisfy these duties in its adoption of Resolution No. R3-2013-0032. The findings in Resolution No. R3-2013-0032 consist of general statements and broad conclusions related to a perceived need for post-construction hydromodification criteria. The findings do not explain the basis for each Post-Construction Requirement or how they relate to the City in particular. For example, the findings do not explain how the broad-scale WMZ designations on which the Post-Construction Requirements are based account for local differences in soils, topography, and other environmental conditions. Accordingly, the findings impermissibly fail to "bridge the analytic gap between the raw evidence and ultimate decision or order" or reveal the "analytic route the [Central Coast Water Board has] traveled from evidence to [ultimate] action." (*Topanga, supra,* 11 Cal.3d at p. 515.)

Resolution No. R3-2013-0032 creates substantive obligations of great significance. Nowhere does it explain or justify these specific requirements. Finding No. 13 states: "The Technical Support Document (Attachment 2) contains rationale, justification, and explanation for the Post-Construction Requirements. This information is hereby incorporated by reference." (Resolution No. R3-2013-0032, p. 3, ¶ 13.) The City submits that incorporating a technical document cannot satisfy the requirement to serve as a bridge between the evidence and ultimate

order. The Central Coast Water Board must make findings, rather than generally referring to a separate informational document.

However, *assuming arguendo* that incorporating Attachment 2 into Resolution No. R3-2013-0032 could ever satisfy the requirement to explain the basis for regulatory requirements in the findings, the findings still fall below the legal standard. Attachment 2 generally discusses the regulatory context and environmental conditions before briefly addressing the categories of the Post-Construction Requirements, rather than the many specific requirements of each category. For example, Attachment 2 does not explain why the Central Coast Water Board determined it necessary to have small MS4s, or the City in particular, apply site design and runoff reduction performance requirements to residential properties. (See, e.g., Resolution No. R3-2013-0032, Attachment 1, p. 3, and Attachment 2, p. 19.) Nor does Attachment 2 explain why 2,500 square feet was determined as the threshold for invoking such performance requirements when that amount of impervious surface is created or replaced. (*Id.*, Attachment 2, p. 19.) Attachment 2 also does not explain why the square-footage thresholds for Performance Requirement Nos. 2, 3, and 4 were determined to be appropriate.

With regard to the requirement to retain runoff from events up to the 95th percentile 24-hour rainfall event, no findings explain how the requirement is technically or economically feasible for the localities in which it is being applied. (Resolution No. R3-2013-0032, Attachment 2, pp. 22-28.) Respecting Attachment D to Attachment 1, which defines the Tributary Area as the entire project without excluding existing impervious areas that will not be replaced, Attachment 2 directs readers to an April 8, 2013 study, which evaluated stormwater control measure sizing criteria. (Resolution No. R3-2013-0032, Attachment 2, p. 22, and Attachment G to Attachment 2.) Though this study justifies the proposed basin sizing requirements to some extent, the study does not contain findings explaining how the retention requirement is technically or economically feasible.

In addition to failing to bridge the analytic gap between the evidence and specific post-construction requirements, the Central Coast Water Board is proposing regulatory requirements not supported by evidence in the record. The record is replete with references to the unnecessary

and unattainable nature of many of the Post-Construction Requirements. As a result, the findings are not supported by evidence in the record.

E. Implementation of Performance Requirement No. 3 May Subject the City to Takings Claims by Project Proponents That Are Unable to Develop Within the City Due to the Challenged Provisions

1. Regulatory Takings

Resolution No. R3-2013-0032 will require the City to impose the Post-Construction Requirements on "Regulated Projects." Regulated Projects that create and/or replace a specific amount of impervious surface will be required to meet the on-site runoff retention requirement to prevent off-site discharge from events up to the 95th percentile 24-hour storm volume. (Resolution No. R3-2013-0032, Attachment 1, p. 6.) Imposition of this requirement on Regulated Projects may constitute a governmental regulation that deprives project proponents of the economic benefit of their private property. The state and federal Constitutions guarantee real property owners just compensation when their land is taken for public use. (*Allegretti & Co. v. County of Imperial* (2006) 138 Cal.App.4th 1261, 1269.) Regulatory takings, though not direct appropriation or physical invasion of private property, are compensable under the Fifth Amendment. (*Lingle v. Chevron U.S.A. Inc.* (2005) 544 U.S. 528, 537.) Courts examining regulatory takings challenges generally analyze three factors to determine whether a taking has occurred. The three factors are the economic impact of the regulation on the claimant, the extent to which the regulation has interfered with distinct investment-backed expectations, and the character of the governmental action. (*Penn Central Transp. Co. v. City of New York* (1978) 438 U.S. 104, 123.) Implementation of Performance Requirement No. 3 may be considered a regulatory taking if its application to Regulated Projects deprives project proponents of the economic benefit of their property.

Specifically, Performance Requirement No. 3 requires project proponents to dedicate significant portions of a project site to retention facilities designed to prevent discharge of stormwater from the site following rainfall events up to the 95th percentile 24-hour event. (Resolution No. R3-2013-0032, Attachment 1, pp. 6, 8, and Attachment D.) Any portion of a project site dedicated to retention will be unavailable for development consistent with the project

proponent's investment-backed expectations. The need to retain the 95th percentile 24-hour storm event volume on-site essentially requires that much of the project site may need to be dedicated to open, pervious areas, thereby making these areas unavailable for development.

The economic impact of the dedication requirement will be particularly severe in the City, where Type D soils predominate. (Geosyntec Memorandum, p. 2, Figure 2.) Performance Requirement No. 3, when applied to projects on Type D soils, may result in retention facilities that occupy more area of a project site than is necessary to achieve the purported objectives of the requirements. Specifically, when the retention basin size required to match undeveloped discharge on Type D soils is compared to the retention basin size necessary to retain the 95th percentile 24-hour event using the "Simple Method," the size of the retention facility would be about 26% larger than necessary. (*Id.*, p. 5, and Figure 4.) Also, when the BMP size for the undeveloped condition on Type D soils is compared to the size of the retention facility necessary using the "Routing Method," the retention facility would be about 40% larger than necessary. (*Ibid.*) By requiring a project proponent to dedicate more area of a project site to retention than is necessary, the City would be placing projects within its jurisdiction at a distinct economic disadvantage.

Further, such a result may interfere with the investment-backed expectations of project proponents. The retention requirements may require project proponents to modify or change the anticipated use of a project site. For example, by limiting the land area available for development, project proponents may be forced to alter their plans for use of the property. Or, in some cases, the need to comply with Performance Requirement No. 3 may prevent the development altogether if a project proponent is expected to dedicate a portion of land to stormwater control measures. Further, it is not reasonable to require incorporation of retention facilities into the project that would exceed the purported environmental objectives (i.e., maintaining more stormwater than that which would otherwise runoff in the undeveloped condition) of the requirement. As such, Performance Requirement No. 3 may interfere with a project proponent's expected return on investment.

Moreover, while Performance Requirement No. 3 may not constitute a typical physical invasion, the regulation would effectively appropriate open, pervious areas to a public use. In this regard, a project proponent's right to use the land dedicated to retention facilities will be eliminated, thereby providing a project proponent with further grounds for a regulatory takings claim against the City. In the City, where imposition of Performance Requirement No. 3 is likely to lead to the oversizing retention facilities, the impact will be exacerbated. Even if no such appropriation is found, the severity of the economic impact and the denial of investment-backed expectations of the landowners could give rise to a regulatory takings claim.

Although Resolution No. R3-2013-0032 includes alternative compliance mechanisms, these provisions could still subject the City to regulatory takings claims. For example, where it is technically infeasible to prevent discharge from the 95th percentile 24-hour storm event, a project proponent must dedicate no less than 10% of the impervious surface area to "retention-based Stormwater Control Measures." (Resolution No. R3-2013-0032, Attachment 1, p. 8.) The Central Coast Water Board has clarified that "retention" means "terminal or indefinite storage of runoff." (Staff Response to Comments, p. 22.) Therefore, it appears that such retention-based measures will essentially require that a portion of the project site be dedicated to open, pervious areas, or facilities that can store water on-site. In either case, a portion of the project site area may need to be appropriated for an intended public use, and unavailable for development purposes. Accordingly, the City will be exposed to regulatory takings claims.

Also, off-site mitigation is an option when a project proponent cannot retain the full retention volume, and either fails to demonstrate technical infeasibility of full retention, or demonstrates technical infeasibility of full retention and fails to dedicate at least 10% of the project's impervious surface area to retention-based Stormwater Control Measures. (Resolution No. R3-2013-0032, Attachment 1, pp. 8-9.) However, in the City, there is very little open space, and the open space that exists is subject to development restrictions. Most open space within with City's sphere of influence is protected by its designation as an Environmentally Sensitive Habitat Area (ESHA), or is agricultural land. Furthermore, the City recently passed an initiative restricting agricultural land development. Also, off-site compliance must be achieved within the

same watershed as the regulated project, unless otherwise approved by the Central Coast Water Board's Executive Officer. (*Id.*, Attachment 1, p. 13.) All of these limitations on off-site mitigation will force project proponents back into on-site measures, which could lead to regulatory takings claims.

2. Per Se Takings

Not only will the Post-Construction Requirements subject the City to regulatory takings claims, but may will also subject it to per se takings claims. For example, Performance Requirement No. 3 may impose unconstitutional conditions on project proponents that rise to the level of a taking, and could subject the City to demands for just compensation. Under the "unconstitutional conditions" doctrine, the government may not require a person to give up its Fifth Amendment right to just compensation when property is taken for public use, in exchange for a benefit that has little relationship to the property. (*Dolan v. City of Tigard* (1994) 512 U.S. 374, 385 (*Dolan*).) In order to not run afoul of the unconstitutional conditions doctrine, the government, when it conditions approval of a permit on the dedication of property to the public, must find a "nexus" and "rough proportionality" between the property it demands and the project's social costs. (*Dolan* at p. 391; *Nollan v. California Coastal Com.* (1987) 483 U.S. 825, 837 (*Nollan*).) In this respect, *Nollan* and *Dolan* protect a landowner's Fifth Amendment right to just compensation for property taken in the land-use permitting process. (*Koontz v. St. Johns River Water Management Dist.* (2013) 133 S. Ct. 2586, 2594 (*Koontz*).)

Imposition of Performance Requirement No. 3 on Type D soils may constitute an unconstitutional condition that may subject the City to takings claims and demands for just compensation. A finding of "rough proportionality" requires that a dedication to public use be related in nature and extent to a development's impact. (*Dolan*, *supra*, 512 U.S. at p. 391.) According to Resolution No. R3-2013-0032, the primary objective of the Post-Construction Requirements is to maintain and restore watershed processes, which the Central Coast Water Board determined is necessary to protect water quality and beneficial uses. (Resolution No. R3-2013-0032, p. 4.) In other words, the Post-Construction Requirements collectively, and Performance Requirement No. 3 specifically, are intended to ensure generally that runoff from

development and re-development sites is approximately the same as that runoff that would otherwise occur should there be no development. Performance Requirement No. 3, when applied to projects on Type D soils, may result in retention facilities that are 26-40% larger than necessary to match undeveloped discharge on Type D soils. (Geosyntec Memorandum, p. 5, Figure 4.) The City cannot reasonably argue that a retention facility that is 26-40% larger than necessary to maintain and restore watershed processes is related in extent to a development's impact on runoff from the project site. Such a condition would likely not pass muster under the rough proportionality standard of *Dolan*, and may constitute an unconstitutional condition absent compensation by the City.

Further, the various adjustments do not protect the City from takings claims. Under recent Supreme Court precedent, a monetary exaction (e.g., an in-lieu fee) must satisfy the nexus and rough proportionality requirements of *Nollan* and *Dolan*. (*Koontz*, *supra*, 133 S. Ct. at p. 2599.) Where a monetary exaction burdens a developer's ownership of a specific parcel of land, there is a link between the government's demand and real property that implicates *Nollan* and *Dolan*. (*Id.* at pp. 2599-2600.)

The off-site compliance alternative to Performance Requirement No. 3 would likely not escape scrutiny under *Nollan* and *Dolan*. Again, off-site compliance is an option when a project proponent cannot retain the full retention volume under Performance Requirement No. 3, and either fails to demonstrate the technical infeasibility of full retention, or demonstrates technical infeasibility of full retention and fails to dedicate at least 10% of the project's impervious surface area to retention-based Stormwater Control Measures. (Resolution No. R3-2013-0032, Attachment 1, pp. 8-9.) By off-site compliance, the Central Coast Water Board means compliance "achieved off-site through mechanisms such as developer fee-in-lieu arrangements and/or use of regional facilities." (*Id.*, Attachment 1, p. 12.) In essence, off-site compliance entails the payment of money to support implementation of projects designed to mitigate for the alleged on-site water quality effects of a project. These types of payments are similar to those that the Supreme Court, in *Koontz*, held are subject to scrutiny under *Nollan* and *Dolan*.

In *Koontz*, a project applicant applied for a permit from a local water management district to develop a 14.9 acre parcel by proposing development on 3.7 acres and offering to grant the district a conservation easement on about 11 acres of the project site. (*Koontz*, *supra*, 133 S. Ct. at p. 2592.) The district denied this proposal, and proceeded to condition issuance of a permit on satisfaction of one of two alternative conditions. (*Id.* at p. 2593.) For one alternative, the district proposed that the developer build on 3.7 acres, deed a conservation easement for the remainder of the property to the district, and pay for improvements to District-owned land several miles away. (*Ibid.*) The district argued that since it only needed to provide one alternative that satisfies the nexus and rough proportionality standards, and an obligation to spend money can never support a takings claim, that the payment for off-site improvements was constitutionally sound. (*Id.* at p. 2599.) The district's argument failed. (*Id.* at p. 2603.)

In this case, where the off-site compliance alternative requires the payment of in-lieu fees for mitigation projects, the off-site compliance alternative will be subject to scrutiny under *Nollan* and *Dolan*. Specifically, Performance Requirement No. 3 puts the City in jeopardy of running afoul of the rough proportionality requirement in *Dolan*. A finding of "rough proportionality" requires that a dedication to public use be related in nature and extent to a development's impact. (*Dolan*, *supra*, 512 U.S. at p. 391.) The off-site retention alternative requires calculation of a retention volume that would have been achieved on-site through implementation of on-site measures. (Resolution No. R3-2013-0032, Attachment 1, p. 9, and Attachment F.) To the extent the on-site retention volume drives development of retention basins off-site, and a developer must pay for oversized off-site retention facilities, then such payments would be disproportionate to the development's impact. In that respect, such payments would not be roughly proportional to the project's impact.

Thus, Performance Requirement No. 3's obligation to construct retention facilities that prevent runoff from the 95th percentile 24-hour event may subject the City to both regulatory and per se takings claims.

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IV. CONCLUSION

For the foregoing reasons, Petitioner requests that the State Water Board grant the relief requested herein.

SOMACH SIMMONS & DUNN

DATED: August 12, 2013

By _____
Theresa A. Dunham
Attorneys for Petitioner CITY OF GOLETA

PROOF OF SERVICE

I am employed in the County of Sacramento; my business address is 500 Capitol Mall, Suite 1000, Sacramento, California; I am over the age of 18 years and not a party to the foregoing action.

On August 12, 2013, I served a true and correct copy of:

CITY OF GOLETA'S PETITION FOR REVIEW; STATEMENT OF POINTS AND AUTHORITIES IN SUPPORT THEREOF

X (by mail) on all parties in said action listed below, in accordance with Code of Civil Procedure §1013a(3), by placing a true copy thereof enclosed in a sealed envelope in a designated area for outgoing mail, addressed as set forth below. At Somach Simmons & Dunn, mail placed in that designated area is given the correct amount of postage and is deposited that same day, in the ordinary course of business, in a United States mailbox in the City of Sacramento, California.

Mr. Kenneth A. Harris, Jr. Executive Officer Central Coast Regional Water Quality Control Board 895 Aerovista Place, Suite 101 San Luis Obispo, CA 93401-7906	Jessica M. Jahr, Esquire Office of Chief Counsel State Water Resources Control Board P.O. Box 100 Sacramento, CA 95812-0100
Tim W. Giles City Attorney City of Goleta 130 Cremona Drive, Suite B Goleta, CA 93117	

I declare under penalty of perjury that the foregoing is true and correct under the laws of the State of California. Executed on August 12, 2013, at Sacramento, California.

Crystal Rivera

SOMACH SIMMONS & DUNN
A Professional Corporation

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL COAST REGION
895 Aerovista Place, Suite 101
San Luis Obispo, California

RESOLUTION NO. R3-2013-0032

APPROVING POST-CONSTRUCTION STORMWATER MANAGEMENT REQUIREMENTS FOR DEVELOPMENT PROJECTS IN THE CENTRAL COAST REGION

The Central Coast Regional Water Quality Control Board (Central Coast Water Board) finds that:

Background

1. On December 8, 1999, USEPA promulgated regulations, known as Phase II, requiring permits for stormwater discharges from small Municipal Separate Storm Sewer Systems (MS4s) and from construction sites disturbing one and five acres of land. On February 5, 2013, the State Water Resources Control Board (State Water Board) adopted the National Pollutant Discharge Elimination System (NPDES) General Permit for the Discharge of Storm Water from Small Municipal Separate Storm Sewer Systems, Order No. 2013-0001-DWQ (Phase II Municipal General Permit). Regulated small MS4s are required to apply to obtain coverage under the Phase II Municipal General Permit and complete a Guidance Document. Under the previous Municipal General Permit (Order No. 2003-0005-DWQ), the MS4s were required to complete a Storm Water Management Plan (SWMP). The Central Coast Water Board implements the Phase II Municipal General Permit to be consistent with its Water Quality Control Plan, Central Coast Region (Basin Plan) to ensure protection of water quality, beneficial uses, and the biological and physical integrity of watersheds in the Central Coast region. The Central Coast Water Board Executive Officer requires specific conditions for MS4s pursuant to the federal Clean Water Act, the Basin Plan, and the Phase II Municipal General Permit.

2. The Phase II Municipal General Permit requires regulated small MS4s to develop and implement Best Management Practices (BMPs), measurable goals, and timetables for implementation, designed to reduce the discharge of pollutants to the maximum extent practicable (MEP) and to protect water quality. The Phase II Municipal General Permit requires regulated small MS4s to address stormwater runoff from development and redevelopment projects through post-construction stormwater management requirements. Phase II Municipal General Permit section E.12.k requires the Permittee to comply with alternative post-construction storm water management requirements based on a watershed-process approach after development and approval by the Central Coast Water Board.

3. The Central Coast Water Board approved Post-Construction Storm Water Management Requirements for Development Projects in the Central Coast (Post-Construction Requirements) on September 6, 2012 through adoption of Resolution R3-2012-0025. Resolution R3-2012-0025 made findings that Central Coast municipalities must implement the Post-Construction Requirements to comply with the statewide Phase II Municipal General Permit, Order No. 2003-0005-DWQ in effect at that time.

4. At the time of adoption of Resolution R3-2012-0025 by the Central Coast Water Board, State Water Board staff was preparing to reissue the Phase II Municipal General Permit. The State Water Board reissued the permit on February 5, 2013.

5. The reissued Phase II Municipal General Permit included several new provisions affecting the implementation of post-construction requirements on the Central Coast. First, the reissued Phase II Municipal General Permit allows for implementation of the Central Coast Post-Construction Requirements in the Central Coast (Section E.12.k, Order No. 2013-0001-DWQ). Second, it identifies the Cites of Greenfield, Gonzales, and Guadalupe, as new Traditional MS4s (Attachment A, Order No. 2013-0001-DWQ). Third, it requires the Guidance Document for Renewal Permittees to (1) identify and describe each BMP and associated measurable goal, included in the Permittee's most current SWMP, that constitutes a more specific local or tailored level of implementation that may be more protective of water quality than the minimum requirements of the Phase II Municipal General Permit; and (2) for any more protective, locally-tailored BMP and associated measurable goal for which the Renewal Permittee will reduce or cease implementation, provide a demonstration to the Executive Officer of the relevant Regional Water Board that the reduction or cessation is in compliance with Phase II Municipal General Permit and the maximum extent practicable standard, and will not result in increased pollutant discharges (Section A.1.b.4., Order No. 2013-0001-DWQ). All of the municipalities participating in the Central Coast Joint Effort for Low Impact Development and Hydromodification Control (Joint Effort MS4s) are Renewal Permittees under the reissued permit.

6. The Central Coast Water Board's September 6, 2012 Resolution R3-2012-0025, which approved the Post-Construction Requirements, must be re-adopted by the Central Coast Water Board after a public process for consistency with the reissued Phase II Municipal General Permit. The language of the Central Coast Water Board's September 6, 2012 Resolution R3-2012-0025: refers to the former Phase II Municipal General Permit, Order No. 2003-0005-DWQ instead of the current Phase II Municipal General Permit, Order No. 2013-0001-DWQ; cites the section numbers for post construction requirements as per Order No. 2003-0005-DWQ instead of the reissued Phase II Municipal General Permit section numbers; and describes implementation via SWMPs as in Order No. 2003-0005-DWQ instead of directly through permit requirements as in the reissued Phase II Municipal General Permit.

7. On February 15, 2008, the Central Coast Water Board Executive Officer notified un-enrolled traditional, small MS4 stormwater dischargers and two un-enrolled non-traditional, small MS4 stormwater dischargers (University of California at Santa Barbara and Santa Cruz) of the process the Central Coast Water Board would follow for enrolling the MS4s under the Phase II Municipal General Permit. In the February 15, 2008 correspondence, the Central Coast Water Board Executive Officer stated his intent to require MS4s to include in their SWMPs a schedule for development and adoption of hydromodification control standards. Subsequently, the Executive Officer required the MS4s' SWMPs to include provisions for development and implementation of hydromodification control criteria. For MS4s previously enrolled, the Central Coast Water Board Executive Officer generally required those MS4s' SWMPs to be updated with hydromodification control provisions.

8. On August 4, 2009 and October 20, 2009, the Central Coast Water Board Executive Officer notified the MS4s of the option to participate in the Central Coast Joint Effort for developing hydromodification control criteria (Joint Effort) as a means to meet the hydromodification control criteria development, adoption, and implementation commitments in the MS4s'

SWMPs. MS4s agreeing to participate in the Joint Effort (Joint Effort MS4s) submitted a written declaration of their intent to meet the terms of participation.

9. Between January and August 2010, Central Coast Joint Effort MS4s amended their SWMPs to include BMPs to codify steps the Central Coast Water Board Executive Officer required of them to participate in the Joint Effort. These BMPs included development and implementation of hydromodification control criteria and selection of applicability thresholds pursuant to the Joint Effort.

10. On September 28, 2010, the Central Coast Water Board Executive Officer notified the Joint Effort MS4s of the commencement of the Joint Effort.

11. On December 2, 2009, the City of Salinas requested to participate in the Joint Effort. On May 17, 2011, Central Coast Water Board Executive Officer outlined to the City of Salinas the steps they needed to take to formalize participation in the Joint Effort. On August 16, 2011, the City of Salinas modified its SWMP to include these steps. On May 3, 2012, the Central Coast Water Board approved Order No. R3-2012-0005, NPDES Permit No. CA0049981, Waste Discharge Requirements for City of Salinas Municipal Stormwater Discharges. Order No. R3-2012-0005, Provision J requires the City of Salinas to revise its Stormwater Development Standards to incorporate the Post-Construction Requirements, developed by the Joint Effort.

Stormwater Management to Protect Beneficial Uses

12. Prior to the Joint Effort, information on the local characteristics of Central Coast watersheds was inadequate for MS4s to develop Post-Construction Requirements that protect watershed processes so that beneficial uses of receiving waters are maintained and, where applicable, restored. The Central Coast Water Board secured funds from the State Water Quality Control Board's Cleanup and Abatement Account to support acquisition and assessment of information to inform the development of hydromodification control criteria and related Post-Construction Requirements. These funds were used to establish an expert team of scientists that would characterize the Central Coast region's watersheds and help create a methodology for developing Post-Construction Requirements based on that characterization. The Post-Construction Requirements included in this Resolution (Attachment 1) are based on the methodology, which has been summarized in the Technical Support Document for Post-Construction Stormwater Management Requirements for Development Projects in the Central Coast Region (Technical Support Document) (Attachment 2).

13. The Technical Support Document (Attachment 2) contains rationale, justification, and explanation for the Post-Construction Requirements. This information is hereby incorporated by reference.

14. Urban runoff is a leading cause of pollution throughout the Central Coast region. Development and urbanization increase pollutant loading and volume, velocity, frequency, and discharge duration of stormwater runoff. First, natural vegetated pervious ground cover is converted to impervious surfaces such as highways, streets, rooftops and parking lots. While natural vegetated soil can both absorb rainwater and remove pollutants, providing an effective natural purification process, impervious surfaces, in contrast, can neither absorb water nor remove pollutants, and thus the natural purification characteristics are lost. Second, urban development creates new pollution sources as the increased density of

human population brings proportionately higher levels of vehicle emissions, vehicle maintenance wastes, pesticides, household hazardous wastes, pet wastes, trash, and other anthropogenic pollutants, which can either be washed or directly dumped into the MS4. As a result, the runoff leaving the developed urban area is significantly greater in pollutant load than the pre-development runoff from the same area. These increased pollutant loads must be controlled to protect downstream receiving water quality. Additionally, the increased volume, increased velocity, and discharge duration of stormwater runoff from developed areas, has the potential to accelerate downstream erosion, reduce groundwater recharge, and impair stream habitat in natural drainages.

15. A higher percentage of impervious area correlates to a greater pollutant loading, resulting in turbid water, nutrient enrichment, bacterial contamination, organic matter loads, toxic compounds, temperature increases, and increases of trash or debris.

16. The discharge of pollutants and/or increased flows from MS4s can cause or threaten to cause exceedances of applicable receiving water quality objectives, impair or threaten to impair designated beneficial uses, and result in a condition of pollution (i.e., unreasonable impairment of water quality for designated beneficial uses), contamination, hazard, or nuisance.

17. Maintenance and restoration of watershed processes impacted by stormwater management is necessary to protect water quality and beneficial uses. Watershed processes affected by stormwater, by actions to manage stormwater, and/or by land uses that alter stormwater runoff patterns include the following: 1) overland flow, 2) groundwater recharge, 3) interflow, 4) evapotranspiration, 5) delivery of sediment and organic matter to receiving waters, and 6) chemical and biological transformations. These watershed processes must be maintained and protected in order to support beneficial uses throughout the Central Coast region's watersheds. Restoration of degraded watershed processes, impacted by stormwater management, is necessary to protect water quality and re-establish impacted beneficial uses. New development, redevelopment, and existing land use activities create alterations to stormwater runoff conditions which in turn result in changes to watershed processes that can cause or contribute to impairment of beneficial uses and violations of water quality standards. Future growth planned within the Central Coast region will degrade watershed processes if not managed properly.

18. Low Impact Development (LID) is an effective approach to managing stormwater to minimize the adverse effects of urbanization and development on watershed processes and beneficial uses resulting from changes in stormwater runoff conditions. LID strategies can achieve significant reductions in pollutant loading and runoff volumes as well as greatly enhanced groundwater recharge rates. The proper implementation of LID techniques results in greater benefits than single purpose stormwater and flood control infrastructure.

19. Controlling urban runoff pollution by using a combination of onsite source control and LID BMPs augmented with treatment control BMPs before the runoff enters the MS4 is important for the following reasons: 1) many end-of-pipe BMPs (such as diversion to the sanitary sewer) are typically ineffective during significant storm events, but onsite source control BMPs can be applied during all runoff conditions; 2) end-of-pipe BMPs are often incapable of capturing and treating the wide range of pollutants which can be generated on a sub-watershed scale; 3) end-of-pipe BMPs are more effective when used as polishing BMPs, rather than the sole BMP to be implemented; 4) end-of-pipe BMPs do not protect the quality or beneficial uses of receiving waters between the source and the BMP; and 5) offsite end-

of-pipe BMPs do not aid in the effort to educate the public regarding sources of pollution and their prevention.

20. The risks associated with infiltration can be properly managed by many techniques, including: 1) designing landscape drainage features that promote infiltration of runoff, but do not "inject" runoff (injection bypasses the natural processes of filtering and transformation that occur in the soil), 2) taking reasonable steps to prevent the illegal disposal of wastes, 3) protecting footings and foundations, and 4) ensuring that each drainage feature is adequately maintained in perpetuity. However, in some circumstances, site conditions (e.g., historical soil contamination) and the type of development (i.e., urban infill) can limit the feasibility of retaining, infiltrating, and reusing stormwater at sites.

21. Redevelopment projects involve work on sites with existing impervious surfaces and other disturbances that contribute pollutants to receiving waters and potentially impact watershed processes such as infiltration. Though implementation of infiltration based LID measures may be constrained by these conditions, post-construction stormwater management applied to redevelopment projects still holds the potential to partially mitigate these existing impacts as well as the impacts associated with the new or expanded portions of the project.

22. Providing long-term operation and maintenance of structural flow/volume control and treatment BMPs is necessary so that the BMPs maintain their intended effectiveness at managing runoff flow/volume and removing pollutants. If BMPs are not properly maintained, new development and redevelopment will cause degradation of watershed processes.

23. When water quality impacts are considered during the planning stages of a project, new development and many redevelopment projects can more efficiently incorporate measures to protect water quality and beneficial uses. Planning decisions should account for potential stormwater impacts to reduce pollutant loading and manage flows in order to maintain and restore watershed processes as necessary to protect water quality and beneficial uses.

24. Infiltration and subsurface flow are the dominant hydrologic processes across all intact watersheds of the Central Coast region. Different physical landscapes, defined by their surface geology and slope, respond differently to the changes in watershed processes imposed by urbanization, but the shift from infiltration to surface flow is ubiquitous.

25. The Post-Construction Requirements' emphasis on protecting and, where degraded, restoring key watershed processes is necessary to create and sustain linkages between hydrology, channel geomorphology, and biological health necessary for healthy watersheds. These linkages cannot be created by fine-tuning any particular flow attribute (e.g., peak, duration) or reconstructing a desired geomorphic feature alone. Instead, these critical linkages only occur where key watershed processes are intact.

26. Section 402 (p) of the Clean Water Act requires the Administrator of the United States Environmental Protection Agency (USEPA) or her designated agent, in this instance, the Central Coast Water Board, to require as part of the stormwater program "controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants." [USC Section 1342 (p)(3)(B)]. The maximum extent practicable (MEP) standard is an ever-evolving, flexible, and advancing concept, which considers technical and

economic feasibility. As knowledge about controlling urban runoff continues to evolve, so does that which constitutes MEP. Reducing the discharge of stormwater pollutants to the MEP in order to protect beneficial uses requires review and improvement, which includes seeking new opportunities, such as establishing these Post-Construction Requirements.

27. In cases of stormwater retention technical infeasibility, the dedication of an area equal to ten percent of a site's Effective Impervious Surface Area is practicable, because ten percent of a site is a typical municipal landscape requirement.

Establishing Post-Construction Requirements

28. This Resolution enacts Post-Construction Requirements which include the components for post-construction requirements based on a watershed-process approach that are identified in section E.12.k of the Phase II Municipal General Permit, Order No. 2013-0001 DWQ.

29. The Post-Construction Requirements enacted by this Resolution protect the beneficial uses of Waters of the United States. The intent of the Post-Construction Requirements enacted by this Resolution is to focus on those discharges that threaten beneficial uses, and to require implementation of BMPs to reduce stormwater pollutant discharges to the MEP and protect water quality and beneficial uses. The Post-Construction Requirements enacted by this Resolution are consistent with the evolving MEP standard.

30. The Post-Construction Requirements constitute a more specific local or tailored level of implementation that may be more protective of water quality than the minimum requirements of the Phase II Municipal General Permit.

31. This action to adopt this Resolution is exempt from the provisions of the California Environmental Quality Act (Public Resources Code §21100, et seq.) in accordance with section 13389 of the Porter-Cologne Water Quality Control Act (Porter-Cologne, Division 7 of the California Water Code).

32. The Post-Construction Requirements, developed by the Joint Effort, will become effective upon approval of this Resolution by the Central Coast Water Board.

Stakeholder Involvement

33. On August 27, 2009, September 3, 2009, and September 8, 2009, Central Coast Water Board staff held stakeholder workshops around the Central Coast region to provide an opportunity for stakeholders to help select project milestones for the two-year Joint Effort process. At the October 23, 2009, December 9, 2010, December 11, 2011, and March 15, 2012 Central Coast Water Board Meetings, staff provided updates on the Joint Effort to the public and Board Members. Central Coast Water Board staff established the Joint Effort Review Team (JERT), consisting of stakeholders representing the regulated governmental agencies, environmental management agencies, developers, and technical consultants, to provide review of Joint Effort project deliverables. The JERT met for the first time December 15, 2010, and held its seventh meeting March 28, 2012. On February 9 and October 31, 2011, Central Coast Water Board staff distributed to stakeholders Joint Effort updates and status reports. In December 2011 and January 2012, Central Coast Water Board staff conducted outreach to Joint Effort MS4s on the status of the Joint Effort. On February 15 and 16, 2012, Central Coast Water Board staff conducted workshops to provide updates on the Joint Effort.

34. Central Coast Water Board staff implemented a process to inform interested persons and the public and solicit comment on the Post-Construction Requirements developed through the Joint Effort. On June 5th and 6th, 2012, Central Coast Water Board staff conducted workshops on the Post-Construction Requirements. On May 14, 2012, staff issued a public notice indicating that the Central Coast Water Board would consider adoption of the Post-Construction Requirements. The public notice provided the public a 53-day public comment period preceding the Central Coast Water Board hearing. Central Coast Water Board staff responded to oral and written comments received from the public. All public comments were considered. Public notice of the public hearing was given by electronic mail on May 14, 2012. Relevant documents and notices were also made available on the Central Coast Water Board website.

35. On September 6, 2012, in San Luis Obispo California, the Central Coast Water Board held a public hearing and heard and considered all public comments and evidence in the record. The Central Coast Water Board adopted Resolution R3-2012-0025, approving the Post-Construction Requirements for the first time on that date.

36. Upon adoption of Resolution R3-2012-0025 on September 6, 2012, the Central Coast Water Board directed Central Coast Water Board staff to continue working with stakeholders to identify potential obstacles over the one-year period leading up to implementation. This Resolution R3-2013-0032 removes an obstacle identified during Central Coast Water Board staff implementation of that process: overly conservative stormwater retention facility sizing.

37. On February 1 and March 14, 2013, Central Coast Water Board staff provided updates to the Central Coast Water Board on the status of implementation of the Post-Construction Requirements and how the Post-Construction Requirements interact with the Phase II Municipal General Permit, Order No. 2013-0001 DWQ. On April 8, 2013, staff issued a public notice indicating that the Central Coast Water Board would consider re-adopting the Post-Construction Requirements. The public notice provided the public a 32-day public comment period preceding the Central Coast Water Board hearing. Central Coast Water Board staff responded to oral and written comments received from the public. All public comments were considered. Public notice of the public hearing was given by electronic mail to all stakeholders on April 8, 2013. The public notice and relevant documents were also made available on the Central Coast Water Board website.

38. On July 12, 2013, in Watsonville California, the Central Coast Water Board held a public hearing and heard and considered all public comments and evidence in the record.

THEREFORE, be it resolved that:

1. The Post-Construction Requirements, as defined in Attachment 1 are appropriate and effective requirements for small MS4s subject to the post-construction requirements of the current and subsequent Phase II Municipal General Permits to apply to development projects, in order to protect watershed processes so that beneficial uses of receiving waters affected by stormwater management are maintained and, where applicable, restored.

2. The Central Coast Water Board adopts the Post-Construction Requirements, as defined in Attachment 1, as the minimum post-construction criteria that Central Coast Traditional MS4s, the University of California at Santa Barbara and Santa Cruz, and any other

municipal discharger who chooses to implement these requirements, must apply to applicable new development and redevelopment projects in order to protect water quality and comply with the MEP standard and Phase II Municipal General Permit section E.12.k. Section E.12.k requires Traditional MS4s to comply with post-construction storm water management requirements based on a watershed-process approach developed by Regional Water Boards. For the Non-Traditional MS4s already undertaking implementation of the Post-Construction Requirements through implementation of BMPs in their SWMPs – the University of California at Santa Barbara and Santa Cruz – the Post-Construction Requirements constitute a more specific local or tailored level of implementation that may be more protective of water quality than the minimum requirements of the Phase II Municipal General Permit.

3. As minimum criteria, MS4s may establish criteria more stringent than the Post-Construction Requirements as defined in Attachment 1. The MS4 may determine the need for greater stringency based on specific factors and conditions affecting implementation of the Post-Construction Requirements. Greater stringency may be achieved by lower applicability thresholds where practical; additional site design and runoff reduction requirements; and more rigorous flow control (peak management) criteria than indicated in the Post-Construction Requirements as defined in Attachment 1.

4. The Central Coast Water Board Executive Officer may approve non-substantive changes to the Post-Construction Requirements that improve clarity without altering the intent of the requirements.

5. By March 6, 2014, the Central Coast Renewal Traditional MS4s, and applicable Non-Traditional MS4s, shall apply the Post-Construction Requirements to all regulated projects as defined in Attachment 1. Central Coast Traditional MS4s, and applicable Non-Traditional MS4s, shall continue to apply the Post-Construction Requirements to all regulated projects as defined in Attachment 1, pursuant to subsequent Phase II Municipal General Permits, unless the Central Coast Water Board Executive Officer requires otherwise.

6. By July 1, 2014, the Central Coast New Traditional MS4s (Cities of Greenfield, Gonzales, and Guadalupe) shall apply the Post-Construction Requirements to all regulated projects as defined in Attachment 1.

7. The Central Coast Water Board adopts the Post-Construction Requirements, as defined in Attachment 1, as the minimum post-construction criteria that the City of Salinas must apply to applicable new development and redevelopment projects in order to protect water quality and comply with the MEP standard and Order No. R3-2012-0005, NPDES Permit No. CA0049981, Waste Discharge Requirements for City of Salinas Municipal Stormwater Discharges.

I, Kenneth A. Harris Jr., Interim Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of the resolution adopted by the California Regional Water Quality Control Board, Central Coastal Region on July 12, 2013.

Kenneth A. Harris Jr.
Interim Executive Officer

ATTACHMENT 1: Post-Construction Stormwater Management Requirements for Development Projects in the Central Coast Region

ATTACHMENT 2: Technical Support Document for Post-Construction Stormwater Management Requirements for Development Projects in the Central Coast Region

POST-CONSTRUCTION STORMWATER MANAGEMENT REQUIREMENTS FOR DEVELOPMENT PROJECTS IN THE CENTRAL COAST REGION

July 12, 2013

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
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Documents also are available at:
http://www.waterboards.ca.gov/centralcoast/water_issues/programs/stormwater/docs/lid/lid_hydromod_charette_index.shtml

POST-CONSTRUCTION STORMWATER MANAGEMENT REQUIREMENTS FOR DEVELOPMENT PROJECTS IN THE CENTRAL COAST REGION

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A. Watershed Management Zones (WMZs)

The urbanized portions of the Central Coast Region are categorized into 10 Watershed Management Zones (WMZs), based on common key watershed processes and receiving water type (creek, marine nearshore waters, lake, etc). Maps in Attachment A illustrate the WMZs for the Central Coast Region's urbanized areas. Designated Groundwater Basins of the Central Coast Region (Attachment B) underlie some but not all WMZs in urbanized portions of the Central Coast Region. The map and table in Attachment B illustrates the Groundwater Basins of the Central Coast Region. Each WMZ and, where present, Groundwater Basin, is aligned with specific Post-Construction Stormwater Management Requirements to address the impacts of development on those watershed processes and beneficial uses.

1) The Permittee shall maintain the ability to identify the WMZs and their boundaries, and to determine the WMZ in which development projects are proposed, throughout the urbanized portions of their jurisdiction corresponding with the Phase I or Phase II Municipal Stormwater Permit boundary.
2) The Permittee shall maintain the ability to determine whether development projects are proposed in areas overlying designated Groundwater Basins, throughout the urbanized portions of their jurisdiction subject to either a Phase I or Phase II Municipal Stormwater Permit.

B. Post-Construction Requirements

The primary objective of these Post-Construction Stormwater Management Requirements (hereinafter, Post-Construction Requirements) is to ensure that the Permittee is reducing pollutant discharges to the Maximum Extent Practicable and preventing stormwater discharges from causing or contributing to a violation of receiving water quality standards in all applicable development projects that require approvals and/or permits issued under the Permittee's planning, building, or other comparable authority. The Post-Construction Requirements emphasize protecting and, where degraded, restoring key watershed processes to create and sustain linkages between hydrology, channel geomorphology, and biological health necessary for healthy watersheds. Maintenance and restoration of watershed processes impacted by stormwater management is necessary to protect water quality and beneficial uses.

1) Regulated Projects
   Regulated Projects include all New Development or Redevelopment projects that create and/or replace $\geq$2,500 square feet of impervious surface (collectively over the entire project site)
   a) Regulated Projects include, but are not limited to the following road projects/practices:
      i) Removing and replacing a paved surface resulting in alteration of the original line and grade, hydraulic capacity or overall footprint of the road
      ii) Extending the pavement edge, or paving graveled shoulders
      iii) Resurfacing by upgrading from dirt to asphalt, or concrete; upgrading from gravel to asphalt, or concrete; or upgrading from a bituminous surface treatment ("chip seal") to asphalt or concrete
   b) Regulated Projects do not include:
      i) Road and Parking Lot maintenance:
         (1) Road surface repair including slurry sealing, fog sealing, and pothole and square cut patching
         (2) Overlaying existing asphalt or concrete pavement with asphalt or concrete without expanding the area of coverage
         (3) Shoulder grading
         (4) Cleaning, repairing, maintaining, reshaping, or regrading drainage systems

(5) Crack sealing
(6) Resurfacing with in-kind material without expanding the road or parking lot
(7) Practices to maintain original line and grade, hydraulic capacity, and overall footprint of the road or parking lot
(8) Repair or reconstruction of the road because of slope failures, natural disasters, acts of God or other man-made disaster

ii) Sidewalk and bicycle path or lane projects, where no other impervious surfaces are created or replaced, built to direct stormwater runoff to adjacent vegetated areas
iii) Trails and pathways, where no other impervious surfaces are replaced or created, and built to direct stormwater runoff to adjacent vegetated areas
iv) Underground utility projects that replace the ground surface with in-kind material or materials with similar runoff characteristics
v) Curb and gutter improvement or replacement projects that are not part of any additional creation or replacement of impervious surface area (e.g., sidewalks, roadway)
vi) Second-story additions that do not increase the building footprint
vii) Raised (not built directly on the ground) decks, stairs, or walkways designed with spaces to allow for water drainage
viii) Photovoltaic systems installed on/over existing roof or other impervious surfaces, and panels located over pervious surfaces with well-maintained grass or vegetated groundcover, or panel arrays with a buffer strip at the most down gradient row of panels
ix) Temporary structures (in place for less than six months)
x) Electrical and utility vaults, sewer and water lift stations, backflows and other utility devices
xi) Above-ground fuel storage tanks and fuel farms with spill containment system

c) The Permittee shall apply the Post-Construction Requirements by March 6, 2014[1], to all applicable Regulated Projects that require approvals and/or permits issued under the Permittee's planning, building, or other comparable authority. Applicable Regulated Projects include both private development requiring permits, and public projects:
   i) Private Development Projects
      (1) Discretionary Projects – The Permittee shall apply the Post-Construction Requirements to those projects that have not received the first discretionary approval of project design.
      (2) Ministerial Projects – If the project is only subject to ministerial approval, the Permittee shall apply the Post-Construction Requirements to those projects that have not received any ministerial approvals. If the ministerial project receives multiple ministerial approvals, the Permittee shall apply the Post-Construction Requirements to the first ministerial approval. Ministerial approvals include, but are not limited to, building permits, site engineering improvements, and grading permits.
   ii) Public Development Projects
      (1) The Permittee shall develop and implement an equivalent approach, to the above approach used for private development projects, to apply the Post-Construction Requirements to applicable public development projects, including applicable university development projects
   iii) Exemptions – The Permittee may propose, to the Central Coast Water Board Executive Officer, a lesser application of the Post-Construction Requirements for

[1] Newly enrolled Permittees Gonzales, Greenfield, and Guadalupe shall apply the Post-Construction Requirements by July 1, 2014.

projects with completed project applications dated prior to September 6, 2012. The Permittee must demonstrate that the application of the Post-Construction Requirements would pose financial infeasibility for the project. The Permittee shall not grant any exemptions without prior approval from the Central Coast Water Board Executive Officer.

2) Performance Requirement No. 1: Site Design and Runoff Reduction
   a) The Permittee shall require all Regulated Projects that create and/or replace ≥ 2,500 square feet of impervious surface (collectively over the entire project site), including detached single-family home projects, to implement at least the following design strategies throughout the Regulated Project site:
      i) Limit disturbance of creeks and natural drainage features
      ii) Minimize compaction of highly permeable soils
      iii) Limit clearing and grading of native vegetation at the site to the minimum area needed to build the project, allow access, and provide fire protection
      iv) Minimize impervious surfaces by concentrating improvements on the least-sensitive portions of the site, while leaving the remaining land in a natural undisturbed state
      v) Minimize stormwater runoff by implementing one or more of the following site design measures:
         (1) Direct roof runoff into cisterns or rain barrels for reuse
         (2) Direct roof runoff onto vegetated areas safely away from building foundations and footings, consistent with California building code
         (3) Direct runoff from sidewalks, walkways, and/or patios onto vegetated areas safely away from building foundations and footings, consistent with California building code
         (4) Direct runoff from driveways and/or uncovered parking lots onto vegetated areas safely away from building foundations and footings, consistent with California building code
         (5) Construct bike lanes, driveways, uncovered parking lots, sidewalks, walkways, and patios with permeable surfaces
   b) The Permittee shall confirm that projects comply with Site Design and Runoff Reduction Performance Requirements by means of appropriate documentation (e.g., check lists) accompanying applications for project approval.

3) Performance Requirement No. 2: Water Quality Treatment
   a) The Permittee shall require Regulated Projects, except detached single-family homes, ≥ 5,000 square feet of Net Impervious Area, and detached single-family homes ≥ 15,000 square feet of Net Impervious Area, to treat stormwater runoff as required in the Water Quality Treatment Performance Requirements in Section B.3.b. to reduce pollutant loads and concentrations using physical, biological, and chemical removal.
      i) Net Impervious Area is the total (including new and replaced) post-project impervious areas, minus any reduction in total imperviousness from the pre-project to post-project condition: *Net Impervious Area = (New and Replaced Impervious Area) - (Reduced Impervious Area Credit),* where *Reduced Impervious Area Credit* is the total pre-project to post-project reduction in impervious area, if any.
   b) The Permittee shall require each Regulated Project subject to Water Quality Treatment Performance Requirements to treat runoff generated by the Regulated Project site using the onsite measures below, listed in the order of preference (highest to lowest). Water Quality Treatment Performance Requirements shall apply to the runoff from existing, new, and replaced impervious surfaces on sites where runoff from existing impervious surfaces cannot be separated from runoff from new and replaced impervious surfaces.

i) Low Impact Development (LID) Treatment Systems – Implement harvesting and use, infiltration, and evapotranspiration Stormwater Control Measures that collectively achieve the following hydraulic sizing criteria for LID systems:
   (1) Hydraulic Sizing Criteria for LID Treatment Systems – LID systems shall be designed to retain stormwater runoff equal to the volume of runoff generated by the 85th percentile 24-hour storm event, based on local rainfall data.

ii) Biofiltration Treatment Systems – Implement biofiltration treatment systems using facilities that must be demonstrated to be at least as effective as[2] a biofiltration treatment system with the following design parameters:
   (1) Maximum surface loading rate appropriate to prevent erosion, scour and channeling within the biofiltration treatment system itself and equal to 5 inches per hour, based on the flow of runoff produced from a rain event equal to or at least:
      (a) 0.2 inches per hour intensity; or
      (b) Two times the 85th percentile hourly rainfall intensity for the applicable area, based on historical records of hourly rainfall depth
   (2) Minimum surface reservoir volume equal to the biofiltration treatment system surface area times a depth of 6 inches
   (3) Minimum planting medium depth of 24 inches. The planting medium must sustain a minimum infiltration rate of 5 inches per hour throughout the life of the project and must maximize runoff retention and pollutant removal. A mixture of sand (60%-70%) meeting the specifications of American Society for Testing and Materials (ASTM) C33 and compost (30%-40%) may be used. A Regulated Project may utilize an alternative planting medium if it demonstrates its planting medium is equal to or more effective at attenuating pollutants than the specified planting medium mixture.
   (4) Proper plant selection[3]
   (5) Subsurface drainage/storage (gravel) layer with an area equal to the biofiltration treatment system surface area and having a minimum depth of 12 inches
   (6) Underdrain with discharge elevation at top of gravel layer
   (7) No compaction of soils beneath the biofiltration facility (ripping/loosening of soils required if compacted)
   (8) No liners or other barriers interfering with infiltration, except for situations where lateral infiltration is not technically feasible.

iii) Non-Retention Based Treatment Systems – Implement Stormwater Control Measures that collectively achieve at least one of the following hydraulic sizing criteria for non-retention based treatment systems:
   (1) Hydraulic Sizing Criteria for Non-Retention Based Treatment Systems:
      (a) Volume Hydraulic Design Basis – Treatment systems whose primary mode of action depends on volume capacity shall be designed to treat stormwater runoff equal to the volume of runoff generated by the 85th percentile 24-hour storm event, based on local rainfall data.

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[2] Facilities or a combination of facilities, of a different design than in Section B.3.b.ii. may be permitted if all of the following measures of equivalent effectiveness are demonstrated: 1) equal or greater amount of runoff infiltrated or evapotranspired; 2) equal or lower pollutant concentrations in runoff that is discharged after biofiltration; 3) equal or greater protection against shock loadings and spills; and 4) equal or greater accessibility and ease of inspection and maintenance.

[3] Technical guidance for designing bioretention facilities is available from the Central Coast LID Initiative. The guidance includes design specifications and plant lists appropriate for the Central Coast climate. (http://www.centralcoastlidi.org/Central_Coast_LIDI/LID_Structural_BMPs.html)

(b) Flow Hydraulic Design Basis – Treatment systems whose primary mode of action depends on flow capacity shall be sized to treat:
  (i) The flow of runoff produced by a rain event equal to at least two times the 85th percentile hourly rainfall intensity for the applicable area, based on historical records of hourly rainfall depths; or
  (ii) The flow of runoff resulting from a rain event equal to at least 0.2 inches per hour intensity.

c) Stormwater Control Plan Requirements – For each Regulated Project subject to the Water Quality Treatment Performance Requirement, the Permittee shall require the Project Applicant to provide the below information in a Stormwater Control Plan. The Permittee shall not grant final project approval, until the Stormwater Control Plan for the Regulated Project sufficiently demonstrates the Regulated Project design meets the Water Quality Treatment Performance Requirements.
  i) Project name, application number, location including address and assessor's parcel number
  ii) Name of Applicant
  iii) Project Phase number (if project is being constructed in phases)
  iv) Project Type (e.g., commercial, industrial, multi-unit residential, mixed-use, public), and description
  v) Total project site area
  vi) Total new impervious surface area, total replaced impervious surface area, total new pervious area, and calculation of Net Impervious Area
  vii) Statement of Water Quality Treatment Performance Requirements that apply to the Project
  viii) Summary of Site Design and Runoff Reduction (Performance Requirement No. 1) measures selected for the project
  ix) Description of all post-construction structural Stormwater Control Measures
  x) Supporting calculations used to comply with the applicable Water Quality Treatment Performance Requirements
  xi) Documentation certifying that the selection, sizing, and design of the Stormwater Control Measures meet the full or partial Water Quality Treatment Performance Requirement
  xii) Water quality treatment calculations used to comply with Water Quality Treatment Performance Requirement and any analysis to support infeasibility determination
  xiii) Statement of Compliance:
    (1) Statement that Water Quality Treatment Performance Requirement has been met on-site, or, if not achievable:
      (a) Documentation of the volume of runoff for which compliance cannot be achieved on-site and the associated off-site compliance requirements.
      (b) Statement of intent to comply with Water Quality Treatment Performance Requirement through Alternative Compliance

4) Performance Requirement No. 3: Runoff Retention
  a) The Permittee shall require Regulated Projects, except detached single-family homes, that create and/or replace $\geq$15,000 square feet of impervious surface (collectively over the entire project site), and detached single-family homes $\geq$ 15,000 square feet of Net Impervious Area, in WMZs 1, 2, 5, 6, 8 and 9, and those portions of WMZs 4, 7, and 10 that overlie designated Groundwater Basins (Attachment B) to meet the Runoff Retention Performance Requirements in Sections B.4.b. and B.4.c. using the LID Development Standards in Section B.4.d. for optimal management of watershed processes.

b) Adjustments to the Runoff Retention Performance Requirements for Redevelopment – Where the Regulated Project includes replaced impervious surface, the below adjustments apply. These adjustments are accounted for in the Retention Tributary Area calculation in Attachment D.
   i) Redevelopment Projects outside an approved Urban Sustainability Area, as described in Section C.3. – The total amount of replaced impervious surface shall be multiplied by 0.5 when calculating the volume of runoff subject to Runoff Retention Performance Requirements.
   ii) Redevelopment Projects located within an approved Urban Sustainability Area (Section C.3.) – The total amount of runoff volume to be retained from replaced impervious surfaces shall be equivalent to the pre-project runoff volume retained.

c) The Permittee shall require Regulated Projects, subject to the Runoff Retention Performance Requirements, to meet the following Performance Requirements:
   i) Watershed Management Zone 1 and portions of Watershed Management Zones 4, 7 and 10 which overlie designated Groundwater Basins:
      (1) Retain 95th Percentile Rainfall Event – Prevent offsite discharge from events up to the 95th percentile 24-hour rainfall event as determined from local rainfall data.[4]
      (2) Compliance must be achieved by optimizing infiltration. Compliance for retention of the remaining volume must be achieved via storage, rainwater harvesting and/or evapotranspiration.
   ii) Watershed Management Zone 2:
      (1) Retain 95th Percentile Rainfall Event – Prevent offsite discharge from events up to the 95th percentile 24-hour rainfall event as determined from local rainfall data.
      (2) Compliance must be achieved via storage, rainwater harvesting, infiltration, and/or evapotranspiration.
   iii) Watershed Management Zones 5 and 8:
      (1) Retain 85th Percentile Rainfall Event – Prevent offsite discharge from events up to the 85th percentile 24-hour rainfall event as determined from local rainfall data.
      (2) Compliance must be achieved by optimizing infiltration. Compliance for retention of the remaining volume must be achieved via storage, rainwater harvesting and/or evapotranspiration.
   iv) Watershed Management Zones 6 and 9:
      (1) Retain 85th Percentile Rainfall Event – Prevent offsite discharge from events up to the 85th percentile 24-hour rainfall event as determined from local rainfall data.
      (2) Compliance must be achieved via storage, rainwater harvesting, infiltration, and/or evapotranspiration.

d) LID Development Standards – The Permittee shall require Regulated Projects, subject to Runoff Retention Performance Requirements, to meet Runoff Retention Performance Requirements (Sections B.4.b. and B.4.c.) using the following LID Development Standards:
   i) Site Assessment Measures – Permittees shall require the applicant for each Regulated Project to identify opportunities and constraints to implement LID Stormwater Control Measures. Permittees shall require the applicant to document the following, as appropriate to the development site:

[4] Use either the methodology provided in Part I.D of the December 2009 Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects under Section 438 of the Energy Independence and Security Act, or, rainfall statistics provided by the Central Coast Water Board, whichever produces a more accurate value for rainfall depth.

- Site topography
- Hydrologic features including contiguous natural areas, wetlands, watercourses, seeps, or springs
- Depth to seasonal high groundwater
- Locations of groundwater wells used for drinking water
- Depth to an impervious layer such as bedrock
- Presence of unique geology (e.g., karst)
- Geotechnical hazards
- Documented soil and/or groundwater contamination
- Soil types and hydrologic soil groups
- Vegetative cover/trees
- Run-on characteristics (source and estimated runoff from offsite which discharges to the project area)
- Existing drainage infrastructure for the site and nearby areas including the location of municipal storm drains
- Structures including retaining walls
- Utilities
- Easements
- Covenants
- Zoning/Land Use
- Setbacks
- Open space requirements
- Other pertinent overlay(s)

ii) Site Design Measures – Permittees shall require the applicant for each Regulated Project to optimize the use of LID site design measures, as feasible and appropriate at the project site. Regulated Projects subject to Performance Requirement No. 3 must augment design strategies required by Performance Requirement No. 1 (Section B.2.a.i-v) with the following:

- Define the development envelope and protected areas, identifying areas that are most suitable for development and areas to be left undisturbed
- Conserve natural areas, including existing trees, other vegetation, and soils
- Limit the overall impervious footprint of the project
- Construct streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided that public safety or mobility uses are not compromised
- Set back development from creeks, wetlands, and riparian habitats
- Conform the site layout along natural landforms
- Avoid excessive grading and disturbance of vegetation and soils

iii) Delineation of discrete Drainage Management Areas (DMAs) – The Permittee shall require each Regulated Project to delineate DMAs to support a decentralized approach to stormwater management.

(1) The Permittee shall require the applicant for each Regulated Project to provide a map or diagram dividing the entire project site into discrete DMAs

(2) The Permittee shall require the applicant for each Regulated Project to account for the drainage from each DMA using measures identified in Sections B.4.d.iv. and B.4.d.v., below.

iv) Undisturbed and Natural Landscape Areas – Permittees shall require each Regulated Project to implement appropriate Site Design (Section B.4.d.ii.), and Runoff Reduction Measures in Performance Requirement No. 1, to reduce the amount of runoff for which retention and treatment is required. Runoff reduction

measures that can be used to account for this reduction also include the below measures. The Retention Tributary Area calculation in Attachment D accounts for these reductions.

(1) Undisturbed or areas planted with native, drought-tolerant, or LID appropriate vegetation that do not receive runoff from other areas may be considered self-treating and no additional stormwater management is required.

(2) Runoff from impervious surfaces, generated by the rainfall events identified in Section B.4.c, may be directed to undisturbed or natural landscaped areas. When the applicant can demonstrate that this runoff will be infiltrated and will not produce runoff to the storm drain system, or a surface receiving waterbody, or create nuisance ponding that may affect vegetation health or contribute to vector problems, then no additional stormwater management is required for these impervious surfaces.

v) Structural Stormwater Control Measures – Where Regulated Project Applicants have demonstrated in their Stormwater Control Plans, and the Permittee has confirmed, that use of Site Design measures listed in Section B.4.d.ii., Runoff Reduction measures listed in Performance Requirement No.1, and undisturbed and natural landscape areas discussed in Section B.4.d.iv., has been maximized to the extent feasible, Structural Stormwater Control Measures designed for water quality treatment and/or flow control shall be used to comply with Performance Requirement No. 3.

(1) The Permittee shall require the Regulated Project applicant to use structural Stormwater Control Measures that optimize retention and result in optimal protection and restoration of watershed processes, such as Structural Control Measures associated with small-scale, decentralized facilities designed to infiltrate, evapotranspirate, filter, or capture and use stormwater.

vi) Hydrologic Analysis and Structural Stormwater Control Measure Sizing – To determine Stormwater Control Measure sizing and design, Permittees shall require Regulated Project applicants to use one of the following: 1) hydrologic analysis and sizing methods as outlined in Attachment D; 2) locally/regionally calibrated continuous simulation model that results in equivalent optimization of on-site runoff volume retention; or 3) hydrologic analysis and sizing methods, equally effective in optimizing on-site retention of the runoff generated by the rainfall event specified in Section B.4.c, that have been approved by the Central Coast Water Board Executive Officer.

e) Ten Percent Adjustment for Sites with Technical Infeasibility – Where technical infeasibility, as described in Section C.1.c., prevents full on-site compliance with the Runoff Retention Performance Requirement, on-site retention of the full Retention Volume per Section B.4.d.vi. is not required and the Regulated Project is required to dedicate no less than ten percent of the Regulated Project's Equivalent Impervious Surface Area[5] to retention-based Stormwater Control Measures.

i) Use the Attachment E instructions to calculate the ten percent adjustment for applying the Runoff Retention Performance Requirement.

ii) The Water Quality Treatment Performance Requirement is not subject to this adjustment, i.e., mitigation to achieve full compliance with the Water Quality Treatment Performance Requirement is required on- or off-site.

f) Off-Site Mitigation – Off-site mitigation is required when Regulated Projects do not retain the full Retention Volume per Section B.4.b and B.4.c, and 1) fail to demonstrate technical infeasibility of full retention; or 2) demonstrate technical infeasibility of full

[5] Calculate Equivalent Impervious Surface Area using guidance in Attachment E

retention AND fail to dedicate at least ten percent of the Regulated Project's Equivalent Impervious Surface Area to retention-based Stormwater Control Measures.

i) Use the Attachment F instructions to calculate the Off-Site retention requirements when a Regulated Project subject to the Runoff Retention Performance Requirement does not allocate the full ten percent of the project site's Equivalent Impervious Surface Area to retention-based Stormwater Control Measures.

g) Reporting Requirements – For each Regulated Project subject to the Runoff Retention Performance Requirement, the Permittee shall require the Project Applicant to provide the below information in a Stormwater Control Plan. The Permittee shall not grant final project approval, until the Stormwater Control Plan for the Regulated Project sufficiently demonstrates the Regulated Project design meets the Water Quality Treatment and Runoff Retention Performance Requirements.

i) Project Name, application number, and location including address and assessor's parcel number
ii) Name of Applicant
iii) Project Phase number (if project is being constructed in phases)
iv) Project Type (e.g., commercial, industrial, multiunit residential, mixed-use, public), and description
v) Total project site area
vi) Total new and/or replaced impervious surface area
vii) Statement of Water Quality Treatment and Runoff Retention Performance Requirements that apply to the Project
viii) Adjusted Requirements based on the local jurisdiction's approval, that the Project is allowed a Special Circumstance, Watershed or Regional Plan, or Urban Sustainability Area designation
ix) Site assessment summary
x) LID Measures used:
   (1) Site design measures
   (2) Runoff Reduction Measures
   (3) Post-construction structural Stormwater Control Measures
xi) Summary of Runoff Reduction Measures and Structural Stormwater Control Measures, by Drainage Management Area, as well as for the entire site
xii) Supporting calculations used to comply with the applicable Water Quality Treatment and Runoff Retention Performance Requirements
xiii) Documentation demonstrating infeasibility where Site Design and Runoff Reduction measures cannot retain required runoff volume
xiv) Documentation demonstrating infeasibility where retention-based Stormwater Control Measures cannot retain and/or treat the required runoff volume
xv) Documentation demonstrating infeasibility where on-site compliance cannot be achieved
xvi) Documentation demonstrating percentage of the project's Equivalent Impervious Surface Area dedicated to retention-based Stormwater Control Measures
xvii) Documentation of certification that the selection, sizing, and design of the Stormwater Control Measures meets the applicable Water Quality Treatment and Runoff Retention Performance Requirement
xviii) O&M Plan for all structural Stormwater Control Measures to ensure long-term performance
xix) Owner of facilities
xx) Statement of Compliance:
   (1) Statement that the Water Quality Treatment and Runoff Retention Performance Requirements have been met on-site, or, if not achievable:

(a) Documentation of the volume of runoff for which compliance cannot be achieved on-site and the associated off-site compliance volume.
(b) Statement of intent to comply with Water Quality Treatment and Runoff Retention Performance Requirements through an Alternative Compliance agreement.

5) Performance Requirement No. 4: Peak Management
The Permittee shall require all Regulated Projects that create and/or replace ≥22,500 square feet of impervious surface (collectively over the entire project site) in Watershed Management Zones 1, 2, 3, 6, and 9 to manage peak stormwater runoff as required below (Section B.5.a.i.), and to meet Water Quality Treatment and Runoff Retention Performance Requirements.
a) The Permittee shall apply the following Peak Management Performance Requirements:
i) Post-development peak flows, discharged from the site, shall not exceed pre-project peak flows for the 2- through 10-year storm events.
b) Reporting Requirements – For each Regulated Project subject to the Peak Management Performance Requirement, the Permittee shall require the Project Applicant to provide the below information in a Stormwater Control Plan. The Permittee shall not grant final project approval, until the Stormwater Control Plan for the Regulated Project sufficiently demonstrates the Regulated Project design meets the Water Quality Treatment, Runoff Retention, and Peak Management Requirements.
i) Project Name, application number, and location including address and assessor's parcel number
ii) Name of Applicant
iii) Project Phase number (if project is being constructed in phases)
iv) Project Type (e.g., commercial, industrial, multiunit residential, mixed-use, public), and description
v) Total project site area
vi) Total new and/or replaced impervious surface area
vii) Statement of Water Quality Treatment, Runoff Retention, and Peak Management Performance Requirements that apply to the Project
viii) Adjusted Requirements based on the local jurisdiction's approval, that the Project is allowed a Special Circumstance, Watershed or Regional Plan, or Urban Sustainability Area designation
ix) Site assessment summary
x) LID Measures used:
(1) Site design measures
(2) Runoff Reduction Measures
(3) Post-construction structural Stormwater Control Measures
xi) Summary of Runoff Reduction Measures and Structural Stormwater Control Measures, by Drainage Management Area, as well as for the entire site
xii) Supporting calculations used to comply with the applicable Water Quality Treatment, Runoff Retention, and Peak Management Performance Requirements
xiii) Documentation demonstrating infeasibility where on-site compliance cannot be achieved
xiv) Documentation of certification that the selection, sizing, and design of the Stormwater Control Measures meets the applicable Water Quality Treatment, Runoff Retention, and Peak Management Performance Requirements
xv) O&M Plan for all structural SCMs to ensure long-term performance
xvi) Owner of facilities
xvii) Statement of Compliance:

(1) Statement that the Water Quality Treatment, Runoff Retention, and Peak Management Performance Requirements have been met on-site, or, if not achievable:
   (a) Documentation of the volume of runoff for which compliance cannot be achieved on-site and the associated off-site compliance requirements.
   (b) Statement of intent to comply with Water Quality Treatment, Runoff Retention, and Peak Management Performance Requirements through an Alternative Compliance agreement.

6) Performance Requirement No. 5: Special Circumstances

The Permittee may designate Regulated Projects as subject to Special Circumstances based on certain site and/or receiving water conditions. The Special Circumstances designation exempts a Regulated Project from Runoff Retention and/or Peak Management Performance Requirements where those Performance Requirements would be ineffective to maintain or restore beneficial uses of receiving waters. The Regulated Project subject to Special Circumstances must still comply with the Water Quality Treatment Performance Requirements.

a) Special Circumstances include:

i) Highly Altered Channel Special Circumstance:

The Permittee may designate Regulated Projects as subject to Special Circumstances for Highly Altered Channels for the following conditions:

(1) Project runoff discharges into stream channels that are concrete-lined or otherwise continuously armored from the discharge point to the channel's confluence with a lake, large river (>200-square mile drainage area).
(2) Project runoff discharges to a continuous underground storm drain system that discharges directly to a lake, large river (>200-square mile drainage area), the San Lorenzo River in the City of Santa Cruz, or marine nearshore waters
(3) Project runoff discharges to other areas identified by the Central Coast Water Board
(4) Under no circumstance described in 6.a.i. can runoff from the Regulated Project result in adverse impacts to downstream receiving waters

ii) Intermediate Flow Control Facility Special Circumstance:

(1) The Permittee may designate Regulated Projects as subject to Special Circumstances for Intermediate Flow Control Facilities if the project runoff discharges to an existing (as of the date when the Central Coast Water Board approved Resolution R3-2012-0025) flow control facility that regulates flow volumes and durations to levels that have been demonstrated to be protective of beneficial uses of the receiving water downstream of the facility.
(2) The flow control facility must have the capacity to accept the Regulated Project's runoff.
(3) Demonstration of facility capacity to accept runoff and to regulate flow volumes and durations must include quantitative analysis based on numeric, hydraulic modeling of facility performance.
(4) Under no circumstance described in Section B.6.a.ii. can runoff from the Regulated Project result in adverse impacts to downstream receiving waters.

iii) Historic Lake and Wetland Special Circumstance:

(1) The Permittee may designate Regulated Projects as subject to Special Circumstances for Historic Lakes and Wetlands for the following conditions:
   (a) Project is located where there was once a historic lake or wetland where pre-development hydrologic processes included filtration and storage but no significant infiltration to support downstream receiving water.

(b) The Special Circumstance has been established based on a delineation of the historic lake or wetland approved by the Central Coast Water Board Executive Officer

b) Performance Requirements for Highly Altered Channel and/or Intermediate Flow Control Facility Special Circumstances:
   i) For Regulated Projects that: 1) create and/or replace ≥22,500 square feet of impervious surface; 2) are located in WMZs 1, 2, 5, and 8, and those portions of WMZs 4, 7, and 10 that overlie a designated Groundwater Basin:
      (1) Water Quality Treatment (Performance Requirement No. 2)
      (2) Runoff Retention (Performance Requirement No. 3)
   ii) For Regulated Projects that: 1) create and/or replace ≥22,500 square feet of impervious surface; and 2) are located in WMZs 3, 6, and 9, and those portions of WMZs 4, 7, and 10 that do not overlie a designated Groundwater Basin:
      (1) Water Quality Treatment (Performance Requirement No. 2)

c) Performance Requirements for Historic Lake and Wetland Special Circumstances
   i) For Regulated Projects that create and/or replace ≥15,000 and < 22,500 square feet of impervious surface and meet the Historic Lake and Wetland Special Circumstance:
      (1) Water Quality Treatment (Performance Requirement No. 2)
      (2) Detention: Detain runoff such that the post-project peak discharge rate does not exceed the pre-project rate for all runoff up to the 95th percentile 24-hr rainfall event, or a more protective rate consistent with the Permittee's own development requirements
   ii) For Regulated Projects that create and/or replace ≥22,500 square feet of impervious surface and meet the Historic Lake and Wetland Special Circumstance:
      (1) Water Quality Treatment (Performance Requirement No. 2)
      (2) Peak Management: Detain runoff such that the post-project peak discharge rate does not exceed the pre-project rate for the 95th percentile 24-hr rainfall event and the 2- through 10-yr storm events or a more protective rate consistent with the Permittee's own development requirements.

d) Documentation and Approval of Special Circumstances – The Permittee shall provide reasonable documentation to justify that a Regulated Project is more appropriately categorized under the Special Circumstances category.
   i) Historic Lake and Wetland Special Circumstance – Prior to granting a Regulated Project Special Circumstances, the Permittee shall submit a proposal to the Central Coast Water Board Executive Officer for review and approval. The proposal shall include, at a minimum:
      (1) Delineation of historic lakes and wetlands and any supporting technical information to substantiate the requested Special Circumstances designation; and
      (2) Documentation that the proposal was completed by a registered professional engineer, geologist, architect, and/or landscape architect.

C. Alternative Compliance (Off-Site Compliance)

Alternative Compliance refers to Water Quality Treatment, Runoff Retention and Peak Management Performance Requirements that are achieved off-site through mechanisms such as developer fee-in-lieu arrangements and/or use of regional facilities. Alternative Compliance may be allowed under the following circumstances:

1) Technical Infeasibility

Off-site compliance with Water Quality Treatment, Runoff Retention, or Peak Management Performance Requirements may be allowed when technical infeasibility limits or prevents use of structural Stormwater Control Measures.

a) To pursue Alternative Compliance based on technical infeasibility, the Regulated Project applicant, for Regulated Projects outside of Urban Sustainability Areas, must submit a site-specific hydrologic and/or design analysis conducted and endorsed by a registered professional engineer, geologist, architect, and/or landscape architect, demonstrating that compliance with the applicable numeric Post-Construction Stormwater Management Requirements is technically infeasible

b) The Regulated Project applicant must submit a description of the project(s) that will provide off-site mitigation. The proposed off-site projects may be existing facilities and/or prospective projects that are as effective in maintaining watershed processes as implementation of the applicable Post-Construction Stormwater Requirements on-site. The description shall include:
   i) The location of the proposed off-site project(s) must be within the same watershed as the Regulated Project. Alternative Compliance project sites located outside the watershed may be approved by the Central Coast Water Board Executive Officer
   ii) A schedule for completion of offsite mitigation project(s), where the off-site mitigation project(s) has not been constructed.

c) Technical infeasibility may be caused by site conditions, including:
   i) Depth to seasonal high groundwater limits infiltration and/or prevents construction of subgrade stormwater control measures[6]
   ii) Depth to an impervious layer such as bedrock limits infiltration
   iii) Sites where soil types significantly limit infiltration
   iv) Sites where pollutant mobilization in the soil or groundwater is a documented concern
   v) Space constraints (e.g., infill projects, some redevelopment projects, high density development)
   vi) Geotechnical hazards
   vii) Stormwater Control Measures located within 100 feet of a groundwater well used for drinking water
   viii) Incompatibility with surrounding drainage system (e.g., project drains to an existing stormwater collection system whose elevation or location precludes connection to a properly functioning treatment or flow control facility)

2) Approved Watershed or Regional Plan

An approved Watershed or Regional Plan as described below (Section C.2.a.), may be used to justify Alternative Compliance for a Regulated Project's numeric Runoff Retention and Peak Management Performance Requirements without demonstrating technical infeasibility.

a) The Permittee must submit the proposed Watershed or Regional Plan to the Central Coast Water Board Executive Officer for approval. Watershed and Regional Plans must take into consideration the long-term cumulative impacts of urbanization including existing and future development and include, at minimum:

[6] According to the CASQA Frequently Asked Questions about LID, "some MS4 permits and BMP guidance manuals require anywhere from 3-10 feet of separation from the groundwater level for infiltration practices. This distance depends on the soil type, pollutants of concern, and groundwater use. In some cases, however, where there may be groundwater or soil contamination, LID infiltrative practices may be restricted completely. (p. 7 in https://www.casqa.org/Portals/0/LID/CA_LID_FAQ_06-28-2011.pdf)

i) A description of the project(s) that will provide off-site mitigation. The proposed off-site projects may be existing facilities and/or prospective projects.
ii) The location of the proposed off-site project(s), which must be within the same watershed as the Regulated Project. Alternative Compliance project sites located outside the watershed may be approved by the Central Coast Water Board Executive Officer.
iii) Demonstration that implementation of projects per the Watershed or Regional Plan will be as effective in maintaining watershed processes as implementation of the applicable Post-Construction Stormwater Requirements on-site. The proposal must include quantitative analysis (e.g., calculations and modeling) used to evaluate off-site compliance.
iv) A schedule for completion of offsite mitigation project(s), where the off-site mitigation project(s) has not been constructed.

b) The Permittee may use projects identified per the Watershed or Regional Plan to meet Water Quality Treatment Performance Requirements off-site only when:
i) The Regulated Project applicant has demonstrated that on-site water quality treatment is infeasible as described in Sections C.1.a and C.1.c., and
ii) The proposed off-site project(s) has been demonstrated to comply with the Water Quality Treatment Performance Requirements for the Regulated Project.

c) The Central Coast Water Board Executive Officer will deem complete a Permittee's Watershed or Regional Plan proposal within 60 days of receiving a complete proposal. The Central Coast Water Board Executive Officer will approve or deny the proposal within 120 days of a proposal being deemed complete.

3) Approved Urban Sustainability Area
The Permittee may allow Regulated Projects located within an approved Urban Sustainability Area to pursue Alternative Compliance for numeric Runoff Retention and Peak Management Performance Requirements without demonstrating technical infeasibility.

a) The Urban Sustainability Area shall encompass high density urban centers (but not limited to incorporated jurisdictional areas) where the Permittee's documented objective is to preserve or enhance an existing pedestrian-oriented and/or public transit-oriented type of urban design through the promotion of high density redevelopment and infill. The Permittee must submit a proposal to the Central Coast Water Board Executive Officer for approval of an Urban Sustainability Area. The USA proposal must include, at minimum:
i) A definition and delineation of the USA for high-density infill and redevelopment for which area-wide approval for Alternative Compliance is sought.
ii) Information and analysis that supports the Permittee's intention to balance water quality protection with the needs for adequate housing, population growth, public transportation, land recycling, and urban revitalization.
iii) Demonstration that implementation of Alternative Compliance for Regulated Projects in the USA will meet or exceed the on-site requirements for Runoff Retention and Peak Management. The proposal must include quantitative analysis (e.g., calculations and modeling) used to evaluate off-site compliance. Identification of specific off-site projects is not necessary for approval of the USA designation.

b) The Permittee may allow Regulated Projects in a USA to meet Water Quality Treatment Performance Requirements off-site only when:
i) The Regulated Project applicant has demonstrated that on-site water quality treatment is infeasible as described in Sections C.1.a. and C.1.c., and
ii) The proposed off-site project(s) have been demonstrated to comply with the Water Quality Treatment Performance Requirements.

c) The Central Coast Water Board Executive Officer will deem complete a Permittee's USA proposal within 60 days of receiving a complete proposal. The Central Coast Water Board Executive Officer will approve or deny the proposal within 120 days of a proposal being deemed complete.

4) Other situations as approved by the Central Coast Water Board Executive Officer
5) Location of Alternative Compliance Project(s) – The location of the proposed off-site project(s) must be within the same watershed as the Regulated Project. Alternative Compliance project sites located outside the watershed may be approved by the Central Coast Water Board Executive Officer.
6) Timing and Funding Requirements for Alternative Compliance Projects – The Permittee shall develop a schedule for the completion of off-site mitigation projects, including milestone dates to identify funding, design, and construction of the off-site projects.
   a) Complete the project(s) as soon as practicable and no longer than four years from the date of the certificate of occupancy for the project for which off-site mitigation is required, unless a longer period is otherwise authorized by the Central Coast Water Board Executive Officer.
   b) The timeline for completion of the off-site mitigation project may be extended, up to five years with prior Central Coast Water Board Executive Officer approval. Central Coast Water Board Executive Officer approval will be granted contingent upon a demonstration of good faith efforts to implement an Alternative Compliance project, such as having funds encumbered and applying for the appropriate regulatory permits.
   c) Require sufficient funding be transferred to the Permittee for public off-site mitigation projects. Require private off-site mitigation projects to transfer sufficient funding to a Permittee controlled escrow account, or provide the Permittee with appropriate project bonding within one year of the initiation of construction of the Regulated Project.
   d) The Permittee may establish different timelines and requirements that are more restrictive than those outlined above.

D. Field Verifications of Post-Construction Stormwater Control Measures

1) The Permittee shall establish and implement a mechanism (a checklist or other tools) to verify[7] that structural Water Quality Treatment, Runoff Retention, and/or Peak Management controls are designed and constructed in accordance with these Post-Construction Stormwater Management Requirements
2) Prior to occupancy of each Regulated Project, the Permittee shall field verify that the Site Design, Water Quality Treatment, Runoff Retention, and/or Peak Management controls have been implemented in accordance with these Post-Construction Requirements
   a) The Permittee may accept third-party verification of SCMs conducted and endorsed by a registered professional engineer, geologist, architect, and/or landscape architect
   b) The Permittee shall ensure, through conditions of approval or other legally enforceable agreements or mechanisms, that site access is granted to all representatives of the Permittee for the sole purpose of performing operation and maintenance (O&M) inspections of the installed Stormwater Control Measures

[7] A series of checklists that can be used by both inspectors and maintenance personnel is available in the City of Santa Barbara Storm Water BMP Guidance Manual, Appendix H: Facility Inspection and Maintenance Checklists. GeoSyntec Consultants, July 2008. http://www.santabarbaraca.gov/Resident/Community/Creeks/Low_Impact_Development.htm

E. Operation and Maintenance for Structural SCMs

The Permittee shall require O&M Plans and Maintenance Agreements that clearly establish responsibility for all structural Water Quality Treatment, Runoff Retention, and/or Peak Management controls on private and public Regulated Projects. The Permittee shall also maintain a structural SCM tracking database to support long-term performance of structural SCMs.

1) O&M Plan
   The Regulated Project applicant shall develop and implement a written O&M Plan that, at a minimum, includes each component listed below. The Permittee may allow the Regulated Project applicant to include the O&M Plan components in the Stormwater Control Plan in place of developing a separate document. The Permittee shall approve the O&M Plan prior to final approval/occupancy. The O&M Plan must include, at minimum:
   a) A site map identifying all structural Stormwater Control Measures requiring O&M practices to function as designed
   b) O&M procedures for each structural stormwater control measure including, but not limited to, LID facilities, retention/detention basins, and proprietorship devices.
   c) The O&M Plan will include short-and long-term maintenance requirements, recommended frequency of maintenance, and estimated cost for maintenance.
2) Maintenance Agreement and Transfer of Responsibility for SCMs
   Prior to issuing approval for final occupancy each Permittee shall require that Regulated Projects subject to these Post-Construction Requirements provide verification of ongoing maintenance provisions for Structural Stormwater Control Measures, including but not limited to legal agreements, covenants, CEQA mitigation requirements, and or conditional use permits. Verification shall include, at a minimum:
   a) The project owner's signed statement accepting responsibility for the O&M of the installed onsite and/or offsite structural treatment and flow control SCMs until such responsibility is legally transferred to another entity; and either
      i) A signed statement from the public entity assuming responsibility for structural treatment and flow control SCM maintenance and stating that the SCM meets all local agency design standards; or
      ii) Written conditions in the sales or lease agreements or deed for the project that require the buyer or lessee to assume responsibility for the O&M of the onsite and/or offsite structural treatment and flow control SCM until such responsibility is legally transferred to another entity; or
      iii) Written text in project deeds, or conditions, covenants and restrictions for multi-unit residential projects that require the homeowners association or, if there is no association, each individual owner to assume responsibility for the O&M of the onsite and/or offsite structural treatment and flow control SCM until such responsibility is legally transferred to another entity; or
      iv) Any other legally enforceable agreement or mechanism, such as recordation in the property deed, that assigns responsibility for the O&M of the onsite and/or offsite structural treatment and flow control SCM to the project owner(s) or the Permittee
3) Structural Stormwater Control Measure O&M Database
   The Permittee shall develop a database with information regarding each structural Stormwater Control Measure installed per these Post-Construction Stormwater Management Requirements. The Database shall contain, at a minimum, fields for:
   a) SCM identification number and location/address
   b) Type of SCM
   c) Completion date of the following project stages, where applicable:
      i) Construction
      ii) Field verification of SCM

iii) Final Project approval/occupancy
iv) O&M plan approval by Permittee

d) Location (physical and/or electronic) where the O&M Plan is available to view
e) Party responsible for O&M
f) Source of funding for O&M
g) Verification that responsible party has maintained the SCM as outlined in the O&M Plan, or, indication that a self-inspection program is in place to verify that the SCM continues to function as designed and to repair and/or replace the SCM if it is not functioning as designed
h) Any problems identified during inspections including any vector or nuisance problems.

F. Permittee Reporting Requirements

1) The Permittee shall submit a sample checklist and the number of permits regulated under the Site Design and Runoff Reduction Requirement (No. 1) as part of Stormwater Program Annual Reporting. This information must demonstrate the Site Design and Runoff Reduction Performance Requirement (No. 1) is applied to all applicable projects.
2) The Permittee shall report the following for all Regulated Projects subject to numeric Performance Requirements (Nos. 2, 3, 4, and 5) in Stormwater Program Annual Reporting:
   a) The total number of completed Regulated Projects
   b) The total number of Regulated Projects within each of the following categories of new and/or replaced impervious surface:
      i) $\geq$ 5,000 and <15,000 (based on Net Impervious Area)
      ii) $\geq$ 15,000 and < 22,500
      iii) $\geq$ 22,500
   c) A list of which projects were granted each of the following :
      i) Special Circumstances – Highly Altered Channel
      ii) Special Circumstances – Intermediate Flow Control Facility
      iii) Special Circumstances – Historic Lake or Wetland
      iv) Alternative Compliance – Technical Infeasibility
         (1) Performance Requirement No. 2: Water Quality Treatment
         (2) Performance Requirement No. 3: Runoff Retention
         (3) Performance Requirement No. 4: Peak Management
      v) Alternative Compliance – Watershed or Regional Plan
      vi) Alternative Compliance – Urban Sustainability Area
      vii) Other Technical Infeasibility
         (1) Technical infeasibility to retain the required runoff volume (per Performance Requirement No. 3: Runoff Retention) using Site Design and Runoff Reduction measures
         (2) Technical infeasibility to retain and/or treat the required runoff volume (per Performance Requirement No. 3: Runoff Retention) using retention-based Stormwater Control Measures
   d) Confirmation by the Permittee that for all Permittee-approved technical infeasibility determinations, the Regulated Project's Stormwater Control Plan adequately demonstrated the basis for the technical infeasibility
   e) A list of mitigation projects constructed for Alternative Compliance and the following project information:
      i) A summary description of mitigation projects constructed during the reporting period comparing the expected aggregate results of Alternative Compliance projects to the results that would otherwise have been achieved by meeting the numeric Performance Requirements on-site

ii) For public offsite mitigation projects, a summation of total offsite mitigation funds raised to date and a description (including location, general design concept, volume of water expected to be retained, and total estimated budget) of all pending public offsite mitigation projects

f) Number of Regulated Projects where Field Verification of Post-Construction Stormwater Management Measures was required and was NOT completed

g) Number of Regulated Projects where the required O&M Plan was NOT submitted/completed

h) Number of Regulated Projects where Ownership and Responsibility of structural Stormwater Control Measures was not completed

i) Structural Stormwater Control Measure O&M Database, including elements identified in Section E.3. Tabular spreadsheet data are acceptable.

i) The Permittee shall provide Central Coast Water Board staff electronic access to the database.

G. Pre-existing Programs

a) A Permittee may propose, for Central Coast Water Board Executive Officer approval, implementation of pre-existing post-construction stormwater management requirements for development projects in the Permittee's jurisdictional coverage area, in place of implementing the requirements set forth in the Post-Construction Requirements. To be eligible for consideration and approval, the proposal must demonstrate the following:

i) The Permittee's pre-existing post-construction stormwater management requirements are as effective as the Post-Construction Requirements in maintaining watershed processes, impacted by stormwater management, that are necessary to protect water quality and beneficial uses;

ii) The Permittee was implementing its pre-existing post-construction stormwater management requirements prior to Central Coast Water Board approval of the Post-Construction Requirements; and

iii) The Permittee's pre-existing post-construction stormwater management requirements include LID site design and runoff reduction measures, numeric runoff treatment controls, numeric runoff retention controls, numeric runoff peak management controls, and project applicability thresholds as effective as those included in the Post-Construction Requirements.

b) A Permittee must submit its proposal within 30 days of adoption of the Post-Construction Requirements by the Central Coast Water Board. The Central Coast Water Board Executive Officer will approve or deny the proposal within 90 days of receipt of a proposal.

c) If the Central Coast Water Board Executive Officer denies a Permittee's proposal, the Permittee shall adhere to the Post-Construction Requirements provisions and deadlines.

ATTACHMENT A: Watershed Management Zones

Available electronically at:
http://www.waterboards.ca.gov/centralcoast/water_issues/programs/stormwater/docs/lid/lid_hydromod_charette_index.shtml

ATTACHMENT B: Designated Groundwater Basins

Groundwater basin areas are defined by the California Department of Water Resources (CDWR)[8] and used in the Central Coast Water Board Joint Effort for Hydromodification Control to identify groundwater receiving-water issues and areas where recharge is a key watershed process. CDWR based identification of the groundwater basins on the presence and areal extent of unconsolidated alluvial soils identified on a 1:250,000 scale from geologic maps provided by the California Department of Conservation, Division of Mines and Geology. CDWR then further evaluated identified groundwater basin areas through review of relevant geologic and hydrogeologic reports, well completion reports, court-determined adjudicated basin boundaries, and contact with local agencies to refine the basin boundaries.

Designated Groundwater Basins include those identified in the CDWR Groundwater Basins Map. Numbers correspond to Groundwater Basins in Table 1.

[8] California Department of Water Resources. 2004. Groundwater basin map. <http://www.water.ca.gov/groundwater/bulletin118/gwbasin_maps_descriptions.cfm>. Accessed September 15, 2006.

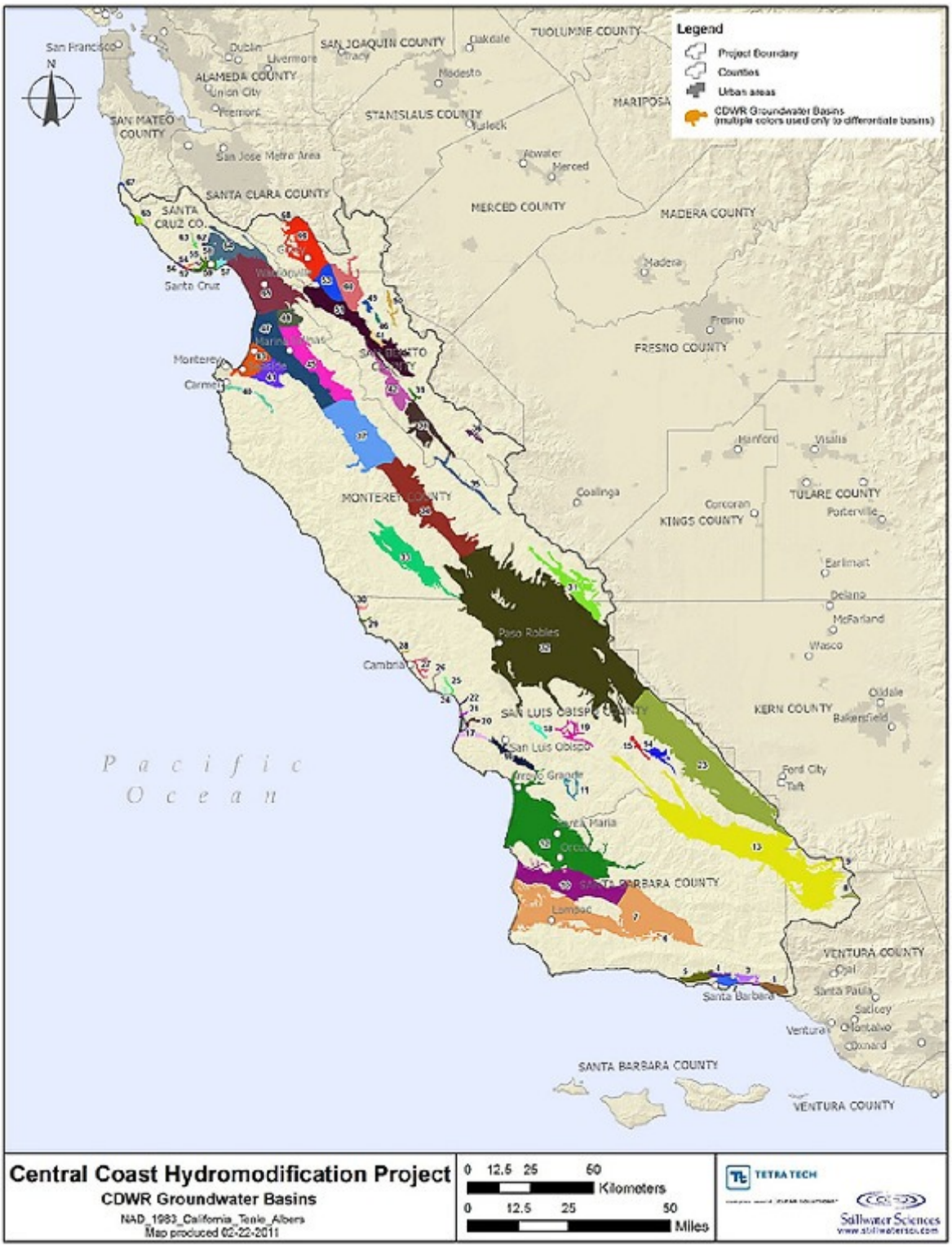
Legend
Project Boundary
Counties
Urban areas
CDWR Groundwater Basins
(multiple colors used only to differentiate basins)
San Francisco
N
SAN JOAQUIN COUNTY
TUOLUMNE COUNTY
ALAMEDA COUNTY
STANISLAUS COUNTY
MARIPOSA
SAN MATEO COUNTY
SANTA CLARA COUNTY
MERCED COUNTY
MADERA COUNTY
SANTA CRUZ CO.
FRESNO COUNTY
MONTEREY COUNTY
KINGS COUNTY
TULARE COUNTY
SAN LUIS OBISPO COUNTY
KERN COUNTY
SANTA BARBARA COUNTY
VENTURA COUNTY
Pacific Ocean
Central Coast Hydromodification Project
CDWR Groundwater Basins
NAD_1983_California_Teale_Albers
Map produced 02-22-2011
0 12.5 25 50
Kilometers
0 12.5 25 50
Miles
TETRA TECH
Stillwater Sciences
www.stillwatersci.com

Table 1: Groundwater Basins in the Central Coast Region by GIS Basin Number (See Map)

GIS BASIN NUMBER	GROUNDWATER BASIN NAME	GIS BASIN NUMBER	GROUNDWATER BASIN NAME
1	Carpinteria	35	Peach Tree valley
2	Santa Barbara	36	Hernandez valley
3	Montecito	37	Salinas valley
4	Foothill	38	Bitter Water valley
5	Goleta	39	Dry Lake valley
6	Santa Ynez River valley	40	Carmel valley
7	Santa Ynez River valley	41	Salinas valley
8	Lockwood valley	42	San Benito river valley
9	Mil Potrero area	43	Salinas valley
10	San Antonio Creek valley	44	Tres Pinos valley
11	Huasna valley	45	Salinas valley
12	Santa Maria	46	Upper Santa Ana valley
13	Cuyama valley	47	Salinas valley
14	Big Spring area	48	Salinas valley
15	Rafael valley	49	Santa Ana valley
16	San Luis Obispo valley	50	Quien Sabe valley
17	Los Osos valley	51	Gilroy-Hollister valley
18	Rinconada valley	52	Needle Rock point
19	Pozo valley	53	Gilroy-Hollister valley
20	Chorro valley	54	West Santa Cruz terrace
21	Morro valley	55	West Santa Cruz terrace
22	Toro valley	56	Majors creek
23	Carrizo Plain	57	Soquel valley
24	Cayucos valley	58	West Santa Cruz terrace
25	Old valley	59	West Santa Cruz terrace
26	Villa valley	60	Gilroy-Hollister valley
27	Santa Rosa valley	61	Pajaro valley
28	San Simeon valley	62	Scotts valley
29	Arroyo de la Cruz valley	63	Felton area
30	San Carpoforo valley	64	Santa Cruz Purisima formation
31	Cholame valley	65	Ano Nuevo area
32	Salinas valley	66	Gilroy-Hollister valley
33	Lockwood valley	67	Pescadero valley
34	Salinas valley	68	Santa Clara valley

ATTACHMENT C: Definitions Related to Post-Construction Requirements

Bioretention – A Stormwater Control Measure designed to retain stormwater runoff using vegetated depressions and soils engineered to collect, store, treat, and infiltrate runoff. Bioretention designs do not include underdrains.

Biotreatment or Biofiltration Treatment –A Stormwater Control Measure designed to detain stormwater runoff, filter stormwater through soil media and plant roots, and release the treated stormwater runoff to the storm drain system. Biotreatment systems include an underdrain.

Discretionary Approval – A project approval which requires the exercise of judgment or deliberation when the MS4 decides to approve or disapprove a particular activity, as distinguished from situations where the MS4 merely has to determine whether there has been conformity with applicable statutes, ordinances, or regulations.

Dispersion – The practice of routing stormwater runoff from impervious areas, such as rooftops, walkways, and patios, onto the surface of adjacent pervious areas. Stormwater runoff is dispersed via splash block, dispersion trench, or sheet flow and soaks into the ground as it moves slowly across the surface of the pervious area.

Drainage Management Area (DMAs) – Following the low impact development principle of managing stormwater through small-scale, decentralized measures, DMAs are designated individual drainage areas within a Regulated Project that typically follow grade breaks and roof ridge lines and account for each surface type (e.g., landscaping, pervious paving, or roofs). Stormwater Control Measures for runoff reduction and structural facilities are designed for each DMA.

Equivalent Impervious Surface Area – is equal to *Impervious Tributary Surface Area* (ft^2) + *Pervious Tributary Surface Area* (ft^2), where *Impervious Tributary Surface Area* is defined as the sum of all of the site's conventional impervious surfaces, and *Pervious Tributary Surface Area* is defined as the sum of all of the site's pervious surfaces, corrected by a factor equal to the surface's runoff coefficient (see Attachment E for how to calculate).

Evapotranspiration (ET) – The loss of water to the atmosphere by the combined processes of evaporation (from soil and plant surfaces) and transpiration (from plant tissues).

Flow-Through Water Quality Treatment Systems – Stormwater Control Measures that are designed to treat stormwater through filtration and/or settling. Flow-through systems do not provide significant retention or detention benefits for stormwater volume control.

Groundwater Basins – Groundwater basin areas defined by the California Department of Water Resources (DWR) and used in the Central Coast Water Board Joint Effort for Hydromodification Control to identify groundwater receiving-water issues and areas where recharge is a key watershed process. DWR based identification of the groundwater basins on the presence and areal extent of unconsolidated alluvial soils identified on a 1:250,000 scale from geologic maps provided by the California Department of Conservation, Division of Mines and Geology. DWR then further evaluated identified groundwater basin areas through review of relevant geologic and hydrogeologic reports, well completion reports, court-determined adjudicated basin boundaries, and contact with local agencies to refine the basin boundaries.

Impervious Surface – A hard, non-vegetated surface area that prevents or significantly limits the entry of water into the soil mantle, as would occur under natural conditions prior to development. Common impervious surfaces include, but are not limited to, roof tops, walkways, patios, driveways, parking lots or storage areas, concrete or asphalt paving, oiled, macadam or other surfaces which similarly impede the natural infiltration of stormwater. Open, uncovered retention/detention facilities shall not be considered as impervious surfaces for purposes of determining whether the thresholds for application of Performance Requirements are exceeded. However, for modeling purposes, open, uncovered facilities that retain/detain water (e.g., retention ponds, pools) shall be considered impervious surfaces.

Land recycling – The reuse of abandoned, vacant, or underused properties for redevelopment or repurposing

Landscaped Areas – Areas of soil and vegetation not including any impervious surfaces of ancillary features such as impervious patios, BBQ areas, and pools.

Large River – A river draining 200 square miles or more.

Low Impact Development (LID) – A stormwater and land use management strategy that strives to mimic pre-disturbance hydrologic processes of infiltration, filtration, storage, evaporation, and transpiration by emphasizing conservation, use of on-site natural features, site planning, and distributed stormwater management practices that are integrated into a project design.

Ministerial Approval – A project approval which involves little or no personal judgment by the MS4 as to the wisdom or manner of carrying out the project and only involves the use of fixed standards or objective measurements.

Native Vegetation – Vegetation comprised of plant species indigenous to the Central Coast Region and which reasonably could have been expected to naturally occur on the site.

Net Impervious Area – The sum of new and replaced post-project impervious areas, minus any reduction in total imperviousness from the pre-project to post-project condition: *Net Impervious Area = (New and Replaced Impervious Area) – (Reduced Impervious Area Credit),* where *Reduced Impervious Area Credit* is the total pre-project to post-project reduction in impervious area, if any.

New Development – Land disturbing activities that include the construction or installation of buildings, roads, driveways and other impervious surfaces. Development projects with pre-existing impervious surfaces are not considered New Development.

Percentile Rainfall Event (e.g., 85th and 95th) – A percentile rainfall event represents a rainfall amount which a certain percent of all rainfall events for the period of record do not exceed. For example, the 95th percentile rainfall event is defined as the measured rainfall depth accumulated over a 24-hour period, for the period of record, which ranks as the 95th percentile rainfall depth based on the range of all daily event occurrences during this period.

Permeable or Pervious Surface – A surface that allows varying amounts of stormwater to infiltrate into the ground. Examples include pasture, native vegetation areas, landscape areas, and permeable pavements designed to infiltrate.

Pre-Project – Stormwater runoff conditions that exist onsite immediately before development activities occur. This definition is not intended to be interpreted as that period before any human-induced land activities occurred. This definition pertains to redevelopment as well as initial development.

Project Site – The area defined by the legal boundaries of a parcel or parcels of land within which the new development or redevelopment takes place and is subject to these Post-Construction Stormwater Management Requirements.

Rainwater Harvest – Capture and storage of rainwater or stormwater runoff for later use, such as irrigation (without runoff), domestic use (e.g. toilets), or storage for fire suppression.

Receiving Waters – Bodies of water, surface water systems or groundwater that receive surface water runoff through a point source, sheet flow or infiltration.

Redevelopment – On a site that has already been developed, construction or installation of a building or other structure subject to the Permittee's planning and building authority including: 1) the creation or addition of impervious surfaces; 2) the expansion of a building footprint or addition or replacement of a structure; or 3) structural development including construction, installation or expansion of a building or other structure. It does not include routine road maintenance, nor does it include emergency construction activities required to immediately protect public health and safety.

Replaced Impervious Surface – The removal of existing impervious surfaces down to bare soil or base course, and replacement with new impervious surface. Replacement of impervious surfaces that are part of routine road maintenance activities are not considered replaced impervious surfaces.

Retention Tributary Area – The entire project area except for undisturbed areas, planted areas with native, drought-tolerant, or LID appropriate vegetation that do not receive runoff from other areas, and impervious surface areas that discharge to infiltrating areas that will not produce runoff or create nuisance ponding. The Drainage Management Areas are smaller Retention Tributary Areas that cumulatively make up the Retention Tributary Area for the entire site.

Routine Road Maintenance – includes pothole and square cut patching; overlaying existing asphalt or concrete pavement with asphalt or concrete without expanding the area of coverage; shoulder grading; reshaping/regrading drainage systems; crack sealing; resurfacing with in-kind material without expanding the road prism or altering the original line and grade and/or hydraulic capacity of the road.

Self-Retaining Areas – (also called "zero discharge" areas), are designed to retain some amount of rainfall (by ponding and infiltration and/or evapotranspiration) without producing stormwater runoff. Self-Retaining Areas may include graded depressions with landscaping or pervious pavement.

Self-Treating Areas – are a portion of a Regulated Project in which infiltration, evapotranspiration and other natural processes remove pollutants from stormwater. The self-treating areas may include conserved natural open areas and areas planted with native, drought-tolerant, or LID appropriate vegetation. The self-treating area only treats the rain falling on itself and does not receive stormwater runoff from other areas.

Single-Family Residence – The building of one single new house or the addition and/or replacement of impervious surface associated with one single existing house, which is not part of a larger plan of development.

Stormwater Control Measures – Stormwater management measures integrated into project designs that emphasize protection of watershed processes through replication of pre-development runoff patterns (rate, volume, duration). Physical control measures include, but are not limited to, bioretention/rain gardens, permeable pavements, roof downspout controls, dispersion, soil quality and depth, minimal excavation foundations, vegetated roofs, and water use. Design control measures include but are not limited to conserving and protecting the function of existing natural areas, maintaining or creating riparian buffers, using onsite natural drainage features, directing runoff from impervious surfaces toward pervious areas, and distributing physical control measures to maximize infiltration, filtration, storage, evaporation, and transpiration of stormwater before it becomes runoff.

Stormwater Control Plan – A plan, developed by the Regulated Project applicant, detailing how the project will achieve the applicable Post-Construction Stormwater Management Requirements (for both onsite and offsite systems).

ATTACHMENT D: Hydrologic Analysis and Stormwater Control Measure Sizing Guidance

Project site conditions will influence the ability to comply with the Water Quality Treatment and Runoff Retention Performance Requirements. This Appendix provides the acceptable Stormwater Control Measure (SCM) sizing methodology to evaluate runoff characteristics. This guidance provides a simple event-based approach and a runoff routing approach. Both of these approaches are based on sizing for a single-event and avoid the necessity of using calibrated, continuous simulation modeling. The Permittee can allow project applicants to use a locally/regionally calibrated continuous simulation-based model to improve hydrologic analysis and SCM sizing.

1) Determination of Retention Tributary Area

Determining the Retention Tributary Area is the basis for calculating the runoff volumes subject to Performance Requirement Number 3. Retention Tributary Area should be calculated for each individual Drainage Management Area to facilitate the design of SCMs for each Drainage Management Area. The generic equation below illustrates how various portions of the site are addressed when determining the Retention Tributary Area. The Retention Tributary Area calculation must also account for the adjustments for Redevelopment Projects subject to Performance Requirement No. 3.

a) Compute the Retention Tributary Area, using the equation:

Retention Tributary Area = (Entire Project Area) – (Undisturbed or Planted Areas) – (Impervious Surface Areas that Discharge to Infiltrating Areas)***

*As defined in Section B.4.d.iv.1.
** As defined in Section B.4.d.iv.2.

b) Adjustments for Redevelopment Project Retention Tributary Area – Where the Regulated Project includes replaced impervious surface, the following Retention Tributary Area adjustments apply:

i) Redevelopment Projects outside an approved Urban Sustainability Area, as described in Section C.3. – The total amount of replaced impervious surface area shall be multiplied by 0.5 when calculating the Retention Tributary Area.
ii) Redevelopment Projects located within an approved Urban Sustainability Area (Section C.3) – The replaced impervious surface areas may be subtracted from the Retention Tributary Area. The total amount of runoff volume to be retained from replaced impervious surfaces shall be equivalent to the pre-project runoff volume retained.

2) Determination of Retention Volume

a) Based on the Regulated Project's Watershed Management Zone, determine the Regulated Project's Runoff Retention Requirement (e.g., Retain 95th Percentile 24-hour Rainfall Event, or, Retain 85th Percentile 24-hour Rainfall Event).

b) Determine the 85th or 95th percentile 24-hour rainfall event:
Use either the methodology provided in Part I.D of the December 2009 Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects

under Section 438 of the Energy Independence and Security Act,[9] or, rainfall statistics provided by the Central Coast Water Board, whichever produces a more accurate value for rainfall depth.

c) Compute the Runoff Coefficient[10] "C" for the area tributary to the SCMs, using the equation:

$C = 0.858i^3 - 0.78i^2 + 0.774i + 0.04$
Where "i" is the fraction of the tributary area that is impervious[11]

d) Compute Retention Volume:

Retention Volume for 95th Percentile 24-hr Rainfall Depth = C x Rainfall Depth$_{95th}$ x Retention Tributary Area

or,

Retention Volume for 85th Percentile 24-hr Rainfall Depth = C x Rainfall Depth$_{85th}$ x Retention Tributary Area

All rainfall directly incident to each SCM must be considered in determining runoff, including: tributary landscaping, impervious areas, pervious pavements, and bioretention features.

Note: For redevelopment projects located within an approved Urban Sustainability Area (Section C.3.), the total amount of runoff volume to be retained from replaced impervious surfaces shall be equivalent to the pre-project runoff volume retained.

3) Structural Stormwater Control Measure Sizing

The Permittee shall require the Regulated Project applicant to use structural SCMs that optimize retention and result in optimal protection and restoration of watershed processes, such as Structural Control Measures associated with small-scale, decentralized facilities designed to infiltrate, evapotranspirate, filter, or capture and use stormwater, to address the volumes calculated in 2 (above). Where the Regulated Project is within a Watershed Management Zone where infiltration is required, Permittees must use SCM designs that optimize infiltration of the entire Retention Volume to minimize the potential need for off-site mitigation. Various resources provide design guidance for fully infiltrative SCMs including:

- The Contra Costa C.3 Manual
- The City of Santa Barbara LID BMP Manual
- The City of San Diego LID Design Manual, July 2011
- Central Coast LID Initiative Bioretention Design Guidance

a) Calculate SCM Capture Volume – Calculate the required SCM Capture Volume, associated with the Regulated Project's Runoff Retention Requirement, by one of the following methods:

Method 1: Simple Method

[9] USEPA, 841-B-09-00. http://www.epa.gov/owow/NPS/lid/section438/pdf/final_sec438_eisa.pdf

[10] As set forth in WEF Manual of Practice No. 23/ASCE Manual of Practice No. 87, (1998), pages 175-178 and based on the translation of rainfall to runoff using a runoff regression equation developed using two years of data from more than 60 urban watersheds nationwide.

[11] As defined in Post-Construction Requirements Attachment C.

SCM Capture Volume = Retention Volume for 95th Percentile 24-hr Rainfall Depth

or,

SCM Capture Volume = Retention Volume for 85th Percentile 24-hr Rainfall Depth

Method 2: Routing Method
Use a hydrograph analysis[12] to determine the SCM Capture Volume needed to retain the Retention Volume for 95th or 85th Percentile 24-hr Rainfall Depth calculated in 2 (above). The SCM Capture Volume shall be based on both the rate of flow from tributary areas into the SCM, and the rate of flow out of the SCM through infiltration into the underlying soil during the rain event. When conducting the hydrograph analysis, adhere to the criteria included in Table 1. The SCM shall be designed such that a single 95th or 85th Percentile 24-hr Rainfall Event will not overflow the SCM.

If the Retention Volume cannot infiltrate within 48-hours, a multiplier of 1.20 shall be applied to the SCM Capture Volume calculated through the routing method.

TABLE 1: Routing Method Criteria

Parameter	Criteria
Hydrograph Analysis Method	National Resources Conservation Service or Santa Barbara Urban Hydrograph
Pond Routing Method	Storage-indication, unless otherwise justified to be more correct based on site and storage conditions.
Infiltration Rate	Underlying soil saturated infiltration rate, as indicated by locally accepted data approved by the Permittee and/or by on-site testing, whichever is more accurate.
Rainfall Distribution	National Resources Conservation Service Type I[13] or based on local rainfall data
Time of Concentration	Permittee's current drainage and flood control standard
Time Increment	0.10 hour, unless otherwise justified to be more correct based on rainfall distribution

b) Demonstration of Compliance – Permittees shall require Regulated Projects to demonstrate that site SCMs: a) will infiltrate and/or evapotranspirate the Retention Volume or, b) will provide sufficient Capture Volume to retain the Retention Volume. Any outlet (i.e., underdrain) installed in a structural SCM shall be installed above the elevation of any portion of the structural SCM dedicated to Retention Volume storage.

[12] HydroCAD is an example of a commonly used and widely accepted program for performing hydrograph analyses and design of stormwater infrastructure. HydroCAD is based on U.S. Department of Agriculture Soil Conservation Service's (now Natural Resources Conservation Service) TR-55: Urban Hydrology for Small Watersheds.

[13] The National Resources Conservation Service developed standard 24-hour rainfall distributions for hydrograph analyses. These rainfall distributions were intended to represent intensities associated with shorter duration storms, ranging from durations of 30 minutes to 12 hours. The National Resources Conservation Service Type 1 storm applies to the California West Coast, including the Central Coast Region. The Type 1 rainfall distribution was derived using National Oceanic Atmospheric Administration Atlas 2 rainfall statistics for the 1-year through 100-year storm.

c) Compliance with Water Quality Treatment Performance Requirement – Permittees shall require Regulated Projects that propose to use the retention-based structural Stormwater Control Measures to also meet the Water Quality Treatment Performance Requirement, to demonstrate, in the Stormwater Control Plan, that the Water Quality Treatment Performance Requirement is being fully met.

ATTACHMENT E: Ten Percent Adjustment to Retention Requirement – Calculation Instructions

Where technical infeasibility, as described in Section C.1.c., prevents full on-site compliance with the Runoff Retention Performance Requirement, on-site retention of the full Retention Volume per Section B.4.d.vi. is not required and the Regulated Project is required to dedicate no less than ten percent of the Regulated Project's Equivalent Impervious Surface Area to retention-based Stormwater Control Measures. The Water Quality Treatment Performance Requirement is not subject to this adjustment, i.e., mitigation to achieve full compliance is required on- or off-site.

Calculating Ten Percent of a Project's Equivalent Impervious Surface Area

The area of the project that must be dedicated to structural SCMs to waive off-site compliance with the Runoff Retention Requirement is equal to ten percent of the project's Equivalent Impervious Surface Area, defined as:

Equivalent Impervious Surface Area (ft^2) = (Impervious Tributary Surface Area (ft^2) + (Pervious Tributary Surface Area (ft^2))

Impervious Tributary Surface Area is defined as the sum of all of the site's conventional impervious surfaces. When calculating Impervious Tributary Area:

- Do include: concrete, asphalt, conventional roofs, metal structures and similar surfaces
- Do not include: green roofs

Pervious Tributary Surface Area is defined as the sum of all of the site's pervious surfaces, corrected by a factor equal to the surface's runoff coefficient. When calculating Pervious Tributary Surface Area:

- Do include surfaces such as: unit pavers on sand; managed turf[14]; disturbed soils; and conventional landscaped areas (see Table 1 for correction factors).
  Example:
  Project Site includes 500 ft^2 of unit pavers on sand.
  Pervious Tributary Surface Area = 500 ft^2 x C = 50 ft^2
  Where C = Correction Factor for unit pavers, 0.1, from Table 1.

- Do not include: Infiltration SCM surfaces (e.g., SCMs designed to specific performance objectives for retention/infiltration) including bioretention cells, bioswales; natural and undisturbed landscape areas, or landscape areas compliant with the Model Water Efficient Landscape Ordinance (California Code of Regulations, Title 23. Waters, Division 2. Department of Water Resources, Chapter 2.7.), or a local ordinance at least as effective as the Model Water Efficient Landscape Ordinance.

[14] Managed Turf includes turf areas intended to be mowed and maintained as turf within residential, commercial, industrial, and institutional settings.

TABLE 1: Correction Factors[15] for Use in Calculating Equivalent Impervious Surface Area

Pervious Surface	Correction Factor
Disturbed Soils/Managed Turf (dependent on original Hydrologic Soil Group)	A: 0.15 B: 0.20 C: 0.22 D: 0.25
Pervious Concrete	0.60
Cobbles	0.60
Pervious Asphalt	0.55
Natural Stone (without grout)	0.25
Turf Block	0.15
Brick (without grout)	0.13
Unit Pavers on Sand	0.10
Crushed Aggregate	0.10
Grass	0.10

[15] Factors are based on runoff coefficients selected from different sources: Turf and Disturbed Soils from *Technical Memorandum: The Runoff Reduction Method.* Center for Watershed Protection & Chesapeake Stormwater Network. p.13, April 18, 2008. http://town.plympton.ma.us/pdf/land/scheuler_runoff_reduction_method_techMemo.pdf. All other correction factors from *C.3 Stormwater Handbook, Santa Clara Valley Urban Runoff Pollution Prevention Program, Appendix F*, p. F-9., May 2004. http://www.sanjoseca.gov/planning/stormwater/pdfs/appendices_files/Appendix_F_Final.pdf

ATTACHMENT F: Calculating Off-Site Retention Requirements When Less Than 10 Percent of the Project Site Equivalent Impervious Surface Area is Allocated to Retention-Based Structural Stormwater Control Measures

The following instructions demonstrate how to determine the Off-Site Retention Requirements when a Regulated Project subject to the Runoff Retention Performance Requirement, cannot allocate the full 10% of the project site's Equivalent Impervious Surface Area[16] to retention-based Stormwater Control Measures (SCMs).

STEP A. Potential Off-Site Mitigation Retention Volume

First calculate the Potential Off-Site Mitigation Retention Volume, which represents the additional volume of runoff that would have been retained on-site, had the full 10% of Equivalent Impervious Surface Area been dedicated to retention-based SCMs.

Equation A:

Potential Off-Site Mitigation Retention Volume = (the portion of the 10% Equivalent Impervious Area not allocated on-site) X (the On-Site Retention Feasibility Factor)

Where:

- *The portion of the 10% Equivalent Impervious Surface Area not allocated on-site* is that portion not allocated to on-site structural retention-based SCMs. For example, if 10% of Equivalent Impervious Surface Area is 1,000 ft^2 and only 8% (800 ft^2) is allocated to retention-based SCMs, the remaining 2% (200 ft^2) is the value inserted in the equation.

- *The On-Site Retention Feasibility Factor* is the ratio of Design Retention Volume[17] managed on-site (ft^3), to actual area (ft^2) allocated to structural SCMs. This establishes the site's retained volume**:**area ratio, expressed as cubic feet of retained runoff volume per square foot of area. For example, if a project is able to infiltrate 3,500 ft^3 of runoff over an 800-ft^2 area, this ratio of 3,500**:**800, or 4.38, is the On-Site Retention Feasibility Factor.

STEP B. Actual Off-Site Mitigation Retention Volume

Next, determine the Actual Off-Site Mitigation Retention Volume, which may be less than the Potential Off-Site Mitigation Retention Volume. The Actual Off-Site Mitigation Retention Volume is the lesser of the volume calculated in Equation A, and the remaining portion of the Design Retention Volume, calculated per Attachment D, not controlled on-site. There are two possible outcomes when the Runoff Retention Performance Requirement is not met on-site and less than 10% of the site's Equivalent Impervious Surface Area is allocated to retention-based SCMs:

- Potential Off-Site Mitigation Retention Volume is the Actual Off-Site Mitigation Retention Volume
- Remaining Design Retention Volume represents Actual Off-Site Design Retention Mitigation Volume

[16] Calculate Equivalent Impervious Surface Area using guidance in Post-Construction Requirements Attachment E

[17] Calculate Design Retention Volume using guidance in Post-Construction Requirements Attachment D, or equivalent method. Final Design Retention Volumes should reflect the applicant's demonstrated effort to use non-structural design measures to reduce the amount of runoff (e.g., reduction of impervious surfaces) as required by the Post-Construction Requirements' LID Development Standards (Section B.4.d).

TECHNICAL SUPPORT DOCUMENT

FOR

POST-CONSTRUCTION STORMWATER MANAGEMENT REQUIREMENTS FOR DEVELOPMENT PROJECTS IN THE CENTRAL COAST REGION

July 12, 2013

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Documents also are available at:
http://www.waterboards.ca.gov/centralcoast/water_issues/programs/stormwater/docs/lid/lid_hydromod_charette_index.shtml

Table of Contents

I. Introduction

The management of stormwater runoff from sites after the construction phase is vital to controlling the impacts of development on water quality. The increase in impervious surfaces such as rooftops, roads, parking lots, and sidewalks due to land development can have a detrimental effect on aquatic systems post construction. Runoff from impervious areas can contain a variety of pollutants that are detrimental to water quality, including sediment, nutrients, heavy metals, pathogenic bacteria, and petroleum hydrocarbons. High levels of impervious cover can result in stream warming and loss of aquatic biodiversity in urban areas. Imperviousness limits both shallow groundwater movement and recharge of underlying groundwater basins. Impervious surfaces also reduce the supply of natural, beneficial sediment and organic matter to receiving waters.

The main goal of post-construction stormwater management is to prevent or limit these effects. This goal is best pursued by setting performance standards for new and redevelopment projects to ensure the projects integrate measures into their design and construction that protect, or to the extent feasible restore, the natural processes that support healthy aquatic systems. Over time, parcel-based requirements reduce the cumulative impacts of development at the watershed scale.

These Post-Construction Stormwater Management Requirements for Development Projects in the Central Coast Region (Post-Construction Requirements) establish the specific performance criteria and related implementation measures that municipalities will use to implement post-construction stormwater management actions. As with many other aspects of urban stormwater management (e.g., illicit discharge detection and elimination, construction management, public education and outreach), municipalities possess the authority to implement post-construction stormwater management actions to prevent impacts from urban runoff. Through implementation of these Post-Construction Requirements, municipalities will ensure that the new and redevelopment projects they approve integrate measures into their design and construction to protect, or to the extent feasible restore, the processes supporting healthy aquatic systems throughout the life of the project.

Contents of this Technical Support Document

This Technical Support Document is intended to provide background, explanation and justification for the Post-Construction Requirements. The background discussion includes the regulatory context in which the Post-Construction Requirements were developed. It continues with a presentation of the analytical basis for developing the Watershed Management Zones that determine which Post-Construction Requirements are applied on a given development site in the Central Coast Region.

Management Strategies are then discussed as the foundation of the specific Performance Requirements. In Section V. each Performance Requirement is discussed in detail as are key aspects of applicability, including exempt projects. The Technical Support Document then describes Alternative Compliance approaches that allow for off-site compliance with Performance Requirements. Additional details are also provided on reporting, including a discussion of the Stormwater Control Plan and the central role it is expected to play in achieving implementation of Low Impact Development (LID). For each of these items, the Technical Support Document includes explanation and justification as necessary.

II. Regulatory Context

On April 30, 2003, the State Water Resources Control Board adopted the National Pollutant Discharge Elimination System (NPDES) General Permit for the Discharge of Storm Water from Small Municipal Separate Storm Sewer Systems (MS4s), Order No. 2003-0005-DWQ (Phase II Municipal General Permit). On February 15, 2008, the Central Coast Water Board Executive Officer notified un-enrolled traditional, small MS4 stormwater dischargers and two un-enrolled non-traditional, small MS4 stormwater dischargers (University of California at Santa Barbara and Santa Cruz) of the process the Central Coast Water Board would follow for enrolling the MS4s under the Phase II Municipal General Permit. The Executive Officer also included in this notification interim hydromodification control criteria and the expectation that dischargers' Stormwater Management Programs (SWMPs) present a schedule for development and adoption of long-term hydromodification control standards.

On August 4, 2009 and October 20, 2009, the Central Coast Water Board Executive Officer notified dischargers of the option to pursue and participate in a "Joint Effort" for developing hydromodification control criteria, in compliance with the Phase II Municipal General Permit. All traditional, small MS4 stormwater dischargers in the Central Coast, as well as two non-traditional, small MS4s, the University of California at Santa Barbara and Santa Cruz, agreed to participate in the Joint Effort by submitting a written declaration of their intent to meet the terms of participation. Each discharger also amended their SWMP to include Best Management Practices (BMPs) to codify the steps of participation in the Joint Effort.

On September 2, 2010 the Central Coast Water Board hired contractors to assist in the development of hydromodification control criteria and on September 28, 2010, Central Coast Water Board staff notified traditional, small MS4 stormwater dischargers of the commencement of the Joint Effort.

The Phase II Municipal General Permit requires small MS4s to develop and implement a SWMP that describes BMPs, measurable goals, and timetables for implementation, designed to reduce the discharge of pollutants to the maximum extent practicable (MEP) and to protect water quality. The General Permit requires regulated small MS4s to require long-term post-construction BMPs that protect water quality and control runoff flow, to be incorporated into development and redevelopment projects. The General Permit further requires the Permittee to incorporate changes required by or acceptable to the Water Board Executive Officer into the Permittee's SWMP and to adhere to its implementation.

These Post-Construction Requirements fulfill the Joint Effort BMPs and are the minimum post-construction criteria that Central Coast traditional, small MS4 stormwater dischargers must apply to applicable new development and redevelopment projects in order to comply with the MEP standard.

The Central Coast Water Board approved Post-Construction Stormwater Management Requirements for Development Projects in the Central Coast (Post-Construction Requirements) on September 6, 2012 through adoption of Resolution R3-2012-0025. Resolution R3-2012-0025 made findings that Central Coast municipalities must implement the Post-Construction Requirements to comply with the Phase II Municipal General Permit, Order No. 2003-0005-DWQ in effect at the time. At the time of adoption of Resolution R3-2012-0025 by the Central Coast Water Board, State Water Board staff was preparing to reissue the Phase II Municipal General Permit. The State Water Board reissued the permit on February 5, 2013. Per section E.12.k of the re-issued Phase II Municipal General Permit, Traditional MS4s in the Central

Coast Region must comply with post-construction stormwater management requirements based on a watershed-process based approach developed by the Central Coast Water Board.

The Central Coast Water Board's September 6, 2012 Resolution R3-2012-0025, which approved the Post-Construction Requirements, must be re-adopted by the Central Coast Water Board for consistency with the reissued Phase II Municipal General Permit. The language of the Central Coast Water Board's September 6, 2012 Resolution R3-2012-0025, refers to the former Phase II Municipal General Permit, Order No. 2003-0005-DWQ instead of the current Phase II Municipal General Permit, Order No. 2013-0001-DWQ, cites the section numbers for post construction requirements as per Order No. 2003-0005-DWQ instead of the reissued Phase II Municipal General Permit section numbers, and describes implementation via SWMPs as in Order No. 2003-0005-DWQ instead of through Guidance Documents as required in the reissued Phase II Municipal General Permit.

Central Coast Water Board staff included specific language on what is required and how to demonstrate implementation of the Post-Construction Requirements. This specific language describing what to do and what to report will greatly assist Central Coast Water Board staff in determining compliance with the Post-Construction Requirements and attainment of the MEP standard.

III. Watershed Management Zones

The urbanized portions of the Central Coast Region are categorized into 10 Watershed Management Zones (WMZs), based on common key watershed processes and receiving water type (creek, ocean, lake, etc). Maps in Attachment A illustrate the WMZs for the Central Coast Region's urbanized areas. Designated Groundwater Basins of the Central Coast Region (Attachment B) underlie some but not all WMZs in urbanized portions of the Central Coast Region. Each WMZ and, where present, Groundwater Basin, is aligned with specific Post-Construction Stormwater Management Requirements (Post-Construction Requirements) to address the impacts of development on watershed processes and beneficial uses.

These Post-Construction Requirements require the Permittee to have the ability to determine the WMZ in which development projects are proposed, throughout the urbanized portions of their jurisdiction corresponding with the Phase II Municipal Stormwater Permit boundary. The Permittee must also have the ability to determine whether development projects are proposed in areas overlying designated Groundwater Basins.

The maps in Attachment A illustrate the WMZs in all the urbanized areas of the Central Coast. However, to implement these Post-Construction Requirements, Permittees may require access to spatial data files of WMZs and Groundwater Basins which they can download for their own use. These files are available for download at the following website: http://www.waterboards.ca.gov/centralcoast/water_issues/programs/stormwater/docs/lid/lid_hydromod_charette_index.shtml

Permittees may also elect to identify WMZs for areas within their jurisdiction, but not depicted as urbanized areas on the maps in Attachment A. The spatial data available at the above website provide the necessary information to designate WMZs in these areas.

The Watershed Management Zones are the basis for post-construction requirements appropriate to the physical context in which development occurs. A key principle underpinning the WMZs is that every location on the landscape does not require the same set of stormwater

mitigation measures, because of intrinsic differences in the key watershed processes at each location and the sensitivity to those processes of the downstream receiving water(s). The Joint Effort contractors completed technical tasks to develop and implement a methodology to identify Post-Construction Requirements consistent with this principle.[1, 2, 3, 4, 5, 6, 7]

The following describes two critical steps conducted by the Joint Effort contractors to support the development of Post-Construction Requirements: (1) identify watershed processes that are integral to receiving water health in the Central Coast Region, and (2) conduct a landscape assessment to identify the basis for defining Watershed Management Zones.

1) Watershed Processes

Watershed processes of interest in the context of stormwater management are those that have their ultimate expression in receiving waters, including groundwater. Watershed processes across the landscape of the Central Coast Region are similar to those found in temperate latitudes throughout the world. Field observations, conducted across the entire geographic extent of the Central Coast, confirmed that conditions and processes in the intact watersheds of the Central Coast were overall consistent with prior assessments of watershed processes.[8] The focus on intact watersheds provided a basis for describing what are effectively predevelopment conditions. Only a few systematic and readily recognized differences distinguished different suites of processes in different areas.

Broadly, all but the steepest mountain ridges and the driest hillslopes are well-vegetated, whether by chaparral, coastal scrub, grasslands, oak woodlands, or evergreen forest. Most hillslopes are relatively ungullied, expressing a predominance of the hydrologic processes of infiltration and subsurface movement of water after precipitation first falls on the ground surface. These hydrologic processes, in turn, largely control the movement of sediment and plant detrital material. Sediment movement is driven by gravity and so is negligible on flat ground regardless of the geologic material. On slopes, surface erosion (rilling, gullying) occurs only in the presence of surface flow, and its expression is rare (in undisturbed areas) except in a few very weak rock types. Landslides (and other forms of mass wasting) are more dependent on rock strength, for which the Central Coast has excellent examples at both the weak (Franciscan mélange) and strong (crystalline rocks) ends of the spectrum.

In addition to the watershed processes of infiltration and subsurface movement of water, whose activity and influence were observed or inferred from observation, four other processes long-recognized from prior watershed studies were included in the subsequent application of this analysis to determine effective stormwater management strategies and support these Post-Construction Requirements. They include evapotranspiration, delivery of sediment and organic matter to receiving waters, and chemical and biological transformations.

<u>Watershed Processes Identified in the Central Coast Region:[9]</u>

[1] Helmle & Booth, 2011a.
[2] Helmle & Booth, 2011b.
[3] Helmle & Booth, 2011c.
[4] Booth, et al, 2011a.
[5] Booth, et al, 2011b.
[6] Booth, et al, 2012.
[7] Helmle, C., 2012.
[8] Helmle & Booth, 2011b. p. 3.
[9] Booth, et al, 2011b. p. 31.

Overland Flow: Precipitation reaching the ground surface that does not immediately soak in must run over the land surface (thus, "overland" flow). Most un-compacted, vegetated soils have infiltration capacities of one to several inches per hour at the ground surface, which exceeds the rainfall intensity of even unusually intense storms of the Central Coast and so confirms the field observations of little to no overland flow in undisturbed watersheds. In contrast, pavement and hard surfaces reduce the effective infiltration capacity of the ground surface to zero, ensuring overland flow regardless of the meteorological attributes of a storm, together with a much faster rate of runoff relative to vegetated surfaces.

Groundwater Recharge and Infiltration: These closely linked hydrologic processes are dominant across most intact landscapes of the Central Coast Region. They can be thought of as the inverse of overland flow; precipitation that reaches the ground surface and does not immediately run off has most likely infiltrated. Their widespread occurrence is expressed by the common absence of surface-water channels on even steep (undisturbed) hillslopes. Thus, on virtually any geologic material on all but the steepest slopes (or bare rock), infiltration of rainfall into the soil is inferred to be widespread, if not ubiquitous. With urbanization, changes to the process of infiltration are also quite simple to characterize: some (typically large) fraction of that once-infiltrating water is now converted to overland flow.

Interflow: Interflow takes place following storm events as shallow subsurface flow (usually within 3 to 6 feet of the surface) occurring in a more permeable soil layer above a less permeable substrate. In the storm response of a stream, interflow provides a transition between the rapid response from surface runoff and much slower stream discharge from deeper groundwater. In some geologic settings, the distinction between "interflow" and "deep groundwater" is artificial and largely meaningless; in others, however, there is a strong physical discrimination between "shallow" and "deep" groundwater movement. Development reduces infiltration and thus interflow as discussed previously, as well as reducing the footprint of the area supporting interflow volume.

Evapotranspiration: In undisturbed humid-region watersheds, the process of returning water to the atmosphere by direct evaporation from soil and vegetation surfaces, and by the active transpiration by plants, can account for nearly one-half of the total annual water balance; in more arid regions, this fraction can be even higher. Development covers soils with impervious surfaces and usually results in the compaction of soils when grading occurs. Native plants are often replaced with turf, which typically has lower rates of evapotranspiration unless irrigated throughout the summer months.

Delivery of Sediment to Receiving Waters: Sediment delivery into the channel network is a critical process for the maintenance of various habitat features in fluvial systems (although excessive sediment loading from watershed disturbance can instead be a significant source of degradation). Quantifying this rate can be difficult and discriminating the relative contribution from different geologic materials even more so; however, the overriding determinism of hillslope gradient is widely documented. In the post-construction period, maintenance of sediment delivery is essential to the health of certain receiving-water types (as is organic matter delivery), and it is this (long-term) process that is being addressed here. Development commonly covers surfaces, and non-native vegetation may also prevent the natural supply of sediment from reaching the stream.

Delivery of Organic Matter to Receiving Waters: The delivery of organic matter is critical to receiving water health as it forms the basis for the aquatic food web. Delivery of organic matter

follows similar pathways as inorganic matter (e.g., sediment). However, the dominant amount and timing of delivery is often associated with the presence, width, and composition of the vegetative riparian zone.

Chemical and Biological Transformations: This encompasses the suite of watershed processes that alter the chemical composition of water as it passes through the soil column on its path to (and after entry into) a receiving water. The conversion of subsurface flow to overland flow in a developed landscape eliminates much of the opportunity for attenuation and transformations within the soil column, and this is commonly expressed through degraded water quality. The dependency of these processes on watershed conditions is complex in detail, but in general a greater residence time in the soil should be correlated with greater activity for this group of processes. Since residence time is inversely proportional to the rate of movement, the relative importance of this process is anticipated to be inversely proportional to slope.

2) Landscape Assessment as Basis of Watershed Management Zones

Physical Landscape Zones

Determinants of the primary watershed processes have been cataloged by many prior studies. Commonly recognized attributes include the material being eroded (i.e., geologic material), a measure of topographic gradient (hillslopes, basin slope), climate (mean annual temperature, mean annual precipitation, climate zone, latitude), land cover (vegetation, constructed cover and imperviousness), and episodic disturbance (e.g., fire, large storms). Reid and Dunne (1996) noted that every study area requires simplification and stratification, with topography and geology as the primary determinants with land cover as a "treatment" variable within each topography–geology class. This perspective is consistent with the underlying purpose for defining Physical Landscape Zones, namely to identify and stratify watershed conditions and processes across the undisturbed landscape of the Central Coast. Thus, geologic material and hillslope gradient were the two landscape attributes judged to be the major determinants of watershed processes and characterized for this step.[10]

Thus, 15 Physical Landscape Zones can be identified across the Central Coast Region, each with a set of properties that are well-correlated with their key watershed processes in an undisturbed landscape. Other factors of potential relevance, particularly the spatial variability of precipitation and the influence of different vegetation types in undisturbed watersheds (e.g., trees vs. shrubs vs. grasslands) were explored but were found to have at most a secondary influence on the dominance of particular watershed processes across the Central Coast as a whole.[11]

The fifteen final landscape categories (plus "open water") of the Central Coast Region are identified in Table 1, and consist of five geologic material types each divided into three hillslope gradient categories:

1. Franciscan mélange: a heterogeneous collection of resistant rocks within a matrix of weaker material that has filled the spaces between the resistant clasts (exposed over 8% of the land area of the Central Coast).
2. Pre–Quaternary crystalline rocks: a group of geologically old and generally quite resistant rocks (23% of the Central Coast).
3. Early to Mid–Tertiary sedimentary rocks: primarily resistant sandstones but also some weaker shales and siltstones (30% of the Central Coast).

[10] Booth, et al, 2011b. p. ii.

[11] Ibid. p. 4.

4. Late Tertiary sediments: weakly cemented sedimentary rocks of relatively young geologic age (6% of the Central Coast).
5. Quaternary sedimentary deposits: weakly cemented or entirely uncemented silt, sand, and gravel that has been deposited in geologically recent time (i.e., the last 2.5 million years; 33% of the Central Coast).

Table 1. Physical Landscape Zone areas as a proportion of the Central Coast Region.

Physical Landscape Zone (geologic material and hillslope gradient (% slope))	**% of total area**	
Franciscan mélange; 0 – 10%	0.5%	8%
Franciscan mélange; 10 – 40%	5%	
Franciscan mélange; >40%	2%	
Pre–Quaternary crystalline rocks; 0 – 10%	1%	23%
Pre–Quaternary crystalline rocks; 10 – 40%	11%	
Pre–Quaternary crystalline rocks; >40%	11%	
Early to Mid–Tertiary sedimentary; 0 – 10%	2%	30%
Early to Mid–Tertiary sedimentary; 10 – 40%	16%	
Early to Mid–Tertiary sedimentary; >40%	12%	
Late Tertiary sediments; 0 – 10%	1%	6%
Late Tertiary sediments; 10 – 40%	4%	
Late Tertiary sediments; >40%	2%	
Quaternary sedimentary deposits; 0 – 10%	18%	33%
Quaternary sedimentary deposits; 10 – 40%	14%	
Quaternary sedimentary deposits; >40%	1%	
Open water	0.4%	0.4%

Source: Booth, et al, 2011b. p.4.

Receiving Waters

Receiving waters of the Central Coast are diverse, comprising streams, rivers, lakes, wetlands, marine nearshore, and groundwater basins. The management of stormwater at particular locations on the landscape will depend not only on the key watershed processes associated with the Physical Landscape Zone but also on the nature of the receiving water. Not every watershed process is critical, or even necessarily relevant, to the long-term health of every type of receiving water. The associations shown in Table 2 are based on a general scientific understanding of the interaction of runoff and detrital material with receiving waters, and are recognized in the Joint Effort.

Table 2. The association of watershed processes with receiving-water types. Cells with "X" indicate those watershed processes that may be affected by urban development, with potentially significant consequences for the indicated receiving water.

RECEIVING WATER	**Watershed Processes**

TYPE	Overland Flow, rilling & gullying	Infiltration and Groundwater Recharge	Interflow (shallow groundwater mvmt.)	Evapotranspiration	Delivery of Sediment to Waterbody	Delivery of Organic Matter to Waterbody	Chemical/Biological Transformations
Streams	X	X	X	X	X	X	X
Wetlands	X	X	X	X		X	X
Lakes						X	X
Large Rivers[a]					X		X
Marine Nearshore					X		X
Groundwater Basins		X					X

a. Defined as having a drainage area $\geq$ 200-square mile
Source: Booth, et al, 2012. p. 24.

A few patterns are evident in the association of receiving water type and watershed processes:[12]

1. Streams are commonly affected by alterations to any of the watershed processes and are well-recognized to respond to disturbances in their contributing watersheds, and they are particularly efficient at passing the effects of disturbance farther downstream. For these reasons, they are a useful surrogate for the full range of receiving waters, but their sensitivity to changes in the delivery of water, sediment, and organics is not fully shared by every other receiving-water type.
2. Natural rates of sediment delivery are presumed important (and beneficial) for streams, large rivers, and the marine nearshore environment, because they sustain in-stream habitat and maintain beaches. Conversely, sediment delivery is not a beneficial process to maintain for lakes and wetlands (indeed, processes that indirectly increase rates of sediment delivery, particularly overland flow, are detrimental) and is irrelevant for groundwater recharge.
3. All receiving waters are influenced by changes to Chemical and Biological Transformations (i.e., all are water-quality sensitive).
4. The interrelated processes of overland flow, interflow, infiltration, and evapotranspiration, which in combination determine surface water flow rates and volumes, are only of concern for streams and wetlands – lakes and large rivers are defined on the basis of their anticipated insensitivity to typical urban-induced changes in these discharge parameters (and thus management strategies do not target these processes for these receiving waters).
5. Groundwater aquifers depend on infiltration, but management for infiltration to aquifers will have different criteria (and perhaps different strategies as well) than management of infiltration as it relates to groundwater discharge to streams or reducing overland flow (i.e., runoff volume).

[12] Booth, et al, 2012. pp. 25.

Where discharge passes from one receiving-water type to another (for example, discharge to a stream then enters a lake), in nearly all cases the "direct" receiving water (i.e., where the runoff first arrives) will determine the necessary management strategies rather than the "terminal" receiving water (the ocean, in all cases; but with potentially an intermediate wetland, lake, or large river). This is because downstream waterbodies are, in general, less sensitive to impacts by virtue of increasing drainage area, and because the most common direct receiving water (streams) already has the greatest sensitivity and therefore will be subject to the most restrictive mitigation. The only exceptions to this rule are (1) drainage into a lake and then to a stream, for which the standing water is presumed to have always functioned to eliminate downstream sediment discharge, and so protection of this process is not necessary; and (2) drainage that includes a lake or wetland as either a terminal or intermediate receiving water, for which targeted control of nutrients or other water quality constituents may be necessary to avoid excessive loading.[13]

Watershed Management Zones

Ten Watershed Management Zones (WMZs) were identified for the Central Coast region. The following discusses the process that led to these ten WMZs. In the terminology of the Joint Effort, every location on the landscape has two attributes: its Physical Landscape Zone, determined by the underlying geology and the local hillslope gradient; and its direct receiving water type. These combine to define the "Watershed Management Zones," of which there are 90 unique combinations (reflecting 15 Physical Landscape Zones and 6 receiving water types). For simplicity, however, Physical Landscape Zones with equivalent sets of key watershed processes combine into single Physical Landscape Zone groups, reducing their number to 9 and thus the total number of unique combinations (9 Physical Landscape Zones x 6 receiving water types) to 54.

The important watershed processes associated with each of these 54 Physical Landscape Zone –Receiving Water combinations are displayed in Table 3 (using the watershed process abbreviations shown at the bottom of the table). Processes listed before the "/" were judged to be of primary concern because they are major factors undergoing large potential change with urbanization; those after the "/" do not typically show such a high magnitude of potential change.[14]

Table 3. Key watershed processes associated with each unique Physical Landscape Zone – Receiving Water combination. (Abbreviations defined below table)

PHYSICAL LANDSCAPE ZONE Geology and Percent Slope	**WATERSHED PROCESSES BY DIRECT RECEIVING WATER TYPE**					
	Stream	**Wetland**	**Lake**	**Large River**	**Marine Nearshore**	**Ground-Water Basin**
Franciscan mélange 0-10% Pre-Quaternary crystalline 0-10%	CBT / OF, ET, DO	CBT / OF, ET, DO	CBT / DO	CBT /	CBT / DO	CBT /
Early to Mid-Tertiary sed. 0-10%	OF, CBT, GW / IF, ET, DO	OF, CBT, GW / IF, ET, DO	CBT / DO	CBT /	CBT / DO	CBT, GW /

[13] Booth, et al, 2012b. p. 4.

[14] Booth, et al, 2012b. p. 5.

Late Tertiary sediments 0-10% Quaternary deposits 0-10%	OF, CBT, GW / IF, ET, DO	OF, CBT, GW / IF, ET, DO	CBT / DO	CBT /	CBT / DO	CBT, GW /
Franciscan mélange 10-40% Pre-Quaternary crystalline 10-40%	/ OF, ET, DO, CBT	/ OF, ET, DO, CBT	/ DO, CBT	/ CBT	/ DO, CBT	/ CBT
Early to Mid-Tertiary sed. 10-40%	OF / GW, IF, ET, DS, DO, CBT	OF / GW, IF, ET, DO, CBT	/ DO, CBT	/ DS, CBT	/ DS, DO, CBT	/ GW,CBT
Late Tertiary sediments 10-40% Quaternary deposits 10-40%	OF, GW / IF, ET, DS, DO, CBT	OF, GW / IF, ET, DO, CBT	/ DO, CBT	/ DS, CBT	/ DS, DO, CBT	GW / CBT
Franciscan mélange >40% Pre-Quaternary crystalline >40%	DS / OF, ET, DO	/ OF, ET, DO	/ DO	DS /	DS / DO	/
Early to Mid-Tertiary sed. >40%	DS / OF, GW, IF, ET, DO	/ OF, GW, IF, ET, DO	/ DO	DS /	DS / DO	/ GW
Late Tertiary sediments >40% Quaternary deposits >40%	DS / GW, IF, ET, DO	/ GW, IF, ET, DO	/ DO	DS /	DS / DO	/ GW

Source: Booth, et al, 2012b. pp. 5, 6.

Watershed Process Abbreviations:
OF = OVERLAND FLOW
GW = GROUNDWATER RECHARGE
IF = INTERFLOW
ET = EVAPOTRANSPIRATION
CBT = CHEMICAL AND BIOLOGICAL TRANSFORMATIONS
DS = DELIVERY OF SEDIMENT
DO = DELIVERY OF ORGANICS

The watershed processes identified in each cell of Table 3 form the basis for determining the necessary elements of stormwater mitigation for each WMZ. Stormwater mitigation is presumed to always include the following additional treatments:

- All stormwater mitigation includes receiving water buffers or waterbody set-backs where applicable, resulting in mitigation of "DO" and "DS" at a low level of change (e.g., combinations "CBT/DO" and "CBT/DS" can be truncated to "CBT/").
- All stormwater mitigation includes some basic level of water quality treatment, and thus "CBT" at a low level of change will always be mitigated (e.g., combinations "/DO, CBT" can be expressed simply as "/DO").
- If a high level of GW change/concern is indicated, a high level of CBT mitigation will occur because of the infiltration required for recharge of groundwater aquifers (e.g., the combination "GW, CBT/" becomes "GW/").

These conditions and principles result in a simplified presentation (Table 4), whose colors are keyed to geographic locations on the associated map of Watershed Management Zones (Figure 1). The presence or absence of an underlying groundwater basin is similarly determined from the mapping available to Permittees (see Section III).

Table 4. A reorganized and simplified presentation of Table 3. Numbers specify which WMZ is represented by the Physical Landscape Zone – Receiving Water combination expressed by the cell. Those marked with an asterisk will require protection of groundwater recharge if underlain by a mapped groundwater basin.

	DIRECT RECEIVING WATER					
PHYSICAL LANDSCAPE ZONE Geology and Percent Slope	**Stream**	**Wetland**	**Lake**	**Lake, w/GW Basin**	**Large Rivers & Marine Nearshore**	**Lg. Rivers & Marine, w/GW Basin**
Franciscan mélange 0-10%	3	3	4	4	4	4
Franciscan mélange 10-40%	9	9	10	10	10	10
Franciscan mélange >40%	6	9	10	10	7	7
Pre-Quaternary crystalline 0-10%	3	3	4	4	4	4
Pre-Quaternary crystalline 10-40%	9	9	10	10	10	10
Pre-Quaternary crystalline >40%	6	9	10	10	7	7
Quaternary deposits 0-10%	1	1	4	4*	4	4*
Quaternary deposits 10-40%	1	1	4	4*	4	4*
Quaternary deposits >40%	5	8	10	10*	7	7*
Late Tertiary sediments 0-10%	1	1	4	4*	4	4*
Late Tertiary sediments 10-40%	1	1	4	4*	4	4*
Late Tertiary sediments >40%	5	8	10	10*	7	7*
Early to Mid-Tertiary sed. 0-10%	1	1	4	4*	4	4*
Early to Mid-Tertiary sed. 10-40%	2	2	10	10*	10	10*
Early to Mid-Tertiary sed. >40%	5	8	10	10*	7	7*

Source: Booth, et al, 2012. p. 26.

Key for Table 4.

Watershed Processes (Processes before the "/" are of primary concern; those after the "/" do not show as high a magnitude of potential change)	**Watershed Management Zone**
Overland Flow, Groundwater Recharge / Interflow, Evapotranspiration	**1**
Overland Flow / Groundwater Recharge, Interflow, Evapotranspiration	**2**
Chemical and Biological Transformations / Overland Flow, Evapotranspiration	**3**
Chemical and Biological Transformations (*) /	**4**
Delivery of Sediment / Groundwater Recharge, Interflow, Evapotranspiration	**5**

Delivery of Sediment / Overland Flow, Evapotranspiration	**6**
Delivery of Sediment / (*)	**7**
/ Groundwater Recharge, Interflow, Evapotranspiration	**8**
/ Overland Flow, Evapotranspiration	**9**
/ (*)	**10**

***Groundwater Recharge, if underlain by Groundwater Basin**

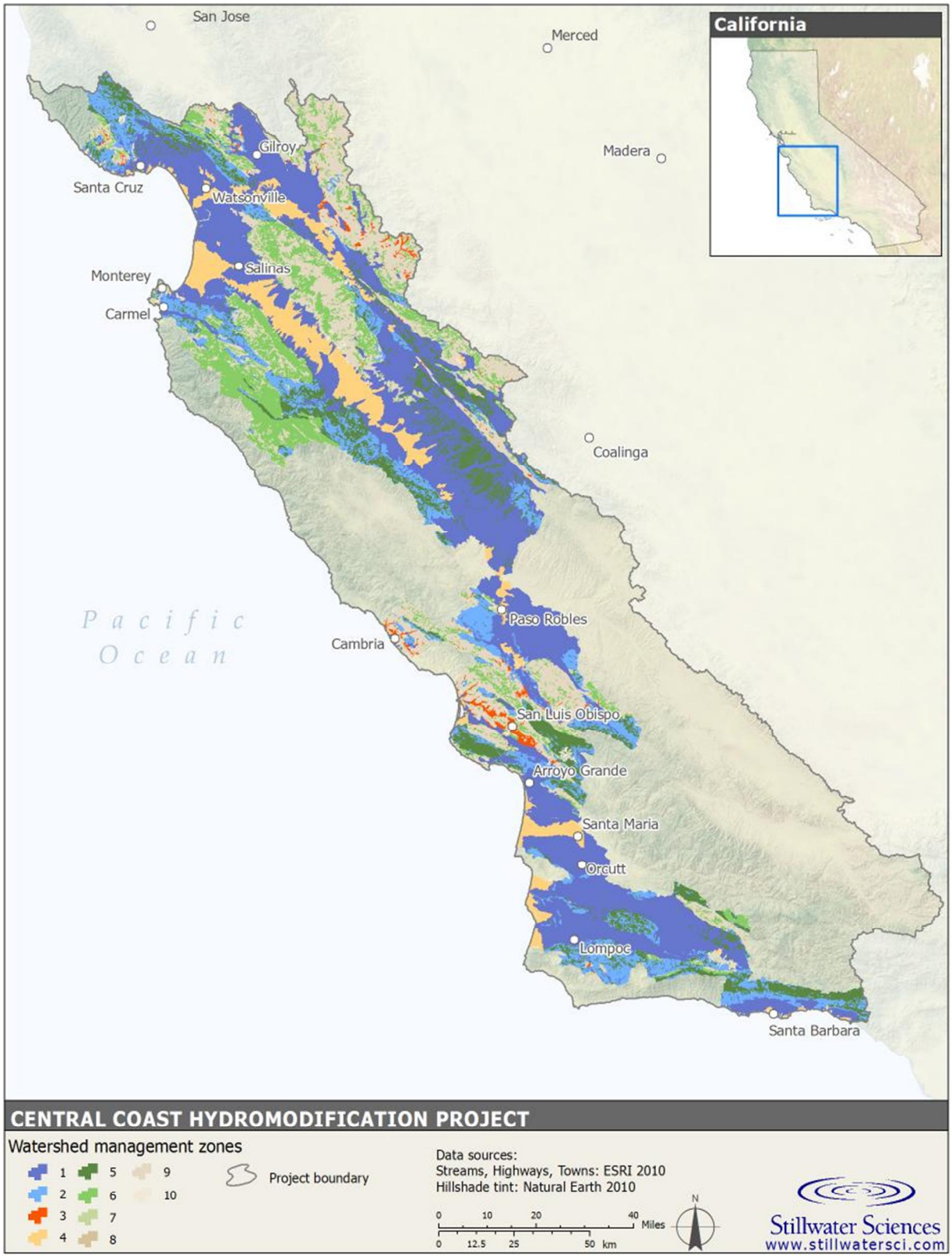

Figure 1. Watershed Management Zones. Areas defined in Table 4. (High resolution spatial data coverages available separately.)
Source: Booth, et al, 2012.

Summary Characteristics of the Watershed Management Zones[15]

The following summarizes each WMZ's characteristics and the management approaches needed to protect the key watershed processes for that WMZ. Table 5 indicates the distribution of the WMZs within the Central Coast Region's urban areas. Attachment A includes maps of the WMZs in the Central Coast Region's urban areas. Spatial data files are available electronically (See Section III.).

WMZ 1: Characteristics: Drains to stream or to wetland. Underlain by: Quaternary and Late Tertiary deposits, 0-40%; Early to Mid-Tertiary sediments, 0-10%. Attributes and Management Approach: This single WMZ includes almost two-thirds of the urban area of the Central Coast Region (Table 5); it is defined by low-gradient deposits (Quaternary and Tertiary in age) together with the moderately sloped areas of these younger deposits that drain to a stream or wetland. The dominant watershed processes in this setting are infiltration into shallow and deeper soil layers; conversely, overland flow is localized and rare. Management strategies should minimize overland flow and promote infiltration, particularly into deeper aquifers if overlying a groundwater basin in its recharge area.

WMZ 2: Characteristics: Drains to stream or to wetland. Underlain by Early to Mid-Tertiary sediments, 10-40%. Attributes and Management Approach: This WMZ is similar to WMZ 1 in both materials and watershed processes, but groundwater recharge is anticipated to be a less critical watershed process in most areas. While almost 9% of the urban areas of the Central Coast Region are in this WMZ (Table 5), only 1% overlies a groundwater basin; thus, whereas management strategies need to minimize overland flow as with WMZ 1, they need not emphasize groundwater recharge as the chosen approach to the same degree.

WMZ 3: Characteristics: Drains to stream or to wetland. Underlain by Franciscan mélange and Pre-Quaternary crystalline, 0-10%. Attributes and Management Approach: This WMZ includes those few flat areas of the Central Coast Region underlain by old, generally impervious rocks with minimal deep infiltration (and intersecting with no mapped groundwater basins). Overland flow is still uncommon over the surface soil; and chemical and biological remediation of runoff, reflecting the slow movement of infiltrated water within the flat soil layer, are the dominant watershed processes. Management strategies should promote treatment of runoff through infiltration, filtration, and by minimizing overland flow.

WMZ 4: Characteristics: Drains to lake, large river, or marine nearshore. Underlain by all geologic types, 0–10%, and Quaternary and Late Tertiary deposits, 10-40%. Attributes and Management Approach: This WMZ covers those areas geologically equivalent to WMZ's 1 and 3, but draining to one of the receiving water types that are not sensitive to changes in flow rates. The dominant watershed processes in this low-gradient terrain are those providing chemical and biological remediation of runoff, but a specific focus on infiltration management strategies is only necessary for those parts of this WMZ that overlie a groundwater basin. This WMZ covers 13.6% of Central Coast Region's urban areas (Table 5); almost 11% of the region's urban areas are in this WMZ and overlie a groundwater basin.

[15] Booth, et al, pp. 13, 14.

WMZ 5: Characteristics: Drains to stream. Underlain by Quaternary deposits, Late Tertiary deposits, and Early to Mid-Tertiary sediments, >40%. Attributes and Management Approach: These steep, geologically young, and generally infiltrative deposits are critical to the natural delivery of sediment into the drainage system; management strategies should also maintain the relatively high degree of shallow (and locally deeper) infiltration that reflects the relatively permeable nature of these deposits. Because this WMZ only covers steeply sloping areas, however, it is relatively uncommon in urban areas (<3%).

WMZ 6: Characteristics: Drains to stream. Underlain by Franciscan mélange and Pre-Quaternary crystalline, >40%. Attributes and Management Approach: The steeply sloping geologic deposits not in WMZ 5 are included here; they are similarly important to the natural delivery of sediment into the drainage system but have little opportunity for deep infiltration, owing to the physical properties of the underlying rock. Management strategies should maintain natural rates of sediment delivery into natural watercourses but avoid any increase in overland flow beyond natural rates, which are low where undisturbed even in this steep terrain.

WMZ 7: Characteristics: Drains to large river or marine nearshore. Underlain by all geologic types, >40%. Attributes and Management Approach: This WMZ is very rare in the urban parts of the Central Coast Region (0.1% total) because such terrain provides little space or opportunity for urban development. The receiving waters that characterize this WMZ are insensitive to changes in runoff rates but still depend on natural sediment delivery processes for their continued health; thus, management strategies need to focus on maintaining the delivery of sediment in the few areas that the WMZ is found.

WMZ 8: Characteristics: Drains to wetland. Underlain by Quaternary deposits, Late Tertiary deposits, and Early to Mid-Tertiary sediments >40%. Attributes and Management Approach: Equivalent to WMZ 5 but with a different receiving-water type, these steep and generally infiltrative deposits should be managed to maintain the relatively high degree of shallow (and locally deeper) infiltration that reflects the relatively permeable nature of these deposits. Delivery of sediment, however, is unlikely to be important to downstream receiving water (i.e., wetland) health. Even more so than with the other steep WMZs, this type is extremely uncommon in the Central Coast Region's urban areas (0.1%).

WMZ 9: Characteristics: Drains to wetland. Underlain by Franciscan mélange and Pre-Quaternary crystalline, >10%; *or* drains to stream or wetland, and underlain by Franciscan mélange and Pre-Quaternary crystalline, 10–40%. Attributes and Management Approach: These moderately sloping, older rocks that drain to either a stream or wetland are neither extremely sensitive to changes in infiltrative processes (because the underlying rock types are typically impervious), nor key sources of sediment delivery (because slopes are only moderate in gradient). Overland flow is still uncommon over the surface soil, and so management strategies should apply reasonable care to avoid gross changes in the distribution of runoff between surface and subsurface flow paths. About 6% of the urban parts of the Central Coast Region are found on this WMZ (Table 5); none include an underlying groundwater basin, emphasizing the relative unimportance of maintaining deep infiltration.

WMZ 10: Characteristics: Drains to lake, large river, or marine nearshore. Underlain by Franciscan mélange, Pre-Quaternary crystalline, Early to Mid-Tertiary sediments, 10-40%; *or*, drains to lake and underlain by all geologic types >40%. Attributes and Management Approach: Covering less than 1% of the urban areas of the Region, this WMZ drains into those receiving waters insensitive to changes in runoff rates. It includes the moderately sloped areas that are anticipated not to be key sediment-delivery sources (by virtue of hillslope gradient) or that drain into lakes (which generally do not require natural rates of sediment delivery for their continued health). Across the entire urbanized part of the Central Coast Region, less than 1 square kilometer of this WMZ also overlies a mapped groundwater basin, suggesting that a broad management focus on deep infiltration is unwarranted.

Table 5. Percentage of Central Coast Urban Areas by WMZ

WMZ	Percent Urban Area
1	62.6
2	8.8
3	2.5
4	13.6
5	2.6
6	2.2
7	0.1
8	0.1
9	6.3
10	1.0
Water	0.2
	100%

Source: GIS analysis by Stillwater Sciences, 2012

IV. Management Strategies for Watershed Management Zones[16]

These Post-Construction Requirements shift from the historic, symptomatic approach to stormwater management and hydromodification control to an approach focusing on the protection of key watershed processes. Instead of identifying a problematic outcome of urban development (e.g., "eroding stream channels") and requiring a targeted 'fix' to the 'problem' (e.g., "armor the bank"), these Post-Construction Requirements target the root causes of changes to receiving waters—namely, aspects of development projects that disrupt the watershed processes that sustain the health and function of these waterbodies. Furthermore, these Post-Construction Requirements reflect the geographic diversity of the Central Coast by stratifying the region into Watershed Management Zones allowing management to focus on watershed processes where they are known to occur. Management strategies, therefore, must focus on the key watershed processes of each Watershed Management Zone. The result is a process-based stormwater management approach.

To support process-based stormwater management, broad sets of management strategies can be assigned that target the protection of watershed processes in various settings, and for which

[16] Booth, et al, 2012. pp. 31-34.

numeric performance requirements are provided. Although there is no formally accepted "list" of such strategies, the following set offers a useful organizational framework:

1) Flow Control
Flow Control encompasses a broad range of stormwater criteria for addressing hydraulic and hydrologic goals. This includes regulations that typically mandate that (1) post-development peak flows are less than or equal to pre-development peak flows for a series of intermediate and/or large design storm events (i.e., "storm event peak flow" control); (2) runoff from flows with the highest risk potential for channel erosion, and by extension damage to aquatic habitat, are not increased in duration ("flow-duration control"); and (3) runoff is infiltrated or retained onsite, without specific reference to the range of stream-channel flows that are affected, to maintain groundwater flow or reduce overall runoff volume ("retain volume").

2) Water Quality Treatment
Water Quality Treatment includes a suite of Stormwater Control Measures (SCMs) that address the major link between urbanization and water quality impairment, which is caused by the increased runoff from impervious surfaces and soil compaction of pervious areas, and the delivery of urban sources of pollutants such as nutrients from fertilizer, metals from brake pads, and sediment from exposed soil surfaces.

3) Preserve Delivery of Sediment and Organics
Preserve Delivery of Sediment and Organics into the channel network is critical for the maintenance of various habitat features and aquatic ecosystems in the fluvial setting. While preservation of these functions is not a goal found in most stormwater regulations, it is often discussed qualitatively as a goal in establishing or justifying riparian buffer requirements.

4) Maintain Soil and Vegetation Regime
Maintain Soil and Vegetation Regime is a valuable and highly effective alternative to water-quality treatment, because much impairment is due to the isolation of soil and vegetation from the path of urban stormwater runoff, which in turn eliminates the processes of filtration, adsorption, biological uptake, oxidation, and microbial breakdown (collectively termed the watershed process of "Chemical and Biological Transformations" by the Joint Effort). Note that this management strategy overlaps with several others: not only can it accomplish water-quality treatment, but also it can constitute stormwater volume-based flow control and preserve the delivery of sediment and organics to waterbodies if located adjacent to waterbodies. Moreover, it is a (typically intentional) byproduct of any application of land-preservation strategies as well.

5) Land Preservation
Land Preservation includes open space requirements and minimization of effective impervious area. Both have the goal of avoiding or directing runoff from impervious surfaces to pervious areas, rather than routing it directly to the storm drainage system.

Within each broad category of management strategies, multiple SCMs are available for direct application to meet performance criteria. Similarly, a single SCM may reflect multiple management strategies and address more than one watershed process, which provides the reminder that well-chosen SCMs can accomplish multiple objectives within a relatively simple mitigation approach. In addition, some SCMs are traditional facilities ('structural' SCMs), whereas others may affect overall site design, choice of construction materials and approaches, or may invoke programmatic strategies administered over a larger area (e.g., rain barrel incentive program). This great variety of available measures means the designer will likely need to make use of a suite of SCMs that, in combination, can meet the performance requirements

required for the protection of watershed processes at the site. The designer's task is to optimize the choice of SCMs to achieve the desired net benefits with a desired level of simplicity and necessary degree of reliability.

V. Post-Construction Performance Requirements

The core of these Post-Construction Requirements is a group of Performance Requirements for new and redevelopment projects that invoke the management strategies discussed above. The following discusses each Performance Requirement and related implementation requirements, including the types of projects subject to the Performance Requirements and the necessary analytical methods required to meet compliance. Flow charts to assist in determining which Performance Requirements apply are provided in Attachment C.

The Performance Requirements rely on four important strategies that are critical to recognize for a full understanding of how the requirements, taken together, will result in protection of watershed processes and the beneficial uses they support: 1) a reliance on LID to the extent feasible to achieve protection of the broadest suite of watershed processes not effectively targeted by structural controls; 2) the use of Stormwater Control Plans to ensure project applicants have followed due diligence in selecting SCMs and have optimized LID; 3) the combination of retention and peak management requirements on larger sites to achieve a broad spectrum of watershed process protection while also protecting stream channels from hydromodification impacts; and 4) the additive application of Performance Requirements as projects trigger each size threshold (e.g., the largest sites must meet Performance Requirements applying to smaller sites). Elements of these strategies are integrated into the Performance Requirements to support successful implementation.

1) Regulated Projects

Development projects subject to these requirements are a subset of the diverse spectrum of development projects Permittees approve. The Post-Construction Requirements specify several exemptions, including, for example, road maintenance projects and trail projects that direct runoff to adjacent vegetated areas.

Following a convention used throughout the United States, these Post-Construction Requirements use the amount of impervious surface as the parameter of interest in determining applicability. Thus, only projects that create and/or replace impervious surface are potentially subject to regulation of post-construction requirements. Central Coast Water Board staff recognizes that a development project's impervious surface is an imperfect proxy for all potential post-construction impacts of the project. For example, land disturbance that does not lead to the placement of impervious surfaces (e.g., construction of a gravel road) may still result in impacts to watershed processes by potentially compacting infiltrative soils, removing vegetation, or permanently altering drainage patterns.

These Post-Construction Requirements compensate for this imperfection by applying Performance Requirements, in some cases, to the entire site area, not just the impervious surface area. For example, Performance Requirement No. 1 applies to the entire site area, while Performance Requirement No.s 2-4 apply only to the site's Equivalent Impervious Surface Area (see Post-Construction Requirements Attachment E).

2) Performance Requirement No. 1: Site Design and Runoff Reduction

This requirement applies to projects that create and/or replace ≥ 2,500 square feet of impervious surface and requires projects to utilize site design and runoff reduction measures, where feasible. The site design measures are the first and best opportunity to invoke management strategies for land preservation, and maintenance of soil and vegetation regime, which in turn support other strategies for flow control, water quality treatment, and preserving delivery sediment and organic matter to receiving waters. For example, minimizing impervious surfaces and minimizing compaction of native soils in site design preserves land area available to support these watershed processes, and retains the soils' capacity to infiltrate water, reducing runoff that requires treatment and flow controls. Performance Requirement No.1 invokes the LID design concept of mimicking predevelopment hydrology to the extent feasible.

Projects creating and/or replacing 2,500 square feet of impervious surface are too small to justify numeric requirements that would require hydrologic or engineering analysis. However, they are large enough to generate impacts to watershed processes, both individually and cumulatively, over time in a watershed. Permittees must apply this requirement by informing project applicants that the specific measures must be pursued on the project site where feasible, and requiring the applicant, through application/approval documents, to indicate which measures are being implemented on their project. Performance Requirement No.1 is required on all Regulated Projects in all WMZs.

3) Performance Requirement No. 2: Water Quality Treatment

The Water Quality Treatment Performance Requirement in these Post-Construction Requirements applies to Regulated Projects that create and/or replace ≥ 5,000 square feet of Net Impervious Area, and to detached single-family residences that create and/or replace ≥ 15,000 square feet of Net Impervious Area. Net Impervious Area, or, the sum of new and reconstructed impervious areas, minus any reduction in total site imperviousness, between pre- and post-project conditions, is used to determine applicability of the Water Quality Treatment Performance Requirement. The Net calculation is intended to provide a possible exemption for projects that would be subject to Water Quality Treatment Performance Requirements when their new and replaced impervious surfaces exceed 5,000 square feet, even when the project results in lower total imperviousness. While expected to occur in a limited number of cases, the Net calculation may provide applicants an incentive to reduce the total amount of imperviousness in some smaller Regulated Projects. Performance Requirement No. 2 applies to all projects in all Watershed Management Zones and is applied 'cumulatively' (i.e., it applies to all projects larger than 15,000 square feet).

A National Urban Runoff Program (NURP) study showed that heavy metals, organics, coliform bacteria, nutrients, oxygen demanding substances (e.g., decaying vegetation), and total suspended solids are found at relatively high levels in stormwater and non-stormwater discharges.[17] It also found that MS4 discharges draining residential, commercial, and light industrial areas contain significant loadings of total suspended solids and other pollutants. In addition, the State Water Board Urban Runoff Technical Advisory Committee (TAC) finds that urban runoff pollutants include sediments, nutrients, oxygen-demanding substances, heavy metals, petroleum hydrocarbons, pathogenic bacteria, viruses, and pesticides.[18] Runoff that

[17] State Water Resources Control Board. *Order WQ 2001-15, In the Matter of Petitions of Building Industry Association of San Diego County and Western States Petroleum Association,* 15 November 2001. Web. 11 August 2011.

[18] State Water Resources Control Board. Nonpoint Source Pollution Control Program. *Urban Runoff Technical Advisory Committee Report,* November 1994. Web. 11 August 2011.

flows over streets, parking lots, construction sites, and industrial, commercial, residential, and municipal areas carries these untreated pollutants through MS4s directly to receiving waters.

The Natural Resources Defense Council (NRDC) 1999 Report, "*Stormwater Strategies, Community Responses to Runoff Pollution*" identifies concentration of pollutants in runoff to be one of the main causes of the stormwater pollution problem in developed areas. The report states that certain industrial, commercial, residential and construction activities are large contributors of pollutant concentrations in stormwater runoff. As human population density increases, it brings with it proportionately higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, and trash.

Studies show that the level of imperviousness in an area strongly correlates with the quality of nearby receiving waters.[19] One comprehensive study, which looked at numerous areas, variables, and methods, revealed that stream degradation occurs at levels of imperviousness as low as 10 – 20 percent.[20] Stream degradation is a decline in the biological integrity and physical habitat conditions that are necessary to support natural biological diversity. For instance, few urban streams can support diverse benthic communities with imperviousness greater than or equal to 25 percent.[21] To provide some perspective, a medium density, single-family residential area can be from 25 percent to 60 percent impervious (variation due to street and parking design).[22] More recently, a report on the effects of imperviousness in southern California streams found that local ephemeral and intermittent streams are more sensitive to such effects than streams in other parts of the country. This study, by the Southern California Coastal Water Research Program, estimated a threshold of response at a two to three percent change in percent of impervious cover in a watershed. [23, 24]

According to the Center for Watershed Protection, urbanization strongly shapes the quality of both surface and groundwater in arid and semi-arid regions of the southwest. Since rain events are so rare, pollutants have more time to build up on impervious surfaces compared to humid regions. Therefore, pollutant concentrations in stormwater runoff from arid watersheds tend to be higher than that of humid watersheds.[25] The effect of antecedent rainfall events is demonstrated in a recent report from the California Department of Transportation (Caltrans) that found the concept of a seasonal first flush is applicable to the southern California climate.[26]

The Water Quality Treatment Performance Requirement addresses post-construction pollutant loading through treatment measures that emphasize LID (harvesting and re-use, infiltration, and evapotranspiration) and biofiltration over conventional non-retention based or flow-based treatment approaches. All SCMs are to be designed for 85th percentile rainfall events as specified.

Flow-through treatment methods are generally recognized as achieving less than 100 percent pollutant removal from runoff leaving the site. By comparison, retention would result in 100 percent removal by virtue of preventing the discharge of runoff from the specified design storm.

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[19] Federal Register, 1999.
[20] Ibid.
[21] Ibid.
[22] Schueler, et al, 2000a.
[23] Coleman, et al, 2011. p. iv.
[24] Helmle and Booth, 2011a, p. 10.
[25] Schueler, et al, 2000b.
[26] Stenstrom, et al, 2011.

However, in these Post-Construction Requirements the allowance of flow-based treatment for projects up to 15,000 square feet is provided in recognition of several factors: 1) total pollutant generation and associated water quality impacts from smaller projects are anticipated to be less than those of larger (≥15,000 square feet) projects; 2) greater technical challenges due to space constraints of achieving retention on smaller sites relative to larger sites; and 3) higher costs, relative to total project value, for smaller projects to achieve retention. Furthermore, the retention requirement imposed for projects larger than 15,000 square feet requires that the project applicant demonstrate technical infeasibility before rejecting retention-based SCMs and selecting flow-through measures (unless the project is in an Urban Sustainability Area, wherein the requirement to demonstrate technical infeasibility is waived).

While the option of flow-through treatment is available for projects <15,000, the project applicant must submit a Stormwater Control Plan demonstrating why LID and biofiltration treatment systems could not be implemented. Permittees are required to review the Stormwater Control Plan and confirm that the feasibility of LID and biofiltration treatment system implementation has been considered before approving non-retention based treatment systems.

Central Coast Water Board staff places biofiltration treatment before non-retention based treatment systems in the order of preference because of the potential for the biofiltration system to achieve infiltration/retention and to replicate watershed processes (evapotranspiration, chemical and biological transformations) to a greater degree than other flow-through (non-retention) measures. The biofiltration treatment system can provide infiltration to the extent site soils allow it (e.g., in sites with highly infiltrative soils, the system would be expected to infiltrate, thus, retain a greater proportion of runoff directed to it, whereas a site with lower permeable soils would release more treated runoff to the storm drain system or receiving water.) While additional information is needed to ascertain more precise understanding of the pollutant removal efficiency of these systems, Central Coast Water Board staff supports their use because of the multiple benefits they offer over non-retention based treatment systems.

The option of providing treatment with biofiltration treatment systems is stipulated by the requirement that the system used be as effective as a biofiltration treatment system with the design parameters specified in the Post-Construction Requirements. Central Coast Water Board staff recommends that the minimum specifications for biofiltration systems in the Post-Construction Requirements be used in conjunction with additional guidance and specifications to ensure proper functioning of biofiltration systems. Central Coast Water Board staff modified the specification of minimum planting depth in biofiltration systems from that specified in designs used commonly in parts of the San Francisco Bay Area. A 24-inch minimum planting medium depth, as opposed to the 18-inch minimum depth indicated in the Bay Area specifications, is required because of current uncertainty of performance for bioretention systems with under-drains.[27] Questions remain about the functional roles of plants and specified soils mixes in California's arid climate, and providing greater soil media depth can provide improved performance in the interim period, as California research is carried out and regional guidelines are developed. Technical guidance for designing bioretention facilities is available from the Central Coast LID Initiative. The guidance includes specification and plant lists selected for the Central Coast climate.
(http://www.centralcoastlidi.org/Central_Coast_LIDI/LID_Structural_BMPs.html)

[27] Hunt, et al, 2012. pp. 6, 8, 10.

4) Performance Requirement No. 3: Runoff Retention

All Regulated Projects that create and/or replace ≥15,000 square feet of impervious surface in all WMZs except WMZ 3, which is underlain by generally impervious rocks, and WMZs 4, 7, and 10 where not underlain by groundwater basins, must retain stormwater runoff to protect watershed processes so that beneficial uses of receiving waters are maintained and, where applicable, restored. Where technically feasible, the goal of the retention requirement is that 100 percent of the volume of water from storms less than or equal to the indicated percentile event (85^{th} or 95^{th}), over the footprint of the project, will not discharge to surface waters. This Performance Requirement indicates compliance can be achieved through infiltration in some WMZs, and through non-infiltrative (storage, use, etc.) methods in others.

The Post-Construction Requirements include hydrologic analysis and sizing methods to calculate runoff volumes and size SCMs. These methods provide an event-based hydrologic analysis approach (see Post-Construction Requirements Attachment D). Calculations are conservative to acknowledge the limitations of event-based approaches while avoiding the necessity of calibrated, continuous simulation modeling. The sizing approach outlined in Attachment D of the Post-Construction Requirements was developed by a team of stakeholders including municipal stormwater agency representatives, practicing professional engineers, and Central Coast Water Board staff. Attachment G of this Technical Support Document describes the analysis conducted to arrive at the sizing approach.

Attachment D describes facility sizing by one of two methods: Simple Method, and Routing Method. The Simple Method is a direct calculation of facility size based on the runoff volume generated by a single 85^{th} or 95^{th} percentile 24-hr rainfall event, whichever applies. The calculated runoff volume is the resulting facility design volume, or, Stormwater Control Measure Capture Volume of the facility.

The Routing Method uses hydrograph analysis to determine the Stormwater Control Measure Capture Volume needed to retain the runoff generated by the 85^{th} or 95^{th} percentile 24-hr rainfall event, whichever applies. In this method, the Stormwater Control Measure Capture Volume is based on both the rate of flow from tributary areas into the Stormwater Control Measure, and the rate of flow out of the Stormwater Control Measure through infiltration into soils during the rainfall event. The Stormwater Control Measure must be designed such that a single 95^{th} or 85^{th} percentile 24-hr rainfall event will not overflow the Stormwater Control Measure. Application of the Routing Method results in stormwater retention facilities that are smaller than those sized using the Simple Method.

As an alternative to the sizing method provided in Attachment D, the Permittee can allow project applicants to use a locally/regionally calibrated continuous simulation-based model to improve hydrologic analysis and SCM sizing, or Central Coast Water Board Executive Officer approved hydrologic analysis and sizing methods as effective in optimizing on-site retention as the sizing methods outlined in Attachment D.

Where technical infeasibility limits on-site compliance, the Post-Construction Requirements specify a 10 percent limit on what portion of a site's Equivalent Impervious Surface Area must be dedicated to retention-based structural Stormwater Control Measures (see Post-Construction Requirements Section B.4.e.). If technical infeasibility can be demonstrated, and a project meets the 10 percent limit, no off-site mitigation is required for any remaining volume per the Runoff Retention Performance Requirement. By establishing an upper boundary on site area dedicated to stormwater controls, this adjustment provides a clear point of compliance that corresponds well with landscape dedications already required by many municipalities. The

upper limit is particularly important for projects in areas of high rainfall depths and tight, clayey soils, though this combination of conditions affect only a fraction of all urbanized portions of the Central Coast Region. Sites with these conditions will be held to the runoff retention that is possible within the 10 percent area and no more.

Where off-site mitigation is required (e.g., where less than 10 percent of the Equivalent Impervious Surface Area is allocated to retention-based SCMs and there is remaining runoff volume), the volume to be mitigated is determined by the project site's characteristics, not the off-site project site's characteristics. The calculation of the volume to be mitigated is thus equivalent to the amount of retention that would have occurred on the project site, had the full 10 percent of Equivalent Impervious Surface Area been allocated. Attachment F provides examples for Calculating Off-Site Retention Requirements.

The Basis for Requiring Runoff Retention

For the purposes of these Post-Construction Requirements, retaining runoff from all rain storms up to and including the 85th or 95th percentile storm is analogous to maintaining or restoring the pre-development hydrology with respect to the volume, flow rate, duration and temperature of the runoff for most sites. Retention of runoff up to these percentile storms is indicated because this storm size represents the volume that appears to best represent the volume that is fully infiltrated in a natural condition and thus should be managed onsite to maintain this pre-development hydrology for duration, rate and volume of stormwater flows. Maintaining pre-development runoff duration, rate, and volume provides broad support to watershed processes, including, reduced overland flow, infiltration, interflow, and groundwater recharge, and achieves reductions in urban pollutant loading of receiving waters that are non-existent under natural conditions.

In general, only large storms generate significant runoff under pre-development conditions. The Joint Effort landscape analysis confirmed that this holds true for most of the Central Coast Region and the designated WMZs reflect this.[28] The relative rarity of overland flow in undisturbed conditions is not unique to the Central Coast however. It is in fact the basis for federal stormwater control standards promulgated by the Energy Independence and Security Act of 2007[29] (EISA) and applied throughout the United States. The EISA standard includes a 95th percentile retention requirement for federal facilities creating or replacing $\geq$ 5,000 square feet. Rain storms smaller than the 95th percentile storm are considered small storms. The EISA Technical Guidance states:

> "The runoff produced by these small storms and the initial portion of larger storms has a strong negative cumulative impact on receiving water hydrology and water quality. In areas that have been developed, runoff is generated from almost all storms, both small and large, due to the impervious surfaces associated with development and the loss of soils and vegetation. In contrast, natural or undeveloped areas discharge little or no runoff from small storms because the rain is absorbed by the landscape and vegetation. Studies have shown that increases in runoff event frequency, volume and rate can be diminished or eliminated through the use of Green Infrastructure/LID designs and practices, which infiltrate, evapotranspire, and capture and use stormwater."[30]

[28] Booth, et al, 2011b. p. vi.
[29] USEPA, 2009. http://www.epa.gov/owow/NPS/lid/section438/pdf/final_sec438_eisa.pdf
[30] Ibid. p. 13.

Retaining 100 percent of all rainfall events equal to or less than the 95th percentile rainfall event approach was selected because "it employs natural treatment and flow attenuation methods that are presumed to have existed on the site before construction of infrastructure (e.g., building, roads, parking lots, driveways) and is intended to infiltrate or evapotranspirate the full volume of the 95th percentile storm."[31]

The United States Environmental Protection Agency's 2010 MS4 Permit Improvement Guide provides the 95th percentile criterion as an example for communities to adopt. In that guidance document, one of the examples of site performance standards states, "Design, construct, and maintain stormwater management practices that manage rainfall onsite, and prevent the offsite discharge of the precipitation from all rainfall events less than or equal to [insert standards, such as 'the 95th percentile rainfall event']." [32]

Runoff retention requirements achieve water quality treatment objectives as well. For the purposes of these Post-Construction Requirements, achieving compliance with Performance Requirement No. 3 equates with compliance with Performance Requirement No. 2, Water Quality Treatment, since runoff retention effectively eliminates pollutant loading of receiving waters from rain events up to the 85th or 95th Percentile event.

Retention Requirements Keyed to WMZs

In WMZ 1 and, where overlying Groundwater Basins, in WMZs 4, 7 and 10, Performance Requirement No. 3 is to retain the 95th Percentile via infiltration. The conclusion of the Joint Effort landscape analysis[33] is that the dominant watershed process throughout these WMZs is infiltration into shallow and deeper soil layers and that overland flow is localized and rare (see Table 4 Key). The imperative for infiltration to support recharge of known groundwater basins is self-evident in a region as heavily reliant on groundwater as the Central Coast.

In WMZ 2 Performance Requirement No. 3 is to retain the 95th Percentile event via storage, rainwater harvesting, infiltration, and/or evapotranspiration. Infiltration is not essential in this WMZ (only 1% of the Central Coast Region's urban area in this WMZ overlies a groundwater basin). Nevertheless, overland flow is still rare due to subsurface flow, so the retention requirement prevents discharges below a threshold presumed to replicate pre-development hydrology. Where non-infiltrative methods are allowed, runoff can be harvested and used and ultimately may be discharged via a sanitary treatment system. For example, if runoff is captured for non-potable uses such as toilet flushing or other uses that are not irrigation related, these waters potentially could be discharged into the sanitary sewer system.

Performance Requirement No.3 for WMZs 5, 6, 8, and 9 is to retain the 85th Percentile Rainfall Event. The dominant watershed processes in these WMZs, as determined by receiving water type, geologic material and slope, indicate a threshold for retention lower than the 95th percentile required for WMZs 1 and 2, and WMZs 4, 7, and 10 where they overly groundwater basins. Watershed processes in WMZs 5, 6, 8, and 9 also include groundwater recharge, interflow, and overland flow (see Table 4 Key), and these processes are effectively managed by retention of small storms on site. However, the processes are less critical or less responsive to disturbance than in the WMZs where 95th percentile retention is required.

[31] Ibid, pp. 12, 13.
[32] Ibid, p. 52.
[33] Booth, et al, 2011b. p. vi.

In WMZs 5 and 8, compliance must be achieved via infiltration. These steep, geologically young, and generally infiltrative deposits require management strategies to maintain the relatively high degree of shallow (and locally deeper) infiltration that reflects the relatively permeable nature of these deposits. However slopes greater than 40% indicate a low potential for overland flow under undisturbed conditions.

WMZs 6 and 9 allow retention of the 85th Percentile Rainfall event through storage, rainwater harvesting, infiltration, and/or evapotranspiration, where feasible. WMZ 6 includes steeply sloping areas that provide little opportunity for deep infiltration, owing to the physical properties of the underlying rock. Management strategies should avoid any increase in overland flow beyond natural rates, which are low where undisturbed even in this steep terrain. WMZ 9 includes moderately sloped, older rocks that drain to either a stream or wetland that are not extremely sensitive to changes in infiltrative processes (because the underlying rock types are typically impervious). Overland flow is still uncommon over the surface soil, however retention is required to avoid gross changes in the distribution of runoff between surface and subsurface flow paths. Deep infiltration is unnecessary in the absence of an underlying groundwater basin.

Feasibility of Achieving Retention

These Post-Construction Requirements require all applicable Regulated Projects to meet the Runoff Retention Performance Requirements using LID Development Standards, which include: site assessment measures; site design measures; site runoff reduction measures; and structural SCMs that optimize protection and restoration of watershed processes, such as bioretention and other small-scale, decentralized, LID measures. The applicant must demonstrate through submittal of the Stormwater Control Plan that each of these elements has been achieved to the extent feasible before selecting more conventional structural SCMs. Where LID SCMs and/or BMPs are not feasible, the Permittee may allow Regulated Projects to use conventional designs (wet ponds, dry wells, infiltration basins) to meet the Runoff Retention Performance Requirement.

The site assessment and site design measures are the first and best opportunity to invoke the entire suite of management strategies that protect watershed processes, including: land preservation, maintenance of soil and vegetation regime, flow control, water quality, and the delivery sediment and organic matter to receiving waters. The runoff reduction measures are intended to further reduce the total volumes of runoff that must be retained through structural measures by directing runoff to undisturbed or natural landscaped areas that the applicant can demonstrate infiltrate runoff. The applicant should quantify the portion of the total Performance Requirement retention volume addressed through these measures and then address any remaining volume using structural SCMs. Structural SCMs consistent with LID principles of retention and/or treatment via infiltration, evapotranspiration, filtration, or capture and reuse are to be prioritized in addressing the remaining volume.

The LID Development Standard ensures that the project applicants avail themselves of the great variety of available measures that, in combination, can meet the performance requirements required for the protection of watershed processes at the site. The applicant's task is to optimize the choice of SCMs to achieve the desired net benefits with a desired level of simplicity and necessary degree of reliability. LID Stormwater Control Measure/Best Management Practice selection and design guidance is available from the following resources: 1) Southern California LID BMP Manual,[34] 2) Contra Costa C.3 Manual,[35] and 3) City of Santa

[34] LID Manual for Southern California: Technical Guidance and Site Planning Strategies. (http://www.casqa.org/LID/tabid/240/Default.aspx)

Barbara LID BMP Manual.[36] Guidance specific to LID structural BMPs is also available through the Central Coast LID Initiative.[37]

Studies Evaluating Feasibility of Retaining the 95th Percentile Rain Event

While there is substantial information available offering broad justification for retention requirements, there is an increasing number of studies evaluating the feasibility of actually achieving retention requirements in development projects. Two studies are discussed here:

Horner and Gretz, 2011: This study investigated the degree to which low-impact development methods or green infrastructure, can meet retention standards.[38] The study assessed five urban land use scenarios (three residential, one retail commercial, and one infill redevelopment); each placed in four climate regions in the continental United States on regionally common soil types (Hydrologic Soil Group (HSG) B, C, D).

For the 95th percentile retention standard, the investigators found that infiltration/bioretention methods could retain all post-development runoff and pre-existing groundwater recharge, as well as attenuate all pollutant transport, in three residential land use development types on HSG B soils, in all cases, in all regions, taking a fraction of the available pervious area to do so. For the more highly impervious commercial retail and redevelopment cases, bioretention would retain about 45 percent of the runoff and pollutants generated and save about 40 percent of the pre-development recharge. Applying roof runoff management measures in these cases approximately doubled retention and pollutant reduction for the retail commercial land use and raised it to 100 percent for the redevelopment scenario. These measures include harvesting, temporarily storing, and applying roof runoff to use in the building or, efficiently directing roof runoff into the soil through downspout dispersion systems.

Results were generally similar with HSG C soils, although more of the pervious portion of sites was required to equal the retention seen on B soils. For development on the D soils in all climate regions, use of roof runoff management techniques was estimated to increase runoff retention and pollutant reduction from zero to approximately one-third to two-thirds of the post-development runoff generated, depending on the land use case.[39].

Using the LID methods considered, projects on HSG B and C soils were projected to meet the 95th percentile retention standard in all but 12 of 125 evaluations. On HSG D soils, all hypothetical projects were able to retain greater than 50 percent of the runoff volume associated with the 85th percentile, 24-hour precipitation event and the authors noted that opportunities to use practices or site design principles not modeled in their analysis could potentially further increase the runoff retention volume.[40]

The distribution of soil types within the urban areas of the Central Coast indicate that approximately half of the region has high to moderately infiltrative soils, A and B, and half has slow to very slow infiltrative soils, C and D (Table 6). The soil groups, based on estimates of

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[35] Contra Costa Glean Water Program, C.3 Guidebook (http://www.cccleanwater.org/c3-guidebook.html)

[36] City of Santa Barbara Storm Water Best Management Practices (BMP) Guidance Manual (http://www.santabarbaraca.gov/Resident/Community/Creeks/Storm_Water_Management_Program.htm)

[37] LIDI Structural BMPs. http://www.centralcoastlidi.org/Central_Coast_LIDI/LID_Structural_BMPs.html

[38] Horner and Gretz, 2011.

[39] Ibid, p. i.

[40] Ibid, p. 42.

runoff potential are mapped over broad areas that do not capture variations in the infiltrative capacity of soils. Consequently, sites mapped as a particular HSG Group, will likely exhibit variation in infiltration capacities.

Table 6. Soil Types within Urban Areas of the Central Coast

Hydrologic Soil Group	Percentage in Urban Areas
A	13%
B	37%
C	19%
D	27%

Source: Stillwater Sciences, GIS analysis

Technical Guidance for the Federal EISA: The EISA Technical Guidance includes nine case studies of projects designed to retain the 95th percentile rain event. The case studies are intended to be representative of the range of projects subject to the EISA requirements and include differing geographic locations, site conditions, and project sizes and types; all for projects with a footprint greater than 5,000 square feet. Assumptions were used to keep a "somewhat conservative cap" on the scenarios in order to demonstrate the feasibility of the approach.[41]

Although sites varied in terms of climate and soil conditions, in most of the scenarios selected, the 95th percentile storm event could be managed onsite with LID and green infrastructure systems.[42] The case studies include eight sites where it was technically feasible to design the stormwater management system to retain the 95th percentile storm onsite. On a ninth site, site constraints allowed the designers to retain only 75% of the 95th percentile storm.[43]

Adjustments to the Runoff Retention Performance Requirements for Redevelopment

In acknowledgement of the technical challenges of meeting retention requirements in redevelopment contexts, and consistent with a presumed water quality benefit of infill and redevelopment, relative to new development, these Post-Construction Requirements include adjustments to the Runoff Retention Performance Requirement for redevelopment. There is precedent for such adjustments in other California municipal stormwater permits as well. In these Post-Construction Requirements the adjustment is applied in determining the total amount of impervious surface that must meet the Performance Requirement. The adjustments result in less of the impervious surface being subject to the retention requirement. In all Regulated Projects, one-half (50%) of *replaced* impervious surface is subject to the Retention Requirements. The entire area (100%) of *new* impervious surface remains subject to the Retention Requirements, unless the project is within an Urban Sustainability Area and eligible for Alternative Compliance. In that instance, one-half (50%) of *new* impervious surface is subject to the Retention Requirements. The Urban Sustainability Area is discussed in greater detail below (Alternative Compliance).

5) Performance Requirement No. 4: Peak Management

The Peak Management Performance Requirement is applied to projects that create and/or replace ≥22,500 square feet of impervious surface. The criterion itself states that post-development peak flows shall not exceed pre-project peak flows for the 2- through 10-yr storm

[41] USEPA, 2009. p. 26.
[42] Ibid, p. 54.
[43] Ibid, p. 25.

events. Peak management is required only in Watershed Management Zones where receiving waters (streams) are potentially impacted by hydromodification effects resulting from alterations to runoff duration, rate, and volume. These include WMZs 1, 2, 3, 6, and 9.

Central Coast Water Board staff recognizes that peak management alone is not sufficient to protect downstream receiving waters due to the extended flow durations that can still cause adverse impacts. However, Central Coast Water Board staff anticipates that the Peak Management criterion, when used in combination with the Runoff Retention requirement, will achieve a broad spectrum of watershed process protection while also protecting stream channels from hydromodification impacts. Central Coast Water Board staff's judgment is based on the fact that the retention requirement is expected to avoid gross changes in the distribution of runoff between surface and subsurface flow paths for smaller events, and that peak management is expected to provide critical stream protection from the larger events, starting conservatively at the 2-year storm event.

Relationship of Retention/Peak Management to Flow Duration Management

Retaining both the runoff produced by small storms and the first part of larger storms can reduce the cumulative impacts of altered flow regimes on receiving water hydrology, including channel degradation and diminished baseflow. For example, the EISA Technical Guidance states, "for the purposes of this guidance, retaining all storms up to and including the 95th percentile storm event is analogous to maintaining or restoring the pre-development hydrology with respect to the volume, flow rate, duration and temperature of the runoff for most sites."[44]

Using retention to maintain flow duration in particular addresses a well-recognized cause of impacts to stream stability. Many current municipal stormwater permits require flow duration control to protect streams from the effects of flow regimes altered by urban development. The use of flow-duration matching in pre- and post-development conditions to maintain channel stability was first suggested in 1989 in watershed plans being developed for the greater Seattle area. The range of urban-influenced flows requiring control was initially established as one-half of the two-year recurrence ($0.5Q_2$) through the 100-year flow (Q_{100}).[45] Flow-duration management typically relies on structural solutions including detention systems with orifice sizing to maintain release rates below the specified critical flow (e.g., $0.5Q_2$).

The current stormwater control manual for western Washington State regulations includes the requirement for flow-duration control from one-half of the two-year recurrence ($0.5Q_2$) through the 50-year flow (Q_{50}) and includes an exemption for channels draining long-urbanized watersheds (and thus presumably re-stabilized). At the same time, the manual explicitly recognizes the fundamental limitation of flow control: "The engineered stormwater conveyance, treatment, and detention systems advocated by this and other stormwater manuals can reduce the impacts of development to water quality and hydrology. But they cannot replicate the natural hydrologic functions of the natural watershed that existed before development, nor can they remove sufficient pollutants to replicate the water quality of pre-development conditions."[46]

While the western Washington State flow-duration requirements remain in place, a recent ruling by the Washington State Pollution Control Hearings Board overturned the narrow regulatory focus on flow-duration standards. The ruling "require[s] non-structural preventive actions and source reduction approaches, including Low Impact Development Techniques (LID), to minimize

[44] USEPA, 2009.
[45] Helmle and. Booth, 2011a. p. 4.
[46] Ibid, p. 4.

the creation of impervious surfaces, and measures to minimize the disturbance of soils and vegetation where feasible."[47] The ruling represents an acknowledgement that flow-duration standards alone are not sufficient to protect or restore receiving waters and that requirements associated with on-site retention such as those represented by LID principles, in combination with flow-duration management of larger storms are more protective.

In California, hydromodification control standards for post-construction new and redevelopment established in the Bay Area municipal permits generally require that post-project runoff shall not exceed pre-project rates or durations over a range of storm event sizes from one-tenth of the 2-year recurrence flow ($0.1Q_2$) up to the 10-year flow (Q_{10}).[48] Meanwhile, in Southern California, authors citing several studies that relate storm event discharge to sediment transport, noted that any attempt to match pre-development flow duration across the entire spectrum of discharges would be problematic, since development leads to an increase in the total runoff volume and so some flows must increase in their total duration to account for the extra total discharge.[49]

An evaluation of candidate numeric criteria to protect watershed processes conducted for the Joint Effort found that overall; while providing stream channel stability, flow duration management narrowly targets the full spectrum of watershed processes.[50] Recognizing the flow duration control inherent in the Runoff Retention Performance Requirement as well as the limitation of flow duration matching requirements found in other California stormwater permits, Central Coast Water Board staff selected not to include specific criteria for matching flow duration in these Post-Construction Requirements.

6) Performance Requirement No. 5: Special Circumstances

The Joint Effort landscape analysis supporting the designation of WMZs was completed at a scale appropriate to a regional scope and scale of the overall Joint Effort. In any broad-scale characterization of a landscape, general patterns will tend to overwhelm minor variations within broad categories, and ignore uncommon exceptions or outright contradictions. The application of regional-scale data to specific localities always includes potential errors, either with imprecise geographic placement or the loss of detail that may be "insignificant" at a regional scale but quite relevant on a particular location of interest.[51] These Post-Construction Requirements allow the Permittee to designate Regulated Projects as subject to 'Special Circumstances' based on certain site and/or receiving water conditions that were not captured at the regional scale of analysis. The Special Circumstances designations effectively exempt Regulated Projects from Retention and/or Peak Management Performance Requirements where those Performance Requirements would be ineffective or inappropriate to maintaining or restoring beneficial uses of receiving waters. Water Quality Treatment Performance Requirements are not affected by Special Circumstance designations (i.e., no exemptions are available for Performance Requirement 2).

<u>Historic Lake and Wetland Special Circumstance</u>

Over time, California has lost many receiving waters such as lakes, and wetlands, to human land use activities (e.g. reclamation, fill, rerouting of water, etc.). These historic environments had intrinsic value and also provided water quality and hydrologic benefit to downstream waterbodies (e.g., streams). The Joint Effort analysis was conducted at a scale that did not

[47] Ibid, p. 4
[48] Ibid, p. 13
[49] Ibid, p. 7
[50] Helmle. C., 2012.
[51] Booth, et al, 2011b. p. 23.

account for these historic hydrologic features and the resulting WMZs do not address the special circumstance of their occurrence. Consequently, the infiltration requirements indicated for the WMZs may not be appropriate for a development project located where there was once a historic hydrologic feature such as a lake or wetland. In these situations, pre-development hydrologic processes did not include significant infiltration of rainwater but did include filtration, storage, and ponding; resulting in the feature functioning as a detention facility. When the largest rainfall events filled these features, their overflow and release of runoff into downstream receiving waters was attenuated by their storage capacity.

Where the Permittee can provide reasonable documentation of the occurrence and location of historic lakes and wetlands, it may designate projects within such areas as a Special Circumstance for Historic Lake and Wetland. Such projects are then subject to detention and/or peak management Performance Requirements more suited to the historic conditions and sensitivity to downstream receiving waters.

The Permittee may select to undertake the analysis to support the designation of the Special Circumstance for Historic Lake and Wetland on a case-by-case basis as projects are proposed in areas potentially qualifying for the designation. Alternately, the Permittee may pursue an area-wide assessment that supports subsequent project designations. In either case, the Permittee shall submit a proposal to the Water Board Executive Officer for review and shall not grant the Special Circumstance designation until the Water Board Executive Officer has granted approval.

Highly Altered Channel Special Circumstance

The Permittee may designate Regulated Projects as subject to Special Circumstances for Highly Altered Channels when project runoff discharges into concrete-lined or otherwise continuously armored stream channels, or are contained by a continuous underground storm drain system, from the discharge point to the channel's confluence with a lake, large river (>200-square mile drainage area), or ocean.

Intermediate Flow Control Facility Special Circumstance

The Permittee may designate Regulated Projects as subject to this Special Circumstance where Project runoff discharges to an existing flow control facility that regulates flow volumes and durations to levels that have been demonstrated to be protective of beneficial uses of the receiving water downstream of the facility. The flow control facility must have the capacity to accept the Regulated Project's runoff.

Projects in the Highly Altered Channel and Intermediate Flow Control Facility Special Circumstances are considered to present no risk of hydromodification to the streams they drain to. Consequently, the peak management requirements that would otherwise apply are waived. However, depending on the WMZ and identified watershed processes, runoff retention may still be required, and in all WMZs, Water Quality Treatment Requirements still apply.

VI. Alternative Compliance (Off-Site Compliance)

Alternative Compliance refers to achieving Performance Requirements off-site through mechanisms such as developer fee-in-lieu arrangements and/or use of regional facilities. Alternative Compliance is allowed for several circumstances including technical infeasibility, an

approved Watershed or Regional Plan, or an approved Urban Sustainability Area. The Water Board Executive Officer may also approve Alternative Compliance in situations other than these.

Technical infeasibility constrains what can be done on some sites to manage stormwater and an alternative is necessary to allow for compliance to be achieved off-site. The site conditions that generally cause or contribute to technical infeasibility in these Post-Construction Requirements are consistent with those indicated municipal stormwater permits throughout California. For Alternative Compliance options to be allowed solely for technical infeasibility, project applicants must submit information demonstrating that meeting the Performance Requirements is technically infeasible. However, projects allowed Alternative Compliance under Watershed or Regional Plans and Urban Sustainability Areas are not required to demonstrate technical infeasibility for Runoff Retention and Peak Management, thus affording these projects an advantage over projects not covered by those overarching assessments.

The Watershed or Regional Plans and Urban Sustainability Areas are programmatic approaches that may be undertaken by Permittees to increase their flexibility in the implementation of Post-Construction Requirements. Central Coast Water Board staff recognizes the multiple priorities confronting municipalities as they manage the growth occurring within their boundaries. These programmatic approaches require planning and assessment work on the part of the Permittee that can balance water quality protection goals with the needs for adequate housing, population growth, public transportation and management, land recycling, and urban revitalization.

"Stormwater cannot be adequately managed on a piecemeal basis due to the complexity of both the hydrologic and pollutant processes and their effect on habitat and stream quality."[52]

With this statement and many that follow, a recent report on managing stormwater in the United States prepared by the National Research Council (NRC) for the United States Environmental Protection Agency (USEPA), argues for a comprehensive strategy to address stormwater impacts at a variety of scales and to curb the development patterns that create excess imperviousness and other anthropogenic disturbances to watershed processes. Beyond the site-level, stormwater impacts are linked to the overall pattern of development in a watershed, including its location and form. The NRC report promotes a watershed-based approach to stormwater management to move beyond the piecemeal approach and address both site and watershed scales.

In an effort to invoke such an approach, these Post-Construction Requirements provide Permittees with the option of developing Watershed or Regional Plans. This Alternative Compliance provision is intended to provide Permittees with an opportunity to identify off-site mitigation projects that address the full suite of watershed processes more effectively than could be done on-site. The Plans would identify off-site SCMs that, when implemented, would be at least as effective in maintaining watershed processes as on-site implementation of the applicable Post-Construction Stormwater Requirements. Watershed and Regional Plans developed per these Post-Construction Requirements will take into consideration the long-term cumulative impacts of urbanization including existing and future development and include.

<u>Requirements for Projects Covered by a Watershed or Regional Plan</u>

[52] National Research Council, National Academies Press, 2008. p. 8.

No adjustments are made to the Performance Requirements for projects in a Watershed Plan or Regional Plan (i.e., off-site compliance must meet the same requirements as if met on-site). The primary relief for the project applicant provided by this Alternative Compliance is the permission to go off-site, and the waiving of the requirement to demonstrate technical infeasibility of achieving the Performance Requirements on-site.

Requirements for Projects Covered by an Urban Sustainability Area

The adjustment to Performance Requirements for projects located within an approved Urban Sustainability Area is a reduction in the amount impervious surface subject to the Runoff Retention Performance Requirement. Qualifying projects can multiply their total new and replaced impervious surface by 0.5 when calculating the volume of runoff to be retained on-site, or off-site.

The Urban Sustainability Area developed per these Post-Construction Requirements should encompass redevelopment, high density, and transit-oriented development projects that are intended to promote infill of existing urban areas and reduce urban sprawl. The Urban Sustainability Areas are intended to support the Permittee's efforts to balance water quality protection with the needs for adequate housing, population growth, public transportation and management, land recycling, and urban revitalization.

Central Coast Water Board staff acknowledges multiple environmental benefits of infill and redevelopment as compared to greenfield development. While these benefits surely include water quality benefits, they are challenging to quantify in any meaningful sense. Nevertheless, we can presume a nexus to water quality and watershed health from focusing development in the urban core. This 'infill' development typically requires less supporting infrastructure (e.g., roads, utilities) and occurs in areas that are already disturbed, as compared to greenfield development, which creates new impacts and expands the urban footprint.

In recognition of the presumed water quality benefit of infill and redevelopment, and to be consistent with post-development requirements in other current municipal stormwater permits in California, Central Coast Water Board staff includes in these Post-Construction Requirements adjustments to Performance Requirements for all redevelopment sites and further adjustments for Alternative Compliance projects in an approved Urban Sustainability Area. (See Section V.I.)

Central Coast Water Board staff is not basing these adjustments to the Performance Requirements on any assumption that equivalent requirements for infill and greenfield projects results in fewer infill projects being pursued. Central Coast Water Board staff cannot predict whether the adjustments, which result in less stringent requirements for redevelopment projects, will address any perceived or real aversion to such projects by the development community. Central Coast Water Board staff has no information beyond anecdotal information to support any assumption about greenfield projects being preferred to infill or redevelopment projects because of the challenges of meeting stormwater requirements in infill or redevelopment sites.

The limited information Central Coast Water Board staff has reviewed does not support the contention that stormwater regulations are a critical factor in determining the location of development. The Smart Growth Association, American Rivers, Center for Neighborhood Technology, River Network, and the National Resources Defense Council, asked ECONorthwest to investigate whether stormwater regulations that require or encourage LID, applied uniformly to greenfield development and redevelopment, would impact developers' decisions about where and how to build. The study, based on case studies of multiple

municipalities, indicated that implementing LID in redevelopment situations tended to be more challenging than on greenfield developments, because LID techniques are usually more site-specific and custom. However, developers were not choosing to invest in greenfield developments over redevelopment because of LID standards. The study indicated that developers' decision-making process for projects incorporates a wide range of economic factors, including various construction costs, current and future market conditions, regulatory incentives and disincentives, and uncertainty and risk. Many developers interviewed for the study described the cost of implementing stormwater controls as minor compared to other economic factors they considered in deciding whether or not to pursue a project, especially in the context of complex redevelopment projects and green building infill projects. The study points out that the demand for green buildings and sustainable stormwater practices has been increasing in response to the rapid growth in the global green building industry, which will likely play an important role in developers' decisions for how and where to build.[53]

VII. Reporting

1) Project Applicant Reporting to Permittee

The Post-Construction Requirements require all applicants for projects $\geq$ 5,000 square feet to submit a Stormwater Control Plan. As additional Performance Requirements apply with increasing project size, the information required to be included in the Stormwater Control Plan also adjusts accordingly. The Post-Construction Requirements identify specific contents associated with each Performance Requirement.

Stormwater Control Plans provide the Permittee information to support review of project SCMs and are often required in California municipal stormwater permits to improve implementation of post-construction requirements. They address a common difficulty encountered when project applicants and municipal staff evaluating projects lack experience with identification and implementation of LID stormwater management strategies. This can lead to a reliance on conventional stormwater management strategies when alternatives that provide greater protection of watershed processes are available and feasible. Stormwater Control Plans serve to focus project review on key steps of the LID design process that are inherently difficult to evaluate, including: site assessment, site design, and runoff reduction measures. They also provide the framework for the applicant to submit the necessary technical information to indicate the infeasibility of meeting Performance Requirements on-site.

2) Permittee Reporting to the Central Coast Water Board

The reporting requirements include items that the Permittee must submit to the Water Board through Stormwater Program Annual Reporting. The information is necessary for the Water Board to evaluate compliance with these Post-Construction Requirements. The requirements are scalable to the size of the municipality in that smaller municipalities with less development activity will have less to report than larger municipalities with more development activity.

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[53] ECONorthwest, 2011

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ATTACHMENT A: Watershed Management Zones

Available electronically at:
http://www.waterboards.ca.gov/centralcoast/water_issues/programs/stormwater/docs/lid/lid_hydromod_charette_index.shtml

ATTACHMENT B: Designated Groundwater Basins

Groundwater basin areas are defined by the California Department of Water Resources (CDWR)[54] and used in the Central Coast Water Board Joint Effort for Hydromodification Control to identify groundwater receiving-water issues and areas where recharge is a key watershed process. CDWR based identification of the groundwater basins on the presence and areal extent of unconsolidated alluvial soils identified on a 1:250,000 scale from geologic maps provided by the California Department of Conservation, Division of Mines and Geology. CDWR then further evaluated identified groundwater basin areas through review of relevant geologic and hydrogeologic reports, well completion reports, court-determined adjudicated basin boundaries, and contact with local agencies to refine the basin boundaries.

Designated Groundwater Basins include those identified in the CDWR Groundwater Basins Map. Numbers correspond to Groundwater Basins in Table 1.

[54] California Department of Water Resources. 2004. Groundwater basin map. <http://www.water.ca.gov/groundwater/bulletin118/gwbasin_maps_descriptions.cfm>. Accessed September 15, 2006.

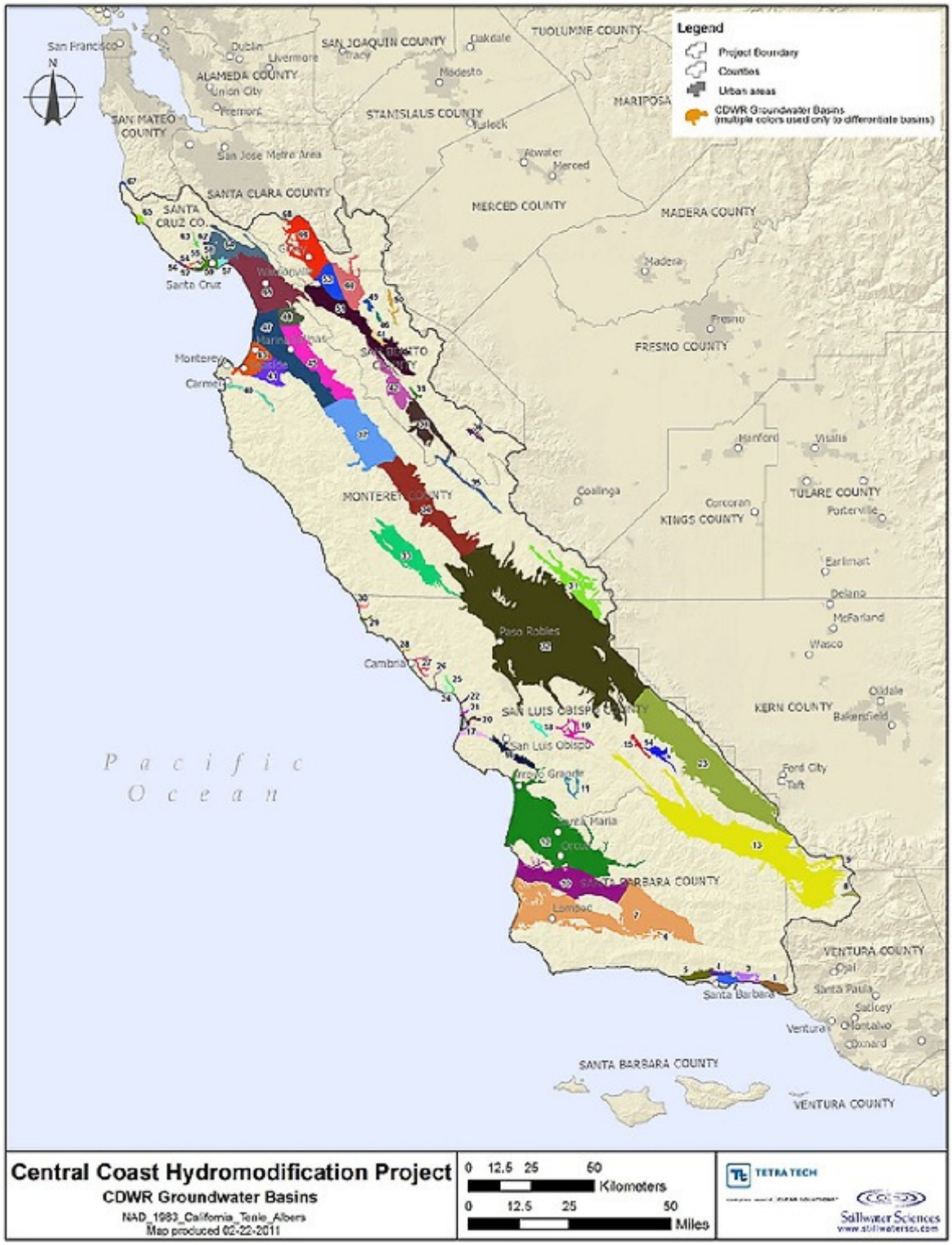

Legend
Project Boundary
Counties
Urban areas
CDWR Groundwater Basins
(multiple colors used only to differentiate basins)
San Francisco
N
SAN JOAQUIN COUNTY
TUOLUMNE COUNTY
ALAMEDA COUNTY
STANISLAUS COUNTY
MARIPOSA
SAN MATEO COUNTY
SANTA CLARA COUNTY
MERCED COUNTY
MADERA COUNTY
FRESNO COUNTY
MONTEREY COUNTY
KINGS COUNTY
TULARE COUNTY
KERN COUNTY
SAN LUIS OBISPO COUNTY
SANTA BARBARA COUNTY
VENTURA COUNTY
Pacific Ocean
Central Coast Hydromodification Project
CDWR Groundwater Basins
NAD_1983_California_Teale_Albers
Map produced 02-22-2011
0 12.5 25 50
Kilometers
0 12.5 25 50
Miles
TETRA TECH
Stillwater Sciences

Table 1: Groundwater Basins in the Central Coast Region by GIS Basin Number

GIS BASIN NUMBER	GROUNDWATER BASIN NAME	GIS BASIN NUMBER	GROUNDWATER BASIN NAME
1	Carpinteria	35	Peach Tree valley
2	Santa Barbara	36	Hernandez valley
3	Montecito	37	Salinas valley
4	Foothill	38	Bitter Water valley
5	Goleta	39	Dry Lake valley
6	Santa Ynez River valley	40	Carmel valley
7	Santa Ynez River valley	41	Salinas valley
8	Lockwood valley	42	San Benito river valley
9	Mil Potrero area	43	Salinas valley
10	San Antonio Creek valley	44	Tres Pinos valley
11	Huasna valley	45	Salinas valley
12	Santa Maria	46	Upper Santa Ana valley
13	Cuyama valley	47	Salinas valley
14	Big Spring area	48	Salinas valley
15	Rafael valley	49	Santa Ana valley
16	San Luis Obispo valley	50	Quien Sabe valley
17	Los Osos valley	51	Gilroy-Hollister valley
18	Rinconada valley	52	Needle Rock point
19	Pozo valley	53	Gilroy-Hollister valley
20	Chorro valley	54	West Santa Cruz terrace
21	Morro valley	55	West Santa Cruz terrace
22	Toro valley	56	Majors creek
23	Carrizo Plain	57	Soquel valley
24	Cayucos valley	58	West Santa Cruz terrace
25	Old valley	59	West Santa Cruz terrace
26	Villa valley	60	Gilroy-Hollister valley
27	Santa Rosa valley	61	Pajaro valley
28	San Simeon valley	62	Scotts valley
29	Arroyo de la Cruz valley	63	Felton area
30	San Carpoforo valley	64	Santa Cruz Purisima formation
31	Cholame valley	65	Ano Nuevo area
32	Salinas valley	66	Gilroy-Hollister valley
33	Lockwood valley	67	Pescadero valley
34	Salinas valley	68	Santa Clara valley

ATTACHMENT C: Flow Chart to Determine Performance Requirements

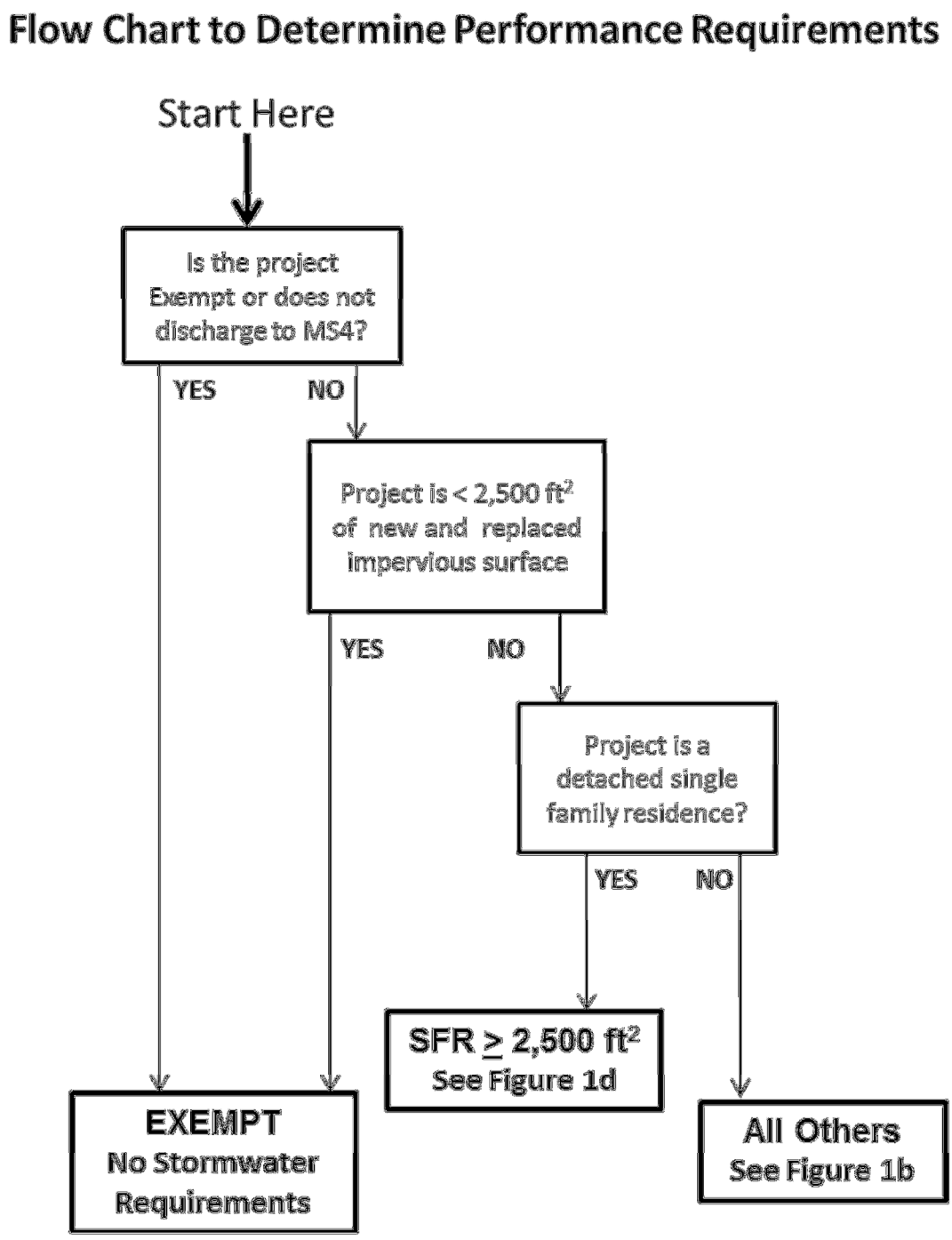


Figure 1a. Initial Screening for All Development Projects

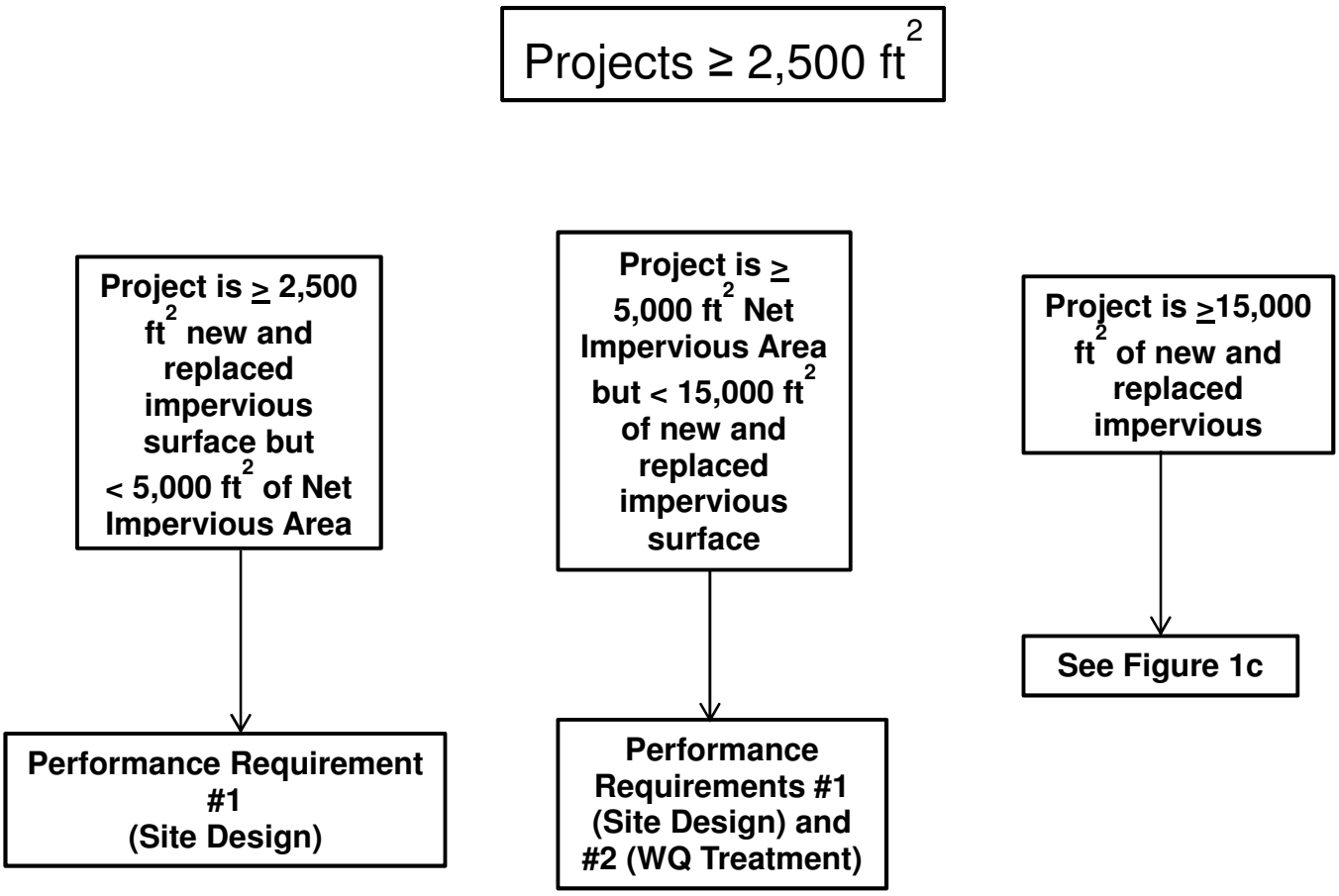


Figure 1b. Requirements for Small to Moderate Development Projects

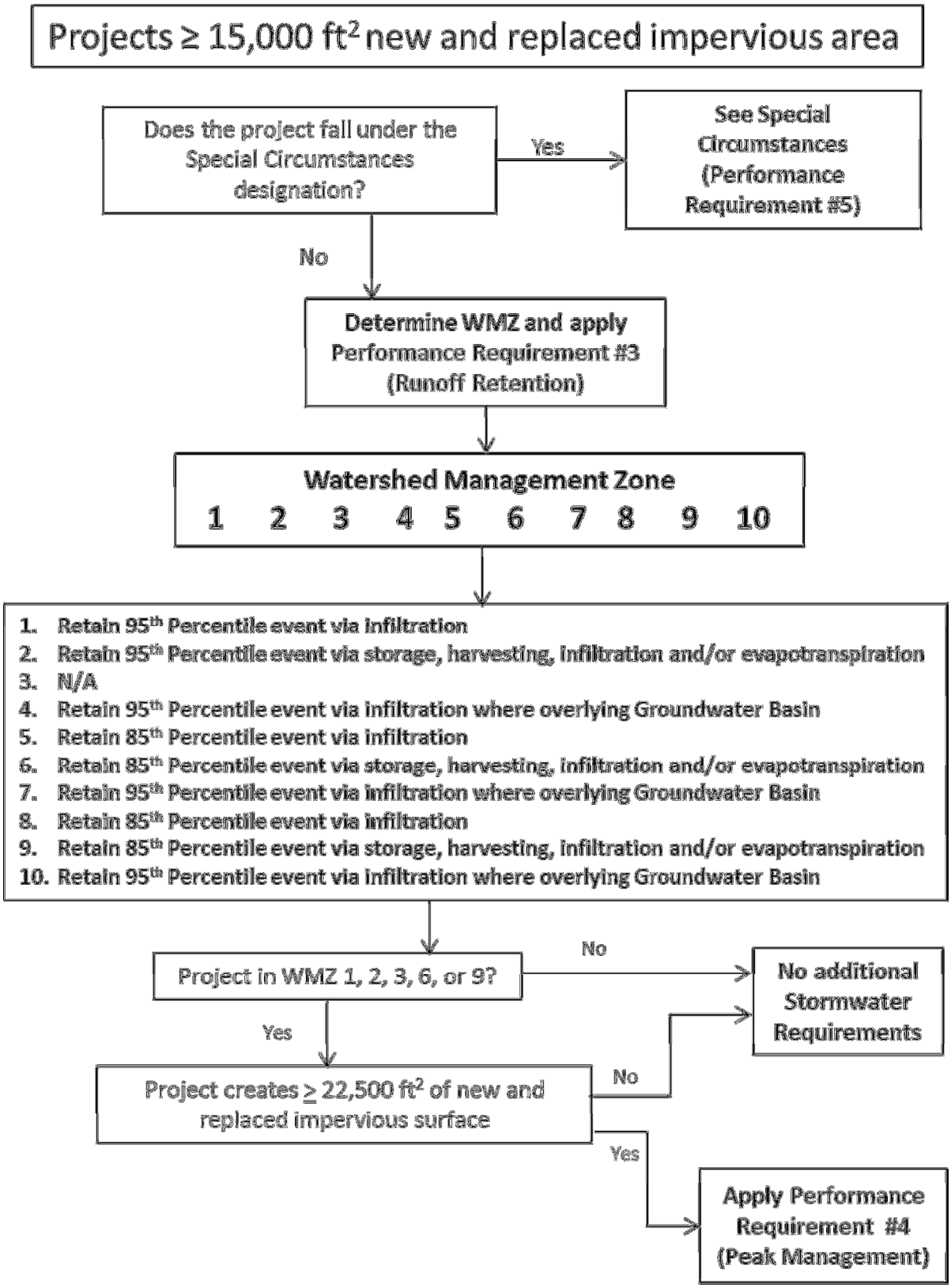


Figure 1c. Requirements for Large Development Projects

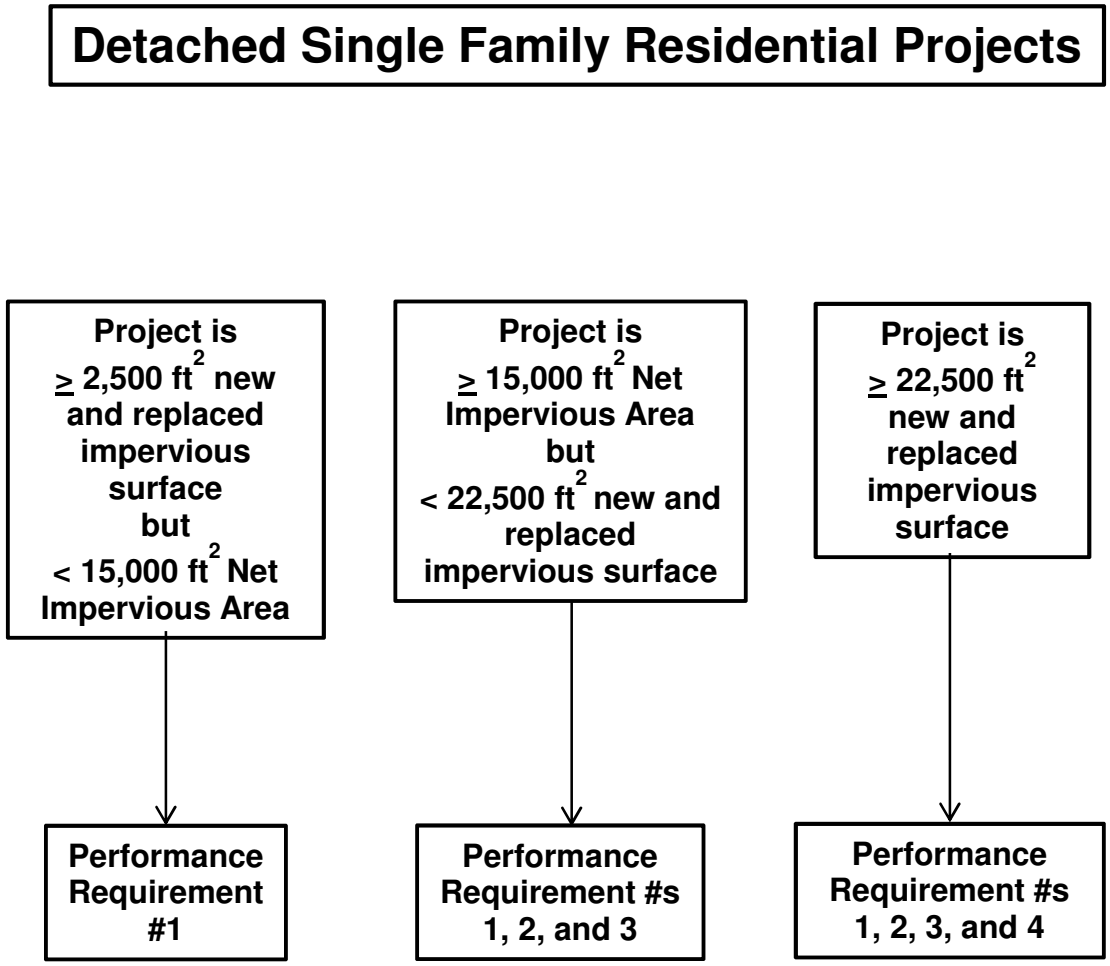


Figure 1d. Requirements for Single Family Residential projects

ATTACHMENT D: Case Study of the Hydrologic Benefits of On-Site Retention in the Central Coast Region

Available electronically at:
http://www.waterboards.ca.gov/centralcoast/water_issues/programs/stormwater/docs/lid/lid_hydromod_charette_index.shtml

ATTACHMENT E: Methods and Findings of the Joint Effort for Hydromodification Control in the Central Coast Region of California

Available electronically at:
http://www.waterboards.ca.gov/centralcoast/water_issues/programs/stormwater/docs/lid/lid_hydromod_charette_index.shtml

ATTACHMENT F: Calculating Off-Site Retention Requirements When Less Than 10 Percent of the Project Site Equivalent Impervious Surface Area is Allocated to Retention-Based Structural Stormwater Control Measures

The following instructions demonstrate how to determine the Off-Site Retention Requirements when a Regulated Project subject to the Runoff Retention Performance Requirement, cannot allocate the full 10% of the project site's Equivalent Impervious Surface Area[55] to retention-based Stormwater Control Measures (SCMs).

STEP A. Potential Off-Site Mitigation Retention Volume

First calculate the Potential Off-Site Mitigation Retention Volume, which represents the additional volume of runoff that would have been retained on-site, had the full 10% of Equivalent Impervious Surface Area been dedicated to retention-based SCMs.

Equation A:

Potential Off-Site Mitigation Retention Volume = (the portion of the 10% Equivalent Impervious Area not allocated on-site) X (the On-Site Retention Feasibility Factor)

Where:

- *The portion of the 10% Equivalent Impervious Surface Area not allocated on-site* is that portion not allocated to on-site structural retention-based SCMs. For example, if 10% of Equivalent Impervious Surface Area is 1,000 ft^2 and only 8% (800 ft^2) is allocated to retention-based SCMs, the remaining 2% (200 ft^2) is the value inserted in the equation.

- *The On-Site Retention Feasibility Factor* is the ratio of Design Retention Volume[56] managed on-site (ft^3), to actual area (ft^2) allocated to structural SCMs. This establishes the site's retained volume**:**area ratio, expressed as cubic feet of retained runoff volume per square foot of area. For example, if a project is able to infiltrate 3,500 ft^3 of runoff over an 800-ft^2 area, this ratio of 3,500**:**800, or 4.38, is the On-Site Retention Feasibility Factor.

STEP B. Actual Off-Site Mitigation Retention Volume

Next, determine the Actual Off-Site Mitigation Retention Volume, which may be less than the Potential Off-Site Mitigation Retention Volume. The Actual Off-Site Mitigation Volume is the lesser of the volume calculated in Equation A, and the remaining portion of the Design Retention Volume, calculated per Post-Construction Requirements Attachment D, not controlled on-site. There are two possible outcomes when the Runoff Retention Performance Requirement is not met on-site and less than 10% of the site's Equivalent Impervious Surface Area is allocated to retention-based SCMs:

- Potential Off-Site Mitigation Retention Volume is the Actual Off-Site Mitigation Retention Volume
- Remaining Design Retention Volume represents Actual Off-Site Design Retention Volume

[55] Calculate Equivalent Impervious Surface Area using guidance in Post-Construction Requirements Attachment E

[56] Calculate Design Retention Volume using guidance in Post-Construction Requirements Attachment D, or equivalent method. Final Design Retention Volumes should reflect the applicant's demonstrated effort to use non-structural design measures to reduce the amount of runoff (e.g., reduction of impervious surfaces) as required by the Post-Construction Requirements' LID Development Standards (Post-Construction Requirements Section B.4.d).

The following examples illustrate different compliance scenarios related to the Runoff Retention Performance Requirement. The values used in the examples are for illustration only; for actual projects, these values are calculated by the project applicant using guidance provided in Post-Construction Requirements, Attachments D, E, and F.

Example 1: On-site Compliance, No Off-Site Mitigation Necessary

Where:

- <10% of Equivalent Impervious Surface Area is allocated to retention-based SCMs
- Water Quality Treatment and Runoff Retention Performance Requirements are achieved on-site

Site details:

1.	10% of Equivalent Impervious Surface Area	3,000 ft^2
2.	Actual area dedicated to retention-based SCMs (9.4%)	2,800 ft^2
3.	Design Retention Volume	4,500 ft^3
4.	Volume managed by directing runoff to landscaped areas[57]	500 ft^3
5.	Remaining volume that must be retained using structural SCMs	4,000 ft^3
6.	Actual volume retained on-site with structural SCMs	4,000ft^3

In this example, the applicant is able to propose a design that uses less than the 10% of the Equivalent Impervious Surface Area to retain the necessary retention volume. Since the entire Design Retention Volume is infiltrated on-site, both the Water Quality Treatment and Runoff Retention Performance Requirements are achieved and off-site mitigation is not required.

Example 2: On-site Compliance, No Off-Site Mitigation Necessary

Where:

- 10% of Equivalent Impervious Surface Area is allocated to retention-based SCMs
- Only a portion of the Runoff Retention Requirement is achieved on-site

Site details:

1.	10% of Equivalent Impervious Surface Area	3,000 ft^2
2.	Actual area dedicated to retention-based SCMs (10%)	3,000 ft^2
3.	Design Retention Volume	4,500 ft^3
4.	Volume managed by directing runoff to landscaped areas	500 ft^3
5.	Remaining volume that must be retained using structural SCMs	4,000 ft^3
6.	Actual runoff volume retained on-site via structural SCMs	3,800 ft^3

In this example, the applicant proposes a design in which only a portion of the Design Retention Volume can be retained using pervious pavements that comprise 10% of the Equivalent Impervious Surface Area. The applicant is able to document that poorly infiltrative soils limit infiltration. The final design achieves the Water Quality Treatment Performance Requirement, but only a portion of the Runoff Retention Requirement. Because the applicant dedicated the full 10% Equivalent Impervious Surface Area to retention-based SCMs, and can substantiate

[57] See Post-Construction Requirements' LID Development Standards (Post-Construction Requirements Section B.4.d) for runoff reduction measures.

technical infeasibility constraints (i.e. poor soils), on-site compliance with the Post-Construction Requirements are met and off-site mitigation is not required.

Example 3: On-site Compliance Not Achieved, Off-Site Volume Mitigation Required

Where:

- An area less than 10% of Equivalent Impervious Surface Area is allocated to retention-based SCMs
- Site soils limit infiltration

Site details:

1.	10% of Equivalent Impervious Surface Area	3,000 ft^2
2.	Actual area dedicated to structural SCMs (7%)	2,100 ft^2
3.	Design Retention Volume	4,500 ft^3
4.	Volume managed by directing runoff to landscaped areas	500 ft^3
5.	Remaining volume that must be retained using structural SCMs	4,000 ft^3
6.	Actual runoff volume retained on-site via structural SCMs	1,000 ft^3

In this example, the applicant proposes a design in which only a portion of the Design Volume can be infiltrated on-site. The applicant has allocated 7% rather than 10% of the Equivalent Impervious Surface Area to retention-based SCMs. The applicant is able to document that poorly infiltrative soils limit infiltration. The final design achieves the Water Quality Treatment Performance Requirement but only a portion of the Runoff Retention Requirement. Because the applicant did not allocate the full 10% of the Equivalent Impervious Surface Area, and there is remaining Design Retention Volume, off-site mitigation is required and is calculated using Steps A and B, above. This calculation takes into account the poorly infiltrative soils of the project site so that undue off-site retention requirements are avoided.

Step A:
Solving for Equation A:
Potential Off-Site Mitigation Retention Volume =
Portion of 10% Equivalent Impervious Area not allocated on-site: 3,000 ft^2 - 2,100 ft^2 = 900 ft^2
X
Onsite Retention Feasibility Factor: 1,000 ft^3 ÷ 2,100 ft^2 = 0.476 ft

= 429 ft^3

Step B:
The Actual Off-Site Mitigation Retention Volume is 429 ft^3, because it is the lesser of the Potential Off-Site Mitigation Retention Volume (429 ft^3) and the remaining portion of the Design Retention Volume not retained on-site (4,000 ft^3 - 1,000 ft^3 = 3,000 ft^3). The Actual Off-Site Mitigation Retention Volume accounts for the poorly infiltrative soils of the project site.

Example 4: Off-Site Volume Mitigation Required

Where:

- An area less than the 10% of Equivalent Impervious Surface Area is allocated to retention-based SCMs
- Infiltration potential of soils not a significant constraint

Site details:

1.	10% of Equivalent Impervious Surface Area	3,000 ft^2
2.	Actual area dedicated to structural SCMs (7%)	2,100 ft^2
3.	Design Retention Volume	4,500 ft^3
4.	Volume managed by directing runoff to landscaped areas	500 ft^3
5.	Remaining volume that must be retained using structural SCMs	4,000 ft^3
6.	Actual runoff volume retained on-site via structural SCMs	3,400 ft^3

The applicant proposes a design in which only a portion of the Design Retention Volume can be infiltrated. The applicant has allocated 7% rather than 10% of Equivalent Impervious Surface Area to retention-based SCMs. The final design achieves the Water Quality Treatment Performance Requirement but only a portion of the Runoff Retention Performance Requirement. Because the applicant did not allocate the full 10% of Equivalent Impervious Surface Area, and there is remaining Design Retention Volume, off-site mitigation is required and is calculated using Steps A and B, above.

Step A:
Solving for Equation A:
Potential Off-Site Mitigation Retention Volume =
Portion of 10% Equivalent Impervious Area not allocated on-site: 3,000 ft^2 - 2,100 ft^2 = 900 ft^2
X
Onsite Retention Feasibility Factor: 3,400 ft^3 ÷ 2,100 ft^2 = 1.62 ft

= 1,457 ft^3

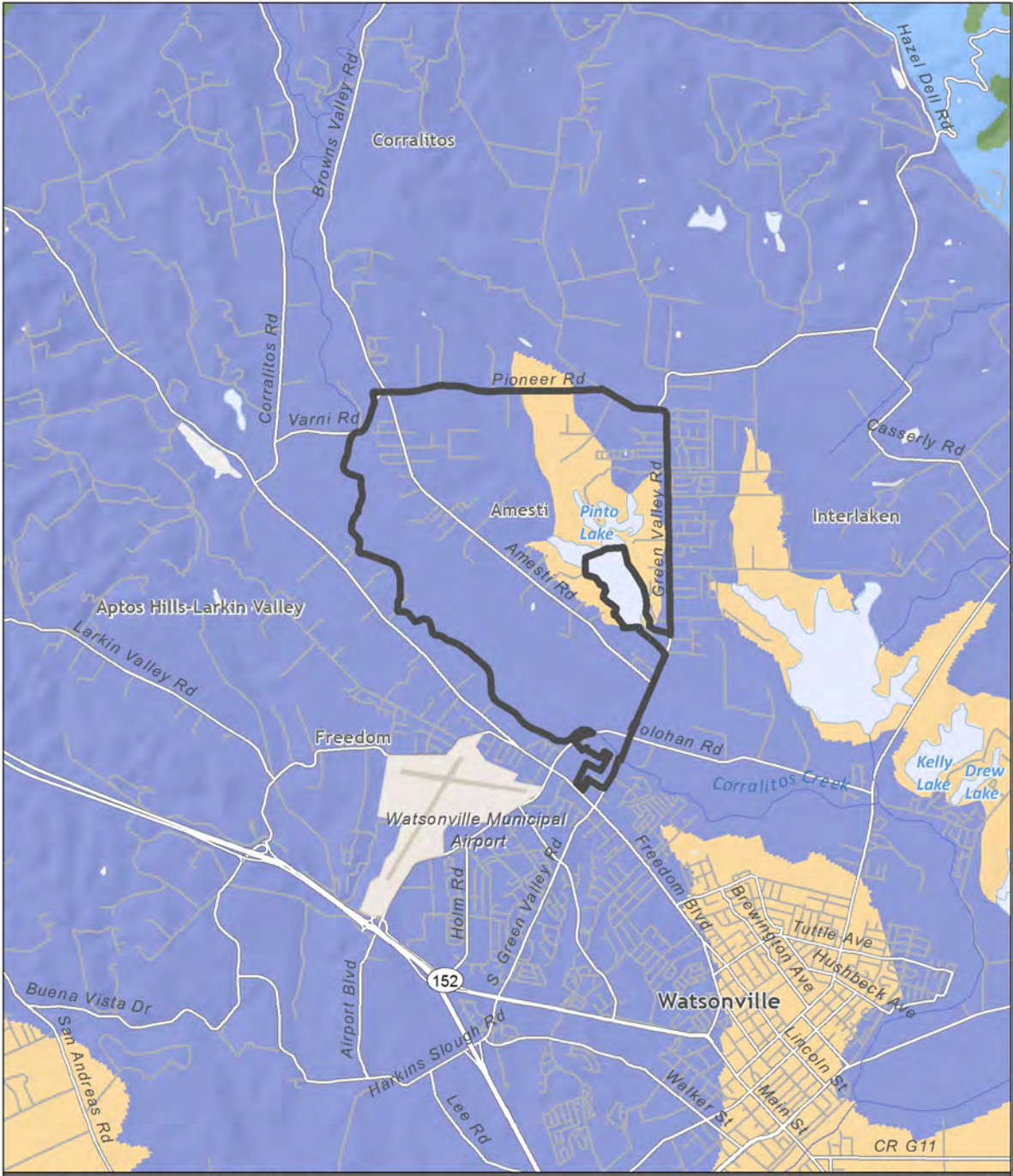
Step B:
The Actual Off-Site Mitigation Retention Volume is 600 ft^3, because it is the lesser of the Potential Off-Site Mitigation Retention Volume (1,457 ft^3) and the remaining portion of the Design Retention Volume not retained on-site (4,000 ft^3 – 3,400 ft^3 = 600 ft^3).

ATTACHMENT G: Stormwater Control Measure Sizing: Evaluation of Attachment D to the Central Coast Post-Construction Requirements

Available electronically at:
http://www.waterboards.ca.gov/centralcoast/water_issues/programs/stormwater/docs/lid/lid_hydromod_charette_index.shtml

ATTACHMENT H: Development and Implementation of Hydromodification Control Methodology: Support for Selection of Criteria

Available electronically at:
http://www.waterboards.ca.gov/centralcoast/water_issues/programs/stormwater/docs/lid/lid_hydromod_charette_index.shtml



CENTRAL COAST JOINT EFFORT **Amesti, California**

Watershed management zones

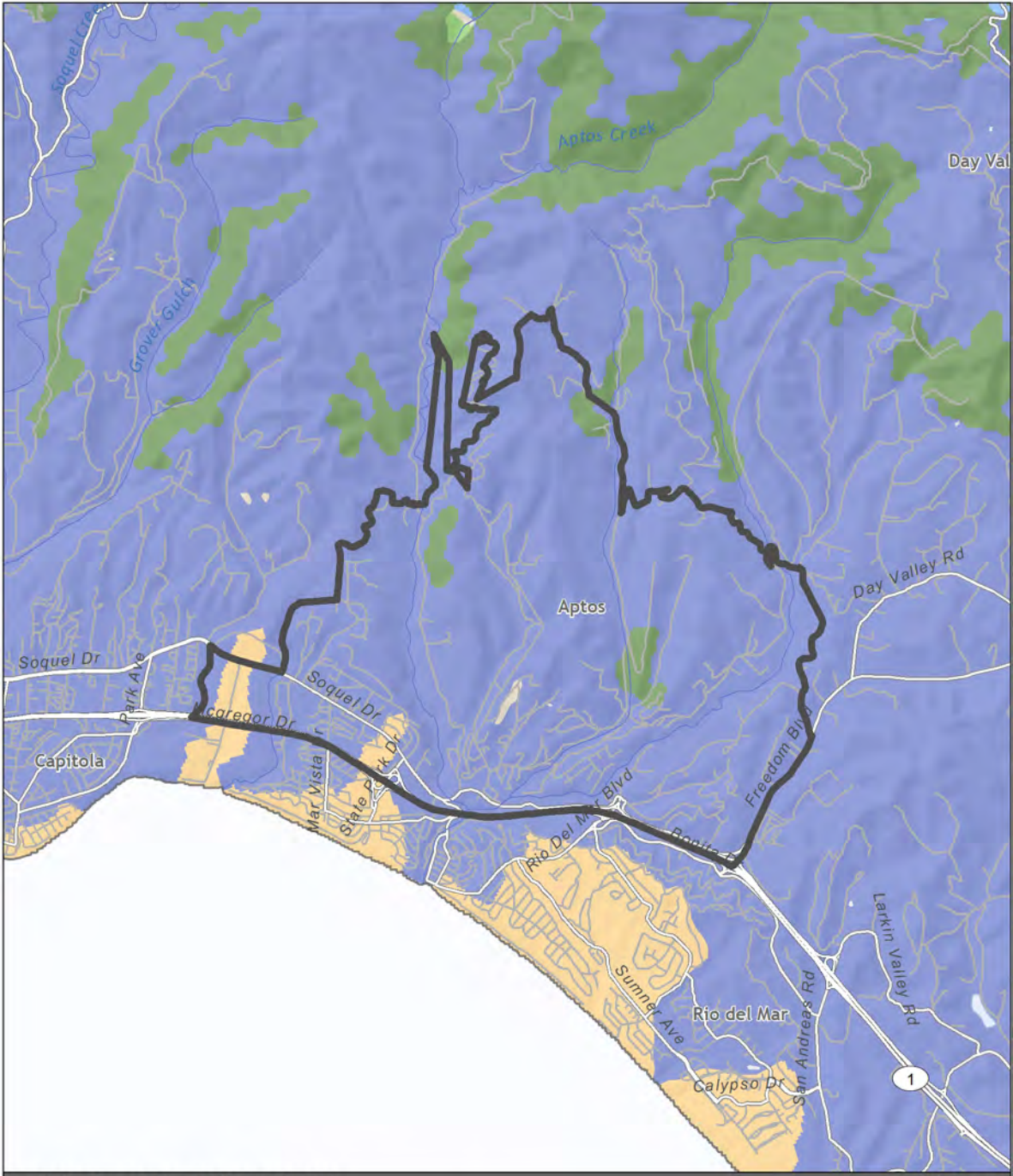
1 2 3 4 5 6 7 8 9 10

Urban area boundary

Data sources
Watershed management zones: Stillwater Sciences, 2012
Base data: ESRI, 2010

0 0.25 0.5 1 Miles
0 0.5 1 2 km

Stillwater Sciences
www.stillwatersci.com



CENTRAL COAST JOINT EFFORT — **Aptos, California**

Watershed management zones

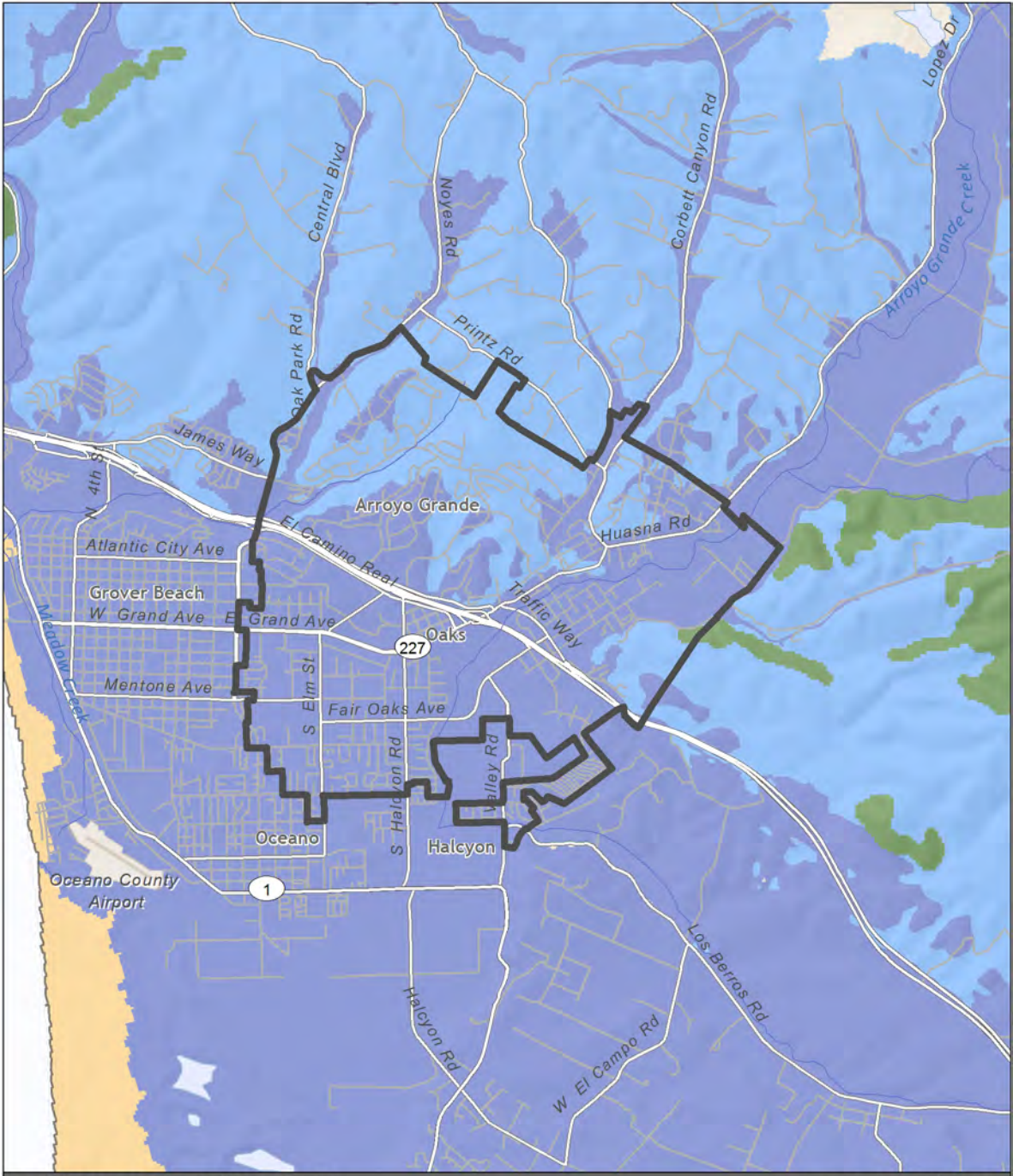
1 2 3 4 5 6 7 8 9 10

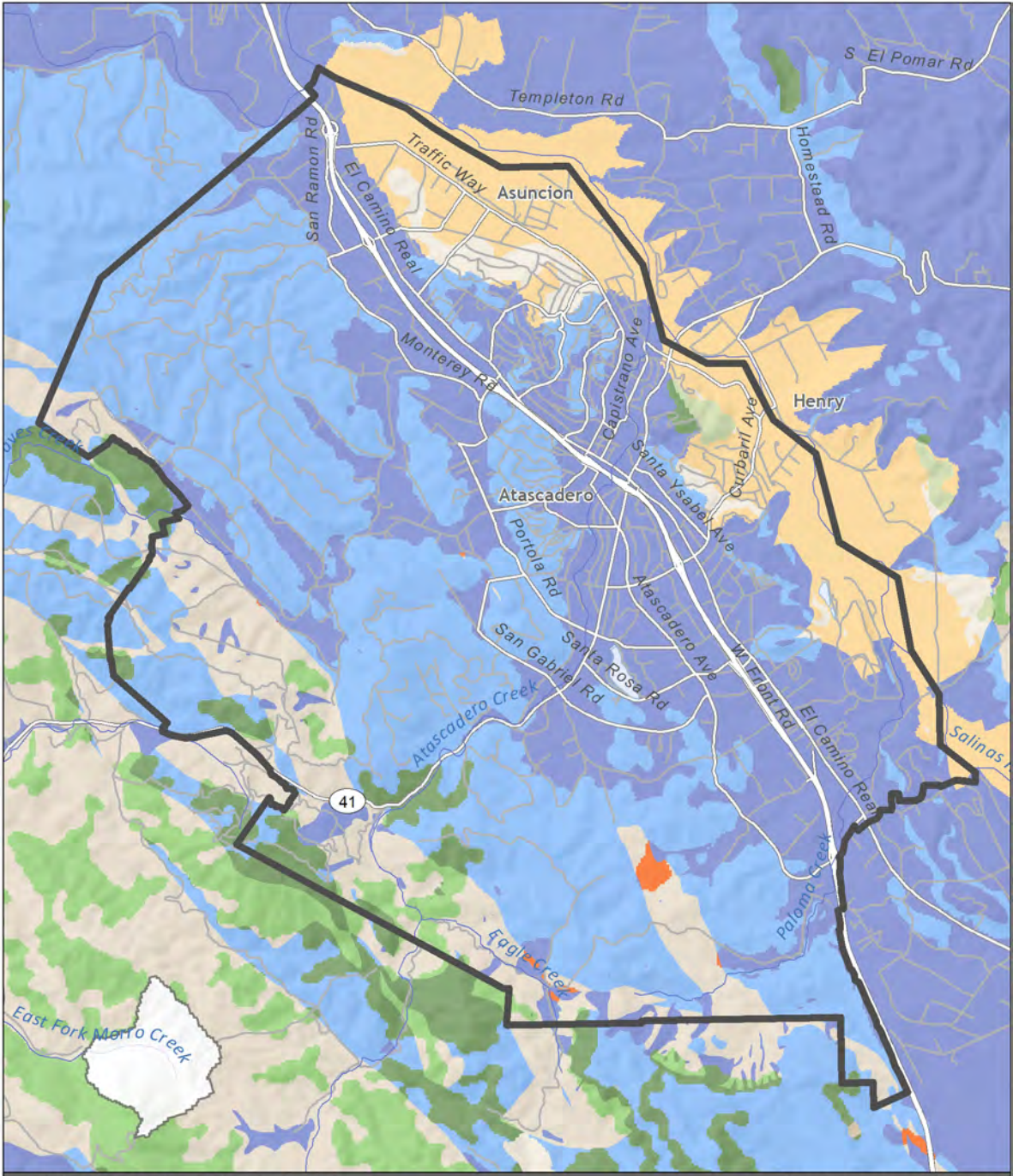
Urban area boundary

Data sources
Watershed management zones: Stillwater Sciences, 2012
Base data: ESRI, 2010

0 0.25 0.5 1 Miles
0 0.5 1 2 km

Stillwater Sciences
www.stillwatersci.com





CENTRAL COAST JOINT EFFORT **Atascadero, California**

Watershed management zones

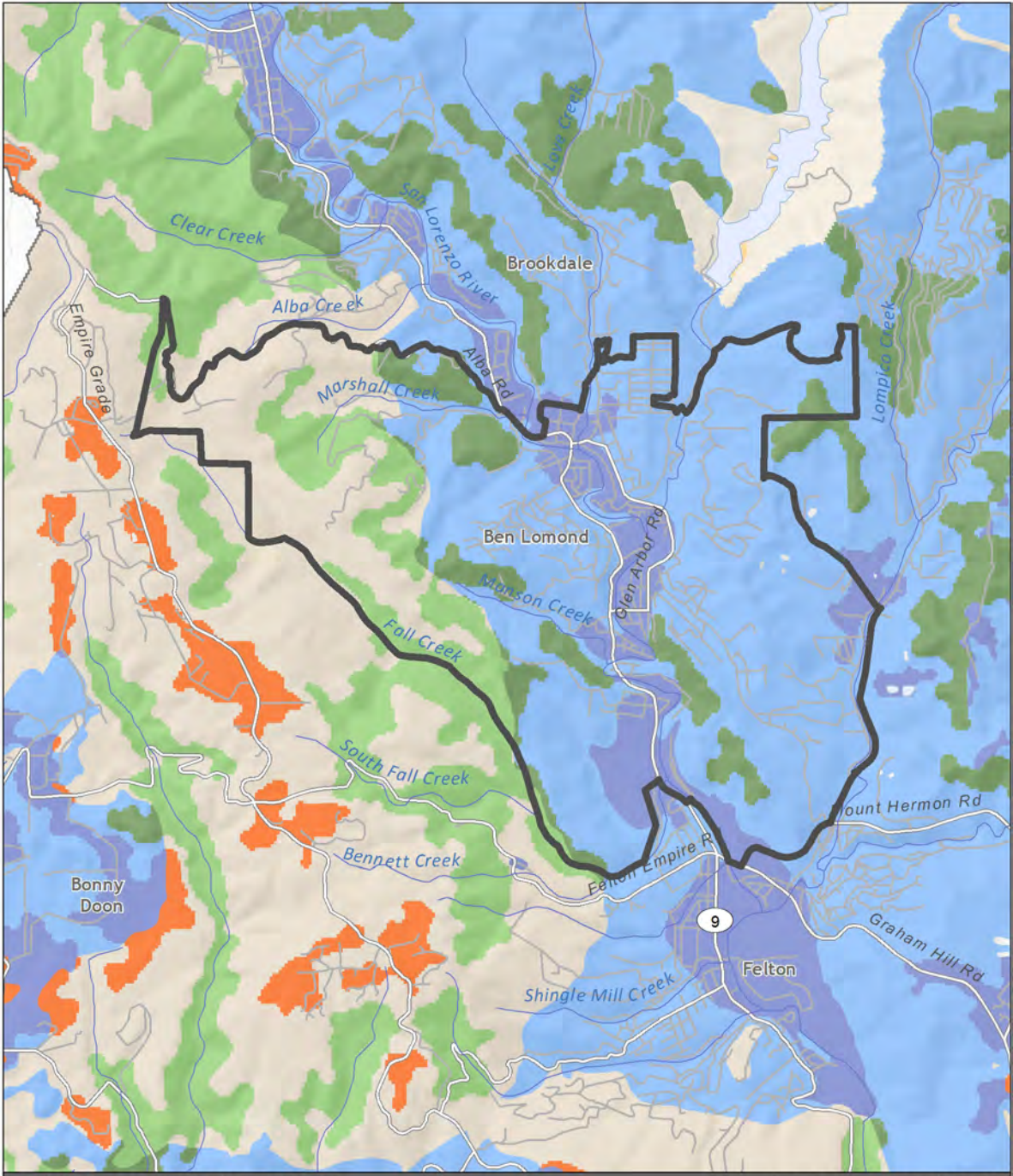
1 2 3 4 5 6 7 8 9 10

Urban area boundary

0 0.25 0.5 1 Miles
0 0.5 1 2 km

Data sources
Watershed management zones: Stillwater Sciences, 2012
Base data: ESRI

Stillwater Sciences
www.stillwatersci.com



CENTRAL COAST JOINT EFFORT **Ben Lomond, California**

Watershed management zones

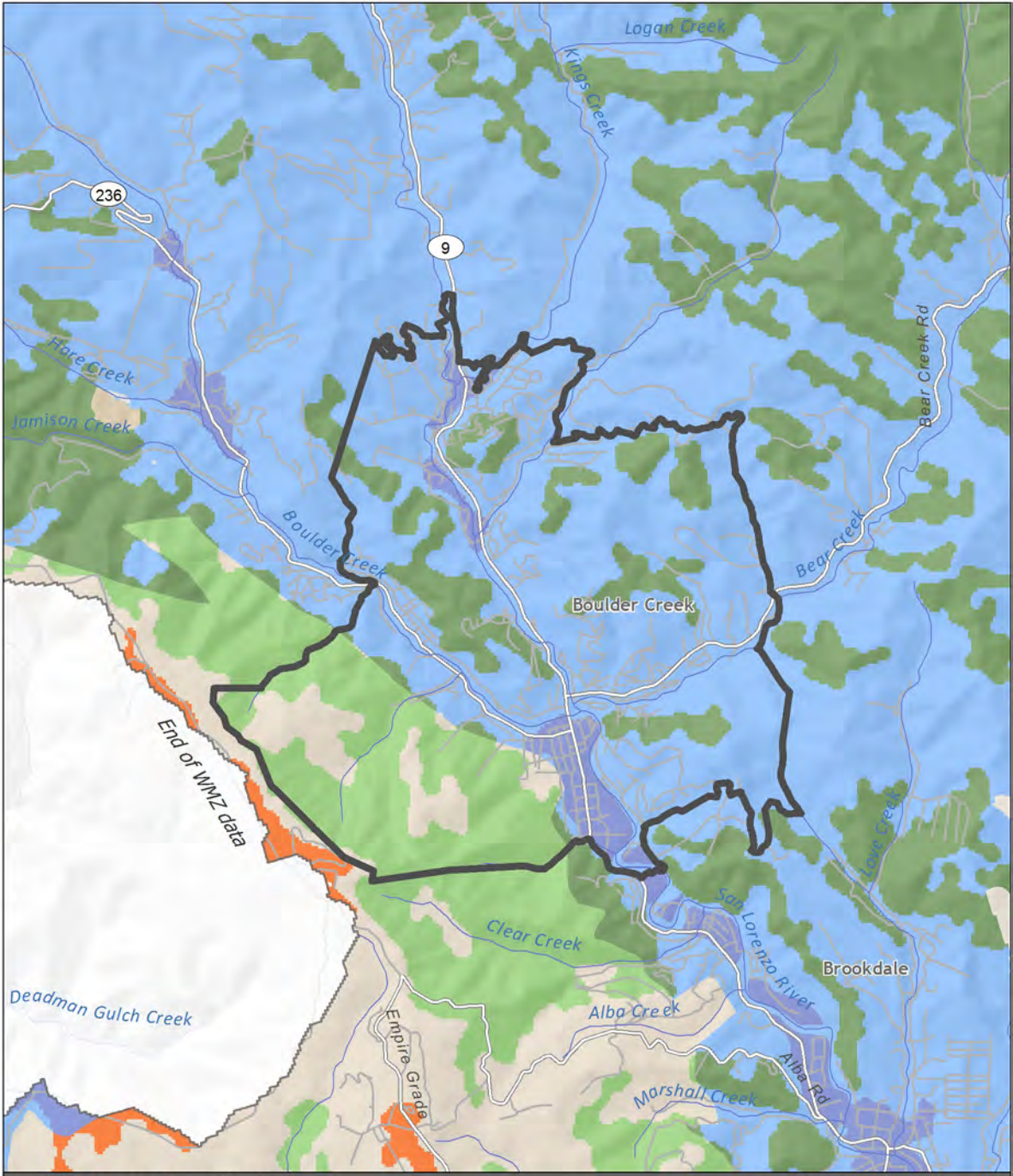
1 2 3 4 5 6 7 8 9 10

Urban area boundary

Data sources
Watershed management zones: Stillwater Sciences, 2012
Base layer: ESRI, 2012

0 0.25 0.5 1 Miles
0 0.5 1 2 km

Stillwater Sciences
www.stillwatersci.com



CENTRAL COAST JOINT EFFORT **Boulder Creek, California**

Watershed management zones

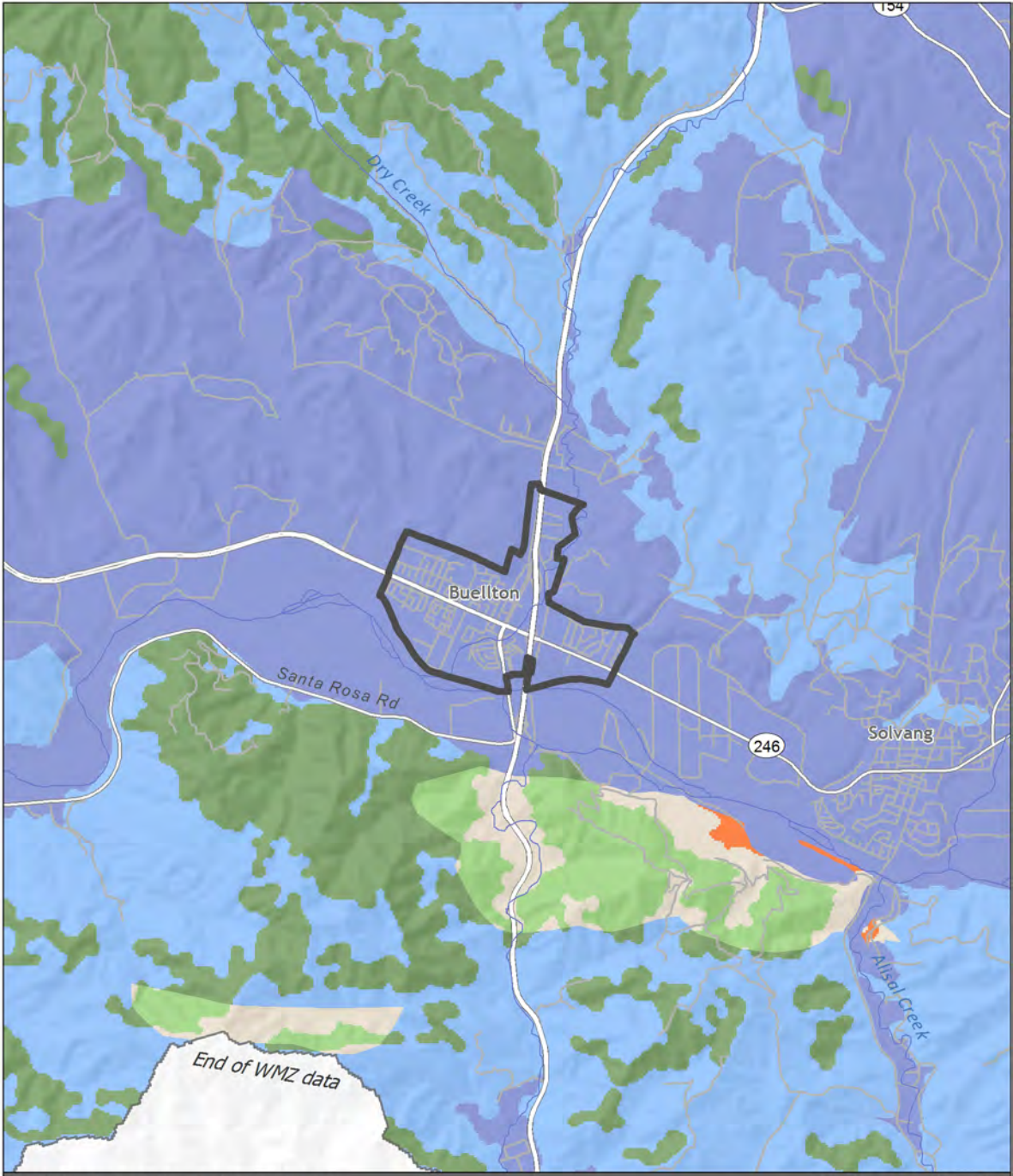
1 2 3 4 5 6 7 8 9 10

Urban area boundary

Data sources
Watershed management zones: Stillwater Sciences, 2012
Boulder Creek, CA

0 0.25 0.5 1 Miles
0 0.5 1 2 km

Stillwater Sciences
www.stillwatersci.com



CENTRAL COAST JOINT EFFORT **Buellton, California**

Watershed management zones

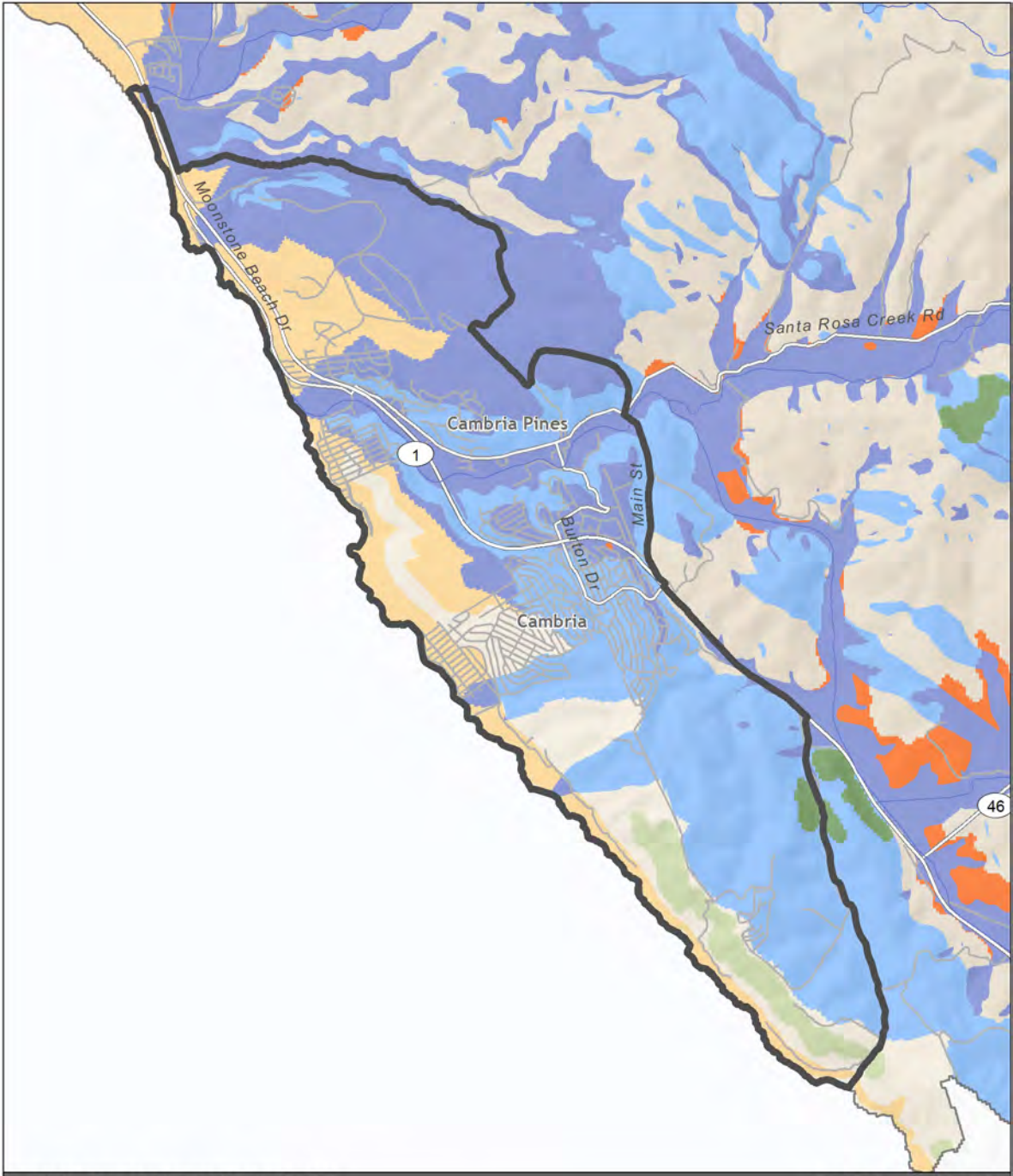
1 2 3 4 5 6 7 8 9 10

Urban area boundary

0 0.25 0.5 1 Miles
0 0.5 1 2 km

Data sources
Watershed management zones: Stillwater Sciences, 2012
Base layer: ESRI, 2010

Stillwater Sciences
www.stillwatersci.com



CENTRAL COAST JOINT EFFORT **Cambria, California**

Watershed management zones

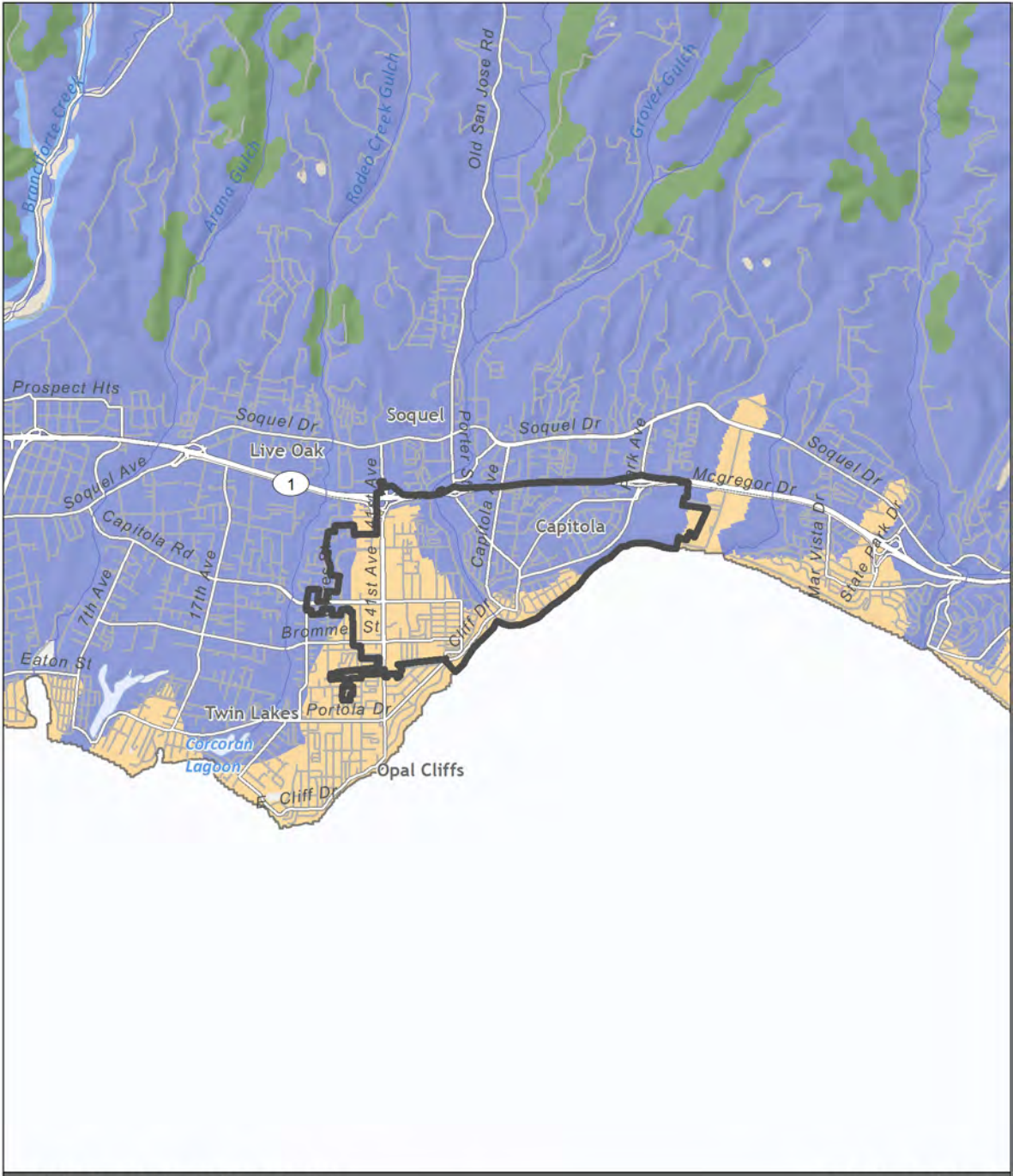
1 2 3 4 5 6 7 8 9 10

Urban area boundary

Data sources
Watershed management zones: Stillwater Sciences, 2012
Base data: ESRI, 2010

0 0.25 0.5 1 Miles
0 0.5 1 2 km

Stillwater Sciences
www.stillwatersci.com



CENTRAL COAST JOINT EFFORT **Capitola, California**

Watershed management zones

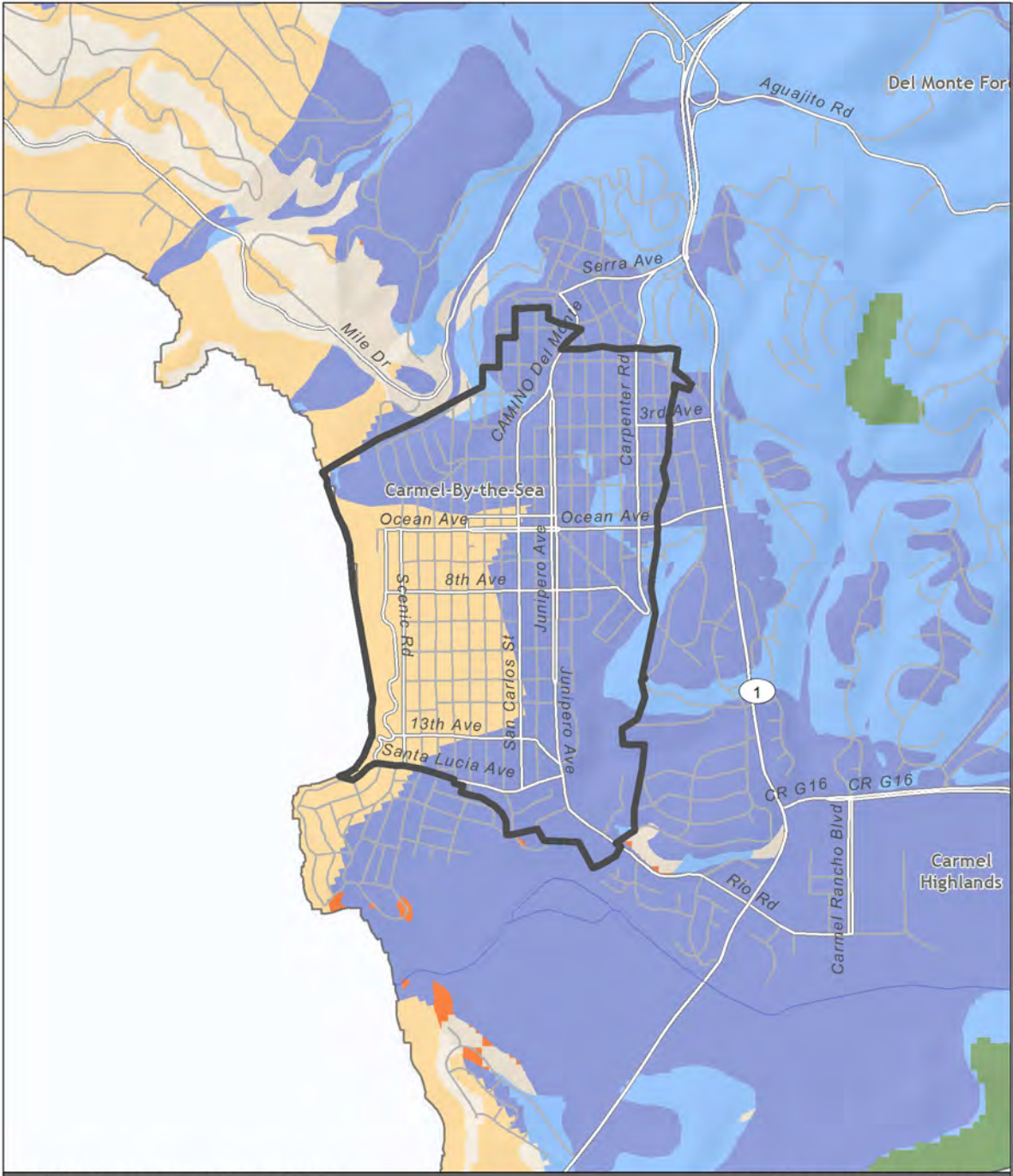
1 2 3 4 5 6 7 8 9 10

Urban area boundary

Data sources
Watershed management zones: Stillwater Sciences, 2012
Base data: ESRI, 2010

0 0.25 0.5 1 Miles
0 0.5 1 2 km

Stillwater Sciences
www.stillwatersci.com



CENTRAL COAST JOINT EFFORT — **Carmel-by-the-Sea, California**

Watershed management zones

1 2 3 4 5 6 7 8 9 10

Urban area boundary

Data sources
Watershed management zones: Stillwater Sciences, 2012
Base data: ESRI

0 0.25 0.5 1 Miles
0 0.5 1 2 km

Stillwater Sciences
www.stillwatersci.com

CENTRAL COAST JOINT EFFORT **Carmel Valley Village, California**

Watershed management zones

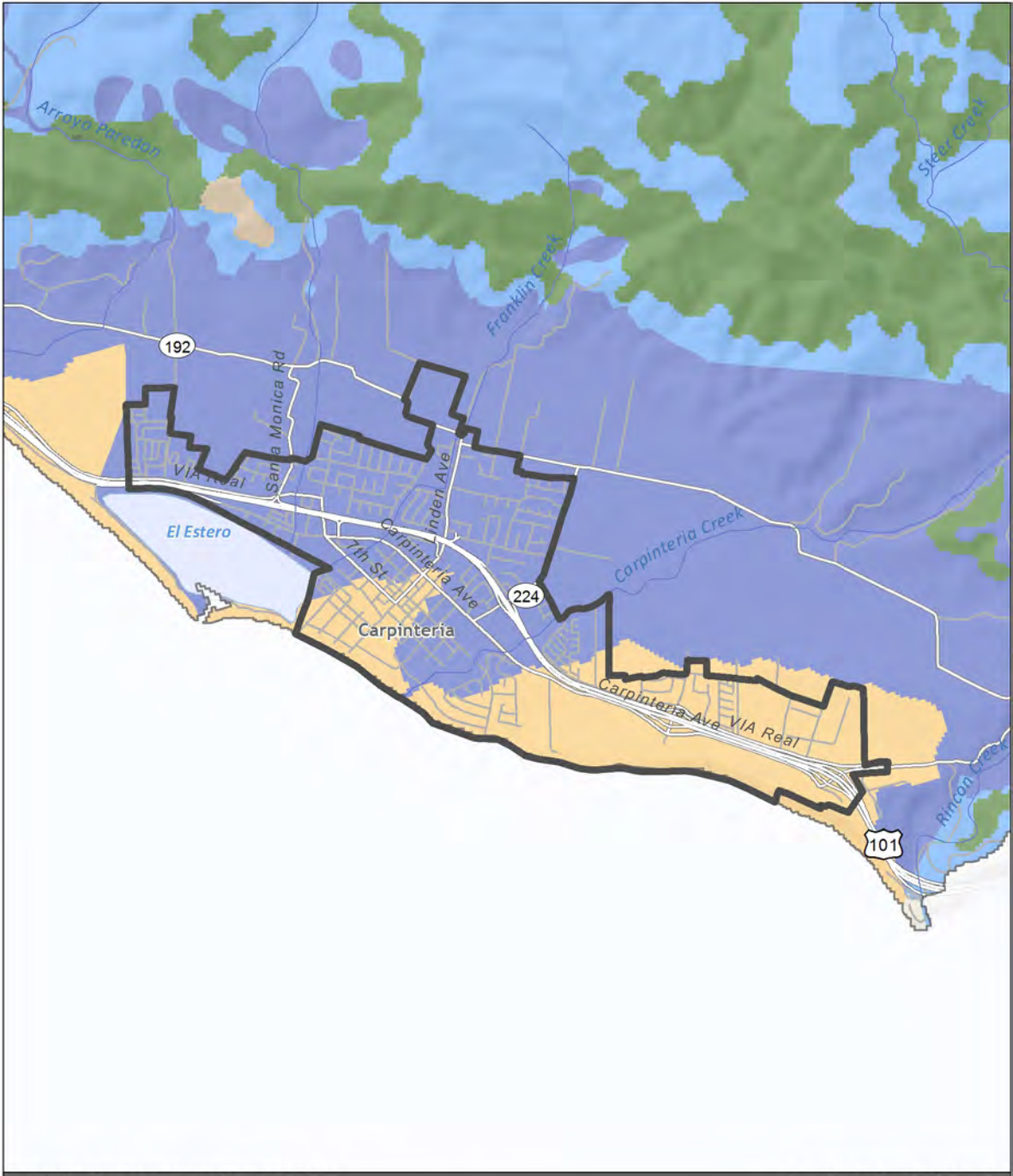
1 2 3 4 5 6 7 8 9 10

Urban area boundary

0 0.25 0.5 1 Miles
0 0.5 1 2 km

Data sources
Watershed management zones: Stillwater Sciences, 2012
Base data: ESRI, 2010

Stillwater Sciences
www.stillwatersci.com



CENTRAL COAST JOINT EFFORT **Carpinteria, California**

Watershed management zones

1 2 3 4 5 6 7 8 9 10

Urban area boundary

Data sources
Watershed management zones: Stillwater Sciences, 2012
Base data: ESRI, 2010

0 0.25 0.5 1 Miles
0 0.5 1 2 km

Stillwater Sciences
www.stillwatersci.com