RESOLUTION NO._____ (CM)

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF WATSONVILLE INCORPORATING STORMWATER POST-CONSTRUCTION STANDARDS TO THE CITY OF WATSONVILLE PUBLIC IMPROVEMENT STANDARDS

Amends Resolution No. 76-13 (CM)

EFFECTIVE DATE: FEBRUARY 27, 2014

WHEREAS, the City of Watsonville desires to manage stormwater runoff from new development and redevelopment projects to protect the community and the environment; and

WHEREAS, the City is required by the Central Coast Regional Water Quality Control Board (CCRWQCB) to implement specific management measures for stormwater runoff for all new development and redevelopment projects.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF WATSONVILLE, CALIFORNIA, AS FOLLOWS:

That the City of Watsonville hereby incorporates the Stormwater Post-Construction Standards into the City of Watsonville Public Improvement Standards required by the Central Coast Regional Water Quality Control Board, a copy of which is attached hereto and incorporated herein by this reference.

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STORMWATER POST-CONSTRUCTION STANDARDS

Contents

Watershed Management Zones (WMZs)

The urbanized portions of Watsonville are divided into two Watershed Management Zones (WMZs), based on common key watershed processes and receiving water type (river/creek or wetland). Each WMZ is aligned with specific Post-Construction Stormwater Management Requirements to address the impacts of development on those watershed processes and beneficial uses. Attachment 1 shows the WMZs.

Post-Construction Requirements

The primary objective of these Post-Construction Stormwater Management Requirements (hereinafter, Post-Construction Requirements) is to ensure the reduction of 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 by the City.

Regulated Projects

Regulated Projects include all New Development or Redevelopment projects that create and/or replace ≥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

Performance Requirement No. 1: Site Design and Runoff Reduction

a) All projects that create and/or replace $\geq$ 2,500 square feet of impervious surface (collectively over the entire project site), including detached single-family home projects, are required to implement at least the following design strategies throughout the 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 City will 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.

Performance Requirement No. 2: Water Quality Treatment

a) All 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, are required to treat stormwater runoff as required in the Water Quality Treatment Performance Requirements in subsection 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) Each project subject to Water Quality Treatment Performance Requirements will treat runoff generated by the 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[1] 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

[1] *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.*

medium is equal to or more effective at attenuating pollutants than the specified planting medium mixture.

(4) Proper plant selection[2]

(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 (0.8").

(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 project subject to the Water Quality Treatment Performance Requirement, the Applicant will provide the information below in a Stormwater Control Plan. The City will not grant final project approval, until the Stormwater Control Plan for the project sufficiently demonstrates the 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

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[2] *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)*

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

Performance Requirement No. 3: Runoff Retention

a) All 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, are required to meet the Runoff Retention Performance Requirements in subsection b. and subsection c. using the LID Development Standards in subsection d. for optimal management of watershed processes.
b) Adjustments to the Runoff Retention Performance Requirements for Redevelopment – Where the 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, – 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– The total amount of runoff volume to be retained from replaced impervious surfaces shall be equivalent to the pre-project runoff volume retained.
c) All projects, subject to the Runoff Retention Performance Requirements, are required to meet the following Performance Requirements:
(1) Retain 95th Percentile Rainfall Event – Prevent offsite discharge from events up to the 95^{th} percentile 24-hour rainfall event (1.3").
(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.
d) LID Development Standards – All Projects, subject to Runoff Retention Performance Requirements, are required to meet Runoff Retention Performance Requirements (subsections b. and c.) using the following LID Development Standards:
i) Site Assessment Measures – The applicant will identify opportunities and constraints to implement LID Stormwater Control Measures. Applicant will document the following, as appropriate to the development site:
- 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 – The Applicant will 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 (subsections. 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 Applicant will delineate DMAs to support a decentralized approach to stormwater management.

(1) The Applicant will provide a map or diagram dividing the entire project site into discrete DMAs

(2) The Applicant will 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 – Each Regulated Project will 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 the project applicant has demonstrated in their Stormwater Control Plans, and the City 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 City will require the 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, the City will require the project applicant 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 project is required to dedicate no less than ten percent of the Regulated Project's Equivalent Impervious Surface Area[3] 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.

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

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 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 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 project subject to the Runoff Retention Performance Requirement, the City will require the project applicant to provide the below information in a Stormwater Control Plan. The City shall not grant final project approval, until the Stormwater Control Plan for the project sufficiently demonstrates the 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.

Performance Requirement No. 4: Peak Management

The City will require all projects that create and/or replace ≥22,500 square feet of impervious surface (collectively over the entire project site) in Watershed Management Zone 1, 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 City will 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 project subject to the Peak Management Performance Requirement, the City will require the project applicant to provide the below information in a Stormwater Control Plan. The City will 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.

Performance Requirement No. 5: Special Circumstances

The City may designate projects as subject to Special Circumstances based on certain site and/or receiving water conditions. The Special Circumstances designation exempts a 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 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 City 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 the Pajaro River.

(2) Project runoff discharges to a continuous underground storm drain system that discharges directly to the Pajaro River

(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 project result in adverse impacts to downstream receiving waters

ii) Intermediate Flow Control Facility Special Circumstance:

(1) The City may designate 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 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 project result in adverse impacts to downstream receiving waters.

iii) Historic Lake and Wetland Special Circumstance:

(1) The City may designate 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 projects that: 1) create and/or replace $\geq$22,500 square feet of impervious surface; 2) are located in WMZs 1 and 4 that overlie a designated Groundwater Basin:

(1) Water Quality Treatment (Performance Requirement No. 2)

(2) Runoff Retention (Performance Requirement No. 3)

ii) For projects that: 1) create and/or replace $\geq$22,500 square feet of impervious surface; and 2) are located in those portions of WMZ 4 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 projects that create and/or replace $\geq$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 (1.3").

ii) For projects that create and/or replace $\geq$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 City will 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 project Special Circumstances, the City will 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.

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 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 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[4]
      ii) Depth to an impervious layer such as bedrock limits infiltration

[4] *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)*

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)

a) 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.

Field Verifications of Post-Construction Stormwater Control Measures

1) The City will establish and implement a mechanism (a checklist or other tools) to verify 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 project, the City will 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 City may accept third-party verification of SCMs conducted and endorsed by a registered professional engineer, geologist, architect, and/or landscape architect
   b) The City shall ensure, through conditions of approval or other legally enforceable agreements or mechanisms, that site access is granted to all representatives of the City for the sole purpose of performing operation and maintenance (O&M) inspections of the installed Stormwater Control Measures

Operation and Maintenance for Structural SCMs

The City will 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 projects. The City will also maintain a structural SCM tracking database to support long-term performance of structural SCMs.

1) O&M Plan

   The project applicant shall develop and implement a written O&M Plan that, at a minimum, includes each component listed below. The City 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 City 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 the City will require that 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 City will 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 City
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

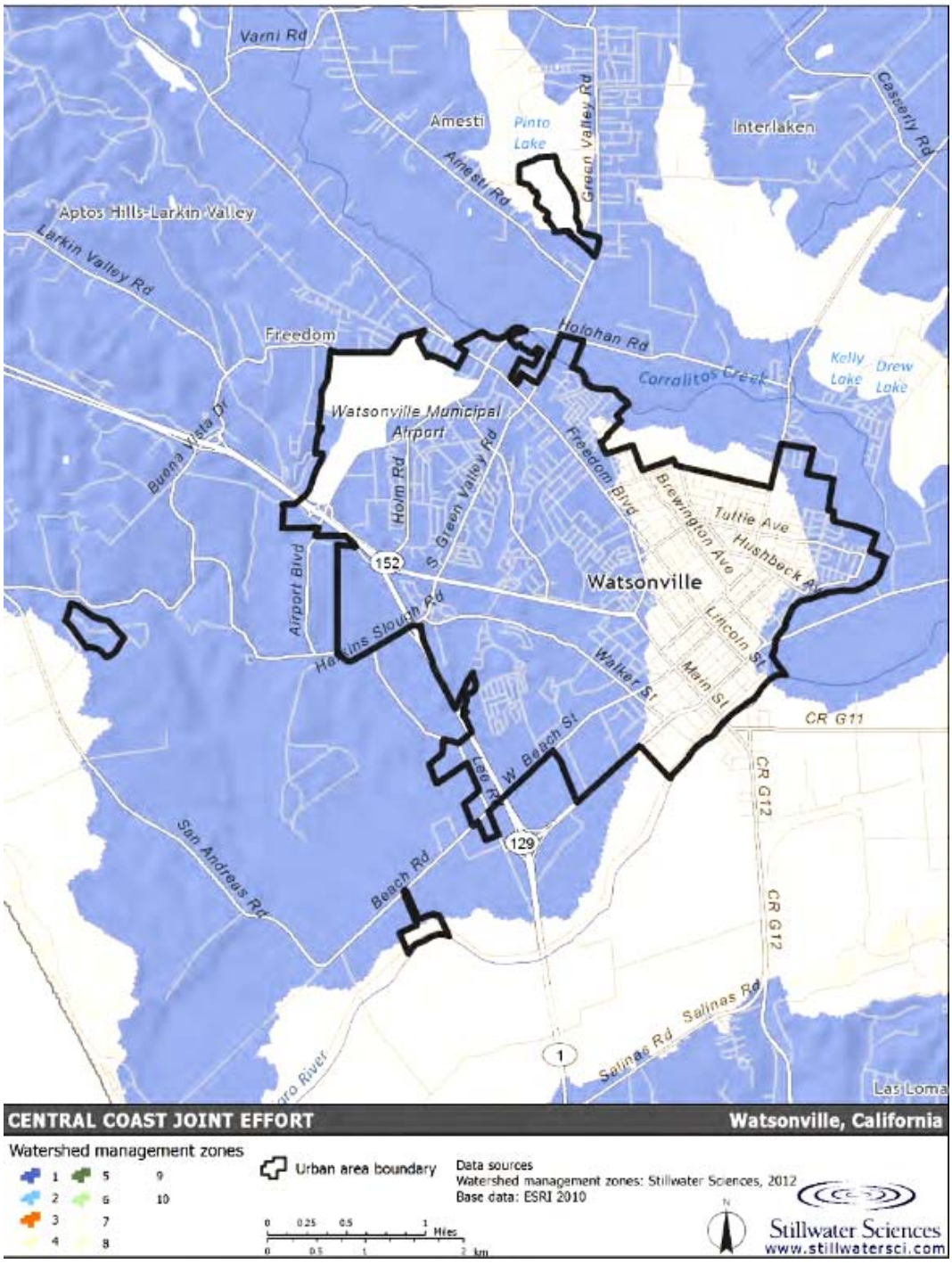
h) Any problems identified during inspections including any vector or nuisance problems.

City Reporting Requirements

1) The City 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 City 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 projects
   b) The total number of 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 City that for all Permittee-approved technical infeasibility determinations, the 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 projects where Field Verification of Post-Construction Stormwater Management Measures was required and was NOT completed
g) Number of projects where the required O&M Plan was NOT submitted/completed
h) Number of 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 City shall provide Central Coast Water Board staff electronic access to the database.

ATTACHMENT 1: Watershed Management Zones



ATTACHMENT 2: 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 3: 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 City may 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 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,[5] or, rainfall statistics provided by the Central Coast Water Board, whichever produces a more accurate value for rainfall depth.

c) Compute the Runoff Coefficient[6] "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[7]

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 City shall require the 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 project is within a Watershed Management Zone where infiltration is

[5] USEPA, 841-B-09-00. http://www.epa.gov/owow/NPS/lid/section438/pdf/final_sec438_eisa.pdf
[6] 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.
[7] As defined in Post-Construction Requirements Attachment C.

required, the applicant 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 project's Runoff Retention Requirement, by one of the following methods:

Method 1: Simple Method
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[8] 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.

[8] 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.

Rainfall Distribution	National Resources Conservation Service Type I[9] 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 – The City will require 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.

c) Compliance with Water Quality Treatment Performance Requirement – The City requires 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.

[9] 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.

ATTACHMENT 4: 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 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[10]; 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.

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

TABLE 1: Correction Factors[11] 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

[11] 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 5: 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 project subject to the Runoff Retention Performance Requirement, cannot allocate the full 10% of the project site's Equivalent Impervious Surface Area[12] 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[13] 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

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

[13] 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).

- Remaining Design Retention Volume represents Actual Off-Site Design Retention Mitigation Volume