EWMP CIMP

Workshop Presentation

Enhanced Watershed Management Program and Coordinated Integrated Monitoring Plan for North Santa Monica Bay Coastal Watersheds

May 22, 2014 - Calabasas, CA

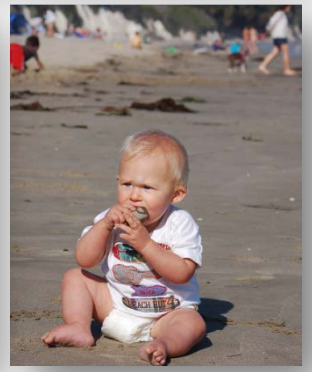
RB-AR 2227

Overview

- Purpose and Introductory Statements
- Enhanced Watershed Management Program
  - Water Quality Priorities
  - Control Measures to Address Water Quality Priorities
  - Modeling (Reasonable Assurance Analysis)
- Monitoring Program
- Next Steps
- Q&A

Purpose

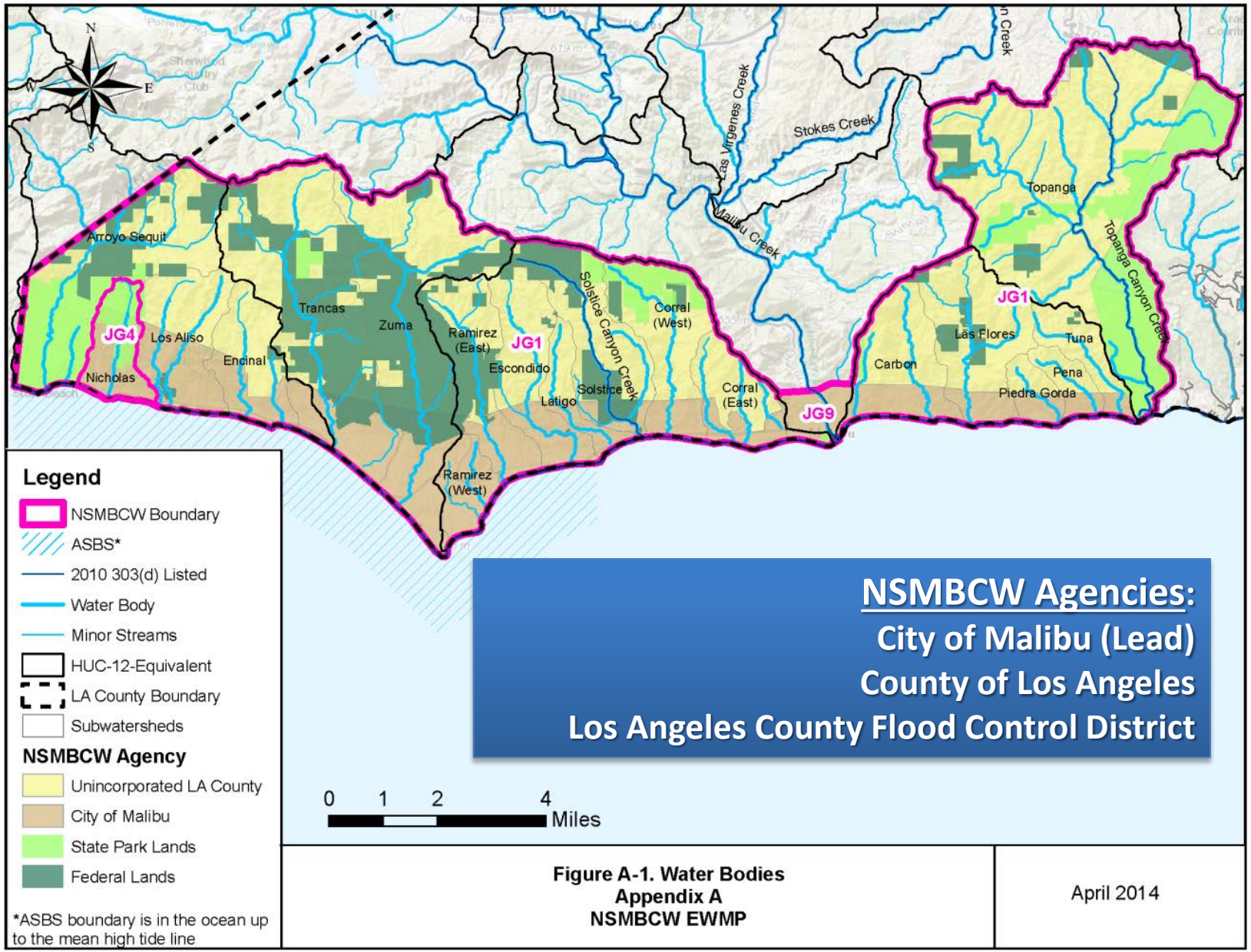
- To improve and protect beach and receiving water quality
- Compliance with:
  - Federal Clean Water Act
  - California Porter-Cologne Act
  - Municipal Stormwater Permit



Your Role in EWMP Development

- Share ideas to improve our process and results
- Provide information that could be helpful
- Submit comments/comment cards
- Sign-in and provide contact information for future notifications

NSMBCW Management Group



Definitions

- Basin Plan = Water Quality Control Plan: Los Angeles Region - Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties
- 303(d) list = List of water bodies that have impaired beneficial uses based on water quality objectives
- TMDL = Total Maximum Daily Loads
- MS4 = Municipal Separate Storm Sewer System
- BMP = Best Management Practice (Stormwater Control Measure)
- EWMP = Enhanced Watershed Management Program
- CIMP = Coordinated Integrated Monitoring Program
- RAA = Reasonable Assurance Analysis

MS4 Permit Objectives

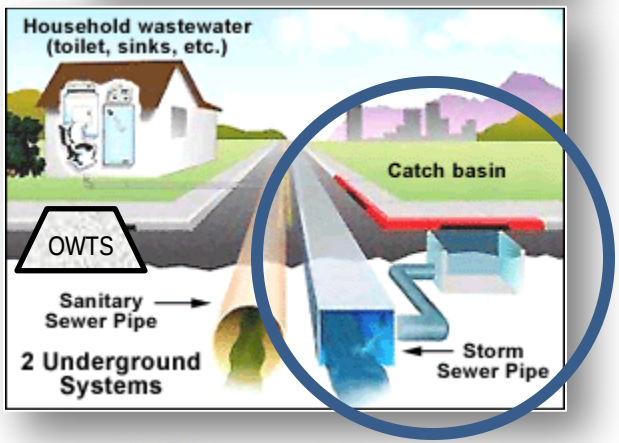
- Prohibit and eliminate *non*-stormwater discharges

  (with a few exceptions)
- Prevent/minimize stormwater pollution via best management practices (BMPs)
- Enforces pollutant limits including TMDLs

MS4 System

Conveyance or system of conveyances for stormwater owned by public body, including:

- Roads with drainage systems
- Municipal streets
- Catch basins
- Curbs
- Gutters
- Ditches
- Manmade channels
- Storm drains

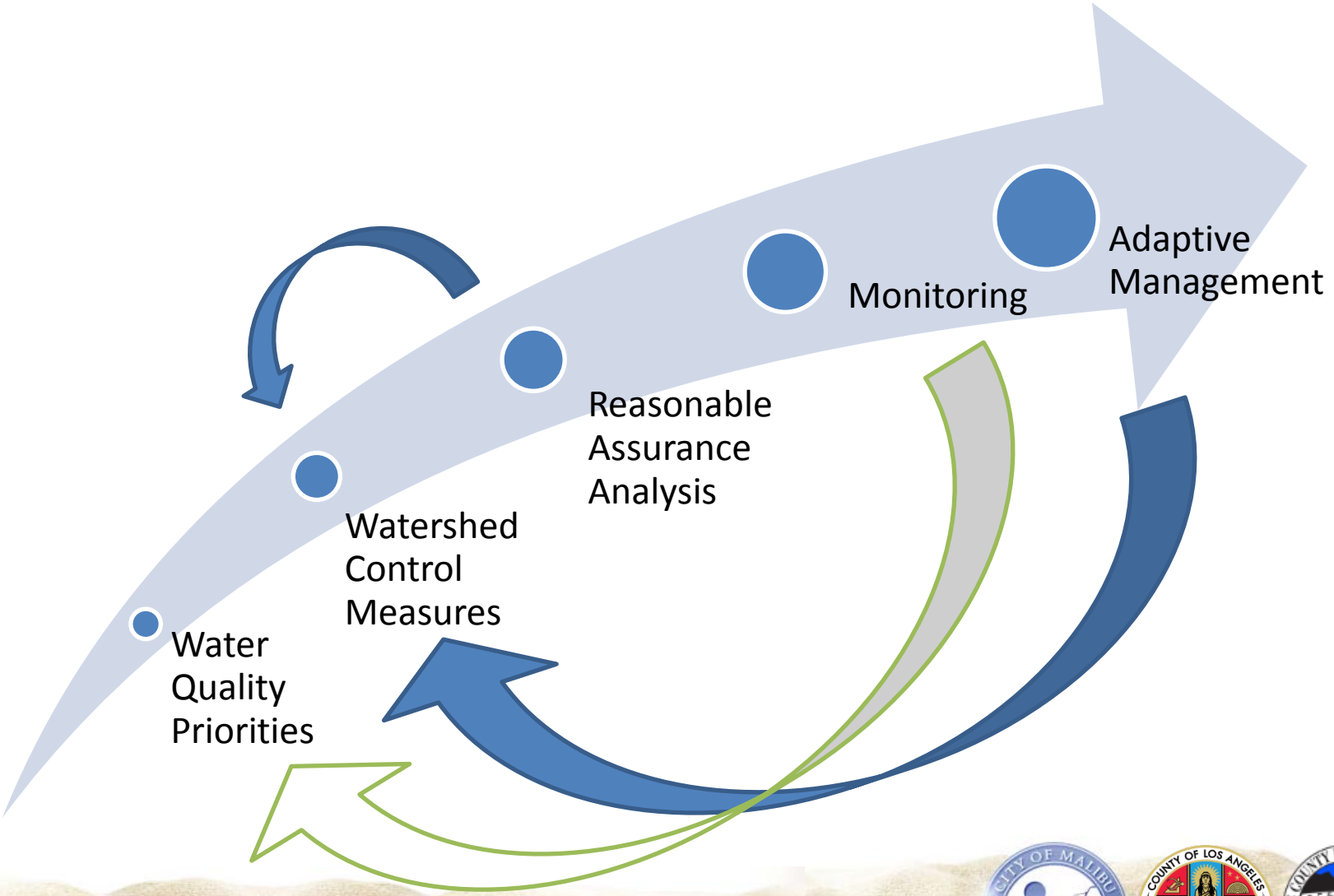


ENHANCED WATERSHED MANAGEMENT PROGRAM

Enhanced Watershed Management Program

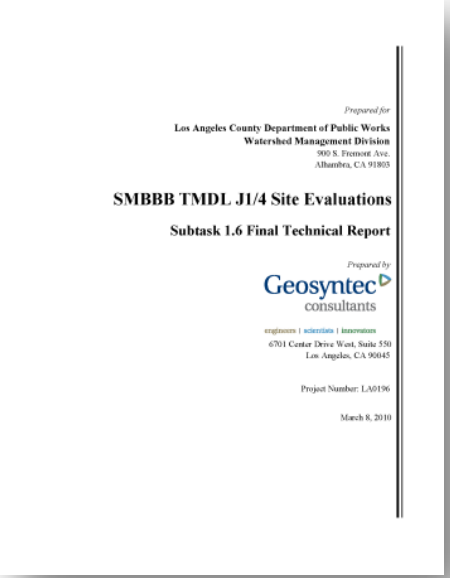
- Evaluates opportunities for multi-benefit regional projects:
  - Collaboration among Permittees and other partners
  - If feasible, retain all non-stormwater runoff and stormwater runoff from the design storm
  - Provide other benefits: e.g., flood control, water supply
- Where it is not feasible to retain design storm, demonstrate via Reasonable Assurance Analysis (RAA) that all final TMDLs and receiving water limitations will be met

EWMP Development Process



EWMP Builds on Previous Work

- Santa Monica Bay Beaches Bacteria TMDL Implementation Plan: Jurisdictional Groups 1&4 (2005)
- Santa Monica Bay Beaches Bacteria TMDL – Jurisdictional Groups 1&4 Implementation (County of Los Angeles)
- Design of Malibu Legacy Park, Broad Beach Biofilters, Wildlife Road (City of Malibu)
- Bacteria TMDL Reopener Studies
- Green Solutions Project Methods
- Ongoing Coastal Bacteria Applied Research
- Malibu Creek Studies


Prepared for
Los Angeles County Department of Public Works
Watershed Management Division
900 S. Fremont Ave.
Alhambra, CA 91803

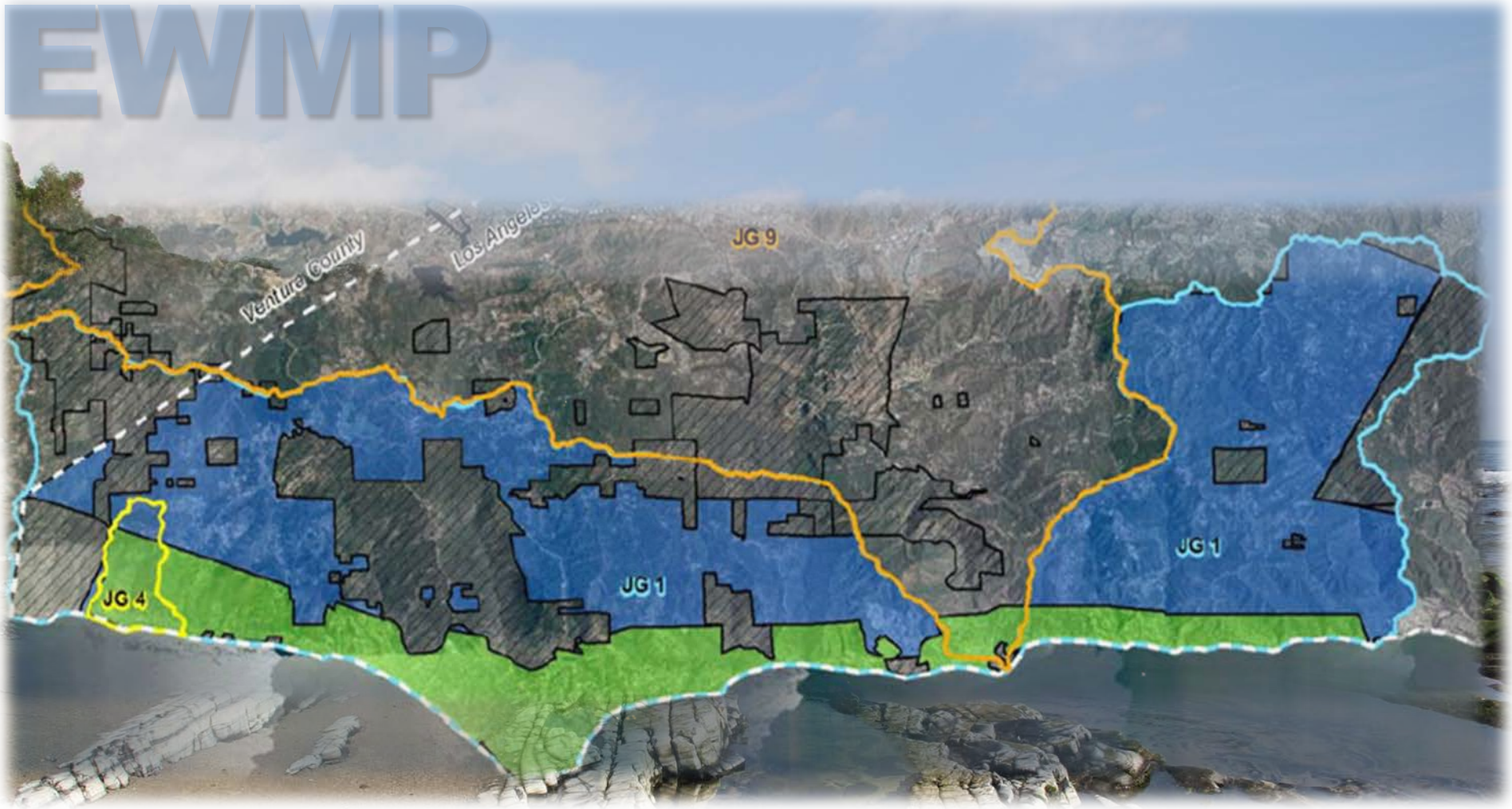
SMBBB TMDL J1/4 Site Evaluations

Subtask 1.6 Final Technical Report

Prepared by
Geosyntec consultants
engineers | scientists | innovators
6701 Center Drive West, Suite 550
Los Angeles, CA 90045

Project Number: LA0196

March 8, 2010



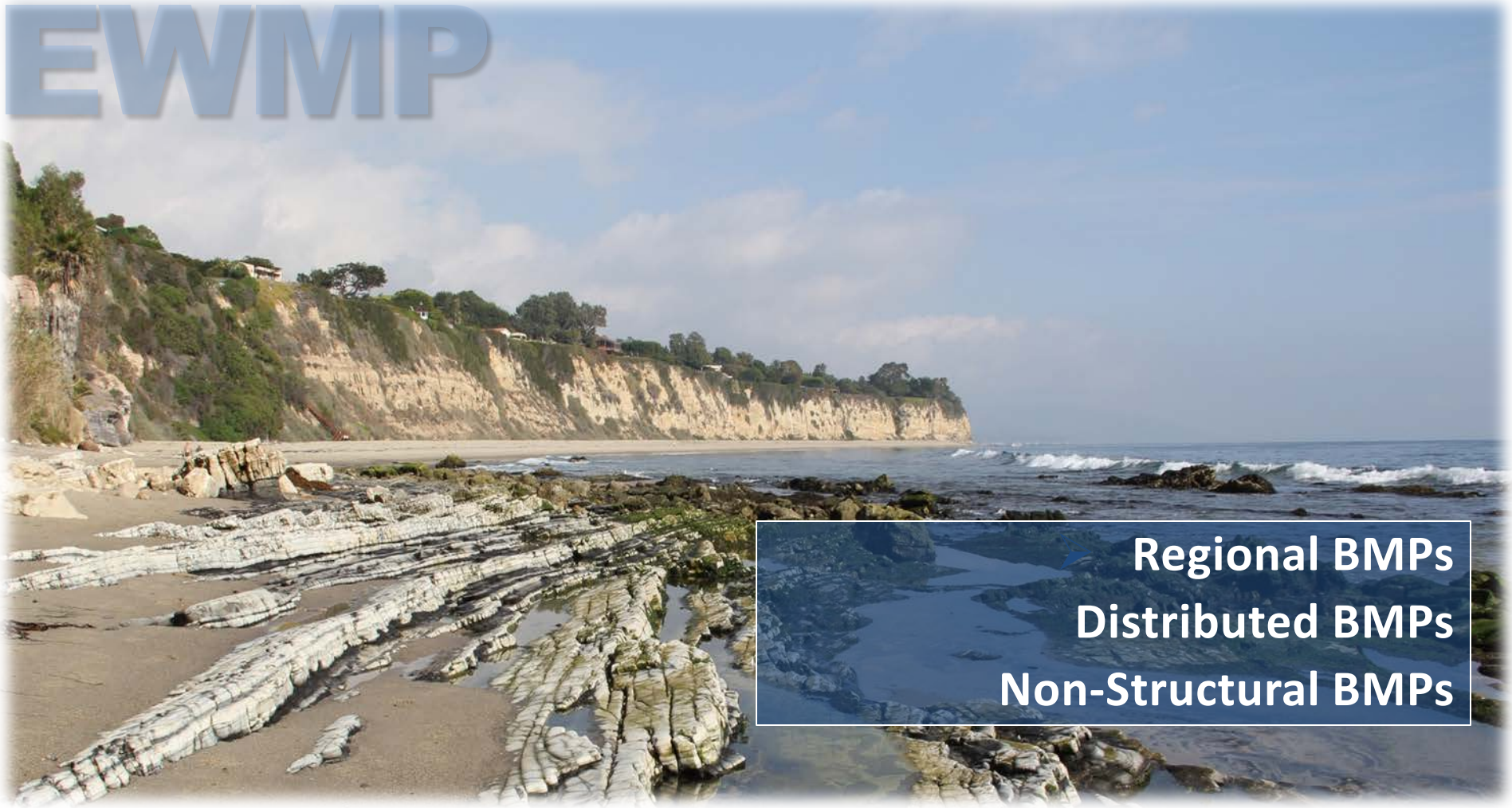
WATER QUALITY PRIORITIES

Total Maximum Daily Loads

- Santa Monica Bay Beaches
  - Dry Weather Bacteria
  - Wet Weather Bacteria
- Santa Monica Bay
  - Nearshore Debris
  - DDT and PCBs
- Malibu Creek and Lagoon
  - Bacteria
  - Trash

Water Quality Priorities

Category	Water Body	Pollutant
1: Highest Priority (TMDLs)	Malibu Creek	Trash
	Malibu Creek and Lagoon	Nutrients
		Indicator Bacteria
	SMB Beaches	Dry Weather Bacteria
		Wet Weather Bacteria
	SMB	Trash/Debris
		DDTs
		PCBs
2: High Priority (303[d] listings)	Topanga Canyon Creek	Lead
	Malibu Creek	Sulfates & Selenium
	Malibu Lagoon	pH
3: Medium Priority (WQ Data)	None	

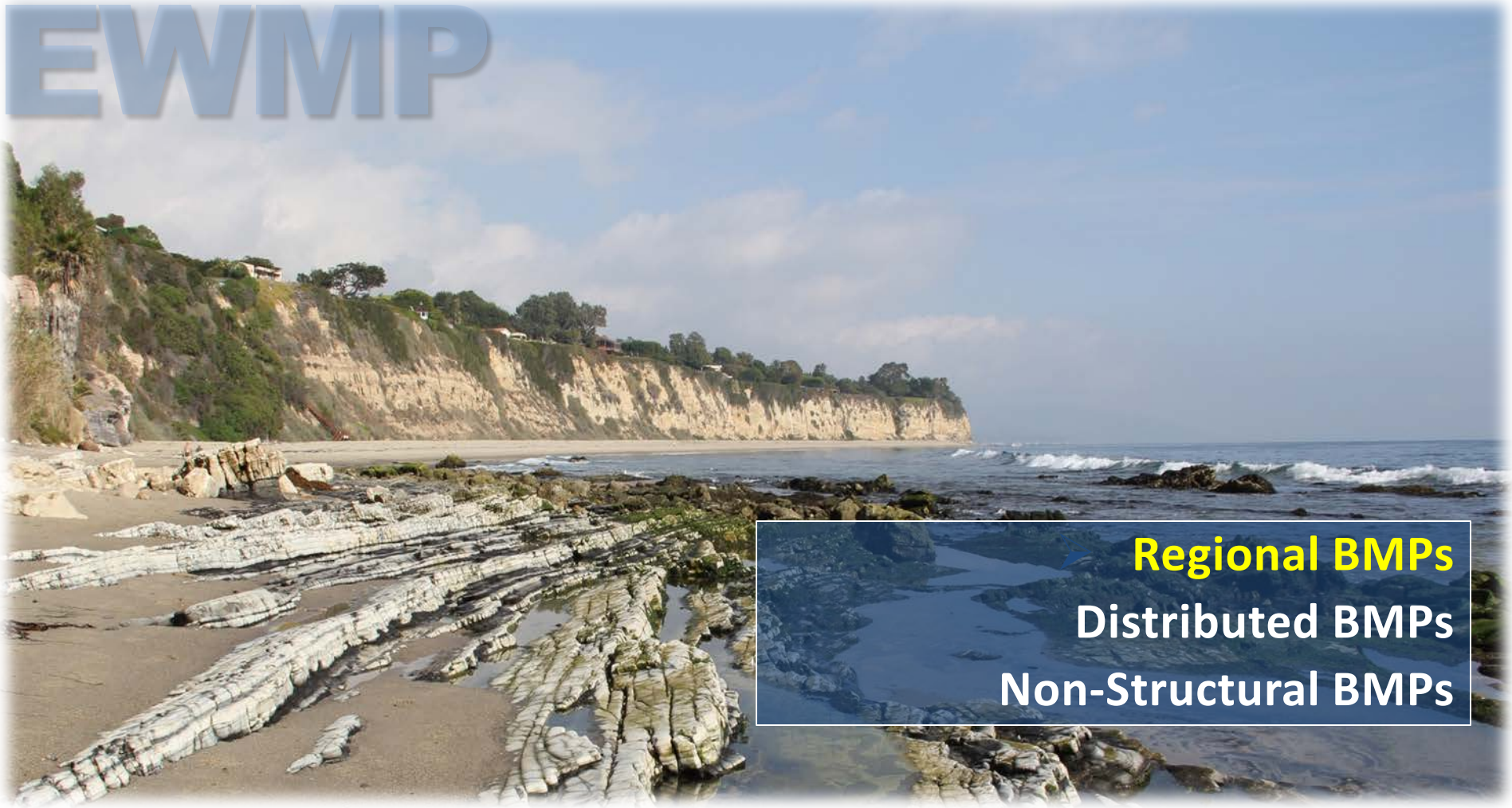


WATERSHED CONTROL MEASURES

Watershed Control Measures

- Structural BMPs
  - **Regional:** Designed to collect runoff from large usually multi-parcel, multi-land use areas (e.g., large infiltration basins, constructed wetlands, etc.)
  - **Distributed:** Designed to collect runoff from small areas, such as single parcels (e.g., porous pavement, bioretention, etc.)
- Non-Structural BMPs

  Source control measures that are intended to prevent the release of flow and/or pollutants to the MS4, (e.g., enhanced street sweeping, “pick up after your pet” program, water conservation ordinance, etc.)



WATERSHED CONTROL MEASURES
STRUCTURAL BMPS

Regional BMPs

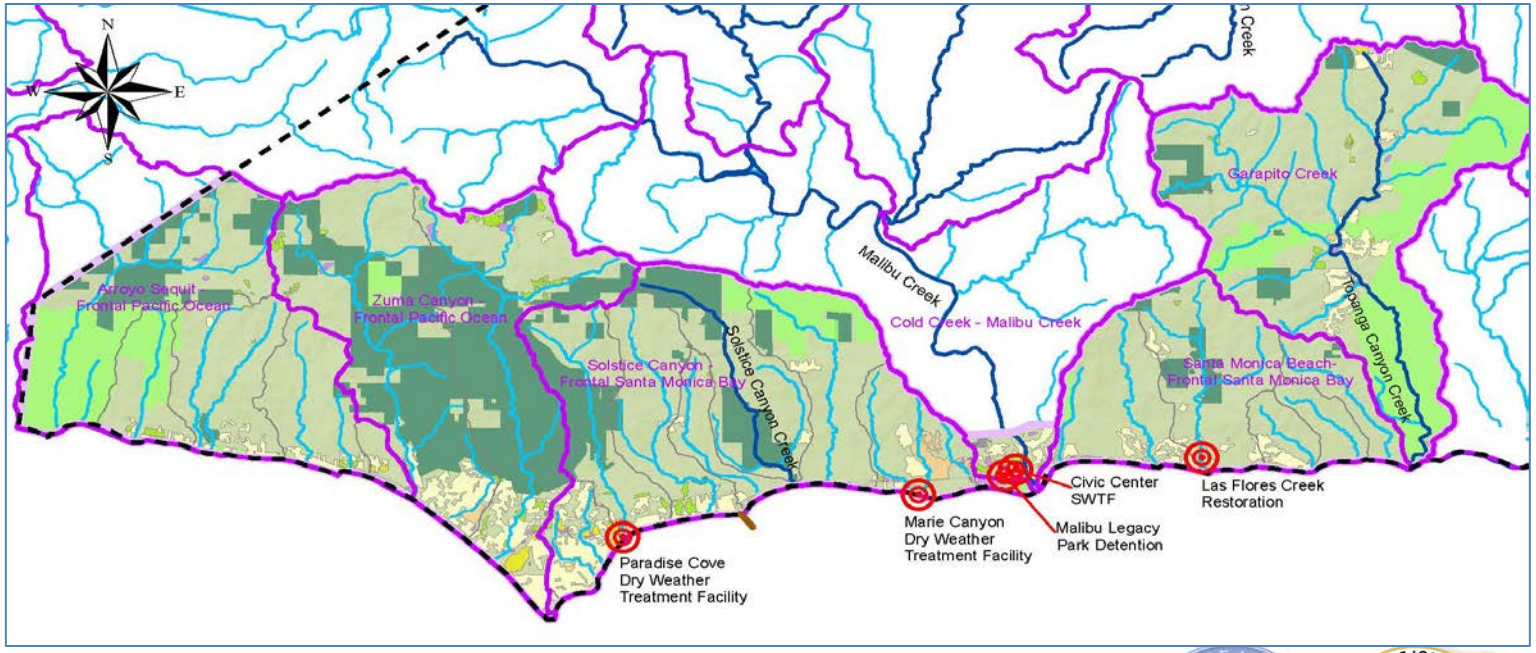
- **Regional BMPs** treat runoff from large, typically multi-parcel, multi-land use areas

- **Regional <u>EWMP</u> projects** retain runoff from 85th percentile, 24-hour event

  while also achieving other benefits including flood control and water supply, among others

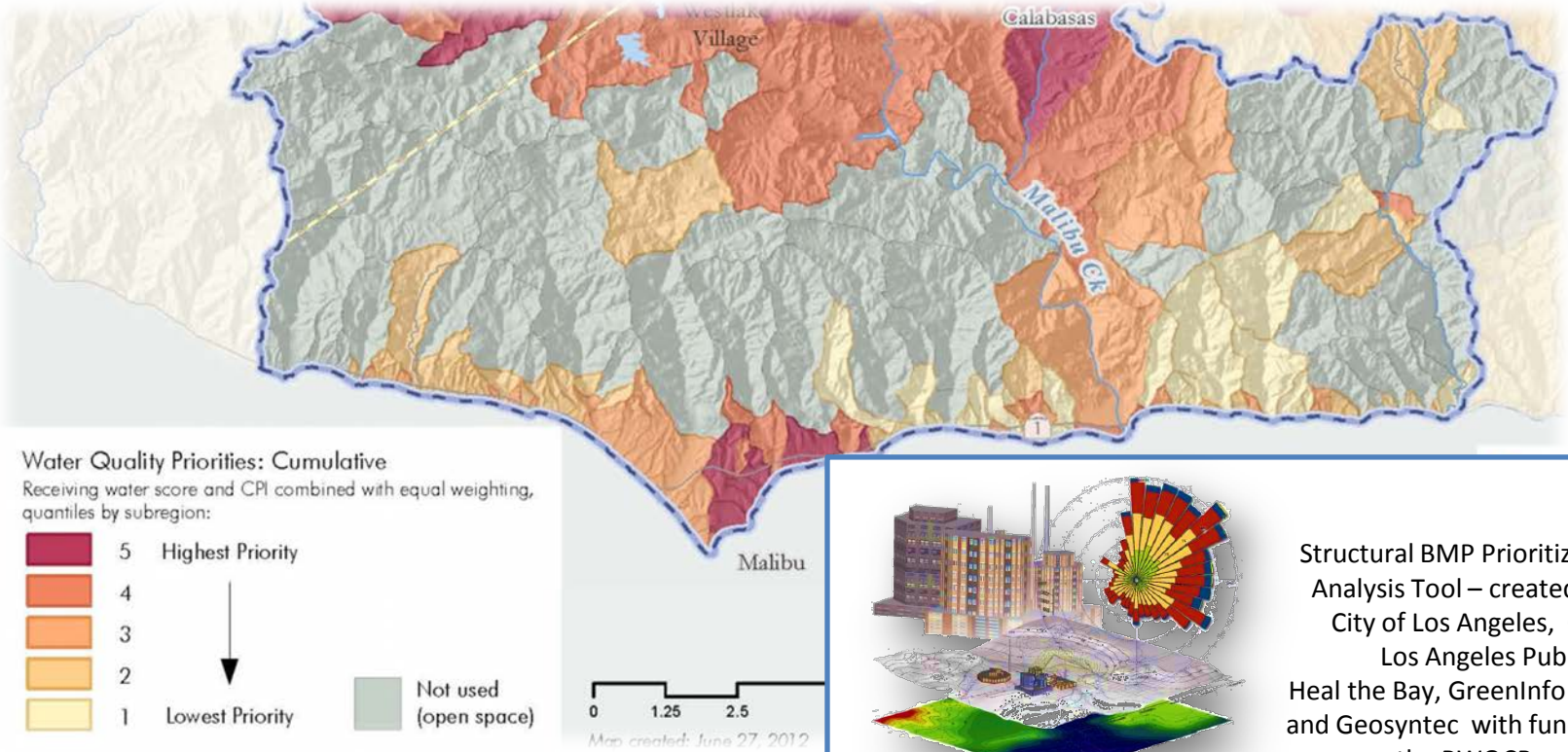
Existing Regional Projects

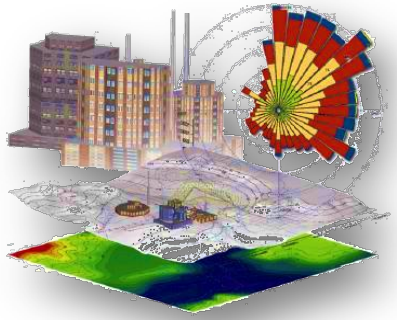
- Paradise Cove Treatment Facility
- Marie Canyon Treatment Facility
- Legacy Park/SWTF (Regional EWMP project)
- Las Flores Creek Restoration



Potential EWMP Projects

Multiple methods to identify new projects





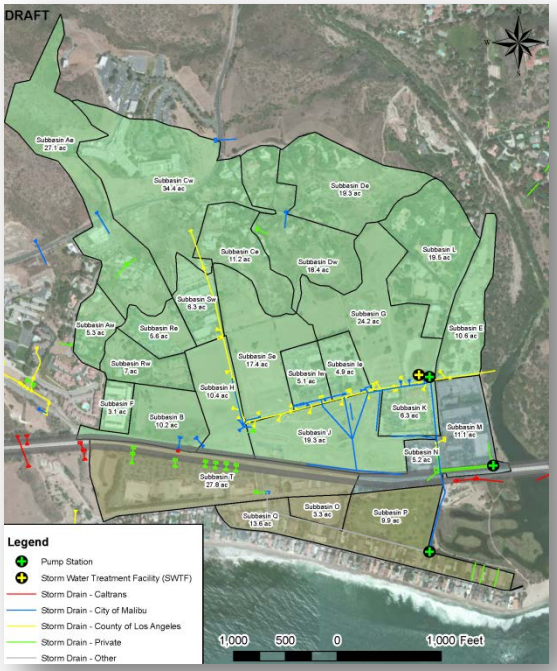
SBPAT

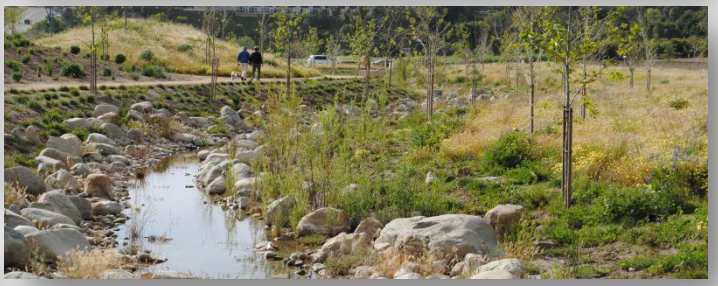
Structural BMP Prioritization and Analysis Tool – created with the City of Los Angeles, County of Los Angeles Public Works, Heal the Bay, GreenInfo Network, and Geosyntec with funding from the RWQCB and SWRCB

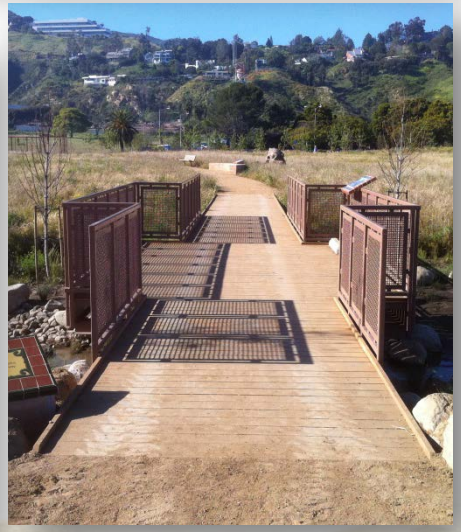
MALIBU LEGACY PARK PROJECT

FULFILL A DREAM, LEAVE A LEGACY

- EWMP Regional Project
- Bacteria TMDL Compliance
- Stormwater capture, disinfection and use
- Habitat development
- Public recreation
- **Upgrading to increase capacity/area**





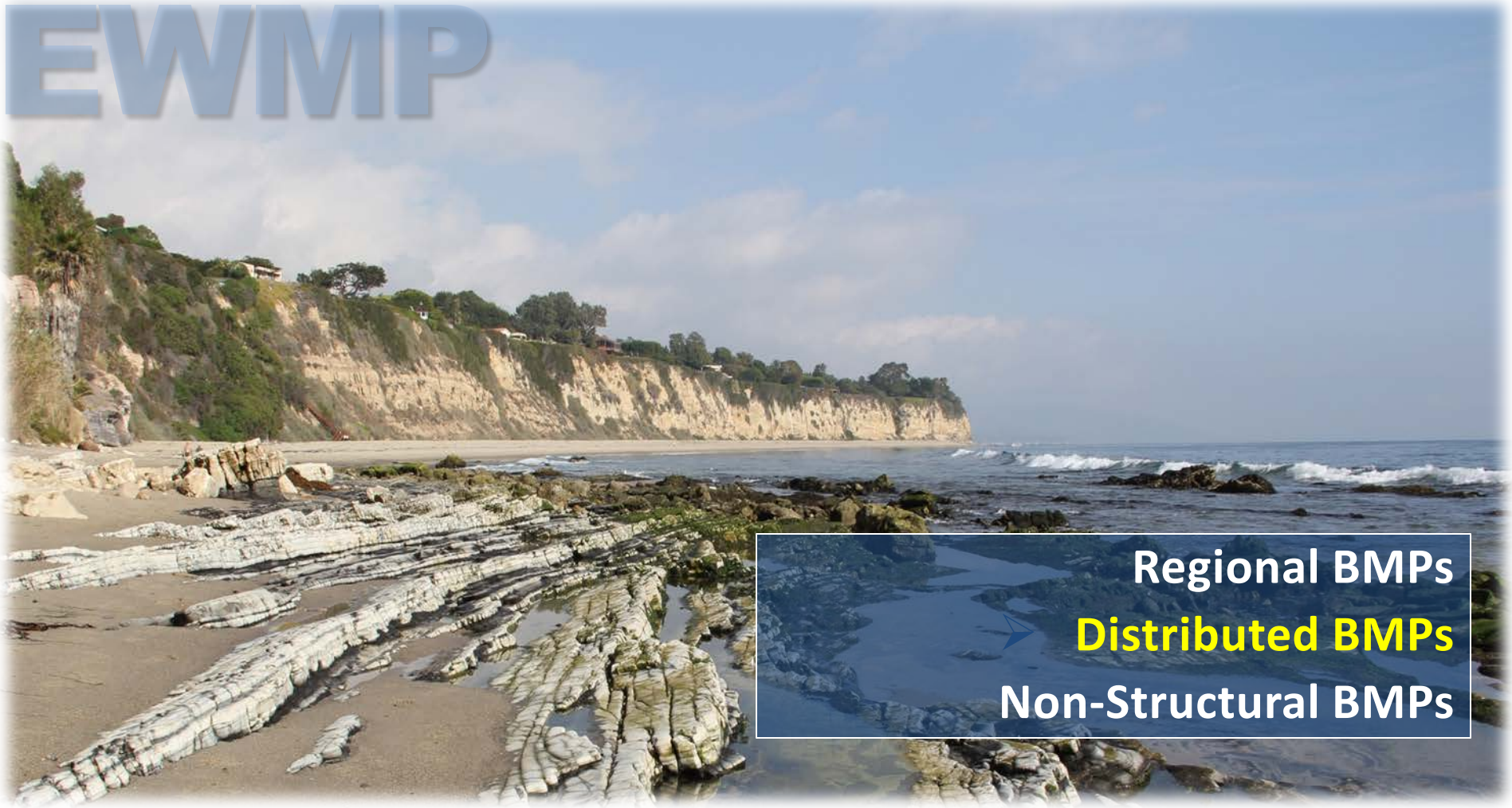


Broad Beach Biofiltration

Beach Infiltration Regional BMP Examples

Hermosa Strand Infiltration Trench

- Low-flow diversion to subsurface trench
- 3-4 ft unsaturated native sand below the trench to provide primary filtration
- Additional saturated filtration through groundwater across 300 feet of beach to ocean interface



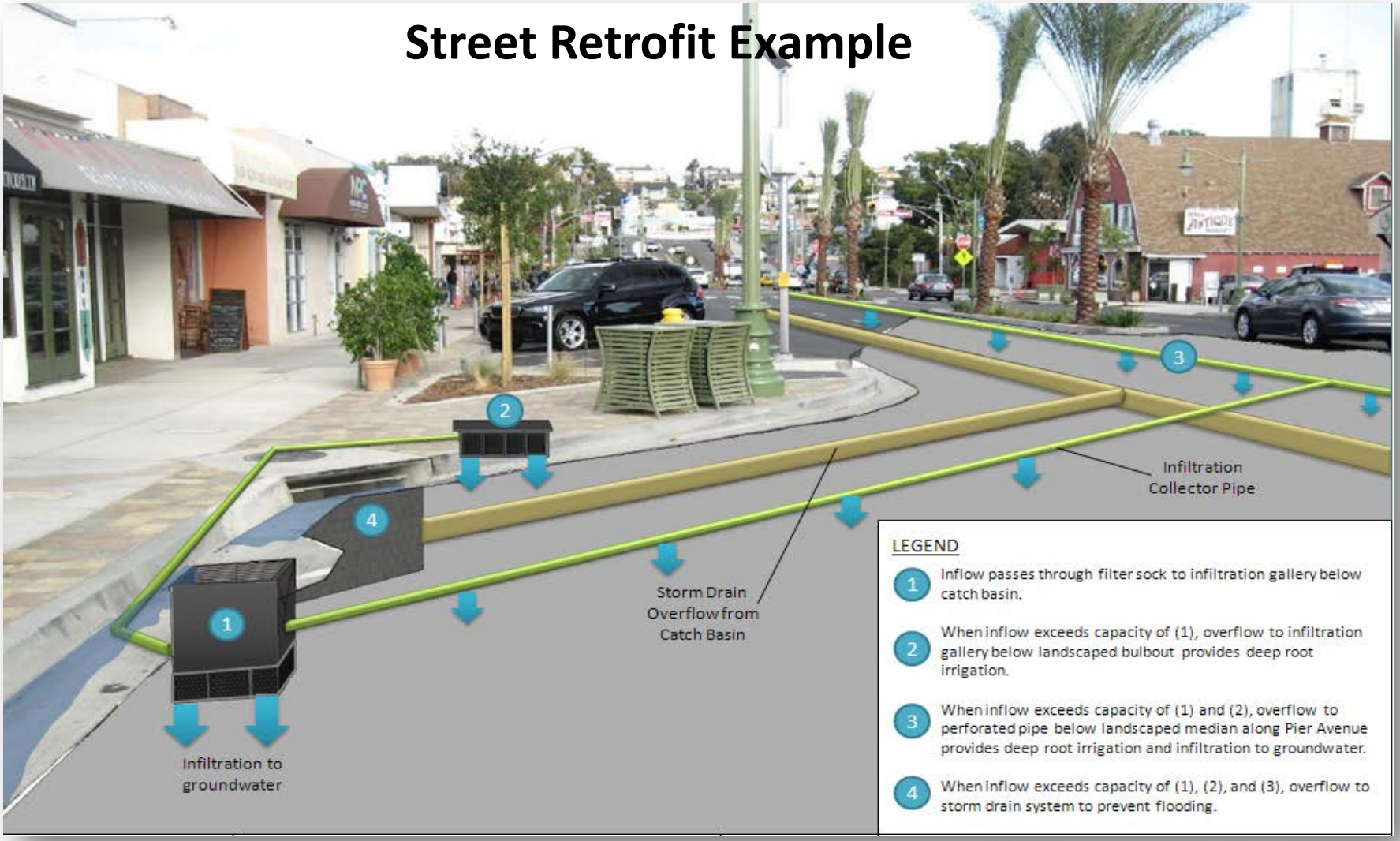
WATERSHED CONTROL MEASURES
STRUCTURAL BMPS

Distributed BMPs

- Distributed BMPs treat runoff typically from a small area and/or single parcel.
- Examples:
  - Infiltration Trenches
  - Catch Basin Inserts
  - Bioretention/Biofiltration
  - Harvest and Use
  - Green Roofs
  - Drywells
  - Permeable Pavement
  - Bioswales
  - Others

Distributed infiltration BMPs

Street Retrofit Example



Distributed BMPs

Examples of Catch Basin Inserts

Connector Pipe Screens

Auto-retractable screens

Fixed screens

Distributed BMPs

Bioretention/Biofiltration Example

- Utilize natural physical, biological and chemical process
- Capture and filter stormwater runoff using a combination of
  - Engineered soil media
  - Mulch
  - Plantings
  - Underdrains (if necessary)

Distributed BMPs

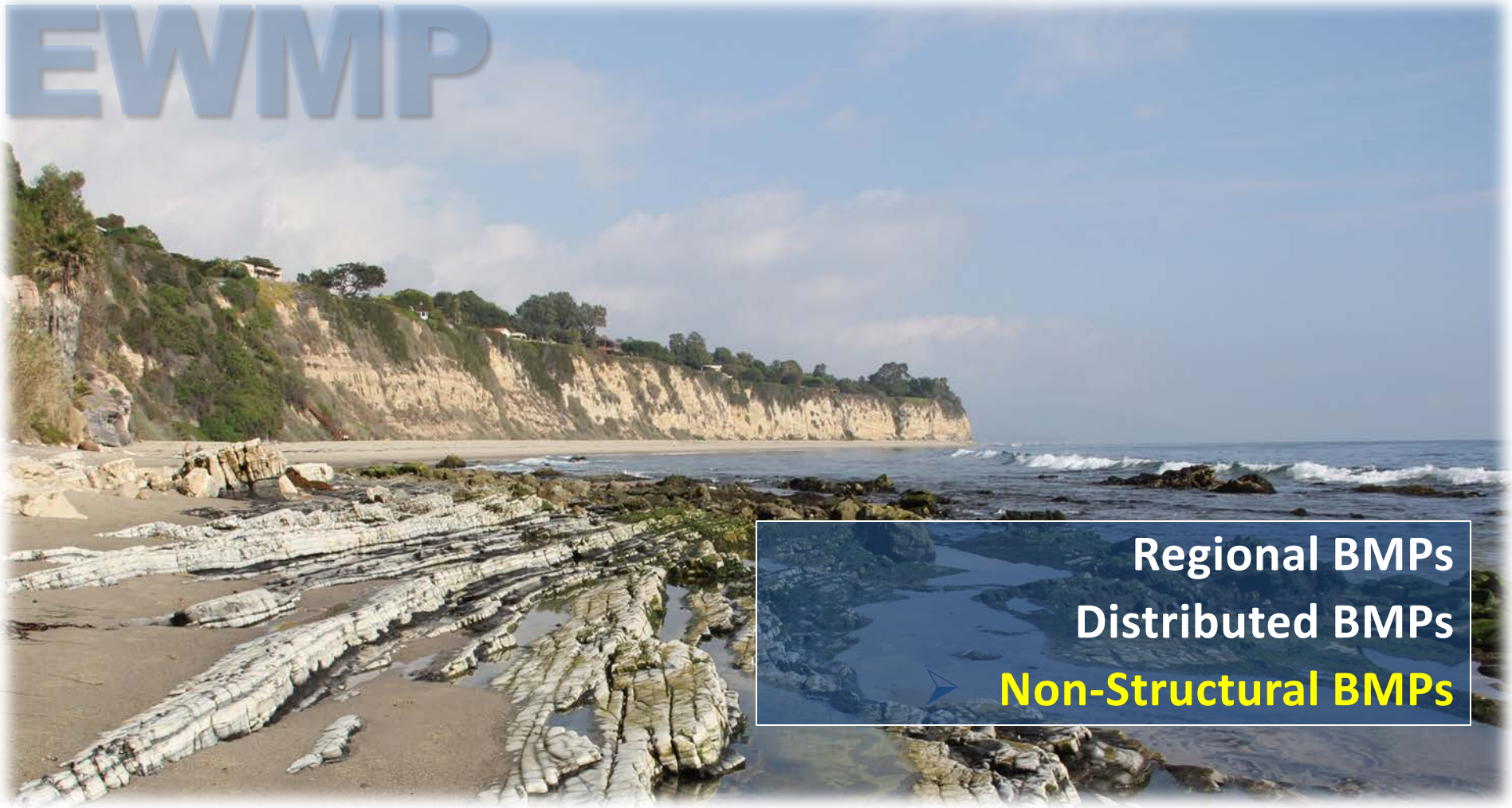
Harvest and Use Example

- Cisterns
- Rainwater harvesting
- Use for landscape irrigation

Distributed BMPs

Green Roof Examples

- Rainfall detention
- Evapotranspiration



WATERSHED CONTROL MEASURES: INSTITUTIONAL BMPS

Non-Structural & Institutional BMPs

- More frequent Industrial/Commercial Inspection Program
- Septic Management Plan Implementation
- Malibu Local Coastal Plan
- Water Conservation Ordinance
- Ocean Friendly/CA Friendly Garden Program
- Outreach Videos and Educational Materials
  - Clean Water Act and Our Backyards
  - Living Lightly in Our Watersheds Guide
  - Keep it Clean, Malibu
- Outreach to Equestrian Community
- Collaborations with regional partners and agencies
  - Chamber of Commerce Environmental Committee
  - Malibu Area Conservation

Low Impact Development Ordinance

- New Development and Redevelopment projects must control pollutants, pollutant loads, and runoff volume emanating from the completed project by:
  - Minimizing impervious surface area
  - Controlling runoff from impervious surfaces through:
    - infiltration, bioretention, and/or rainfall harvest and use
    - design storm = 85th percentile, 24-hour storm or ¾ inch, whichever is greater

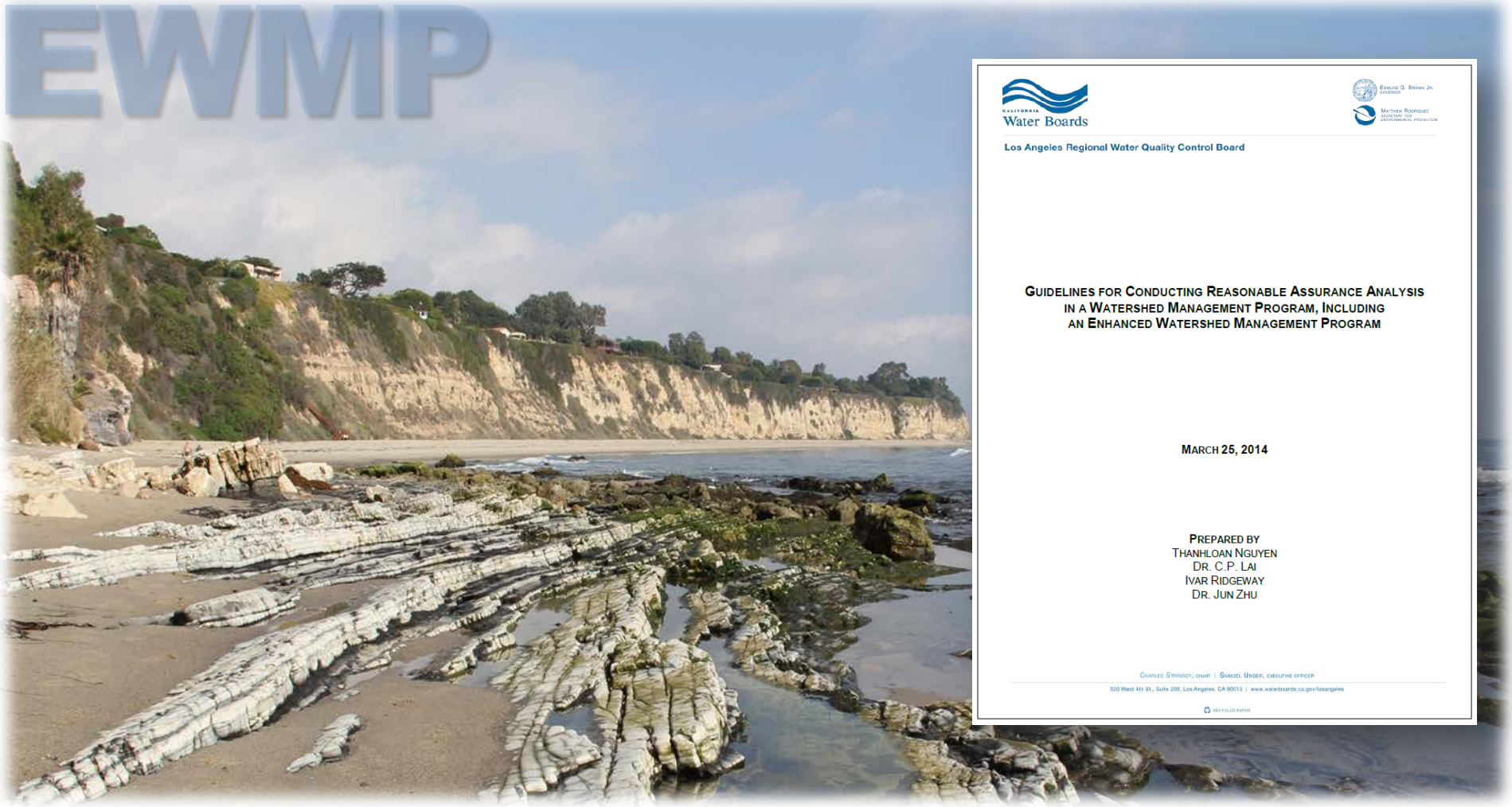
LID = Reduce Imperviousness + Structural BMPs

Green Street Policy

- Specify the use of green street strategies for transportation corridors
- Policy must prescribe a menu of BMPs for street and road construction projects of 10,000+ sq.ft. of impervious surface
- USEPA guidance regarding Managing Wet Weather with Green Infrastructure: Green Streets

How Can Residents/Businesses Help

- Minimize use of fertilizer and pesticides
- Cover outdoor trash cans
- Wash cars at commercial carwash
- Fix oil leaks promptly
- Instruct contractors and gardeners to use green waste bins, and not to dispose of debris or wash water into streets & storm drains
- Do not allow irrigation to overflow property
- Deposit pet waste in the trash
- Convert to drip or high efficiency irrigation
- Replace turf with landscape that requires less water, fertilizers, pesticides
- As appropriate:
  - Use porous paving for driveways and patios
  - Divert roof drains to vegetated areas



California Water Boards

Los Angeles Regional Water Quality Control Board

GUIDELINES FOR CONDUCTING REASONABLE ASSURANCE ANALYSIS IN A WATERSHED MANAGEMENT PROGRAM, INCLUDING AN ENHANCED WATERSHED MANAGEMENT PROGRAM

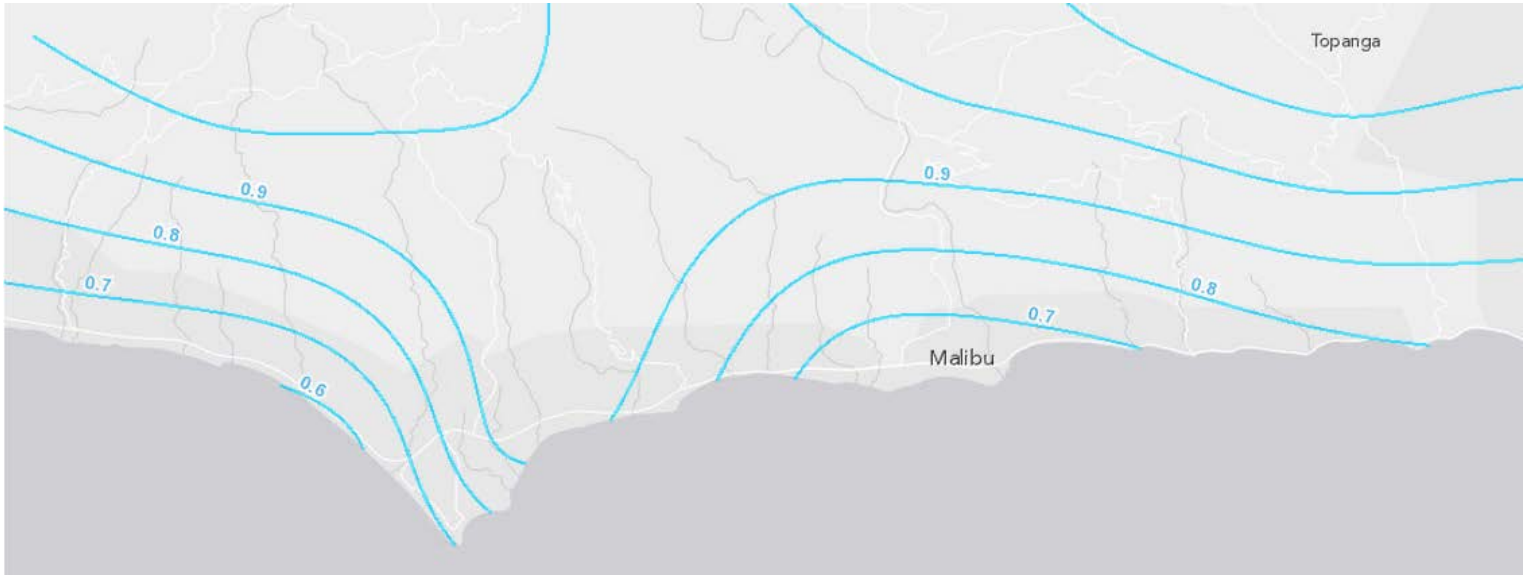
MARCH 25, 2014

PREPARED BY
THANHLOAN NGUYEN
DR. C.P. LAI
IVAR RIDGEWAY
DR. JUN ZHU

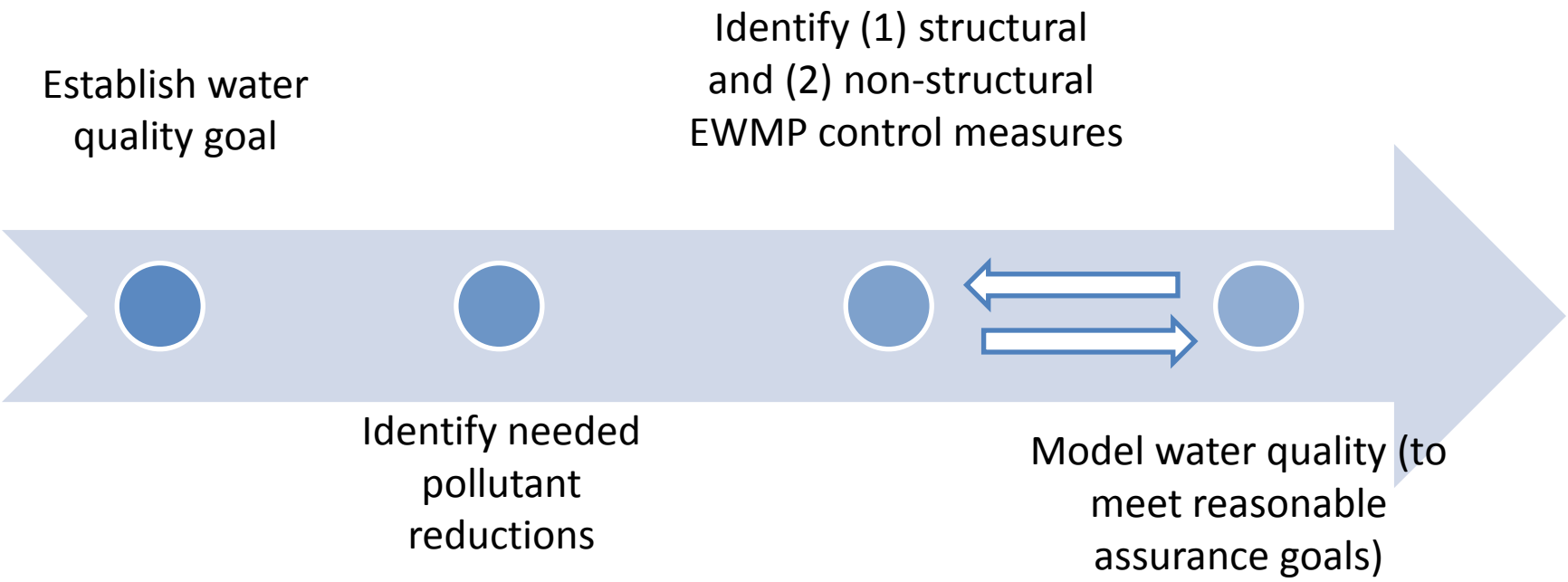
REASONABLE ASSURANCE ANALYSIS (RAA)

Is RAA required?

- RAA is not required for drainage areas where non-stormwater runoff and storm water runoff from 85th percentile 24-hour storm event is retained

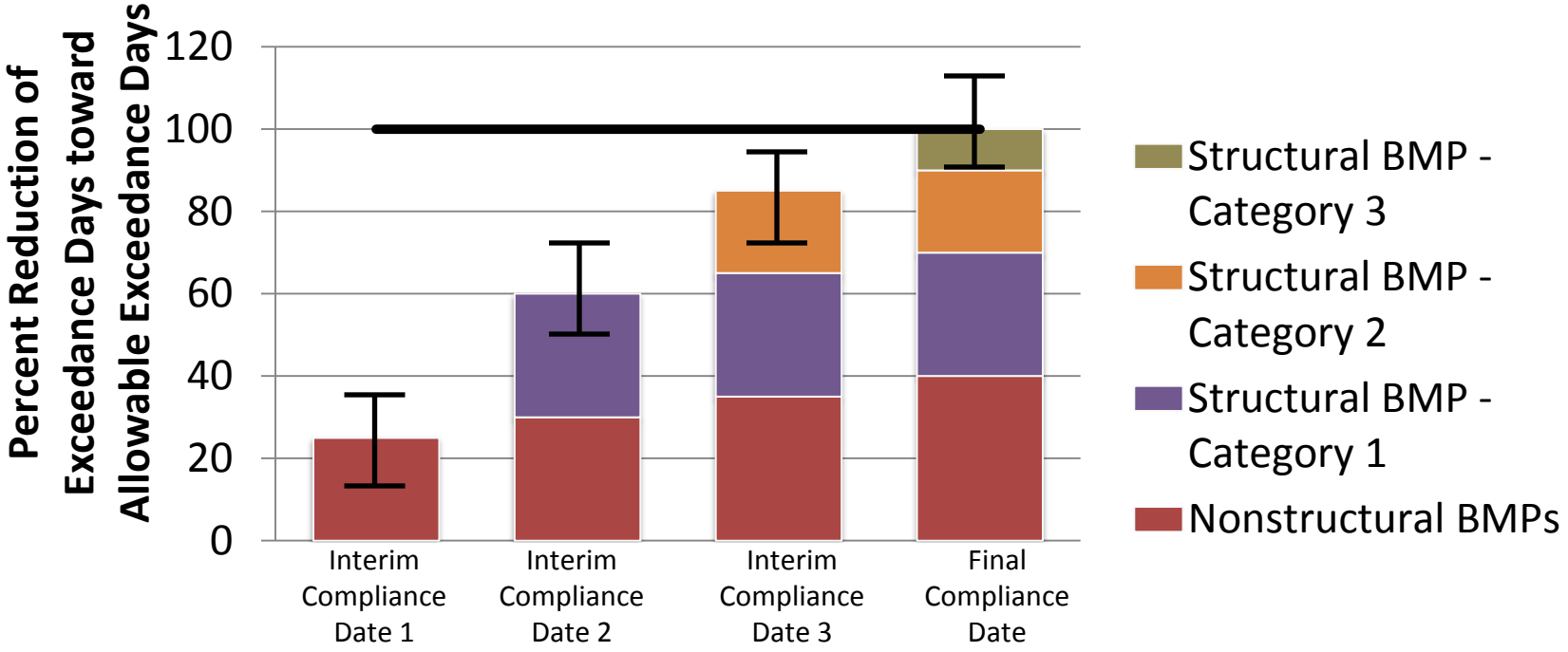


RAA Methodology



RAA Goals

Meet water quality targets using a combination of structural and nonstructural BMPs



COORDINATED INTEGRATED MONITORING PROGRAM

Coordinated Integrated Monitoring Program (CIMP)

- Customized monitoring program to:
  - Achieve 5 primary objectives to assess:
    1. Pollutant loads in MS4 discharges
    2. Whether water quality standards are met
    3. Sources of pollutants in MS4 discharges
    4. Chemical, physical, and biological impacts on receiving waters
    5. Effectiveness of pollutant controls
  - Provide for cost-efficient, effective water quality monitoring on a watershed basis
  - Coordinate with EWMP

Next Steps

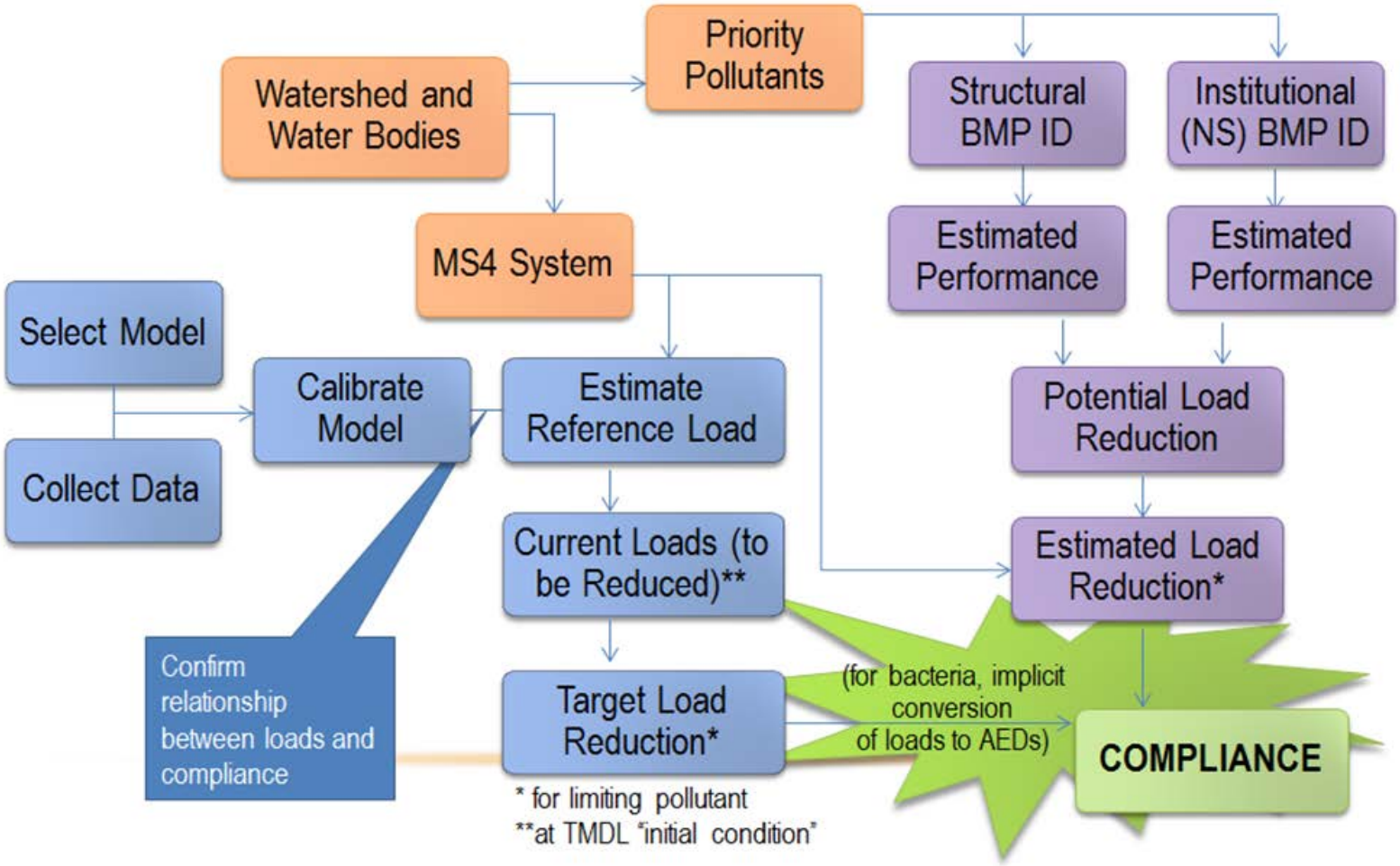
- EWMP Work Plan - June 28, 2014
- CIMP - June 28, 2014
- Low Impact Development Ordinances – April 2015
- Green Street Policies – June 2015
- EWMP - June 28, 2015

- Complete comment card/email input
- Attend next stakeholder meeting
- Sign attendee/interest list

QUESTIONS - COMMENTS – ANSWERS

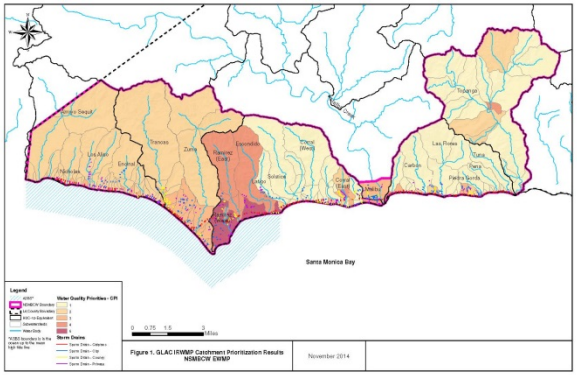
www.malibucity.org/EWMP

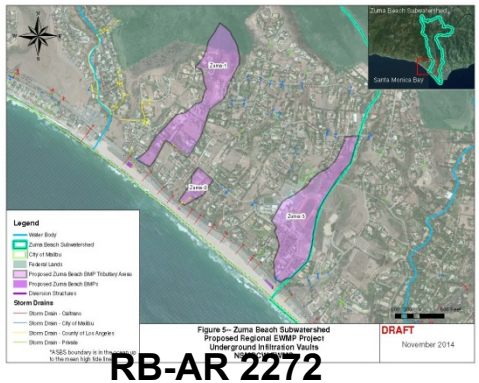
RAA Process Overview



NORTH SANTA MONICA BAY COASTAL WATERSHEDS ENHANCED WATERSHED MANAGEMENT PROGRAM

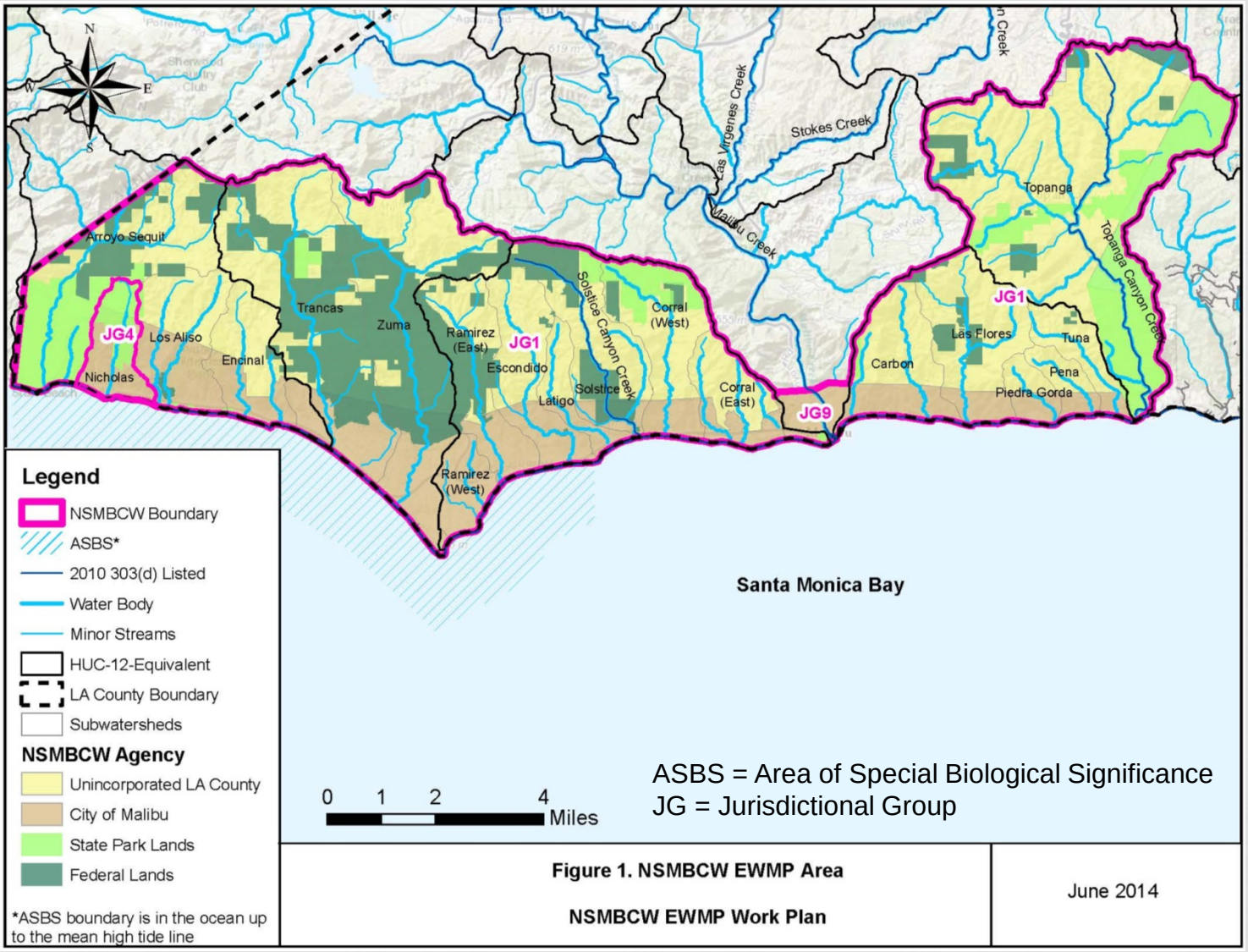
Public Workshop #2
King Gillette Ranch, Calabasas
November 13, 2014





RB-AR 2272

NSMBCW WATERSHED



REVIEW & OVERVIEW

Public Meeting #1

- Overview of Enhanced Watershed Management Program (EWMP) Process
  - Water Quality Priorities
  - Control Measures to Address Water Quality Priorities
  - Reasonable Assurance Analysis (RAA)
- Overview of Coordinated Integrated Monitoring Program (CIMP)

Public Meeting #2

- Identification of Potential Regional EWMP Projects

BACKGROUND

- The Municipal Stormwater Permit requires agencies to identify potential projects to improve water quality and provide other benefits ("Regional EWMP Projects")
- Areas not draining to these projects must use scientific modeling to show that water quality objectives will be met
  - This modeling process is called the Reasonable Assurance Analysis (RAA)
  - The RAA may lead to the identification of additional, smaller-scale water quality improvement projects

REGIONAL EWMP PROJECTS

Regional EWMP Project

- Design storm: 85th percentile, 24-hour
- Design storm must be fully retained
- Size of drainage area not limited
- Identified prior to RAA
- No RAA required

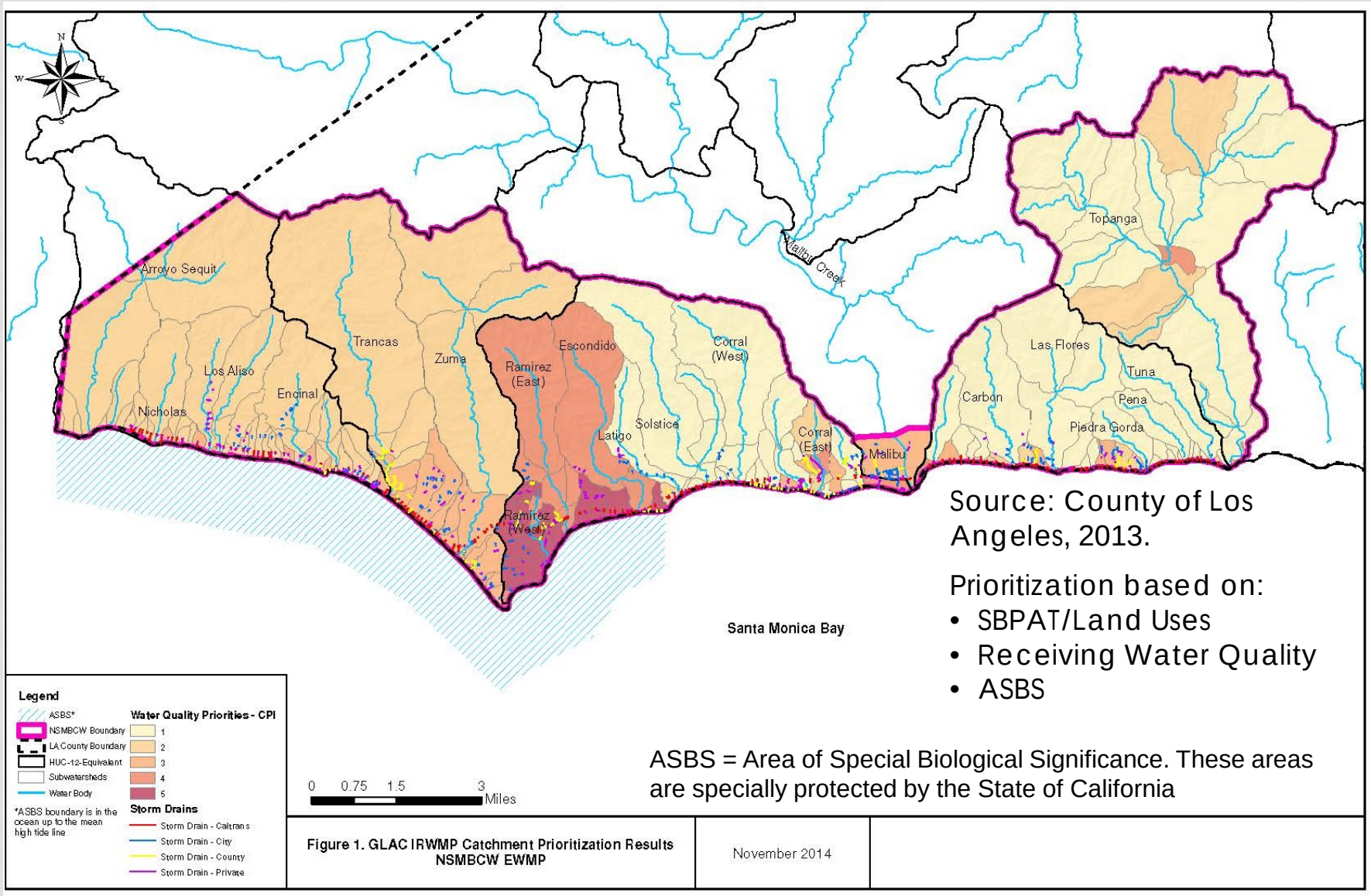
Regional BMP

- Design storm: not specified
- Design storm not required to be retained (treat and release ok)
- Typically defined by tributary area ≥ 5 acres
- Identified via RAA

APPROACH

- Input from NSMBCW Group
- Previous Studies to Identify Projects
  - Greater LA County Integrated Regional Water Management Plan (GLAC IRWMP)
  - North Santa Monica Bay Beaches J1/4 Bacteria TMDL Implementation Plan (IP)
  - Santa Monica Bay Beaches Bacteria TMDL J1/4 Site Evaluations Technical Report
  - Additional work conducted by the City of Malibu
- Desktop-level Screening
  - Drainage area ≥ 5 acres
  - Can the 85th percentile storm be retained?
  - Environmental and construction feasibility

GLAC IRWMP PRIORITIZATION



Source: County of Los Angeles, 2013.

Prioritization based on:

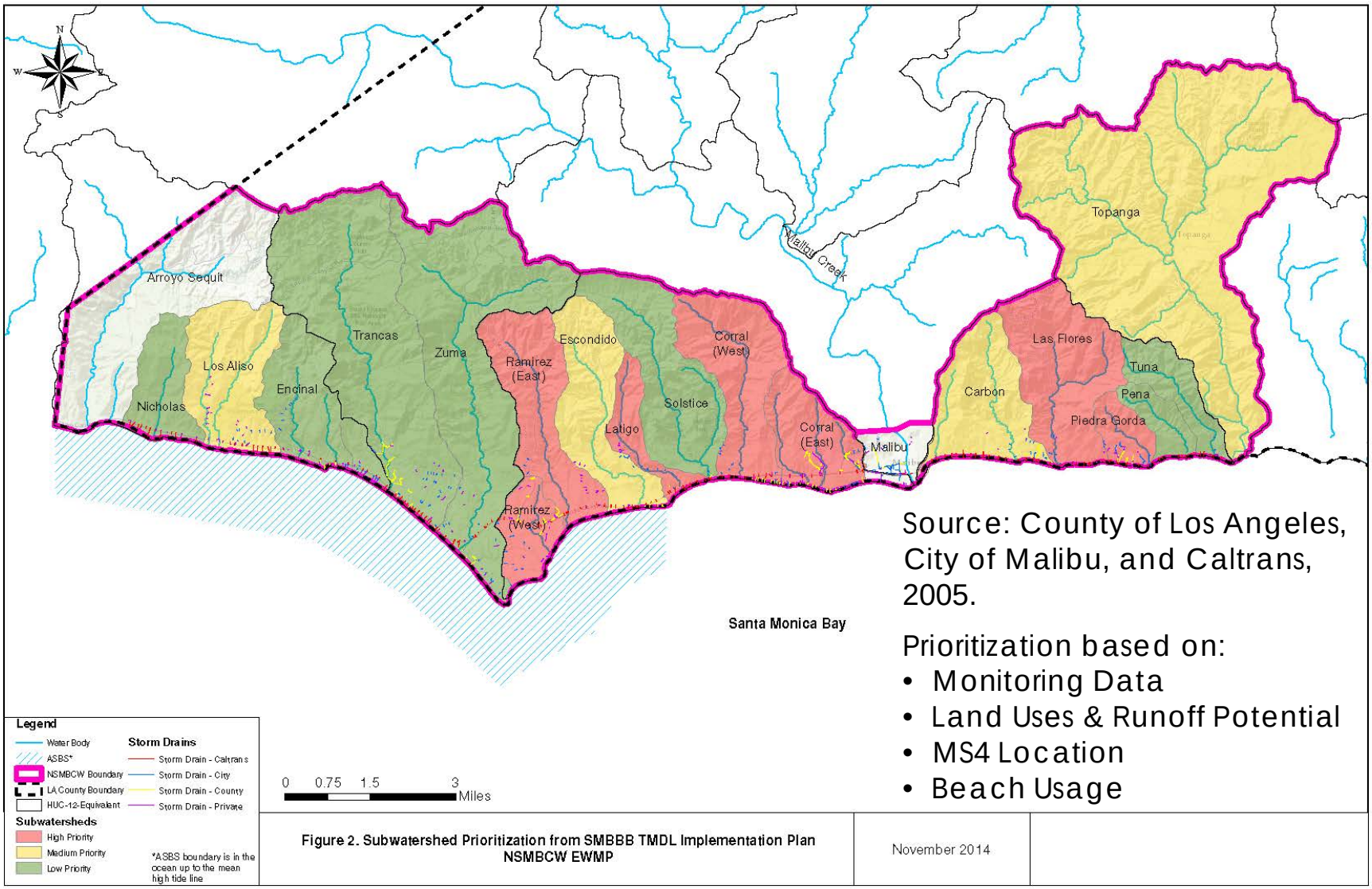
- SBPAT/Land Uses
- Receiving Water Quality
- ASBS

ASBS = Area of Special Biological Significance. These areas are specially protected by the State of California

Figure 1. GLAC IRWMP Catchment Prioritization Results
NSMBCW EWMP

November 2014

J1/4 BACTERIA TMDL IP PRIORITIZATION



Source: County of Los Angeles, City of Malibu, and Caltrans, 2005.

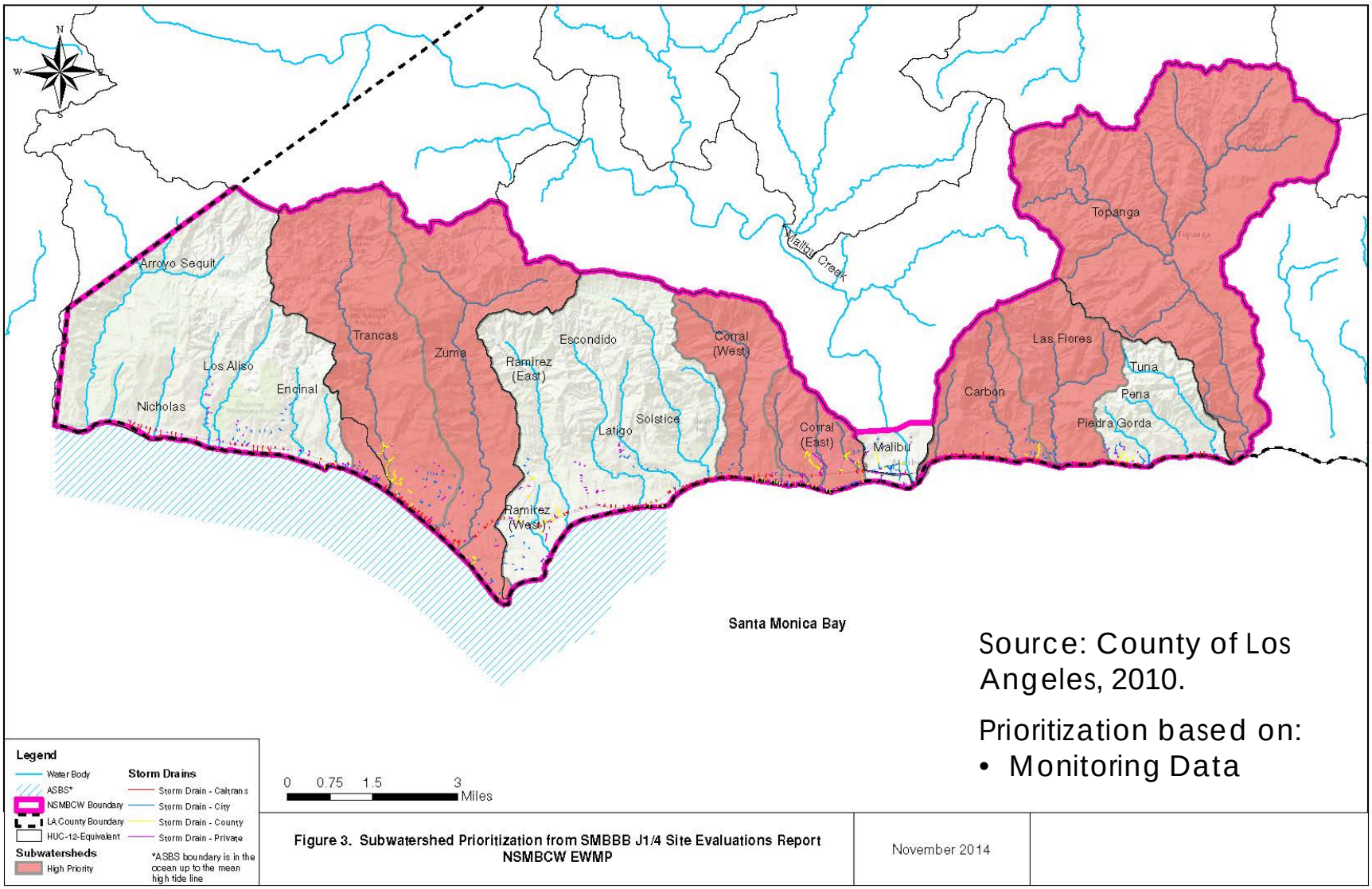
Prioritization based on:

- Monitoring Data
- Land Uses & Runoff Potential
- MS4 Location
- Beach Usage

Figure 2. Subwatershed Prioritization from SMBBB TMDL Implementation Plan NSMBCW EWMP

November 2014

J1/4 SITE EVALUATION PRIORITIZATION



Source: County of Los Angeles, 2010.

Prioritization based on:

- Monitoring Data

Figure 3. Subwatershed Prioritization from SMBBB J1/4 Site Evaluations Report NSMBCW EWMP

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PREVIOUSLY IDENTIFIED BMPS

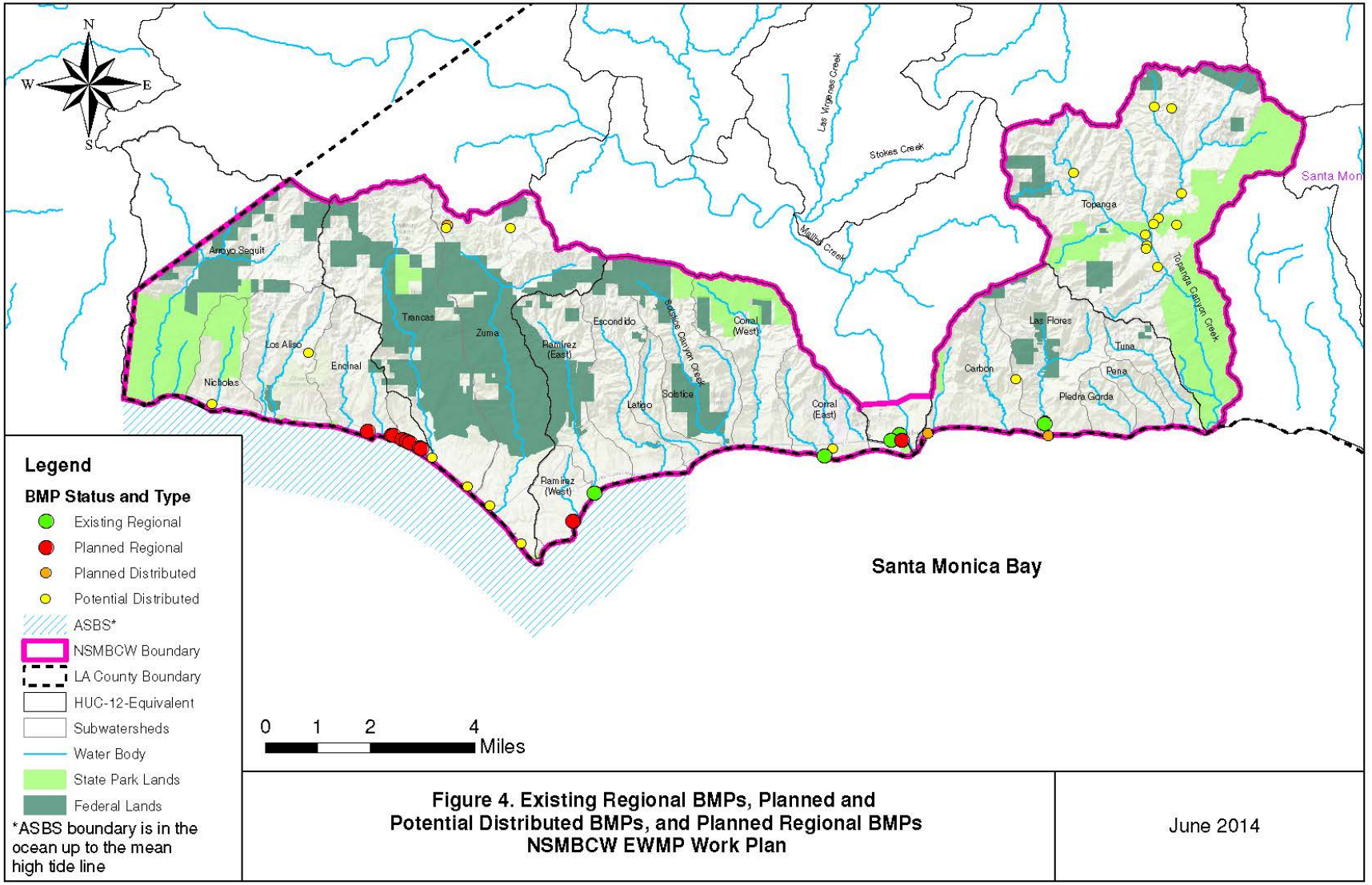


Figure 4. Existing Regional BMPs, Planned and Potential Distributed BMPs, and Planned Regional BMPs NSMBCW EWMP Work Plan

June 2014

SAMPLE OF SCREENING ANALYSIS

Subwatershed	Agency	Project Name	BMP Category	Siting Notes
Los Aliso	Malibu/ SMMC	Charmlee Nature Center Public Rec Area	Infiltration	Minimal benefit based on tributary land use (limited development) ; Ownership being transferred — No
Trancas	County	Trancas-2	Infiltration Trench	Minimal benefit based on tributary land use (limited development) — No
		Trancas-3	Infiltration Trench	Minimal benefit based on tributary land use (limited development) — No
Trancas/Zuma	County	Zuma-3	Bioretention	Not capable of retaining the design storm — No
	LACDBH	Zuma County Beach Parking Lots	Infiltration	Potential — Yes

Analysis conducted for 39 project sites

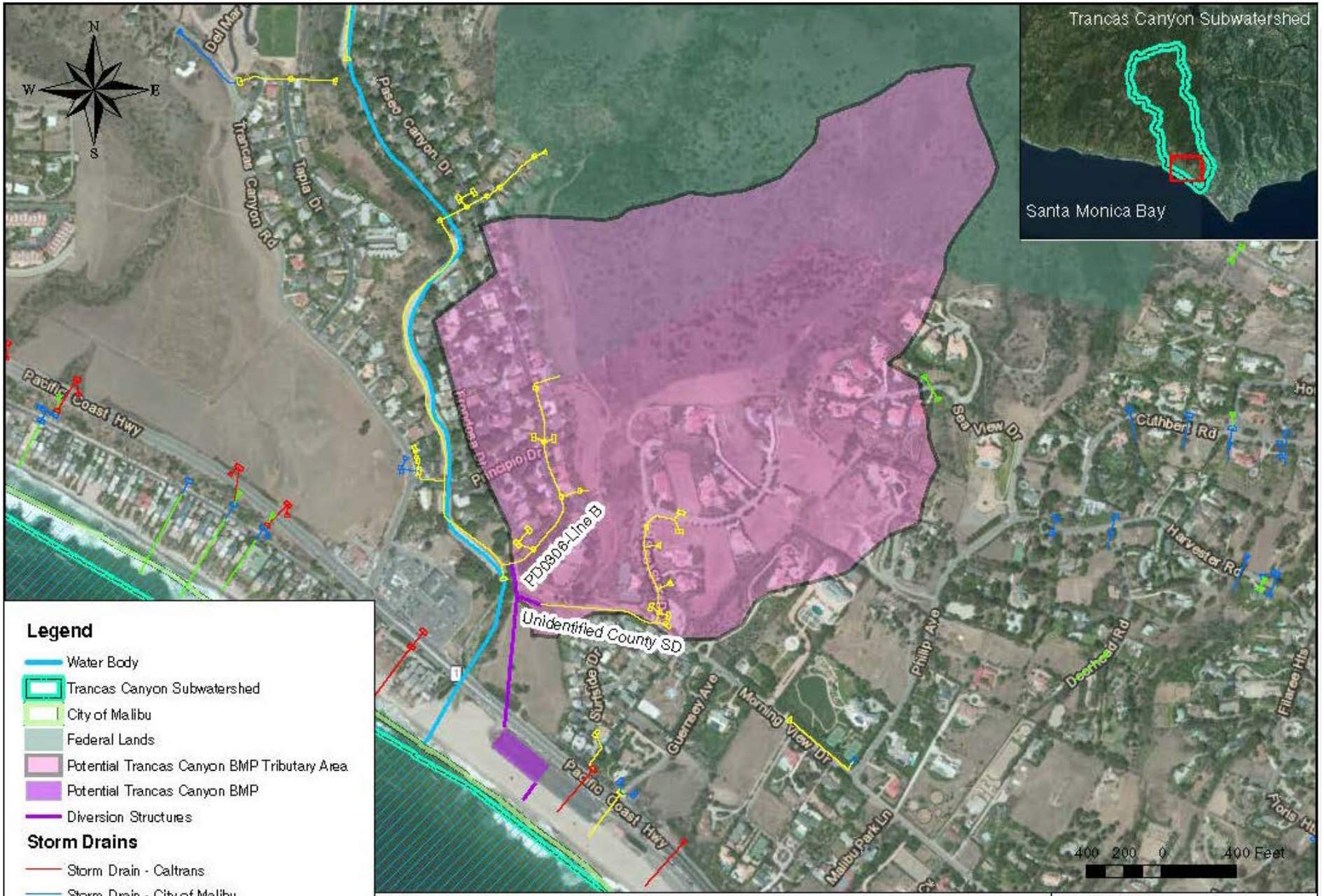
EXAMPLE PROJECTS

TRANCAS CANYON, ZUMA BEACH,
TOPANGA CANYON

TRANCAS CANYON CREEK

POTENTIAL REGIONAL EWMP PROJECT

AERIAL PHOTO OF TRANCAS CANYON WATERSHED, FACING NORTH



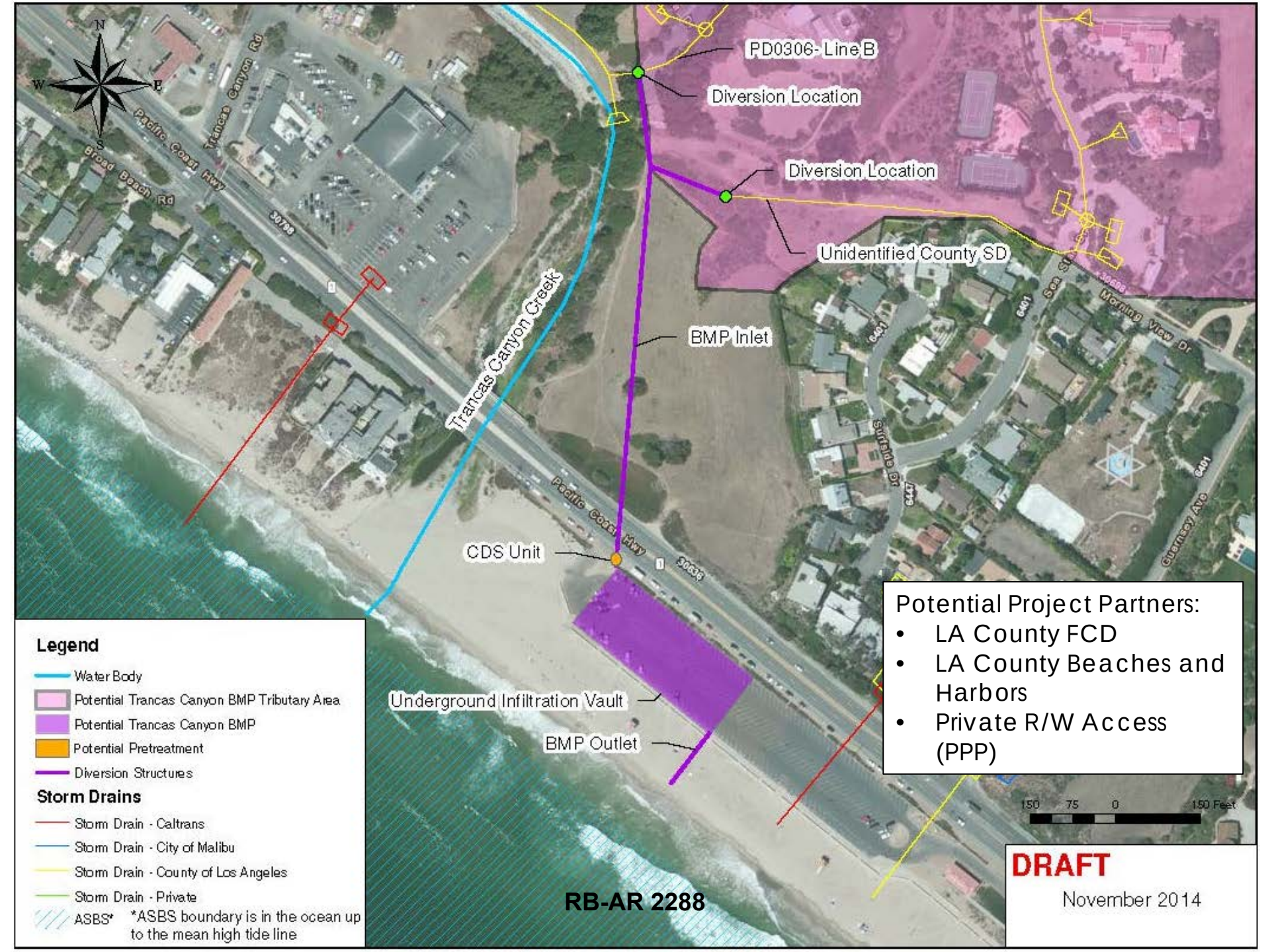
Trancas Canyon Subwatershed
Potential Regional EWMP Project
Underground Infiltration Vault
NSMBCW EWMP

DRAFT

November 2014

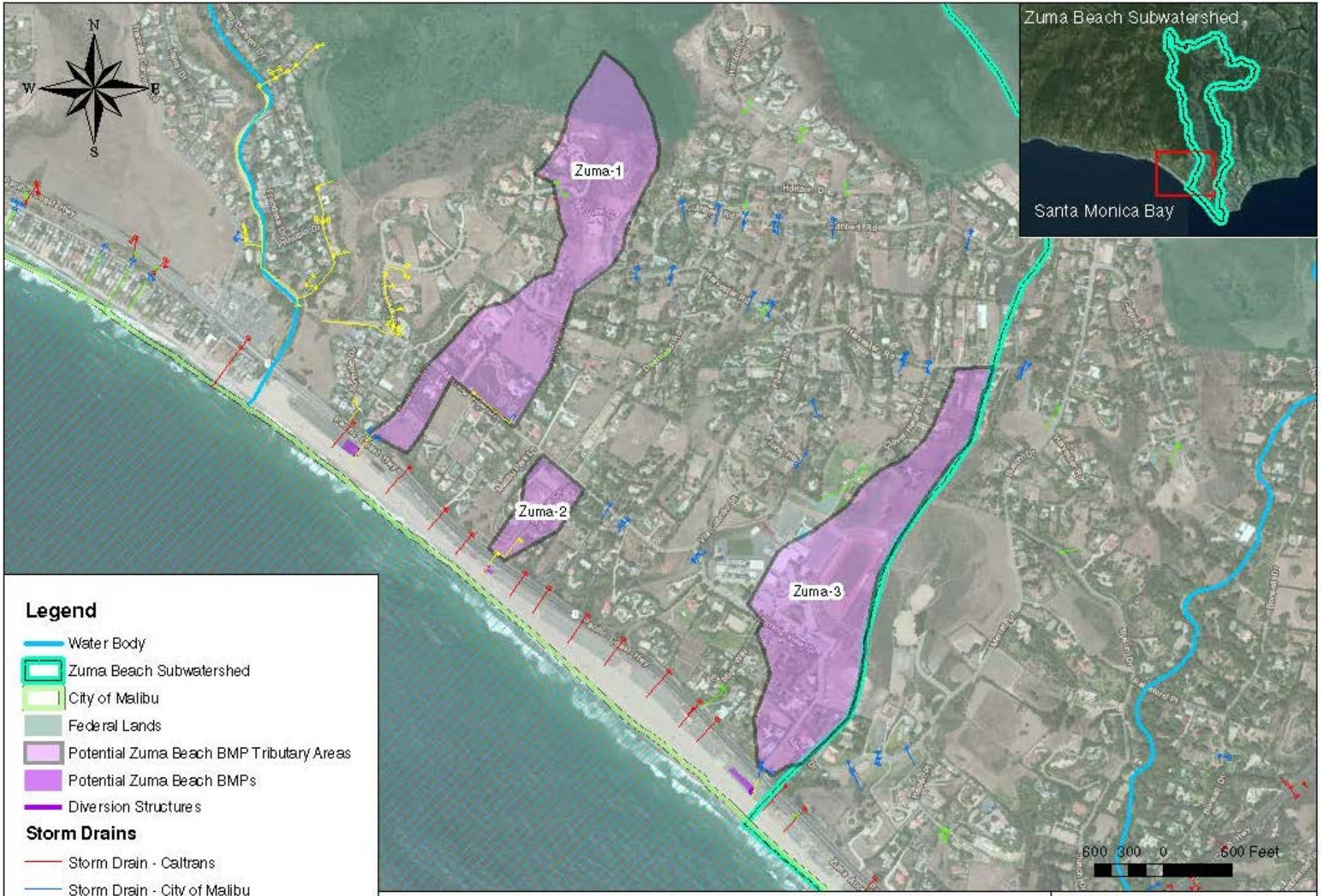
TRANCAS CANYON CREEK POTENTIAL REGIONAL EWMP PROJECT

- Underground infiltration gallery at Zuma Beach
- Pretreatment via a large solids separator (e.g., "CDS unit")
- Diversion of two County-owned storm drain lines draining approximately 130 acres
- Designed to retain 85th percentile, 24-hr storm event
- Treating runoff from single family residences and undeveloped land


PD0306- Line B
Diversion Location
Diversion Location
Unidentified County SD
BMP Inlet
Trancas Canyon Creek
CDS Unit
Underground Infiltration Vault
BMP Outlet
Pacific Coast Hwy
Broad Beach Rd
Trancas Canyon Rd
Sea View Dr
Morning View Dr
Surfside Dr
Guernsey Ave
Legend
Water Body
Potential Trancas Canyon BMP Tributary Area
Potential Trancas Canyon BMP
Potential Pretreatment
Diversion Structures
Storm Drains
Storm Drain - Caltrans
Storm Drain - City of Malibu
Storm Drain - County of Los Angeles
Storm Drain - Private
ASBS*
*ASBS boundary is in the ocean up to the mean high tide line
Potential Project Partners:
• LA County FCD
• LA County Beaches and Harbors
• Private R/W Access (PPP)
150 75 0 150 Feet
DRAFT
November 2014
RB-AR 2288

ZUMA BEACH

POTENTIAL REGIONAL EWMP PROJECTS



Zuma Beach Subwatershed
Potential Regional EWMP Project
Underground Infiltration Vaults
NSMBCW EWMP

RB-AR 2290

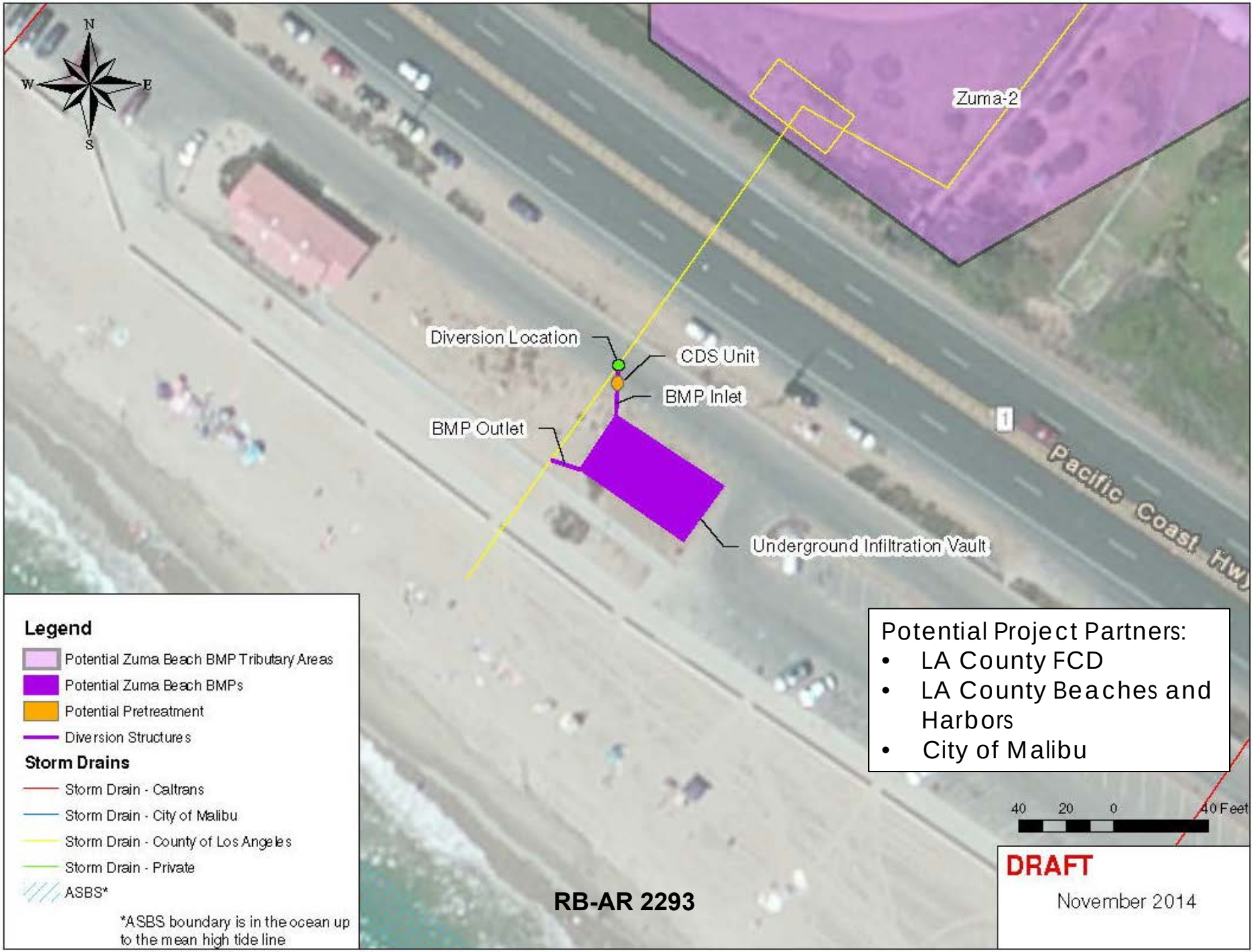
DRAFT

November 2014

POTENTIAL LOCATION OF ZUMA-01, FACING NORTHEAST, SHOWING GUERNSEY AVE MEETING PACIFIC COAST HIGHWAY

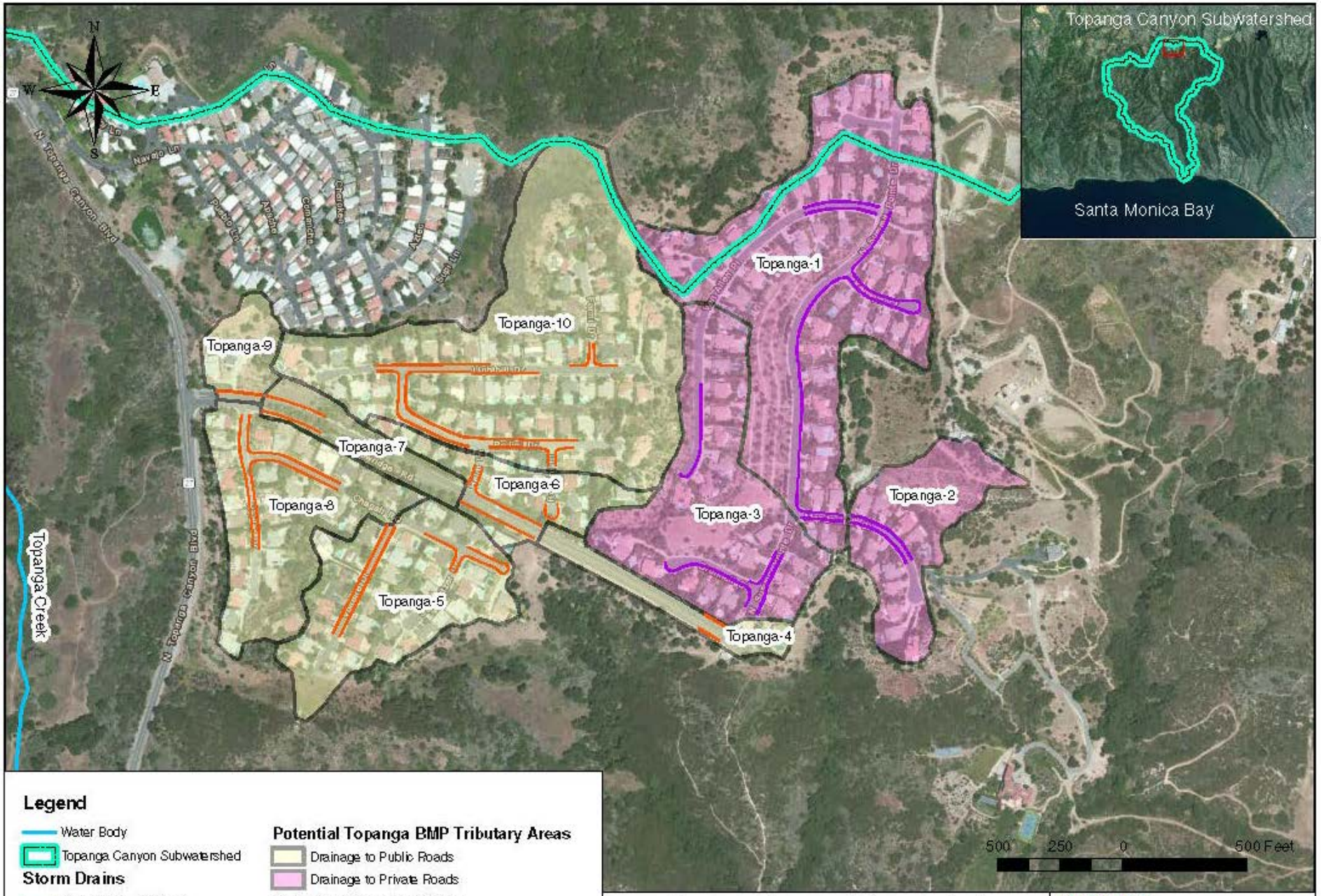
ZUMA BEACH
POTENTIAL REGIONAL EWMP PROJECTS

- Underground infiltration galleries
- Pretreatment via large solids separators (e.g., "CDS units")
- Located at the terminus of the Agency-owned storm drains at Zuma Beach, under parking lots
- Collectively, designed to retain 85th percentile, 24-hr storm event from 111 acres of single family residential neighborhood


N
W
E
S
Zuma-2
Diversion Location
CDS Unit
BMP Inlet
BMP Outlet
Underground Infiltration Vault
1
Pacific Coast Hwy
Legend
Potential Zuma Beach BMP Tributary Areas
Potential Zuma Beach BMPs
Potential Pretreatment
Diversion Structures
Storm Drains
Storm Drain - Caltrans
Storm Drain - City of Malibu
Storm Drain - County of Los Angeles
Storm Drain - Private
ASBS*
*ASBS boundary is in the ocean up to the mean high tide line
Potential Project Partners:
• LA County FCD
• LA County Beaches and Harbors
• City of Malibu
40 20 0 40 Feet
DRAFT
November 2014
RB-AR 2293

TOPANGA CANYON CREEK

POTENTIAL REGIONAL EWMP PROJECTS



Topanga Canyon Subwatershed
Potential Regional EWMP Projects
Permeable Pavement and Infiltration Trench
NSMBCW EWMP

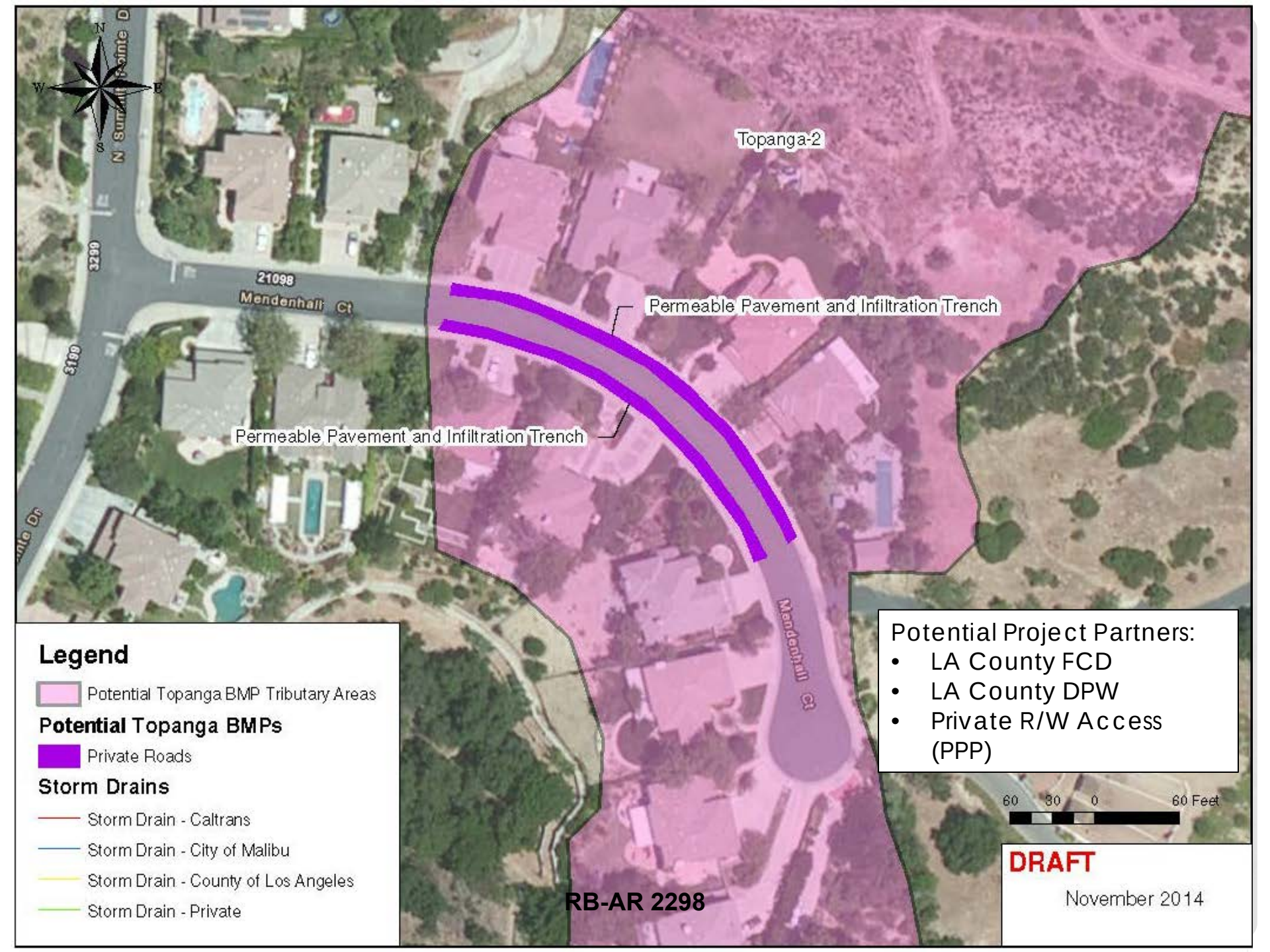
DRAFT

November 2014

POTENTIAL LOCATION OF TRANCAS-06, FACING WEST ALONG VIEWRIDGE ROAD

TOPANGA CANYON CREEK POTENTIAL REGIONAL EWMP PROJECTS

- Green Street BMPs: permeable pavement and underground infiltration trenches
- Located in the neighborhood near the intersection of Viewridge Rd and Topanga Canyon Blvd.
- Designed to retain 85th percentile, 24-hr storm event from 103 acres of single family residential property


Topanga-2
Permeable Pavement and Infiltration Trench
Permeable Pavement and Infiltration Trench
21098
Mendenhall Ct
3230
3199
Mendenhall Ct
Legend
Potential Topanga BMP Tributary Areas
Potential Topanga BMPs
Private Roads
Storm Drains
Storm Drain - Caltrans
Storm Drain - City of Malibu
Storm Drain - County of Los Angeles
Storm Drain - Private
Potential Project Partners:
• LA County FCD
• LA County DPW
• Private R/W Access (PPP)
60 30 0 60 Feet
DRAFT
November 2014

RB-AR 2298

POTENTIAL CONSTRAINTS

- Environmental Screening
  - CA Environmental Quality Act (CEQA)[1]: Clearance is likely Mitigated Negative Declaration
  - National Environmental Policy Act (NEPA)[2]: Not anticipated to be required
- Proximity to septic systems
- Private ownership and/or access
- Geotechnical Issues
  - Landslide and liquefaction potential , based on desktop-level screening
  - Depth to groundwater (> 10 ft) at beach (climate change impacts)
  - Geotechnical investigation planned

1. CEQA is a statute that requires state and local agencies to identify the significant environmental impacts of their actions and to avoid or mitigate those impacts, if feasible.
2. NEPA is similar to CEQA, but for federal projects.

PERMITTING

- Los Angeles County Flood Control District
  - Redirected flows from MS4
- Los Angeles County Beaches and Harbors
- Los Angeles County DPW
  - Grading
  - Building and Safety
- City of Malibu
  - Building and Safety
- Regional Water Quality Control Board
- Private Community Agreements (as needed)

NEXT STEPS

- Geotechnical Investigation and Feasibility Analysis for Potential Projects
- Evaluation of Minimum Control Measures
- RAA
  - Establish Target Load Reductions
  - Estimate non-structural BMP benefit
  - Conduct RAA on all portions of NSMBCW that do not drain to a Regional EWMP Project, in order to identify additional BMPs
- Project Cost Opinions
- Develop EWMP

SCHEDULE

- Draft EWMP – February 2015
- Public Workshop #3 – TBD (May 2015?)
- Draft Final EWMP – June 2015
- Receive and Address Comments from Regional Board
- Final EWMP

QUESTIONS/COMMENTS

Comments can be included on the provided comment cards

City of Malibu contact:

Rob DuBoux

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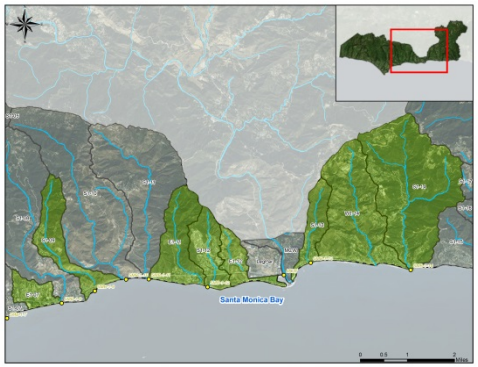
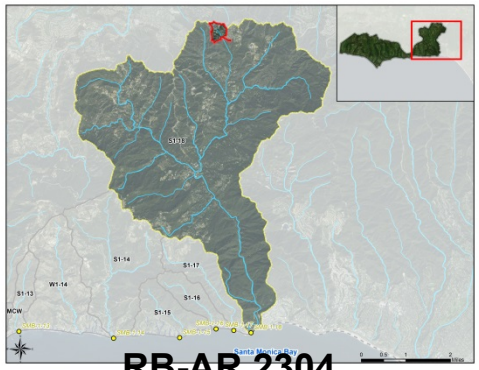
rduboux@malibucity.org

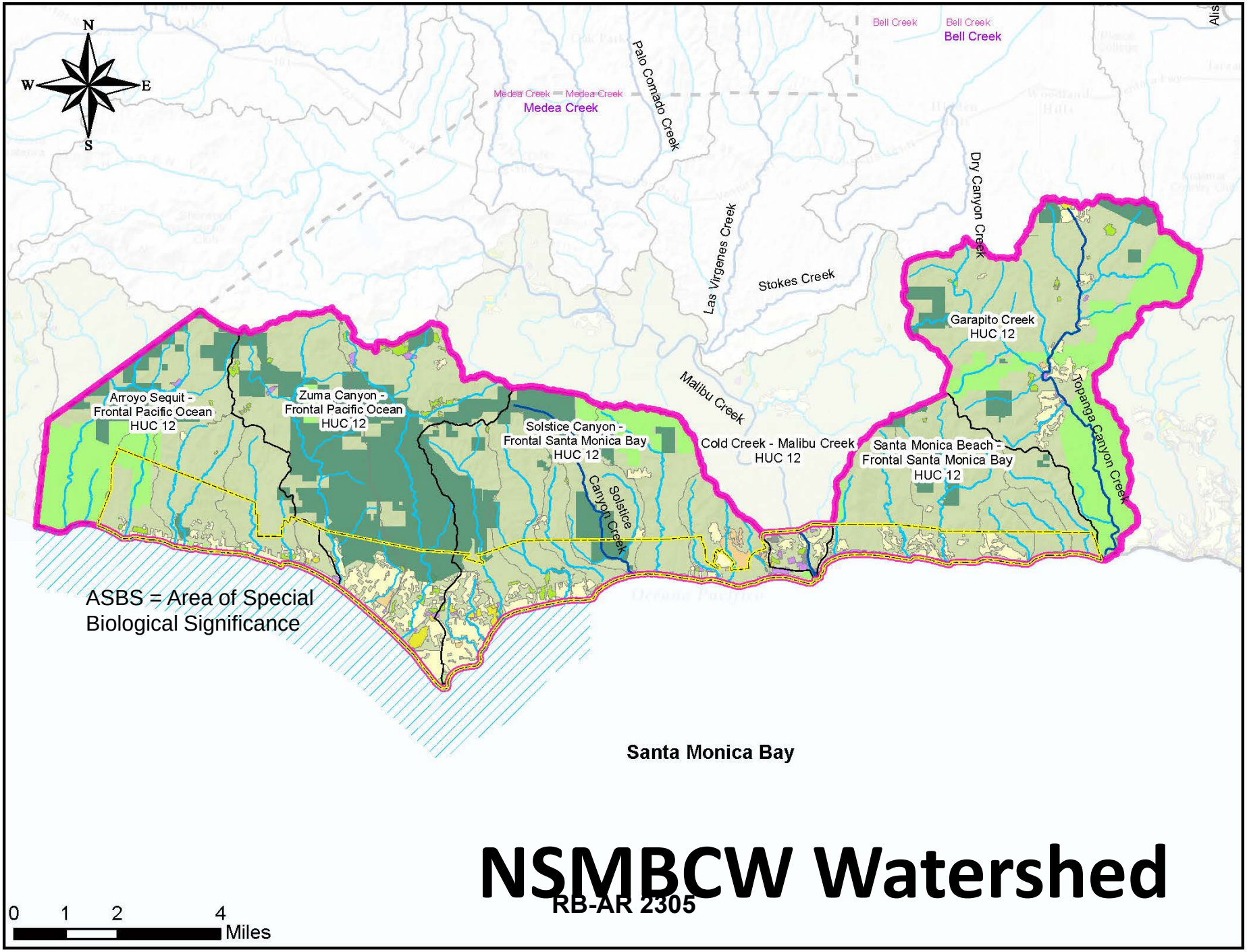
www.malibucity.org/ewmp

NORTH SANTA MONICA BAY COASTAL WATERSHEDS
ENHANCED WATERSHED MANAGEMENT PROGRAM

Public Workshop #3
King Gillette Ranch, Calabasas
May 14, 2015







NSMBCW Watershed

RB-AR 2305

Background

Public Meeting #1

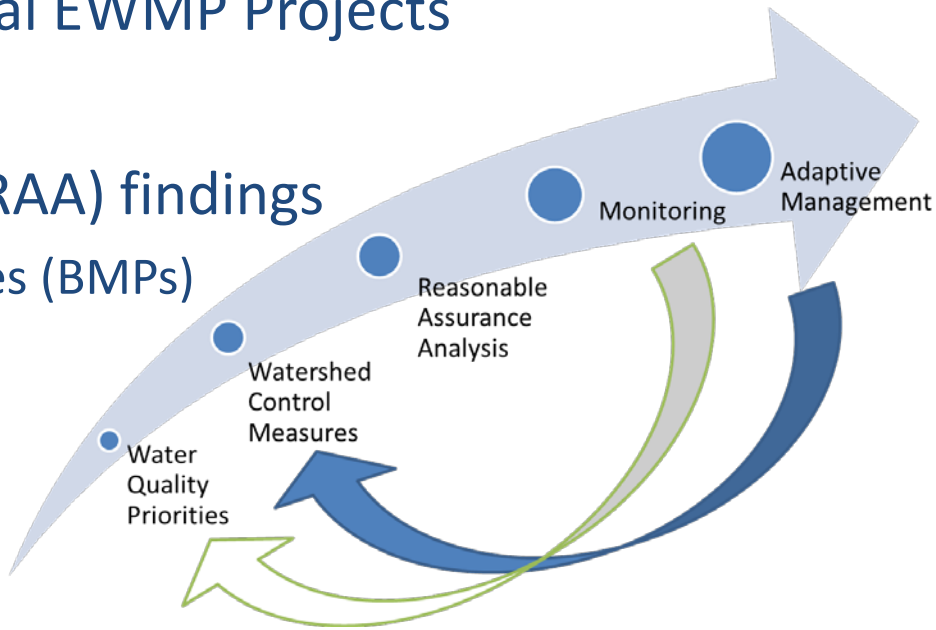
- Overview of Enhanced Watershed Management Program (EWMP) Process

Public Meeting #2

- Identification of Potential Regional EWMP Projects

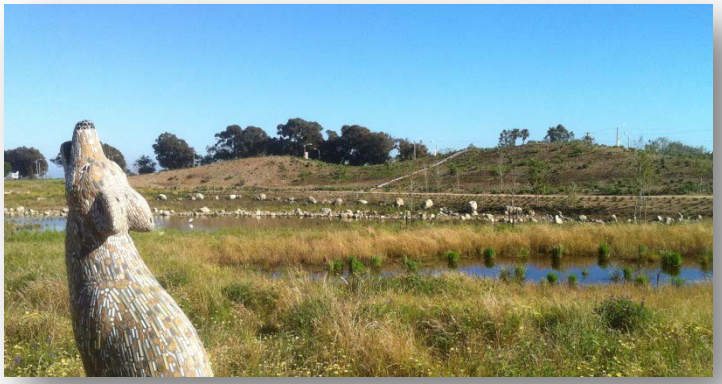
Public Meeting #3

- Reasonable Assurance Analysis (RAA) findings
  - Identified Best Management Practices (BMPs)



Structural BMPs

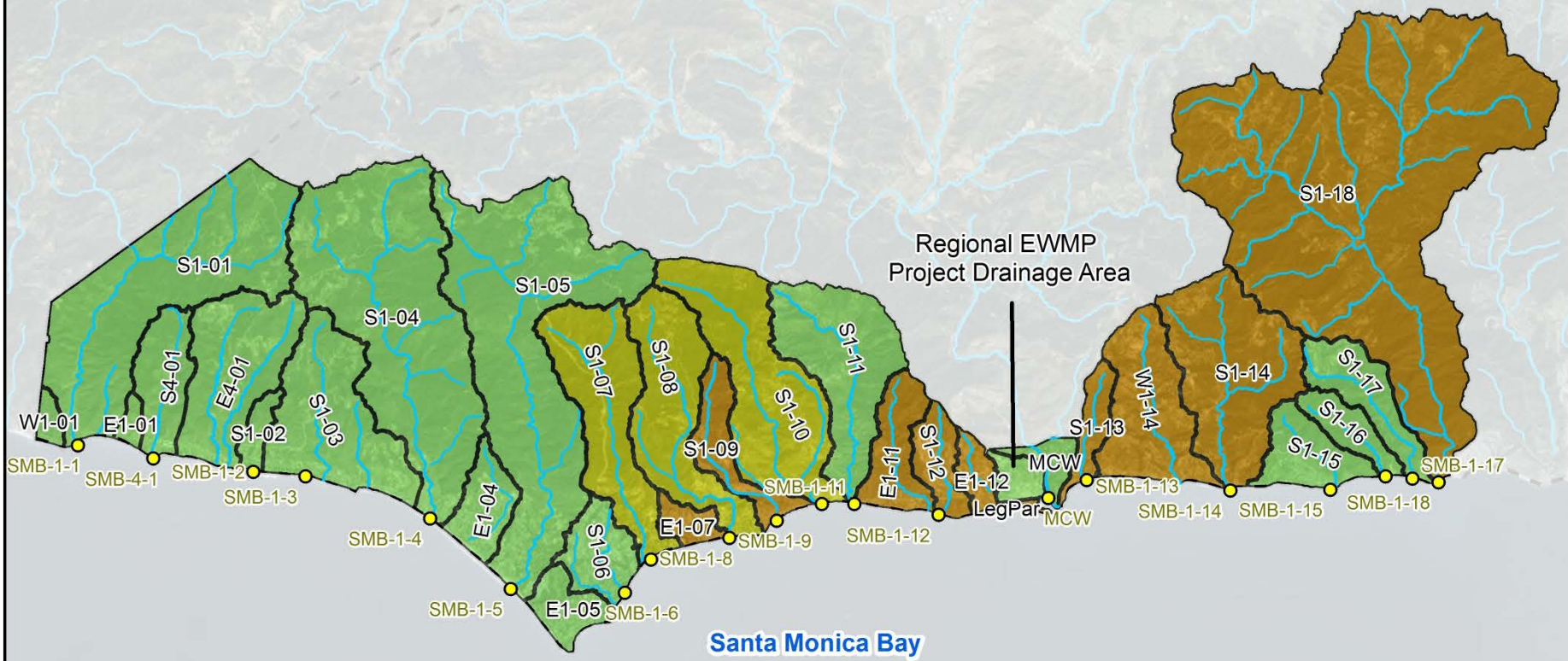
- **Regional BMPs:** Designed to collect runoff from large usually multi-parcel, multi-land use areas
- **Distributed BMPs** treat runoff typically from a small area and/or single parcel.
  - Porous pavement
  - Infiltration systems
  - Bioretention/biofiltration
  - Cisterns



Non-Structural & Institutional BMPs

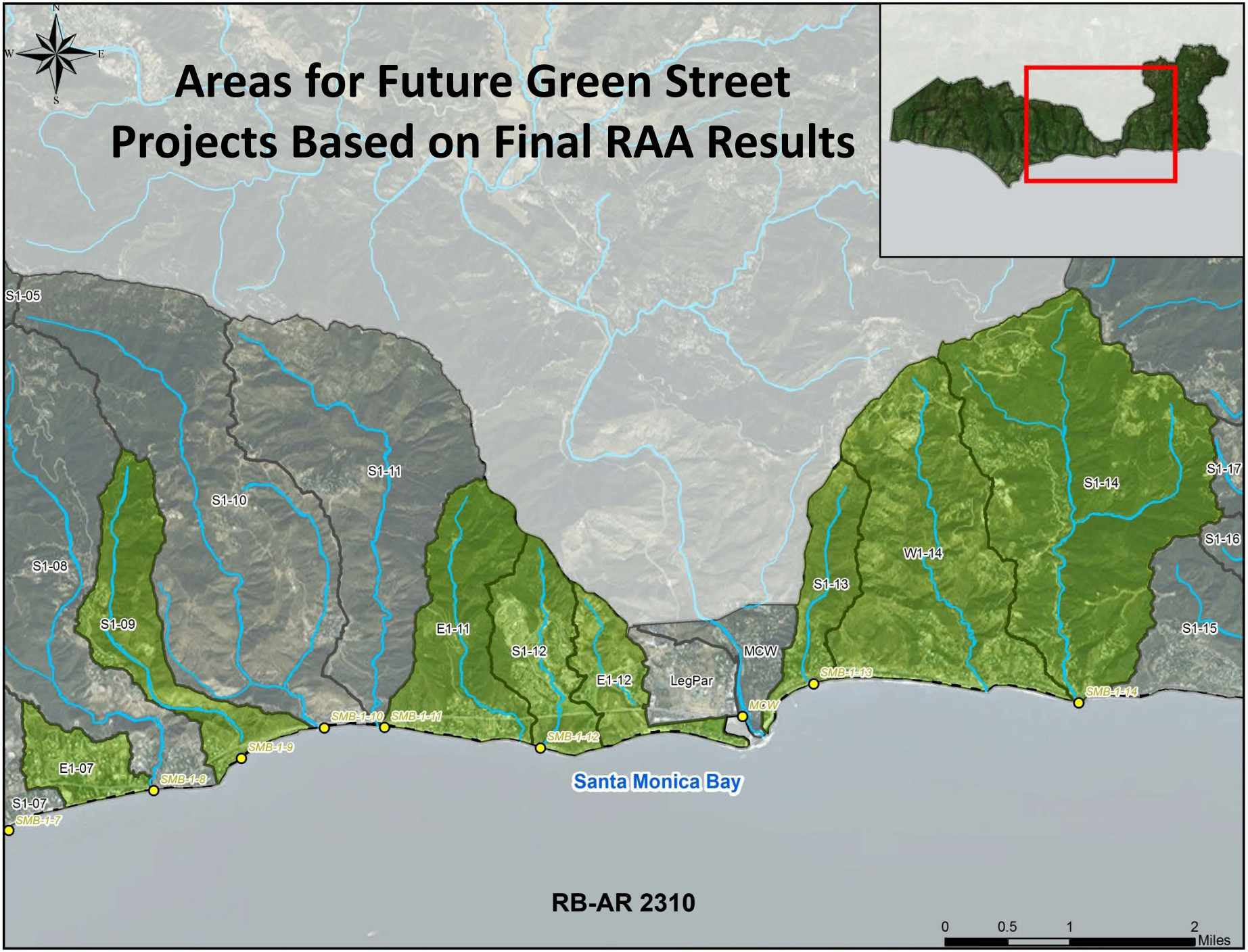
- Accelerated Commercial Inspection Program
- Septic Management Plan Implementation
- Malibu Local Coastal Plan
- Water Conservation Ordinance
- Ocean Friendly Garden Program
- Clean Water Act and Our Backyards
- Outreach to Equestrian Community
- Living Lightly in Our Watersheds Guide

Wet Weather Target Load Reductions

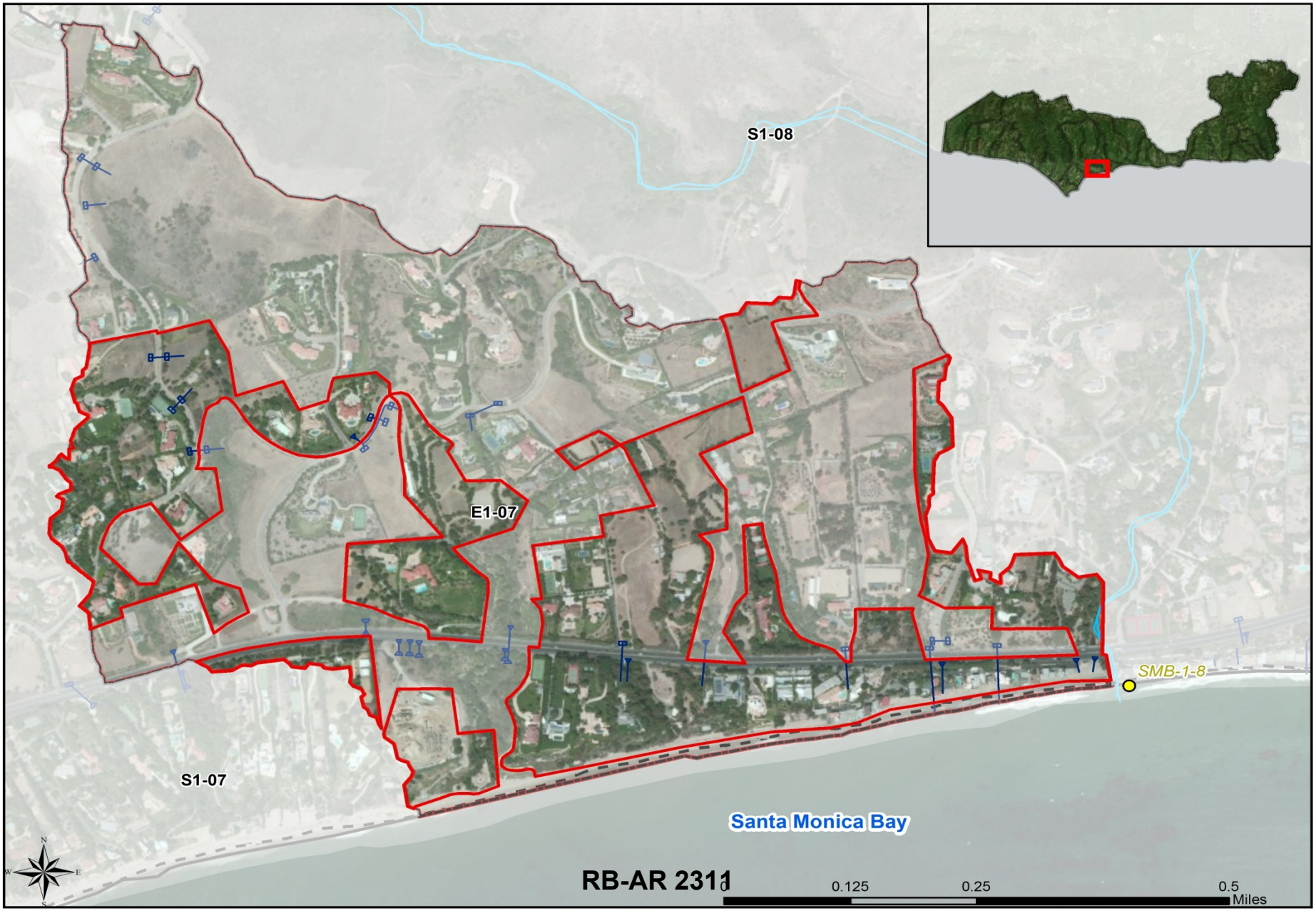


RB-AR 2309

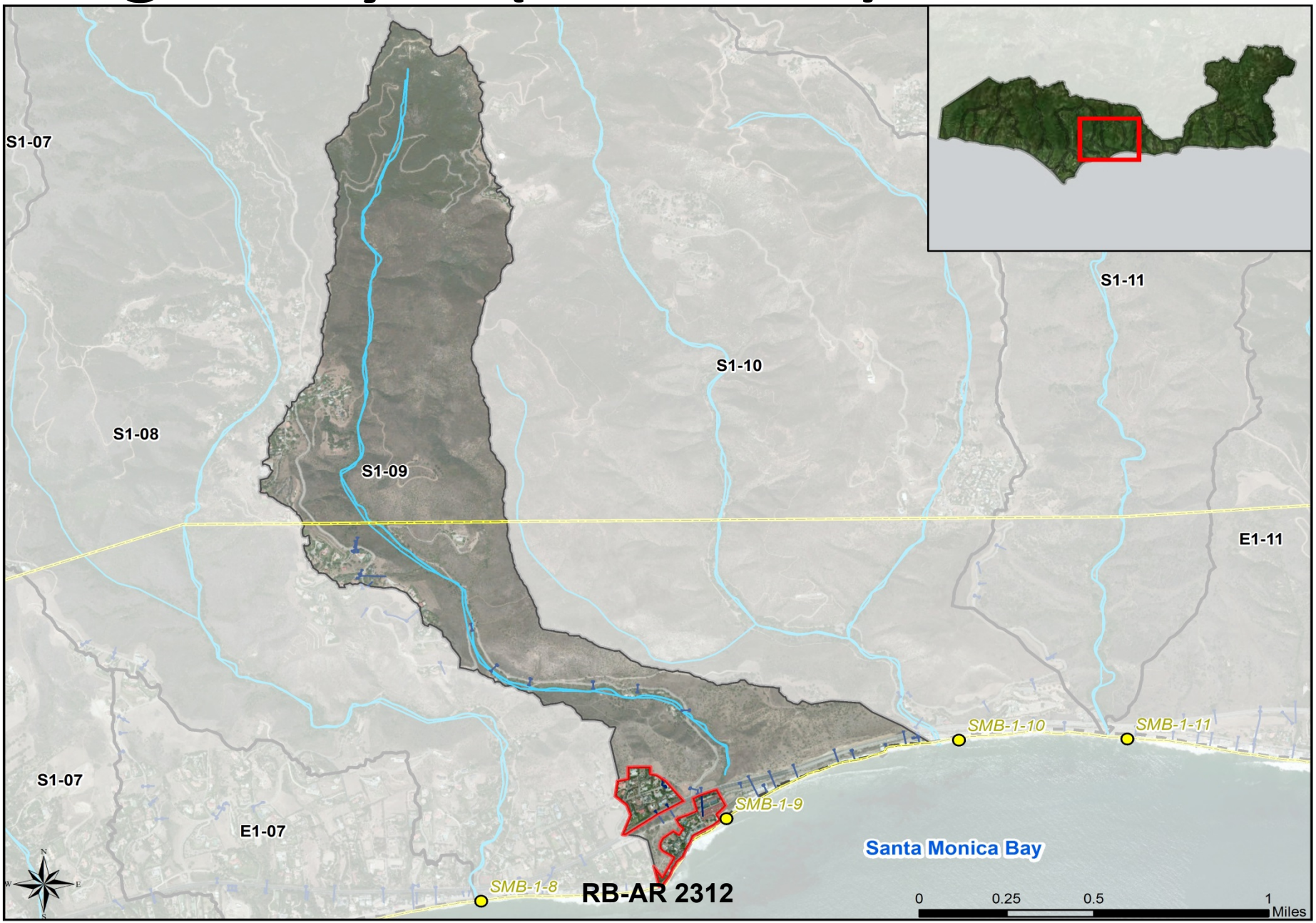
0 1 2 4 Miles


Areas for Future Green Street Projects Based on Final RAA Results
N
W
E
S
S1-05
S1-11
S1-10
S1-08
S1-09
E1-11
S1-12
E1-12
LegPar
MCW
S1-13
W1-14
S1-14
S1-17
S1-16
S1-15
E1-07
S1-07
SMB-1-7
SMB-1-8
SMB-1-9
SMB-1-10
SMB-1-11
SMB-1-12
MCW
SMB-1-13
SMB-1-14
Santa Monica Bay
RB-AR 2310
0
0.5
1
2
Miles

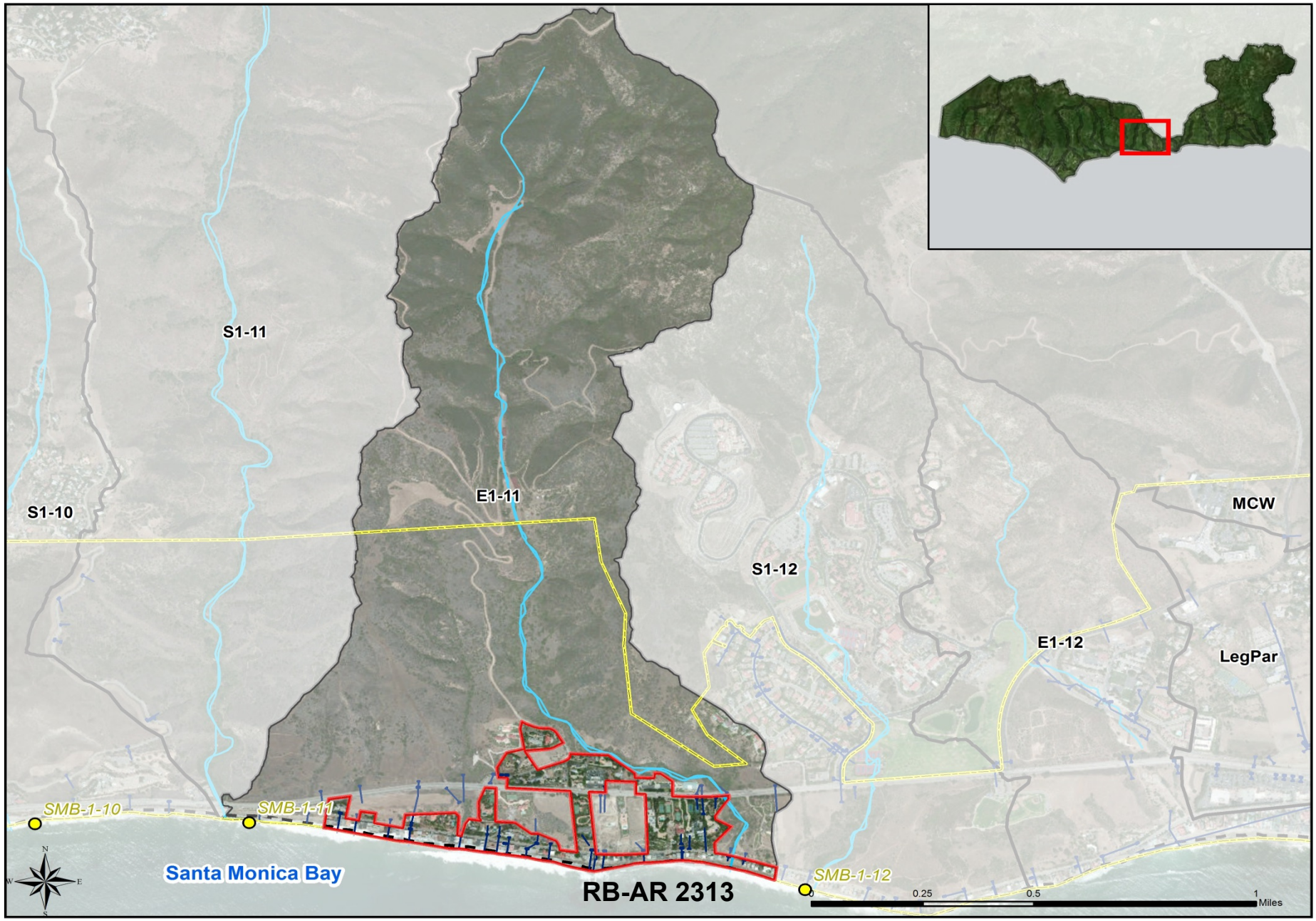
East of Ramirez Canyon (E1-07)



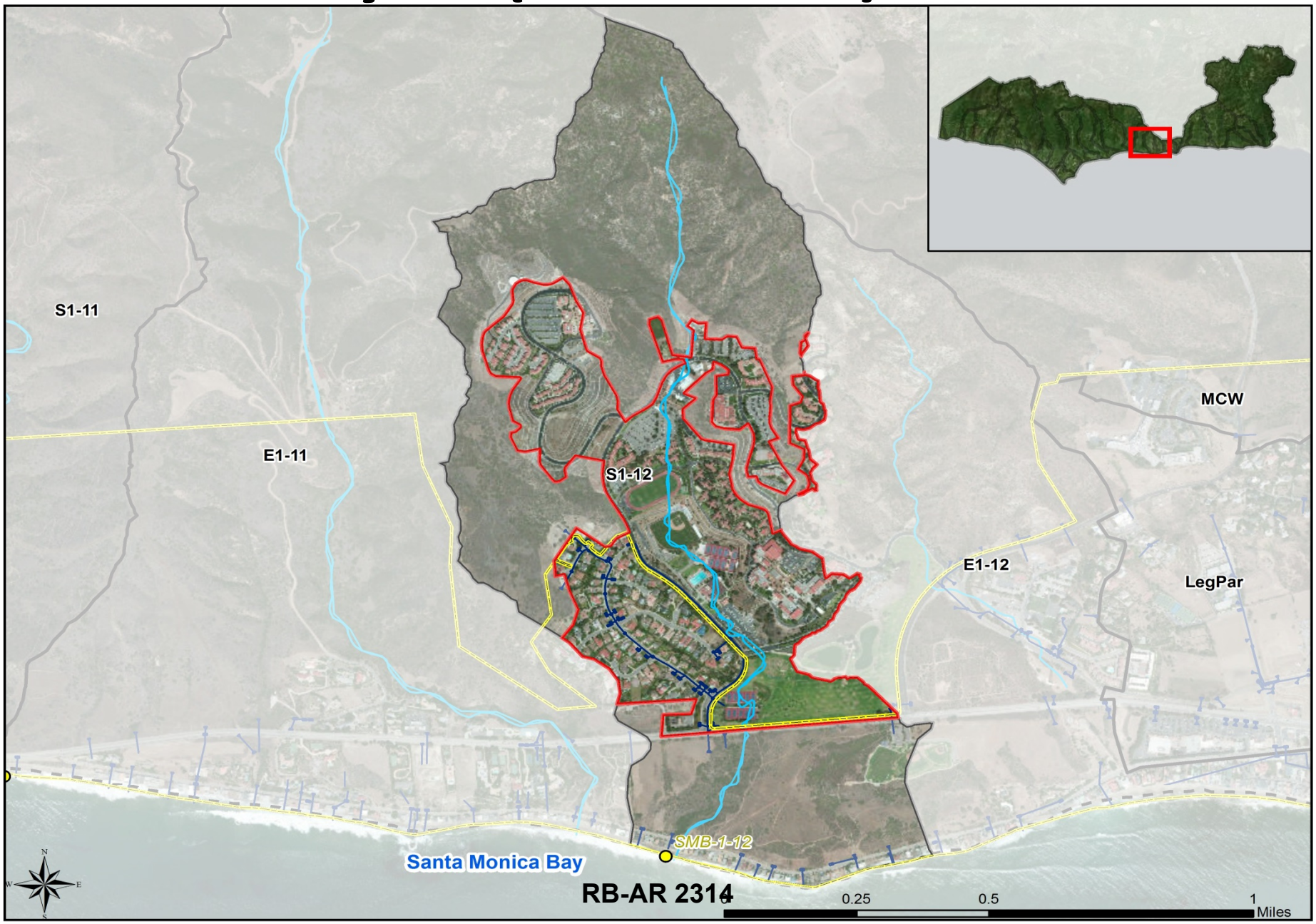
Latigo Canyon (SMB 1-09)



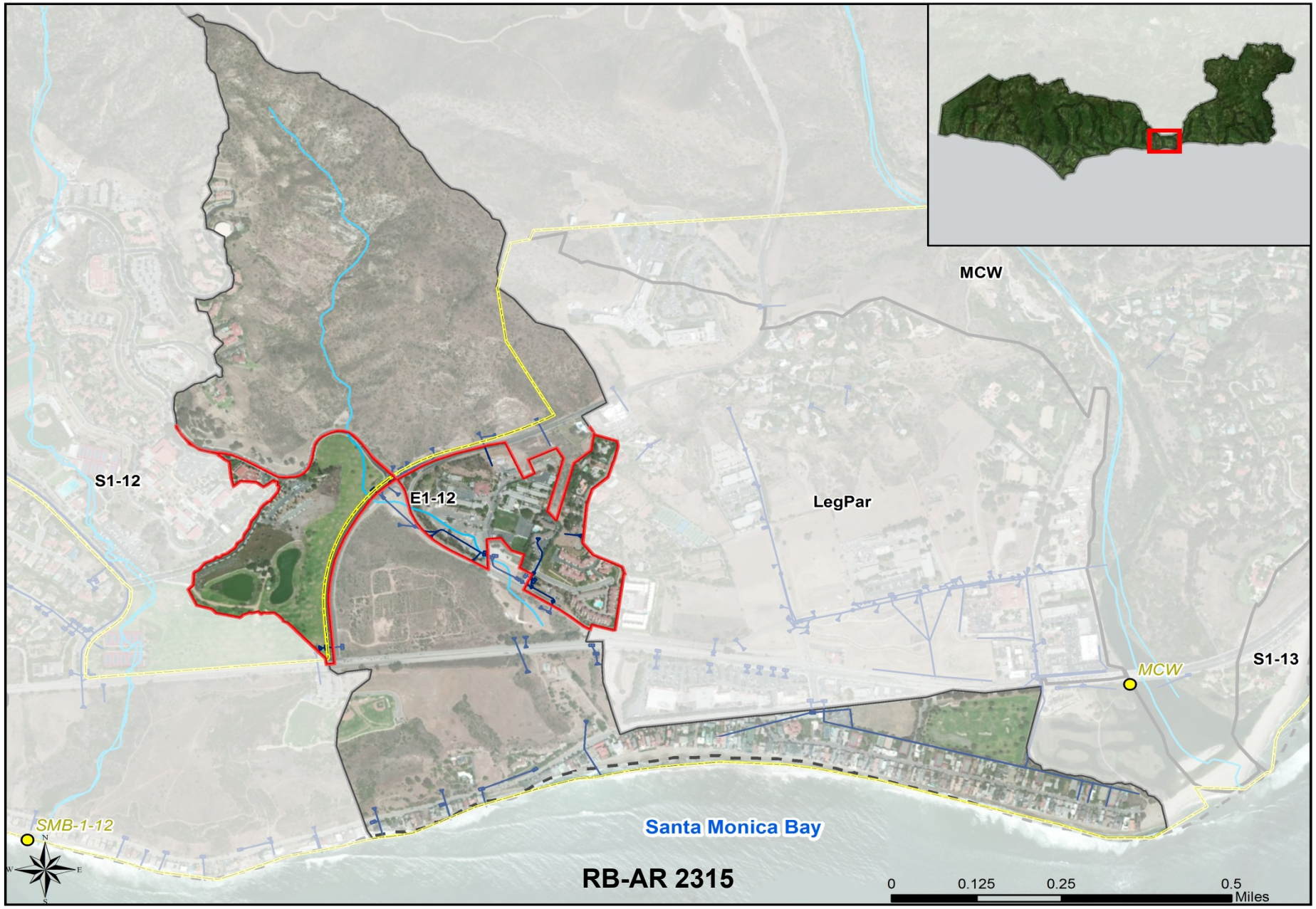
East of Corral Canyon (E1-11)



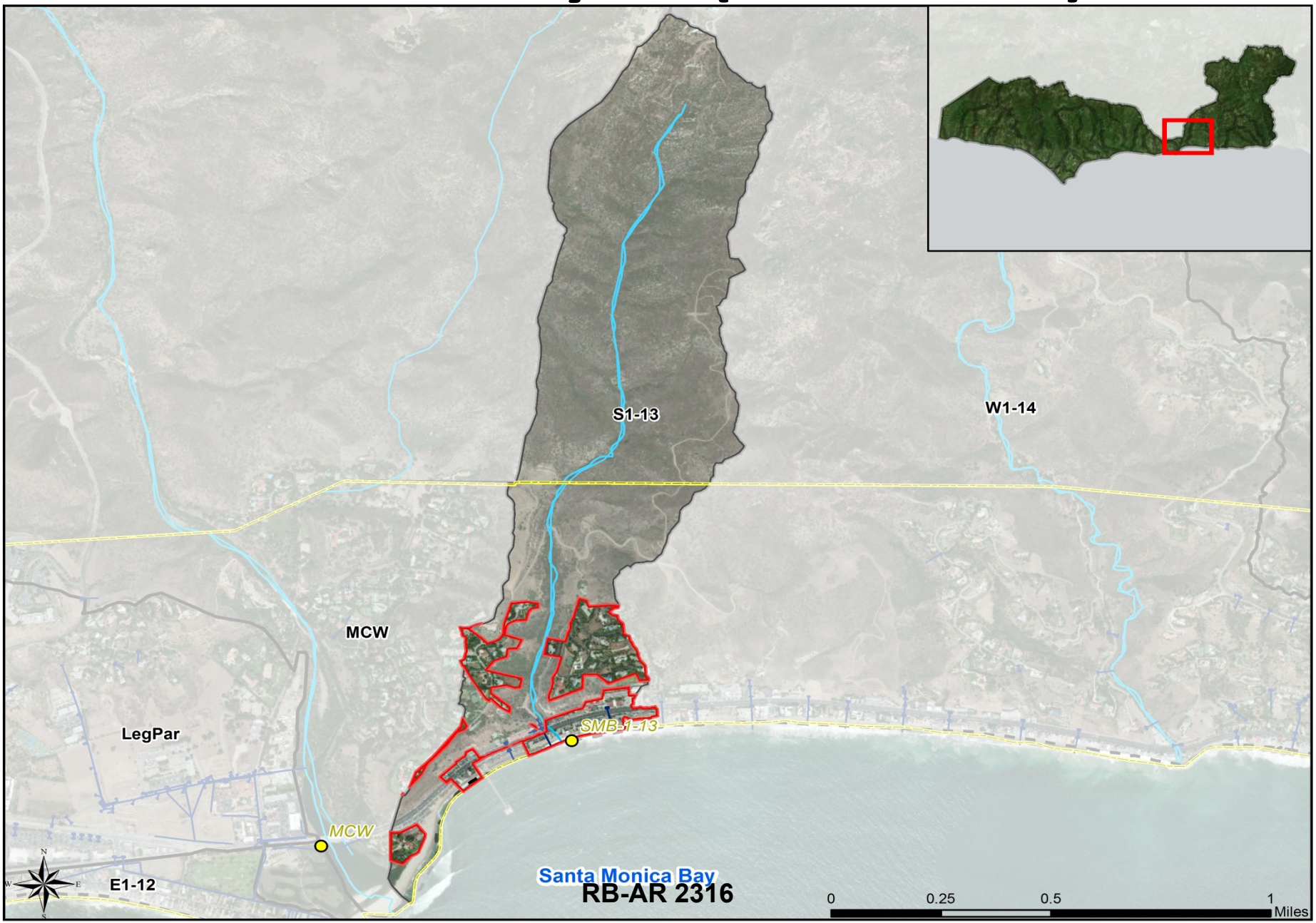
Marie Canyon (SMB 1-12)



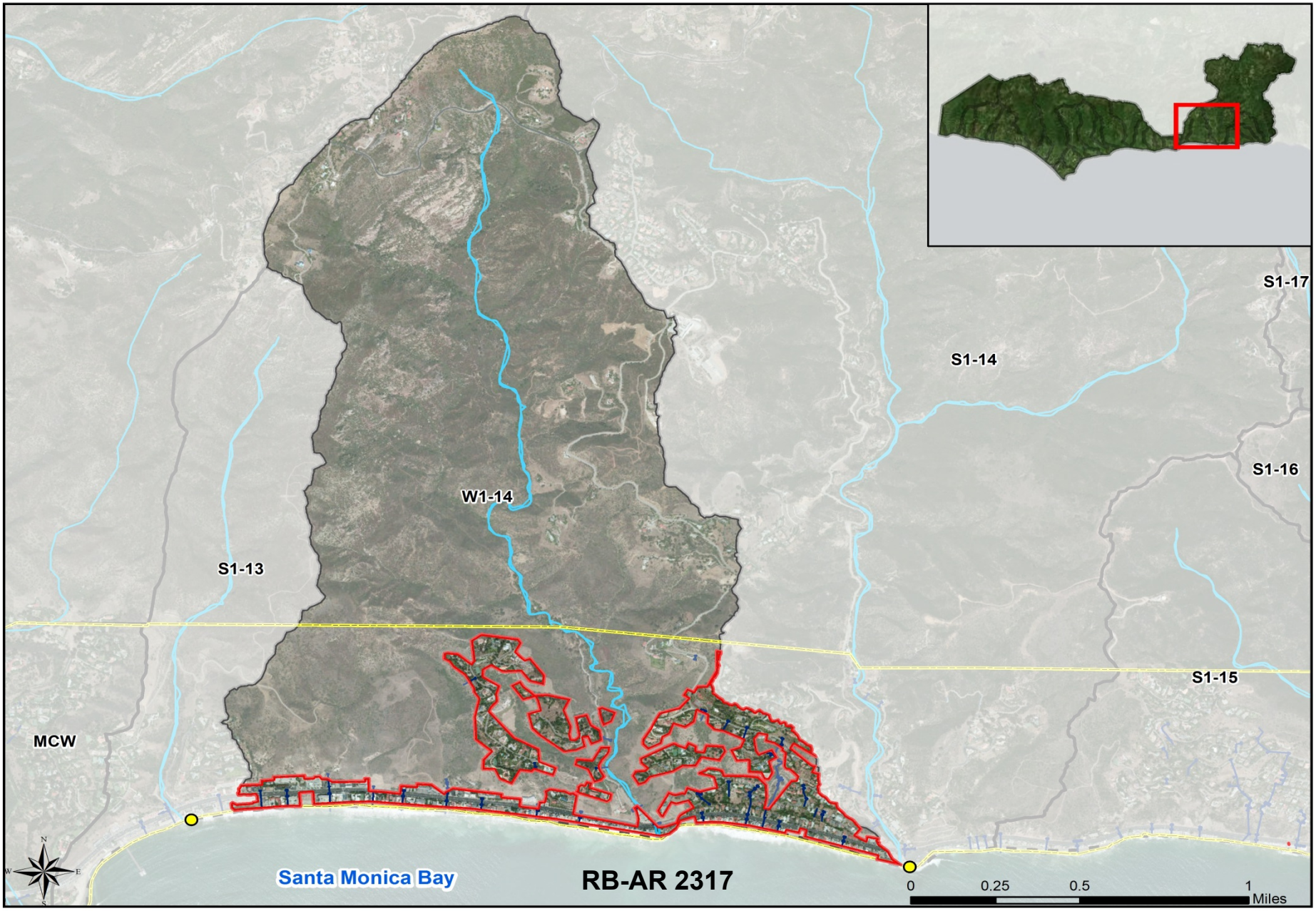
Winter Canyon (E1-12)



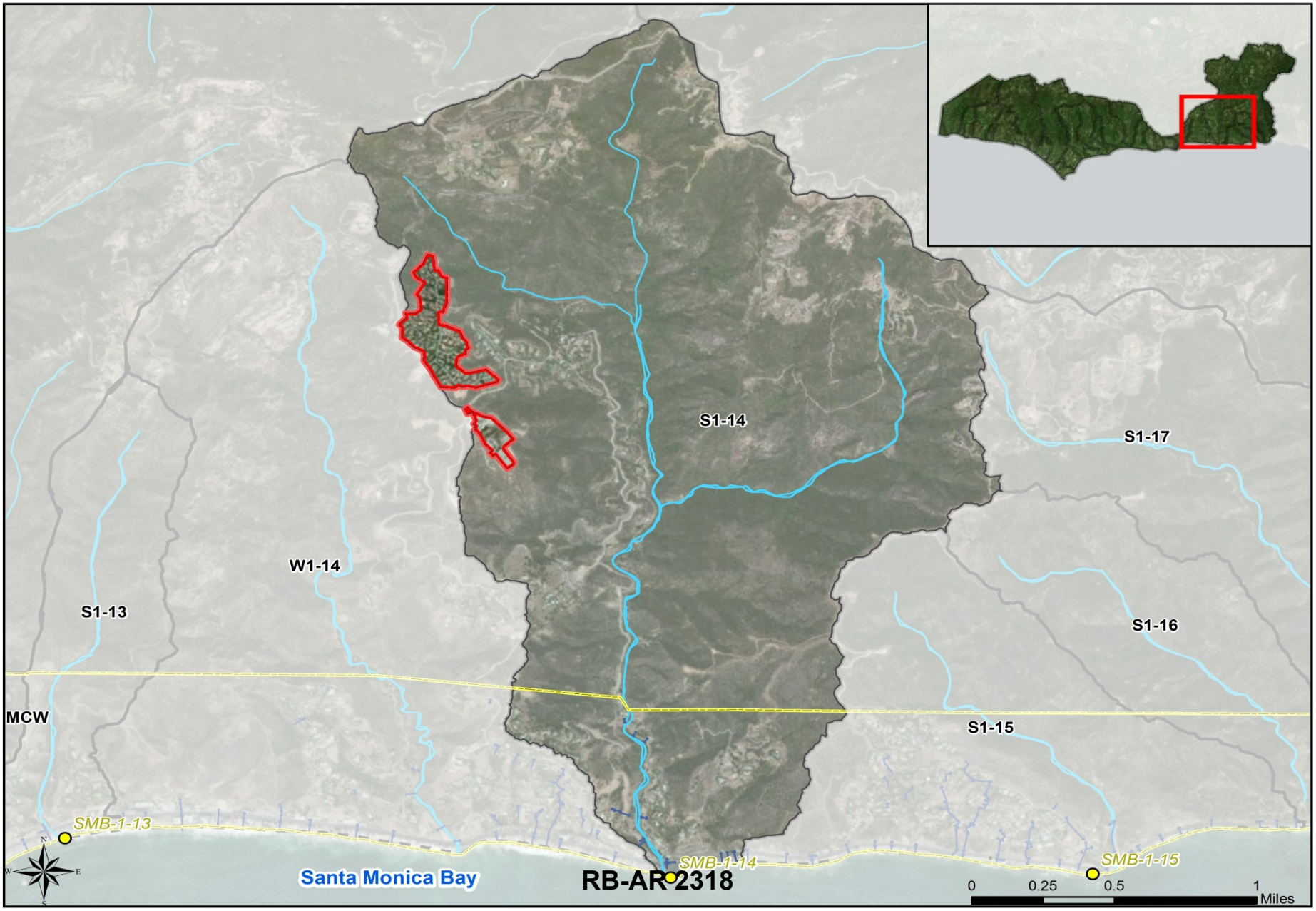
Sweetwater Canyon (SMB 1-13)



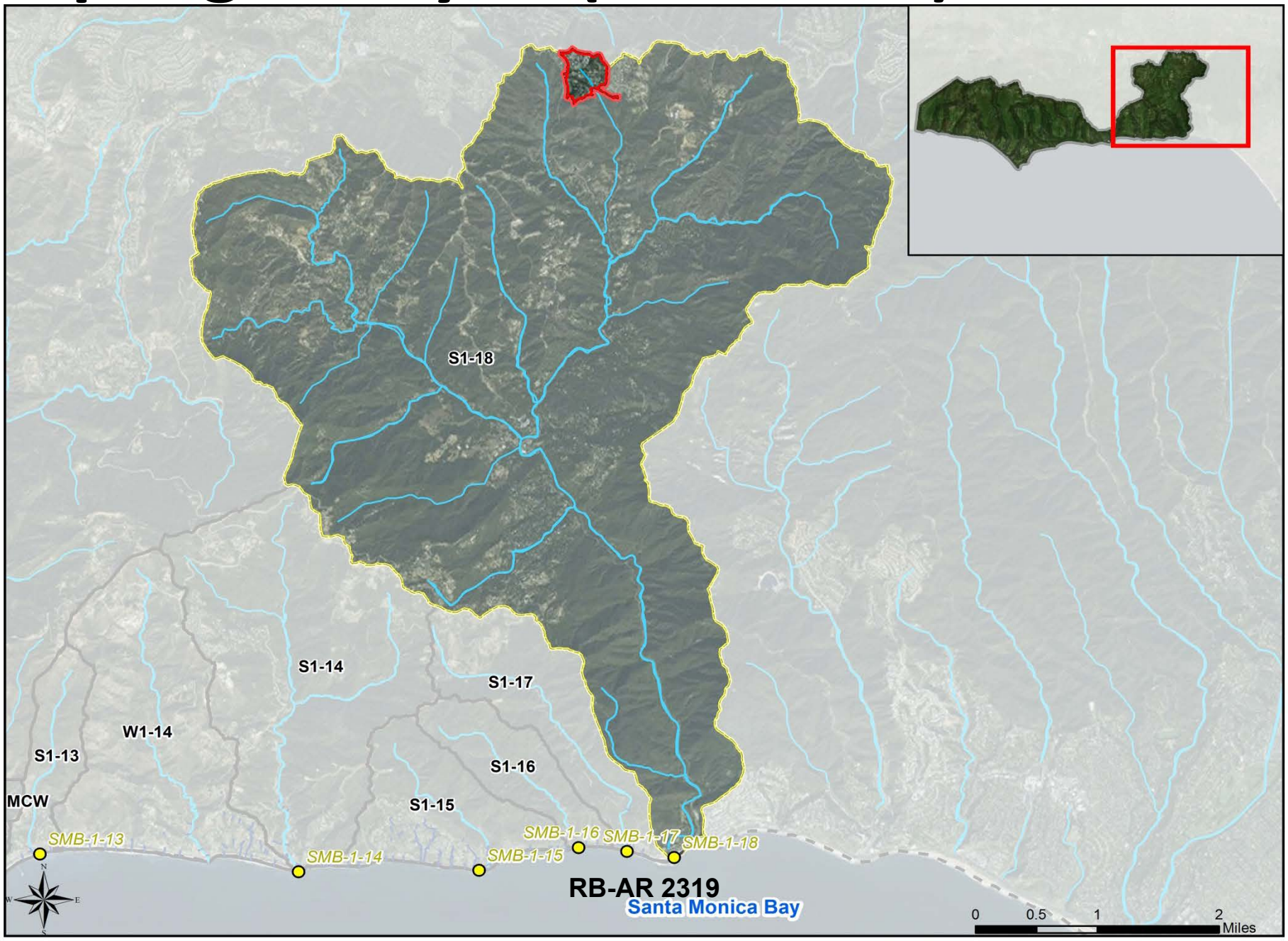
Carbon Canyon (W1-14)



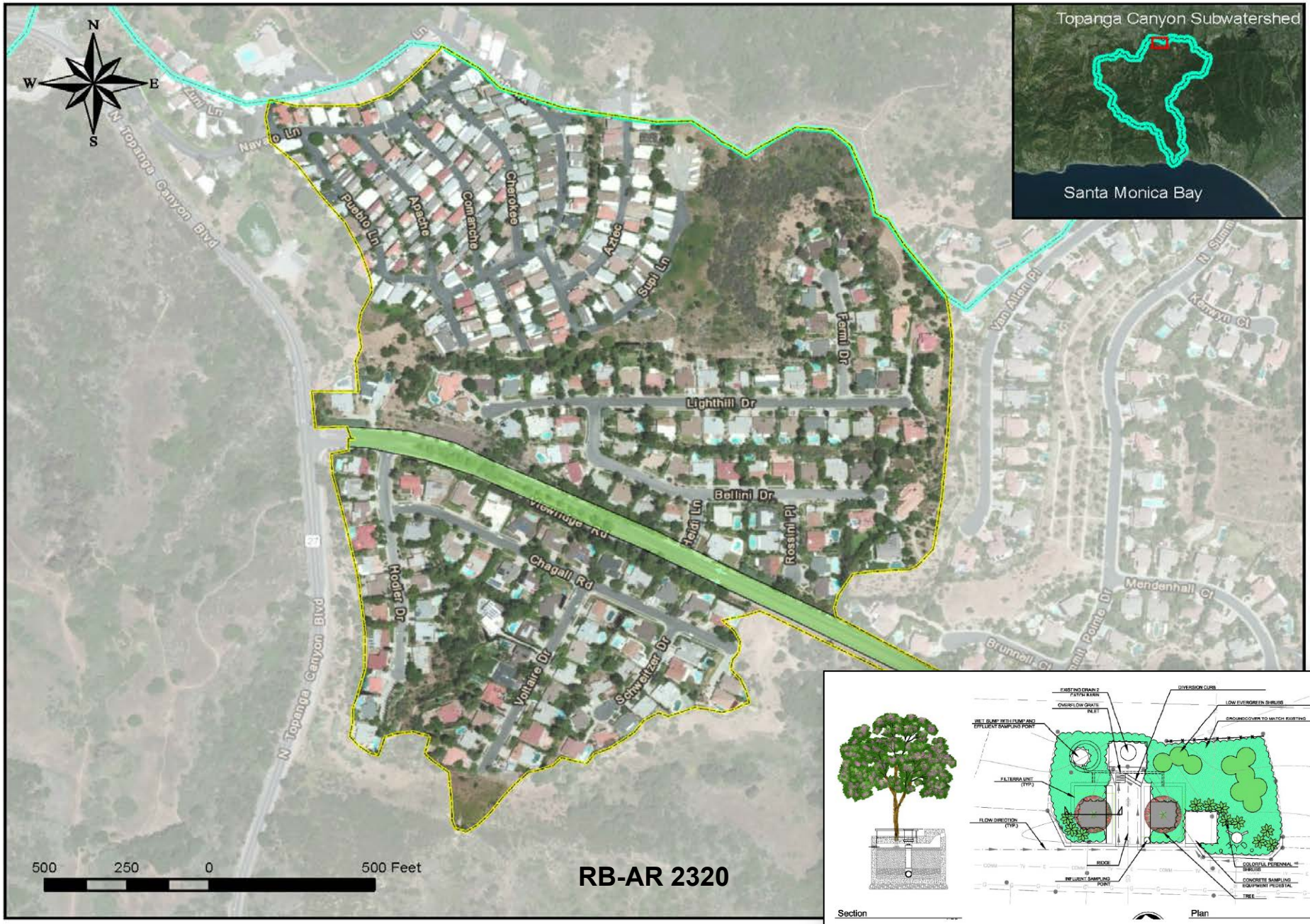
Las Flores Creek (SMB 1-14)



Topanga Canyon (SMB 1-18)



Topanga Regional Green Street Project



Cost Summary

Capital Cost	$32.5M
20 Year O & M	$21.7M
20 Year Life Cycle	$54.2M

Costs include

- "Hard" costs (e.g., construction and materials)
- "Soft" costs (e.g., design and permitting)
- O&M costs (6% of hard costs, annually)

Schedule

- Address comments
- Draft Final EWMP – June 28, 2015
- Receive and Address Comments from Regional Board
- Final EWMP – 3 months following Regional Board Comments

Questions/Comments

Comments can be included on the provided comment cards

City of Malibu contact:

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Assistant Public Works Director/Assistant City Engineer

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