

Proposed Renewal of the
County of Ventura
“Municipal Separate Storm Sewer
System” (MS4) Permit
Workshop

Regional Water Quality Control Board
Los Angeles Region
April 5, 2007

MS4 Permitting History – Ventura County

- Clean Water Act Section 402 (p) (1987)
- 40 CFR 122.26 (1990)
- Part 1 and Part 2 MS4 permit application
 - City of Thousand Oaks
 - City of Oxnard
 - Unincorporated Ventura County
 - Ventura County Flood Control District

MS4 Permitting Background – Ventura County

- Area wide designation
- Consolidated Part 2 application (1993)
- First term Ventura County MS4 Permit (1994)
 - Program development
- Second term Ventura County MS4 Permit (2000)
 - Program implementation

MS4 Permitting – Main Advancements in Third Term

Transparency and Accountability

- Municipal Action Levels (MALs)
- Specified Best Management Practices
- Numerical criteria to reduce runoff volume
- Low Impact Development implementation
- Waste Load Allocations for wet weather

Land Jurisdictions in Ventura County, California

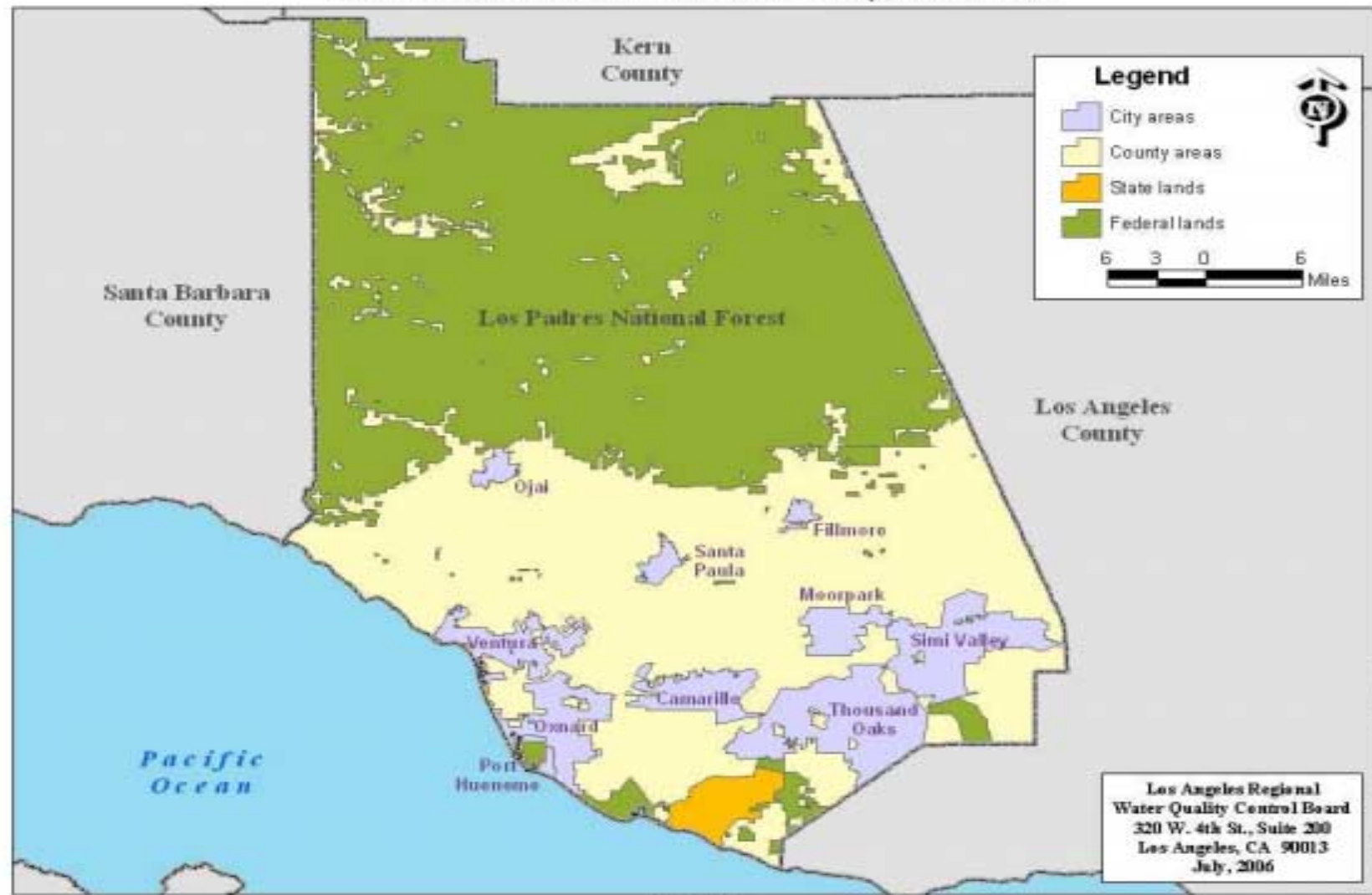


Figure 1

Ventura County with Watersheds



Legend

- Country Boundary
- Primary Streams

A north arrow is located to the right of the legend. Below the legend is a scale bar marked with 0, 4, and 8 miles.

California Regional
Water Quality Control Board
Los Angeles Region
320 W. 4th St., Suite 200
Los Angeles, CA 90013
April 5, 2007

Map by: gplanning@cwqa.com/this.mxd

Municipal Storm Drain Systems Within Ventura County

CO-PERMITTEE AGENCIES	OPEN CHANNEL SOFT SIDE AND BOTTOM	OPEN CHANNEL HARD SIDE OR BOTTOM	OPEN CHANNELS HARD SIDE AND BOTTOM	UNDERGROUND STORM DRAINS	DITCHES	GUTTERS	OTHER STORM DRAIN	TOTAL LENGTH in ft.
Principal Co-permittee								
VCWPD	409,728	307,296	204,864	102,432	-	-	-	1,024,320
Co-permittees								
City of Camarillo	-	-	-	400,00	32,178	2,956,800	1.095	3,390,073
County of Ventura	29,568	22,176	14,784	7,392	-	-	-	73,920
City of Fillmore	-	-	300	35,500	1,000	316,800	-	353,600
City of Moorpark	-	-	-	136,000	10,000	940,000	22	1,086,022
City of Ojai	-	-	7,920	31,680	-	337,920	-	377,520
City of Oxnard	63,360	15,840	26,400	211,200	-	2,112,00	-	2,428,800
City of Port Hueneme	5,000	-	-	66,000	-	440,000	-	511,000
City of Ventura	9,477	-	9,869	-	76,603	-	1,708	97,657
City of Santa Paula	582	-	-	96,817	18,174	633,600	-	749,173
City of Simi Valley	4,000	-	1,000	553,115	-	3,146,880	-	3,704,995
City of Thousand Oaks	-	534	-	790,164	-	5,533,440	-	6,324,138

MS4 Permit

- This Permit represents a challenge and a willingness to achieve an effective goal oriented Storm Water Program by both the Ventura Countywide Storm Water Quality Management Program and the Los Angeles Water Board

Public Information & Participation Program – Objectives

- Increase public awareness of the potential impacts on storm water quality common activities can have, such as vehicle maintenance and improper household waste materials disposal
- Create an increase in public knowledge of storm water regulations



Public Information & Participation Program – Current

- Existing Requirements
 - Designation of staff contact(s) to provide storm water quality information
 - Implementation of educational activities and participation in county wide events
 - Distribution of outreach materials to the general public and school children
 - Distribution of educational materials to industrial/commercial facilities



Public Information & Participation Program – New Provisions

- Additional Pollutant-Generating Activities Targeted for Educational Outreach
- Organization of Watershed Citizen Advisory Groups/Committees
- Option to Provide Funds to the Environmental Education Account in Lieu of Providing Funding to School Districts



Public Information & Participation Program – New Provisions

- Implementation of a Corporate Outreach Program



Illicit Connections & Illicit Discharges Elimination Program – Objective

- Each Permittee shall eliminate all Illicit Connections and Illicit Discharges (IC/ ID) to the storm drain system.



Illicit Connections & Illicit Discharges Elimination Program – Current

- Existing Requirements
 - Investigation of illicit discharge/dumping incidents
 - Referral of non-storm water discharges and connections to an appropriate agency



Illicit Connections & Illicit Discharges Elimination Program – New Provisions

- Mapping required of permitted connections to storm drain systems
- Field screening for illicit connections to storm drain systems required
- Investigation of reported suspected illicit connections

Industrial & Commercial Program

General Objectives

- To reduce and control the contribution of pollutants in storm water from sites of industrial/commercial activity
- Establish the responsibilities of the municipal operator to control pollutants discharged through municipal systems

Source: FR 11/19/1993

Industrial & Commercial Program – Current

- Site Visits
- Type of Facilities
 - Automotive Service
 - Food Service
 - Phase I facilities notification of need to comply with IASGP
 - Additional facilities to be identified based on Pollutants of Concern
- Emphasis on Education
 - Distribution of educational materials
 - Site visits, once every 24 months

Industrial & Commercial Program – Proposed Provisions

- Education Only Not Enough
 - Education-only visits are simply not enough for all sites
 - Inspections do make a difference
- Target the Pollution Sources
 - Critical source sites that contribute disproportionately to storm water pollution

Industrial & Commercial Program – Proposed Provisions

- Require and confirm the implementation of a minimum set of mandatory BMPs
- Frequency of inspections
 - Twice in five years
- Same categories of facilities covered with the addition of non-agricultural nurseries



Focus on Source Control



Focus on Source Control



Not Ventura based photo



Land Development Planning

General Objectives

- To maintain the pre-construction natural hydrology of the site to reduce adverse impacts
- To select the most appropriate suite of post-construction storm water controls during project planning and design for implementation during construction

Land Development Planning Categories – Current

Existing New Development Categories

- Hillside residences, ten or more unit housing developments
- 100,000 square feet or greater commercial developments
- Automotive repair shops, retail gasoline outlets, and restaurants
- Parking lots 5,000 sq. ft. or greater
- Projects situated in or adjacent to environmentally sensitive areas

Land Development Planning Provisions – Current

Existing Planning Provisions

- Peak flow rate control
- Water quality volume/ flow criteria
- Modify CEQA guidelines and checklist to address storm water mitigation
- Incorporate watershed and storm water elements in General Plans during significant rewrite

Land Development Planning

Specific Objectives of Proposed Changes

- Implement flow/volume control measures to prevent hydromodification / protect stream habitat
- Implement an integrated approach to removing pollutants, reducing runoff, and reusing storm water
- Reduce effective impervious area to less than five percent of project area
- Implement Low Impact Development (LID) strategies

Land Development Planning Categories – Proposed

Proposed Categories - New

- Disturbed land area of one acre or greater
- Streets, roads, highways 5,000 sq. ft. or greater
- Industrial parks 5,000 sq. ft. or greater
- Commercial strip malls 5,000 sq. ft. or greater

Land Development Planning Categories – Proposed

Categories - Continuing

- Parking lots 5,000 sq. ft. or greater
- Projects situated in or adjacent to environmentally sensitive areas
- Automotive repair shops, retail gasoline outlets, and restaurants

Land Development Planning Provisions – Proposed

Proposed Development Planning Provisions

- Tiered numerical hydromodification criteria
- Tiered water quality mitigation design criteria
- Post construction BMP maintenance and transfer agreement
- Post construction BMP inspection and tracking
- Regional and Redevelopment Area Mitigation alternative

Land Development Planning Provisions – Proposed

Categories – Continuing

- Modify CEQA guidelines and checklist to address storm water mitigation
- Incorporate watershed and storm water elements in General Plans during significant rewrite

Development Construction Program Objectives

- Reduce/eliminate sediment loss
- Sediment a primary pollutant impacting beneficial uses
- Sedimentation/siltation adversely affect fish spawning
- Other pollutants adsorb onto sediment particles

Development Construction Program

Current Categories

- Storm Water Pollution Control Plan (SWPCP)
- Signatory and proper site oversight requirements
- Proof of notice of intent (NOI) before city permits are issued
- Educational outreach and wet season inspection with follow-up and enforcement, as necessary
- Training of city/county inspectors

Development Construction Program New Provisions

- Grading Prohibitions
- Minimum set of best management practices (BMP) Requirements
- Inspection Requirements
- Interagency Coordination



Development Construction Program

Grading Prohibitions

- Wet season (October 1-April 15) land disturbance prohibition only at sites that fall in one or more of the following criteria:
 - Hillsides with 20% or steeper slopes
 - Sites directly discharging to a 303 (d) water body listed for siltation or sediment
 - Within or adjacent (200 feet) to an environmentally sensitive area (ESA)

Development Construction Program Additional Requirements

- Build upon the program already being implemented
- Optimize the inspectors presence onsite
- Standardize best management practices (BMPs) for construction activities
- Standardize legal requirements and enforcement countywide



Development Construction Program Additional Requirements

- Site propensity to lose massive sediments in wet season despite best efforts
- Examples include a canyon residence tract and another site which impacted Malibu Creek
- Only approximately less than 8% of active construction sites in Ventura impacted by the prohibition
- Permittees may request Executive Officer for a waiver for good cause

Development Construction Program

Minimum Set of BMPs

- Acreage - based approach
- Includes best management practices (BMPs) for roadway paving and repaving operations
- Commonly used BMPs and recommended by California Storm water Quality Association and Caltrans
- Provides the option of BMP substitution

Public Agency Activities – Existing

- A Model Storm Water Pollution Control Plan for each City Yard
 - Includes General BMPs
 - Discharge Prohibitions
- Trash Management Controls – Street Sweeping
- Storm Drain Maintenance and Cleaning
- Staff Training

Public Agency Activities – Proposed

- Standardized Permitting and BMPs for Construction Activity, Public Works/Capital Improvement Projects
- Post Construction Controls for Public Projects consistent with Private Projects
- Standard Trash Management Controls
- Storm Drain Maintenance and Treatment Controls
- Conditionally Allowing Municipal Potable Water Supply Discharges

Sewage System Operations

- Sewage System Operations
 - Implement a Response Plan
 - Maintain System
 - Provide Notification to Appropriate Agencies (2 hrs)
 - Initiate Immediate Response to Overflows/Spills (2 hrs)

Public Construction Projects Equal to Private Requirements

- Development Planning Requirements Apply
- Construction Requirements Apply
- Capital Improvement Projects must obtain Separate Construction NPDES Storm Water Permit
- Linear Construction Requires a Separate Linear Construction NPDES Storm Water Permit

Public Agency Activities – Changes

- Corporation Yards - Vehicle Maintenance Areas, etc...
 - Standard Implementation of General and Activity-Specific BMPs
- Landscape and Parks
 - Implement Integrated Pest Management (IPM) Program
 - Training of Pesticide Applicators to Reduce Discharge of Pesticides to Environment
 - Encouraging Use of Water Saving Native Plants

Storm Drain Operation

- ABC Prioritization of Catch Basins for Cleaning and when 25% full
- Trash Mgmt at Public Events
- Trash Receptacles at Transit Stops and Install and Maintain Catch Basin Trash Excluders in Commercial Areas and near Schools
- Maintenance of Storm Drains before Rains
- Inspect and Maintain Publicly Owned Treatment Controls

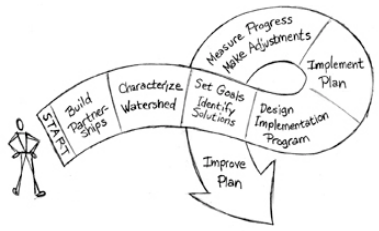
Public Agency Requirements – Changes

- Street Sweep Commercial Areas and near Schools 2x/month
- Municipal Industrial Activities Require Separate NPDES Permit



Watershed Ecological Restoration Planning

- Purpose of restoration - reestablish ecological integrity
- Purpose of planning - provide a tool
- CWA § 303(d) list of impaired waterbodies
- Watershed Ecological Restoration Plan (ERP) and Annual Watershed Ecological Restoration Status Report (ERSR)



Watershed Ecological Restoration Planning

- ERP contains basic restoration principles:
 - Addressing ongoing causes of degradation.
 - Focusing on feasibility
 - Developing clear, achievable & measurable goals
 - Involving a multi-disciplinary team such as:
 - Wetlands Recovery Project
 - Ventura County Task Force of the Wetlands Recovery Project



Watershed Ecological Restoration Planning

- ERSR is developed on the ERP and includes:
 - Background Information
 - Evaluation of site conditions
 - Progress towards goals, linked to specific stressors and measurement endpoints
 - Bioassessment monitoring data



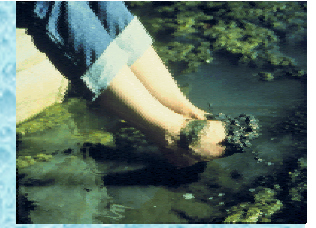
Total Maximum Daily Load (TMDL) Provisions

- MS4 TMDL Waste Load Allocations (WLAs) have been incorporated into this Permit
- WLAs are expressed as provisions
- WLAs have monitoring requirements



TMDL Provisions

- MS4 TMDL WLAs that have been adopted and incorporated into this Permit are:
 - Santa Clara River - Nitrogen Compounds
 - Malibu Creek - Bacteria
 - Calleguas Creek - Toxicity, Chlorpyrifos, and Diazinon
 - Calleguas Creek - Organochlorine Pesticides, Polychlorinated Biphenyls (PCBs), and Siltation



Monitoring Program

- New provisions consist of:
 - Relocation of the ME-SCR
 - Submittal of Monitoring Data Electronically
 - Total Suspended Solids (TSS) Testing
 - Toxicity Reduction Evaluation (TRE)
Corrective Action Plan
 - Tributary Monitoring
 - MS4 TMDL WLA Monitoring
 - Special Studies



Reporting Program

- Reporting Program requires an Annual Report
- Annual Report is composed of:
 - Monitoring Report
 - Program Report
- Details of Annual Report questions to be determined

Ventura County Municipal Storm Water Permit – Draft

Significant Advancements

- Municipal Action Levels
- Hydromodification Control Criteria
- Low Impact Development Strategies
- Wet Season Hillside Grading Restriction
- Monitoring for Compliance
- TMDL Implementation

Construction Industry Coalition on Water Quality

Alternative Approaches to the Proposed Planning and Land Development Program in the Draft Ventura County MS4 Permit

By

Mark Grey, Ph.D., Technical Director,
CICWQ/BIASC



Introduction

- Municipal Action Levels
- New Development and Redevelopment
 - Spatial Scales of Development Projects
 - Low Impact Development Implementation
 - Hydromodification Control
- Construction-phase Requirements
 - Wet Season Grading Ban
 - Consistency with CGP and BMPs

Shared Objectives

- Protection of Water Quality and Beneficial Uses
- Implementability
- Limit need for interpretation
- Consistency of approach



Municipal Action Levels

Issues with this provision include:

- Whether the MALs, based on national dataset, are appropriate benchmarks for implementation of MEP in Ventura County.
- Whether using a central tendency (median) with limited variability of observed urban runoff quality ($COV = 2$) is appropriate for setting MALs.
- Whether a permit violation is the appropriate remedy for two exceedences of an MAL (in-stream).

Pollutant	Proposed MAL	Southwestern US Data
		90th Percentile
TSS (mg/l)	106.2	513
COD (mg/l)	58.3	361
Cadmium Total (ug/l)	2.0	3
Cadmium Dissolved (ug/l)	0.55	0.8
Chromium Total (ug/l)	10.5	34
Chromium Dissolved (ug/l)	1.5	3.8
Copper Total (ug/l)	32.0	120
Copper Dissolved (ug/l)	12.8	33
Lead Total (ug/l)	30.6	225
Lead Dissolved (ug/l)	6.0	22
Nickel Total (ug/l)	9.6	54
Zinc Total (ug/l)	232	1,120
Zinc Dissolved (ug/l)	104	1,300

Low Impact Development and Imperviousness



- Consider project scale
- Consider percent imperviousness at all scales
- Consider the special needs of infill and redevelopment projects

Disconnecting Impervious Surfaces

- Typical urban development reduces evapotranspiration and infiltration, creating large increases in runoff volume
- Need to recreate the “sponge” in vegetation and non-compacted soils
- Disconnection of impervious surfaces mimics the pre-development evapotranspiration rate by managing the “sponge” in landscaped areas or vegetated BMPs
- This sponge can exist anywhere on the landscape - the receiving water can't tell if it is “on-site” or “regional”

Bioretention/Swale (One Street)



Vegetated Swale (Small Neighborhood)



Wet Pond (Sub-Regional)

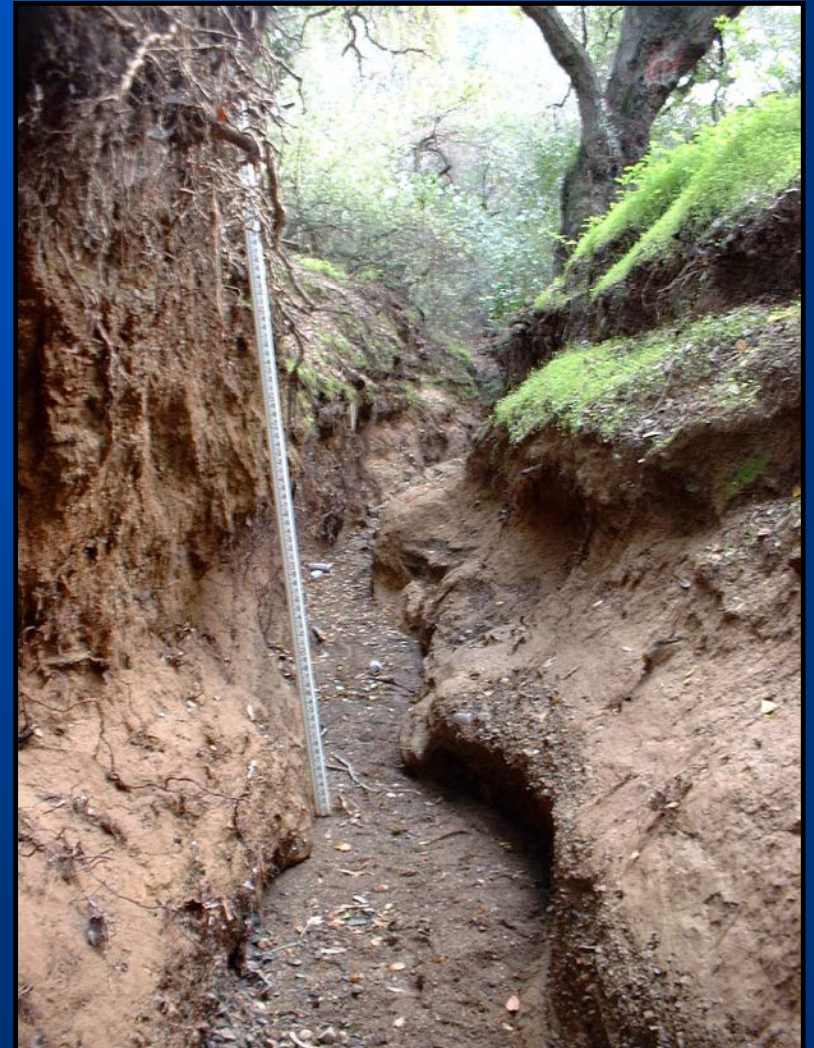


Infiltration Basin (Regional System)



Hydromodification Impacts

- Increase in runoff peak flow, volume, and flow durations
- Intensifies sediment transport and erosion processes



Hydromod Issue #1

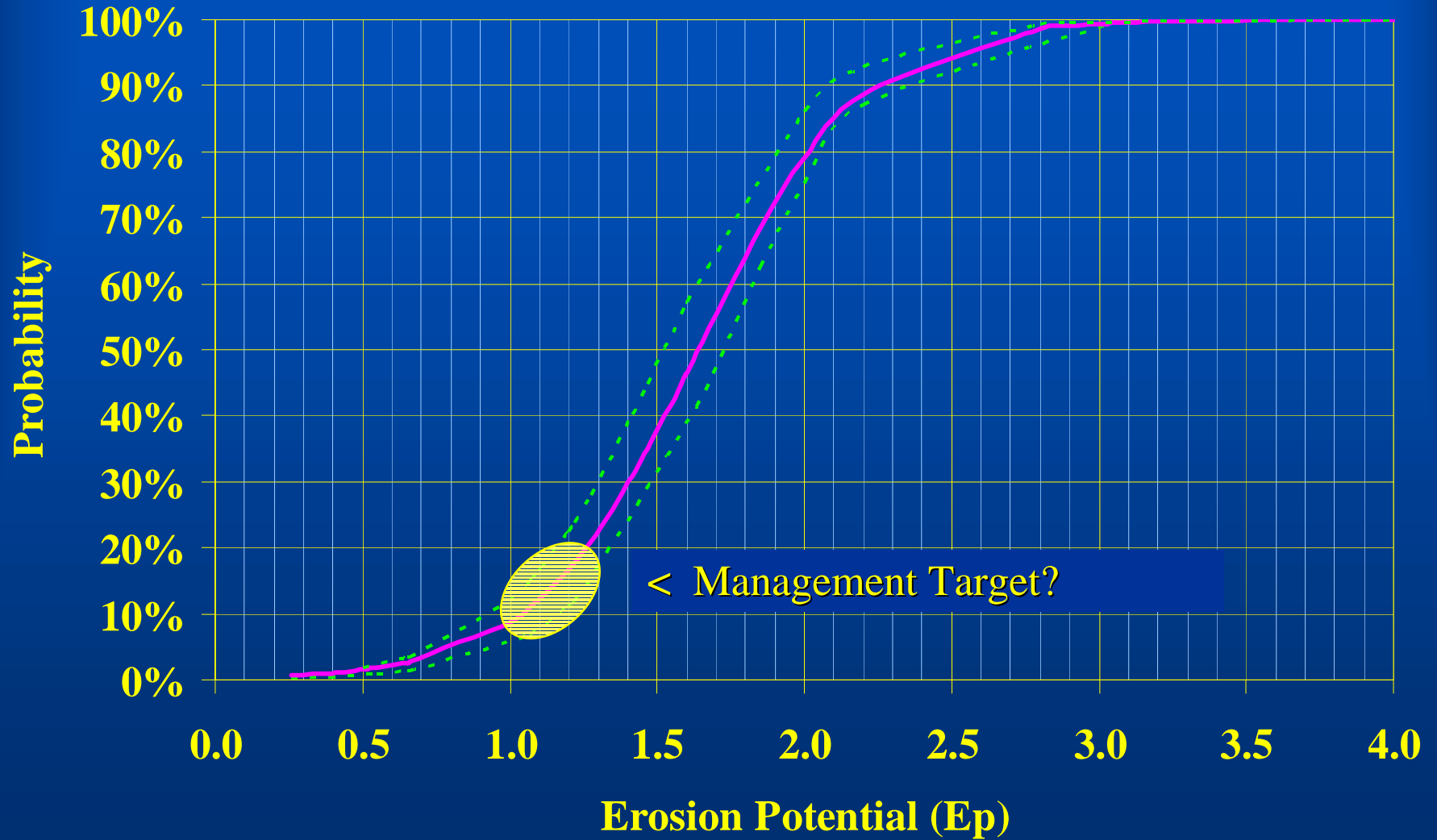
- Requirement
 - All projects shall maintain pre-development stormwater runoff flow rates and durations
- Issue
 - Does not consider stream channel susceptibility



Hydromod Issue #2

- Requirement
 - All projects in natural drainage systems must meet $E_p = 1$
- Issues
 - $E_p = 1$ does not account for effect of changes in sediment supply
 - Lacks practical tolerance value using risk-based approach

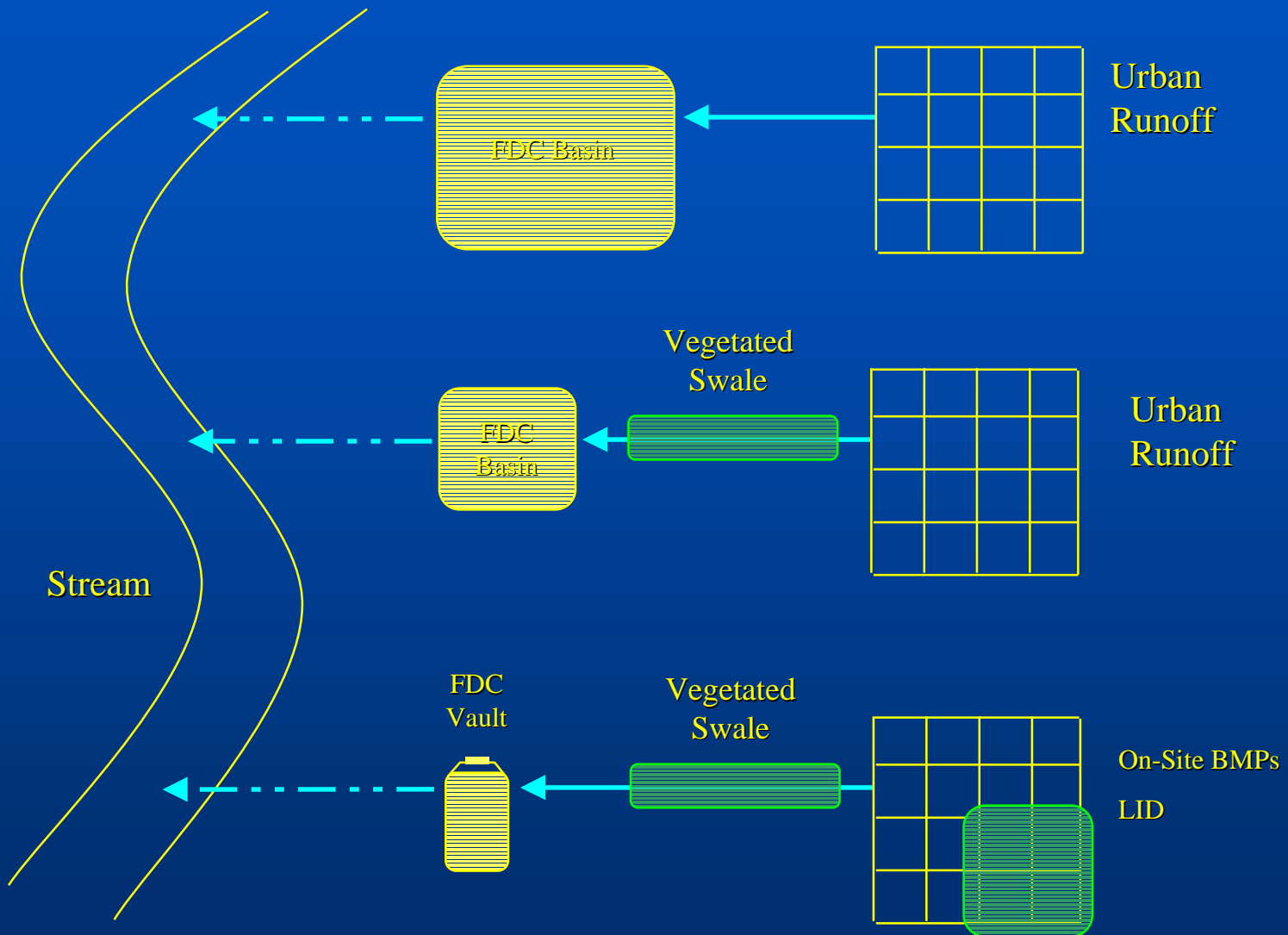
Risk of Channel Instability



Hydromod Issue #3

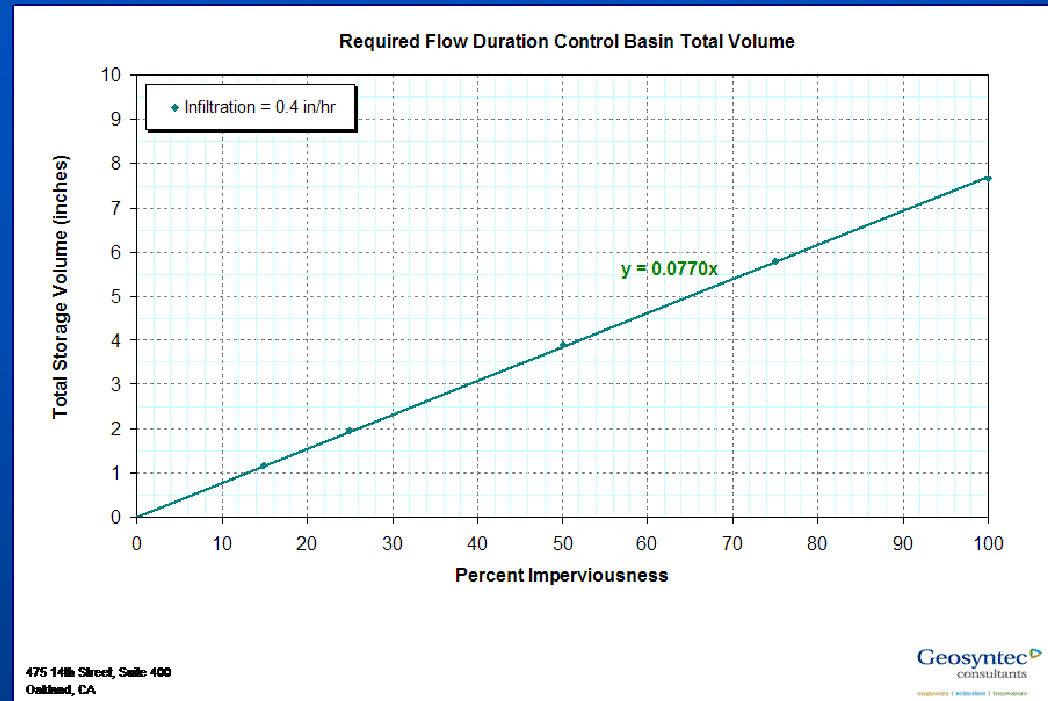
- Requirement
 - All projects shall maintain Effective Impervious Area <5%
- Issue
 - Mandates one of many tools to achieve numeric Ep standard and is redundant with numeric Ep standard

Hydromodification Control Options



Hydromod Issue #4

- Requirement for Interim hydrograph matching standard not protective of stream channels



- Propose replacement with nomograph tool based on Ep method

Construction Grading Restrictions

- Wet Season Grading Ban
 - There are between 23 to 28 days within the 6½ month (approximately 195 day) wet season on which rain occurs
 - Require a two-tiered approach to BMP implementation, with more stringent BMPs required in the wet season for sites with a high erosion potential
- Consistency with Construction General Permit and BMPs

Summary Points

- **Revise approach to setting Action Levels.....actions, not violations**
- **Consider project scales in implementing LID and hydromod approaches**
- **Consider watershed and waterbody characteristics in setting hydromod standards....consider real risks...**
- **Construction requirements consistent with General Permit....no ban, please**

















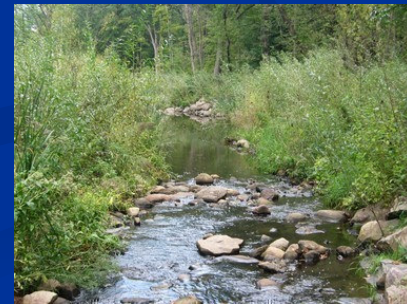
Comments on the Draft Ventura County MS4 Permit



April 5, 2007

Positives

- Inclusion of Low Impact Development (LID) Requirements
- Hydromodification Control Provisions
- Watershed Ecological Restoration Planning



Municipal Action Levels (MALs)

Receiving Water Limitations (RWLs):

- If in compliance with MALs, “the Permittee does not have to repeat the procedure for continuing or recurring exceedences of the same water quality standard....”

Instead:

- Remove and clarify that BMP implementation process isn't complete until RWLs are met

MALs (cont.)

Includes:

- pH
- TSS
- COD
- Total Coliform
- E. Coli
- Metals

Missing:

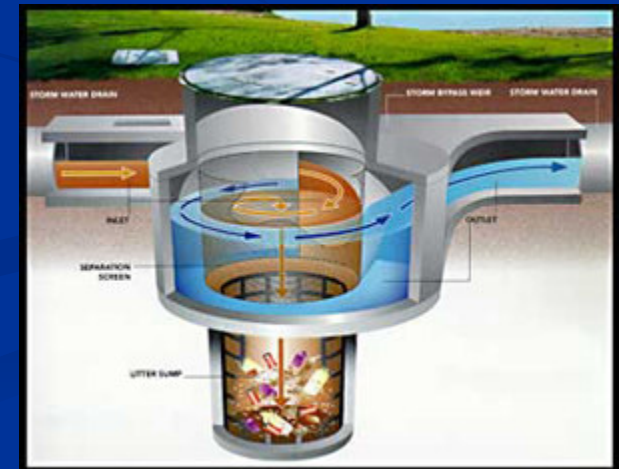
- Hg
- OP pesticides
- PAHs
- Nutrients
- Chlorides

Performance Criteria

The Order is intended “to reduce the discharge of pollutants in storm water to the MEP and achieve **water quality objectives**....”

Proposed Change:

- Add performance based criteria in response to RWL exceedence



TMDLs and Waste Load Allocations (WLAAs)

- “The WLAAs in the Order are expressed either as a numerical limitation, or a **suite of BMPs** that have been determined as providing a reasonable expectation that the WLAAs will be achieved for wet weather flows, or as a prohibition for dry weather flows.” (P.88)
- “This Order translates MS4 TMDL WLAAs...by use of alternative temporal increments, concentrations, **presumptive BMPs**, ...” (P. 21)

Proposed Action:

- Express WLAAs in numeric form

TMDLs (cont.)

Missing TMDLs:

- Calleguas Creek Nitrogen TMDL
- Calleguas Creek Chloride TMDL
- Santa Clara Chloride TMDL
- Malibu Creek Nutrients TMDL
- Calleguas Creek Metals and Selenium TMDL



TMDLs (cont.)

Missing Implementation Requirements:

- Interim WLAs
- Monitoring Program
- Required Special Studies
- Annual Progress Reports
- Work plans

Attachment A to Resolution No. R4-2006-012

**Table 7-19.2 Calleguas Creek Watershed Metals and Selenium TMDL:
Implementation Schedule**

Item	Implementation Action ¹	Responsible Party	Completion Date
1	Effective date of interim Metals and Selenium TMDL waste load allocation (WLAs), and final WLAs for other NPDES permittees	POTWs, Permitted Stormwater Dischargers ² (PSD), Other NPDES Permittees	Effective date of the amendment
2	Effective date of interim Metals and Selenium TMDL load allocation (LAs)	Agricultural Dischargers	Effective date of the amendment
3a	Submit Calleguas Creek Watershed Metals and Selenium Monitoring Program	POTWs, PSD, Agricultural Dischargers	Within 3 months after the effective date of the amendment
3b	Implement Calleguas Creek Watershed Metals and Selenium Monitoring Program	POTWs, PSD, Agricultural Dischargers	Within 3 months of Executive Officer approval of the monitoring program
3c	Re-calibrate HSPF water quality model based on first year of monitoring data	POTWs, PSD, Agricultural Dischargers	1 year after submittal of first annual monitoring report
4a	Conduct a source control study, develop and submit an Urban Water Quality Management Program (UWQMP) for copper, mercury, nickel, and selenium	MS4s	Within 2 years after the effective date of the amendment
4b	Conduct a source control study, develop and submit an UWQMP for copper, mercury, nickel, and selenium	Caltrans	Within 2 years after the effective date of the amendment
4c	Conduct a source control study, develop and submit an UWQMP for copper, mercury, nickel, and selenium	NAWS point Mugu (US Navy)	Within 2 years after the effective date of the amendment
5	Implement UWQMP	PSD	Within 1 year of approval of UWQMP by the Executive Officer
6	Develop and submit an Agricultural Water Quality Management Program (AWQMP) as described in the Conditional Waiver Program	Agricultural Dischargers	Within 2 years after the effective date of the amendment
7	Implement AWQMP	Agricultural Dischargers	Within 1 year of approval of AWQMP by the Executive Officer
8	Develop WLAs and LAs for zinc if impairment for Mugu Lagoon is maintained on the final 2006 303(d) list	Regional Board or USEPA	Within 1 year of the final 2006 303(d) list
9	Submit progress report on salinity management plan, including status of reducing WRP effluent discharges to Conejo and Calleguas Creek reaches of the watershed	POTWs	Within 3 years after the effective date of the amendment
10	If progress report identifies the effluent discharges reduction is not progressing, develop and	POTWs	Within 4 years after the effective date of the

Monitoring

Prohibitions:

- Discharges causing or contributing to a condition of pollution, contamination or nuisance
- Discharges causing or contributing to exceedences of receiving water quality objectives

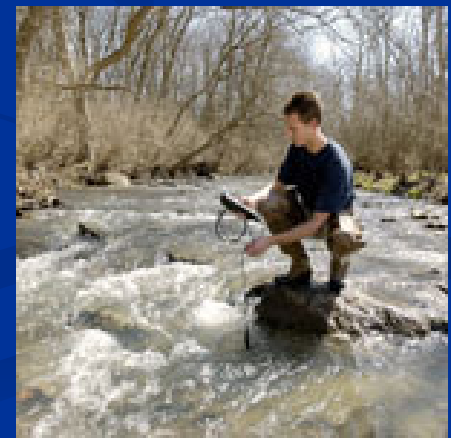


Monitoring (cont.)

- 3-5 mass emission stations
- Rotating tributary stations
- Rotating bioassessment

Proposed Action:

- Increase number of locations
- No rotation
- Year-round sampling
- Revise toxicity triggers



LOW IMPACT DEVELOPMENT (LID)

What Is LID?

General LID Principles

- LID is an ecologically-friendly approach to site development and stormwater management that helps prevent impacts to land & water resources.
- LID conserves the natural systems and hydrologic functions of a site.
- LID focuses on prevention rather than mitigation.

10 Common LID Practices:

1. Reduce & disconnect impervious surface (*Effective Impervious Area*)
2. Soil amendment
3. Permeable pavers
4. Rain gardens & bioretention
5. Sidewalk storage
6. Vegetated swales, buffers, & strips
7. Roof leader disconnection
8. Rain barrels & cisterns
9. Rooftop gardens
10. Pollution prevention & good housekeeping

Examples of LID In Practice



Why LID?

LID Is Cost-Effective

The screenshot shows the NAHB Research Center website. The header includes the NAHB Research Center logo and navigation links for Green Building, Market Research, Quality, and Lab/Certification Services. Below the header are links for ABOUT US, PRESS ROOM, JOBS, and BOOKSTORE, with sub-links for Conferences & Seminars and Awards & Competitions. A search bar is also present. The main content area is titled 'Guides to Low Impact Development' and features a highlighted text box with the following text: 'Ever wish you could simultaneously lower your site infrastructure costs, protect the environment, and increase your project's marketability? Using Low Impact Development (LID) techniques you can.' Below this, there is a list of benefits of LID, a description of LID practices, a featured case study about the Somerset development, and links to download brochures. The footer contains the NAHB Research Center address and contact information.

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Guides to Low Impact Development

Ever wish you could simultaneously lower your site infrastructure costs, protect the environment, and increase your project's marketability? Using Low Impact Development (LID) techniques you can.

LID has a variety of benefits for the built Environment such as:

- The reduction of land clearing and grading costs;
- Balancing the need for growth and environmental protection;
- The protection of local land and water resources.

LID utilizes a system of source controls and small-scale, decentralized treatment practices to help maintain a hydrologically functional landscape. The conservation of open space, the reduction of impervious surfaces, and the use of small-scale storm water controls, such as bioretention, are just a few of the LID practices that can help maintain predevelopment hydrological conditions.

Featured case study

Somerset is an 80-acre development in suburban Maryland consisting of 199 homes on 10,000 square foot lots. During Somerset's creation, the developer used LID practices to reduce its storm water management costs. By using LID, the developer:

- Eliminated the need for storm water ponds by using bioretention techniques saving approximately \$300,000;
- Gained 6 additional lots and their associated revenues;
- Reduced finished lot cost by approximately \$4,000.

For more information, download copies of the [Builder's Guide to Low Impact Development](#) and [Municipal Guide to Low Impact Development](#) brochures.

NAHB Research Center
400 Prince Georges Blvd.
Upper Marlboro, MD 20774
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NAHB
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LID Is Cost-Effective

What is Low Impact Development (LID)?

Ever wish you could simultaneously lower your site infrastructure costs, protect the environment, and increase your project's marketability? With LID techniques, you can. LID is an ecologically friendly approach to site development and storm water management that minimizes development impacts to land resources. This approach emphasizes the use of natural systems and hydrologic processes.



Source: Prince George's County, MD

LID Benefits

In addition to the environmental benefits, LID techniques can also provide a variety of stakeholder benefits:

Developers

- Reduce land clearing and site preparation costs
- Potentially reduce infrastructure costs (streets, curbs, gutters, sidewalks, storm sewer)
- Reduce storm water management costs
- Potentially reduce impact fees and increase lot yield
- Increase lot and community marketability

Municipalities

- Protect regional flora and fauna
- Balance growth needs with environmental protection
- Reduces municipal infrastructure and utility maintenance costs (streets, curbs, gutters, sidewalks, storm sewer)
- Increase collaborative public/private partnerships

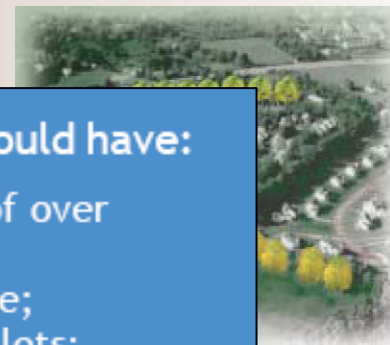
Environment

- Preserve integrity of ecological and biological systems
- Protect site and regional water quality by reducing sediment, nutrient, and toxic loads to water bodies
- Reduce impacts to local terrestrial and aquatic plants and animals
- Preserve trees and natural vegetation

Cover Photo: R. Arendt

Case Study

Kensington Estates is a conventional development on 24 acres consisting of 103 single-family homes in Pierce County, WA. A study was conducted to redesign the site using a new state storm water model and to illustrate the full range of LID practices and technologies available to developers.



Overall, the redesigned LID site could have:

- Resulted in construction cost savings of over 20%;
- Preserved 62% of the site in open space;
- Maintained the project density of 103 lots;
- Reduced the size of storm pond structures and eliminated catchments and piped storm conveyances; and
- Achieved "zero" effective impervious surfaces.

Guide to Low Impact Development

For More Information

- Low Impact Development Center
<http://www.lowimpactdevelopment.org>
- Prince George's County, Maryland
<http://www.goprincegeorgescounty.com>
- NAHB Research Center Toolbase Services
<http://www.toolbase.org>
- U.S. EPA
<http://www.epa.gov/owow/nps/urban.html>



*Assumes paving costs of \$15/sq. yd. Printed on recycled paper with soy ink.

Would you be interested in saving upwards of \$70,000* per mile in street infrastructure costs by eliminating one lane of on-street parking on residential streets?

Did you know that communities designed to maximize open space and preserve mature vegetation are highly marketable and command higher lot prices?

Are you aware that most homeowners perceive Low Impact Development practices, such as bioretention, as favorable since such practices are viewed as additional builder landscaping?

Did you know that by reducing impervious surfaces, disconnecting runoff pathways, and using on-site infiltration techniques, you can reduce or eliminate the need for costly storm water ponds?

LID Is Flexible

GREEN
from the Ground Up

Nature-friendly design practices for land-savvy developers

Capitalize on your natural assets

This fact sheet is one of a series on nature-friendly development practices created by Metro through its Nature in Neighborhoods initiative.

Low impact site design

Description of practice

Low impact site design uses planning techniques that are intended to conserve the

Appropriate site conditions

One of the best attributes of low impact site design principles and techniques is that they are extremely flexible. They can be incorporated into any site; the unique characteristics of a site will dictate what practices are best suited to a particular project. These practices work in highly constrained urban areas as well as on sites with larger lots and valuable natural resources.

that every citizen in the region has access to nature.



www.metro-region.org/nature



vacy, and design swales and rain gardens as visual features

- retain buffers along streams and rivers.

LID Can Be Implemented Now

Over 100 LID reference documents are in the record that demonstrate that LID is ready to implement:

- Case studies
- Technical manuals
- Scientific studies
- Industry reports & guidelines

LID Can Be Implemented Now

Planning & Zoning 3.7

SWMPs, SWPPPs, and BMPs

The current construction environment presents designers and developers with an array of mandates, regulations, and conditions for approval that relate to stormwater quality. By understanding the alphabet soup of acronyms, review agencies, and conditions it becomes easier to navigate the approval process and anticipate the design strategies that will be successful.

The National Pollution Discharge Elimination System (NPDES), a provision of the federal Clean Water Act, mandates that each large population center obtain a permit to discharge stormwater. BASMAA's seven participating stormwater programs, for example, serve as umbrella organizations for their co-permittee municipalities.

These NPDES permits are issued by the Regional Water Quality Control Board (RWQCB), a division of the State of California Environmental Protection Agency. There are nine regions throughout the state, and each Regional Board monitors each permittee for compliance.

To meet the goals of the NPDES permit, each local stormwater program, and each co-permittee within a program, establishes a

A SWPPP is a series or collection of Best Management Practices (BMP). The term Best Management Practice is a widely used, but somewhat inaccurate nomenclature, because the elements described as BMPs are not necessarily always best, nor are they always management practices. They can range from public education, like stenciling catch basins (which may not be as good as replacing the catch basin with an infiltration area), to site planning and design features, like a vegetated swale (which requires management but is not a management practice), to street sweeping (which actually is a management practice). In any case, the term BMP has wide currency and has been formalized in many local ordinances and codes. This document doesn't explicitly use the term BMP to describe the design alternatives presented, though each could be identified as a BMP in any particular SWPPP depending on the requirements of the local SWMP.

The true management practices widely adopted in the past twenty years like stenciling catch basins and street sweeping, can be considered "first wave BMPs." These housekeeping practices have value, and deserve to be continued. But they perpetuate a conventional approach to stormwater management based on collection and conveyance.

“...a collection of proven methods and techniques that integrates stormwater management into planning and design, reduces overall runoff, and manages stormwater as a resource, by starting at the source.”

for a construction permit, each new development project resulting in a land disturbance of five acres or larger must prepare a Storm Water Pollution Prevention Plan (SWPPP). In a typical project, a SWPPP is a document consisting of narrative and a separate sheet within the construction document set, usually in the Civil Engineering or Landscape series, that outlines both a plan to control stormwater pollution during construction (temporary controls) and after construction is completed (the permanent constructed stormwater pollution prevention elements). The permanent controls are usually found on the sheet within the construction documents.

ing about impervious land coverage and stormwater management. They are a collection of proven methods and techniques that integrates stormwater management into planning and design, that reduces overall runoff, and manages stormwater as a resource, by starting at the source.

These "second wave BMPs" require a new way of thinking about impervious land coverage and stormwater management.

No further study is needed to adopt the LID program today:

Examples of LID In Practice



Draft Ventura County Municipal Permit -- The Municipal Impact

A Presentation to the Los Angeles Regional Water Quality
Control Board

By

Larry Forester

City Councilmember, City of Signal Hill

on behalf of the

Coalition for Practical Regulation

Burbank, CA

05 April 2007

CPR's Interest in the Ventura Permit

- Our cities are very interested in the Draft Ventura Permit because we see it as a potential model for our next permit or permits.
- As a councilmember, I must assure my constituents that I am spending the public's monies wisely.
- The current Draft Permit would be prohibitively expensive to implement and will expose cities to third-party litigation.
- The California Constitution recognizes the countless services a city must provide its citizens, and the strain on local funds from the numerous public programs to be conducted by cities.

Unfunded Mandates Jeopardize Cities' Ability to Provide Essential Services

- Police and fire protection, ambulance and paramedic services, and public libraries and parks all compete for the same General Fund monies used by water quality programs.
- The California Constitution prevents State entities, including the State and Regional Boards, from imposing additional obligations on municipalities without first providing a funding mechanism or funds to address the mandates. In other words, the State may not impose unfunded mandates.
- The Draft Ventura Permit recognizes the need for funds to meet Permit requirements, but does not provide a funding mechanism. It instead asserts that cities must find the money themselves.

Non-Federally Required Elements of the Draft Permit Should Not Be Imposed Upon Cities Until Appropriate Funding Has Been Provided

- We recognize that a Permit is required by the federal Clean Water Act, but a number of expensive program requirements contained in the Draft Permit are not federal requirements.
- The Municipal Action Levels (MALs) are not required by federal law and will cost millions, if not billions, of public dollars for compliance.
- Additional expensive provisions in the Draft Permit that are not required by federal law, include: (1) provisions under Parts 1 and 2 requiring strict compliance with water quality standards; (2) TMDL provisions requiring strict compliance with numeric waste load allocations; (3) Permit terms obligating cities to effectively be responsible for atmospheric deposition; and (4) programs such as the Industrial Facility Inspection Program, the Pesticide Program, the Watershed Ecological Restoration Program, the SUSMP requirements, and the Low Impact Development requirements.

Non-Federally Required Elements of the Draft Permit Should Not Be Imposed Upon Cities Until Appropriate Funding Has Been Provided (Continued)

- The Fiscal Resources Section should be modified to require cities to implement the non-required programs only after sufficient funds have been allocated by the State and made available to the cities so as to not diminish funds that are to be available for other important public services.
- The statement in Part 3.C.1 that states, “The Permittees shall allocate all necessary funds to implement the activities required to comply with the provisions of this Order,” should be removed from the permit.

Major Policy Issues with the Ventura Permit

A presentation to the Los Angeles Regional Water
Quality Control Board

By

Richard A. Watson, A.I.C.P.

on behalf of the

Coalition for Practical Regulation

Burbank, CA

05 April 2007

Municipal Action Levels (MALs) and Numeric Effluent Limits (NELs)

- The proposal in the Draft Ventura Permit to establish municipal action levels (MALs) as statistically derived numeric effluent limits (NELs) is inconsistent with the iterative process in State Water Board Order 99-05.
- The proposed use of MALs is contrary to the findings of the State Water Board's Blue Ribbon Panel that found that "It is not feasible at this time to set enforceable numeric criteria for municipal BMPs and in particular urban discharges."

The Draft Ventura Permit Proposes Inappropriate and Wrongly Applied Action Levels

- The municipal action levels in the Draft Permit are based on nationwide monitoring data.
- Action levels should be based on watershed-specific or even waterbody-specific data that reflect natural background and local conditions.
- The municipal action levels, as proposed, are really numeric effluent limits that trigger permit violations and enforcement.
- Action levels should only be used as triggers for the application of enhanced management measures as part of the iterative process.

We Need a Good Working Definition of Maximum Extent Practicable

- The draft Ventura Permit operationally defines MEP on the basis of exceedances of Municipal Action Levels derived from nationwide monitoring data. This ignores the need to comply with the provisions under the Porter-Cologne Act and ignores local factors and characteristics.
- MEP is a general guideline, and the Permittees believe it should be applied consistent with the factors set forth in the Porter-Cologne Act, including only imposing requirements “that could reasonably be achieved.”
- In the absence of a statewide definition, this Regional Board could take the lead in developing a good working definition of MEP.

The Draft Ventura Permit's Definition of MEP (Maximum Extent Practicable)

- The Draft Ventura Permit has a short definition of MEP referring to the Clean Water Act, State Board Order no. 2000-11, and the Browner Decision:

“Maximum Extent Practicable (MEP) - means the standard for implementation of storm water municipal programs to reduce pollutants in storm water. CWA Section 402(p)(3)(B)(iii) requires that municipal permits ‘shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design, and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants.’”
- In year three after permit adoption, two or more exceedances of a MAL will be considered a violation of the MEP provisions of the Order, regardless of whether or not the cities have taken action in accordance with the maximum extent practicable standard or whether the MALs “could reasonably be achieved”.

The New San Diego Permit's Definition of MEP (Maximum Extent Practicable)

- The San Diego Permit contains a long definition of MEP that is partly based on the 1993 Elizabeth Jennings memo defining MEP. The Permit says, in part:

“MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense)...MEP considers economics and is generally, but not necessarily, less stringent than BAT. A definition for MEP is not provided either in the statute or in the regulations. Instead the definition of MEP is dynamic and will be defined by the following process over time: municipalities propose their definition of MEP by way of their urban runoff management programs. Their total collective and individual activities conducted pursuant to the urban runoff management programs becomes their proposal for MEP as it applies both to their overall effort, as well as to specific activities...In the absence of a proposal acceptable to the Regional Board, the Regional Board defines MEP.”

The New San Diego Permit's Definition of MEP (Maximum Extent Practicable) (Continued)

- The San Diego Permit goes on to note that useful factors to consider in selecting BMPs to achieve the MEP standard include effectiveness, regulatory compliance, public acceptance, cost, and technical feasibility. (From 1993 memo entitled “Definition of Maximum Extent Practicable” by Elizabeth Jennings, Senior Staff Counsel, SWRCB.)
- The Regional Board or the State Board has the final determination as to whether a municipality has reduced pollutants to the MEP, but copermitees have the opportunity to propose their own definition as applied to their overall efforts and to specific activities.

SB 1342 (2002) Proposed Definition of MEP

Section 2(b):

The “maximum extent practicable” standard means the maximum degree of pollutant reduction achievable through the application of practical, technologically feasible, and economically achievable best management practices, including but not limited to, pollution control techniques and system design and engineering methods.

SB 1342 (2002) Definition of Technologically Feasible and Economically Achievable BMPs

Technologically feasible and economically achievable best management practices are those practices that satisfy all of the following criteria :

- (1) Demonstrate effectiveness in removing pollutants of concern.
- (2) Demonstrate compliance with subsection (p) of Section 1342 of Title 33 of the United States Code.
- (3) Demonstrate the support and acceptance of the public served by those best management practices.
- (4) Demonstrate a reasonable relationship between the cost of the best management practice and the pollution control result to be achieved.
- (5) Demonstrate technological feasibility to effect the intended pollutant removals, considering soils, geography, topography, water resources, and such other limiting physical conditions as may exist.
- (6) Demonstrate economical achievability through the identification of available funding sources or through a proposed funding plan, or both, considering the need for the continuation of existing municipal services and the application of legal restrictions for approval of new sources of funding consistent with the state law and federal regulatory requirements prescribed under subsection (d) of Part 122.26 of Title 40 of the Code of Federal Regulations.

Recommendations

- Direct staff to only use municipal action levels (MALs) as triggers for the application of enhanced management measures.
- Direct staff to work with interested parties to develop a draft statewide framework for determining maximum extent practicable.

Permit Implementation

A presentation to the Los Angeles Regional Water Quality
Control Board

By

Dr. Gerald E. Greene, DEnv, PE, QEP
City of Downey
on behalf of the
Coalition for Practical Regulation

Burbank, CA
05 April 2007

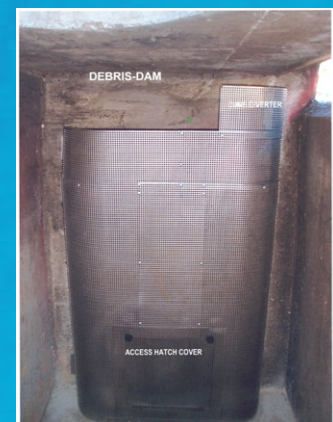
General Questions about Municipal Permit Implementation

- In a May 10, 2000 letter from the California Business, Transportation, and Housing Agency to Cal EPA, Secretary Contreras-Sweet noted to Secretary Hickox that:
 - “Failure to comply with the Clean Water Act exposes California’s municipalities and Caltrans to regulatory action and fines and third-party lawsuits...Full compliance in the near term may not be technically or economically feasible for Caltrans or any municipality.”
- This letter further raises several broad policy questions:
 - “- What strategies should local agencies and state agencies who discharge storm water, and state and federal agencies who enforce the Clean Water Act, follow in achieving compliance with water quality standards and objectives, and permit requirements?”
 - How can implementation of state and federal clean water laws avoid becoming a watershed of litigation and enforcement activity?
 - What is the best way for Californians to pay for these water quality investments? How can these needed investments be balanced with other community needs?”

General Questions about Municipal Permit Implementation (Continued)

What approaches should we collectively be following?

- What is the best way to implement needed water quality improvements while balancing the many services that Californians demand?
- What strategy do we follow to avoid further litigation?
- These fundamental questions remain for the most part unanswered seven years later.

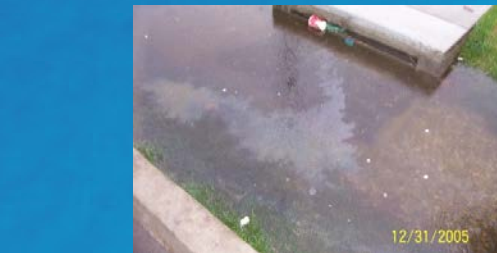


TMDL Implementation Should Be Separated from Permit Implementation

- Current MS4 Permits are already unwieldy and cumbersome.
- Finding E6 ties the Draft Permit to the 1999 Consent Decree between USEPA, NRDC, HTB, & SMBK.
- The Draft Ventura Permit states that the TMDL waste load allocations are to be expressed as wet weather numeric limits and prohibitions against all dry-weather discharges.
- Permittees are to implement “all control measures” to achieve TMDL waste load allocations by the effective dates.
- The TMDL Consent Decree doesn't require implementation or enforcement of TMDLs through NPDES Permits.
- The Clean Water Act gives great flexibility to the States in implementing and enforcing TMDLs.

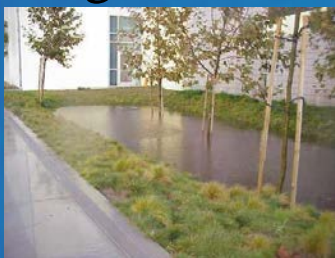
TMDLs Should Be Implemented Through MOUs

- USEPA stated that TMDLs can be implemented through a variety of voluntary agreement mechanisms (e.g. MOUs).
- Cities are rightfully concerned that implementing and enforcing the TMDLs through waste load allocations and receiving waters prohibitions in the NPDES permit will result in daily fines of \$31,500 and in third-party litigation.
 - Recent “differing” interpretation of SUSMP and infiltration
- Implementation of the TMDL program is in its infancy and that there is still much experimentation necessary in the construction and operation of capital improvements and in devising source control programs. It is too early to subject local government to third-party litigation for investing in the iterative process.



TMDLs Should Be Implemented Through MOUs (Continued)

- MOUs should be the preferred TMDL implementation strategy.
 - MOUs can set forth BMPs to be implemented by the cities.
 - MOUs allow Board enforcement through Supplemental Environmental Programs (SEPs) that consist of programs designed to enhance water quality.
 - MOUs can give the Board adequate enforcement power.
- We request that Finding E6 of the Draft Permit be revised to specify that implementation of the TMDL program will be through MOUs between the Regional Boards and local governments rather than through the Permit.



Atmospheric Deposition and Its Role in the Permitting Process

Presented by
Lisa Rapp
Director of Public Works,
City of Lakewood

Los Angeles Regional Water Quality Control Board
April 5, 2007
Burbank, CA

Atmospheric Deposition and Water Quality

- There is increasing recognition of the connection between atmospheric deposition and water quality.
- Multi-media problems demand multi-agency planning and policy coordination.
- CARB and the State Water Board had an historic joint workshop in February 2006.

Atmospheric Deposition and Water Quality (Continued)

- The State Board has acknowledged the importance of atmospheric deposition in meeting water quality objectives.
 - “We will not be able to fully address these impaired water bodies until the component of atmospheric deposition is understood and quantified.”
 - “As was made apparent by our atmospheric deposition workshop, U.S. EPA’s air regulation structure needs to include atmospheric deposition’s known impact on water quality.”

Source: April 14, 2006 letter from Celeste Cantú,

Former Executive Director, State Water Resources Control Board to U.S. EPA

NRDC Pushing for Action on the Air-Water Interface

- NRDC petitioned the Los Angeles Regional Board to request technical information from industrial aerial emission sources.
- NRDC says that failure to issue 13267 letters by 15 May 2007 will be considered a “failure to act” under CWC Section 13320(a) for purposes of appeal to the State Water Board.
- NRDC gathered data on emissions of six chemical and metal pollutants in 303(d) listed waterbodies from EPA’s Toxic Release Inventory.
- NRDC requested that 13267 letters be sent to the top 10 dischargers of each of the selected constituents.
- NRDC cited scientific studies illustrating the problems of atmospheric deposition in the Region's waterbodies.

Water Pollutants Identified as Significant for Atmospheric Deposition in at Least One Location

- Sulfur compounds
- Nitrogen compounds
- Mercury compounds
- Lead compounds
- Cadmium compounds
- Chlorpyrifos
- Copper
- Zinc
- Polychlorinated biphenols (PCBs)
- Diazinon
- Dioxins/furans
- Dieldrin
- DDT/DDE
- Hexachlorobenzene (HC3)
- α -hexachlorocyclohexane (α -HCH)
- Lindane
- Toxaphene
- Polycyclic organic matter (POM), incl. polycyclic aromatic hydrocarbons (PAHs)
- Atrazine

Source: USEPA, *Frequently Asked Questions About Atmospheric Deposition, A Handbook for Watershed Managers*, Sept. 2001.

Local Governments Understand the Importance of the Air-Water Interface

- Permittees in the Los Angeles River Watershed are developing an atmospheric deposition research project related to the Los Angeles River Metals TMDL.
- The two-year project involves paired measurements of atmospheric deposition and storm flow.
- It is estimated that local governments will be contributing approximately \$1.5 million to fund this atmospheric deposition research project.

Storm Water Permittees Caught in a Regulatory/Authority Bind

- The combination of directly connected impervious areas and atmospheric deposition of pollutants produces a “perfect storm” impacting water quality control.
- Removing all pollutants at the end of storm drains would be very expensive - many, many billions of dollars.
- The regulatory reality is that water boards can regulate permittees but don't have regulatory control over some of the major pollutant sources such as the sources of atmospheric deposition.

The Water Boards and the Regulated Community Need Help from the Air Boards

- While water quality regulations have been broadening, air quality regulation has become more focused.
- Air quality regulation is increasingly focused on fine, breathable particles, but air deposition impacts on water quality involve both fine particles and coarse particles.
- Water quality practitioners need help from the Air Boards to monitor a wider range of particle sizes.
- The Air Boards need to acknowledge that water pollution is one of the public welfare effects that need to be addressed in regulating sources of atmospheric pollution.

Atmospheric Deposition Is Not Adequately Addressed in the Draft Ventura Permit

- Finding B.16 is a good start; it recognizes the importance of dry indirect deposition to water quality.
- Finding B.16 also indicates that the Regional Board will cooperate with the South Coast AQMD and CARB. Municipalities would like to work with the Regional Board to develop a strategy to stimulate more action by the air boards.
- Neither the Regional Board nor municipalities can control atmospheric deposition, and we won't be able to achieve clean water until it is controlled.

Policy & Implementation Concerns: Atmospheric Deposition Is Not Adequately Addressed in the Ventura Permit (Continued)

- The Santa Ana Regional Board recognizes that permittees can't control atmospheric deposition and other specified discharges:
 16. The permittees may lack legal jurisdiction over storm water discharges into their systems from some State and Federal facilities, utilities and special districts, Native American tribal lands, waste water management agencies and other point and non-point source discharges otherwise permitted by the Regional Board. The Regional Board recognizes that the permittees should not be held responsible for such facilities and/or discharges. Similarly, certain activities that generate pollutants present in storm water runoff may be beyond the ability of the permittees to eliminate. Examples of these include operation of internal combustion engines, atmospheric deposition, brake pad wear, tire wear and leaching of naturally occurring minerals from local geography.

(From Santa Ana Board Order No. R8-2002-0010 - Waste Discharge Requirements for the County of Orange, Orange County Flood Control District and The Incorporated Cities of Orange County Within the Santa Ana Region Areawide Urban Storm Water Runoff Orange County)

- We ask that you include a similar finding in the Ventura Permit and the other MS4 permits you will issue later.

Environmental Impact Issues Associated with Infiltration

Presented by
Ray Tahir
TECS Environmental
on behalf of
The Coalition for Practical Regulation

Los Angeles Regional Water Quality Control Board
April 5, 2007
Burbank, CA

Draft Permit Requires Thorough Environmental Impact Analysis

- A CEQA clearance or other mechanism is needed to evaluate the impact of the next MS4 Permit in terms of:
 - Potential adverse impact on other Permittee programs and services resulting from excessive compliance costs associated with this MS4 Permit; and
 - Potential adverse environmental impacts resulting from required SUSMP provisions (e.g., impact of infiltration on groundwater quality).

Draft Permit Requires Thorough Environmental Impact Analysis (Continued)

- Draft MS4 proposes mandatory infiltration (through the 95% perviousness requirement)
- Infiltration cannot be mandatory because of infeasibility, such as:
 - Property line to line projects where there is no area to infiltrate
 - Projects that are situated in known areas of contamination (areas in the San Gabriel Valley)
 - Project sites where there is the possibility that an accidental release of caustic pollutants could enter the sub-surface and threaten groundwater (automotive repair shops, gas stations, landfills, airports, certain categories of industrial facilities)
 - Areas where the water table is high (City of Cerritos will attest to this during public comment period)
 - Public and private streets

Draft Permit Requires Thorough Environmental Impact Analysis (Continued)

- Need to evaluate appropriateness of infiltration controls within the context of specific types of projects and site conditions
- Need to consider feasible alternatives and mitigation measures
- Appropriate environmental evaluation will greatly improve permit implementation by:
 - Taking the guess work out of the process;
 - Better improving water quality; and
 - Reducing if not eliminating the need for litigation.

Municipal Action Levels & Assessing Compliance and Effectiveness

Geoff Brosseau

California Stormwater Quality
Association (CASQA)

April 5, 2007



Presentation Outline

- California Stormwater Quality Association
- MALs – Purpose and Derivation
 - California Water Board's Expert Blue Ribbon Panel Findings
 - Ventura MS4 draft permit
- Quantifiable Measures for assessing Permit Compliance and Program Effectiveness

California Stormwater Quality Association

- Founded as the Stormwater Quality Task Force – official technical advisory body to State Water Board
- Nonprofit public benefit 501(c)(3) corporation
- Professional member association dedicated to the advancement of stormwater quality management through:
 - collaboration,
 - education,
 - regulatory review,
 - implementation guidance,
 - and scientific assessment.
- Specific purpose is to assist those entities charged with stormwater quality management responsibilities with the development and implementation of stormwater quality goals and programs
- Practitioners of stormwater quality management
- Technical focus

Collaboration / Education / Implementation guidance / Scientific assessment

➤ Meetings

- General Membership meetings (1991-)
- Workshops (BMP Handbooks, ASBS)
- Conferences (2005-)

➤ Guidance

- BMP Handbooks (3/93 and 1/03)
- Retail Gasoline Outlet (RGO) BMP Guide (3/97)
- Construction Stormwater Sampling & Analysis Guidance (10/01)
- Effectiveness Assessment White Paper (10/05)
- Resource Library – Public education materials (12/05)
- Stormwater Monitoring and Research Priorities (3/07)
- Effectiveness Assessment Manual (4/07)

Municipal Action Levels – Purpose and Derivation



Expert Blue-Ribbon Panel Findings

"It is not feasible at this time to set enforceable numeric effluent criteria for municipal BMPs and in particular urban discharges....."

For catchments not treated by a structural or treatment BMP, setting a numeric effluent limit is basically not possible.

Expert Blue-Ribbon Panel Findings (cont')

- Action Level as defined by Panel
 - Used to identify the “bad actor catchments”
 - Functionally same as an “upset value”
- 3 approaches suggested for developing action levels
 - Consensus based
 - Ranked percentile distribution (90% value)
 - Statistically based population parameters

Expert Blue-Ribbon Panel Findings (cont')

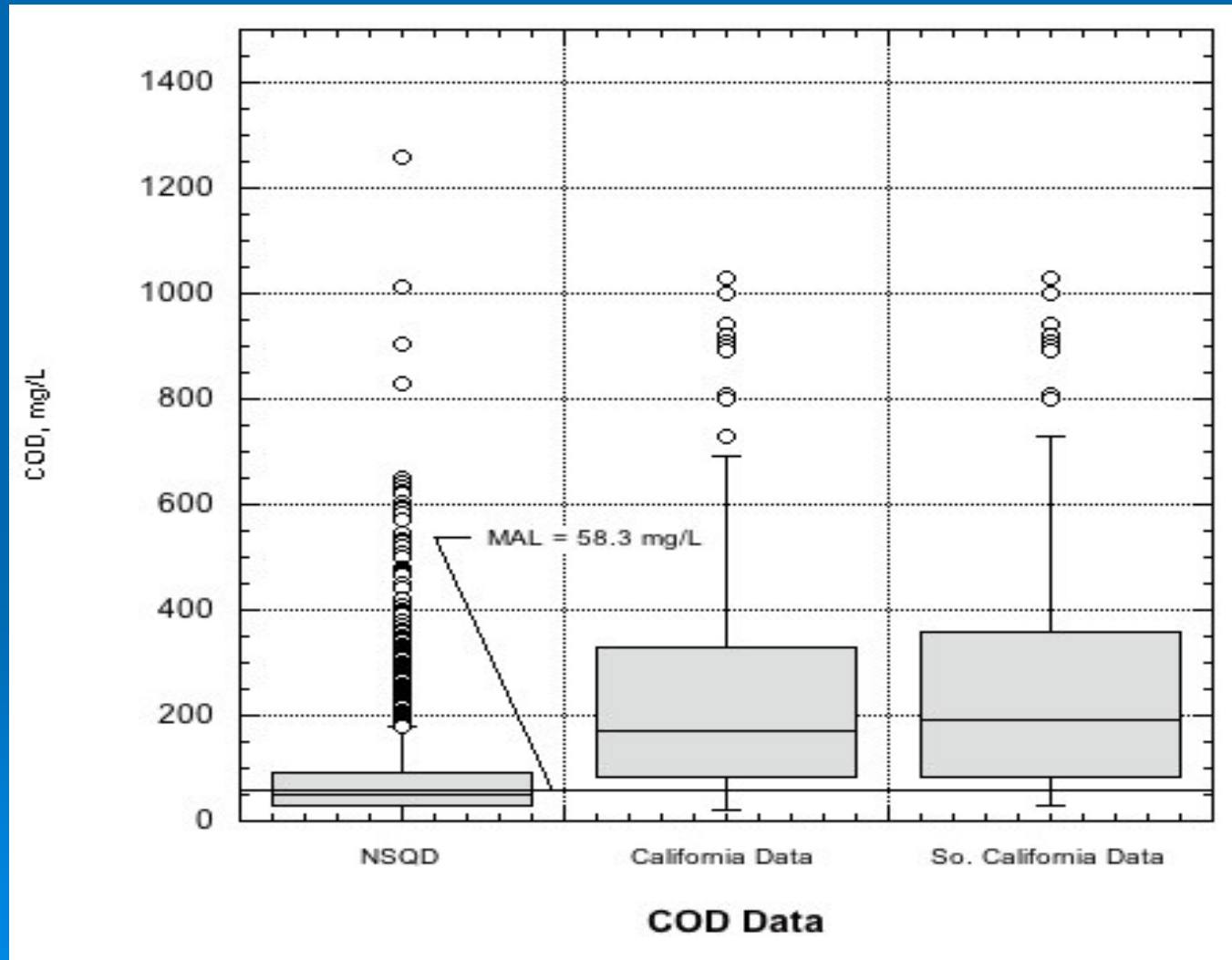
- Recommended Database for establishing “upset values” (in order of preference)
 1. Local urban stormwater monitoring data
 2. Combine municipal permit monitoring data when insufficient local data
 3. National database
- Ventura draft permit reflects the third preferred dataset

National vs. Local Datasets

- National datasets demonstrates local differences (COD)

EPA Rain Zone	Location	Average (mg/L)
3,7	SE and NW	44
2,4,5	TX, MidAtlantic	72
6	CA, AZ	162
National		74

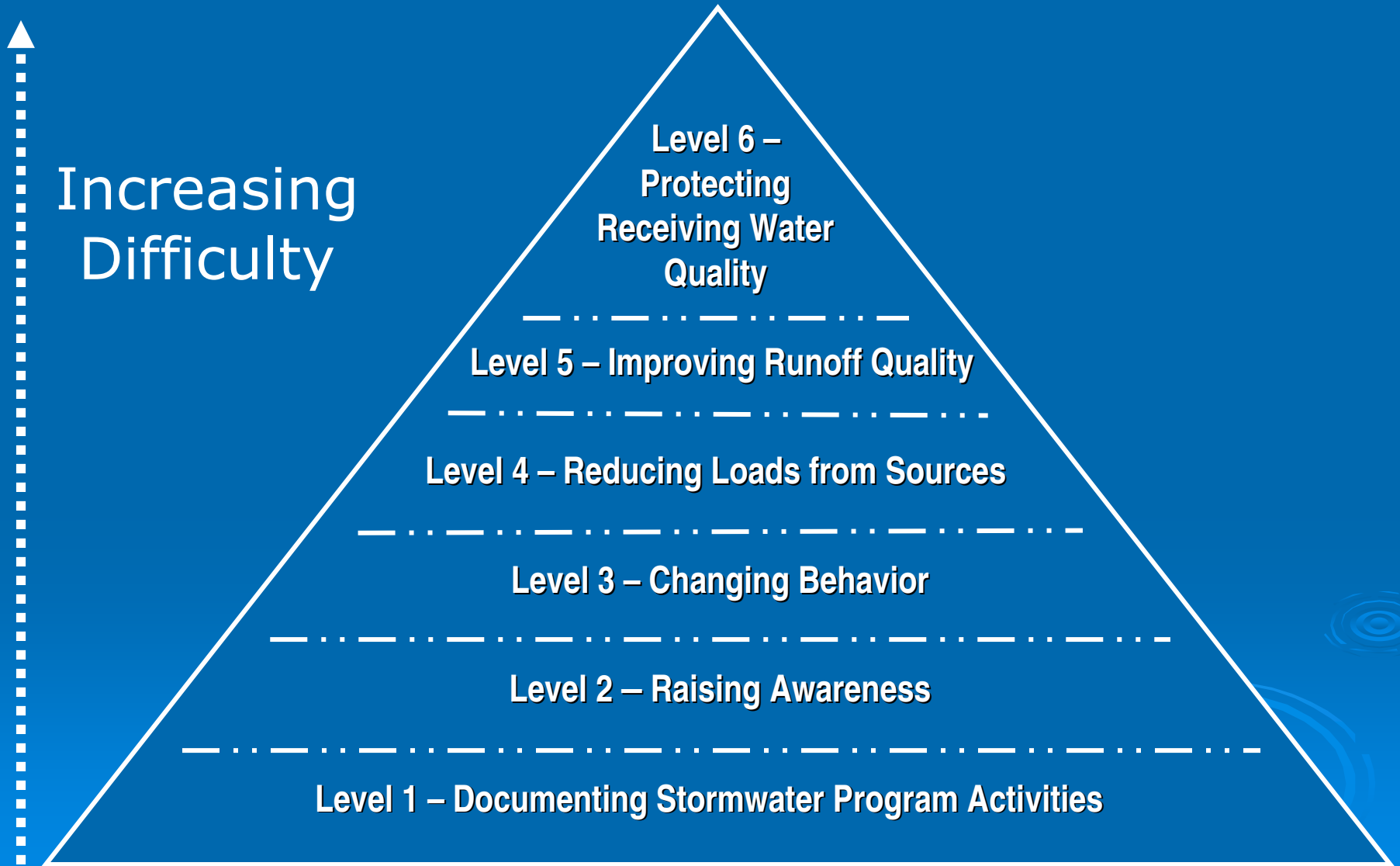
California Data is Different (> 99.9% probability that means are different)



Quantifiable Measures for assessing Permit Compliance and Program Effectiveness



Assessment Outcome Levels



Attributes of Assessment Method

➤ Assess

- Effort (Outcome Level 1)
- Achievement (Outcome Levels 2 - 6)

➤ Type

- Narrative or qualitative
- Numeric or quantifiable

➤ Progress

- Effort → Achievement
- Qualitative → Numeric or quantifiable

Challenges to measuring stormwater program effectiveness (Cause –?→ Effect) (Action –?→ Outcome)

- Degrees of separation phenomenon
- Complicating effects of integrating all inputs
- Outcome Level is defined by:
 - Type of BMP being measured
 - Power of BMP

Implementation Success Story: Pesticides and Stormwater

- By 2006 – Aquatic toxicity and diazinon concentrations in urban creeks have decreased dramatically – in many cases below TMDL targets - Level 6 Outcome – Protecting receiving water quality
- USEPA and DPR changing the way pesticides are regulated to address/prevent water quality problems / Retailer data show less-toxic product sales ↑ - Level 3 Outcome – Changing behavior
- Surveys - Level 2 Outcome – Raising awareness

Action Levels – Draft Examples

Program Element	Outcome Level	Goal	Examples of Defining Quantifiable Measure	Action Level
Construction	Level 1 – Documenting Activities	Provide frequent inspection of construction sites	Percentage of all construction sites inspected according to specified schedule during wet season	90
	Level 3 – Changing Behavior	Increase the number of construction sites in compliance with BMP implementation and local stormwater requirements	<u>Upon first inspection</u> , percentage of construction sites in significant compliance with local construction stormwater requirements	(75% >1 ac. / 50% < 1 ac.)
			Percentage of State permitted sites that have a completed SWPPP for each site (document during inspection)	80

Action Levels – Draft Examples

Program Element	Outcome Level	Goal	Examples of Defining Quantifiable Measure	Action Level
Illegal Discharges / Illicit Connections	Level 3 – Changing Behavior	Respond rapidly and efficiently to illicit discharges	% of illicit discharges impacting human health responded to within 24 hours upon receiving notification	80
		Eliminate all illegal connections	% of illegal connections eliminated or permitted once detected	80

Summary

- MALs are numeric effluent limits with significant implications for MS4s
- Draft Ventura Permit differs from the Blue Ribbon Panel Recommendations
 - Purpose of “Action Levels”
 - Application to MS4s
 - Dataset for developing MALs inappropriate

Opportunity

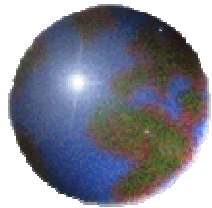
- There is a viable approach for developing quantifiable measures for program implementation and demonstrating progress towards water quality protection
- Embraced by San Diego Water Board; incl. in State Water Board Construction General Permit; considered by other Water Boards
- CASQA is fleshing out the details now

Thank you



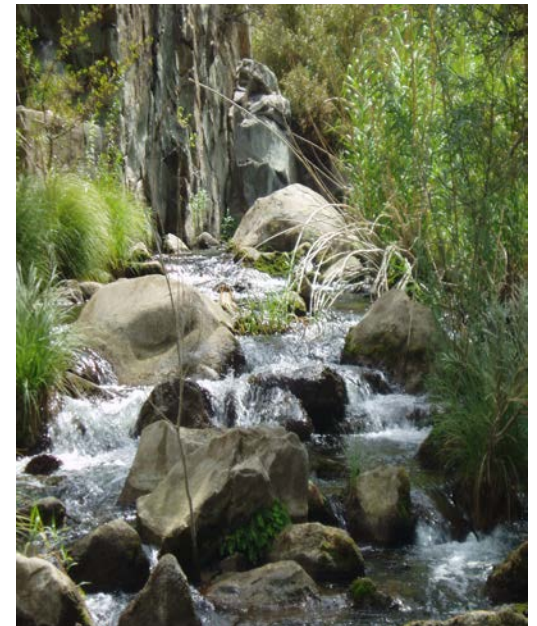


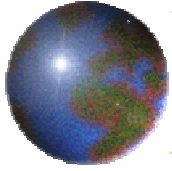
*Ventura Countywide
Stormwater Quality
Management Program*



**Presentation to the
RWQCB-LA**

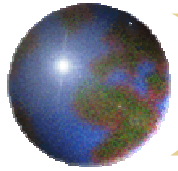
**Ventura Countywide
Program Municipal
Stormwater Program and
Draft RWQCB Permit**





Presentation Overview

- ⊕ Program Highlights and Successes
- ⊕ Characteristics of Ventura County Are Unique
- ⊕ Ventura County is a Leader in Watershed Based Planning
- ⊕ Concerns with Current Permit Structure
 - Use of Municipal Action Levels
 - Water Quality Protection and NPDES permitting
- ⊕ Conclusion



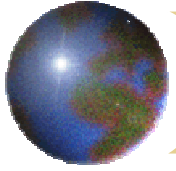
Ventura Stormwater Permit

1992 - Implementation Agreement Signed Between:

- ❖ **Watershed Protection District**
- ❖ **County of Ventura**
- ❖ **10 Cities in the County of Ventura**

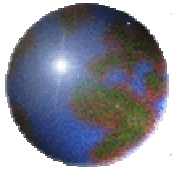
Camarillo	Fillmore
Port Hueneme	Moorpark
Ojai	Oxnard
San Buenaventura	Santa Paula
Simi Valley	Thousand Oaks

Principal Co-Permittee: Ventura County Watershed Protection District



Ventura Program History

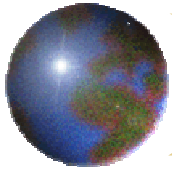
- Mature and Comprehensive Stormwater Management Program;
- Modified Over-Time to Address Local Water Quality Issues;
- Permits Issued in 1994 and 2000 Reflect Character of the Program.



Ventura Program Recognition

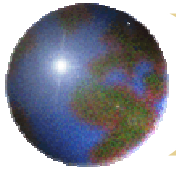
- ❖ 2003 National U.S. EPA Award for Excellence;
- ❖ Reflects Program's Commitment to Improve and Protect Water Quality in Ventura County.





Public Outreach





Public Outreach Highlights

Participation in Coastal Cleanup Day

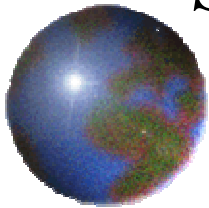
- ✦ 2,000 volunteers participate
- ✦ 47 miles of inland watersheds and coastal shorelines
- ✦ More volunteers & less trash each year

Successful Media outreach campaign

- ✦ Three 60 second TV Commercials
- ✦ 8 million impressions
- ✦ Public Service Announcement
- ✦ Advertising Artwork and Posters
- ✦ Continue to develop new Commercials and Print Material

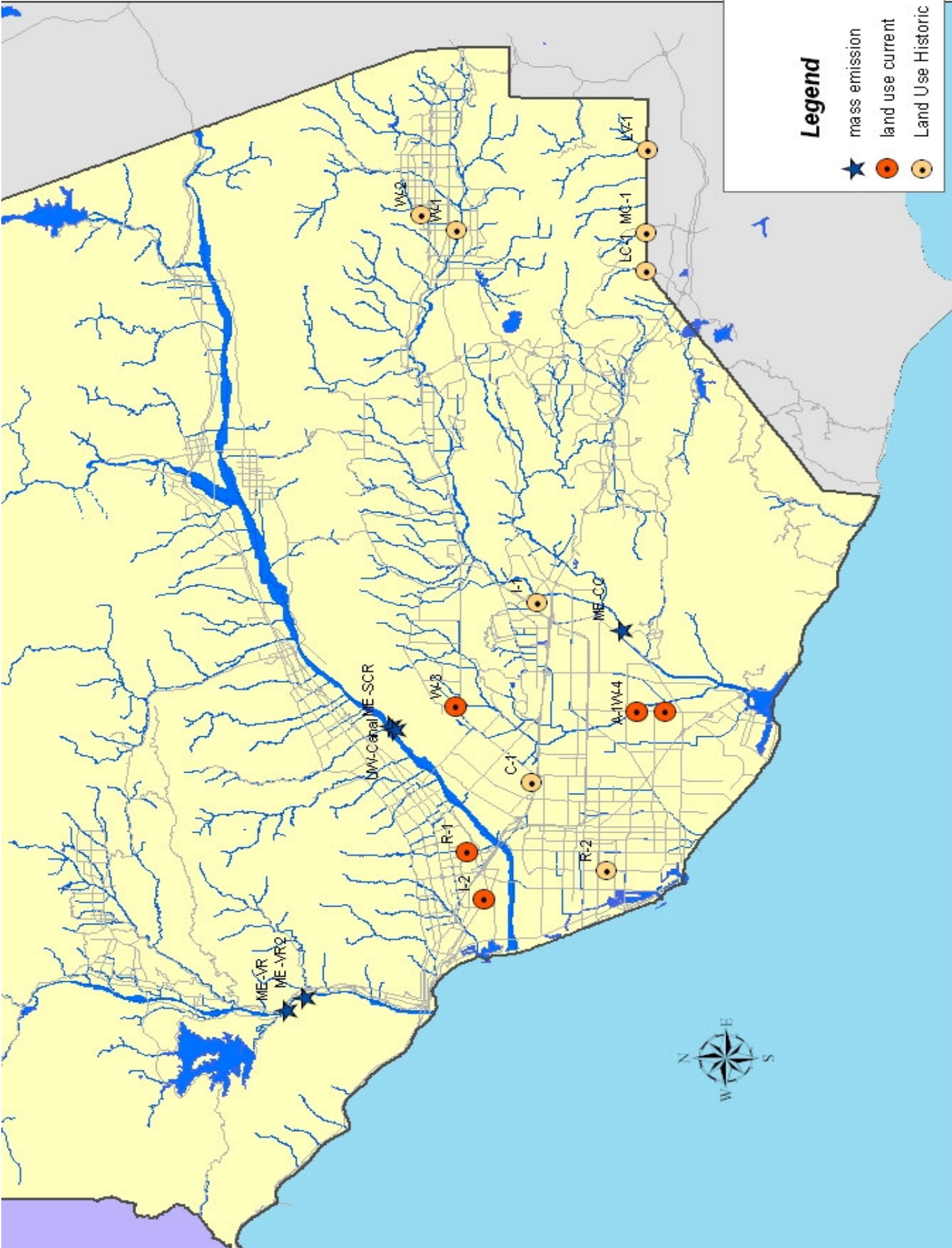


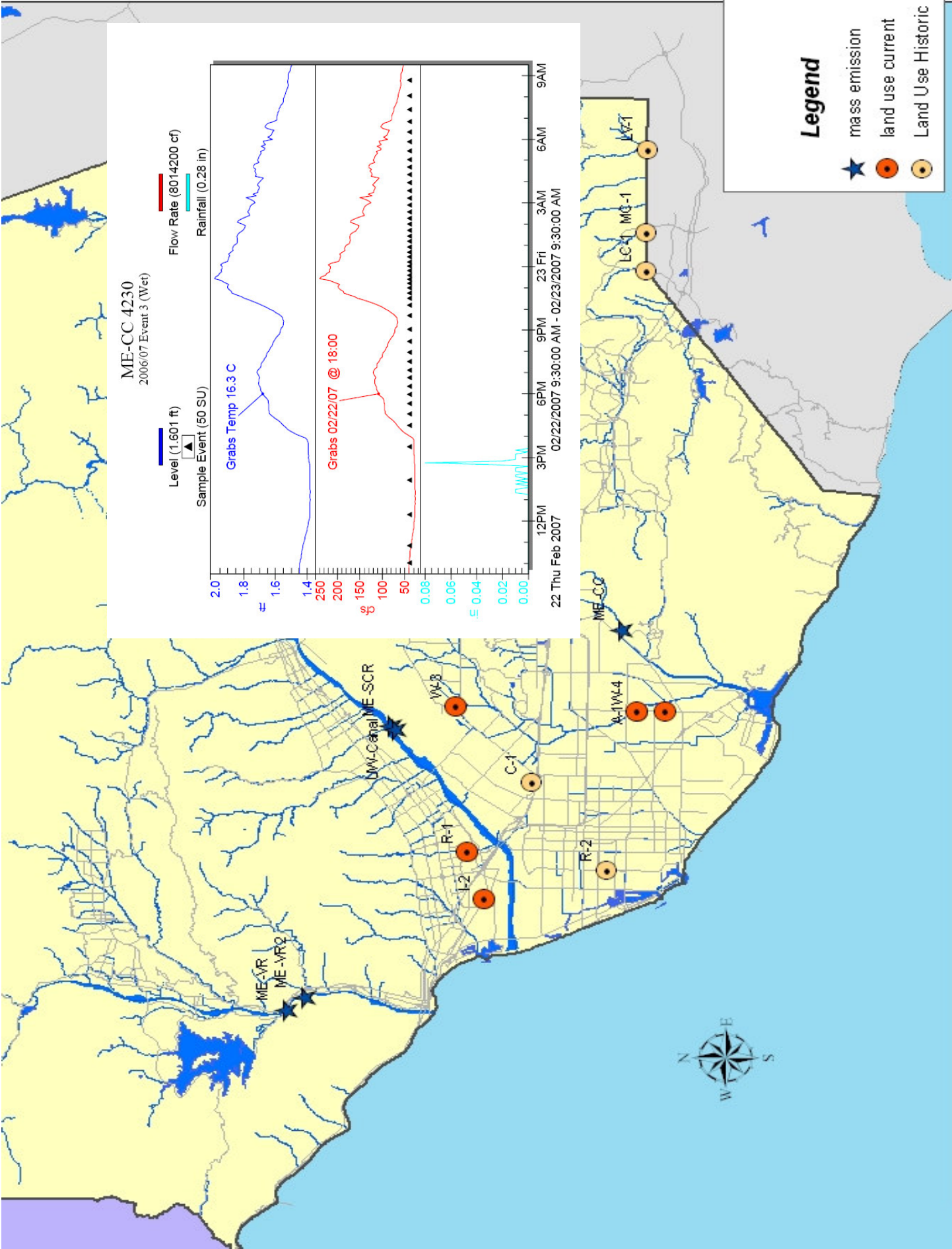
Stormwater Water Quality Monitoring



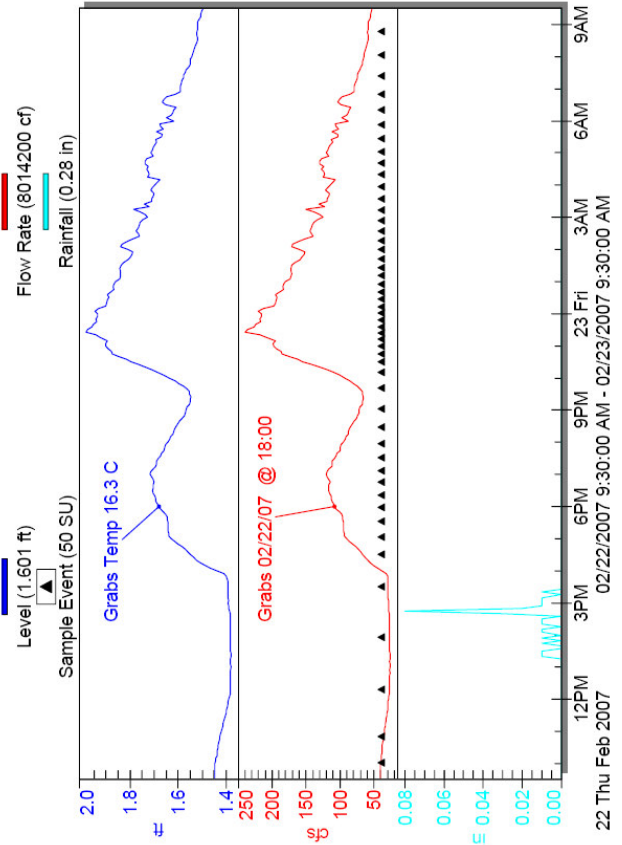
- Conduct 6 sampling events (4 wet / 2 dry weather)
- Macroinvertebrate Bioassessment Monitoring
- Completion of Trend Analysis for Pollutants of Concern
- Database







ME-CC 4230
2006/07 Event 3 (Wet)



Legend

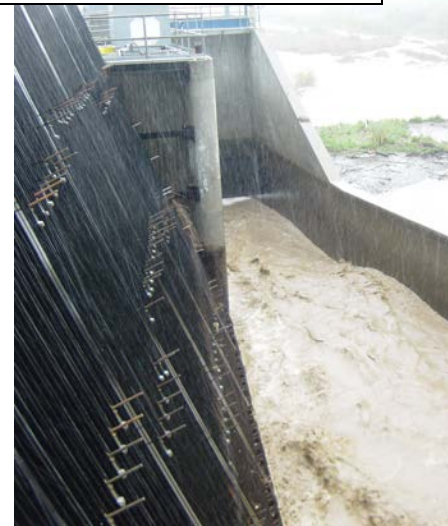
- ★ mass emission
- land use current
- Land Use Historic



Calleguas Creek (ME-CC)

Mass Emission Sites

Ventura River (ME-VR)



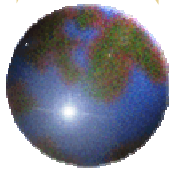
Santa Clara River (ME-SCR)



Sample Collection







Ventura Countywide Stormwater Quality Management Program



[Enter New Data](#)

[Select to enter new data into the database](#)

[Confirm New Data](#)

[Select to view, edit, and confirm newly entered data](#)

[Evaluate and Qualify New Data](#)

[Select to evaluate and qualify newly entered data](#)

[Query Data](#)

[Select to query the database](#)

[Edit Historic Data](#)

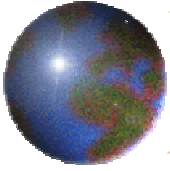
[Select to edit historic data](#)

[Exit Application](#)

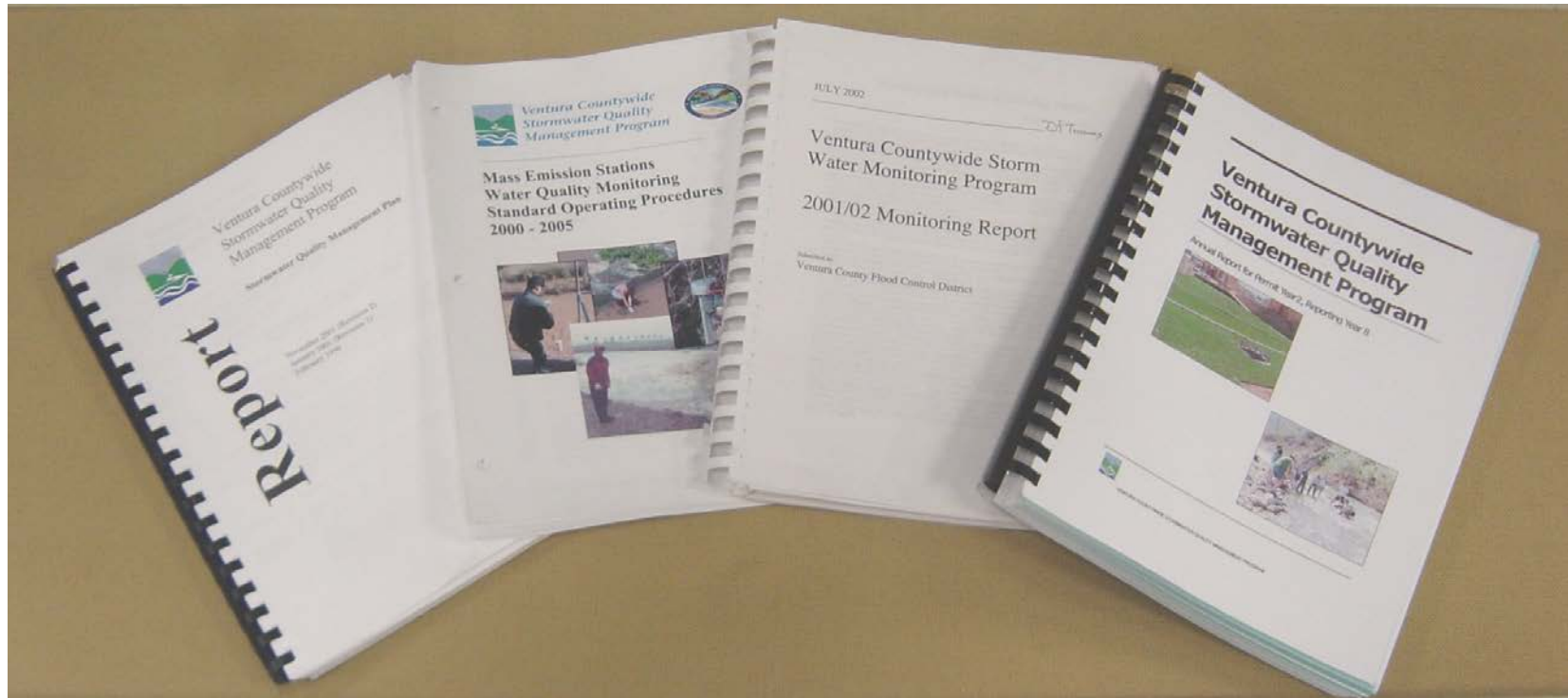
[Select to exit the database application](#)

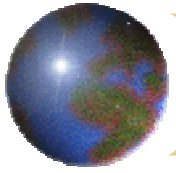
[Compact and Repair Database](#)

[Run database's compact and repair utility](#)



Program Evaluation





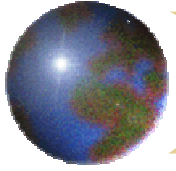
Characteristics of Ventura County Are Unique

- ✦ Significant Open Space;
- ✦ Rural Character;
- ✦ Valuable Agricultural Land;
- ✦ Total Population of the entire County is 817,346 persons (2006)

Ventura County by Land Use

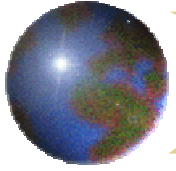


- Open Space (Including Federal Land) - 79%
- Urban Area (subject to NPDES SW permit) - **12%**
- Agriculture - 8%
- Rural - .008%
- Military - .006%
- Harbor(s) - .0003%



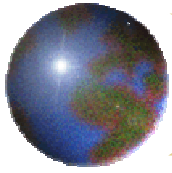
Characteristics of Ventura County Are Unique

- ✦ SOAR - From 1995-2002, the residents of Ventura County adopted "Save Open-Space and Agricultural Resources",
- ✦ Greenbelt agreements;
- ✦ Thus, the urban areas of Ventura County are unlikely to expand significantly.



Ventura County is a Leader in Watershed Based Planning

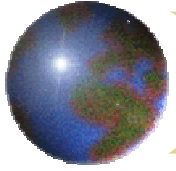
- Watershed Based Planning Since the 1970s;
- Numerous Water Quality, Wetland Restoration & Reclamation Projects;
- Numerous Individuals and Agencies Involved.



Ventura County is a Leader in Watershed Based Planning

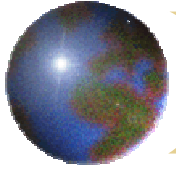
- ✦ Watersheds Coalition of Ventura County (WCVC) formed in 2006;
- ✦ WCVC adoption IRWMP;
- ✦ WCVC received \$25 million grant;
- ✦ Other Watershed Groups:
 - ✦ Calleguas Creek Watershed Management Plan Steering Committee;
 - ✦ Santa Clara River Watershed Committee and;
 - ✦ Ventura River Watershed Council.





Appreciation of Board Staff's Intent

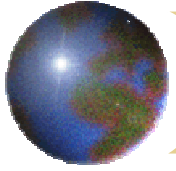
- ⊕ Importance of Water Resource Protection
- ⊕ Enhancement of Current Program
- ⊕ Performance-based Measurement Criteria
- ⊕ LID Preferred Method (Smart Growth)
- ⊕ Cost-effective Methods to Improve Water Quality



Primary Concern w/ Draft Permit

Compliance Structure

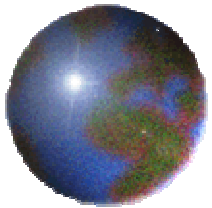
- ✚ Use of Municipal Action Levels (MALs)
- ✚ Consistency with TMDL Program



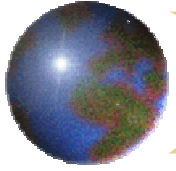
Use of Municipal Action Levels

✦ Policy Concerns

✦ Technical Concerns

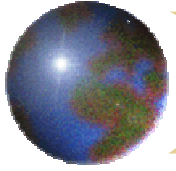


Policy Concerns w/ MALs



Municipal Stormwater Compliance Standard

- ❖ Municipal stormwater program is required to reduce pollutants in its discharges to the maximum extent practicable (MEP).
 - ❖ *Clean Water Act, Section 402(p)*
 - ❖ *Draft Permit Provision A.2*

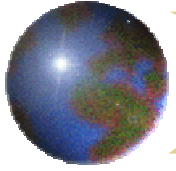


Definition of MEP

Broadly defined to be a highly flexible concept that balances numerous factors Including

- Technical feasibility*
- Cost*
- Public Acceptance*
- Regulatory Compliance*
- Effectiveness*

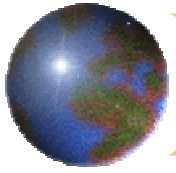
(BIA of San Diego County v. SWRCB (2004) 124 Cal.App.4th 866, 889.)



Draft Permit Uses MALs to define MEP

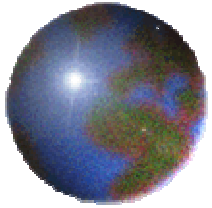
- MALs expressed as Water Concentration Levels
- MALs used to define MEP (Finding F.11 and Permit Part II)
- Stormwater must meet MALs at “end-of-pipe”
- Two exceedances presumed to be a violation of the MEP standard

MALs = Numeric Effluent Limits Used to Define MEP

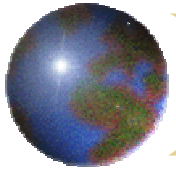


Numeric Limits Contrary to EPA Policy

"In regulating stormwater permits the EPA has repeatedly expressed a preference for doing so by way of BMPs, rather than by way of imposing technology based or water quality based numerical limitations." (Divers' v. SWRCB (2006) 145 Cal.App.4th 246, 256.)



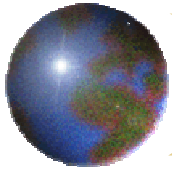
Technical Concerns w/ MALs



MALs Contrary to Blue Ribbon Panel

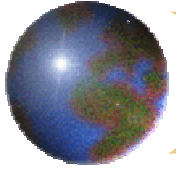
"It is not feasible at this time to set enforceable numeric effluent criteria for municipal BMPs and in particular urban discharges....."

For catchments not treated by a structural or treatment BMP, setting a numeric effluent limit is basically not possible."



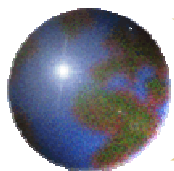
Blue Ribbon Panel Use of MALs v. Draft Permit Use of MALs

<i>Panel Use of MALs</i>	<i>Draft Permit Use of MALs</i>
Use to Identify need for follow-up action	Defines MEP
Not to be used as enforceable limit	Enforceable numeric limit
Develop using local data, if available	Developed using national database

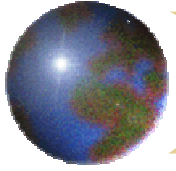


Cadmium – MAL vs. CTR Criteria vs. Runoff Concentrations

<i>Cadmium</i>	<i>Value, ug/L (dissolved)</i>
Acute Water Quality Objective (avg. hardness)	7.1
Acute Water Quality Objective (95% hardness)	3.2
Ventura County rivers and creeks (54 of 55 samples)	<2.5
Ventura Urban Runoff (average)	0.8
MAL	0.55

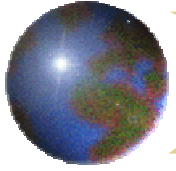


TMDL Program Consistency



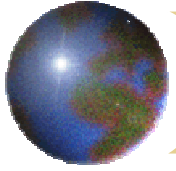
TMDL Program

- ✦ Clean Water Act program for ensuring compliance with water quality standards
- ✦ Based on sound science and stakeholder involvement
- ✦ Considers all point and nonpoint sources of impairment
- ✦ Establishes waste load allocations and load allocations
- ✦ Includes implementation program
- ✦ NPDES permits are required to be consistent with approved TMDLs



Draft Permit Inconsistent w/ TMDLs

- ❖ **MALs misdirect focus and resources of the Countywide Program**
- ❖ **MALs are inconsistent with TMDL approved Targets and Waste Load Allocations**
- ❖ **Prescriptive Permit is inconsistent with TMDL implementation program for municipal stormwater**

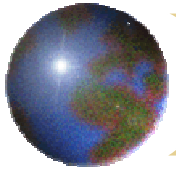


MALs vs. TMDL targets

Constituent	Municipal Action Levels ¹	TMDL Target Limits²
Copper (dissolved, ppb)	12.8	26.3-41.6
Zinc (dissolved, ppb)	104	90-324

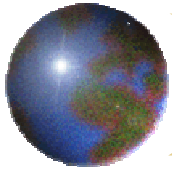
1 Attachment C to Draft Ventura Stormwater Order.

2 Attachment A to Resolution No. R4-2006-012.



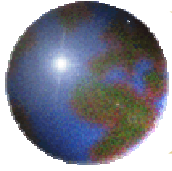
Draft Permit vs. TMDL Implementation

Prescriptive Draft Permit	TMDLs
Retrofit <u>all</u> catch basins w/ excluders	No adopted trash TMDLs Small % of water bodies listed
Prescriptive BMP measures for street sweeping, inspections, outreach, etc.	Requires achievement of targets; not method of compliance
Time Schedule – 6 months for majority of BMPs	Time schedule – 2 to 20 years for achievement of targets



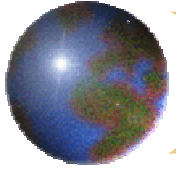
Need to Focus on Local Issues of Concern

Constituent	Draft Permit MALs	Ventura County Developed POCs	TMDL
TSS	X		
Siltation			X
COD	X		
Metals (Cu, Pb, Zn)	X	X	X
Metals (Cd, Cr)	X		
Bacteria		X	X
Mercury			X
Selenium			X
Organics (PCBs)			X
Pesticides (OC)		X	X
Pesticides (OP)		X	X
Nutrients		X	X
Toxicity			X
Salts			X



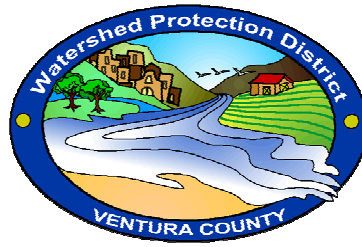
Cost Implications of Prescriptive Permit and MALs

Program	Annual Cost \$/Household			
	Current Effort	Draft Order Baseline	Baseline + Trash Excluders	Baseline + Excluders + MAL Compliance
Statewide Study				
Range	\$18-46	--	--	--
Mean	\$29	--	--	--
Ventura County				
Range	\$18-44	--	--	--
Mean	\$35	\$60	\$87	\$213



Other Issues of Concern

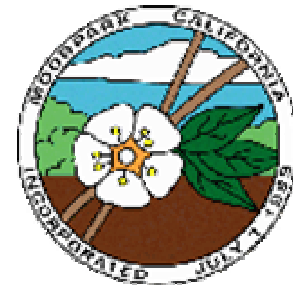
- ✦ Expands Geographic Area of Coverage
- ✦ Ecological Restoration Planning and Implementation
- ✦ Land Development Requirements
- ✦ Time Frames
- ✦ Monitoring Program

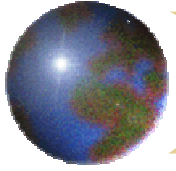


Ventura Countywide Stormwater Quality Management Program



Any Questions?

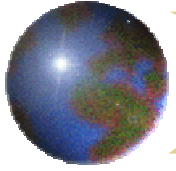




Summary of Primary Concerns

- ⊕ Municipal Action Levels as MEP
 - Inconsistent with EPA policy and Court decisions

- ⊕ Municipal Actions Levels as Compliance End Points
 - Contrary to Blue Ribbon Panel recommendations
 - Disconnect between local water quality issues



Summary of Primary Concerns

❖ Inconsistent with TMDL Program

- ❖ Focus of the program
- ❖ MALs vs. TMDL Target
- ❖ Prescriptive implementation requirements vs. flexible strategies