



**Stormwater Treatment and
Flow-Control Requirements
in
Phase I and Phase II
Municipal NPDES Permits**

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Outline

- **20-year evolution of NPDES treatment and flow-control requirements**
- **Requirements in a nutshell**
 - **Developers**
 - **Municipalities**
- **Phase I/Phase II differences**
- **Current trends in California**
- **Current issues in stormwater treatment and flow control**

Effects of New Development





1987-1994: The Early Years

- 1987** **Clean Water Act Amendments**
- 1990** **Phase I Stormwater Regulations**
- 1990** **First California Municipal Stormwater NPDES Permits**
- 1992-** **Focus on impracticability of**
1993 **“end of pipe” treatment**
- 1994** ***Start at the Source***
 “Do what you can where you can”



1994-1999: Experimentation

- *The Importance of Imperviousness*
- **Examining barriers to better site design**
- **Engineering criteria for treatment systems**
- **Specification of source control BMPs**
- *Low Impact Development*



2000-Now: Getting Serious

- | | |
|-------------|--|
| 2000 | <i>Bellflower</i> decision |
| 2001 | Santa Clara permit reissued |
| 2003 | California Phase II permit |
| 2006 | Beginning implementation of flow-control (HMP) facilities |
| 2007 | San Diego permit mandates Low Impact Development |



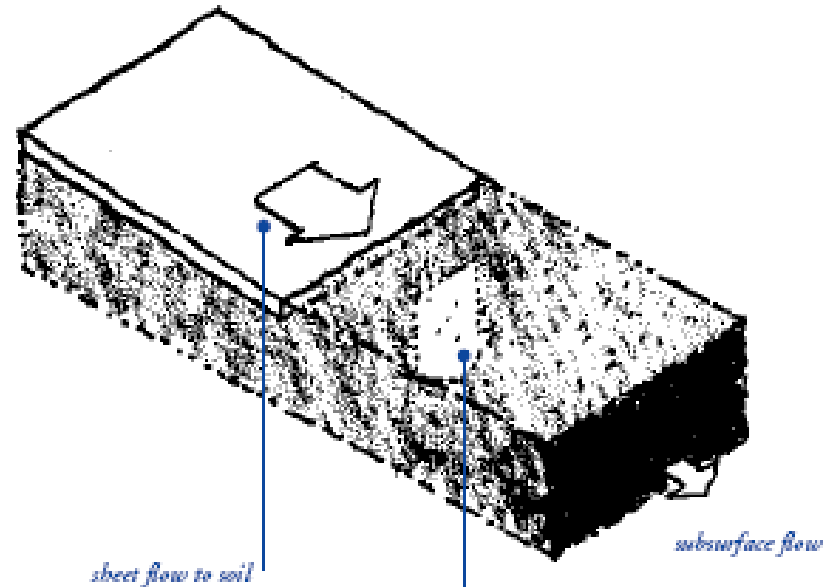
In a nutshell



Project designs must:

- **Minimize imperviousness**
- **Control potential pollutant sources**
- **Treat stormwater before discharge**
- **Match runoff peaks/durations to pre-project conditions**
- **Maintain treatment and flow-control facilities in perpetuity**

Minimize Imperviousness



*existing trees and
infiltration basins preserved*

Control Pollutant Sources

■ Material and refuse storage

- Cover
- Berm
- Drain to sanitary sewer



■ Restaurant mat wash areas

■ Vehicle wash areas

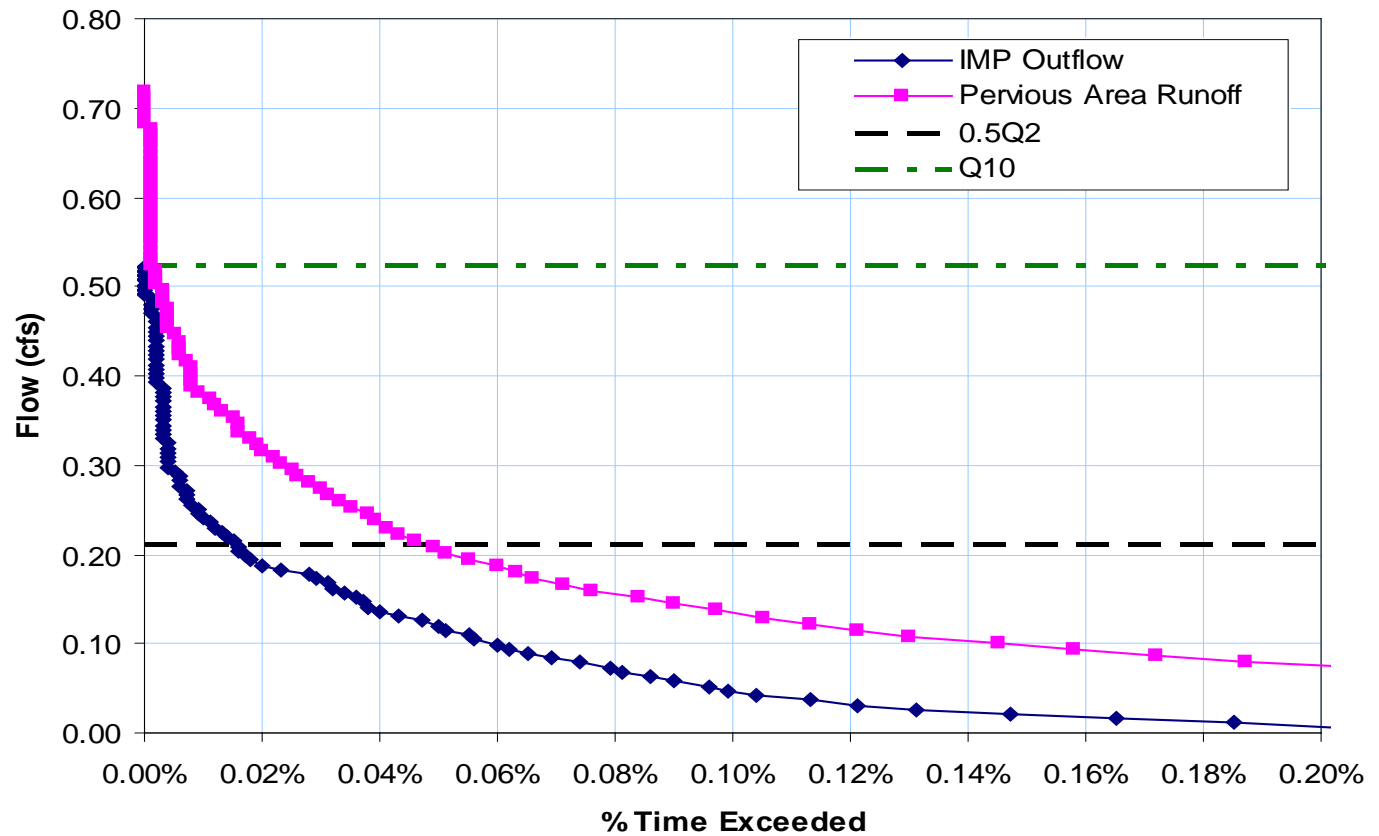
■ Spas, pools, and fountains

■ Landscaping

Treat Stormwater



Match Pre-project flows





Maintain Facilities

- **Operation & Maintenance Plan**
 - **Responsibilities**
 - **Resources**
 - **Procedures**
- **Conduct and document preventative & corrective maintenance**
- **Reports**
- **Inspections**



In a nutshell




All permitted municipalities must:

- **Incorporate requirements into development review process**
- **Review development projects for compliance**
- **Report applicable projects approved and measures required**
- **Verify on-site treatment devices are maintained**



Contra Costa's Process





Stormwater Control Plan

- **Accompanies application for planning and zoning approval**
- **Exhibit (1 sheet)**
 - **Site divided into drainage areas**
 - **Locations of stormwater facilities**
- **Report (6-10 pp.)**
 - **Opportunities and constraints**
 - **Narrative explaining drainage areas and facilities**
 - **Table of source controls**
 - **Maintenance requirements & responsibility**
 - **Table of items to check at plan review**



Stormwater C.3 Guidebook

Guidance in four formats:

- **Checklist**
- **Step-by-step instructions**
- **Example outline**
- **Example reports and exhibits**

<http://www.cccleanwater.org>



Operation & Maintenance

- 1. Determine ultimate ownership and maintenance responsibility**
- 2. Identify maintenance requirements**
- 3. Prepare a detailed Operation and Maintenance Plan**
- 4. Operate and maintain facilities during construction**
- 5. Formally transfer responsibilities**
- 6. Maintain facilities in perpetuity**

A background image showing numerous water droplets of various sizes on a vibrant green leaf. The droplets are in sharp focus, reflecting light and creating a textured, shimmering effect. The leaf's veins are visible, adding to the natural aesthetic of the slide.

Phase I and Phase II

■ Phase I—over 100,000 population

- “...develop, implement and enforce controls to reduce the discharge of pollutants... ..from areas of new development and significant redevelopment.” (40 CFR 122.26)
- In California, municipalities must apply for an NPDES permit issued by Regional Board

■ Phase II—other urbanized areas.

- “Develop and implement strategies which include a combination of structural and/or non-structural best management practices.”
- In California, municipalities apply for coverage under a single statewide permit



Phase I/II--Requirements

■ California Phase I permits

- Hydraulic criteria for treatment facilities
- Control of peak flows and volumes
- Enhanced source control measures
- Thresholds for treatment and flow-control requirements vary from region to region

■ California Phase II permit

- Hydraulic criteria for treatment facilities
- Control of peak flows
- “Design criteria” require source controls and treatment facilities for specific land uses



Regulatory Trends

- **Project size thresholds**
- **Flow control
(HMP) requirements**
- **Treatment
Facility Effectiveness**
- **Low Impact Development**
- **Extending requirements to
smaller communities**



Current issues

- **Consistent Implementation**
 - Every applicable site
 - All impervious areas
- **Selecting Treatment Facilities**
 - Targeting Pollutants
 - Treatment Effectiveness
 - Allowable loading rates for filters
 - Practicability on small or sloped sites
- **Details & Specifications**
 - Inlet, underdrain, and overflow
 - Engineered soils for filtration
- **Facility Construction Inspection**



Current issues

■ Operation and Maintenance

- Who owns and maintains treatment & flow-control facilities?
- Financing the inspection program
- Enforcing maintenance requirements
- Remediation and cost-recovery
- Reporting

■ Options

- Maintenance agreements
- Enforcement of stormwater ordinance
- Assign to homeowner or HOA
- Benefit Assessment Districts



Current issues

- **Hydrograph Modification Management and:**
 - **Flood control requirements**
 - **Flood control assessments**
 - **Stream restoration programs**