

Chapter 1. Introduction

Purpose

This *Stormwater Quality Design Manual for the Sacramento Region* (manual) outlines planning tools and requirements to reduce urban runoff pollution to the maximum extent practicable (MEP) from new development and redevelopment projects.

This manual is a collaborative effort of the Sacramento Stormwater Quality Partnership¹ and is intended to satisfy the regulatory requirements of their respective municipal stormwater permits. (See the section *Background Information* later in this chapter for more about the Partnership and permit requirements.)

Goals

The Sacramento permitting agencies have the following goals for this manual:

- Protect the quality of our local creeks and rivers.
- Consolidate all stormwater quality design requirements into one document.
- Provide a consistent set of requirements for stormwater quality management that apply in the urbanized part of Sacramento County; this is intended to facilitate better area-wide compliance with clean water laws.
- Promote the consideration of stormwater management early in the site planning and project design process; the optimal, most cost-effective approach often involves integrating stormwater controls into overall site design.
- Provide tools and criteria (including maintenance and construction considerations) for selecting and designing a range of stormwater quality control measures.
- Incorporate recommendations of the local vector control districts so that stormwater quality control facilities do not create mosquito breeding habitat.



The stormwater quality development standards are intended to protect our valuable creek and river resources for future generations.

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This Design Manual

This comprehensive manual outlines a consistent set of stormwater quality management design standards for many new and redevelopment projects in the urbanized parts of Sacramento County. It provides planning and design tools for use by planners, architects, landscape architects, engineers, and environmental professionals.

¹ The Sacramento Stormwater Quality Partnership includes the County of Sacramento and the Cities of Citrus Heights, Elk Grove, Folsom, Galt, Rancho Cordova and Sacramento. For more information, see the Glossary.

Background Information

Under the federal Clean Water Act, stormwater discharges are regulated through National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permits. In California, the State Water Board and its nine Regional Boards oversee implementation of the Clean Water Act, and the Central Valley Regional Water Quality Board (Regional Board) issues and enforces NPDES stormwater permits and the State water quality law, Porter – Cologne, within the Central Valley. Phase I NPDES permits have been issued to municipalities with a population greater than 100,000 (and certain industries and construction projects) since 1990. The Regional Board began issuing Phase II NPDES general permits to smaller municipalities in 2003. Municipal stormwater permits require municipalities to regulate and manage the quality of urban runoff throughout their jurisdictions, including runoff from new development and significant redevelopment projects.

Sacramento Areawide Stormwater Permit Requirements

The Sacramento Areawide NPDES Municipal Stormwater Permit is a Phase I permit and applies to the County of Sacramento along with the Cities of Citrus Heights, Elk Grove, Folsom, Galt, Rancho Cordova and Sacramento. Originally issued in 1990, the Sacramento stormwater permit has been reissued several times. The most recent permit (NPDES Permit No. CAS082597) was adopted in December 2002, reissued in September 2008, and reissued again in April 2015. The Central Valley Water Board replaced it with a Region-wide MS4 Permit in June 2016. The Permittees function independently on many tasks, including reviewing, processing and permitting plans for new development and redevelopment in their respective jurisdictions. However, they work together on other tasks and projects, such as the creation of this manual. This manual is an outgrowth of prior steps taken to comply with the municipal stormwater permit.

The Permittees (collectively referred to as the Sacramento Stormwater Quality Partnership, or Partnership) began conditioning development projects in Sacramento County to include stormwater quality control measures in the mid 1990's. The City and County of Sacramento published the *Guidance Manual for On-Site Stormwater Quality Control Measures* in January 2000; that document was widely referenced by all the Permittees and has since been replaced by this manual.

This manual is the second edition of the Stormwater Quality Design Manual for the Sacramento Region, replacing the May 2007 version.

In July 2003, the Permittees published their Stormwater Quality Improvement Plans, which described their comprehensive program to comply with their municipal stormwater permit and reduce pollutants in urban runoff to the maximum extent practicable. The New Development program element of the plans called for an assessment of existing development standards and amendment/adoption of new standards as needed to better address the permit. (As used here, the term “development standards” collectively refers to the policies, ordinances, codes and design standards established and enforced by each of the permitting agencies.)

In December 2003, the Partnership submitted a Development Standards Plan (DSP) to the Regional Board; the DSP assessed the existing development standards (as of 2003) and proposed actions that

would be taken to amend the standards within one year of approval of the DSP. The Regional Board officially approved the DSP on May 18, 2005 and gave the Permittees until May 18, 2006 to complete the process of amending/adopting new standards. According to the municipal stormwater permit, the Permittees had until May 18, 2007 to publish technical design guidelines to help the development community understand and implement the new standards. The required technical guidance was initially developed in the 2007 version of this manual. The 2018 version of the manual expands upon the 2007 version to address more prescriptive LID requirements, new hydromodification management requirements, and full capture trash requirements, as required in the 2016 MS4 General Permit.

The DSP affected the types of projects subject to this manual. The Sacramento municipal stormwater permit specifies different categories of new development and redevelopment projects that are subject to development standards related to stormwater quality management. Some of the categories and corresponding thresholds specified in the stormwater permit were effectively modified when the Regional Board approved the DSP in May 2005. Those changes are reflected in this manual (Table 1-2, Table 3-2 and Table 3-3).

Agency Collaboration in Developing this Manual

This manual is the result of a collaborative planning effort by a steering committee comprised of managers and staff from the following agencies:

- County of Sacramento, Department of Water Resources
- City of Rancho Cordova, Department of Public Works
- City of Sacramento, Department of Utilities
- City of Citrus Heights, General Services Department, Engineering Division
- City of Elk Grove, Department of Development Services/Public Works
- City of Folsom, Department of Public Works
- City of Galt, Department of Public Works

In addition, the local vector control districts were consulted, since several types of stormwater quality control measures could have the potential to support mosquito breeding habitat, if not properly designed, constructed and maintained. Other contributors included local sanitation districts, fire departments and districts and solid waste interests.

Using the Manual

Intended Audience

This manual is primarily intended for people involved in the design or review/approval of development projects. Table 1-1 lists the different professionals who typically should be involved at each phase of a project. It is important to involve many different design professionals early in the planning process when the initial site layout is determined. It is equally important that those involved in site planning and design work collaboratively throughout the site design process; that way,

stormwater quality features can be optimally integrated into the site and project design. Benefits of the collaborative team approach and strategies for involving everyone throughout the process are discussed more in Chapter 2, **Integrated Approach to Stormwater Management**.

The manual also contains some information related to construction and maintenance of stormwater quality facilities; therefore, it may be used by contractors, inspectors, property owners and others as shown in Table 1-1.

Finally, the manual may be used by developers, elected and appointed public agency officials, environmental regulatory agencies and interested citizens.

Projects Covered by the Manual

Table 1-2 lists the types of projects and land uses generally addressed by this manual. If a project falls into one of those categories, see Table 3-2 and Table 3-3 (in Chapter 3, **Steps to Managing Stormwater Quality**) to see if the project meets the size threshold that triggers the requirements and, if so, to see which specific requirements apply.

Development projects potentially subject to this manual include both new development as well as "significant redevelopment" projects. Significant redevelopment means land-disturbing activities on an already developed site. It includes but not limited to: expansion of a building footprint; replacement of a structure; replacement of impervious surface that is not part of routine maintenance activity; and land-disturbing activities related to structural or impervious surfaces.

For redevelopment projects subject to this manual, the applicable design standards apply only to the redeveloped area, and not to the entire site, except in cases where untreated drainage from the existing developed portion is allowed to enter/flow through the redeveloped portion. In such cases, any new required treatment control measures must be designed for the entire contributing drainage area. Redevelopment and infill project applicants should check with the local permitting agency at the start of project design to verify whether or not the manual requirements apply.

Table 1-1 Applying the Design Manual to Every Phase of Development

Project Phase	Typical Decisions/Activities	Professionals Involved
Initial site layout and planning	Building and parking footprints; site access; preservation/integration of existing natural resource features (trees and other vegetation, creek buffers, wetlands, vernal pools, open space); use of natural or existing depressions for siting certain stormwater quality features; identification of existing sewer and drainage facilities; preliminary on-site soils testing to determine which stormwater quality features will work on the site	Architects; planners; environmental consultants; geotechnical and drainage engineers; landscape architects; arborists; and permitting agency planning and engineering staff (initial consultations and pre-application meetings)
Site improvement design	Site contouring and grading; on-site drainage and connections to municipal system; other utilities (sanitary sewer, water, power); pavement selection for parking, roads and walkways	Civil and other engineers; landscape architects; permitting agency plan review staff (drainage engineers, traffic, fire, etc.)
Building design	Final building footprint; building access; roof type and materials; roof drainage/downspout system; location/type water features (e.g., ponds, waterfalls, fountains); location of landscaping around the building (and possibly selection of vegetation type/style to complement building design or provide consistency with existing vegetation to be preserved on site or in the surrounding area)	Architects; civil/structural, geotechnical and other engineers as appropriate
Landscape and irrigation design	Final selection of type of trees and other vegetation; final contouring of landscaped areas; installation of vegetation and bark/other ground cover materials; design and installation of irrigation system; construction of water features	Landscape architects; municipal arborists; wetland specialists/biologists if applicable
Construction	Installation of stormwater quality facilities; installation of erosion and sediment control measures to protect the facilities from receiving high sediment loads during construction process; final clean-out and preparation of stormwater facilities prior to permitting agency acceptance	Contractors; erosion control specialists; permitting agency inspectors
Maintenance	Building, grounds and landscape maintenance, including maintenance of vegetated stormwater quality facilities (mowing, watering schedule, application of fertilizers, herbicides and insecticides, replacing/repairing damaged vegetation and eroded areas)	Property owners and managers; maintenance and landscape contractors; permitting agency maintenance staff

Table 1-2 Types of Projects Addressed by This Manual

Priority Project Category ²	Description
Single Family Residential	In general, this category includes detached single-family homes and duplexes. Check with local permitting agency for verification.
Multi-Family Residential	In general, this category includes attached single-family homes (except duplexes), condominiums, townhomes, and apartments. Check with local permitting agency for verification.
Commercial and Light Industrial	Development on private land that is not for heavy industrial or residential uses. This category includes, but is not limited to, hospitals, laboratories and other medical facilities, educational institutions, churches, recreational facilities, parks, commercial nurseries, car wash facilities, mini-malls and other business complexes, shopping malls, hotels, office buildings, public warehouses, kennels, equipment rental facilities, and other light industrial facilities.
Automotive Repair Shops	A facility that is categorized by one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 7532-7534, or 7536-7539.
Retail Gasoline Outlets	Any facility engaged in selling motor vehicle fuels and categorized by Standard Industrial Classification (SIC) code 5541.
Restaurants	Any facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812).
Hillside Developments	Any development in an area with known erosive soil located in an area with natural slopes having a twenty-five percent or greater grade.
Parking Lots	All or portion of parking lots exposed to rainfall (uncovered impervious area) for the temporary parking or storage of motor vehicles used personally, for business, or for commerce.
Streets/Roads	Any paved surface used by automobiles, trucks, motorcycles, and other vehicles.
Heavy Industrial	Heavy industrial facilities (light industry covered under commercial category)
<p>¹ Thresholds for determining which types of stormwater quality measures apply to each project type can be found in Table 3-2 and Table 3-3 in Chapter 3, Steps to Managing Stormwater Quality.</p> <p>² Refer to applicable permitting agency's zoning definitions.</p>	

How the Manual is Organized

Chapter 1 provides an introduction.

Chapter 2 explains the benefits of integrating stormwater quality management into overall project design and describes strategies and principles for doing so.

Chapter 3 outlines a step-by-step process for fulfilling the requirements of this manual and references the other chapters for more information.

Chapter 4 and Chapter 5 provide specific siting and design criteria (as well as construction and maintenance considerations) for a range of stormwater quality control measures. Chapter 4 covers source controls; Chapter 5 covers hydromodification control measures, low impact development measures, and treatment controls.

Chapter 6 provides guidance for design of green streets for municipal projects, as well as incorporation of associated LID design elements.

The Appendices provide additional detail on a number of topics. In addition:

- Appendix C lists permitting and contact information related to discharges to the sanitary sewer; that is included since some source control measures call for discharging potentially polluted site runoff to the sanitary sewer.
- Appendix F lists sources for stormwater management information not covered by this manual (as described in the next section).

CASQA's "California BMP Handbook for Development" was referenced in the creation of this Design Manual, with many adaptations made for the Sacramento Region. In the event of conflicts between this manual and the CASQA handbook, this manual will generally take precedence. Contact your local permitting agency for clarification.

Reference materials used to develop each chapter are listed at the end of that chapter, and references used to develop the various control measure fact sheets are presented at the end of each fact sheet in Chapter 4 and Chapter 5. The two main reference documents were the *Stormwater Quality Design Manual for the Sacramento and South Placer Regions* (May 2007) and the California Stormwater Quality Association's statewide document, *California Storm Water Best Management Practice Handbook for New Development and Redevelopment* (January 2003, revised September 2004). Also referenced were the *Sacramento Stormwater Quality Partnership Hydromodification Management Plan* (July 29, 2011, revised February 14, 2013) and the *Low Impact Development Standards Development, Stormwater Quality Design Manual Update and BMP Sizing Tool Enhancement – Task 1: Develop Low Impact Development (LID) Standards for New Development and Redevelopment Projects and Associated Work Report* (June 23, 2012).

Stormwater Management Information Not in this Manual

This manual does not include:

- Drainage/flood control design standards
- Temporary erosion and sediment controls and other pollution controls used during construction activities
- On-going operational practices to control pollution at industrial and commercial facilities once they are constructed (such as making sure employees don't dump hazardous or liquid wastes in the trash).

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For information about those topics, see the references listed in Appendix F.

Obtaining the Manual and Updates

Go to www.beriverfriendly.net to download this manual (PDF format) and obtain information for ordering a hard copy.

The manual will be updated periodically to reflect new information. To determine if updated information or errata sheets are available, check www.beriverfriendly.net regularly or contact one of the local permitting agencies listed in the front of this manual.

Questions and Comments

We welcome your questions and comments and will also consider this information in making future updates and improvements.

For information related to projects in Sacramento County, contact the appropriate permitting agency listed at www.beriverfriendly.net (new development).

Send questions and comments on the design manual to: dfadl@cityofsacramento.org with “stormwater design manual” in the subject line.