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August 6, 2008

Lisa McCann, Environmental Programs Manager
Matt Thompson, Water Resource Control Engineer
California Regional Water Quality Control Board
Central Coast Region
895 Aerovista Place, Suite 101
San Luis Obispo, California 93401-7906

Via e-mail: lmcann@waterboards.ca.gov; mthompson@waterboards.ca.gov

Re: City of Salinas Design Standards

Dear Ms. McCann, and Mr. Thompson;

At the July RWQCB meeting, Board Members suggested Monterey Coastkeeper offer constructive criticism of the Salinas design standards including suggested language.

Monterey Coastkeeper is involved and concerned, but we are not engineers or technical experts on design standards. In order to be as helpful as possible, we engaged the services of an independent, third party consultant, Mr. Dan Cloak. Mr. Cloak is highly qualified, respected, and experienced. Mr. Cloak is a civil and environmental engineer and has been assisting California municipalities to comply with stormwater NPDES permit requirements since 1992. He has prepared stormwater NPDES compliance guidance manuals to be used by applicants for development approvals in Contra Costa, Marin, and San Diego counties. Mr. Cloak oversaw development of the Contra Costa Clean Water Program's Hydrograph Modification Management Plan. Importantly, Mr. Cloak's principal clients are municipalities and he offers very practical approaches to stormwater and design standard plans.

Mr. Cloak was tasked with reviewing chapter 1 of the Salinas Design Standards Plan (the chapter detailing "City of Salinas Requirements") and providing redline/strikeout text changes. As Mr. Cloak notes, "Further changes will be needed to coordinate and unify the guidance, make the guidance easier for applicants to use, and make it easier for Salinas staff to consistently and accurately review submittals for compliance."

Mr. Cloak's comments and text changes are attached, in full, unedited.

Sincerely,

Steve Shimek
Monterey Coastkeeper

WATERKEEPER® ALLIANCE
MEMBER

Item No. 8 Attachment No. 2
September 4-5, 2008 Meeting
Salinas Stormwater Development Standards

Dan Cloak Environmental Consulting

1 August 2008 (DRAFT)

Steve Shimek
Executive Director
Monterey Coastkeeper
The Otter Project
3098 Stewart Court
Marina, CA 93933

Subject: City of Salinas *Storm Water Development Standards*
25 July 2008 Revision

Dear Steve:

As you requested, I have reviewed the SWDS for compliance with the City's NPDES permit and for maximum extent practicable (MEP) implementation of stormwater controls for new developments and redevelopments. I have focused on the specification of standards in Chapter 1 while also reviewing other portions of the document where those standards are elaborated.

To briefly note my qualifications, I am a civil and environmental engineer and have been assisting California municipalities to comply with stormwater NPDES permit requirements since 1992. I have prepared stormwater NPDES compliance guidance manuals to be used by applicants for development approvals in Contra Costa, Marin, and San Diego counties. I oversaw development of the Contra Costa Clean Water Program's Hydrograph Modification Management Plan.

My comments are in two parts: (1) A brief explanation of what I believe are significant technical flaws in SWDS and (2) Specific recommended language changes to remedy those flaws.

Technical Flaws in the SWDS

Technical flaws in the SWDS include:

1. The flow-control standards do not adequately protect streams against erosion.

2. The criteria for selection of treatment and flow-control facilities do not ensure MEP implementation.

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3. The procedures and criteria for selection of structural source controls are inadequate to ensure implementation to MEP.

1. The flow-control standards do not adequately protect streams against erosion. Flow-control standards aim to mitigate future changes to watershed hydrology by requiring new developments to retain the pre-project rates and durations of flows.

Since the mid-1990s, practitioners have been aware that extended duration of low and moderately high flows cause significant erosion of streams. Basins or other facilities designed to control peak flows alone do not adequately protect streams; in some cases the drainage from these facilities can actually exacerbate downstream erosion.

Two approaches are currently used. The first approach is to require applicants to prepare a computer continuous simulation of runoff using 30 years or more of hourly rainfall data from a nearby gauge. The simulation is run for pre-project and post-project conditions. Hourly runoff is analyzed and the results compared statistically. Then a flow duration control basin and/or other facilities are designed to ensure the output from the post-project condition (with controls) matches the pre-project condition. This is the approach currently used in Santa Clara, Alameda, and San Mateo counties. NPDES permittees in those counties are continuing to develop a Bay Area Hydrology Model (BAHM) to simplify the work required for the simulations; however, there are currently concerns regarding BAHM's usability.

The second approach is to specify that runoff from developed areas must be routed to LID features and facilities so that the site's pre-development hydrology is mimicked. Contra Costa municipalities used continuous simulation to develop sizing criteria for LID facilities for "unit acre" developed areas. Applicants in that county can simply scale the facilities proportionately to the square footage of impervious area draining to them. Alternatively, Contra Costa applicants may choose to prepare their own site-specific continuous simulation. San Diego County municipalities are currently pursuing a similar approach to compliance with their NPDES permit issued in 2007.

SWDS Section 1.5.3 specifies for new development projects "one acre or greater of impervious surfaces, pre-project and proposed hydrologic calculations using approved computer-based hydrologic modeling must show that the proposed 100-year peak discharge is less than the pre-project 10-year peak discharge...." This peak-flow-based standard is technically flawed and could result in approval of development designs that do not adequately project local streams.

Elsewhere in California, such as in the Los Angeles and San Diego regions, permittees are using interim flow-control criteria. The interim criteria are intended to begin protecting streams during this period when the techniques and

technologies for implementing flow-control are still being developed. The reissued statewide Phase II municipal stormwater NPDES permit, expected in 2009, is also likely to adopt an interim approach.

In these circumstances, it is reasonable for Salinas to require the use of LID to control peak flows and durations and to establish minimum standards for the use of LID in new developments. However, it is essential that those criteria be well-crafted, conservative, and consistently applied. The SWDS does not meet that mark (see immediately below).

2. The criteria for selection of treatment and flow-control facilities do not ensure MEP implementation.

SWDS Section 1.5.5 states BMPs must manage stormwater treatment and volume to the MEP. Paragraph #3 in Section 1.5.5 references the IMPs presented in Section 3 of the SWDS and states the IMPs shall be designed to treat runoff from all site drainage areas to which the SWDS applies using the LID techniques, unless those IMPs are shown to be impracticable and alternatives are approved by the City Engineer.

SWDS Section 3 includes a variety of LID IMPs, including site design measures, pervious pavements, landscape detention, and bioretention. Some but not all of the IMP descriptions and criteria reference Section 4.4.2, which provides a method for calculating the required detention volume, based on the criteria referenced in the NPDES permit.

Together, the SWDS provides a maze of cross-references and a smorgasbord of criteria which might be used to design LID facilities, but with no criteria which apply to the project as a whole.

Nor does the SWDS include a required site design procedure which would ensure the use of LID to the MEP throughout the site. For example, Section 3.2 suggests, but does not seem to actually require, that the entire site be divided into discrete drainage management areas and the drainage from each area be accounted for and shown to be managed so as to meet MEP. However, the same section then references the Bay Area Stormwater Management Agencies Association document, "Using Site Design Techniques to Meet Development Standards for Stormwater Quality." That document, in turn, suggests various LID techniques be used to reduce the size of conventional (non-LID) treatment facilities which would still be used on the site. This would guide the user to employ a conventional approach to treatment, while obtaining some but not all of the benefits of a complete LID design. Again, here the SWDS seems to provide a wide variety of choices to the applicant without setting a clear standard for what must be achieved. Similarly, SWDS Table D-1 in Appendix D instructs the applicant to choose from a wide variety of

calculation procedures, some of which do not incorporate LID and may not meet MEP.

Examples of municipal guidance with more thorough and specific standards for using LID include Contra Costa's *Stormwater C.3 Guidebook* and San Diego's *Countywide Model SUSMP.*

3. *The procedures and criteria for selection of structural source controls are inadequate to ensure implementation to MEP.*

Structural source controls—such as requirements that outdoor trash and materials storage areas be bermed, roofed, and drained to the sanitary sewer, and that restaurants be equipped with an area for washing mats that drains to the sanitary sewer—are independent of and complementary to stormwater treatment and flow control. SWDS Section 1 provides no specific requirements for the use of structural source controls. Some controls are listed in Table 2-1, but there is no accompanying guidance that would ensure the controls are consistently applied where needed. The SWDS should include specific instructions for determining what structural source controls are required for a project. Most Phase I NPDES-permitted California municipalities have more specific standards for source controls than are provided in the SWDS.

Needed Changes to SWDS

The following changes to the standards in Section 1 represent the minimum needed to bring the SWDS up to the MEP requirement. Changes are shown in redline/strikeout. Further changes will be needed to coordinate and unify the guidance, make the guidance easier for applicants to use, and make it easier for Salinas staff to consistently and accurately review submittals for compliance.

Section 1.5, Stormwater Management

Overall, stormwater management practices for development shall rely on a "tiered" approach. The first tier shall be site design planning per Section 1.5.1 to avoid and preserve natural drainage features, minimize topography changes, maintain the same overall size of drainage areas that discharge to receiving waters. The second tier shall be site source control measures that minimize stormwater contamination and pollutant transport. The third tier shall be stormwater treatment controls using LID techniques (e.g. IMPs) consistent with the numeric criteria listed in section 1.5.3. Full implementation of all three tiers is required for development approval.

Section 1.5.3, Numeric Criteria for Stormwater Management

All applicable projects per the criteria listed in Section 1.4.1 shall be required to meet the following stated numeric requirements:

1. All new development projects shall direct runoff from 100% of the area of new impervious surfaces (equivalent to 0% Effective Impervious Area) into BMPs meeting the requirements of these standards. Exceptions may be allowed for driveways when grade breaks are located to minimize the area draining to the street. Plans for new development projects not meeting this requirement will only be approved if the applicant demonstrates, to the satisfaction of the City Engineer, that the full achievement of such is impracticable.

2. All redevelopment projects shall direct runoff from a minimum of 95% of the area of new impervious surface area (equivalent to 5% or less Effective Impervious Area) into BMPs meeting the requirements of these standards. Plans for redevelopment projects not meeting this requirement will only be approved if the applicant demonstrates, to the satisfaction of the City Engineer, that the full achievement of such is impracticable.

3. The project applicant shall prepare an exhibit showing the entire site divided into discrete drainage areas and demonstrate in submitted site stormwater control plans (SWCPs) that for each discrete drainage area ~~BMPs for runoff of impervious surfaces~~ either (1) runoff from impervious areas produced by the first 0.6 inches of rainfall is detained and infiltrated ~~from each specified drainage area~~ or (2) runoff is routed to BMPs meeting the requirements of these standards. ~~and are each~~ All BMPs must be adequately sized ~~to accommodate its shown designated drainage area~~ per the following numeric criteria:

A. All flow based BMPs shall be sized to, at minimum, the maximum flow rate of runoff from the designated specific drainage area using the 85th percentile hourly rainfall intensity multiplied by two. For the City of Salinas, this equates to a rainfall intensity of 0.22 inches per hour.

B. All volume based BMPs shall be sized, at minimum, for the volume of runoff produced from a 24 hour 85th percentile storm event. For the City of Salinas, this equates to a rainfall depth of 0.6 inches.

~~C. All SWCPs shall incorporate LID strategies and associated BMPs to the maximum extent practicable (MEP). Other treatment control BMPs may be used to treat runoff of portions of redevelopment projects where there is to be no new or replaced impervious surfaces installed.~~

4. For all new development and redevelopment projects~~,~~ that result in an increase of one acre or ~~greater~~ more of impervious surface, the project

applicant shall demonstrate post-project runoff rates and durations do not exceed pre-project runoff rates and durations where such increases could accelerate downstream erosion or harm beneficial uses. ~~s,~~ The project applicant may demonstrate compliance with this requirement by either of the following methods:

A. For each discrete drainage area, show runoff from impervious areas produced by the first 0.6 inches of rainfall is either (1) detained and infiltrated or (2) detained and allowed to infiltrate and/or seep away slowly, as occurs in a bioretention facility designed with a minimum 18 inches of soil, a design surface loading rate not exceeding 5 inches/hour, and a total volume (including surface detention, soil interstices, and subsurface storage) equal to the volume of runoff produced by the first 0.6 inches of rainfall on the drainage area tributary to the facility.

B. Create computer continuous simulation of runoff in the pre-project and post-project condition using 30 years or more of local hourly rainfall data. Analyze the resulting hourly runoff flows to show peaks and durations of runoff from the development will not increase significantly, or alternatively, show any increases of peaks and durations of flow in waterways downstream of the development will not accelerate stream erosion or harm beneficial uses. ~~pre-project and proposed project hydrologic calculations using approved computer based hydrologic modeling must show that the proposed project 100 year peak discharge is less than the pre project 10 year peak discharge unless modeling of the project within the regional drainage system demonstrates no adverse impacts of alternative mitigation measures proposed by the applicant. For instance, if the applicant can show with accepted computer modeling of 5 , 20 , and 100 year design storm events that the project would result in no adverse impact to peak flows or its tributary regional storage areas; then the proposed project conditions would be acceptable.~~

Section 1.5.5 BMP Implementation

The BMPs selected for implementation for new development and significant redevelopment projects shall:

1. Have pollutant prevention and minimize the exposure of potential pollutants to rainwater (source control BMPs) as the first consideration in stormwater design. The applicant's Storm Water Control Plan shall identify each potential source within the project and incorporate corresponding source control BMPs into the project design, including the following:

A. Interior floor drains, elevator shaft sump pumps, and parking garage floor drains will be plumbed to the sanitary sewer.

B. Landscaping shall use pest-resistant plants appropriate to site soils, slopes, climate, sun, wind, rain, land use, air movement, ecological consistency, and plant interactions so as to minimize the need for fertilizers and pesticides.

C. Pools, spas, ponds, decorative fountains, and other water features shall have a sanitary sewer cleanout located in an accessible area within 10 feet.

D. Restaurants, grocery stores, and other food service operations shall have indoors or in a covered location outdoors, a floor sink or other area for cleaning floor mates, containers, and other equipment, plumbed to the sanitary sewer.

E. Refuse areas will be covered, graded, and paved to prevent run-on and bermed to prevent runoff, and any drains within these areas will be plumbed to the sanitary sewer.

F. All industrial processes and activities are to be performed indoors, and no processes may drain to the exterior or the storm drain system.

G. Outdoor storage areas shall be covered, graded, and bermed to prevent run-on or run-off from the area. Storage of hazardous materials or hazardous wastes must be in compliance with local ordinances and the Hazardous Materials Management Plan for the site.

H. Vehicle washing shall be prohibited on-site unless an area designed for that purpose (that does not drain to the storm drain system) is provided.

I. No vehicle repair or maintenance may be done outdoors.

J. Fueling areas must be paved with Portland cement concrete or other equivalently smooth and impermeable surface and equipped with an overhanging roof or canopy that extends beyond grade breaks around the fueling area.

K. Loading docks shall be covered and/or graded to minimize run-on to and runoff from the loading area.

L. Where fire sprinklers are blown down, a means must be provided to avoid discharge of fire sprinkler test water to storm drains.

M. Boiler drain lines, condensate drain lines, rooftop mounted equipment, and drainage sumps may not discharge to storm drains.

2. Be selected based the type of developed site use, identified pollutants of concern and other pollutants expected to be on site in concentrations that may pose potential water quality concerns ~~(see BMP Design and Selection Matrices in Section 2.3)~~. A combination of appropriate source control BMPs and Low Impact Development treatment BMPs, when properly designed, are considered to address pollutants of concern.

3. Be selected for maximum effectiveness in removing pollutants and achieving other principles and objectives of Low Impact Development. Treatment BMPs shall be selected in the following order of preference. If a less-highly-preferred BMP is used, the applicant's Storm Water Control Plan must document the infeasibility of all more-highly-preferred BMPs:

A. Bioretention facilities designed with a minimum 18 inches of soil and a design surface loading rate not exceeding 5 inches/hour and fed by gravity.

B. Capture of the design flow in a vault or sump and pumping to bioretention facilities.

C. A sand or media filter with a maximum design surface loading rate of 5 inches per hour and a minimum media depth of 18 inches. The sand surface must be made accessible for periodic inspection and maintenance (for example, via a removable grating).

D. A higher-rate surface biofilter, such as a tree-pit-style unit. The grading and drainage design should minimize the area draining to each unit and maximize the number of discrete drainage areas and units.

E. A higher-rate vault-based filtration unit, such as those using cartridge filters.

~~3. Manage stormwater treatment and volume to the MEP. All areas of the site to which these SWDS apply shall be treated using the IMPs presented in Section 3: of these standards. Unless otherwise shown to be impracticable and alternatives are approved by the City Engineer, IMPs shall designed to treat runoff from all site drainage areas to which these SWDS apply using the LID techniques. The Regional Board has determined that use of LID meets the MEP criteria for stormwater management.~~

~~4. Be designed and maintained with an engineered soil mix with minimum infiltration rate of 5.0 inches per hour and be engineered to accommodate overflow during larger storm events (e.g., storm events exceeding the design criteria for flow and volume-based BMPs discussed above). Refer to Section 4.3.5 for detailed bioretention system design criteria, including engineered soil mix specifications.~~

Summary

The July 25 version of the SWDS has much to offer but contains technical flaws and lacks specificity in standards for implementing LID, selecting effective treatment BMPs, and incorporating source control BMPs to address on-site pollutant sources. The relatively modest edits proposed in this letter would bring the SWDS closer to the practicable efforts being implemented by some other California Phase I municipal NPDES permittees.

Very truly yours,
DAN CLOAK ENVIRONMENTAL CONSULTING

Dan Cloak
Principal