Dan Cloak Environmental Consulting

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Jeanine Townsend, Clerk to the Board
State Water Resources Control Board
1001 I Street, 24th Floor
Sacramento, CA 95814

Sent via email to: commentletters@waterboards.ca.gov

Subject: 2nd Draft Phase II Small MS4 General Permit
Low Impact Development (LID) Standards

Dear Members of the Board,

I worked with Dominic Roques (Region 3 staff) and with Noah Garrison of the Natural Resources Defense Council (NRDC) to develop suggested draft language for Low Impact Development Standards. Some of this language is incorporated in Provision E.12.d.2. I write in support of the proposed provision.

Background

I am a professional engineer with more than 25 years' experience, much of it related to the effects of urbanization on watersheds and implementation of stormwater requirements for new developments. I authored current guidance for Low Impact Development (LID) to implement NPDES post-construction requirements in Contra Costa, Marin, and San Diego Counties and in the City of Watsonville. I oversaw development of the Hydrograph Modification Management Plan (HMP) for Contra Costa municipalities (2006). I drafted the California Ocean Protection Council's resolution on LID (2008) and prepared guidance on CEQA and LID for the Governor's Office of Planning and Research (2009). I count state agencies, private advocacy groups, and municipal governments among my current and past clients.

My comments are my own and are provided to you in the interest of promoting rapid and effective implementation of LID in California.

Low Impact Development Standards

Provision E.12.d.2, Low Impact Development Standards, addresses (1) Source Control Requirements, (2) Site Design Measures, (3) Stormwater Treatment Measures and Baseline Hydromodification Management Measures.

Source Control Requirements

This section includes a comprehensive list of potential stormwater pollutant sources that can and should be addressed by features and facilities incorporated into the development project design. I recommend each Permittee be required to adopt specific source controls to address each of the listed sources. For example, the Contra Costa Clean Water Program's *Stormwater C.3 Guidebook* includes, as Appendix D, a table showing the appropriate source control for each of these sources. Requiring each Permittee to develop and adopt specific source controls provides the necessary flexibility to adapt to local conditions while also providing accountability.

Site Design Measures

This section lists measures that "shall be used to reduce the amount of runoff to the extent technically feasible…" The conditional language is appropriate because these measures, while very effective, are applicable to some but not all development sites. A requirement to document infeasibility of each measure would be cumbersome and ultimately ineffective, as decisions about pavement design, whether to use a green roof, etc., require project-specific application of engineering and aesthetic judgment.

Storm Water Treatment Measures and Baseline Hydromodification Management Measures

This section requires that runoff from remaining impervious areas be directed to one or more facilities designed to infiltrate, evapotranspire, and/or biotreat runoff. The section further states that "facilities must be demonstrated to be at least as effective as a bioretention system…" with stated design parameters. Runoff seeps through a matrix of sand, compost, and plant roots, and is captured in a subsurface gravel layer, where it is held until it infiltrates into underlying native soils. If runoff enters faster than it can infiltrate, the gravel layer fills, and then treated runoff discharges through an underdrain located at the top of the gravel layer.

Based on my experience designing, or reviewing the design of, such facilities on over a hundred development sites, I emphasize the following to the Board:

- Facilities with the stated design parameters can be incorporated into nearly all development sites with minor effects (if any) on site layout and uses.

- The relative cost of such facilities is small (less than 1% of construction costs).
- The design is constructable, implementable, and does not create mosquito or geotechnical hazards when properly executed.
- The facilities are effective at removing trash, heavy metals, and other pollutants that tend to associate with sediments.
- The facilities are effective at preventing spills and slug loadings from reaching storm drains.
- The facilities have relatively low maintenance costs—little more than for ordinary landscape maintenance—and are attractive amenities when properly designed and maintained.

Facilities with this design will retain some proportion of runoff on-site and will reduce flows which may cause downstream hydromodification. The amount of runoff retained and the flows reduced depends almost entirely on the infiltrative capacity of native soil. In highly infiltrative soils, this design will infiltrate the volume of runoff from the 85th percentile storm specified in Provision E.12.d.2.(ii)(3)d. This corresponds to approximately 80% of average annual runoff. Most of the remaining 20% of average annual runoff will be filtered through the matrix of sand, compost, and plant roots before being discharged. In less infiltrative soils, a smaller portion of average annual runoff will be infiltrated, and more of the runoff will be filtered and discharged. Actual infiltration performance will vary considerably from facility to facility and site to site, and cannot be precisely predicted in advance.

There is little field data documenting the proportion of runoff infiltrated vs. treated and discharged for bioretention facilities. Studies are underway; and initial results suggest that bioretention facilities infiltrate a considerably greater portion of average annual runoff than shown in previous estimates based on modeling.

This facility design would accomplish a higher degree of hydrologic control than is specified in Provision E.12.e. Further, Provision E.12.f. specifically invites the Regional Boards to augment the requirements as necessary to fully protect watersheds.

Very truly yours,

Dan Cloak, P.E.