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Applicability of Inlet Filters, Oil/Water Separators, Hydrodynamic Separators, and Media Filters

As described in Section 5.2, beginning December 1, 2011, no underground vault systems are allowed for use, except in certain types of “Special Projects,” in which media filters may be allowed. Special Projects criteria are included in Appendix J. Three types of underground systems have been shown to have particular difficulty meeting the NPDES stormwater permit standard of removing pollutants to the maximum extent practicable (MEP) These three systems – inlet filters (also called manufactured drain inserts), oil/water Separators (also called water quality inlets), and hydrodynamic separators – are described below. The Water Board staff’s August 2004 letter that describes issues associated with these treatment measures is included at the end of this Appendix. A discussion of media filters precedes the attached letter.

As described below, some of these devices can be extremely effective in removing trash and other gross solid pollutants, as well as sediment and oil. While not adequate to meet the MEP standard alone, their use may be worth considering if used as part of a treatment train.

D.1 Inlet Filters

The California Stormwater Quality Association’s (CASQA) New Development BMP Handbook describes storm drain inlet filters (which are also called manufactured drain inserts) as manufactured filters or fabric that are placed in a storm drain inlet to remove sediment and debris. In a letter dated August 5, 2004, the Water Board’s Executive Officer described its assessment of studies and literature reviews for this type of treatment measure. The letter reported that these filters are subject to clogging, have very limited ability to remove dissolved pollutants, need very frequent maintenance, and are likely to receive inadequate maintenance. The following conclusion was made regarding inlet filters:

“Based on our review of these references and experience in the Bay Area, it would be very unlikely for a proposal using inlet filters as the sole treatment measures to meet the MEP standard.”¹

Based on the Water Board staff’s statements, the municipalities do not approve proposals for the use of inlet filters as permanent, post-construction treatment measures, unless they are part of a stormwater “treatment train” approach that includes other, more effective types of stormwater treatment measures. The use of treatment trains is discussed in Section 5.1.4.

D.2 Oil/Water Separators

Oil/water separators, also called water quality inlets, are described in CASQA’s New Development BMP Handbook as consisting of one or more chambers that promote sedimentation of coarse materials and separation of free oil (as opposed to emulsified or dissolved oil). The Water Board’s August 5, 2004, letter described oil/water separators as originally developed for industrial uses and recognized as generally ineffective in removing the types of pollutants normally found in urban stormwater. The letter included the following summary statement regarding oil/water separators:

“With the exception of projects where oil and grease concentrations are expected to be very high, and other measures are included in a ‘treatment train’ approach, Board staff is unlikely to consider oil/water separators as a means of meeting the MEP standard.”

As with inlet filters, based on the Water Board staff’s statements, the municipalities do not approve proposals for the use of oil/water separators to treat stormwater, unless they are used to treat high concentrations of oil and grease and the stormwater receives further treatment for fine-particulates associated with pollutants.

D.3 Hydrodynamic Separators

The US Environmental Protection Agency (USEPA) has described hydrodynamic separators as “flow-through structures with a settling or separation unit to remove sediments”.² The energy from the flowing water allows sediments to settle, so no outside power source is needed.

The Contra Costa Clean Water Program conducted a literature review that found that hydrodynamic separators were substantially less effective than various landscape-based treatment measures for removing pollutants that are associated with very fine particles and are identified as pollutants of concern in the Contra Costa Countywide NPDES municipal stormwater permit. Contra Costa’s technical memorandum also described local experience successfully applying a variety of landscape-based treatment measures to development projects in Contra Costa County, as well as operation and maintenance concerns and mosquito generation potential associated with hydrodynamic separators. Effective December 1, 2011, the stand-alone use of hydrodynamic separators is no longer allowed to meet stormwater treatment requirements.

¹ Letter from Bruce H. Wolfe, Executive Officer of the San Francisco Bay Regional Water Quality Control Board to the Bay Area Stormwater Management Agencies Association (BASMAA), dated August 5, 2004, http://www.cleanwaterprogram.org/uploads/RWQCB_letter_re_inlet_filters_etc.pdf.

² USEPA, Hydrodynamic Separators Fact Sheet, 1999. <https://www.epa.gov/nscep>

Hydrodynamic separators can be very effective at removing trash and gross solids from runoff, and may be included as part of a treatment train in order to remove large solids before the stormwater is routed to a treatment measure that is more effective at removing fine particulates.

D.4 Media Filters

A technical description of media filters is provided in Section 6.11. Effective December 1, 2011, the stand-alone use of media filters to meet stormwater treatment requirements is no longer allowed, except for use in Special Projects, as described in Appendix J. While media filters have been demonstrated to remove suspended solids more effectively than the manufactured treatment systems described above, concerns remain about the maintenance of these systems. Media filters have more intensive maintenance requirements than low impact development treatment measures, and, since they are located underground, tend to be “out of sight, out of mind,” and often do not receive the maintenance required to function properly. When used in Special Projects, it will be important for municipal staff to conduct regular maintenance verification inspections to verify that these systems are maintained properly and operating as designed.

D.5 Water Board Staff’s Letter

A copy of the Water Board staff’s August 2004 letter is included in the following pages.