Douglas Herring & Associates
Environmental, Policy, and Planning Services

MEMORANDUM

June 13, 2005

TO: All Clients and Colleagues

FROM: Doug Herring

SUBJECT: **NPDES Municipal Stormwater Permits Provision C.3 Stormwater Requirements of the California Regional Water Quality Controls Boards**

Are You C.3 Compliant?

Introduction

In February 2003 the San Francisco Bay Regional Water Quality Control Board added Provision C.3 to the National Pollutant Discharge Elimination System (NPDES) stormwater permits issued to the municipalities under its jurisdiction. While some of Provision C.3's requirements took effect in 2004, additional requirements have been taking effect in recent months that apply to new development applications. Intended to reduce the introduction of urban pollutants into San Francisco Bay and the creeks, streams, lakes, and other water bodies in the region, Provision C.3 requires the onsite treatment of stormwater prior to its discharge into downstream receiving waters. Note that these requirements are in addition to the existing NPDES requirements for erosion and sedimentation controls during project construction.

Incorporating the C.3 requirements into the early phases of new project planning will speed the approval process (by reducing or eliminating the need for redesign of the site plan once it gets to the municipal review process), improve the integration of treatment into site landscaping, enhance the project's aesthetics, reduce the water quality impacts of the project, improve the natural absorption of urban pollutants into the environment, and reduce the amount of stormwater discharged from the site. Although the requirements will generally add to the cost of development projects, with careful design and planning, they can reduce other infrastructure and maintenance costs. If these requirements are not incorporated into the early stages of site design, a subsequent redesign of the site plan may be required in order to provide all of the required onsite water treatment, adding unnecessarily to project development costs.

1331 Linda Vista Drive • El Cerrito, California 94530
Phone: 510-237-2233 • *Fax:* 510-237-2363 • *E-mail:* doug@douglasherring.us

Who Must Comply With Provision C.3?

Any development project that would create or modify 1 acre or more of impervious surfaces and whose application is deemed complete by the city or county after February 15, 2005 must comply with Provision C.3. The requirements apply to the construction of roads, streets, and freeways, as well as private development projects. On August 15, 2006, the qualifying threshold will drop to 10,000 square feet of impervious surfaces.

Projects that entail construction on a previously developed site may also be subject to Provision C.3. If the proposed project entails redevelopment of a previously developed site and involves replacement of 50 percent or more of the existing impervious surfaces or an increase in impervious surfaces of 50 percent or more, the entire project is subject to the C.3 requirements, unless stormwater runoff from the site was previously subject to onsite treatment measures. If less than 50 percent of previously existing impervious surfaces would be developed, only that portion of the site would be subject to Provision C.3. Pavement resurfacing, roof replacement, and similar maintenance activities are exempt from these requirements.

What Is the Purpose of Provision C.3?

Urban/suburban developments introduce a variety of pollutants that contribute to surface water pollution. Even building rooftops are a source of pollutants, because mercury and polychlorinated biphenyls (PCBs) are airborne pollutants that get deposited on roofs and other impervious surfaces. While the incremental pollutant load from a single site may not be significant, the additive, regional effects of pollutants from all development have a significant adverse effect on water quality and the innumerable organisms that depend on the region's surface water bodies. Even low concentrations of heavy metals such as mercury bioaccumulate in fish, resulting in levels that adversely affect the health of sea animals and humans that eat them. Testing in the San Francisco Bay Area has shown elevated levels of mercury and PCBs in the sediment of urban storm drains throughout the region. Provision C.3 is intended to reduce the amount of pollutants carried in stormwater discharge from new and redeveloped project sites, thereby reducing the cumulative effect of heavy metals and other contaminants on regional surface waters.

What Does Compliance With Provision C.3 Entail?

Projects subject to Provision C.3 must include the capture and onsite treatment of all stormwater from the site prior to its discharge, including rainwater falling on building rooftops. Project applicants are required to implement appropriate source control and site design measures and to design and implement stormwater treatment measures in order to reduce the discharge of stormwater pollutants to the *maximum extent practicable*. While the Clean Water Act, the enabling legislation for the NPDES municipal stormwater permits, does not define "maximum extent practicable," the Stormwater Quality Management Plans required as a condition of the municipal NPDES permits identify control measures (known as Best Management Practices, or BMPs) and, where applicable, performance standards, to establish the level of effort required to satisfy the maximum extent practicable criterion. It is ultimately up to the professional judgment of the reviewing municipal staff in the individual jurisdictions to determine whether a project's proposed stormwater controls will satisfy the maximum extent practicable criterion. However, there are numeric criteria used to ensure that treatment BMPs have been adequately sized to accommodate and treat a site's stormwater.

A key requirement of Provision C.3 in Contra Costa County is the obligation for project applicants to prepare a Stormwater Control Plan (SWCP) that must be submitted with their development application. Although a formal SWCP may not be required by every jurisdiction

(e.g., Alameda County), a similar demonstration of compliance with Provision C.3 is required throughout the Bay Area. The following brief description of the SWCP identifies the approach that will be required to comply with Provision C.3 whether a formal plan is required in a particular jurisdiction or not. The SWCP is separate and distinct from the Stormwater Pollution Prevention Plan (SWPPP) required to obtain an NPDES General Construction Activity Stormwater Permit. The SWCP (or whatever steps for compliance with Provision C.3 are required locally) should be developed in tandem with and be closely integrated with the project site plan and landscape plan. The SWCP must include the following:

Constraints and Opportunities. The SWCP must identify constraints to incorporating BMPs into the project, such as site topography, soils, vegetation, water features, depth to groundwater, existing drainage, proposed and/or adjacent land uses, etc. Similarly, opportunities might be provided by some of the same types of parameters, and must be described. (For example, while a steep slope may act as an impediment to the use of certain BMPs, a difference in elevation (i.e., hydraulic head) can provide an opportunity for onsite water treatment.)

Proposed Treatment BMPs. The appropriate stormwater treatment BMPs will be governed by the constraints and opportunities, and will be highly site- and project-specific. While BMPs utilizing infiltration to groundwater for treatment are generally cost-effective measures, they can't be used on many sites. Preliminary designs demonstrating the effectiveness of the proposed BMPs must be included in the SWCP. More information on treatment BMPs is provided below.

Proposed Source Control BMPs. Source control BMPs may reduce the presence of pollutant sources or reduce the exposure of rainwater to these sources, thereby reducing the incremental water quality impacts of a project. The SWCP must identify the potential sources of pollution on the project site and list the permanent and operational source control BMPs that will prevent pollutants from entering the site's stormwater runoff.

Stormwater BMP Operation and Maintenance. The SWCP must identify general maintenance requirements for the BMPs that are proposed. Prior to issuance of occupancy permits, the local permitting agency will require the applicant to prepare a more detailed Stormwater BMP Operation and Maintenance (O&M) Plan. Project applicants are required to maintain the proposed stormwater BMPs in perpetuity. The SWCP must specify how this maintenance will be financed. Examples of mechanisms for this might include landscape and lighting districts, homeowners' associations, execution of a maintenance agreement that is transferable with the property title, dedication of the BMP and easement to the municipality, etc. Most jurisdictions will require annual certificates of compliance with the O&M Plan.

The preceding list of SWCP requirements is merely conceptual. The specific list of requirements is more detailed and specific, and may vary by jurisdiction, but will include a combination of narrative descriptions and drawings/plans illustrating the opportunities, constraints, and proposed BMPs.

Concepts to Guide Stormwater Management

Similar to the approach with solid waste management, the preferred approach to stormwater management is to first reduce the amount of stormwater runoff generated from a site by minimizing the amount of impervious surfaces included in a proposed project. By reducing impervious surfaces, the amount of area requiring treatment BMPs will be reduced, along with

their associated installation and maintenance costs. Provision C.3 requires project applicants to reduce the pollutant load in stormwater runoff to the maximum extent practicable, which will be facilitated by reducing the amount of impervious surfaces on project site.

The RWQCB also encourages project applicants to reduce the amount of interconnectivity between impervious surfaces, contrary to traditional site engineering practice. Reduced interconnectivity allows for smaller, localized treatment measures, a reduced need to maintain hydraulic flow across the site (especially important on flat sites), and fewer impacts such as erosion and sedimentation associated with higher discharge rates.

Projects should also reduce the potential for pollutant sources to come into contact with rain water. One way to do this is by covering potential sources, such as trash areas, loading docks, fuel stations, vehicle and/or equipment wash areas, material or equipment storage, outdoor processing areas, etc.

A fourth concept—that of reducing the volume of stormwater discharge from a site—will become more critical in the future as an additional requirement of Provision C.3 takes effect.

Types and Examples of Stormwater BMPs

Stormwater Best Management Practices are devices or design features that minimize the amount of pollutants discharged into storm drains or downstream receiving waters. The BMPs needed for onsite stormwater treatment differ from the construction BMPs that are required as a condition of NPDES general construction permits. The stormwater BMPs are generally classified as either source control BMPs or treatment BMPs. They can be structural devices and site features, or operational practices, such as dumping wash water into a sanitary sewer rather than a storm sewer. Structural BMPs may be flow-based controls, which treat runoff through continuous filtration, or volume-based controls, which treat stormwater through infiltration or settlement.

Following is a brief description, with examples, of source control and treatment BMPs:

> Source Control BMPs. Source control BMPs prevent or limit exposure of rainwater to sources of pollution, such as loading docks and other examples provided above. All operational BMPs act as source control BMPs, but structural BMPs can also provide this function. Examples of source control BMPs include berms around dumpster areas; marking storm inlets with "Drains to Bay" warnings; using Integrated Pest Management controls instead of pesticides; plumbing parking garage floor drains to the sanitary sewer; preserving existing vegetation and trees; providing roof overhangs on loading docks; discharging wash water to the sanitary sewer; etc.
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> Treatment BMPs. As the name implies, treatment BMPs remove pollutants that have already become suspended or dissolved in stormwater. Because many pollutants attach to soil particles more readily than water molecules, natural filtration through vegetation and soil is a highly effective way to naturally treat stormwater. While numerous manufactured devices are available for the treatment of stormwater, they are better at capturing trash and heavy sediment than the fine sediments to which pollutants tend to adhere. For this reason, stormwater BMPs increasingly rely on natural site features and landscaping to achieve reduction of pollutants to the *maximum extent practicable*.
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> While infiltration to groundwater is often the most cost-effective treatment BMP, it is frequently impractical in the Bay Area due to low permeability soils and/or insufficient depth to groundwater. Examples of infiltration devices include infiltration basins, infiltration trenches, unlined retention basins, and below-grade, open-bottomed vaults.

On sites where infiltration is not feasible due to soil types, depth to groundwater, steep slopes, and/or geotechnical instability, detention and treatment devices can be employed. Examples include grassy swales and bioretention areas. Landscape planters and planter boxes are also a popular and effective way to provide onsite stormwater treatment. Another option is a green roof, which can be covered with low-profile grass or can support a more varied high-profile garden. The Gap Headquarters in San Bruno, California uses an extensive green roof system with great success. In addition to treating rainwater, a green roof can reduce runoff, provide sound and thermal insulation, and reduce the reflected heat that raises summertime temperatures in urban environments.

To calculate the volume of water from a project site that must be treated to the maximum extent practicable, Provision C.3 requires the use of one of two hydrological methods, depending on the type of proposed treatment BMPs. For flow-based controls, the facilities must accommodate either: (1) 10 percent of the peak flow from the 50-year storm; (2) the runoff produced by a storm equal to at least two times the 85th percentile of hourly rainfall intensity for the applicable area (based on historical records of hourly rainfall depths); or (3) the flow of runoff equivalent to rainfall intensity of at least 0.2 inches per hour. For volume-based controls, they must be designed to treat stormwater runoff equivalent to either: (1) the maximized stormwater volume for the area (based on historical rainfall records), determined using the formula and volume capture coefficients set forth in Urban Runoff Quality Management, WEF Manual of Practice No. 23/ ASCE Manual of Practice No. 87, (1998), pages 175-178 (e.g., approximately the 85th percentile 24-hour storm runoff event); or (2) the volume of annual runoff required to achieve 80 percent or more capture of total rainfall, determined in accordance with the methodology set forth in Appendix D of the California Stormwater Best Management Practices Handbook (1993), using local rainfall data.

What's Next?

Provision C.3 also requires projects whose storm runoff may cause increased erosion of creek beds and banks, surface water siltation, or other impacts on downstream receiving waters to restrict runoff flow and volume from the site to pre-project levels. This requirement is being implemented at the local level (i.e., by the Municipal Stormwater Permit holders, such as the counties), and requires preparation and implementation of a Hydrograph Modification Management Plan (HMP). Many permitees, including Alameda and Contra Costa counties, do not yet have HMPs approved by the RWQCB. Once they do, new projects may also be subject to this requirement of Provision C.3.

Conclusion

Provision C.3 imposes significant additional requirements on new development and redevelopment projects that collectively will result in environmental improvements benefiting us all. Project applicants will serve themselves and their projects best if they begin incorporating the required stormwater controls into the earliest stages of site and project design.