California Regional Water Quality Control Board

Los Angeles Region

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July 31, 2002

VIA HAND DELIVERY

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Dear Mr. Mayer:

PETITIONS OF WESTERN STATES PETROLEUM ASSOCIATION (AMENDMENT REVISING PROVISION C.3 OF WASTE DISCHARGE REQUIREMENTS ORDER NO. 01-024 FOR SANTA CLARA VALLEY URBAN RUNOFF POLLUTION PREVENTION PROGRAM), SAN FRANCISCO BAY REGION AND WESTERN STATES PETROLEUM ASSOCIATION (WASTE DISCHARGE REQUIREMENTS ORDER NO. 01-182 FOR MUNICIPAL STORM WATER AND URBAN RUNOFF DISCHARGES [NPDES NO. CAS004001] WITHIN LOS ANGELES COUNTY, EXCEPT FOR LONG BEACH), LOS ANGELES REGION**:** RESPONSE TO ISSUES RAISED AT JULY 2, 2002 WORKSHOP
SWRCB/OCC FILES A-1430(b), A-1448(f)

The California Regional Water Quality Control Board, Los Angeles Region (LA Regional Board) appreciates the opportunity to submit additional arguments and materials related to the regulation of storm water discharges from retail gasoline outlets (RGOs). While the LA Regional Board believes that the administrative record for Order No. 01-182 amply justifies extending standard urban storm water mitigation plans (SUSMPs) to RGOs meeting specified criteria, the State Water Resources Control Board (State Board) requested additional argument on five points raised during the July 2, 2002 RGO workshop and identified in your July 11, 2002 letter.

Below the LA Regional Board has addressed each point in the order presented by your July 11 letter. The supplemental argument underscores the need for RGO regulation under Los Angeles County's municipal separate storm sewer system (MS4) program. While some data may support state-wide regulation of RGO storm water dischargers, the LA Regional Board believes that the concentration of RGOs in highly urbanized areas requires additional measures like SUSMPs to address the impacts of RGO storm water dischargers. Simply put, the LA Regional Board may support a general permit for RGOs, but believes it is essential to allow Regional Boards the flexibility to develop more restrictive local regulation of RGOs under the MS4 program if the

need warrants. The record supporting Order No. 01-182 demonstrates the need, and the RGO component of the order should be upheld.

INTRODUCTION

On December 13, 2001, the LA Regional Board adopted Order No. 01-182 (LA County MS4 Permit) which serves as the MS4 permit for Los Angeles County and the cities within, except for the City of Long Beach. The LA County MS4 Permit includes new development requirements for RGOs that establish thresholds for the applicability of SUSMPs. SUSMPs are applicable primarily to various land uses within Los Angeles County, and SUSMPs are numeric mitigation criteria for treatment-control best management practices (BMPs). The extension of these requirements to RGOs recognizes that RGOs contribute significant pollutant loads to storm water runoff in the Los Angeles region.

The Western States Petroleum Association (WSPA) (Petitioner) filed a petition challenging these requirements in the LA County MS4 Permit. The State Board consolidated its consideration of the LA RGO Petition with a similar challenge by WSPA to new development requirements adopted by the California Regional Water Quality Control Board, San Francisco Bay Region (SF Bay Regional Board) for the Santa Clara Valley Water District.

The LA Regional Board submitted its response to the LA RGO Petition to the State Board on April 24, 2002. The State Board conducted a workshop on July 2, 2002, to receive comments on competing regulatory approaches for controlling storm water pollution from RGOs. Following the workshop, the State Board issued a notice extending the comment period to July 31, 2002, and invited comment focused on particular issues of concern.

Prior to preparing these supplemental comments LA Regional Board staff contacted three peer water quality agencies from other states, each with more than a decade of experience in regulating storm water discharges from new development and redevelopment. The out-of-state agencies we contacted to elucidate significant policy considerations and regulatory approaches, are the Washington Department of Ecology, the Maryland Department of the Environment, and the Connecticut Department of Environmental Protection. Their e-mail responses to our queries are being provided to the State Board for its consideration in this matter.[1] The LA Regional Board contends that the existing record adequately supports the LA County MS4 Permit's approach to RGO regulation; however, the e-mails, along with other materials accompanying this submittal, are provided in direct response to your July 11, 2002 letter. The materials bear on the broader policy concerns raised during the State Board's workshop.

[1] Post RGO Workshop Supplemental Documents, Items 1, 2, and 3.

DISCUSSION

- Studies That Assess the Effectiveness Of the 1997 Storm Water Quality Task Force Best Management Practices (Task Force BMPs). The State Board wants to learn more about any existing studies or other empirical data that demonstrate whether or not the Task Force BMPs are effective. You must clarify how widespread the Task Force BMPs are and whether the sites that were studied had implemented the Task Force BMPs.

As stated in our letter to the State Board dated June 27, 2002, the LA Regional Board relied on several studies and the record before it to extend the requirement for treatment/infiltration design standards to new and redeveloped RGOs. LA Regional Board staff prepared a technical document which concluded that the 1997 Storm Water Quality Task Force BMPs (Task Force BMPs) were deficient based on a comprehensive review of existing studies and empirical evidence.[2] While the LA Regional Board is not aware of any carefully controlled study that evaluated storm water quality discharges at RGOs with full Task Force BMP implementation, the anecdotal evidence that the Task Force BMPs are ineffective is powerful and compelling. This conclusion can be drawn from the widespread use of the Task Force BMPs and the continuing listing of RGOs as critical sources by the permittees.[3]

The Use of Task Force BMPs in the LA Region is Widespread

The prior LA County MS4 permit required the use of the Task Force BMPs at RGOs in the Los Angeles Region and the implementation of Task Force BMPs should be widespread. During the second permit term, the LA County MS4 permit included a provision that municipal permittees conduct two educational site visits at RGOs between 1996 and 2001 to instruct operators to implement Task Force BMPs that are operational in nature and not design-related such as site grading [See Table 1 comparison of LA County RGO Minimum BMPs with Task Force RGO BMP Guide].

Further, the Task Force RGO BMPs mirror post-construction BMPs recommended for RGOs by the 1993 California Storm Water Quality Task Force in its Storm Water BMP Handbooks [See Table 2 comparison of Task Force Handbook BMPs with Task Force RGO BMPs]. The California Task Force BMP Handbooks are standard reference materials for storm water quality practitioners and experts in the State.[4] In essence, implementation of the Task Force BMPs and

[2] See Administrative Record Index LA MS4 Item 328 at G1 for our review of the Task Force BMPs.
[3] This submittal will not reiterate the substantial evidence identified in the April 24, 2002, petition response, or in the RGO Technical Documents prepared by Regional Board staff. The record is clear that despite current efforts, RGOs contribute significant storm water pollutant loading and contribute to impairment conditions.
[4] The California Storm Water Task Force BMP Handbooks are presently being updated and are expected to be released in early 2003. The revision provides the State Board with an opportunity to recommend treatment-control BMPs for implementation at RGOs. RGOs are recognized pollutant "hot spots" nationally.

their predecessor BMPs[5] provide nearly eight years of data to gauge the effectiveness of the post-construction BMPs. As set forth below and in prior submittals, the data indicate that RGOs are a continuing "hot spot" for polluted storm water discharges. The hot spot designation exists despite the Task Force BMPs, and the data causally demonstrate the ineffectiveness of the Task Force BMPs.

Existing Studies and Empirical Data Demonstrate That the Task Force BMPs Are Ineffective

At RGOs, sources of potential storm water pollution include, (i) fuel dispensing areas, (ii) waste generation areas, (iii) vehicle traffic areas, and (iv) vehicle repair areas. The Task Force BMPs are source-control practices, which primarily address spill clean up at fuel dispensing areas, and site planning practices to minimize run-on on to waste generation areas. Surprisingly, no BMPs are recommended in the Task Force RGO BMP Guide for pollution generated from vehicle traffic areas and vehicle repair areas [See Table 1, which summarizes BMPs implemented and studies that evaluated the effectiveness of these BMPs]. As demonstrated elsewhere vehicle traffic on impervious surface is significant source of storm water pollutants—regardless of the land use.[6] Yet Petitioner contends that no controls other than the Task Force source-control BMPs are needed.

The County of Sacramento evaluated the effectiveness of source-control BMPs at RGOs prior to the development of the Task Force BMP Guide. Selected BMPs were implemented at six RGOs in 1993. The Sacramento County RGO Study[7] concluded:

> Based on the observations by project personnel and best professional judgment about the efficacy of source controls, it is highly likely that of the six BMPs implemented at the gas stations... The combined effect of the other five source controls [Litter Control, Public Notices, Storm Drain Stenciling, Spill Cleanup Materials, and Employee Training] was not likely to have a significant impact on the sources of pollution at the stations, namely, high volume vehicle traffic and leaks and spills of vehicle fluids.
> * * *
> Monitoring results for the pre- and post-BMP study showed that constituent concentrations in runoff from the fueling stations are similar to those found in

[5] The LA Regional Board is not aware of any argument by WSPA that its members and other RGOs are failing to implement the Task Force BMPs or their predecessor BMPs as required by municipal ordinances and the MS4 program.
[6] See, e.g., San Francisco Bay Regional Board's July 31, 2002, supplemental submission.
[7] See, Action Plan Demonstration Project – Demonstration of Gasoline Fueling Station Best Management Practices – Final Report-Uribe & Associates, Larry Walker Associates, October 1994, pp. iv-v, 49, 61 [Supporting Documents Administrative Record Index LA MS4, Item 33.]

> storm water monitoring data on streets, parking lots, driveways, oil/grit separators, and other areas that have significant exposure to vehicle traffic." [and]
> * * *
> It is clear from this study and others that it is not just gas station runoff, but runoff from any area where vehicles travel, park, or are serviced that is of concern [Emphases added].

In effect the conclusion of the Sacramento County RGO Study is further validated by a recent study, completed by the City of Long Beach,[8] which evaluated storm water pollution from motor-vehicle parking lots with average daily traffic (ADT) of less than 100 [100 ADT being the RGO threshold trigger together with 5,000 square feet of impervious surface area]. The study found that,

> Significant accumulation of mean constituent concentrations were observed after 28 antecedent dry days…[and] One hundred percent of simulated runoff samples [from the parking lots] were toxic….

Further support for the case for implementation of treatment-control BMPs at RGOs comes from the fact that the Task Force RGO BMPs do not address storm water pollutants generated as a result of vehicle repair activities (a common auxiliary service provided at many RGOs). From 1999 to 2000 LA County conducted a BMP Effectiveness Study of six automotive service facilities, which did not provide refueling services but conducted vehicle repair.[9] Facility operators were asked to implement a selection of source-control BMPs. The LA County Automotive Service BMP Study concluded that,

> "[while e]ach business owner agreed to be responsible for installing and using the [preventive-type] BMPs…[Comparing] the results of those companies fitted with BMPs to those without. [t]he …auto repair businesses showed no significant differences." [Emphasis added]

The State Board should note that as early as 1993, source-control BMPs in California, more extensive than the Task Force RGO BMPs, were considered promising at service station/ automotive service areas. The author went on to comment that,

> [I]t is hard to quantify the degree of pollutant reduction that can be achieved through the pollution prevention approach. A possible test would be to monitor priority pollutant concentrations in the sediments and pool water of oil/grit

[8] Supporting Documents Administrative Index LA MS4 Item 50.
[9] Los Angeles County 1994-2000 Integrated Receiving Water Impacts Report (2001) at p.4-13

> separators serving gas stations that practice pollution prevention and compare the results with those do not.[10]

Petitioner has not documented the effectiveness of the Task Force RGO BMPs, which they contend are all that is needed at RGOs. In the face of tremendous evidence that high traffic areas and RGOs contribute significant, storm water pollutant loads, the Petitioner has not come forward with any studies to undermine the causal connection in the data. Petitioner's suggestion that the State Board and Regional Boards now partner with it to conduct a study appear to be no more than a tactic to delay timely implementation of treatment-control BMPs at RGOs.

Notably, Petitioner members in the State of Washington already provide treatment for storm water runoff from areas surrounding the vehicle refueling areas and have done so for more than a decade.

> We recommend conveying the contaminated storm water to treatment such as an oil-water separators or other appropriate treatments such as a sand filter or emerging technologies from convenience store parking and other paved areas around the fuel-island.[11]

WSPA RGO members in the State of Washington do so because Washington has concluded that source-control BMPs alone are not enough to eliminate pollutants generated from vehicle traffic and vehicle fluid drips that eventually contaminate storm water with serious consequences to the aquatic environment.

Another reason that source-control BMPs alone are not adequate is that they rely on consistent worker diligence and vigilance with no margin for error. In contrast, treatment-control BMPs can serve as the back-stop line of defense to prevent the discharge of storm water pollutants from RGOs, thereby recognizing the fallibility of human behavior in implementing source-control BMPs.[12] In fact, source-control BMPs may be cost effective for RGO operators only because the cost of storm water contamination is externalized and borne by the public.[13]

- RGO Treatment Requirements in the District of Columbia. At the workshop, it was stated that the District of Columbia has required the installation of treatment devices

[10] See, Practical Pollution Prevention Practices Outlined for West Coast Service Stations, *Watershed Protection Techniques* 1: 14-15 (1993).
[11] E-mail from Mr. Ciuba, Washington Department of Ecology, to Dr. Swamikannu (July 18, 2002).
[12] S. Hoehn, *Cost Comparison of Storm Water Filters & Remediation Techniques*, In, Investigating the Environment, Senior Seminar, University of California at Berkeley, J. Latto, R. Deumling, and J. Remais, Editors (2001). The author postulates it is more cost effective to treat storm water at RGOs than to rely on worker conduct because humans err at great cost to the environment.
[13] *Ibid*.

since 1988, and that approximately 400 RGOs[14] had installed sand filters since that date. The State Board would like to receive analyses of these efforts and actions.

- RGO Treatment Requirements in Other States. Some attendees mentioned the regulatory approaches of Texas, New York, Western Washington, Oregon, Virginia, and Georgia. The State Board would like to receive information concerning the specific requirements of these states, any information on the effectiveness of these requirements, and comments on whether the hydrology of California allows for a similar approach.

Storm Water Runoff Treatment Requirements Have Been Implemented in Other Areas for more Than a Decade

Several jurisdictions across the U.S. have required the implementation of post-construction storm water runoff treatment controls at new development and redevelopment projects, including gas stations, since the late 1980s and early 1990s.[15] Recent data show that over 400 treatment devices, including sand filters are installed in Washington D.C. area.[16] At least 20 devices have been installed at gas stations and there have been no reported problems of explosions or groundwater contamination.[17] The City of Alexandria, Virginia, reports that approximately 500 BMPs have been installed within the City, most of these being either intermittent sand filters or bioretention filters.[18] A survey done by the University of Texas at Austin identified more than one thousand (1,000) sand filters operational in the Austin area designed to treat storm water runoff.[19] Other States which have imposed post-construction storm water runoff treatment requirements for more than a decade include Delaware, Florida, Colorado, and Washington. More recently, New York and Georgia and several other States have imposed post construction treatment criteria on RGOs as well.

The LA Regional Board is not aware of any study that assesses the impact of these other states' transition to treatment-control BMPs over source-control BMPs. Nonetheless, the effectiveness of these other approaches is discussed in greater detail below in the final section concerning the effectiveness of the underlying BMPs. Much of the data on the effectiveness of various treatment-control BMPs are derived from studies conducted in states with existing treatment-control BMP requirements. The LA Regional Board believes the data support a conclusion that these other states' approaches have been effective.

[14] For purposes of clarification, the LA Regional Board believes that the 400 RGOs refers to the metropolitan area of Washington, D.C., and not just the RGOs within the municipal boundaries.
[15] See Tables 3 and 4, which summarize nationally, Treatment-control BMP Effectiveness, and Threshold Criteria for the inclusion of RGOs.
[16] See Additional Supporting Documents, Item 5.
[17] See Additional Supporting Documents, Item 4.
[18] See Additional Supporting Documents, Item 6.
[19] See Texas Water Resources Volume 23 Number 2: Fall 1997

Regulatory Approaches and Overview of Specific Requirements of Peer States

Storm water runoff water quality from RGOs is similar to that which is discharged from parking lots, streets, highways and other areas that have significant exposure to vehicle traffic.[20] One of the pollutants of concern in storm water runoff from high traffic vehicular areas is Polycyclic Aromatic Hydrocarbons (PAHs) group. The U.S. EPA has identified several PAHs as "priority pollutants" on the basis of their known or potential ability to cause cancer, mutations, or other genetic damage. Studies performed show that these compounds are present in sediment from gas stations in levels higher than from streets or parking lots.[21] More recent studies confirmed the fact that gas stations have a significant contribution of PAHs in urban storm water runoff, higher than the parking lots and highway ramps.[22] Due to their contribution of pollutants, such as PAHs and toxic heavy metals[23], in storm water runoff, RGOs are designated as "hot-spots" or "high-risk" pollutant land uses by many jurisdictions in Florida, Virginia, New York, Washington State, Oregon, and Georgia. Due to their designation as "hot-spots", additional treatment controls must be implemented at RGOs in addition to the basic treatment controls based on impervious area thresholds.

Currently, in some jurisdictions, permitting authorities have started to provide educational workshops with case examples on how the post construction control requirements must be implemented, including the application to gas stations.[24]

One such example is the history of implementation of post-construction storm water treatment controls for new development and redevelopment in the City of Austin, Texas. During the late 1980s and early 1990s, Austin passed three major ordinances to reduce and prevent urban runoff pollution problems.[25] These ordinances place limits on the allowable impervious cover on proposed new developments. In addition to restriction on site percent imperviousness, developments in these watersheds are required to incorporate structural control [treatment] practices. Among acceptable control practices are sedimentation basins and filtration basins. Basins must be designed to capture, isolate, and hold at least the first one-half inch of runoff from contributing drainage areas. As a consequence of these requirements, a significant number of storm water runoff treatment devices were installed in the Austin area.[19]

In general, most of the jurisdictions, in their regulations, converge toward requiring a limit on the percent of impervious cover in new development or redevelopment projects, use an area threshold criteria around 5,000 square feet, with some using an additional enhanced treatment

[20] See, *supra*, footnote 8.
[21] See Additional Supporting Documents, Item 8.
[22] See Additional Supporting Documents, Item 7.
[23] See Additional Supporting Documents, Item 19, page 2-10, Appendix A-2.
[24] See Additional Supporting Documents, Item 17.
[25] Bibliography Documents Administrative Index LA MS4 Item 164., Page 130.

requirement for high-risk, "hot-spot" land use activities. These jurisdictions require the capture and treatment of 80% to 90% of the local annual runoff volume.[26]

It is interesting to note that, as early as 1993, in its guidance,[25] U.S. EPA recommended treatment controls of storm water runoff at gas stations:

> "Certain commercial and industrial sites can be responsible for disproportionate contributions of some pollutants (e.g., grit, oil, grease, and toxic materials) to the drainage system. Typical sources of potential concern include gasoline stations… Pretreatment measures can be required as part of a community's regulations. Examples of pretreatment measures include oil/water separators for gasoline stations…"

Recent guidelines from U.S. EPA regarding the implementation of post-construction storm water controls in new development and redevelopment for Phase II of the storm water regulations identify storm water "hot-spots" land use activities. U.S. EPA continues to identify fueling stations as one of the land uses that generate highly contaminated runoff, and suggests the use of treatment devices to control the quality of the storm water runoff discharged from this land use.[27] As a result, experience in other states and by U.S. EPA support a conclusion that alternate approaches incorporating treatment-control BMPs are appropriate for RGOs.

The Climate and Hydrology of California Allow for Comparable Approaches

The climate regime in California ranges from humid (Northwest) to semi arid (Northeast and Coastal) to arid (Central East and South East). Appropriate general strategies, in fact have been identified for implementation of treatment-control BMPs that span the California climate regimes and their related hydrology. The potential for pollution of storm water in semi-arid and arid regions in California is immense, but has been given scarce attention in the past because rain events are infrequent in these areas. Higher pollutant concentrations in storm water discharges from these areas are best explained by,

> [S]ince rain events are rare, pollutants have more time to build up on impervious surfaces compared to humid regions. Second, pervious areas produce high sediment and organic carbon concentrations because the sparse vegetative cover does little to prevent soil erosion in uplands and along channels when it does rain.[28]

[26] For comparison purposes, the LA MS4 permit provides the 80 percent annual runoff volume as an alternative water quality volume criterion for storm water mitigation.
[27] See Additional Supporting Documents, Item 15.
[28] See, Stormwater Strategies for Arid and Semi-Arid Watersheds, *Watershed Protection Techniques* 3: 695-706 (1996)

Thus, the special characteristics of semi-arid and arid California call for aggressive and immediate action by Regional Boards to reduce storm water pollution and to reverse impairment of receiving waters. U.S. storm water quality management experts recommend that semi-arid and arid regions (such as Southern California) embrace three broad strategies in order to mitigate storm water pollution. These are,

> [A]ggressive source control, better site design, and application of "western [U.S.]" storm water [treatment-control BMP] practices.[29]

The effort and cost to improve storm water quality is much less in semi-arid and arid regions of California as when compared with humid regions of the Atlantic Northeast and the Pacific Northwest because,[30]

> Not only does rain seldom fall, not much falls when it does. In arid watersheds, 90% of all rainfall events in a given year are usually less than 0.50 to 0.80 inches, compared to 1.0 to 1.5 inches in humid watersheds.[31]

Thus the delay in implementing treatment criteria for new and redeveloped RGOs in California appears to be simply a case of a lack of attention to the matter until now, and not its impropriety or non-applicability.

- Approaches Taken by the Los Angeles and San Francisco Regional Water Quality Control Boards. The Los Angeles RWQCB requires treatment/infiltration BMPs for specified land use types and/or locations if they exceed an impervious surface area threshold. The San Francisco RWQCB applies these requirements to all land uses that exceed the impervious surface area threshold. The State Board would like to receive comments on whether one of these approaches is preferable, or if a hybrid approach is possible. Can RWQCBs grant local agencies the appropriate flexibility to make important micro-decisions regarding unique local circumstances while fostering statewide consistency and certainty? If not, which is more important for RGO regulation: local flexibility or state consistency?

The question before the State Board in the consolidated Petitions is whether new and redeveloped RGOs in the LA region and the San Francisco Bay region should be subject to treatment-control BMP design criteria. The Los Angeles Regional Board requires treatment/infiltration BMPs for specified land use types and/or locations if they exceed an impervious surface area threshold, while the San Francisco Bay Regional Board applies new development and redevelopment requirements to all land uses that exceed a certain impervious

[29] *Id*. at 45.
[30] *Id*. at 43.
[31] The default criterion for the LA Region is the 85th percentile rainfall event for the representative rain gauge station in LA County and equates to 0.75 inch.

surface area threshold. On close scrutiny, the two approaches are very similar in effect although distinct in character. They are nearly identical as they apply to new and redeveloped RGOs.

The LA Regional Board's Approach and the SF Bay Regional Board's Approach are Similar

The LA Regional Board's approach identifies land-use types and locations to comprehensively include residential developments, commercial developments, and industrial developments, each with trigger thresholds that eventually converge to one acre of disturbance. The exception to the one-acre threshold is priority sites – RGOs and restaurants – which have a threshold of 5,000 square feet of impervious surface because they are considered pollutant "hot-spots" and projects situated in environmentally sensitive areas which exceed a threshold of 2,500 square feet of impervious surface area. While currently no custom BMPs are identified for these categories, it is expected that they might be in future iterations of the LA County MS4 permit. The LA Regional Board's approach is consistent with that of peer States such as Washington, Maryland, Florida, New York and Virginia who have two tiers of regulation - the first tier that applies to all new development land-uses and a stricter second tier for pollutant "hot-spots" and environmentally sensitive areas.

In contrast, the SF Bay Regional Board's approach identifies a threshold of one acre of impervious surface area to trigger new development and redevelopment requirements for all land uses now. The trigger threshold is lowered to 5,000 square feet of impervious surface area in 2004. A second tier for pollutant "hot-spots," or environmentally sensitive areas is not identified during the current permit term. It is possible that a stricter second tier of BMPs might be identified for future iterations of the Santa Clara Valley Water District MS4 permit.

For RGOs, the trigger thresholds for the LA Regional Board and the SF Bay Regional Board are the same, i.e. 5,000 square feet of impervious surface area, but are separated temporally in terms of the effective date when the thresholds take effect. The LA Regional Board's threshold is effective now, while the SF Bay Regional Board's threshold takes effect in October 2004. The LA Regional Board also adds a second conjunctive trigger threshold of projected 100 Average Daily Traffic (ADT) to ensure that only RGO sites with the highest potential to contaminate storm water are covered by the MS4 permit requirements.

A Recommended Approach for Triggering New Development and Redevelopment Requirements

A recommended statewide approach for the application of new development controls might be to have a general threshold of one acre of land disturbing activity for all categories of land use development. For certain categories that are considered potential pollutant "hot-spots" such as parking lots, gas stations, and restaurants, stricter thresholds might apply. The LA MS4 permit establishes a threshold of 5,000 square feet of impervious surface area for this category.

Similarly, sites considered locationally sensitive, such as environmentally sensitive, might need stricter thresholds. The LA County MS4 permit establishes a threshold of 2,500 square feet of surface area for this category. The two-tier approach is consistent with the pattern of post construction controls required by peer storm water programs in the U.S. In order, to maximize the opportunities for storm water mitigation, Redevelopment that adds, creates, or replaces 5,000 square feet of impervious surface area should serve as another mitigation threshold for all categories of redevelopment.

To the Extent There is Incompatibility Local Flexibility Should Prevail Over Statewide Consistency for Regulation of RGOs

The LA Regional Board does not believe local flexibility and statewide consistency are inherently incompatible, but to the extent they are incompatible goals, the LA Regional Board believes local flexibility should trump statewide consistency. Already dischargers throughout the state are subject to various local requirements. These requirements are dictated by the nature of varying water quality standards for receiving waters, as well as varying impairment statuses. Industrial dischargers to San Francisco Bay receive very different discharge requirements than dischargers to the Pacific Ocean, the Russian River, or the Los Angeles River. The current system of RGO requirements dictated by varying MS4 requirements is no different.

Further, RGOs already operate in a climate carefully controlled by local municipalities. Local land use and design issues play an important role in the construction of RGOs. While some of these requirements are driven by aesthetic concerns (e.g., signage), other requirements such as canopy placement, proximity to drinking water wells, and zoning are driven by public health and safety concerns.

Statewide consistency is particularly problematic when it comes to storm water discharges from RGOs. Bluntly, the LA Regional Board has concerns that attempting to address the storm water discharges from RGOs on a statewide basis will result in watered down requirements. There can be no serious dispute that storm water discharges are a more serious problem in heavily urbanized areas where there are high concentrations of RGOs. As a result, the environmental benefits from treatment-control BMPs in a heavily urbanized area such as Los Angeles can be substantial. In contrast, the incremental environmental benefit of treatment-control BMPs at an RGO in rural California (where there may be only one RGO within an five-mile radius) is considerably less. Lumping all the State's RGOs together has the effect of dramatically diluting the environmental benefit relative to the cost.

That said, the LA Regional Board sees the dilemma as a false choice. As the State Board Chair stated at the workshop, RGOs contribute significant storm water pollutant loads. The State Board can initiate the process of a tailoring a statewide general permit for RGOs, while preserving the discretion of Regional Boards to develop more restrictive requirements. This approach would mirror the way the Clean Water Act works (setting a national floor, but allowing

individual states to be more stringent) and the way other general permits work (setting a statewide floor, but allowing Regional Boards to determine whether a specific facility warrants a more-stringent individual permit). Such an approach would allow the Regional Boards to develop requirements tailored to the degree of urbanization and storm water pollution in their region.

- Effectiveness of Storm Water Runoff Treatment Devices. The State Board would like empirical data on the effectiveness of various treatment devices. Please indicate whether studies have been peer reviewed, and information on the relevant metric. For example, petitioners stated that treatment devices remove a smaller percentage of pollutants when the input stream is cleaner. Is pollutant removal efficiency a better indicator than overall effluent quality (after source control and treatment have occurred)?

  Summary of the Effectiveness of Treatment-control BMPs

Beginning with the early 1990s, and on a more accelerated pace in recent years, a significant amount of research and studies have been performed to determine the effectiveness of devices used to treat storm water runoff. Review of ultra-urban, space-limited storm water BMPs reveals that the pollutant removal efficiency of these devices generally varies between

- 48% to 95% removal for Total Suspended Solids (TSS),
- 32% to 78% removal for Chemical Oxygen Demand (COD),
- 44% to 70% removal for Total Nitrogen (TN),
- 7% to 89% removal for Total Phosphorous (TP),
- 57% to 90% removal for Oil and Grease (O&G) or Total Petroleum Hydrocarbons (TPH), and,
- 21% to 98% removal for heavy metals.[32]

One of the more common treatment-control BMPs for RGOs and widely in use outside of California are sand or media filters. These treatment devices are preferred because they produce very consistent effluent quality unrelated to influent concentration.[33] The technical literature available provides a significant amount of information regarding applicability, design criteria, performance, number of installations, and costs for these systems.[34] A brief overview of the effectiveness of these devices shows pollutant removal efficiencies between,

- 66% to 98% for removal of TSS,
- 4% to 84% for removal of TP,

[32] See Additional Supporting Documents, Item 9.
[33] See, *Report Card on Conventional Structural BMPs, Presentation by Dr. Michael Barrett, Ph.D., P.E., Center for Research in Water Resources, University of Texas at Austin to the* California Stormwater Quality Task Force - November 2001.
[34] See Additional Supporting Documents, Items 10, 11, 12, 13, 14, 15, 16, 18, 19.

- 44% to 47% for removal of TN,
- 26% to 100% for removal of heavy metals,
- 14% to 62% for removal of Nitrate-Nitrogen,[35]
- 80% to 90% for removal of Hydrocarbons,
- 37% to 83% bacteria removal, and
- 40% to 76% Fecal Coliform removal.

Sand filters can be applied in most regions of the country in ultra-urban areas because they consume little space. Underground and perimeter sand filters in particular are well suited to the ultra-urban setting because they consume no surface space. These systems are an excellent option to treat runoff from storm water "hot-spots" because storm water treated by sand filters has no interaction with, and thus no potential to contaminate, the groundwater. Sand filters provide a highly effective means of removing pollutants from storm water while remaining flexible in application to allow for modifications in basic design structure to accommodate site specific criteria. Sand filters are currently common treatment-control BMPs and are used in Delaware; Florida; Austin, Texas; Alexandria, Virginia; and Washington D.C.

In fact, the California Storm Water Task Force BMPs Handbook (1993) considered:

> The sand filter should be an ideal system for the Central Valley and Southern California.

It is rather remarkable, given this recommendation, that sand and media filters have rarely been implemented anywhere in California.

Studies on Treatment-control BMPs for RGOs are Peer Reviewed

As a general rule, studies of treatment-control BMPs published in national and international scientific journals are peer reviewed. In addition, evaluation of treatment-control BMP effectiveness by North America based certification agencies includes a procedure for peer review. The more appropriate question might be "Did the evaluations of the effectiveness of the treatment-control BMPs cited utilize standardized testing protocols accepted by regulatory agencies in North America so as to ensure comparability of results?"

Although a variety of published information on storm water BMP performance exists, up until recently, there was no centralized, easy to use, and scientifically sound tool for evaluating the appropriateness or performances of BMPs under a range of conditions. There now exists a National Storm Water BMP Database sponsored by the U.S. EPA, which sets standardized data collection and reporting protocols for use with BMP Monitoring studies and summarizes

[35] Results from Peat/Sand Filter, Delaware Sand Filter and Multi-Chamber Treatment Train

historical BMP study data in a standardized format for easy access.[36] It can be accessed on the Internet at, www.bmpdatabase.org, to retrieve performance data for storm water treatment-control BMPs such as sand and media filters. The database contains performance data on about 30 sand and media filters that have been tested in North America under various climatic regimes. Petitioner's contention that there is not enough data to demonstrate that treatment-control BMPs can be effective in reducing storm water pollution at RGOs is simply not true.

The Relevant Metric to Measure Effectiveness of Treatment-control BMPs.

We note that the LA County MS4 permit neither establishes pollutant removal efficiency criteria nor numeric effluent limits for storm water discharges from RGOs. The LA Regional Board appreciates the State Board's forward-looking inquiry and interest in this area of concern.

Pollutant removal efficiency is not a better indicator than overall effluent quality. A review of the literature indicates that,[37]

> BMP performance should not be based on comparisons using percent removal alone….because chosen performance evaluation method can affect reported pollutant removal efficiencies. For example, some BMP types may have been historically mischaracterized as less effective because of cleaner influent. Most BMPs will exhibit lower percent removals when the concentrations are lower in the influent.

Rather, the better measure is,

> …Effluent quality [which] is useful for characterizing the effectiveness of the BMP. However, it is still important to determine if the BMP had a statistically significant impact on water quality….[38]

In other words, any evaluation of BMP effectiveness should take into consideration the consistent quality of effluent that can be achieved by the technology and also whether the BMP removes enough pollutants to positively improve water quality.

If the State Board should elect to establish, in addition to BMP design criteria, numeric effluent criteria for storm water discharges from all RGOs to ensure statewide consistency and that "hot-spots" are addressed, it should consider the following two quotes from national storm water experts, "[sand and media filters produce] very consistent effluent quality unrelated to influent concentration…."[33] Sand and media filters are well regarded for implementation at RGOs and

[36] In, 'Developing, Evaluating and Maintaining a Standardized Stormwater BMP Effectiveness Database', J. Clary, Urbonas B., Jones J., Strecker E., Quigley M. and Brine J.O., *Water Science and Technology*, 45: 65-73 (2002)
[37] *Ibid.*
[38] *Ibid.*

are, "[Relatively] high cost, highly effective, [have]significant head requirements, moderate maintenance."[39]

The State Board may consider establishing numeric effluent criteria for storm water discharges from new and existing RGOs based on the effluent quality achievable by sand and media filters, both of which are proven technologies. Such action would advance storm water science in California and promote a search for innovative other low cost effective solutions to mitigate storm water runoff from RGOs in arid and semi-arid regions, based on a best technology standard to protect receiving waters.

CONCLUSION

It is time for the State Board and Regional Boards to require the implementation of adequately designed treatment-control BMPs at new and redeveloped RGOs through the MS4 permits. Doing so recognizes the unique impacts of storm water discharges, and RGO storm water discharges in particular, in an urban environment. RGOs represent significant "hot-spots" of potential storm water pollution in California as they do elsewhere in the U.S. Treatment devices for implementation at RGOs, such as sand and media filters, are not only safe, effective, occupy limited space, and necessary at RGOs to reduce storm water pollution, they also constitute proven technologies widely implemented in the rest of the U.S.

If you have any questions or required additional information, please call me at (213) 576-6605.

Sincerely,

Dennis A. Dickerson
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Enclosure

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[39] *Ibid.*

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