September 13, 2005

Mr. Bruce Fujimoto
Post Office Box 1977
Division of Water Quality
State Water Resources Control Board
Sacramento, CA 95812-1977

Dear Mr. Fujimoto:

Re: National Pollution Discharge Elimination System (NPDES) Storm Water Program
Meeting of Storm Water Panel of Experts
September 14 and 15, 2005

The Riverside County Flood Control and Water Conservation District (District) appreciates the opportunity to comment on the question posed to the Panel of Experts regarding the establishment of numeric effluent limits, or other objective criteria, for inclusion in National Pollutant Discharge Elimination System (NPDES) storm water permits. The District is the Principal Permittee for three separate Phase I NPDES Municipal Separate Storm Sewer System (MS4) Permits, issued by three Regional Water Quality Control Boards (RWQCB):

- Santa Ana Region RWQCB, Order No. R8-2002-0011, NPDES No. CAS 618033;
- San Diego Region RWQCB, Board Order R9-2004-001, NPDES No. CAS0108766; and
- Colorado River Basin Region RWQCB, Board Order No. 01-077, NPDES No. CAS617002.

The District and the County of Riverside are the only MS4 permittees in California that are subject to three Phase I NPDES MS4 Permits. In summary, although the District supports the development of objective measures of compliance for storm water permits, it is opposed to the use of numerical effluent limits for that purpose. The District's comments focus on our position based on our experience implementing Phase I NPDES MS4 Permits, however, the District believes that the points raised below are also applicable to the NPDES General Construction and Industrial Permits.

Need for Objective Measures of Compliance Should Be Discussed Within the Context of an Overall Statewide Storm Water Policy

The three Phase I NPDES MS4 Permits issued to Riverside County vary significantly in the degree of prescription of compliance programs and monitoring and reporting requirements. These variations appear to be reflective of each RWQCB's individual policy for dealing with the iterative approach to the storm water program and each RWQCB's efforts to incorporate meaningful measures of compliance. However, it is not always clear that these permit requirements are appropriate to the needs of the watershed or that they will lead to meaningful improvements in the water quality of MS4 discharges or the receiving waters. In addition, the inability to implement uniform compliance programs throughout the County increases the complexity of administering the program, the staffing

requirements, and the compliance costs for the permittees subject to multiple Phase I NPDES MS4 Permits.

From our unique perspective of being regulated under three Phase I NPDES MS4 Permits, the District can understand the interest in developing objective measures of compliance for the storm water program that would reduce the perceived need for the degree of prescriptive requirements found in the current Phase I NPDES MS4 Permits. However, the discussion and study of objective measures of compliance should be conducted in an open public process and not as a question posed before a panel of experts. The discussion needs to occur from within the context of an overall statewide storm water policy, as this issue has significant policy, economic, and legal ramifications for the MS4 Permittees and regulatory staff.

Numeric Effluent Limits Are Not the Answer

The District supports the study of appropriate objective measures of compliance to facilitate moving away from prescriptive NPDES storm water permits. However, the District strongly opposes the incorporation of numeric effluent limits into NPDES storm water permits for the following reasons:

i. The inclusion of numeric effluent limits into NPDES storm water permits is contrary to United States Environmental Protection Agency (USEPA) guidance on the iterative process of BMPs and the Congressional intent of the Clean Water Act.

ii. There is currently no reasonable technical basis for establishing numeric effluent limits in NPDES storm water permits.

iii. Variability in flow, large numbers of outfalls, and commingling of flows from non-urban sources and discharges from sources not under the jurisdiction of the permittees (state, federal and tribal lands and special districts), exempt from regulation under NPDES (agriculture) or otherwise permitted by the RWQCBs makes establishing points of compliance and measures of compliance with numeric effluent limits technologically and economically unfeasible for Phase I NPDES MS4 Permits.

Additional support for these positions is detailed below.

The Inclusion of Numeric Effluent Limits into NPDES Storm Water Permits is Contrary to USEPA Guidance on the Iterative Process of BMPs and the Congressional Intent of the Clean Water Act.

The Clean Water Act states that Phase I NPDES MS4 Permit requirements "shall require controls to reduce the discharge of pollutants to the maximum extent practicable" (Section 402(p)(3)). Over time, the maximum extent practical (MEP) standard has come to be defined by the RWQCBs as "an ever evolving, flexible, and advancing concept, which considers technical and economic feasibility." This definition has been developed from USEPA guidance.

This Guidance includes the Federal Regulations promulgated by USEPA 40 CFR 122.26 (d) (v) (vi) which identify management programs, or BMPs, to be incorporated into Phase I NPDES MS4 Permits. These management programs include controls to manage pollution from construction projects, new subdivisions and industrial activities, monitoring, public education and participation, emergency spill response programs, and illicit connection and illicit discharge control programs. These management programs were to include "a comprehensive planning process ... to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and such other provisions which are appropriate." It is clear that the focus of the NPDES storm water program is on implementation of compliance programs – not compliance with numerical effluent limits.

In September 1996, USEPA published its Interim Permitting Approach for Water Quality Based Effluent Limitations in Storm Water Permits (Guidance). This Guidance states:

> "The interim permitting approach uses best management practices (BMPs) in first-round storm water permits, and expanded or better-tailored BMPs in subsequent permits, where necessary, to provide for the attainment of water quality standards. In cases where adequate information exists to develop more specific conditions or limitations to meet water quality standards, these conditions or limitations are to be incorporated into storm water permits, as necessary and appropriate."

Although the Guidance does recommend that more specific conditions or limitations be imposed where information exists, the Guidance goes on to ask and answer several questions from USEPA's perspective with respect to the applicability, feasibility and economics of incorporating numeric effluent limits into NPDES storm water permits, among other things. Three of those questions are pertinent to this panel:

> **QUESTION 2:** Has EPA provided guidance on a methodology for deriving numeric water quality-based effluent limitations?
>
> **ANSWER 2:** Yes, but primarily for continuous wastewater discharges at low flow conditions in the receiving water, not intermittent wet weather discharges during high flow conditions. *(emphasis added)* Regulations at 40 CFR 122.44(d) specify the requirements under which permitting authorities establish water quality-based effluent limitations when a facility has the "reasonable potential" to cause or contribute to an excursion of numeric or narrative water quality criteria. In addition, EPA guidance in the Technical Support Document for Water Quality-Based Toxics Control (TSD) and the NPDES Permit Writers Training Manual, supplemented with total maximum daily load (TMDL) and modeling guidance supports issuing permits that include numeric water quality-based effluent limitations. This guidance was based on crafting numeric water quality-based effluent limitations using TMDLs, or calculations similar to those used in developing TMDLs, and wasteload allocations (WLAs) derived through modeling. EPA expects the Urban Wet Weather Flows Federal Advisory Committee (60 FR 21189, May 1, 1995) will review this issue at greater length and may provide recommendations on how to proceed.

QUESTION 3: Why can numeric water quality-based effluent limitations be difficult to derive for storm water permits?

ANSWER 3: Storm water discharges are highly variable both in terms of flow and pollutant concentrations and the relationships between discharges and water quality can be complex. The water quality impacts of storm water discharges are related to the uses designated by States and Tribes in their WQS, the quality of the storm water discharge (e.g., conventional or toxic pollutants conveyed to the receiving water), and quantity of the storm water (e.g., erosion and loss of habitat caused by increased flows and velocity). Uses may be impacted by both water quality and water quantity. Depending on site-specific considerations, some of the water quality impacts of storm water discharges may be more related to the physical effects (e.g. stream bank erosion, streambed scouring, extreme temperature variations, sediment smothering) than the type and amount of pollutants present in the discharge. For municipal storm water discharges in particular, the current use of system-wide permits and a variety of jurisdiction-wide BMPs, including educational and programmatic BMPs, does not easily lend itself to the existing methodologies for deriving numeric water quality-based effluent limitations. These methodologies were designed primarily for process wastewater discharges which occur at predictable rates with predictable pollutant loadings under low flow conditions in receiving waters. *(emphasis added)* Using these methodologies, limitations are typically derived for each specific outfall to be protective of low flows in the receiving water. Because of this, permit writers have not made wide-spread use of the existing methodologies and models for storm water discharge permits. In addition, wet weather modeling is technically more difficult and expensive than the simple dilution models generally used in the permitting process.

QUESTION 5: What are the potential problems of using standard methodologies to derive numeric water quality-based effluent limitations for storm water permits?

ANSWER 5: Correctly derived numeric water quality-based effluent limitations provide a greater degree of confidence that a discharge will not cause or contribute to an exceedance of the WQS, because numeric water quality-based effluent limitations are derived directly from the numeric component of those standards. In addition, numeric water quality-based effluent limitations can avoid the expense associated with overly protective treatment technologies because numeric water quality-based effluent limitations provide a more precisely quantified target for permittees. Potential problems of incorporating inappropriate numeric water quality-based effluent limitations rather than BMPs in storm water permits at this time are significant in some cases. Deriving numeric water quality-based effluent limitations for any NPDES permit without an adequate effluent characterization, or an adequate receiving water exposure assessment (which could include the use of dynamic modeling or continuous simulations) may result in the imposition of inappropriate numeric limitations on a discharge. *(emphasis added)* Examples of this include the imposition of numeric water quality criteria as end-of-pipe limitations without properly accounting for the receiving water assimilation of the pollutant or failure to account for a mixing zone (if allowed by applicable State or Tribal WQS). This could lead to overly stringent permit requirements, and excessive and expensive controls on storm water discharges, unnecessary to provide for attainment of WQS. Conversely, an inadequate effluent

characterization could lead to water quality-based effluent limitations that are not stringent enough to provide for attainment of WQS. This could result because effluent characterization and exposure assessments for discharges with high variability of pollutant concentrations, loadings, and flow are more difficult than with process wastewater discharges at low flows.

In a November 22, 2002 EPA Guidance Memorandum on the establishment of TMDLs, USEPA reiterated its recommendation that effluent limits in NPDES storm water permits be expressed as BMPs or other similar requirements, rather than as numeric effluent limits:

> EPA's policy recognizes that because storm water discharges are due to storm events that are highly variable in frequency and duration and are not easily characterized, only in rare cases will it be feasible or appropriate to establish numeric limits for municipal and small construction storm water discharges. *(emphasis added)* The variability in the system and minimal data generally available make it difficult to determine with precision or certainty actual and projected loadings for individual dischargers or groups of dischargers. Therefore, EPA believes that in these situations, permit limits typically can be expressed as BMPs, and that numeric limits will be used only in rare instances.

Despite the increased regulatory authority provided to USEPA via the TMDL process, this guidance continues to recommend the BMP approach for compliance as opposed to numeric effluent limits. This is indicative of the difficulty in establishing meaningful numeric effluent limits for storm water, even under conditions of impaired receiving waters where more rigorous effort to understand watershed conditions, sources, and treatment technologies has likely already occurred. The District would further note that the questions raised by USEPA regarding numeric effluent limits are particularly applicable to arid and semi-arid environments dominated by ephemeral receiving waters, high intensity, shorter duration rainfall and flash flooding.

There is Currently No Reasonable Basis for Establishing Numeric Effluent Limits in NPDES Storm Water Permits

There are currently no reasonable bases for establishing numeric effluent limits for NPDES storm water permits. Potential sources of basis for numeric effluent limits include current RWQCB Receiving Water Standards, California Toxic Rule limits, other numeric effluent limits established by RWQCBs or numeric effluent limits established in other regions of the Country. However, the aforementioned USEPA guidance (See Question 2 above) has noted that most of its guidance for establishing numeric effluent limits, including TMDLs, and thus effluent limits that follow are "primarily for continuous wastewater discharges at low flow conditions in the receiving water, not intermittent wet weather discharges during high flow conditions." Water Quality Standards included in many RWQCB Basin Plans are also so limited.

According to the aforementioned USEPA guidance, any effort to establish numeric effluent limits in storm water permits should consider:

i. The complex nature of the relationship between storm water discharges and water quality;
ii. The high variability of frequency, volume and duration of storm water flows and pollutant loads relative to point source discharges currently subject to numeric effluent limitations;
iii. A receiving water exposure assessment;
iv. Mixing zones and/or receiving water assimilation on an outfall by outfall basis; and
v. Background and/or ambient water quality conditions under different storm flow/dry weather flow scenarios.

The Phase I NPDES MS4 Permittees, and other NPDES storm water permittees, lack the resources to conduct such assessments, especially in view of the number of points of discharges and receiving waters that would need to be considered. We believe that the RWQCBs similarly lack the resources to conduct such assessments. Absent such assessments, it is likely that numerical limitations included in NPDES storm water permits would be inappropriate. The USEPA response to Question 5 presented above eloquently summarizes the potential problems that may result from implementation of inappropriate numeric effluent limitations in NPDES storm water permits.

In California, many regulators and environmental advocates would likely look to the RWQCB Basin Plan Water Quality Standards as a basis for numeric effluent limits for inclusion in NPDES storm water permits. However, these Basin Plan Water Quality Standards were often set prior to the development of the storm water program and most, if not all, of the current Water Quality Standards do not adequately consider the aforementioned factors. In addition, the Porter-Cologne Water Quality Act imposes additional burdens on the state to consider economics and other factors under Sections 13241 and 13242 when developing Water Quality Standards for inclusion in Basin Plans. Since the Water Quality Standards often predate the storm water program, they could not have properly considered either USEPA's guidance, or Porter-Cologne Sections 13241 and 13242 requirements to consider the economic ramifications of applying the Water Quality Standards to NPDES storm water permits.

A review of the administrative record supporting the Water Quality Control Plan for the Los Angeles Region (Basin Plan) in 2003 by Environmental Defense Sciences (EDS) found several additional and significant deficiencies in the Basin Plan:

> "The analysis concludes that many Basin Plan elements lack adequate technical foundation and were not adopted in conformance with the California Porter-Cologne Act (Porter-Cologne). Several Basin Plan use designations and water quality objectives do not adequately consider economics, housing, hydrology, water quality conditions that could reasonably be achieved, or other factors mandated by the Act, fail to consider the full range of natural and ambient conditions, and result in unreasonable and contradictory regulatory priorities. As a

result, the Basin Plan conflicts with the Porter-Cologne Act's stated objective of achieving the maximum "reasonable" protection of California water quality."

Specific findings included:

"1. Basin Plan water quality criteria and associated implementation programs have been adopted with inadequate consideration of and adherence to the Porter-Cologne Section 13241 and 13242 requirements.
2. Certain water quality objectives, including bacterial, sediment, and mineral quality standards, inadequately consider natural processes, ambient data, the quality of water imported to the region, and hydraulic linkages between surface and ground waters.
3. The Basin Plan contains beneficial use designations that do not reflect current or probable future beneficial uses and that therefore trigger regulatory controls that seek to protect unlikely or inapplicable beneficial use protections."

A study of the Central Valley Region Basin Plan by Larry Walker and Associates found similar deficiencies. The deficiencies that exist in the Los Angeles Region and Central Valley Region Basin Plans are also likely to exist in other Basin Plans. Given the lack of a rigorous basis for many existing Basin Plan Water Quality Standards, and the further lack of consideration for their applicability to NPDES storm water permits, it is not reasonable to use them as a basis for establishing numeric effluent limits in these permits. Other existing numeric effluent limits are likely to suffer from the same or similar deficiencies.

Numeric Effluent Limits are not Technologically or Economically Feasible

Numerical effluent limits are appropriate measures of compliance for relatively low volume discharges with consistent pollutant loads such as are found in industrial wastewater and POTW discharges. Such discharges are amenable to treatment to attain numerical effluent limits. This too contrasts with the relatively high volume; intermittent discharges of widely varying pollutant loading that are not amenable to treatment.

Variability in flow, large numbers of outfalls and commingling of sources from non-urban sources and discharges from sources not under the jurisdiction of the MS4 Permittees (state, federal and tribal lands and special districts), exempt from regulation under NPDES (agriculture) or otherwise permitted by the RWQCBs makes establishing points of compliance and measures of compliance with numeric effluent limits technologically and economically unfeasible. Many Phase I NPDES MS4 Permits contain language such as "Historic and current developments make use of natural drainage patterns and features as conveyances for urban runoff. Urban streams used in this manner are both MS4 and receiving waters." Commingling of natural and urban sources adds environmental variables beyond the control of MS4 dischargers. Other sources of natural variables outside the control of the dischargers include debris flows, mud flows, debris and deposition from fires, aerial deposition, and migratory patterns of wildlife. The ratio of natural to urban flows is also variable given time of year, variability in storm(s) intensity and other factors beyond the control of Phase I NPDES MS4 Permittees.

The commingling of background sources with MS4 flows raises several questions regarding:

i. Where do you determine point of compliance (number of outfalls, outfall vs. receiving water)
ii. When is compliance determined?
iii. How should compliance monitoring be constructed (chronic/acute, mass load/grab, mean of samples/individual sample, etc)?
iv. Is there a need to contain exemptions for certain circumstances such as high flows, natural disasters and migratory wildlife?

Phase I NPDES MS4 Permits can regulate discharges of hundreds of outfalls into multiple receiving waters. Answering these questions is particularly daunting with respect to determining compliance via monitoring. Throughout California, MS4 monitoring programs are already spending millions of dollars annually on storm water permit compliance monitoring. A shift to outfall specific monitoring and increasing the number of monitoring parameters, and/or monitoring samples to capture full ranges of flow conditions and discharge limitations could exponentially increase monitoring costs and would contribute little, if anything, to pollutant reduction and protection of beneficial uses.

Compliance with numeric effluent limits is also not economically or technically feasible. Specifically:

i. Treating wet weather MS4 discharges to comply with numeric effluent limits is not feasible. As an example, Hemet, California is a small city encompassing approximately 26 square miles and consists of 61,000 residents. Based on sewer system industry standards, the City may need one treatment works to address the 6.1 MGD of sanitary wastewater flows that would be expected from its population in a given day. In contrast, if the City were to receive ½ inch of runoff from a 24-hour storm (a typical annual storm depth), approximately 226 MGD of storm water could be generated, potentially requiring ***37 treatment plants*** to provide equivalent treatment capacity. Storm depths exceeding 3" in a day are not uncommon in valley areas of Riverside County, and storm depths upwards of 13 inches in a day are not uncommon in hillside or mountainous communities. Treatment facilities designed to address wet weather MS4 discharges would sit idle many months of the year. Further, extreme rainfall can come in "bursts" requiring significant holding capacity or treatment capacity to address localized peaks in flow rates and volume.
ii. Variability in storm water pollutant concentrations affects effectiveness (efficiency) of treatment BMPs. Specific BMPs may function well under certain flow conditions but not well under other flow conditions. Compliance may require treatment systems in series to address full range of flows and pollutant concentrations.
iii. Several BMPs available to the Phase I NPDES MS4 Permittees have "irreducible concentrations" below which they become ineffective. These irreducible concentrations can be significantly higher than Water Quality Objectives established in Basin Plans or CTR/USEPA criteria. A few published irreducible concentrations (The Practice of Watershed Protection, Schueller and Holland, 2002) include:

Constituent	Storm Water BMP Irreducible Concentration (mg/l)	Comparable Wastewater Treatment Train Irreducible Concentration (mg/l)	Typical RWQCB Basin Plan Standard (mg/l)
Total Phosphorus	0.15 – 0.2	0.02-0.07	.1
Total Nitrogen	1.9	1	1

iv. The costs of compliance with numeric effluent limits are economically infeasible. As an example, the Santa Ana RWQCB recently adopted the Nutrient TMDL for Lake Elsinore and Canyon Lake (Board Order R8-2004-0037). This TMDL included numeric effluent limits for Total Phosphorus (TP) and Total Nitrogen (TN) in the form of loads for a 780+ square mile watershed tributary to the named lakes. The RWQCB staff report included cost estimates for compliance with the TMDL (which equated to storm water discharge concentrations of approximate average of 0.1 mg/l for TP and 1.0 mg/l for TN). The estimated cost of compliance for wet weather flows was between $2 billion and $40 billion dollars, depending on BMPs implemented. Based on approximately 500,000 people within the watershed, the potential cost of compliance is between $4,000 and $80,000 dollars per resident just to address nutrients. Per household costs could exceed $400,000. These costs are not economically feasible.

Support of CASQA Comments and Position

In addition to the comments provided below, the District would also like to support pending written and verbal comments submitted by the California Stormwater Quality Association (CASQA) on this issue.

Summary

The incorporation of numeric effluent limits, or other objective standards, into NPDES storm water permits raises several important questions. The District believes that as the panel looks at these questions in detail, they will find that inclusion of numeric effluent limits in NPDES storm water permits is neither economically nor technologically feasible, and that USEPA's recommendation for an adaptive BMP program continues to be the best approach for managing storm water discharges.

The District's position on this issue is summarized as follows:

i. If the SWRCB wishes to pursue objective measures for the NPDES storm water program, they should pursue it from the context of a broader, statewide storm water policy that provides for full public participation and input. Pursuit of numeric effluent limits for inclusion in NPDES storm water permits should involve scientific study to address the aforementioned

issues and should incorporate stakeholders from the regulated community, statisticians, economists, regulators and environmental scientists familiar with the issues.

ii. It is neither technologically or economically feasible to include numeric effluent limits in NPDES storm water permits.

iii. Other objective measures of compliance are being developed by CASQA and others.

iv. The District supports the comments that CASQA will be submitting on this topic.

Closing

The District looks forward to working with the State Water Resources Control Board and CASQA on ways to continue to improve the measures of compliance for use in the storm water programs. If you have any questions regarding the comments within this letter, please contact Jason Uhley at 951.955.1273.

Very truly yours,

STEPHEN E. STUMP
Chief of Regulatory Division

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