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By E-mail and U.S. Mail

Jeremy Haas
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4353

Subject: Tentative Order No. R9-2007-0002; NPDES No. CAS0108740

Dear Mr. Haas:

Please find attached additional comments regarding the Fact Sheet/Technical Report for Tentative Order No. R9-2007-0002.

Please contact me directly if you have any questions. For technical questions, please contact Richard Boon at (714)973-3168.

Sincerely,

Chris Crompton, Manager
RDMD/Environmental Resources

Attachment A: Additional Comments

cc: Permittees

Attachment 1
Comments on Fact Sheet/Technical Report For Tentative Order R9-2007-0002

Economic Issues (p.11)

The Fact Sheet's discussion of Economic Issues considers the costs and benefits of water quality protection and management. This discussion is prefaced with a reference to the work of Ribaudo and Hellerstein (2002). These authors note that that a "knowledge of benefits and costs to water users is required in any complete assessment of policies to create incentives for water quality improving changes in agricultural practices." The paraphrasing of this work in the Fact Sheet unfortunately omits consideration of the context and scope of this work. Since their work is advocating cost-benefit analysis to initially inform policy development rather than subsequently validate its implementation, Ribaudo and Hellerstein's target audience are clearly the policy writers (or permit writers) and not the practioners of agricultural production. This key point is missed by the Fact Sheet author.

The scope and limitations of environmental cost-benefit analysis also have to be recognized. Indeed, the beach closure studies noted in the Fact Sheet quite possibly represent the limits of meaningful cost-benefit analysis as it can be applied to water quality protection and management in Orange County. In environmental cost-benefit analysis there are no markets for environmental quality and no prices with which to completely measure environmental value. Consequently, such analyses have to determine economic effects through the measurement of observed changes in the behavior of water users (e.g. a reduction in beach use) and the determination of direct use values. However, direct use values such as those identified by Lew et. al. (2001) only capture a portion of the total economic value of an environmental asset. For example, NOAA observes that indirect use values (e.g. biological support, climate regulation etc.), non-use values (e.g. potential future use), and intrinsic values (biota has a value irrespective of usefulness to humanity) also have to be considered in the evaluation of an environmental resource

In summary, cost-benefit analysis requires that the natural environment be translated into monetary terms. The Center for Progressive Regulation (CPR) (2007) believes that this feature is one aspect of cost-benefit analysis that "makes it a terrible way to make decisions about environmental protection, for both intrinsic and practical reasons." CPR also believes that "it is not useful to keep cost-benefit analysis around as a kind of regulatory tag-along, providing information that regulators may find useful even if not decisive. Cost-benefit analysis is exceedingly time- and resource-intensive, and its flaws are so deep and so large that this time and these resources are wasted on it." Part of this latter observation is underscored by the 1998 the state of Minnesota's scoping study on a cost-benefit model to analyze water-quality standards. Its task force estimated costs of $3.6 to $4.4 million over four years to support model development and the project was stopped at the conclusion of the scoping study. If the Fact Sheet retains a discussion of cost benefit analyses, this discussion should be revised to explicitly recognize the limited utility of the approach when applied to environmental protection.

Discharge Characteristics (p.21)

The Fact Sheet presents a chronological record of investigations into the environmental significance of dry and wet weather runoff from urban areas starting with Nationwide Urban Runoff Program (NURP). This discussion is overly selective in its sources and needs to temper some of the assertions predicated on NURP and the federal assessments of water quality with more recent research (see discussion below).

Illicit Connections/Discharges: NURP clearly identified illicit connections as an issue of concern with respect to dry weather processes. However, the NURP studies of this issue were predominantly from the older urban environments of the East Coast. For example, USEPA's investigative guidance cites studies from Washentaw County, Michigan; Toronto, Canada; and Inner Grays Harbor, Washington. While the Fact Sheet reports that NURP "found pollutant levels from illicit discharges were high enough to significantly degrade receiving water quality," and thereby connotes the potential significance of this issue in Orange County, the Permittees' extensive and repeated inspections of their storm drain infrastructure during the first and second term permits found very few illicit connections. Moreover the most recent annual report identified only 12 illegal discharges identified through the dry weather reconnaissance program. The Fact Sheet needs to recognize this significant regional disparity.

Fecal Indicator Bacteria: The Fact Sheet notes Haile et. al's (1996) epidemiological study conducted in the summer of 1996 to assess adverse impacts from swimming in ocean water receiving untreated urban runoff. The study presents adverse health effects as risk ratios, comparing the risk to swimming near storm drains with swimming varying distances (1-50, 51-100, and >400 yards) from storm drains. It also assessed risk by Fecal Indicator Bacteria (total coliform, fecal coliform, enterococcus, and E. coli), and by virus. The study found elevated risk for the majority of the disease symptoms, most notably for Highly Credible Gastro-intestinal Illness (HCGI) when swimming near the storm drain. However, the only statistically significant results were for a subset of symptoms: fever, chills, ear discharge, cough and phlegm, and significant respiratory disease. The correlation between health effect and FIB was poor. For HCGI, the relationship was strongest with the FIB enterococcus since the risk increases with concentration. However, this risk was not statistically significant.

The Fact Sheet is significantly remiss in not discussing Colford et al. (2005) who conducted an epidemiological study at Mission Bay, California during the summer of 2003. The study's goal was to evaluate health impacts in relation to traditional fecal indicator bacteria where non-point sources, non-human fecal sources are dominant. One important finding was that no significant correlation was observed between increased risk of illness and increased levels of traditional water quality indicators, including enterococcus, fecal coliform, or total coliform (see Table 15 in Colford et al., which summarizes health outcome and odds ratio). The Table shows a weak correlation, or an odds ratio greater than 1 for various symptoms, but the confidence intervals indicate the results are not statistically significant. On the other hand, significant associations were observed between the levels of male-specific coliphage and HCGI-1 (vomiting and diarrhea, or fever; or cramps and fever), HCGI-2 (vomiting and fever), nausea, cough, and fever-but this was a rare circumstance, possibly indicative of the presence of human sewage, and not many swimmers were exposed.

The results from the epidemiological studies conducted both at Santa Monica and Mission Bay agree that fecal indicator bacteria do not adequately assess risk. However, it is anticipated that the results from a new epidemiological study being conducted by Southern California Coastal Water Research Project (SCCWRP) in association with the City of Dana Point will offer insight about the impact from fecal indicator bacteria reaching beaches. The Fact Sheet needs to be revised to correct its current oversimplification of epidemiological understanding and omission of both current and impending research in this area.

Environmentally Sensitive Areas (ESAs): The Fact Sheet contends that CWA 303(d) impaired waterbodies have a much lower capacity to withstand pollutant shocks than might be acceptable in other areas. This contention appears contrary to the Permittees's bioassessment data which finds degraded habitats to be characterized by diminished biological diversity and higher numbers of a limited range of pollutant tolerant taxa. CWA 303(d) impaired waterbodies might be better characterized as pollution *insensitive* areas.

Infiltration and Groundwater Protection: The Fact Sheet notes the Tentative Order's incorporation of existing guidance regarding urban runoff infiltration and groundwater quality protection. This discussion needs to be re-considered in the context of studies that suggest that the threat to groundwater may be overstated. Nightingale (1987) examined the impact of urban runoff on water quality beneath five retention/recharge basins in Fresno as part of NURP. He concluded that "no significant contamination of percolating soil water or groundwater underlying any of the five basins has occurred for the constituents monitored in the study." More recently, the Los Angeles Basin Water Augmentation Study (2005) has specifically examined the fate and transport of urban runoff-borne pollutants by monitoring storm water quality as it infiltrates through the soil to groundwater. The data collected during this study showed no immediate impacts, and no apparent trends to indicate that storm water infiltration will negatively impact groundwater.

In Summary: Regarding urban stormwater discharges, it has been observed that:

- Impacts to water quality in terms of chemistry tend to be transient and elusive, particularly in streams;
- Impacts to habitat and aquatic life are generally more profound and are easier to see and quantify than changes in water column chemistry;
- Impacts are typically complex because urban stormwater is one of several sources of adverse impact including agricultural and non-urban area runoff, and
- Impacts are often interrelated and cumulative. For example, the condition of an urban stream system's biological resources reflects both degraded water quality and hydromodification.

Prefacing the Discharge Characterization discussion with an equivalent summary would help balance the chronological presentation of information that has the effect of perhaps overly connoting the significance of urban stream chemistry.

Urban Runoff Management Programs (p.34)

Sweeping of Municipal Areas: Street sweeping was essentially discredited as a BMP after the 1983 NURP report. However, since that time technological advances, specifically the development of vacuum assisted dry sweepers, have led to street sweeping as a practice that can potentially be effective in improving water quality. For example, RWMWD (2005) reports a number of studies that show regenerative air and vacuum sweepers capable of 70% total suspended solids (TSS) removal. Higher rates of TSS recovery are reported by Bannerman (2007).

On the specific issue of effectiveness and the relative significance of street sweeping frequency, frequency is clearly subordinate to other considerations. The Center for Watershed Protection (2002) notes that "arguably the most essential factor in using street sweeping as a pollutant removal practice is to be sure to use the most sophisticated sweepers available." The Center also notes the ability to regulate parking as another important aspect. Martinelli (2002) concludes that "…freeway sweeping with a high efficiency sweeper can be a BMP for the control of stormwater runoff pollutant…" and that his study supports the purchase and use of high efficiency sweepers. [These findings are consistent with the current and proposed 2007 DAMP.]

The significance of the technology is also a recurrent message in the extensive annotated bibliography of street sweeping studies in RWMWD (2005). RWMWD notes street sweeping effectiveness begins first with the choice of the right equipment. Other important variables include the timing of sweeping in relation to rainfall events and the speed of sweeper operation. Where frequency has been examined, the Center for Watershed Protection also observes that efficiency at greater frequencies than weekly declines because of (1) only small incremental gain and (2) higher removal could be obtained on residential streets versus heavily traveled roads. This finding contradicts CASQA's (2002) recommendation to increase frequency in high traffic areas.

It is clear from a review of the available literature there is no robust technical justification for working to try to optimize street sweeping based on traffic counts. Consequently, while street sweeping will continue to be a focus of the Permittees efforts with respect to pollutant load reduction efforts. The requirement to try to optimize frequency based upon traffic counts needs to be deleted from the Order.