Stormwater Runoff Water Quality Science/Engineering Newsletter
Devoted to Urban/Rural Stormwater Runoff
Water Quality Management Issues

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This issue of the Newsletter is devoted to a presentation of the US Environmental Protection Agency Environmental Appeals Board, Washington, DC February 2002 Order regarding the government of the District of Columbia municipal storm sewer system's need to comply with water quality standards in urban stormwater runoff. In August 2000 a petition was filed by "Friends of the Earth and Defenders of Wildlife" to require that the municipal separate storm sewer system of the District of Columbia achieve numeric limits to control pollutant discharges and to meet the District's water quality standards in its urban stormwater runoff rather than meeting BMPs that have been applied to this runoff by the District. The appeal was made of a US EPA Region III NPDES permit for stormwater runoff issued to the government of the District of Columbia. This permit requires that the District use various BMPs to control pollutant discharges toward attaining the District's water quality standards. The Petitioners argued that US EPA Region III should issue a NPDES stormwater permit to the District that requires compliance with water quality standards.

The Appeals Board denied the petition with respect to having to achieve water quality standards in the urban stormwater runoff; however, it remanded the permit back to the US EPA Region III, based on the fact that the Region failed to show that the selected BMPs will ensure compliance with water quality standards. The Board was concerned that the Region had not properly evaluated whether the BMPs being allowed were making reasonable progress toward achieving water quality standards in the stormwater runoff. Remanding the permit back to the Region will apparently set in motion a required assessment of whether conventional BMPs that are often used for urban stormwater runoff management can be expected to control potential pollutants in the stormwater runoff as part of an overall water quality management program to ultimately achieve water quality standards in this runoff.

The issue of having to achieve water quality standards in urban stormwater runoff is a key issue in regulating the potential water quality impacts of chemicals and pathogen indicator organisms in municipal and highway stormwater runoff. This issue has been discussed in previous Newsletters, such as Volume 1 Nos. 2, 3 and 5, and Volume 2 No. 2. These Newsletters are available from www.gfredlee.com, with the link to the Newsletters provided near the bottom of the first page.

The syllabus (summary) of the US EPA Appeals Board Order is appended to this Newsletter. The complete Order (50 pages) covers a number of other topics pertinent to regulating urban area and highway stormwater runoff water quality impacts. A copy of this Order can be made available via email upon request from gfredlee@aol.com.

The recent US EPA Appeals Board ruling follows on to a 1998 Ninth Circuit Court ruling regarding the need for Arizona municipal stormwater NPDES permits to require achieving water quality standards in the stormwater runoff. Newsletter Volume 2 No. 2, issued on October 16, 1999,

presented a review of the Ninth Circuit Court ruling. That ruling determined that the US EPA Region IX had discretionary authority to determine when NPDES-permitted urban stormwater runoff must be treated/managed to control violations of water quality standards at the point of runoff. While the current US EPA national stormwater runoff water quality management program requires that NPDES-permitted urban stormwater runoff must ultimately meet water quality standards in the runoff, the date of this compliance has not yet been established. The recent US EPA Appeals Board ruling reaffirms this position, but may make a significant step toward implementing the BMP ratcheting-down process, where under the current regulatory approach, violations of a water quality standard in urban stormwater runoff must lead to improved BMPs so that ultimately, through ratcheting-down, water quality standards will be achieved.

Environmental groups have been concerned that the BMP ratcheting-down process is not being adequately implemented. In many areas, little progress has been made over the past 10 years in controlling violations of water quality standards associated with urban stormwater runoff. While in some areas, especially in new development, conventional BMPs, such as grassy swales, detention basins, etc., are being installed, it is well known that these conventional BMPs will not achieve the degree of treatment needed to prevent violations of water quality standards in urban area and highway stormwater runoff. Newsletter Volume 3 No. 2 issued on May 19, 2000, provides information on the expected ability of conventional BMPs to remove potential pollutants from urban stormwater runoff.

As discussed in previous Newsletters, the conventional BMPs that are being used are not designed to control violations of water quality standards. Their design is based primarily on hydraulic considerations with little regard to the real potential pollutants, such as dissolved heavy metals, that are present in urban stormwater runoff at concentrations above worst-cased-based US EPA water quality criteria and state standards based on these criteria. While under low flow conditions a detention basin can remove substantial amounts of particulate heavy metals that are present in urban area and highway stormwater runoff, particulate heavy metals, such as copper, zinc, cadmium and lead, are not regulated in ambient waters by the US EPA, since they have been found to be in non-toxic forms. On the other hand, the dissolved forms of these heavy metals are potentially toxic. These forms, however, are often poorly removed by conventional BMPs.

Previous Newsletters have provided information on the fundamental problem with achieving water quality standards in urban area stormwater runoff. The problem is the high cost of collection and treatment of urban area stormwater runoff so that the constituents in the treated runoff do not cause or contribute to violations of water quality standards at the point of discharge to ambient waters. The installation of conventional BMPs in developed areas is projected to cost from $1 to $3 per person per day for the population served by these areas. Most of this cost is associated with acquisition of property. Advanced wastewater treatment BMPs which could achieve the treatment needed to control potential pollutant concentrations in urban stormwater runoff so that the runoff-associated constituent does not cause or contribute to violations of water quality standards at the point of discharge are projected to cost from $5 to $10 per person per day for the population served. These costs are the primary reason why regulatory agencies are not aggressively implementing the BMP ratcheting-down process to achieve water quality standards in NPDES-permitted urban stormwater runoff.

The author, in previous Newsletters and in his professional papers, has repeatedly stressed the importance of the regulated community, environmental groups and the regulatory agencies working together to define the degree of treatment of urban area and highway stormwater runoff needed to protect the designated beneficial uses of the receiving waters for the runoff. It is well understood by those who are familiar with how the US EPA water quality criteria are developed (based on worst case assumptions) that these criteria and standards derived from them tend to significantly over-regulate urban area and highway stormwater runoff-associated constituents. Applying US EPA worst-case-based water quality criteria and state standards to urban area stormwater runoff leads to the need to construct and operate treatment works that are far more costly than those needed to protect designated beneficial uses of most receiving waters for urban stormwater runoff.

While this situation is well understood, almost no progress has been made by the municipalities and the regulatory agencies in developing the information base that is needed to define appropriate BMPs to manage the real significant water quality impacts that arise from pollutants in urban area and highway stormwater runoff. Because of their high cost, there will be few situations where treatment BMPs can be implemented. It is likely that source-control BMPs will become the main stay for controlling violations of appropriately based water quality standards.

A basic problem with the current stormwater runoff water quality management program at the federal and state level is that the current stormwater runoff water quality monitoring programs are largely a waste of public funds in addressing issues that need to be addressed as part of managing the water quality impacts of urban area and highway stormwater runoff-associated constituents. There is controversy today about the appropriate approach to follow in developing an urban NPDES permit-based stormwater runoff water quality monitoring program. In some areas, such as for MS4s in California, detailed monitoring of several storms per year has been undertaken for approximately five to 10 years. These monitoring programs have shown that there are some constituents, such as copper, lead, occasionally cadmium, aquatic life toxicity, etc., that are present at concentrations in the runoff waters which could cause or contribute to violations of water quality standards/objectives. Some MS4 municipalities and regulatory agencies are justifiably questioning what new information is being gained from a substantial expenditure for continued edge-of-the-pavement monitoring of stormwater runoff.

It is my recommendation that the routine end-of-the-pipe/pavement monitoring of urban and highway stormwater runoff be curtailed, in favor of using these funds, plus additional funds derived from the MS4s, to conduct detailed studies at selected sites of the water quality impacts of the regulated, as well as unregulated, constituents in the stormwater runoff that have the potential to impair the designated beneficial uses of the receiving waters for the runoff. As discussed in my editorial in the May/June 2001 issue of *Stormwater*, the current US EPA approach of trying to regulate urban stormwater runoff as though it were an NPDES-permitted municipal or industrial wastewater, is inappropriate and cannot possibly succeed, based on the high cost of dollars per person per day for the community to purchase the land, install the collection, storage and treatment works, and operate and maintain these works so that the discharges of treated stormwater do not cause or contribute to exceedances of water quality standards at the point of discharge by any amount more than once every three years (i.e., current wastewater discharge requirements).

It will be important that the water quality impact studies focus on evaluating the existing beneficial use impairment of the receiving waters for the stormwater runoff and determine where these waters are impaired through toxicity-caused alteration of aquatic life assemblages, excessive concentrations of bioaccumulatable chemicals, impairment of domestic water supply water quality or impaired contact recreation/beach closures, etc. Basically, the Evaluation Monitoring approach developed by the author and his colleagues, which focuses not on determining concentrations of a constituent such as copper, but on copper impacts to aquatic life, is a technically valid, readily implementable approach that can be used to appropriately regulate urban stormwater runoff impacts on the beneficial uses of receiving waters.

Where there are exceedances of water quality standards at the point of discharge, there is need to determine whether these exceedances are "administrative," related to the overly protective nature of most water quality criteria/standards when applied to urban area and highway stormwater runoff, or whether they represent real impacts on the beneficial uses of the receiving waters. For those situations where the MS4 or highway department is practicing stormwater infiltration as a water quality BMP, the Evaluation Monitoring approach would involve monitoring of groundwater near the infiltration point to determine if the constituents in the stormwater runoff are polluting the groundwaters/impairing their use.

The receiving water impact studies should be conducted in a stakeholder-developed consensus approach, where the regulatory agencies, environmental groups, dischargers and others work together to develop an appropriate assessment of the beneficial use impairment of the receiving waters caused by the stormwater runoff. This approach will require that the MS4s fund environmental groups and others so that they can participate in the stakeholder process and hire the necessary consultants who will provide them with a valid assessment of technical issues that are important to them.

An important part of this impact assessment is the development of funds that can be used to search for unidentified, unknown-caused problems associated with urban and highway stormwater runoff. The search for unknown or new water quality problems should be repeated every five years to address new or expanded-use constituents that are introduced into urban stormwater runoff at higher concentrations. Further, the Evaluation Monitoring assessment of impairment of beneficial use caused by urban stormwater runoff-associated constituents should consider the physical impacts on habitat associated with the stormwater runoff. This is especially important in urban streams where the urbanization of an area greatly increases the amount of runoff in the receiving waters.

It would not be necessary to monitor every stormwater runoff discharge point for its impacts. Representative situations can be selected to evaluate, for that type of situation, the potential impacts of stormwater runoff-associated constituents. Further information on Evaluation Monitoring is available from Jones-Lee and Lee (1998).

References

Jones-Lee, A. and Lee, G. F., "Evaluation Monitoring as an Alternative to Conventional Water Quality Monitoring for Water Quality Characterization/Management," Proc. of the NWQMC National Conference "Monitoring: Critical Foundations to Protect Our Waters," US Environmental Protection Agency, Washington, D.C., pp. 499-512, (1998), available from www.gfredlee.com, in the Water Quality/Stormwater section.

US EPA Water Quality Criteria and Standards Newsletter

The US EPA Office of Water, Washington, D.C., has recently issued its Fall-Winter 2001 Water Quality Criteria and Standards Newsletter. The Newsletter is an important source for information on the US EPA's current efforts to develop new water quality criteria and to revise criteria, as well as implementation approaches. It frequently contains information that is pertinent to regulating urban area and highway stormwater runoff.

The most recent Newsletter contains information on a National Water Quality Standards Data Base, publication of Nutrient Criteria, the new Beach Act covering US EPA's water quality for bacteria, National Methylmercury Fish Consumption Advisory, Aquatox which is a simulation model for aquatic ecosystems, Estuarine and Coastal Marine Waters: Bioassessment and Biocriteria Technical Guidance, Stressor Identification Document, Final Revisions to the Methodology for Deriving Ambient Water Quality Criteria for the Protection of Human Health and New Ambient Water Quality Criteria Documents for Tributyltin (TBT), Atrazine, Methyl Tertiary-Butyl Ether (MTBE) and Nonylphenol, and Streamlined Water-Effect Ratio Procedure for Discharges of Copper. While the US EPA states in its Newsletter that "*the Streamlined Procedure is recommended only for situations where copper concentrations are elevated primarily by continuous point source effluents*," it should also be applicable to urban stormwater runoff situations where, through the use of the Streamlined procedure, it would be possible to adjust the copper criterion/standard for the detoxification of dissolved copper due to its complexation with organic matter present in discharge and receiving waters.

This Newsletter is available to anyone interested by sending your name and address to:

Environmental Protection Agency
Standards & Health Protection Division (4305)
Attn: Micki Treacy
1200 Pennsylvania Avenue, NW
Washington, DC 20460

(Slip Opinion)

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BEFORE THE ENVIRONMENTAL APPEALS BOARD
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C.

In re:	)	
Government of the District of Columbia Municipal Separate Storm Sewer System	)	NPDES Appeal Nos. 00-14 & 01-09
NPDES Permit No. DC 0000221	)	

[Decided February 20, 2002]

ORDER DENYING REVIEW IN PART
AND REMANDING IN PART

Before Environmental Appeals Judges Scott C. Fulton, Edward E. Reich, and Kathie A. Stein.

GOVERNMENT OF THE DISTRICT OF COLUMBIA
MUNICIPAL SEPARATE STORM SEWER SYSTEM

NPDES Appeal Nos. 00-14 & 01-09

ORDER DENYING REVIEW IN PART AND REMANDING IN PART

Decided February 20, 2002

Syllabus

In April 2000, U.S. EPA Region III (the "Region") issued a National Pollution Discharge Elimination System ("NPDES") permit, number DC 0000221 (the "Permit"), to the Government of the District of Columbia (the "District"). The Permit authorizes storm water discharges from the District's municipal separate storm sewer system ("MS4"). The Permit requires the District to use various best management practices ("BMPs") to control pollutant discharges in furtherance of attaining the District's water quality standards. The required BMPs are set forth in the District's storm water management plan ("SWMP"), which is incorporated into the Permit by reference. On August 11, 2000, Friends of the Earth and Defenders of Wildlife ("Petitioners") timely filed a petition requesting that the Environmental Appeals Board review the Permit (the "Petition") (the Petitioners also filed a second petition after the Region withdrew and reissued a portion of the Permit).

HELD: The Permit is remanded to the Region for further analysis and explanation in a number of areas. Petitioners and the Region have grouped their arguments in the nine categories described below, and the Board's holding on each is summarized as follows:

1. Compliance with Water Quality Standards. Petitioners object to the Permit's conditions that specify BMPs, rather than numeric limits, to control pollutant discharges and meet the District's water quality standards. The Petitioners' general argument that the Region violated an affirmative duty to set numeric limits is rejected, in keeping with the Board's decision on similar issues in *In re Ariz. Mun. Storm Water NPDES Permits*, 7 E.A.D. 646 (1998). The Petitioners' more specific argument that numeric limits could have been set equal to the numeric water quality standards of the receiving waters is also rejected on the grounds that Petitioners failed to demonstrate that they raised this argument and the cited authority during the public comment period. The Petitioners' argument that the Region should have included narrative provisions requiring compliance with water quality standards is also rejected on the grounds that there is no statutory or regulatory provision that requires use of narrative limits.

There is merit, however, to Petitioners' argument that the Region failed to show that the selected BMPs will be adequate to ensure compliance with water quality standards. First, it is not clear that the Region's determination that the specified BMPs are "reasonably capable" of achieving water quality standards fully comports with 40 C.F.R. § 122.4(d), which prohibits issuing a permit "when imposition of conditions cannot *ensure* compliance with the applicable water quality requirements of all affected states." (emphasis added). Second, even accepting the Region's suggestion that ensuring compliance was what the permit writer has in mind, there is nothing in the record, apart from the District's section 401 certification, that supports the conclusion that the Permit would, in fact, achieve water quality standards. Without such record support the Board cannot conclude that the approach selected by the Region is rational in light of all the information in the record. The Region does not dispute that the Region cannot rely exclusively on the District's section 401 certification, at least in a circumstance like this one in which there is a body of information drawing the certification into question. Accordingly, additional record support for the Region's determination is required, and the Permit is remanded for further analysis in this regard.

2. Hickey Run. Petitioners argue that the Permit is deficient in that (a) it contains an aggregate numeric effluent limit for four outfalls into Hickey Run instead of a limit for each outfall and (b) it contains monitoring requirements that the Petitioners allege are inadequate. The regulation cited by Petitioners contains the disjunctive phrase "outfall or other discharge point" and therefore must be read as contemplating some flexibility in appropriate circumstances to frame effluent limits at a discharge point other than the outfall. There is no clear error in the Region's conclusion that, in the unique circumstances of this case, an aggregate limit fixed at a point proximate to four closely connected outfalls was appropriate. However, the proposed delayed development of the Hickey Run monitoring requirements is problematic in two respects. First, both 40 C.F.R. § 122.48(b) and 40 C.F.R. § 122.44(i) require that certain monitoring conditions be included in all permits. The Region has not explained how its issuance of this Permit, which does not at its inception contain monitoring requirements for Hickey Run, comports with the regulatory directive that all permits include these conditions. Second, while the monitoring requirements are expected to be added at the time of the District's first annual report and thus should be in place before the Hickey Run effluent limit becomes effective, the Board finds it troubling that this would be accomplished through minor permit modification without notice and opportunity for public comment. Given that the regulations appear to contemplate that monitoring requirements ordinarily be included as up-front permit conditions -- conditions which would thus ordinarily be subjected to public notice and comment -- and there does not appear to be anything in the regulations allowing for minor permit modifications that authorizes use of a minor permit modification in this setting, the Board concludes that this Permit does not meet minimum regulatory requirements and that remand of these parts of the Permit is necessary.

3. Reductions to the "Maximum Extent Practicable". Petitioners' argument that the Region erred in determinating that the Permit will reduce storm water pollutant discharges to the maximum extent practicable ("MEP") as required by CWA § 402(p) is

rejected. The record demonstrates that the Region duly considered the issue raised by Petitioners in their comments, and the record does not lead to the conclusion that any additional BMPs beyond those identified in the Permit are practicable in this case.

4. Deferral of Complete Program. Petitioners' arguments that the Permit's provision for upgrading the SWMP indicates that the Permit is inadequate at its inception is rejected. The evaluation and upgrade requirement incorporates into the Permit a process for adjusting the Permit's terms and conditions to take into account new knowledge and changed circumstances affecting practicality of BMPs. This adjustment process does not imply that the Region has failed to properly assess MEP at the time of the Permit's issuance; it simply recognizes that what is practicable will change over time and that the Permit should be adaptable to such changes.

5. Failure to Require Compliance Within 3 Years. Petitioners' argument that the Permit fails to require compliance within the three-year time period set forth in CWA § 402(p)(4) is rejected. The Permit does not authorize a deferred implementation of the BMPs that were determined to be MEP at the time of issuance of the Permit; instead, the Permit simply recognizes that what is practicable will change during the Permit's term and that upgrades of the Permit's requirements should not be delayed until the Permit is renewed.

6 & 7. Storm Water Implementation Plan and Funding. Petitioners' argument that the "cost benefit and affordability" analysis required by Part III.E of the Permit violates the CWA is rejected. Information concerning a "cost benefit analysis" of the various BMPs is relevant to the upgrading of the SWMP and BMPs. Cost benefit information, however, is not relevant for purposes of determining compliance with the Permit's requirement that the District implement the BMPs in its current SWMP. The Permit recognizes this distinction and states that "[a]ffordability cannot be used as a defense for noncompliance."

8. Modifications. The Board addresses Petitioners' various arguments regarding deficiencies in the Permit's modification provisions as follows. The Board adopts the Region's interpretation that the reference in the Permit to 40 C.F.R. § 122.63 serves to limit the allowable extensions of interim compliance dates undertaken as minor modifications to "not more than 120 days after the date specified in the existing permit and [provided that it] does not interfere with attainment of the final compliance date requirement." 40 C.F.R. § 122.63(c).

The Region did not err in characterizing the deadlines set forth in Part III.A and Part III.B.10 of the Permit as "interim compliance date[s] in a schedule of compliance" that may be modified by minor modification as set forth in 40 C.F.R. § 122.63(c). On the other hand, Permit Parts IV.A.1, VIII.A, IX.A.5 & IX.C, which together authorize changes in monitoring location by minor modification, cannot be squared with 40 C.F.R. § 122.63(c). That section only authorizes the addition of new monitoring requirements by minor modification; it does not authorize a change in monitoring location by minor

modification. Accordingly, any such changes must be made through the formal "notice and comment" procedures of section 122.62. Therefore Permit Parts IV.A.1, VIII.A, IX.A.5 & IX.C are remanded for revision.

Petitioners object to the Permit's conditions that allow the Region to "approve" schedules for developing and implementing an enforcement plan (Petition, Part III.B.11), to approve certain additional SWMP program activities (Petition, Part III.B.12), and to approve, disapprove or revise the District's Annual Reports and Annual Implementation Plans (Petition, Part III.E). It is unclear whether these provisions are simply intended to reference EPA actions in administering the Permit that do not themselves result in changes to the Permit (or the SWMPs subsumed within the Permit) and thus should not be subjected to formal notice and comment procedures, or whether these provisions, referenced as they are in the minor modification section of the permit, are intended to serve as a basis for substantive changes to permit conditions. The Region is directed on remand to clarify the extent to which these provisions in the Permit allow for changes in permit conditions by minor modification.

9. Waivers and Exemptions. The Petitioners argue that the District's storm water regulations, incorporated into the Permit by reference, require the granting of various waivers or exemptions that are in conflict with the CWA and EPA rules. Because the Region's Second Response to Comments does not challenge the validity of Petitioners' Comments, but rather tends to treat them as meritorious, and because the Region failed to make changes to the Permit or to otherwise address Petitioners' concerns regarding these waivers and exemptions, this portion of the Permit is remanded to the Region to either make appropriate changes to the Permit or to explain why the Petitioners' comments do not merit such changes.

Before Environmental Appeals Judges Scott C. Fulton, Edward E. Reich, and Kathie A. Stein.