

Guest Editorial,

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Developing Appropriate Stormwater Runoff Water-Quality Management Programs



US EPA is forcing regulation of urban area and highway stormwater runoff into the domestic/ industrial wastewater NPDES permit mold.

This approach will ultimately require the control of regulated constituents in stormwater runoff so that they do not cause or contribute to exceedance of water-quality standards by any amount more than once every three years. Implementing this approach results in large-scale expenditures for additional wastewater treatment works needed to meet water-quality standards at the edge of a mixing zone, if allowed.

The funding burden for the necessary and unnecessary treatment to protect receiving water beneficial uses has been passed on to the public in increased wastewater disposal fees and/or the cost of industrial production. This approach focuses on achieving water-quality standards and control of chemical concentrations to achieve standards rather than controlling chemical impacts. Although EPA's administration has characterized it as "highly successful," this approach does not protect beneficial uses of receiving waters at the lowest cost. This chemical concentration-based approach tends to over-regulate the regulated constituents (those for which water-quality

standards exist) and largely ignores pollutants without these standards, even though these constituents, too, can impair beneficial use.

Problems With Current Approach

Applying the NPDES permit approach to urban and highway stormwater runoff is not workable for several reasons. Many constituents of concern, such as heavy metals, are present in nontoxic, nonavailable forms and have a short period of aquatic life exposure during stormwater runoff events. Therefore, applying EPA's worst case-based criteria or the state standards based on these criteria can be grossly overly protective of beneficial uses of the receiving waters.

Another reason this approach is not applicable to urban stormwater runoff is that the stormwater runoff management agencies do not have the financial structure and the captive audience to obtain funding to build and operate the collection, storage, and treatment works that is necessary to implement this approach. These costs can be \$1 - \$3 per person per day for retrofit of conventional BMPs, such as detention basins and grassy swales, and these BMPs will not "treat" urban and highway stormwater runoff to meet EPA worst case-based water-quality criteria and the related state standards. To fully comply with these standards will cost, on a retrofit basis, on the order of \$5 - \$10 per person per day for the

population served by the stormwater management system. The approach is cost-prohibitive.

Need for a Different Approach

The first step in finding an alternative approach is to change the focus from chemical concentration control to evaluation of chemical impact on beneficial uses. Basically there is an urgent need to determine the significant adverse impacts of urban area and highway stormwater runoff on the beneficial uses of the receiving waters for this runoff. Several years ago, my colleagues and I, as part of developing an alternative approach for assessing the impacts of highway stormwater runoff, developed an Evaluation Monitoring approach, which shifts the emphasis from trying to extrapolate from the chemical characteristics of the runoff waters to specifically examining the actual impacts the runoff has on beneficial uses of the receiving waters. Rather than measuring copper in stormwater runoff from urban area streets and highways and finding that the copper concentrations exceed the worst case-based water-quality standards, Evaluation Monitoring assesses whether the stormwater runoff is toxic. If toxicity is found, is this toxicity significantly adverse to beneficial use? If so, then the cause of this toxicity is determined and control programs are developed to control the constituents causing pollution at the source. This is a technically valid, cost-effective approach for developing BMPs to control the significant water-quality impacts associated with chemical constituents in urban area and highway stormwater runoff.

Stormwater management agencies, regulatory agencies, environmental groups, and the public need to begin to work together to define, through appropriately conducted receiving-water impact studies,

the real water-quality use impairments for urban area and highway stormwater runoff. Where such impairments are found, appropriate source controls should be implemented. Adopting this approach will lead to the use of public and private funds to address real, significant urban area and highway stormwater runoff water-quality problems that need control. Information on the Evaluation Monitoring approach is available at www.gfredlee.com.

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